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**FROM PLACE TO SPACE:
Migrating to Profitable Electronic Commerce
Business Models**

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November 2001

CISR WP No. 324

MIT Sloan School of Management Working Paper No. 4358-01

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FROM PLACE TO SPACE: Migrating to Profitable Electronic Commerce Business Models

I. Executive Summary

The Internet is a powerful channel that presents new opportunities for touching customers, enriching products and services with information, squeezing out costs through process automation, and redesigning internal business processes through enhanced communication and knowledge sharing. In most firms e-business processes are changing the nature of the buyer-seller relationship, the role of information technology (IT), and the design of organizational structures and roles. As firms attempt to capitalize on their existing capabilities through the Internet, they necessarily disrupt their embedded processes. This process of leveraging strengths and disrupting habits underlies the migration to e-business—a migration from market place to market space. This report describes that migration using cross-case analysis of nine firms' e-business efforts. Key findings of this study include:

1. E-business represents an evolutionary rather than a disruptive change. Firms have been moving toward e-business through such business trends as TQM (total quality management), BPR (business process reengineering), and globalization during which they automated processes, integrated systems, and worked towards customer intimacy.
2. Successful e-business strategies offer customers a compelling value proposition. Firms learn what constitutes a compelling value proposition through constant experiments and feedback.
3. Migrating to e-business involves simultaneously *exploiting* existing processes through information rich channels, *expanding* core processes to include adjacent businesses, and *extracting* management attention and manual labor from these processes as they are folded into the core.
4. E-business leverages a firm's intangible assets, most notably existing business processes, customer perceptions, and IT infrastructure. Conversely, e-business exposes weaknesses; thus undisciplined processes, negative customer perceptions, or a poorly designed infrastructure can severely hinder effectiveness.
5. Many firms are finding that they must build more centralized infrastructures around core data in order to compete in an e-business environment.
6. E-business migration requires three management imperatives: (a) IT governance to ensure strategic positioning of IT in the firm, (b) human resource alignment to dynamically allocate key resources to critical projects, and (c) customer connectedness to enlist customers in ongoing market experiments.
7. IT and e-business governance demand that senior management clarify business strategy and aggressively leverage IT capabilities.
8. Firms cannot rapidly develop new competencies and habits. Strategic partnerships allow them to respond to e-business opportunities beyond their internal capabilities.
9. Firms are struggling to find metrics that can help them make and assess investment choices in e-business.

The process of growing and leveraging e-business capabilities will be a marathon. Only a few firms will “win.” Most firms will find satisfaction in merely surviving the challenge, so that they can excel in other areas. To survive, it is essential that participants in the race understand the objective and know the route. That is the purpose of this report.

II. Introduction

The US stock market devaluations of many dot com companies may have deflated enthusiasm for e-business startups, but have not diminished the potential long-term impact of e-business on established companies. For many established businesses the rise and fall of the dot com was a wakeup call to the potential of e-business. E-business is creating a more global, virtual, and efficient business environment. In order to prosper, and indeed even to survive, traditional businesses must move from the *marketplace* to the *marketspace*, integrating new electronic business models with existing models.

In February 2000 PricewaterhouseCoopers LLP provided the core funding for a study by Melbourne Business School and MIT’s Center for Information Systems Research to explore the key issues facing successful established businesses when migrating from their traditional marketplace business models to a combination of place and space. This report summarizes the study’s findings and is organized as follows:

Section III, Research Overview: describes the methodology and the participating firms and poses research questions.

Section IV, Key Findings: presents an analysis of key research issues based on the data from the study.

Section V, Conclusion: summarizes the findings and offers a framework for the migration from place to space.

Section VI, Top 10 Leadership Issues: discusses the 10 key take-aways from this study for business executives.

Case Studies:

In reporting the findings from this study, this document cites many examples from the case studies. Please refer to CISR Working Paper Case Studies 314–322 for additional details on issues of specific interest. For more information on CISR Working Papers or to place an order please visit <http://web.mit.edu/cisr/www/html/publications.html>.

III. Research Overview

For purposes of this study we defined e-business as any business transaction or service conducted over the Internet. We do not believe that all firms should necessarily aspire to conduct a significant proportion of business online. However, we believe that the Internet has introduced important changes to the business environment. In particular, the following characteristics of e-business suggest that, for most firms, long-term business success will demand effective use of the Internet:

1. Price transparency, allowing easier comparisons among competitors' value propositions;
2. Greater reach and low-cost electronic connections to customers, suppliers, intermediaries, and partners, introducing supply chain efficiencies;
3. Greater availability of information to customers, requiring the repackaging of products and services according to the needs of more knowledgeable buyers; and
4. Loss of personal touch and feel, forcing new paradigms for establishing and nurturing relationships and trust.

Given the assumption that firms must effectively integrate e-business processes into their business models, the primary objective of the study was to investigate how established firms successfully migrate from traditional business environments to more electronic environments.

A. Methodology

To address the question of e-business migration we examined eight factors that were emerging as important to successful e-business initiatives. These factors are: business model, information technology infrastructure, IT portfolio integration, partnering, channel selection, brand, measurements, and critical success factors, as shown in Table 1.

Issue	Description
Business Models	Changes in how the firm generates revenues or manages costs.
IT Infrastructure	Key infrastructure characteristics for e-business support.
IT and Business Integration	Managing enterprise-wide e-business strategy.
Partnering	Characteristics of new business and technology partnerships.
Channels	Realignment of channels to support new business opportunities.
Brand	Rethinking brand strategies.
Measurements	Designing performance measures to motivate and assess e-business success.
Critical Success Factors	Characteristics of successful e-business initiatives

Table 1: Research Issues

To examine these issues we conducted in-depth case studies at nine firms: five in the US, three in Australia, and one in Singapore. At each firm we conducted on-site interviews with senior business and information systems managers regarding the firm's electronic commerce experiences. We developed written case studies and videotaped interviews with senior managers to summarize our findings at each site and to provide material for executive education.

B. Participating Firms

We looked for industry leaders who approached e-business aggressively and were willing to participate in both audio and videotaped interviews. The nine firms (described in Table 2) were: Australia Post, Brady Corporation, Chase Global Markets (now part of JP Morgan Chase), Delta Air Lines, Digiland (a business unit of the Singaporean computer manufacturer, GES), Manheim Auctions (a subsidiary of Cox Communications), National Australia Bank, Plum Financial Services (a joint venture of Vanguard and MLC), and United Parcel Services (UPS).

Company	Business	Location	1999
Australia Post	Postal Services	Australia	Aus \$10.6B
Brady Corporation	Process Manufacturing	US & 20 other countries	US \$500M
Chase Global Markets	Financial Services	US & 30 other countries	US \$45B
Delta Airlines	Transportation	US & 28 other countries	US \$16B
Digiland	Distribution	Singapore	Sing \$300M
Manheim Auctions	Used Car Auction	86 US sites, UK, Australia, NZ	US \$37B
National Australia Bank	Financial Services	Australia	Aus \$12.3B
Plum	Financial Services	Australia	NA
United Parcel Services (UPS)	Transportation	US and 200 other countries	US \$27B

Table 2: Participating Firms

Three of the firms (Chase, National, and Plum) operated in the financial services industry. Two firms were manufacturers and distributors (Brady and Digiland), and four firms performed various types of logistics: moving people (Delta); moving cars (Manheim); moving mail (Australia Post); and moving packages (UPS). All of the firms except Plum were industry leaders. Plum was a startup joint venture between two leading financial institutions, Vanguard and MLC, entering a new market segment in Australia. All firms were operated for profit including Australia Post, which paid a significant financial dividend to the Australian government while at the same time operating in increasingly deregulated markets.

Many of the firms had been recognized for their e-business efforts. Delta's CEO had been named by *Forbes* magazine as one of twelve executives who were "forcing the web to grow up." UPS was awarded MIT Sloan School's "Clicks and Mortar" award, recognizing UPS as the most advanced company in integrating physical and online business practices. Both UPS and Delta had received Smithsonian awards for advanced business applications of information technology. Chase's online foreign exchange application was touted by *Euromoney* magazine as the best in the industry. Brady was featured in an IBM case study for its e-business prowess applying an IBM technology environment. Digiland received considerable press attention for becoming Singapore's first online retailer.

Most of the firms in this study were pursuing multiple e-business initiatives. At five firms we examined the approach and outcomes associated with a centrally coordinated portfolio of initiatives (Australia Post, Brady, Chase, Delta, and UPS). At Manheim and Plum we studied new business units whose focus was e-business. Our focus at Digiland and NAB was one major e-business initiative that addressed new customer segments. We refer to these initiatives throughout this report.

C. Research Team

The research team included Michael Vitale and Peter Weill who were at Melbourne Business School (MBS) at the beginning of the study. Michael is now Dean of the Australian Graduate School of Management and Peter is Director of the Center for Information Systems Research (CISR) at the Sloan School of Management, MIT. The team also included Jeanne Ross, Jack

Rockart, Richard Woodham, and Natalia Levina at CISR and Richard Speed and Kristine Dery at MBS. The team would like to gratefully acknowledge all the senior managers and their firms for their enthusiastic participation in the project and the time and insights they shared with us.

D. Data Collection

The researchers developed a single interview guide to ensure that they collected comparable data across the nine firms. One or two research team members visited each firm and conducted between four and ten interviews with business and IT executives, e-business managers and project team members, and IT managers. For five cases (Brady, Chase, Delta, Digiland, and Manheim) all, or nearly all, interviews were videotaped. At the other sites, initial interviews provided material for the written case studies and selected managers participated in a second videotaped interview. Researchers collected key documents and reviewed the websites of the participating firms in addition to collecting interview data.

Researchers probed each firm's most interesting and important challenges and experiences. Each case was written to emphasize what was most interesting about e-business at that particular firm. As a result, the cases differ in the extent to which they discuss each of the eight issues. To provide comparable data for purposes of cross-case analysis, an interviewer wrote detailed responses to each of the standard interview questions.

E. Analysis

To analyze the findings, we individually reviewed both the written cases and the answers to the interview questions. We looked for patterns in responses across the firms and for specific outcomes attributed to particular decisions or initiatives. Based on this analysis, we developed frameworks for understanding individual research issues as well as more general findings. We then shared our tentative frameworks with each other, and provided feedback on whether generalizations about the conclusions could be drawn based on our understanding of the cases each of us had written. As a result, frameworks were revised and retested. A number of preliminary frameworks were then discussed in a one-day workshop in February 2001 to determine both their validity and usefulness. Sixteen senior business executives, including representatives from two of the firms studied, and six MIT faculty and researchers attended the workshop. Following the workshop, the frameworks were again revised and debated among the researchers. This report represents the cumulative analysis.

To better understand the migration from place to space, we mapped the firms on a two-axis plot noting the size of the e-business opportunity (or threat) versus the firm's percentage of revenues currently online. The size of the e-business threat and opportunity for the firm as a whole was measured using a ten item indicator.¹ The firm's score, which ranged from 10 to 50, was the basis for placement on the vertical axis in Figure 1. The firm's percentage of revenues online as estimated by the individual firms was used for placement on the horizontal axis.

