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DESIGNING ORGANIZATIONS TO IMPLEMENT E-COMMERCE
INTEGRATING OBSERVATION AND THEORY

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INTRODUCTION

The objective of this research project is to understand how "clicks and mortar" companies successfully implement business-to-business electronic commerce. Specifically, how do they use (or circumvent) their information technology[1] (IT) group when building e-commerce applications? Is it more effective to outsource the development or to do it in house? Should the existing IT group be responsible for the development or should a separate unit be created? We hope to answer these questions so that businesses yet to launch e-commerce can learn from the experiences of those that preceded them.

Phase I of this research focused on four firms that had successfully implemented e-commerce development. We not only explored how the firms approached the development, but also looked at the organizational characteristics that seemed to influence the approach each one took. Our earlier paper (Grant and Huston, 2000) described the four companies and their implementations in detail. From those cases studies, we derived a model we believe will help explain and suggest appropriate implementation approaches for businesses in general. In this paper, we look at the work of other researchers and writers, comparing and contrasting their ideas to ours. The paper begins with a brief overview of the model we derived, followed by a review of related theory and observation by others. We conclude by discussing the next stages in the research project.

BASICS OF THE CONCEPTUAL MODEL

The four companies we studied in Phase I used four different approaches to implementing e-commerce. Kenonic Controls, for example, began with a project-based design, using a small team drawn from the IT group. Because Kenonic's application began as a client project and the IT group had strong systems skills, the company used existing staff and structures for its development. Eventually, however, the project team became a product team. The membership of the team changed little, and the employees were identified with the IT group. But they are clearly charged with the development and enhancement of e-commerce products and subject to product (rather than project) management procedures and standards.

Chubb Insurance's IT organization had been building systems for internal users for more than 30 years. They were transaction-focused and tailored to the needs of specific functional areas. In developing its e-commerce model, Chubb went with a dual structure. The technology group handled the technical aspects of web implementation. It was responsible for developing and maintaining infrastructure and for establishing standards. At the same time, the business opportunity identification and development were handled by an internal, non-IT, group.

Boise Cascade Office Products' internal IT group was strong in efficiency and maintenance. E-commerce staffing, training, system design and all related activities fell under the aegis of Marketing. BCOP believed that the strategic significance of e-commerce had grown with each enhancement. So did the need for a marketing perspective on the introduction and implementation of the systems. Hence, the company created a new unit outside IT and hired web technical expertise from outside the company into the new unit.

Grand & Toy's IT group was strikingly similar to that of its parent, Boise Cascade. While smaller, the group represented about the same proportion of total employees. It demonstrated the same strength in building and maintaining efficient transaction-processing systems. Yet G&T saw web-based e-commerce

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[1] Some companies and authors distinguish between the terms "Information Technology (or IT)" and "Information Systems (or IS)", but there is inconsistency in their use. We have chosen to use the term Information Technology (IT) whenever possible to refer to any activities and organizational units related to information systems development, implementation, operation and/or maintenance. However, where "information systems (or IS)" appears, it is interchangeable with IT.

as primarily a new delivery mechanism for existing services, while BCOP saw it as opening up significant new business opportunities. Thus, G&T chose to outsource, rather than build, its web systems.

The data gathered in the Phase I interviews suggests the two dimensions shown in the model of Figure 1. First, did the company see e-commerce as an opportunity to create new businesses or business models? Or did the firm see e-commerce as a technical application using new technologies to deliver existing products and services? Kenonic and BCOP, for example, saw the Web as a platform for developing entirely new products or services. G&T, on the other hand, saw it primarily as a means to deliver existing products and services. Chubb viewed it both ways.

Second, what was the company's existing IT competence? Was IT noted for its leading edge skills, business orientation and ability to innovate – the innovation perspective? Or was it primarily involved in providing technical support to well-established systems with well-understood technologies – the operations perspective? Kenonic specialized in leading edge systems development based on complex and evolving technologies. E-Commerce executives at BCOP and G&T described their IT groups as excellent at maintaining legacy and mainframe systems. Those groups were not proficient in web-based technologies and showed little interest in improving skills in that area. Chubb had a large organization skilled in traditional technologies and systems, but had also spawned a subset of technical staff who developed sophisticated technical skills in e-commerce.

