

CHAPTER 1

The e-Business Challenge

In today's business climate, e-Business can have an impact on every facet of the organization, including processes, applications, staffing, infrastructure, relationships, sales, and sales channels. Not only is e-Business transforming companies and industries, it's doing so at an accelerating rate. Business cycles that use to be measured in years are now measured in days.

Competition in the future, even today in certain industries, will not be company against company but supply chain against supply chain. Companies will be only as strong as the weakest link in their supply chain. The winners will be companies that can build up, or tear down, electronic B2B relationships rapidly and seamlessly.

As part of this transformation, enterprise borders are starting to disappear. e-Business is all about providing open access to infrastructure services, data, and applications. Partners, suppliers, customers and, in some cases, even your competition (or co-opetition) will be able to peer 3into your corporate nervous system.

Hopefully, all of this will be for the better. But, if not handled correctly, sometimes it may be for the worse.

Customer expectations are rising mercilessly in terms of the speed and reliability they expect from your e-Business applications. Studies show that Web customers will wait only eight seconds for a page view, even if they are on a slow connection that you have no control over.

Not only are your external customer's expectations rising but so are the expectations of your internal customers. They can't watch the news or read an airline magazine without being reminded about what is possible in e-Business.

As a result, they are clamoring for the functionality that e-Business provides, asking you to take the business "from brick-and-mortar to click-and-mortar." And application developers may be pushing to develop online systems that involve users outside your organization, and that connect to the external systems of your business partners.

WHY INFRASTRUCTURE (SUDDENLY) MATTERS

All of these pressures place a great strain on infrastructure components such as networks, security, servers, and middleware. If your e-Business front door isn't robust, highly available, and totally secure, your company risks major losses.

The Internet has made applications and infrastructure increasingly visible to customers and to the general public. Today much of your organization's reputation and brand identity depends on the quality of your e-Business infrastructure, not just on your applications.

With the Internet as a common currency in the business world, any lack of integration, robustness, or agility on your part becomes immediately and embarrassingly obvious to key customers—no matter where they are in the world. In the past, when you made mistakes, only your employees knew and it wasn't as big a deal. Now, if you have problems, the whole world knows. CNN may broadcast a report on how your Web site hasn't been up for five hours! That's definitely not good advertising for the company's brand.

An infrastructure that frequently fails, that doesn't support the traffic load or that can't provide an single integrated view of your complex organization can cost your company immediately in lost sales and lost goodwill. When you realize what's at stake, you begin to see why savvy, agile organizations are investing more to make sure that their infrastructure doesn't lag far behind their business vision and applications. Unfortunately, once your lack of robustness and agility is exposed, you can't change things very quickly. Having an adaptive infrastructure will ensure that you don't get caught flat-footed when your time comes to shine on the world's commercial stage.

GETTING IT RIGHT

As time goes by, more businesses are buying, commissioning, and even renting applications in one form or another. Meanwhile, fewer companies are building their applications internally from scratch. In such situations, an adaptive infrastructure strategy becomes crucial to providing a versatile, flexible, and agile foundation for application deployment.

As your organization outsources more of its applications work, what's left for IT to do is to *get the infrastructure right*. From a practical standpoint, if

you are implementing a Microsoft SQL Server back-end, what differentiates your effort isn't the SQL Server application itself, but how successfully or quickly you get it running, and how well it works for your purposes. In many cases, these problems aren't application issues, they're infrastructure issues.

As infrastructure becomes more important (and more separate from application design), the resulting adaptive infrastructure solutions should exhibit several key traits:

- **Efficiency.** The ability to provide reusable components that are priced reasonably and can be quickly turned around for application development projects.
- **Effectiveness.** The easy integration of all components in a way that supports their robust operation.
- **Agility.** Good planning and design processes that allow companies to develop new applications quickly and to repurpose or upgrade their existing infrastructure to support new requirements for existing or new applications.

If you also outsource operations to run the infrastructure, then what you have left is a group that makes sure those applications can run effectively on the outsourced infrastructures. The ability to smoothly manage separate service providers will be the key role of infrastructure planning in organizations for some time. This is particularly key in e-Business where the option to outsource is both a best practice and yet still is problematic from a planning perspective.

What's the Difference?

You often hear the terms "e-Business" and "e-commerce" used interchangeably. But they are far from the same.

e-Business means conducting any aspect of business online, including buying, selling, transacting, or exchanging information with customers, suppliers, distributors, resellers, or employees. e-Business can include Web-driven applications as well as other electronically automated capabilities (voice, wireless, PDAs). e-Business reaches beyond Web-based commerce to include core business processes such as back-office, supply chain management, and customer relationship management.

e-Commerce is a subset of e-Business that involves transaction-oriented Web-based systems such as online catalogs, purchasing, and payments.

e-Commerce is the sales aspect of your online process, whereas e-Business is everything.