¹ The ten item e-business opportunity and threat indicator appears in *Place to Space: Migrating to e-business Models* by Peter Weill and Michael Vitale, published by Harvard Business School Press, 2001. Each item was scored by the researcher on a scale of 1 to 5 resulting in a measure ranging from 10 to 50 with high scores indicating a large e-business opportunity (or threat).

All things being equal we would expect the distribution of the firms on the plot to closely track the diagonal line from top right to bottom left. If no other factors were important, we posited that firms with larger e-business opportunities or threats would have a greater percentage of their revenues generated through online sources. Conversely, firms with fewer e-business opportunities or threats were expected to be less aggressive in converting revenues to online sources. Figure 1 shows that the expected pattern is not followed as several firms are off the diagonal indicating other major factors are at work. This report attempts to uncover and explain these factors and learn from the firms' experiences with e-business.

IV. Key Findings

While dot com start-ups burst onto the scene with an understanding of the power of the web and a business vision, the firms in this study entered the fray with a set of assets that was already generating business value. Of course, these established firms were also saddled with legacy systems and processes that limited their agility relative to start-ups. Consequently, they attempted to leverage their assets in order to seize advantage against potentially more agile new entrants and to ward off equally powerful competitors.

Respondents noted that many of the assets e-business leveraged were intangible, such as brand, customer base, purchasing power, systems capabilities, industry leadership, distribution channels, technical knowledge, and financial strength. The e-business head at Delta enthused about the opportunity to leverage what the firm referred to as its hidden assets:

Delta's brand is a hidden asset. The fact that we have a hundred and seventeen million customers a year, the fact that we have twenty seven million frequent flyers, the fact that we have one million interactions a day, the fact that we have nine billion dollars worth of purchasing spending -- these are assets that you won't find on the balance sheet, but these are assets that a new economy company would essentially die for.

—Senior Vice President, e-Business, Delta Air Lines

This SVP explained that the goal of e-business at Delta was to leverage these assets “to lower distribution costs, increase productivity, drive additional kinds of revenues, and, in fact, enhance customer service and motivate employees.”

As firms conduct business over the Internet, they leverage these intangible assets to both exploit and expand their core business proposition. They *exploit* their core business by packaging existing products and services with improved information and introducing efficiencies into their supply chains. Firms *expand* their core business by offering new products and services to carefully defined customer segments. Most firms pursued exploitation and expansion simultaneously through portfolios of e-business initiatives. Thus, we refer to each initiative as fulfilling either an *exploitation* strategy, designed to enhance or leverage existing capabilities, or an *expansion* strategy, designed to build new capabilities. In Table 3 we categorize the initiatives of the firms in this study. We will discuss these initiatives throughout this report.

Approach	Expected Benefits	Sites Studied
Exploitation		
Electronic Self-Service	Lower cost through self-service Higher revenue through better products & services	Brady, Chase, Delta, Digiland, Manheim, National, Post, UPS
Intermediary Bypass	Lower cost through value chain efficiency Higher revenue through greater responsiveness to end customers	Brady, Delta, Digiland
Customer Intimacy	Higher revenue through data/information exploitation Lower cost through process improvements	Delta, Manheim, National, UPS
Supplier Efficiencies	Lower cost through efficiencies and price transparency	Brady, Delta, Digiland
Expansion		
New Business	New revenues and possible cost savings through new customers and products	All 9 firms
Equity Investments	New Revenues through new lines of businesses Equity Income	Delta, Plum, UPS
Partnership Consortia	New customers through expanded reach	Chase, Delta, National, Post

Table 3: Approaches to e-Business Initiatives

Most firms have a pipeline of both exploitation and expansion projects, so that they regularly introduce new products and services while revising the old. The pipeline is critical for establishing an R&D environment. Firms experiment and check customer reactions against their internal assessments. Unsuccessful experiments are dropped or reshaped. Successful experiments are built into the fabric of the organization to make them more robust and efficient internally while adding value for customers. For example, Digiland decided to extend its distribution model, which depended upon resellers, and introduce direct-to-customer sales of personal computers. Its experiment was so successful that the firm decided to develop an online shopping mall that offered a variety of consumer products. Customers, however, responded negatively to the expanded offering, and Digiland scaled down to a consumer electronics site. Firms knew that regular learning from experiments was valuable, so most projects were narrowly scoped for fast delivery. Chase, for example, had introduced a 90-day project life cycle. The constant experimentation meant that e-business was more often shaped by learning than by detailed strategic planning exercises.

In addition to exploiting and expanding the firm's core business, firms were engaged in *extracting* excess human capital from both new and old processes through standardization and automation. This had the effect of compressing the core—making it denser and more efficient (See Figure 2). Ultimately, the effect of simultaneous exploitation, expansion, and extraction was that firms were building a bigger, more powerful core. They were automating existing processes, which freed management attention to focus on creating new products and services. These new products and services led to new processes, which they subsequently standardized and automated and built onto the core. Our sense was that e-business efforts in a firm could become as natural as breathing. Inhale (fill the lungs) by expanding the business model to include new customers, partners, products, and services. Exhale (expel the waste) by exploiting the potential of the Internet to standardize, centralize, and automate new processes. e-Business became a corporate

conditioning exercise. Firms built corporate muscle that could be leveraged to attract new customers and alliances while resisting intruders.

The surprise in this finding is that organizational theorists predicted that the Internet would blur organizational boundaries. Instead, we found that firms are more clearly defining their boundaries. The core business is becoming denser as firms automate processes end-to-end, but the core is also expanding as firms introduce related products and services to meet the needs of existing and potential customers. Expansion followed by extraction means that firms are subtly redefining themselves and, in this way, distinguishing themselves from competitors. *Industry* boundaries are indeed blurring as each firm defines its product/service/customer portfolios, but each *firm* is clearly demarcated from its customers, suppliers, and partners. The challenge for firms is one of focus. The opportunities to exploit and expand are nearly limitless. Firms need to recognize what customer demands they can best absorb into their cores.

B. Leveraging Corporate Assets

Although firms leveraged many physical and intangible assets in their e-business endeavors, our analysis indicates that three assets in particular positioned firms for e-business success:

- disciplined, standardized, customer-focused business processes;
- customer perceptions as captured by brand recognition or long-term customer relationships; and
- an IT infrastructure built to provide data whenever and however it was needed.

These assets tended to create opportunities and stimulate e-business thinking. Conversely, where firms lacked these assets, they needed to overcome obstacles to successfully migrate to e-business. In this section, we will describe the characteristics of these assets and why they were important.

1. Existing Processes

E-business processes are as dependent upon a reliable, predictable back end as they are on a user-friendly front end. As a result firms noted that standardized, disciplined processes were more readily converted to e-business. For example, UPS observed that moving call center processes, like package tracking, to the Web was “easy” because the firm had a centralized, standardized approach to package tracking with a single system supporting it. Initially UPS had questioned the value of a tracking capability:

We thought, “Why do they care about tracking? We know we deliver them all. It’s really only a creature comfort, because we deliver every package every day. We’re so effective that there’s no reason to track these packages.”

—Vice Chairman and Executive VP, UPS

Ultimately, however, the standardization and discipline inherent in its delivery processes facilitated UPS’ efforts to share information with its customers.

In contrast, Brady management noted that before the firm could engage in e-business, they had to change the culture. Historically, business units within Brady had competed with one another. In preparation for e-business, Brady's CEO worked to eliminate functional and business unit silos and to introduce integrated, customer-centric processes. Early e-business initiatives at Brady started with defining standardized terms across the business units.

Australia Post had for many years served customers not only as a post office but also as a location to pay many of their bills. The firm's experience as a bill collector easily translated itself to an electronic service in an e-business environment. Australia Post might have been disintermediated by electronic payment capabilities at the individual firms, but it instead leveraged its expertise to create a valued electronic service.

Existing processes represent a firm's existing knowledge and competencies. Where these are well-defined, disciplined, and customer-focused, they are an asset that can be leveraged in an e-business environment. Where processes are defined within silos or have not been standardized, they create a liability for e-business migration.

2. Customer Perceptions

The firms in the study have, over the years, developed valuable brand names. Chase, UPS, and Delta are brands recognized worldwide. Within their sectors, Brady and Manheim are market leaders, and thus also have considerable brand equity. Australia Post and the National Australia Bank are two of Australia's best-known brands. Only Plum and Digiland among our sample were attempting to establish brand names—Plum as a new company, Digiland as a result of moving into the consumer sector, when it had formerly only operated in the B2B environment.

Firms recognized the value of their brand equity as customers turned to market exchanges:

When the Internet allows navigators to compare Brand A to Brady to Brand C and we're all forced to enter our data so that it is easily comparable, price will be brought to bear. We are relying on the fact that the Brady brand will stick out. I think even if our product costs a little more, the Brady brand will help us achieve online what we had offline.

—Business Unit e-Business Director, Brady

Several firms noted that the Web allowed them to serve customers they had previously been unable to serve economically. For example, Chase Global Markets had provided advice to their customers as part of the service of selling them financial instruments. As a result, they limited their customer base to institutional investors whose transactions were in the hundreds of thousands or millions of dollars. With the Web, they were able to provide transaction services to much smaller institutional investors who did not need advice. Chase, like other firms, designed web services targeted at newly affordable customer segments.

In addition to brand equity, firms leveraged existing customer relationships to move services online and identify demand for new products and services. For example, Manheim's

relationships with used car dealers positioned the firm to offer Manheim Market Reports, a web posting that listed wholesale pricing information on all vehicles sold by Manheim:

There are many dealers who subscribe to our service who are simply not yet ready to buy cars online. And yet they continue to pay the \$50 a month because they can go online, look at the market report, and get absolutely accurate data about vehicle values in real time.

—CEO, Manheim Interactive

Customer perceptions, whether they resulted from trusted brand names or long-established relationships, provided opportunities to exploit and expand the core through e-business. We did not observe, in our sample, examples of negative customer perceptions, but Plum provided an example of how hard a firm must work to establish a presence. Plum attempted to leverage the brand name of its parents to attract customers.

3. IT Infrastructure

Although e-business opportunities were, in some respects, unique, firms applied years of experience as they leveraged existing processes and customer perceptions. In contrast, these firms had little experience in leveraging IT infrastructure to exploit and expand their business. Most of the firms in this study were working to develop an IT infrastructure to position themselves for e-business. In this section, we will first describe how some firms leverage their IT infrastructures, and then discuss the process of building an e-business ready IT infrastructure.

Leveraging the Infrastructure. One firm with an e-business ready infrastructure was UPS. Responding to competitive pressure, UPS had built a centralized infrastructure in the early nineties characterized by three core databases (package, customer, employee), centralized operations and services, and open technical standards. This infrastructure allowed UPS to quickly build web interfaces and adopt online processes.

As the drive to e-business hit the travel industry, Delta was in the process of rebuilding its infrastructure. Delta's "Nervous System" consisted of a layer of middleware around its core operational databases. This nervous system created opportunities to rapidly develop e-business and related applications:

The real power behind the Digital Nervous System is having the ability to push the technology out in ways that would make it easier for customers who do business with us.

—Executive VP, Customer Service, Delta

Plum was established to facilitate self-management of individual retirement accounts through web-based services, so its IT infrastructure was built to enable web transactions:

IT provides the leverage for the organization. We have a 'can do' attitude to meeting company needs.