Figure 1: The Conceptual Model
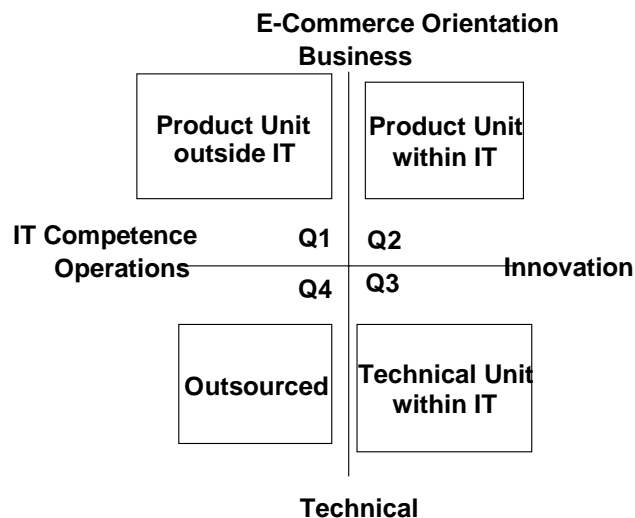
The model shown in Figure 1can be used first to predict the structure we will see in successful firms. Firms that fall into Quadrant 1 (business/operations) will rely on an in-house e-commerce group, separate from the traditional IT organization. Although the orientation and skill set of the IT group isn't consistent with the needs of e-commerce, the firm will resist outsourcing a significant new business opportunity. Firms in Quadrant 2 (business/innovation), on the other hand, are well positioned to create an e-commerce group under the umbrella of the company's IT group. Firms in Quadrant 3 (technical/innovation) will be most effective if e-commerce initiatives are treated as projects within the existing IT organization. The applications do not represent dramatically new strategic initiatives that would call for a separate organization within IT. Instead, they can be handled by the company's IT group within the framework of

support for current applications. Finally, those in Quadrant 4 (technical/operations) are best served by contracting out the e-commerce development. Without the leading edge skills in-house, the firm will be unable to implement e-commerce projects quickly. At the same time, the applications are unlikely to have such strategic impact that the company would be concerned about bringing them to the attention of a third party. The firm is also unlikely to build a new in-house group to handle implementation of a new channel. Hence the suitability of outsourcing.

Another use of the model is normative. That is, we may be able to use it with companies yet to implement e-commerce. The model, if robust, would use a specific company's orientation and IT competence to illustrate which approach that company should adopt. The integration of related work with our earlier cases is the first step in confirming the generality of the model and its usefulness as a normative tool.

REVIEW OF LITERATURE

E-commerce is still new, and there is comparatively little research that deals directly with the kind of implementation questions we are studying. However, work in related fields does offer insights for our project. In this section, we look at the literature in from three perspectives. First, we discuss three frameworks with interesting parallels to the model we have derived. Next, we look at empirical work related to our "E-Commerce Orientation" dimension. Finally, we discuss empirical work related to the "IT Competence" dimension.

A. Additional supporting frameworks

Our model focuses on two organizational elements as factors in e-commerce structuring. The first, e-commerce orientation, is directly related to the firm's strategy regarding whether a particular IT function is considered core. The second, IT competence, considers the overall strength of the organization's IT group. Outsourcing literature is especially relevant in assessing these characteristics. Early outsourcing work concentrated on outsourcing as a low-cost and low-pain option. Recent studies consider many more factors into account when weighing whether to outsource IT services. We will begin by examining three outsourcing frameworks with parallels to our model.

Industry watchers have attributed IT outsourcing to two primary factors: a shift in business strategy and the perceived uncertainty about IT's value. Many companies abandoned their diversification strategies – once pursued to spread risk – to focus on core competencies. From 1991 to 1994, Lacity et al. (1996) investigated whether IT outsourcing had delivered on its promise by studying 62 IT sourcing decisions made by 40 US and European companies. They found that many of the companies that outsourced all IT services should have retained some of those activities in-house. Companies that didn't outsource at all and ignored the external services market also had problems.

Most of the companies that had successful experiences with IT outsourcing used a reasoned, incremental, and selective approach to outsourcing (known variously as `selective,' `smart,' or `right' sourcing). Figure 2 depicts the framework derived from the Lacity work. Critical differentiators were factors that were critical to operations but also helped to distinguish the business from its competitors. Critical commodities were critical to business operations but failed to distinguish the business from its competitors. Useful commodities provided incremental benefits to the business but failed to distinguish it from its competitors. Useful differentiators distinguished the business from its competitors in a way that was not critical to success.