THE IMPORTANCE OF INTEGRATION

e-Business is no longer about being on the bleeding edge, or being the latest and greatest. It's about trying to be a leader in a world where your own competitors are also increasingly agile. To do this, you simply won't have time to reinvent the wheel, or to rebuild your entire IT infrastructure from scratch. Instead, you will have to learn how to adapt many of the infrastructure components you already have—all the while being smarter about how you use your legacy systems and how you grow them.

For most established enterprises, e-Business applications and infrastructure are often nothing more than a graceful way to capture more external users for existing “legacy” applications. To do this safely and well might require adding or improving infrastructure, but not necessarily huge amounts of new application programming.

Assuming you don't have the time or resources to replace every system, integrating legacy systems will be crucial strategy when trying to meet time-to-market deadlines. You must integrate applications and points of interaction (Web, PDA, and voice access, for example) so that data is instantly synchronized and so that various points of interaction share the same look and feel.

Despite the extremely short shelf life of e-Business initiatives, and the resounding crash of the dot-coms, the changes caused by the e-Business revolution will be increasingly felt over the coming years. While early high-profile initiatives focused on the front-end -- with applications such as online stock trading, online auctioning, and industry portals -- many companies are starting to apply e-Business to front- and back-end enterprise processes.

Business to Business (B2B) integration will become an increasingly key infrastructure solution, finally moving beyond solutions based on electronic document interchange (EDI) to solutions based on the more extensible markup language (XML) to facilitate the flow of transactions between organizations.

Enterprise-wide task forces sponsored by company executives will be given authority to coordinate and plan business process re-engineering

projects related to e-Business. The benefits of a fully adaptive approach will be felt when business partners can be easily added and dropped without undue cost or conversion time.

THE GLOBALIZATION CHALLENGE

Along with integration, many companies will face the challenge of scaling to a global level. The good thing about e-Business is that it opens up new markets. But is your company ready for this? Globalization demands depth of resources: being able to service clients around-the-clock, in different languages and with different cultural expectations. It also demands scalability. How do you estimate the potential load on your infrastructure when the potential client load is unlimited?

Clearly e-Business raises the stakes for IT, but it provides greater opportunity as well. IT has to become a key partner in e-Business activity. No longer viewed as just a cost center, IT can become a revenue generator and a business enabler.

Leading enterprises have created new roles such as chief technology officer (CTO) to help lead the e-Business charge and educate business leaders on what is possible. Later chapters in this book will show how you can create additional roles and functional groups to meet the e-Business challenge and improve the agility of your business by improving the adaptability of its IT infrastructure. Much of your challenge will be in terms of marketing agile solutions within your organization and securing the correct level of budget funding.

What is Infrastructure?

What does the term “e-Business infrastructure” really mean? In the physical world, infrastructure often refers to public utilities, such as water, electricity, gas, sewage, and telephone services. Often, as shown in Figure X, these utilities are layers of a total structure that includes e-Business infrastructure. Each layer is:

- Shared by a larger audience than the structure it supports
- More static and permanent than the structures it supports
- Considered a *service*, including the people and processes involved in support, rather than just a physical structure or device
- Often physically connected to the structure it supports

- Distinct from the structures it supports in terms of its lifecycle (plan, build, run, change, exit)
- Distinct from the structures it supports in terms of its ownership and the people who execute the lifecycle