—CIO, Plum

Plum management credited the firm's IT capability with enabling it to get products to market faster than competitors, but competitors were preparing to invest as necessary to keep pace. Accordingly, Plum provided regular upgrades of its base technology to stay a step ahead.

We observed that an e-business ready infrastructure was fundamentally different from the infrastructures firms had been building throughout the 1990s. In most firms, the IT infrastructure had evolved from years of investment on an as-needed basis to support functional applications and thus was not well suited to e-business:

In the past, the business case for an IT initiative included costs for the project itself, with a bit of infrastructure thrown in. We used a full chargeback model, so the first project that needed a particular piece of infrastructure had to pay the entire cost of creating it. We were not making best use of our opportunities.

—CIO, Australia Post

In most cases, firms' prior IT investment practices resulted in an infrastructure that looked like the model in Figure 3. Over the years firms invested in a set of infrastructure services most often providing enterprise-wide communications and some standardized support services. Onto these infrastructure services, firms built functional and business unit systems, many with application-specific databases. As these firms experienced an increasing need to share data across systems, they often hard-wired systems together, which, although effective, was difficult to maintain over time. More recently, firms created data warehouses or other tools to gain wider access to their most critical data.

e-Business forced a major change of emphasis, in which corporate data became the foundation for IT services. As a result, emerging IT infrastructure designs look more like Figure 4. Centralized databases containing the data needed for core operations (e.g. customer, product, and financial data) constitute the base on which the firm's IT infrastructure is built. These core databases are populated and accessed through enterprise systems, and increasingly through a layer of middleware. The data and enterprise systems layers are wrapped in a set of infrastructure services that ensure their security, reliability, performance, and accessibility within the firm. Together the core databases, enterprise and middleware systems, and infrastructure services comprise the corporate IT infrastructure. Most firms distinguish themselves competitively through a set of customized applications built to support competitive capabilities. These competitive systems are built onto the core infrastructure to provide cost effective and reliable operations. All firms have some applications that do not tie into their corporate infrastructures. We refer to these as "stop gap" or "maverick" systems because they may address an urgent need or they may be experiments that will be rebuilt if successful. In fact, most firms have far more maverick systems than they would like.

We observed gravity in the infrastructure described in Figure 4. Maverick systems, if their value is proved, should eventually be built onto the firm's corporate infrastructure and become "competitive systems." In some cases, applications that were once deemed competitive are subsumed into modules in enterprise systems. The applications transition from "competitive" to "competitive necessity" and become part of the enterprise systems infrastructure. As systems are integrated into the infrastructure, they become more standard and less costly to operate and

maintain. This process of gravity is how firms achieve the extraction of excess human capital described in section IV(A).

The most stable parts of the infrastructure depicted in Figure 4 comprise the foundation on which less stable parts are built. Data definitions supporting the core business represent, for most firms, the most stable aspect of the firm's systems. ERPs and middleware are also relatively stable, although firms will regularly upgrade the technology itself and will likely expand its reach. Infrastructure services will expand, and occasionally contract, as technology and business requirements evolve, but they too, are relatively stable functionally while still requiring upgrades to reflect new technologies. Competitive systems, on the other hand, have relatively shorter life expectancies, and maverick systems are intended to be very short-lived.

Figure 4 depicts an ideal rather than a real infrastructure. Only Plum (firm H), as a start-up, had the luxury to build all its key infrastructure components at once. Delta (Firm C) was partly replicating the experience of a start-up through a major rebuilding effort that involved defining core data and creating the middleware and infrastructure services to access it. UPS (Firm E) created its centralized infrastructure in the early nineties. Because of the stability of the lower layers of the infrastructures, building from the bottom up was the ideal approach. Most firms, however, were dealing with the realities that legacy systems presented. Figure 5 shows the researchers' view of the starting point from which different firms built their e-business infrastructures. Firms started from less than ideal infrastructures to leverage the strengths of the systems they had, while incrementally building infrastructures to support e-business more effectively.

Approaches to Building Infrastructure. Depending upon the quality of their existing infrastructures, the clarity of their desired future infrastructures, and the risks they were willing to assume, firms took four different approaches to building infrastructure:

- Infrastructure Overhaul
- Enterprise Systems
- Green Field
- Incremental

Delta and UPS took the *infrastructure overhaul approach*, ripping out local business unit infrastructures to implement a globally integrated infrastructure. The motivation for overhauling infrastructure was not initially e-business. In these two firms, top management believed that the firm's technology base was a competitive liability and thus made a large up-front investment to support not only e-business but all the firm's business initiatives.

The overhaul approach was risky because it involved building a core infrastructure to support daily business operations. Delta's Nervous System captured and disseminated all the information needed to keep planes running and customers served:

Saying you have a nervous system that you're going to connect all your body parts to is a wonderful idea, and it's an exciting concept. But the responsibility is huge from a reliability and stability and backup and recovery view. The good news is, everything will have access to everything real-time. Bad news is, if it

doesn't work, if it can't scale, if it gives you the wrong answer, then literally you shut down the airline.

—Vice President, Information Technology, Delta

In addition, executives at both Delta and UPS were quite visionary in identifying applications that leveraged the infrastructure in order to generate returns that justified the investment. An infrastructure overhaul approach requires senior management teams whose strategies focus on taking advantage of the new technical capabilities.

Brady and Digiland took a related, but somewhat less dramatic approach by introducing ERPs to provide integrative capabilities. Like infrastructure overhaul, the **enterprise systems approach** was motivated by a sense that the firm's existing infrastructure was limiting its ability to conduct operations efficiently. The ERP approach provided a standard back-end to simplify web application development and systems maintenance:

We took the approach that we're going to design our applications from the customer in and we're going to build our applications from the technology platform out. In the long run if you want to integrate to a back-end system, you want to do it once; you don't want to do it 20 times.

—CIO, Brady

The enterprise systems approach tended to be less risky technically than the overhaul, because it used a software package. It appeared to be well suited to manufacturers and distributors where IT is important but not the infrastructure supporting the firm's core competency (e.g. production). For Brady and Digiland, an ERP offered the freshness of an infrastructure overhaul approach without requiring the technical skills and capital investment involved in building a customized infrastructure. Firms encountered the risks associated with force-fitting organizational processes around the capabilities and constraints of a software package, but they had managed these risks by limiting the scope of their enterprise systems.

Plum and Manheim Interactive represented new businesses and took a **green field approach** to building infrastructure. This approach resulted from the absence of legacy systems. Plum management believed that its freshly built IT infrastructure was a competitive advantage. Indeed, the freedom from legacy systems is a key benefit to creating a new business unit for e-business:

We do not have some of the [IT] legacies to fix. We do not have the IT patchwork. It is very expensive for our competitors to keep up.

—GM, Business and Online Services, Plum

In establishing Manheim Interactive as a separate business unit, Manheim freed its e-business subsidiary to choose a new platform. Manheim Interactive built new web based front-end systems and middleware but chose to use Manheim Auctions' existing transaction processing systems for back room operations, picking the best from the legacy systems. Management noted, however, that the pressure for fast time to market led to an IT infrastructure that was not scalable and needed to be rebuilt as the business grew:

The ability to always respond quickly eventually became a problem. We became very good at scrambling to meet demands very quickly but that has a cost and eventually we just said, okay, we're out of magic dust now. We need to rethink.

—Director of Software Development, Manheim

Chase, NAB, and Australia Post took an **incremental approach** to building infrastructure which involved gradually replacing infrastructure as new e-business initiatives demanded it. These firms were particularly challenged by the requirements of the e-business infrastructure because they had excelled at hard-wiring independent applications together. All the hard wiring exacerbated the difficulty of disentangling individual pieces in order to rebuild the infrastructure. In addition, dramatic industry changes confounded efforts to clarify their core business:

We are conscious of the fact that the way we define what Chase really brings to the table for clients is going to need to shift.

—Head, e-Capital Markets, Chase

Infrastructures at Chase, NAB and Post had grown to support individual functional processes rather than integrated cross-functional processes. E-Business focused attention on cross-functional integration creating pressure for a more standardized technology environment and adherence to an IT architecture:

Historically, buy-in to architecture programs has always been difficult, but something has happened in the last year or two. I think it's a combination of, top down, management driving the need for architecture and seeing the value of it, and, bottom up, technology managers realizing that there's so much work to do that they can't do it all themselves without sharing.

—Senior Vice President, Wholesale Architecture and eCommerce, Chase

These firms found that the incremental approach to IT infrastructure is slow and involves investments in IT whose benefits are not immediately apparent. The incremental approach avoids the risks and huge investments associated with major overhaul, but it requires persistence to prevent infrastructure obsolescence.

The common theme across the four infrastructure building approaches was the importance of an enterprise architecture as a guide to infrastructure development. The incremental approach focused on slow but steady progress toward an architectural blueprint, but was very difficult to achieve given the combination of long lead times changes in architectures. Firms overhauling their infrastructures or starting from a green field observed that an effective infrastructure should comply with an architecture that mapped the IT infrastructure to core business processes. Finally, firms installing ERPs found that architectural assumptions were built into ERP packages. In all cases, understanding and communicating the importance of architecture has become a key challenge for IT and senior management:

In the past, IT architecture was primarily concerned with technical standards. It picked the best product in each category and then checked compliance. But now architectural decisions need to be made quickly— and also involve how the total

applications portfolio is managed, not just specific technologies. IT architects need to tell a lot of people about their directions, and the process by which their decisions are implemented needed refreshing.

—IT Architecture Manager, Australia Post

In order to ensure that the firm's IT architecture reflected core business processes, some firms were creating an enterprise level architecture that provided an IT view of core business processes. For example, Delta senior management defined four core processes: the operational pipeline, the customer experience, revenue management, and general administrative processes. Rather than rip out its entire IT infrastructure, Delta chose to focus on the first two processes and define the required data. This data was shown at the center of its enterprise architecture.² Similarly, as Brady defined its e-business strategy, management defined the core infrastructure upon which it would be built.³

Firms found that they could leverage infrastructure benefits even if their infrastructures were far short of the architecture plan. Brady management noted that the firm was able to leverage an IBM e-business environment and a set of e-business tools to create an online catalog for its direct business and to support some distributor needs even though some other e-business applications were temporarily stalled until an ERP was implemented. Similarly, NAB was generating e-business benefits from a significant investment in data warehousing without creating a new e-business infrastructure.

Nonetheless, firms with e-business ready IT infrastructures described fewer obstacles to e-business implementation. Firms with infrastructures facilitating electronic data access and providing enterprise-wide services in support of e-business were better positioned to identify and respond to e-business opportunities. Firms that did not have electronic access to corporate data found their infrastructures were less a stimulus for e-business initiatives than a challenge to be conquered.

C. Managing the Migration

The three intangible assets identified in the prior section provided a base for e-business, but developing a rhythm to the exploitation-expansion-extraction sequence demanded effective management of e-business initiatives—individually and as a whole. Traditional organizational structures, processes, and roles were not well suited to the cross-functional, global nature of e-business. To ensure the development and maintenance of an e-business ready infrastructure, firms were forced to reexamine IT governance processes. To ensure that they leveraged existing processes and competencies, firms introduced management practices focused on human resource alignment. Finally, to foster effective customer perceptions, firms designed mechanisms to help their customers migrate from place to space. These new management practices were subtly but fundamentally changing how firms went about their business. This section discusses each of these three categories of management practices.