Other elements of the Lacity et al. work are especially relevant to e-commerce research. Outsourcing technically immature activities, they said, engenders significant risk, primarily because it is difficult to define system requirements to external vendors. At present, e-commerce can be considered an immature activity by Lacity et al.'s definition. First, it is a new and unstable technology. Second, it is often adopted by businesses little experience with the technology, although it may be better established elsewhere. that may be better established elsewhere. Third, for many businesses, it also entails radically new uses of familiar technologies. We would further emphasize that technology risk goes up when a business embarks on a radically new use of a radically new technology.

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Figure 2: Selecting IT outsourcing candidates (Lacity et al. 1996)

	Critical	Best Source	Insource
Contribution of IT Activity to Business Operations	**Useful**	Outsource	Eliminate or migrate
		Commodity	**Differentiator**
		Contribution of IT Activity to Business Positioning	

Another technical factor affecting risk is the degree of integration with other business processes and technical systems. When technical integration with other business processes is high, the risks of outsourcing increase (Lacity et al., 1996). If e-commerce is the vehicle for new products and services (i.e., a new business model), implementation will require considerable integration with other business processes and technical systems. Thus, risk may increase if it is not developed in-house. Lacity et al. concluded that different situations require different outsourcing decisions.

Earl (1996) also addressed the issue of selective or `smart' outsourcing of IT services. He argues that companies should first ask why they should not **insource** IT services. His conclusions were based on eleven risks of outsourcing, ranging from inexperienced staff to indivisible technologies. Businesses often outsourced on the false assumption that it would be easier and less expensive than managing in-house development. This was not always true. Earl said that the objectives of outsourcing should be:
- a desire to focus on the business, not on IT (i.e., core systems, not on the total application portfolio);
- subcontracting responsibilities for operating and maintaining legacy systems; and
- cost cutting.

The first of these applies most directly to our model – in one sense, our vertical dimension asks whether the firm sees e-commerce as a core system or a support function.

Figure 3: IT Sourcing Strategies Framework (Earl, 1996)

	Core	Market test	Insource
Business Value of IT	**Commodity**	Outsource	Smart source
		Anxieties	**Satisfaction**
		Operational Performance of IT	

Earl's model (Figure 3) closely mirrors our own. Along one dimension he asked if the company saw IT as a core competency or as a commodity. On the other, was the organization satisfied with its IT performance or were there particular anxieties and concerns? The decision to 'smart source' (or selectively outsource) IT applications depended on a firm's view of the particular application with regard to the organizational strategy and IT capabilities. We hypothesize that sourcing e-commerce development will hinge on the strategic importance placed on e-commerce and the company's present IT capabilities.

We have chosen innovation vs. operations IT orientation as the horizontal dimension of our model. Underlying that choice is the belief that e-commerce represents innovation. We may be able to draw a parallel between those anchors and Earl's satisfaction/anxieties scale. If companies have innovative IT groups, they may be less anxious about the IT performance with respect to e-commerce.

Earl's framework would discourage outsourcing of information systems central to business strategy. Insourcing would be preferred. If the company placed high business value on the technology but were anxious about its IT group, market testing, or benchmarking, would let the company compare potential performance of internal and external sources. If both business value and capabilities were both low, outsourcing would be an obvious choice. Our case interviews revealed companies choosing three of Earl's four options; we did not see any instances of benchmarking. The absence of benchmarking may, in fact, reflect the time pressures facing companies – competitive pressures make it essential that companies in the upper left quadrant take action, whether internal or external, rather than spend time conducting market or benchmark tests.

Recently McFarlan and Nolan (1995) said five factors influenced outsourcing decisions:
- position on the strategic grid;
- development portfolio;
- organizational learning;
- a firm's position in the market; and
- current IT organization.

A company's position on the strategic grid (see Figure 4) and its current IT organization apply most directly to our current project, although the others may come into play later.

The strategic grid assesses two dimensions. First is the degree of the company's current dependence on information; that is, the extent to which business operations depend on reliable, real-time information processing. If the company has a high dependence on information currently, then we might expect that the IT department has matured to a level to support an innovative IT approach. Having a low current dependence on information may have produced an IT group less inclined to innovate. Where IT is not strategic, numerous factors converge to encourage an emphasis on cost cutting rather than innovation.