² Delta's architecture is illustrated and explained in the case study, "e-Business at Delta Air Lines: Extracting Value from a Multifaceted Approach," by J. Ross, CISR Working Paper Number 317.

³ Brady's core infrastructure for e-business is shown in "Brady Corporation: Delivering Customer Value through Multiple Channels," by J. Ross and N. Levina, CISR Working Paper Number 315.

1. IT Governance

For many firms, e-business thrust IT into a far more strategic role than in the past. Increasing the visibility of IT at senior management levels resulted in new governance structures and processes (i.e. the way the firm balances decision rights for e-business across the firm). Senior management leadership was necessary for funding and guiding the development of the more centralized IT infrastructure, and then for protecting, enhancing, and leveraging that infrastructure. Two governance processes were particularly critical: IT investment and prioritization and IT architecture stewardship.

IT investment and prioritization. IT investment opportunities can easily overwhelm the resources that can be applied. Rather than fritter away organizational resources on narrowly focused initiatives with limited impact, firms wanted to ensure strategic allocation of resources. In more centralized business environments, such as Delta, UPS, and Australia Post, IT investment decisions rested with an IT steering committee. At UPS, for example, the IT steering committee consisted of the Vice Chairman, the CIO, and two senior vice presidents who established IT strategy and protected the infrastructure from gradual dismantling as new initiatives were introduced. In decentralized environments, such as Brady and Chase, the IT steering committee was responsible for central infrastructure decisions, while business units applied local resources to their IT initiatives.

All firms in the study recognized a growing need for corporate investment in the central IT infrastructure. At Digiland and Brady, for example, corporate funds were underwriting the ERP implementation. IT executives at Delta and UPS applied corporate funds to infrastructure renewal—updating infrastructure systems and technologies on an annual basis to enhance performance, capacity, and maintainability. They noted that funding for infrastructure renewal fell to corporate because the return on investment was difficult for individual business units to justify. The concept of infrastructure renewal became salient only after firms had started to build infrastructure in accordance with an architecture. At that point they had components that could be replaced.

IT architecture stewardship. Related to their efforts to invest strategically in IT, senior executives were increasingly focused on protecting and enhancing the firm's IT architecture. They valued both the cost effectiveness and the integration capabilities of shared infrastructure. The excitement around e-business, however, tempted managers to circumvent IT architectural policies:

A few businesses developed things on their own, but people got their heads chopped off, and the problem was resolved.

—*Business Manager, Australia Post*

Despite efforts to leverage standard technologies, firms occasionally needed to introduce non-standard technologies to address a unique business need or test a new technology (i.e., to develop maverick or stopgap systems). At Chase much of the responsibility for maintaining architecture standards fell to developers who were instructed to always reuse before buying or building new technologies and systems. Over time a culture of re-use had developed:

Our culture has evolved, over time, to ask the question of why didn't you use something that already exists? And I would say everybody typically goes through a thought process that would say, "How am I going to answer that question?" And the grilling that you can get means you really have to give it serious thought.
—Senior Vice President, IT Management, Chase

At UPS management observed that new business opportunities regularly challenged the need to “tie in” to the existing infrastructure. UPS implemented an architecture stewardship process to consider the relative merits of complying with standards versus developing a maverick application. Through this process the firm distinguishes between experiments built on maverick systems and new processes intended to extend the core, which are built onto the core infrastructure. The architecture stewardship process ensures that UPS’ infrastructure manifests the “gravity” described earlier in this report.

Summary on IT Governance. These two key IT governance processes—IT investment and prioritization and architecture stewardship—emphasized the ongoing strategic importance of IT in an e-business environment. Without clear processes to protect, enhance, and leverage IT infrastructure, firms risked the gradual degradation of the infrastructure and failure to capture its potential value. These processes established IT infrastructure as a renewable asset capable of generating long-term benefits.

2. Human Resource Alignment

In moving online, firms tried to leverage existing competencies and to build or borrow additional competencies. Both individual initiatives and the migration process as a whole put pressure on firms to staff projects with the right set of skills, which meant drawing resources from all available internal—and often external—sources. It also required creativity in structuring roles, developing skills, and motivating individuals to incorporate e-business throughout the firm. Four human resource alignment approaches were commanding particular attention: (1) organizing for e-business, (2) managing e-business project teams, (3) creating partnerships to source e-business initiatives, and (4) designing e-business incentives and assessment metrics.

Developing a coherent e-business strategy required that firms introduce new structures responsible for developing e-business initiatives, assessing their impacts, learning from the experience, and determining next steps. Large firms found it necessary to create governance structures that could focus on e-business in order to move aggressively to identify e-business opportunities:

To maintain operations in a core business and do e-business—we tried that initially, but it just didn't allow people to focus on either side.
—Executive Vice President, Customer Service, Delta

We observed three different governance structures: new business unit functions, corporate teams, and new business units. The choice of a structural mechanism generally paralleled the relative emphasis that the firm placed on exploitation versus expansionary strategies.

New **business unit functions** were introduced at Brady and Chase. These two firms emphasized the importance of integrating their e-business initiatives into the existing business. Thus, they appointed e-business heads within the major business units who reported to the heads of the business units. The e-business heads were responsible for identifying e-business opportunities and for project management and implementation within their business units:

e-Commerce is a new function that is added, a little bit like perhaps a finance function.

—Head of e-Business, Chase e-Capital Markets

Brady had three business unit e-business heads and a head of corporate e-business. At the corporate level, the e-business unit designed tools that were used for local development. At Chase, the head of e-business for Global Markets had a staff of 30 project managers and developers who worked with the IT function to ensure architectural compliance. Because these business unit functions were embedded in existing business units, the focus was on creating electronic channels for existing products and services and enhancing those products and services with increased information or better service:

We can't afford to send direct salespeople to all customers, so we want to make their expertise available online. We can do this on our website, and by allowing distributors to put our content on their websites thereby commissioning them to share our expertise with end customers, or by allowing customers to take the content and put it on their intranets.

—Vice President, Brady

This type of governance structure was best suited to ensuring that e-business exploited the company's core business capabilities. New business unit functions did not, however, preclude business expansion. Chase's e-business function had a VP of Partnering, who had developed several partnerships with Chase competitors to expand their offerings and web presence. Brady's corporate e-business unit was specifically looking for new business opportunities. Brady's corporate e-business unit was similar to the second type of e-business governance structure, the corporate team.

Delta, Australia Post, and UPS had created **new corporate teams** to lead and coordinate e-business efforts. Pulling primary responsibility for e-business into a central unit gave visibility and focus to e-business at a corporate level. Delta had a team of 50 individuals who were matrixed back to their originating business units while pursuing B2B, B2C, and B2E initiatives. UPS had two teams. In addition to its ECAMs (electronic commerce account managers), who worked with customers to teach them how to use and benefit from its online tools, another team developed IT specifications for those online tools. Australia Post had an e-business team of 12 who developed strategy and worked with business units to derive value from the Internet. All three firms relied on corporate IT to approve their e-business proposals and carry out the technical work necessary to implement those proposals. These corporate teams could pursue either exploitation or expansion strategies.

The heads of e-business in these firms, including the corporate e-business head at Brady, commented that their role was to “evangelize” and educate about e-business. Most felt that their roles were temporary and would disappear when everyone in the firm accepted responsibility for e-business as a natural part of what they did:

The one key thing is that we did not create a separate organization in and of itself. In other words, my team is the core—the driving component of e-commerce, but it is not like we went off in a new building and closed the door and said, “Don’t come in, UPSers.” We knew that we had to raise everyone up to know and understand 21st century commerce.

—Senior Director of e-Commerce, UPS

New business units were intended to implement expansion strategies. Plum was a new business developed by two existing financial services firms that wanted to develop a competency in managing retirement investments. UPS created e-Ventures (in addition to its two corporate teams) as a separate business unit to create new e-businesses. E-Logistics, its first offspring, was created to address the back-end fulfillment needs of web start-ups. Finally, Manheim created Manheim Interactive to identify ways to explore opportunities beyond simply offering used automobiles online.

The new business approach overcame some of the challenges associated with e-business integration. New business units experienced little organizational resistance to change, few of the limitations of legacy systems, and, as separate business units, none of the complexities of cross-functional integration. But they had to work harder than firms using other governance structures when they wanted integration with the existing business, particularly in managing incentive systems. Manheim’s CEO noted that staying aligned with the core business was a constant—and critical—challenge:

What we do is spend a very, very large amount of time making sure that we know what the auction company is doing that affects us, and that they know everything that we’re doing.

—CEO, Manheim

Thus, new business units allowed firms to accelerate and focus on new e-business initiatives that were outside the core business, but they were less appropriate for exploitation strategies.

All three of the above structures had distinct budgets for their efforts. Except at Plum, these budgets purchased IT services from the firm’s central IT unit. e-Business opportunities ultimately competed for IT resources with all other IT projects for limited resources. This competition was generally positive, but firms found they needed a holistic approach to e-business and IT investment:

We each have our own budgets, but it’s a little bit like squeezing a balloon. If the folks [on the ERP team] need to do something that requires infrastructure, my budget goes up and if I need to do something that could affect [e-business and ERP], their budgets go up. So you have to look at it in its entirety.

—CIO, Brady

Brady addressed this need by designing an e-business and IT steering committee that included in its membership the heads of both e-business and IT. In addition, members of the e-business and IT steering committee sat on the executive steering committee, which was responsible for firm-wide strategy and funding. We expect that such integrated approaches will be critical to helping firms recognize the strategic potential of e-business opportunities and IT in general. (See Figure 6 for an example of an integrated approach to IT and e-business governance.)

Project Teams. Regardless of their e-business management structure, many firms found that the highly integrated nature of many e-business initiatives and the tight linkage with IT made e-business projects particularly complex to manage:

One of the things we found was that deadlines were constantly being missed, and it was nobody's fault. It was just that issues would come up at the last minute, and everybody couldn't believe that we didn't think about them, but not all the stakeholders were involved in the beginning.

—Vice President, Chase e-Capital Markets

Firms addressed these challenges with two approaches to project team management: (1) temporary cross-functional teams and (2) regular stakeholder meetings.

Temporary cross-functional teams allowed firms to recruit necessary expertise wherever it existed in the firm without permanently depleting the talent of operational units:

Traditionally, Post has set up projects very formally, including creating new full-time positions and seconding staff to fill them. This process can take quite a long time, and once the project is going the people can lose touch with the business. Moreover, at the end of the project they generally find it very hard to resume their old roles.

—Project Manager, Australia Post

Australia Post has since formed project teams of part-time staff who report to two bosses—their business unit manager and the e-business project manager. While this creates tension, Australia Post experienced accelerated project delivery while sustaining momentum within the business units. Delta had 50 people on its corporate e-business team who were drawn from the business units and retain their business unit reporting relationships. These team members identify individuals within their operating units who can provide expertise to project teams. Delta is able to give its e-business efforts full-time focus while ensuring that project teams are fully aware of the implications of their efforts on all relevant business units.