Figure 4: Strategic Grid (McFarlan and Nolan, 1995)

Current Dependence on Information	**High**	**Factory** Outsourcing presumption: Yes, unless company is huge and well-managed	**Strategic** Outsourcing presumption: No
	Low	**Support** Outsourcing presumption: Yes	**Turnaround** Outsourcing presumption: No
		Low	**High**
		Importance of Sustained, **Innovative Information Resources** **Development**	

The second dimension reflects the extent to which future competitive position depends on innovative computer applications. In our model, this dimension relates to whether e-commerce is as a tool to deliver the traditional products and services or as a mechanism by which to create a new business model.

The more the firm's operations depend on IT, the more sense outsourcing makes (McFarlan and Nolan, 1995). However, as firms acquire more significant systems, the strategic grid model argues that the outsourcing decision should be scrutinized more carefully. This, said McFarlan and Nolan, would be especially true when the firm had a large, technically innovative IT organization. This should also be important in deciding whether to outsource e-commerce development.

For firms in McFarlan and Nolan's 'support' quadrant, outsourcing is a definite `yes'. This corresponds loosely to our Q4, where a technical e-commerce orientation intersects with IT operations competence. The 'turnaround' quadrant presumes no outsourcing because it represents an unnecessary, unacceptable delegation of competitiveness. This corresponds to our Q1, the intersection of a business orientation for e-commerce with an operational IT. The 'strategic' quadrant also presumes no outsourcing because companies will find it hard to justify outsourcing if they are not facing a crisis of IT competence. This corresponds to our Q2 (business view of e-commerce/innovative IT group); our model suggests in-sourcing rather than outsourcing. The 'factory' quadrant loosely corresponds to our Q3, where the IT group has innovative talents but e-commerce is looked upon as simply a means to deliver existing products and services. We would suggest establishing a technical unit within the IT group rather than outsourcing. However, McFarlan and Nolan presumes outsourcing, unless the company is huge and well managed.

B. E-Commerce Orientation: Business or technical?

The frameworks described above reinforce our model as an overall framework. Other prior work addresses specific issues in each of its two dimensions. This section looks at work by other researchers relevant to the strategic importance of e-commerce. Section C, "IT Competence" reviews work related to the horizontal dimension of the model.

Grover and Teng (1993) analyzed the wisdom of outsourcing in a three-stage process. Their first level of analysis focused on the maturity of the system being considered (this is discussed in more detail in Section C below). The second stage concentrated on IT's strategic potential. Applications with strategic potential, they said, should be outsourced rarely and reluctantly. Grover, Cheon, and Teng (1996) reiterated the message that in-house development should be used for strategic systems, while outsourcing is appropriate for systems that were primarily technical and unrelated to the core business. This supports our model's representation of outsourcing as appropriate in the lower left quadrant, and suggests that it may also be feasible in the lower right.

McLellan and Marcolin (1994) reported that three-quarters of the executives they interviewed put financial motivations second to other strategic objectives when deciding whether to outsource. Firms that considered IT a core competitive capability typically managed their outsourcing relationships as alliances rather than as a buyer-supplier relationship. The alliance style of management is seen in our cases in the upper left quadrant, where Boise Cascade hired contract programmers but housed them within the company and managed them very much like employees.

Quinn (1992) said that successful businesses focused on creating advantage through a small number of core activities, while outsourcing other activities to supplier-partners. Core IT capabilities are those that a firm must possess to respond to the fundamental, recurring issues it faces over time. Thus managers must determine whether IT (and, in the present case, e-commerce) is core to the business. Feeny and Willcocks (1998) linked the idea of a strong IT staff with this concept of core competencies and the potential for IT outsourcing. They argued that managers should really focus on which IT capabilities were core to the business's future. Thus, the way a firm looked at e-commerce, whether as a technical application to deliver the same products and services, or as an opportunity to create new businesses and business models would be central to the outsourcing decision.

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Feeny and Willcocks (1998) pointed to two convergent trends facing organizations. They said organizations must either manage IT as a strategic resource or manage external IT service providers. We expect the same to hold true for e-commerce application development. Our model encompasses these two directions in Q2 and Q4. Q2 (business/innovation) clearly reflects a situation where IT is a strategic resource. Q4 (technical/operations) is where the organization will be managing outsourcing of the e-commerce development. Q1 and Q3 are not conditions where we have seen outsourcing. However, Q1 in particular may be an area where the firm must manage e-commerce as a valuable resource.