Regular stakeholder meetings brought together everyone who needed to take action, approve, or even just stay apprised of how an e-business initiative was designed and implemented. At Chase even the simplest of e-business initiatives required the involvement of not only process managers, but lawyers, marketing managers, security specialists, IT architecture experts, and applications programmers to examine its implications. These stakeholders were assembled in weekly meetings run by the head of e-Business and attended by everyone who needed to be involved in project decisions:

Because of the way e-commerce works—it touches on many parts of the business, many parts of technology, both infrastructure and applications development—these meetings are often attended by many people. Typically, 20 or 30 people are in the room. And what’s very impressive is that we can cover a half dozen topics with that many stakeholders, hitting the key issues, and we can cover them in a half hour, forty-five minutes.

—Senior VP for IT, Chase

Similarly, when Delta was in the throes of rebuilding its infrastructure, daily meetings could include as many as 100 people.

Both temporary cross-functional team structures and regular all-stakeholder meetings recognized the value of integrating new business opportunities into existing structures, processes, and business models thus leveraging firms’ hidden assets. Firms could simultaneously achieve the strengths of a start-up while leveraging the assets of a successful brick-and-mortar firm.

Partnerships. As firms attempted to add new products, services, or customer segments, they typically lacked necessary internal expertise or competencies. They often dealt with their shortcomings by looking outside their own walls for new skills, competencies, and even customers. Firms reported five reasons for partnering with other companies:

- To reduce the risk of entering new markets.
- To increase speed to market.
- To acquire knowledge about new markets or technologies.
- To gain access to new customers.
- To respond to customer demands for greater transparency among competitive products.

Firms viewed partnerships as particularly appropriate for expansion initiatives. Recognizing that entering into new markets necessarily would find them short some competencies, firms looked for partners who could compensate for their inadequacies. Firms in the study were pursuing five different kinds of partnerships as shown in Table 4: competitor consortia, purchasing consortia, investment partnerships, channel partnerships, and vendor partnerships. These are described below.

Type of Partnership	Driver/Motivation	Characteristics	Examples
Competitor Consortia	Customer demand or industry price comparisons	Portal linking competitors’ systems	Brady, Chase, Delta, NAB
Purchasing Consortia	Drive down costs of materials and supplies	Empowers buyers to dictate conditions	Brady, Post
Investment Partnership	Compensate for lack of market expertise/skill	Equity position in firm that can apply needed talent	Delta, Plum, UPS
Channel Partnership	Expand customer base by linking to another firm’s customers	Combine offerings of firms at different points in supply chains	Delta, Post, UPS
Vendor Partnership	Compensate for inadequate technical skills/knowledge	Facilitates quick entry and knowledge transfer	Brady, Delta, Digiland, Plum, UPS

Table 4: e-Business Partnering Relationships

Competitor consortia were partnerships among competitors to offer portals that would assist customers in their efforts to shop among competitor products. Typically, these partnerships were defensive initiatives, responding to customer demands for greater price transparency. Chase and NAB participated in portals that summarized product information and linked into their own transaction processing systems. Delta participated with other major airlines in developing Orbitz, a travel services portal designed to compete with Travelocity and Expedia. Brady was assessing e-marketplaces, which included firms selling complementary products as well as competitors, to identify where to have a presence to reach existing and potential customers who preferred doing business that way.

In **purchasing consortia** firms apply pressure on their suppliers to provide price transparency. As a smaller firm (\$0.5 billion), Brady was exploring the value of banding with similar firms to gain a price advantage from mutual suppliers. Australia Post has joined with 13 other large Australian companies to form corProcure, a purchasing consortium for maintenance, repair, and operating (MRO) supplies. In contrast, Delta was focused on centralizing its own spending to pressure suppliers for quantity discounts or other services, without the challenge of working effectively with partners.

Investment partnerships allowed firms to compensate for their inexperience or lack of market knowledge by taking an equity investment in a firm with critical skills. One type of investment partnership is a joint venture. Plum, which delivered integrated retirement services to the Australian market, was a joint venture between a firm with retirement services experience but little knowledge of the Australian market with a firm familiar with the Australian market but with no experience in retirement services. By creating a new firm, these two established firms acquired the agility of a start-up without incurring the same level of risk and, as already noted, were able to build a new technology infrastructure free of the constraints of a legacy.

A second type of investment partnership involved taking an equity position in a firm (usually much smaller) with complementary capabilities. UPS invested in firms that were developing technologies that would likely become important to UPS. Delta was pursuing equity income in e-business start-ups and new technology companies, often by negotiating an equity position in exchange for its business. Delta managers noted that the company's alliance with Priceline not only provided the specified benefit of selling excess inventory (empty seats on the plane) but also generated equity income. This was a model that Delta hoped to replicate:

What we're all about is partnering with thought leaders and with companies in the new economy that provide us with opportunities to improve the core of Delta Air Lines. In doing so, we take advantage of the fact that we have these hidden assets, such as our brand, to drive some potential equity value. But the value to the core is paramount.

—Senior VP of e-business, Delta

Channel partnerships allow a firm to lock into another firm's customers. For example, Australia Post arranged to deliver groceries purchased online by Coles Myer customers. Thus, Coles Myer customers effectively became Post customers. UPS secured the agreement of major software providers, such as SAP and Peoplesoft, to install UPS functionality in their software. As a result, firms that implemented SAP, Peoplesoft, or other partners' products would find UPS an easy

company to do business with. Like Post, UPS saw this partnership as a way to pursue business with a non-competing firm's customers, although in this case, UPS pursued the partnership because many existing customers were purchasing these ERP packages and wanted UPS functionality in their ERP systems. Thus, UPS noted that software vendors benefited from the relationships as much as UPS did:

A lot of vendors wanted us to pay them to get the tools into their software, and we said no, we're giving you the value of our brand. We're increasing the functionality. Your customers will see greater value in what you're offering.

—Senior VP, Marketing and Corporate Development, UPS

In a related effort Delta's MYOBusiness.com was offered as a small business travel portal, but part of the objective was to encourage customers to buy from a set of complementary services. Thus partnering firms could leverage one another's customers.

Vendor partnerships give access to specialized technical skills enabling speed to market. Vendors were contracted to support e-business projects when firms did not have sufficient technical skills in-house (Brady, Digiland, Delta, Plum, UPS) to implement their e-business initiatives without delay. New technical skills were acquired by working with the vendors via knowledge transfer. UPS noted that its decision to deploy open standards in the development of its infrastructure created opportunities for partnerships with hundreds of technology firms:

We realized that we could get to larger groups of people quicker if we would embrace open standards. There were people out there, like IBM and Andersen and Harbinger, and hundreds of other folks that we've done alliances with that did an awful lot of things better than we did. That really put us in the lead. Our competition wanted to do it all themselves, and that really gave us a leg up as we built these things. It was a good move for us.

—Vice Chairman and Executive Vice President, UPS

Most firms were eager to pursue partnerships with technology vendors. Firms sought name-brand talent who they trusted to deliver both project outcomes and knowledge transfer. The vendor partnerships we observed were more often contractual arrangements between a customer and a vendor with clearly stated deliverables. While it is arguable whether these relationships should be called partnerships, firms did not question the value that these vendors had delivered to their e-business efforts.

The benefits of some other partnerships were less clear. For example, firms were looking for opportunities to seize benefits from competitor consortia but partnering with competitors to provide greater price transparency for customers held greater benefits for customers than competitors. The emphasis within the firms was on cost-effective operations, differential customer services, and building interfaces or end-to-end processes that delivered products and services in a manner compatible with the design of the portal. Ultimately, firms participating in competitor consortia had to commit management and often technical resources, so they had to weigh the cost of participating in a new consortium with the cost of not participating—

specifically, not having a presence on what might be a key industry portal. Brady noted that many opportunities to join consortia or e-marketplaces had a weak value proposition:

One of the tricks going forward is to spot a good value proposition for the customer in these marketplaces. It might be around technology or a service. When we see the value proposition, we'll ask how can we work with them.

—Business Unit Vice President, Brady

Thus, competitor consortia, despite requiring important external relationships, tended to focus attention on internal processes and the capabilities that could distinguish a company from its competitors. In effect, these partnerships created added pressure to extract human capital from existing processes.

Similarly, investment partnerships offered opportunities for firms to move into new marketplaces, but these investments tended to be highly uncertain. Delta pocketed \$750 million as a result of its equity position in Priceline as well as the additional revenue from Priceline sales of its excess inventory. Delta perceived the Priceline deal as a model for future e-business, and senior management received daily solicitations from firms interested in partnering with Delta. But opportunities with the potential of the Priceline deal do not regularly emerge. Delta, as well as several other firms in the study, will continue to look for investment partnership opportunities, but when management talks about e-business fundamentally changing the face of Delta, they are most often referring to the impacts of improved customer service, new product lines, and meeting the demands of a mobile workforce.

Channel partnerships appear positioned to leverage the capabilities of the web, but most of the firms in our study had not established channel partnerships. UPS has seen notable outcomes from providing its functionality to software providers, and a number of firms described pending channel partnerships. As has consistently been true of strategic partnerships, channel partnerships require a good strategic and cultural fit and they demand management attention. Channel partnerships will likely become a piece of many firms' e-business strategies but perhaps not as important as we initially expected. Like competitor consortia and investment partnerships, channel partnerships are built on strong organizational processes.

Incentives and performance assessment. E-business initiatives in firms could lead to internal channel and role conflict. Digiland, Chase, and Brady all noted that e-business was changing the role of salespeople so that they were less responsible for order entry and more responsible for educating customers about products and the features of the website. This change required some rethinking about performance measures, compensation, and even staffing levels. At Digiland sales people were freed of many of the tasks they had performed in the past, including checking inventory levels and tracking shipments, giving them time to promote the use of the firm's online ordering capability with customers. In turn, they were given no commissions for sales to a given customer unless at least half of that customer's orders were placed online.

Manheim's CyberAuction represented a more extreme case of channel conflict within a firm. At least some individuals within Manheim perceived that on-line sales would compete directly with the physical auctions. Manheim management noted that only three of every ten used cars

purchased by used car dealers were bought at an auction. They were hopeful that the online auction would result in incremental sales. Nonetheless, when online sales could be traced to a physical auction, Manheim gave credit for online sales to off-line managers. This contributed some cohesion between Manheim's online and offline efforts, so that auction personnel welcomed Manheim Interactive technology demonstrations at their auctions.

Summary on Human Resource Alignment. The ability to strategically allocate human resources to align with business priorities—through e-business governance, project teams, partnerships, and incentives—is critical to e-business migration. Regardless of the quality of the IT infrastructure and the governance processes that protect, enhance, and leverage that infrastructure, business success is ultimately dependent upon a firm's processes. Even when processes are highly automated, the human resources allocated to designing, implementing, and assessing those processes are critical to their effectiveness. Based on their internal competencies and market opportunities, firms are tapping internal and external human resources and focusing their attention on the task at hand through project structures and team incentives. It is important to recognize that migration, by definition, means disrupting organizational habits. Thus, attempts to migrate without changing organizational structures, drawing on external resources, rethinking incentives, and reengineering project management are likely to be feeble.

3. Customer Connectedness

Many e-business offerings do not immediately meet with customer enthusiasm. For example, Manheim noted that some used car dealers were not comfortable with the idea of buying an automobile online. Brady had some distributors who were not interested in providing web access to their sales and service personnel. Plum noted that online retirement programs worked best when individuals could access them through a company intranet, and many of their client firms did not have an intranet. Chase found that, although customers were clamoring for some online services, individuals who were completing very large transactions were reluctant to push a button to complete a transaction, rather than work through a salesperson:

Once the initial novelty wore off, investors sort of felt like, well, it is great that you have a web site for me to enter orders into; but, basically, if you want my business, I am going to call you up and tell you what I want to do and you can put it in your own silly web site.

—Managing Partner, Chase

The challenge for firms is to identify when a lack of enthusiasm is simply resistance to change and when the offering has no compelling value proposition. If an offering has no compelling value proposition, firms want to recognize the failed experiment and discontinue the offering. If an offering is just facing early resistance, firms want to aggressively encourage customers to use online products and services.

One way firms sought to ensure a value proposition was to carefully segment the market. Brady found it possible to differentiate customers on the basis of their preferred channel. Some customers wanted to transact business through distributors, some wanted to call direct, some wanted to buy online, and some wanted account managers (and were big enough to warrant them). Brady developed e-business initiatives to enhance each of those channels:

Some customers like the value provided by a distributor. That's how they do business. It's what's comfortable for them. We like those people. Some prefer to sit in their pajamas at 2:30 in the morning and look through a Seton catalog and then get onto the Internet and order some product. We're glad to serve them that way. In the end it's really the customer who decides. We'll serve them through any channel they like.

—CIO, Brady

Delta, too, was attempting to provide an array of online offerings according to customer segment. Delta.com was useful primarily to loyal Delta customers who wanted to complete a transaction quickly without investigating other airlines. For customers who wanted to choose from a variety of airlines, Delta created Orbitz, a travel industry portal. Finally, Delta sold discount tickets through Priceline for customers who emphasized lowest cost in making their travel choices.

When firms believed their value proposition was sound, they took three approaches to addressing initial customer resistance: education, value-added features, and incentives. Many firms were providing customer education. Brady walked its distributors through the capabilities of their distributor extranet. Manheim invited used car dealers at physical auctions to view and test the technology for online auctions. Plum spent an average of \$13 to train each individual from each client firm who opted to use Plum's online retirement account management services. UPS had a team of 100 e-commerce technology account managers (ECAM) who visited large UPS customers with the regular UPS account representative and demonstrated the firm's technology offerings. Digiland held seminars for its resellers to explain the ways in which they could participate in the new Internet-based sales channel.

Firms were supplementing training with value-added services that were available only on the web. Through its online returns and exchanges services, UPS provided shipping documentation for customers' customers who wanted to return goods received. This was a service that could not be made available through any other medium. Brady introduced a web-to-workbench product that allowed end customers to contact Brady directly with specific instructions for customized signs rather than ask a distributor to relay design requirements.

Finally, firms were offering incentives to customers who used web services, particularly transaction services. Delta offered frequent flier miles for online ticket sales. Brady offered occasional discounts to direct customers.

Firms both leveraged and developed customer relationships through their education and incentive initiatives, and their value-added features. Firms who had cemented online relationships shifted their focus to using electronic connections to "lock in" their relationships:

We are driving deeper into our customers' systems so that they get a benefit. Then when we're in there, it's harder for them to get us out. If we are just talking to them at the dock, we can be replaced in a day. If we are in their order entry system, if we're adding value in their picking system, if we're adding value in

their customer service system, in their warehousing system, it's harder to be replaced.

—Senior Vice President, Corporate Development, UPS

Despite all their efforts to entice customers to use their online services, most firms found customers less enthusiastic about online offerings than they had hoped. What was possible did not equate to what was wanted. Listening and responding to customer needs was essential for alignment between e-business offerings and customer adoption. UPS observed that listening closely to customers and responding to their needs was taking the firm in unexpected directions:

Our customers are demanding broader, deeper services, whether that's running telephone centers for them or doing their billing for them or going out and repairing and replacing their computer parts for them. We're doing all kinds of things we didn't dream of doing ten years ago.

—CEO, UPS

Summary on Customer Connectedness. Recognizing the potential for e-business to offer greater reach and lower cost connections does not immediately lead to successful e-business initiatives. Firms were sometimes being pushed by their customers and sometimes they were pulling their customers. When pushed by customers, firms needed to determine whether the direction made sense strategically and they needed to work closely with key customers through the experiment and design stage. When firms were pulling customers, they needed to ensure that the concept offered real customer value and then provided education, incentives, and value added features to entice customers to break internal habits. While both pushing and pulling facilitated e-business migration, customer pushing appeared to accelerate the process. Pulling customers inevitably meant delays in adoption and consequently slower migration.

D. e-Business Metrics

The firms in this study were struggling to identify appropriate metrics for assessing e-business Success. (See Figure 7.) Initially, they focused on e-business activity, such as number of web page hits, number and length of sessions, number of abandoned shopping carts, and percentage of business done electronically (orders, revenues, customers, number of transactions). Most also attempted to assess some of the business impacts of e-business initiatives with metrics like decrease in call center volume, cost savings per transaction, and profitability of new online ventures. Over time, they hoped to find metrics for assessing the impact of e-business initiatives on shareholder value:

Today we measure things like percentage of business done electronically, percentage of transactions confirmed electronically, number of web page hits, number of new clients, number of new clients coming on the web site, but ... everything else in the organization has to translate into shareholder value added and the Internet activities are going to be no different.

—Managing Partner, Chase

Although ultimately what really matters is the impact of e-business on the bottom line, metrics that focus on hits, online queries and transactions, and number of customers online are valuable

for assessing e-business migration progress. Most firms have e-business targets and their metrics indicate whether e-business was becoming “part of the firm’s DNA,” as one firm thought of it. Most firms indicated that once e-business became absorbed into their operations, their e-business units would disperse, but firms had not yet established a metric that defined when the migration would be essentially complete.

A complicating factor in e-business assessment is that, while project costs are quite visible, many costs are shared across initiatives. e-Business typically represents an additional channel for doing business. It does not replace old channels. Thus, the costs associated with a project may understate actual costs. The measured outcomes, as noted above, emphasize direct project costs and benefits. The costs represent interventions targeted at pulling customers online (e.g. education, incentives, and value added features). Organizational interventions, which are more often not measured, include the costs of organizational change, such as role changes, new organizational structures, new project team dynamics, and the acquisition and management of partnership relationships.

As firms pursue IT governance, human resource alignment, and customer connectedness they take on the cost of creating new habits in order to become e-capable. Building an e-business capable firm is a necessary investment in the firm’s future, but most firms are not measuring it. Thus, it appears that firms need three types of metrics to assess e-business migration: (1) the e-business activity metrics that most firms have in place in order to assess customer reaction to e-business initiatives; (2) business impact metrics that assess the effect of e-business initiatives on profitability and other balanced scorecard elements; and (3) e-business readiness metrics that measure the quality of their assets (existing processes, customer perceptions, and IT infrastructure) and the sophistication of their e-business processes (IT governance, human resource alignment, and customer connectedness). This final measure allows firms to determine when migration has been achieved. It is more useful for determining migration progress than e-business activity metrics because firms do not know their optimal e-business activity level. Sophisticated e-business processes will not ensure the profitability of e-business initiatives, but they can be helpful in identifying when e-business has become THE-business.

V. Conclusion

Firms are implementing e-business as a series of projects that either offer existing products and services through a new channel or create new products and services to capitalize on existing capabilities of the firm and the Internet. We found that the migration from physical business environments to electronic market environments involved leveraging intangible assets and adopting new or enhanced management practices. Figure 8 depicts the key e-business assets and the related management practices that enable firms to migrate from place to space.

While firms could leverage many different intangible assets, we found that existing processes, customer perceptions, and IT infrastructure were particularly valuable in transitioning products and services from physical to electronic markets. In attempting to leverage these assets firms needed to address three management imperatives: IT governance, human resource alignment, and customer connectedness. These management imperatives are not new to e-business. Most

firms had introduced related practices in the early 1990s as part of globalization, business process reengineering, mass customization, customer intimacy, enterprise resource planning, or customer relationship management initiatives. What is new is that these management imperatives appear to be a necessary condition for the migration from the marketplace to the marketspace. Like the initiatives list above, attention to e-business will wane as the essence of e-business is absorbed into the management tool kit.

IT governance is critical to migration because e-business is technology dependent. Creating the capability to regularly shift business between physical and electronic channels demanded a centralized, data-centric, integrated IT infrastructure that reflected the organization's core processes. A strong IT infrastructure permits experimentation with new capabilities but, more importantly, an e-business ready infrastructure allows firms to rapidly incorporate successful experiments into their ongoing operations. By standardizing and automating existing processes, firms free management attention and human resources for new initiatives. Possessing an e-business ready IT infrastructure, however, does not ensure success. Senior management needs to protect, enhance, and leverage the infrastructure in order to generate a payback on the investment. Protecting the infrastructure means providing architecture stewardship, so that the entire firm is committed to maintaining technology standards. Enhancing infrastructure means continued investment in the IT infrastructure to ensure its growing capability. Leveraging the infrastructure means recognizing opportunities to create value quickly, while competitors with less able infrastructures struggle to mimic new customer services.

Human resource alignment is critical because firms have limited management attention and human resources. Thus, it is necessary to apply business talent to strategic priorities and to regularly reshuffle experts to projects where they can provide the most value. Firms exploit existing processes by moving them to new channels as appropriate; they also expand into adjacent businesses in order to regularly redefine themselves and drive deeper into their customers; and they extract unneeded human capital from projects as they go live so that they can make them cost effective and free up resources for the next project. Human resource alignment involves identifying when partners will be valuable to either transfer knowledge or provide competencies that don't exist within the firm. Alignment also involves designing incentives, so that needed role changes are adopted.

Customer connectedness is critical to e-business migration because e-business demands constant experimentation in order to identify what customers want and how they want to access the products and services. Firms need very wide bandwidth between themselves and their customers so that customers can effectively react to new electronic offerings early in the development process. Customer-driven e-business opportunities are less risky, but firms were also identifying new products and services that required customer enticements. When approaching a new customer base or just disrupting habits of existing customers, firms must offer education, incentives and/or features that make the value proposition for customer more apparent.

A. Assessing e-Business Migration Success

To better understand how firms migrate from place to space, the researchers designed an assessment tool so that any firm can determine how far along the e-business migration it has traveled. These assessments are based on practices we witnessed in the sample firms that

positioned the firm for e-business. The assessment lists seven practices for each of the management imperatives. Firms receive a point for each of the practices they have instituted, so that they will have a score between 0 and 7. The assessment items are as follows:

1. IT governance

- a. Senior management sets strategic IT investment priorities.
- b. Investment process is responsive to unanticipated opportunities.
- c. Senior management understands the value of IT architecture and establishes policies to protect it.
- d. Firm has accepted process for resolving architecture vs. unique-business-need controversies.
- e. Firm provides for centralized databases and IT infrastructure services where appropriate to ensure integration and low cost.
- f. e-Business and IT governance are integrated.
- g. Firm annually funds infrastructure renewal projects.