DiRomualdo and Gurbaxani (1998) described the evolution of outsourcing from a primary focus on cost reduction to an emerging emphasis on improving business performance. They highlighted three strategic intents behind the outsourcing decision: IT improvement, business impact, and commercial exploitation. The historic use of outsourcing to reduce costs fell into the category of IT improvement. However, business impact and commercial exploitation have recently emerged as significant factors for a company's outsourcing decision. Outsourcing for business impact focuses on improving IT's contribution to company performance within its existing lines of business, while commercial exploitation focuses on leveraging technology-related assets through the development and marketing of new technology-based products and services.

DiRomualdo and Gurbaxani's research revealed four levels of ambition for business impact, ranging from the modest goal of better alignment of IT resources with business needs to delivery of new IT-based business capabilities and competencies. Some organizations outsource to move their internal staff to an environment that will support the business in the future. Such organizations must then identify whether they consider e-commerce development as part of that future; this will depend on whether they view e-commerce as an opportunity to create a new business model.

Companies that engaged in outsourcing for business impact recognized the significant potential of technology to create business value (DiRomualdo and Gurbaxani, 1998). It was crucial that the internal IT organization retain ownership of the user management and IT innovation processes. Extending this to our focus on e-commerce, we would hypothesize that it would be equally important for Q1 and Q2 firms to retain control of these factors

Interestingly, DiRomualdo and Gurbaxani discovered that companies pursuing outsourcing with the strategic intent of commercial exploitation were often those with innovative information systems to begin with. They found that many of these firms came from technology intensive industries, which had mission-critical systems that were expensive to maintain and enhance. Additional expenditure on migration to new technology platforms or to exploit technological advances like the Internet were difficult to fund based on internal returns alone. Only when the broader revenue potential of the proposed innovation was taken into account did the investment become viable.

Few IT organizations had the capabilities required to exploit IT in the marketplace (DiRomualdo and Gurbaxani, 1998). Necessary capabilities included:
- the know-how to commercialize and sell IT products and services originally developed for use by a single company;
- the ability to establish new distribution channels for IT-based products and services;
- the skill to port systems to various technology platforms; and
- the wherewithal to support and enhance products and services after they are sold.

One way to gain those capabilities was through relationships with outsourcing vendors. Our model would argue that an organization could also choose to develop those capabilities in-house if e-commerce was strategic.

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Another study (Clark 1992) found that approximately 40% of firms examined had used, were using, or planned to use consultants[2], while some 30% said they would never use consulting services. These decisions were independent of firm size or industry. However, none of the managers that had used outside services said they would employ them for systems with strategic importance. It will be interesting to see if those firms looking at e-commerce development as an opportunity to create new business models are less likely to outsource than those that simply see e-commerce as a technical application.

Technology management findings in the Clark study also offer interesting insights for our project. Technology management structure was governed by three different philosophies, each of which produced a very different technological environment. The 'leading edge' philosophy, seen in a very few businesses, was most often linked to the 'technology-need pull' model. The manager attempted to develop a strong link between the business strategy and technology required to implement the strategy. Most companies (65%) had a 'lagging-edge' philosophy that prevailed with most administrative and transaction-processing systems. It was most often coupled with the 'technology push' model and was prevalent in less competitive environments. The technology in this case was directed at current rather than anticipated business needs, meeting business goals from an efficiency enhancement position. The third model was a vendor-oriented mixture of the previous two models. It was found where strategic systems had been or were being developed, demonstrating that the technological structure of the firm was determined by the interaction between the technology model, the management strategy, and the competitive environment.

Only one organization in Clark's study blended business issues and technological opportunity in a planning process. This was consistent with the work of Huff and Munro (1985) and the prevalent 'lagging edge' philosophy expressed by most of the individuals in Clark's study.

C. IT Competence: Operational or innovative?

The articles discussed in this section offer ways to more precisely think about and categorize firms along the "IT Competency" dimension of our model. We are focusing on successful implementations. However, many other researchers looked at outsourcing decisions without regard for their ultimate success or failure. Their findings are relevant to our project nonetheless. Some studies, for example, revealed that outsourcing may have been the wrong decision; their analysis of the reasons for the decision offers insights useful in our work.