2. Human Resource Alignment

- a. e-Business governance structure assigns resources to a portfolio of initiatives that can both exploit and expand the firm's core.
- b. e-Business governance structure ensures strategic priorities while enabling individual business units to exploit new channels.
- c. e-Business project teams are staffed with persons positioned to implement new initiatives.
- d. e-Business implementation teams hand off to operations teams who can integrate new initiatives into existing processes as appropriate.
- e. Firm seeks out partners who can transfer technology knowledge the firm needs for building e-business initiatives.
- f. Firm seeks out business partners who can provide competencies that offer the potential to generate added value from the firm's existing competencies.
- g. Incentive structures encourage behaviors aligned with the objectives of the firm's e-business initiatives.

3. Customer Connectedness

- a. Firm works with key customers in the process of developing e-business initiatives.
- b. Online initiatives have a clear value proposition for the customer.
- c. Firm carefully segments customers and appeals to different segments with different products.
- d. For offerings that are not customer-driven, firm offers customer training, incentives or value-added features to entice customers to adopt new online products and services.
- e. Online offerings drive deeper into customer systems to help lock in the relationship.
- f. Firm recognizes and drops offerings that do not have a viable value proposition for both themselves and their customers.
- g. Firm provides online services to support key intermediaries or substitutes online services to bypass intermediaries who are not adding value.

A very rough plotting of the scores of the nine firms in the sample suggests that there is a correlation between management practice score and the percentage of revenues generated online. While we cannot be certain this relationship would exist in a larger sample, we believe that e-business savvy firms will rate strongly on all three management imperatives. To identify their management strengths and limitations, firms can plot the three imperatives separately. Figure 9 shows the plots for three firms in the study. These plots highlight the individual firms' progress toward marketplace migration, and guide future investment decisions.

B. Approaches to e-Business Initiatives

In implementing an e-business initiative, we found that two considerations should guide implementation approach. One was the firm's readiness with regard to its management practices. The other was the customer's readiness for a new online product or service (see Figure 10).

In the ideal case, a firm has the assets and management capacity to pursue an initiative in response to, or anticipation of, strong customer demand. In such cases, firms can move aggressively to develop and implement the service. UPS found that, as its customers became familiar with its online tools, new tools were greeted enthusiastically. Thus, it has tried to maintain a steady stream of new capabilities in an attempt to move too fast for a competitor to catch up.

In a few cases we observed customer demand outpacing organizational capability. For example, Chase found that some customers were clamoring for an industry-wide portal for fixed income instruments that Chase was not positioned to offer. In these circumstances, it is wise to partner with competitors or providers to meet the immediate need.

Often, a firm was ready to offer a service, but the target customer was not ready to adopt the service. These situations, such as Manheim's ability to sell cars online or Brady's ability to connect electronically to distributors, demanded customer education and promotion. UPS noted that it was also important to understand how customers wanted to do business and to tailor offerings accordingly. In general, firms should probably focus on products and services their customers are already convinced they want, but in cases like Manheim and Brady were facing, they needed to bring their customers "up to speed" in the use of technology.

Finally, we observed a few cases where firms pursued initiatives for which both the firm's readiness and customer readiness were questionable. Brady found this to be true of its first implementation of an online catalog. Chase noted lack of enthusiasm for some customer self-service offerings. Digiland expanded its online catalog to a lukewarm response. In some cases, firms retracted from these offerings. In other cases, they found early attempts were worthwhile learning experiences that led to improved—and more successful—offerings in subsequent releases.

C. Summary

This study has observed that e-business migration started years ago. It continues to emerge as a firm implements a stream of e-business initiatives and changes in management practices related to IT governance, human resource alignment, and customer connectedness. As a firm goes to

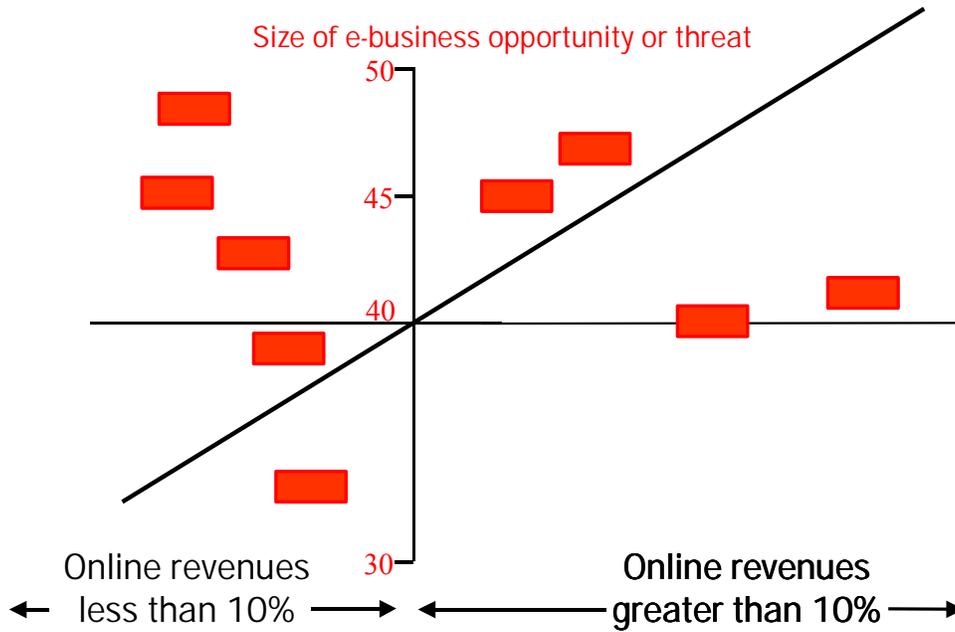
market with e-business initiatives, management should consider the strength of its assets and both its internal readiness for the required changes in systems and processes and its target customers' readiness for process changes. With each new initiative, a firm should learn more about the needs of its customers, so that it can develop a pipeline of business initiatives targeted at exploiting its existing capabilities and expanding into related business areas. We believe this process of exploiting, expanding, and then extracting excess human capital captures the essence of business in the electronic age. Firms will condition themselves to perform in this environment so that they can constantly redefine their business and discourage competition.

VI. Top 10 Leadership Lessons

This study offers 10 lessons for executives who are attempting to migrate their firms from traditional to more electronic businesses. These lessons are as follows:

1. e-Business migration is an evolutionary process. Get started.
2. e-Business migration results from ongoing experiments. Shape e-business strategy based on customer feedback.
3. e-Business migration can take on a rhythm like breathing. Exploit by moving processes to the Web, expand by moving into adjacent businesses, and extract excess human capital by standardizing and automating existing processes.
4. A firm's existing processes, customer perceptions, and IT infrastructure represent strategic assets or strategic liabilities. Recognize the assets that the firm can leverage.
5. Firms can destroy outdated infrastructures radically or incrementally, but they must destroy them. Build a centralized infrastructure around the firm's core data.
6. IT governance protects, enhances, and leverages the IT infrastructure. Seize responsibility for IT governance within senior management.
7. E-business migration represents a disruption to organizational habits and those who must keep the firm running cannot also disrupt it. Create an e-business organization linked to core operations.
8. Expanding a firm's core means expanding its competencies. Get a little help from a partner.
9. Many e-business concepts do not immediately appeal to potential customers. Educate, incent, and listen, but also recognize and abandon failures.
10. The full impacts of e-business can be difficult to trace to the bottom line. Measure the migration as well as the initiative.