Grover and Teng's (1993) three-stage process began by categorizing decisions according to the maturity of the IT system to be outsourced. Was it in the initiation, growth or maturity stage? We would argue that e-commerce was in the initiation stage in all of the case studies we reported. Today some businesses are in the initiation stage, others are in the growth stage.

Once the system maturity stage was determined, outsourcing decisions were next based on the strategic significance of the applications. If it was low, outsourcing was appropriate. Otherwise, firms should consider the strength of their IT groups relative to the competition. If IT was average or strong, systems should not be outsourced. If weak, Grover and Teng indicated that there were arguments to be made for either in-house and outsourced development, with a marginal preference for in-house. Our model proposes that absolute IT competence is important; perhaps Grover and Teng's work suggests that competence should be assessed relative to the competition instead.

In a later paper, Grover, Cheon, and Teng (1996) examined the relationships among strategic orientation, IT competence, and propensity to outsource. They concluded that "IS outsourcing may bridge the gap between an organization's information needs and the ability of its internal sources to meet such needs" (p. 95). Grover et al. focused on firms that had outsourced IT functions; they did not directly measure the conditions that prompted the choice of outsourcing. However, we have seen parallels in our interview responses to their assertion that outsourcing may be related to the fact that it is becoming "increasingly difficult to get the personnel and equipment in-house on a real-time basis" (p. 98).

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[2] Consultants were broadly defined to include people from a software vendor, from consulting firms, or individuals hired for short-term specific tasks.

McLellan and Marcolin's (1994) work is closer to the core of our model. They discussed the risks inherent in the technological uncertainty of IT. If IT skills supported a strategic thrust, one goal of management was to reduce technological uncertainty. IT groups with a low level of e-commerce experience drive up the risk of technological uncertainty. Outsourcing may reduce this risk. McLellan and Marcolin's concluded that outsourcing could support a firm's strategic initiatives by providing early and cost-effective access to emerging strategic technologies.

DiRomualdo and Gurbaxani (1998) have contradicted one of the assertions we make in our model. We believe that having an innovative IT department predisposes an organization toward in-house development of e-commerce. DiRomualdo and Gurbaxani, however, identified a number of companies (such as DuPont, British Petroleum Exploration, Lufthansa, Swill Bank Corporation, and JP Morgan) that had well run and innovative IT departments. Those businesses nonetheless engaged in significant outsourcing deals. The relevance of these findings to our work will call for further investigation.

DiRomualdo and Gurbaxani also pointed that out, as the importance of IT increased, companies often confronted a wide disparity between their IT capabilities and those necessary to realize benefits. Many organizations had to simultaneously create a new IT capability for the digital world while maintaining and improving the status quo. It was difficult for IT groups to do so on their own because most lacked the necessary technical talent, management skills, and financial resources.

As the firm assesses itself with regard to IT competency and subsequent e-commerce development, important lessons can be learned from the literature pertaining to the adoption of other technologies. A common mistake in assessing an organization's technological base is focus entirely on matters of technical competence (Adler and Shenhar, 1990). While questions concerning the existing technical competence of the organization are crucial to our model, it is important to ask a broad range of questions. Adler and Shenhar assessed a company's potential to achieve competitive from its IT. They looked at four components of the technological base: technological assets; organizational assets; external assets; and project management. Of these, organizational assets proved to be the limiting element.

Ross et al. (1996) conducted a two-year study of IT management practices. Their evaluation of how a firm stacked up in the three IT asset categories may help us measure a company's IT capabilities. The three key IT assets are a highly competent IT human resource, a reusable technology base, and a strong partnering relationship between IT and business management.

First, the defining characteristic of a valuable human asset is an IT staff that consistently solves business problems and addresses business opportunities through information technology. There were three dimensions to this asset: technical skills, business understanding, and a problem-solving orientation (Ross et al., 1996). Rapidly changing technologies that are powerful but immature (such as e-commerce) have generated renewed emphasis on the technical qualifications of IT staff. Most of the IT managers in the Ross study acknowledged that they were challenged to keep people interested in supporting old technologies. Their staffs viewed increased technical knowledge and the opportunity to address new technical challenges as a primary motivating force in their jobs.