Figure 1: e-Business Migration – What We Saw



Note: Size \equiv revenue, positions based on researcher assessment

Figure 2: Impacts of e-Business on Traditional Firms

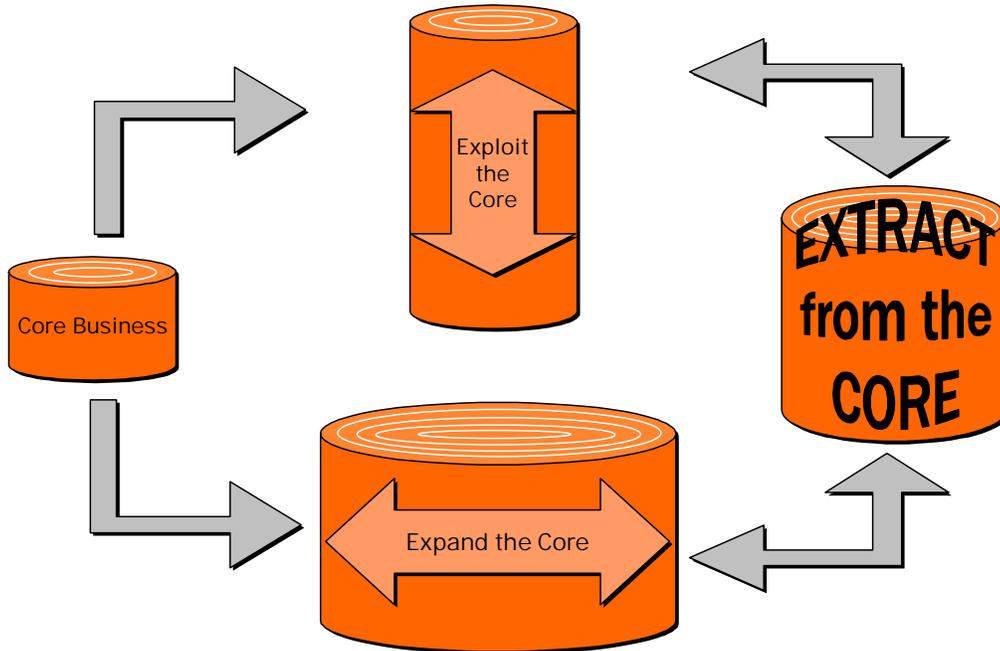


Figure 3: Twentieth Century IT Architecture

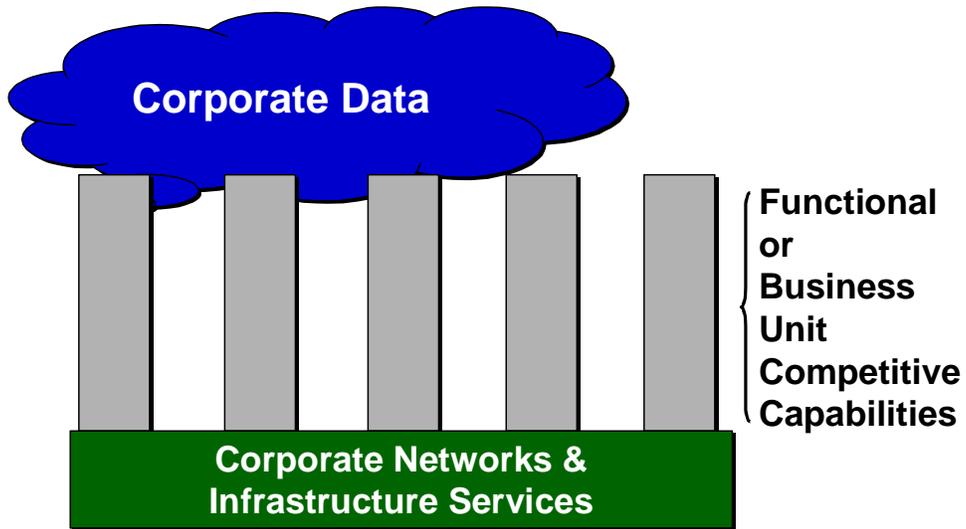


Figure 4: e-Business Infrastructure

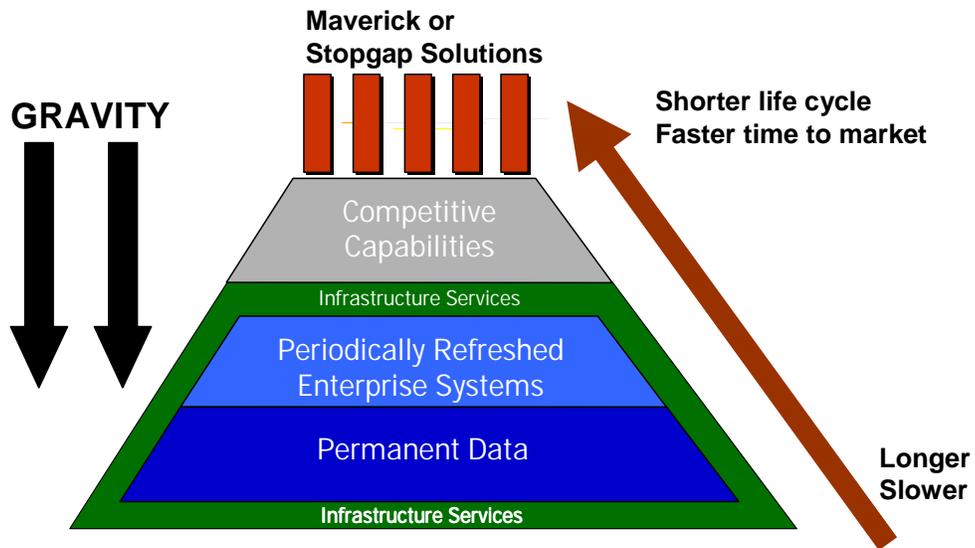
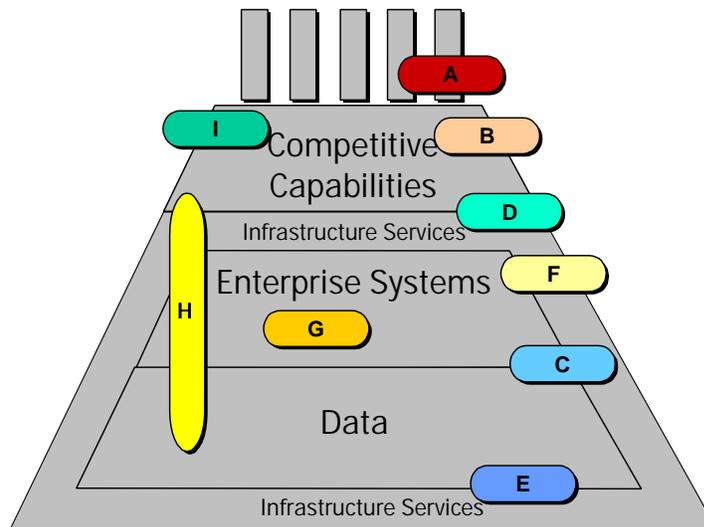


Figure 5: Rebuilding and Renewing IT Infrastructure



Researcher assessment of base on which research sites started to build e-business applications.

Figure 6: Integrated Approach to IT Governance

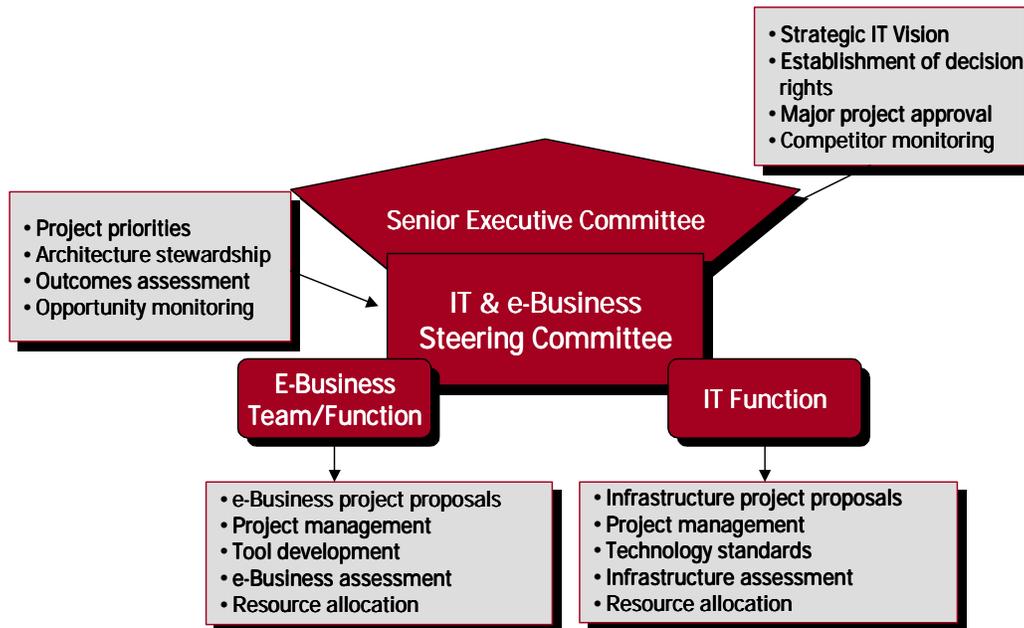


Figure 7: e-Business Measurements – The Usual Suspects

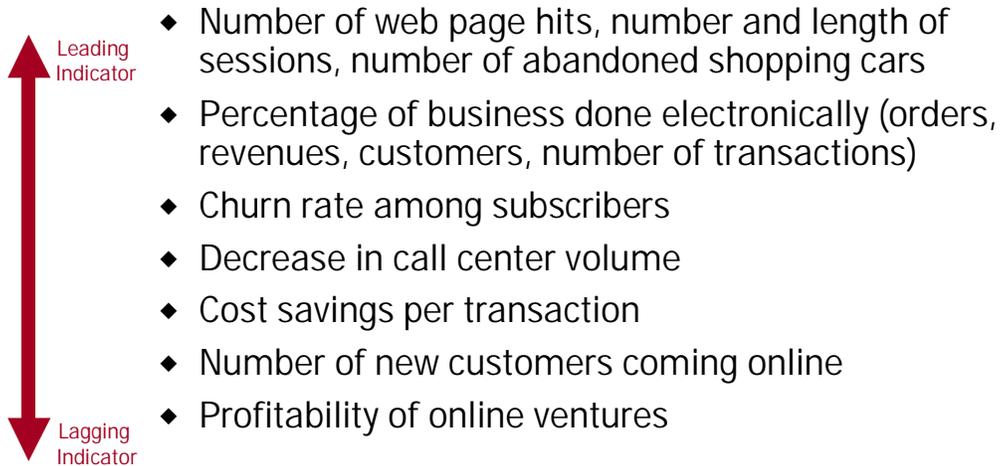


Figure 8: Exploit-Expand-Extract Management Model

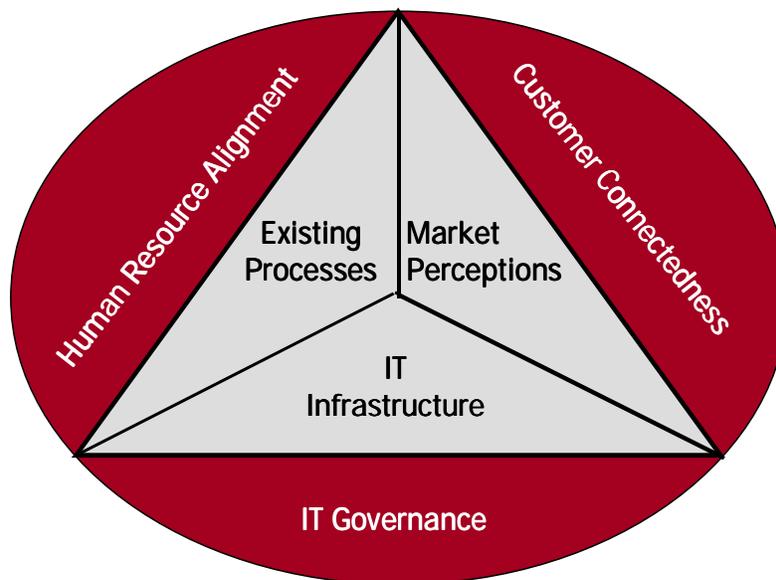


Figure 9: Mapping e-Business Capability

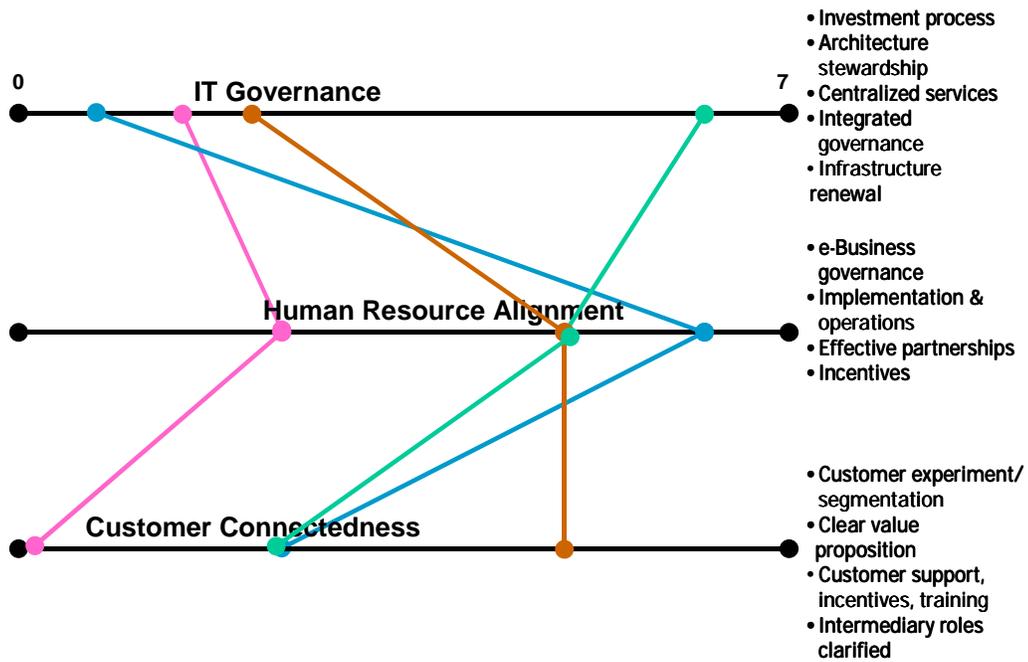


Figure 10: Going to Market with e-Business Initiatives

Target Market Readiness

High	Alliances	Rapid Incremental Implementations
Low	Experiments with key Customers	Customer Incentives and Training
	Low	High

Firm Readiness