The business understanding component results from frequent interaction with clients. Close working relationships allowed IT staff to observe business processes in action and to accumulate experience in solving business problems. Firms with a valuable human asset distribute responsibility for solving business problems to every member of the IT staff. This differs from more traditional IT organizations in which staff members are responsible only for completion of well-defined tasks.

Rockart et al. (1996) offered guidelines for IT managers trying to respond to business and technological changes, assume new roles, and build relationships with line managers. Their conclusions were partially drawn from a study of IT management practices in 50 firms and a comparative study of IT organizations in four countries (Europe, Japan, and the U.S.). The CIOs and other IT managers of these firms offered diverse views of their environments, but many common themes emerged. These themes included the degree to which an organization could:

- Achieve two-way strategic alignment (aligning IT strategy with organization's business strategy)
- Develop effective relationships with line managers
- Deliver and implement new systems
- Build and manage infrastructure
- Reskill the IT organization
- Manage vendor partnerships
- Build high performance

The degree to which an organization operates in these various areas is an indication of current state of IT capabilities. Rockart et al. concluded that the success or failure of an organization's use of IT only partially depends on the effectiveness of the IT organization. Even more important was the ability of line managers at all levels to understand the potential of IT resource and to use it effectively.

Earl and Feeny (1994) referred to the requirement for a CIO-level executive with a profound knowledge of IT and significant experience in the IT function. They profiled successful CIOs and the CEOs who supported them in 60 different organizations. In doing so, they discovered two patterns. First, the CEOs appeared to be polarized between those who saw IT as a strategic resource and those who saw IT as a cost. Second, the CIO's role and actions were crucial in ensuring that IT was deployed for strategic advantage and that the IT function delivered value. The most successful approaches were those where there were no IT strategies --only business strategies. The CIO added value by building informed relationships with key executives, thus making sure that IT requirements became an integral component of business strategy.

CONCLUSION: NEXT STEPS

The above literature overview both helps support our model at this stage of development as well as pointing out additional areas that should be considered in future work. Some of the work brings up possible contradictions to certain assumptions we have made at this early stage but, as addressed above, the possible contradictions may not be contradictions as much as added points to incorporate as the model development continues.

We believe that the early evidence from companies and past research as presented in this progress report help substantiate our initial model of e-commerce implementation structure. As identified above, we have discovered additional questions to ask with regard to the current state of affairs of an organization's IT group. We have also examined work that supports our notion that a major attribute of the development decision lies in a company's view of the strategic importance placed on the use of e-commerce.

It has become clear in our interviews and follow-up that survey-based research is unlikely to be productive. First, identifying the right source of information requires significant personal contact with each company, making a mass mailing inappropriate. Second, despite similarities with models in the literature, there are no validated survey research instruments that could be adapted to our project's focus. The time needed to create, validate and pretest such an instrument is unlikely to produce more useful information than additional intensive interviews with carefully selected companies. Finally, the interviews of the past year have demonstrated the importance of being able to probe conditions at different companies in different ways, according to their unique (or common) e-commerce experiences. Our work so far has convinced us that the value of exploring unexpected answers in depth immediately outweighs the benefits of more sites.

The next stage of the project involves more extensive and detailed interviewing. An anniversary interview with Boise Cascade has been conducted, looking at the changes in their structure in the year since the initial interviews were conducted. A report on their structural evolution is forthcoming. At the time of writing this paper, we haven't received the release to discuss their changes in detail. However, we are pleased to say that the changes were consistent with our model and the structure we would have predicted.

Similar anniversary interviews are scheduled or being scheduled with Kenonic Controls, Chubb, and Grand & Toy. Chubb Canada will also be participating in that round of interviews. Transamerica Life Insurance, the Chicago Board of Trade and The Boeing Company's Phantom Works unit have been the subject of recent interviews. The results of those interviews will be integrated into our findings as soon as the individuals who have participated approve the interview transcripts.

We are presently pursuing leads with Fletcher Challenge, as well as with e-business consultants at KPMG Chicago, Burntsand, and the former e-business director for KPMG Vancouver. Business Depot and CompuWave have agreed to participate and will be interviewed later this summer. Finally, our research assistant in Toronto is lining up insurance company sites in eastern Canada and the central US. The interviews recently conducted and those in the works will provide the ability to do comparisons within and across the insurance and office products industries, as well as in a variety of high-tech companies.

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