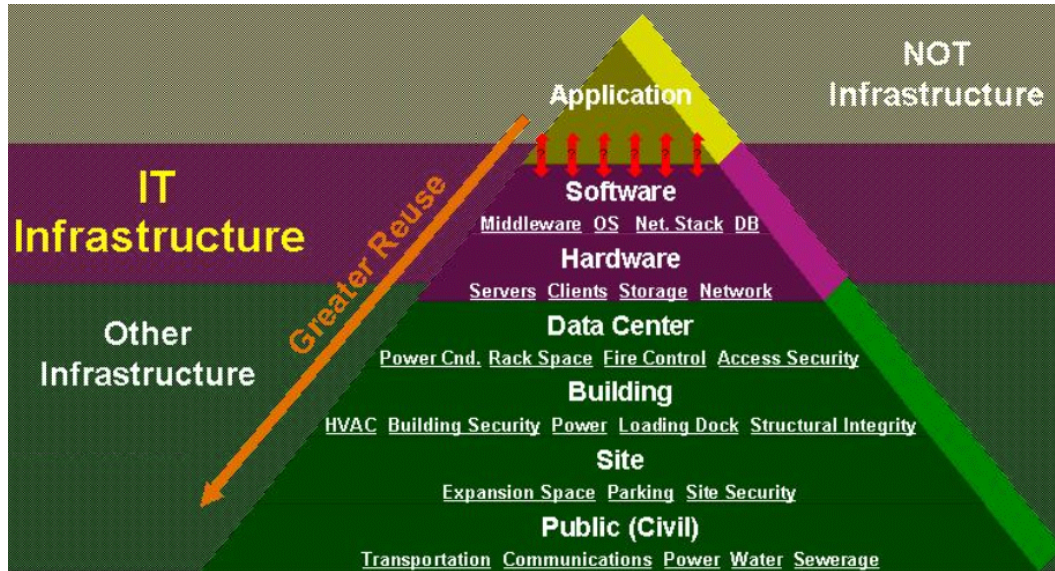


Figure 0.1 Types of Infrastructures

The notion of a separate ownership and lifecycle is crucial to the concept of infrastructure as used in this book.

e-Business is already replaying many of the traditional battles between line of business and central IT over ownership of applications and infrastructure. In many companies, the marketing departments run the e-Business function, but marketing gets tired of the day-to-day headaches of designing upgrades and maintaining uptime. When this happens, they ask IT to take it over and “run” it. But IT must do more than just run it – they must take over the entire lifecycle. They must also “fix it” by applying IT best practices to make it better.

THE CLASH OF CULTURES

So you’d like a better infrastructure but you’re a little short on funding? IT people realize all too well how hard selling infrastructure improvements

into the organization can be. In companies with less enlightened management, any IT department trying to reach the goal of an adaptive infrastructure will encounter two common yet fundamental reactions.

Stability is good. People often feel it's good to have an infrastructure that is stable, unchanging, and predictable. Certainly predictable, systematic behavior must be achieved at some level. However, infrastructure must also be flexible, and even breakable, to be fully leveraged by business. Many people have found that existing e-Business applications are not that stable and that infrastructure is often the culprit. To get infrastructure more stable – but not too unchangeable --- will take a careful balance of structure (standards) and innovation (adaptiveness).

Infrastructure costs are bad. Businesses usually regard infrastructure as a cost to be minimized or a necessary evil. However, e-Business costs until recently had been exempt from this problem – no budget was too big if the project was e-Business. Now, however, even e-Business infrastructure work is undergoing careful ROI scrutiny for business value.

As business increasingly becomes “informational” in nature, the systems for information capture, management, and delivery become even more central to business strategy. If infrastructure can provide this kind of key value to the organization, even if only making it possible for orders to be taken, the organization will see it as something valuable. The hard part will be convincing the business to spend money on anything beyond the particular project needs of the moment. To counteract this tendency, you will need a funding strategy that is more responsible and focused on the long-term.

A clear misalignment between business and IT organizations dominates infrastructure decision-making. Business is chronically disconnected from what is happening on the infrastructure side. When this happens, the business units may go off and support their own application development projects using outside consultants, without considering whether the infrastructure is fully in place to support the planned applications.

Not surprisingly, this disjointed style of solution delivery often results in applications that do not perform nearly as well as originally intended and that are too complex and costly to implement. Such applications can even degrade the performance of other applications, because developers don't understand the complexities of a shared network infrastructure within the organization. e-Business is no different – just with larger scale issues that create even more pressure on IT to get things right for all applications, rather than just one at a time.

This disjointed approach further increases the complexity of managing the whole infrastructure. New applications often arrive with new or different components that require support from your already over-stretched IT organization. Unfortunately, the need to support everything often leads to mediocre support at best--or expensive and ineffective outsourcing at worst.

In e-Business, each new application could be based on what is seen as the latest and greatest solution that requires extensive variations in infrastructure. Because it's all so new, business is still trying everything.

Now, given the renewed interest in affordability, business must make choices about what really makes a difference and then IT must deliver it. This situation is actually better for infrastructure planners, since vague goals are being replaced by specific projects with explicit service level requirements. This in turn should make planning easier.

WHAT'S THE SOLUTION?

Obviously, with pressures coming from so many directions, you need an organized way to cope with everything. This book will provide a number of strategies to help you cope, but in a nutshell it boils down to the following key concepts:

Plan your infrastructure end to end. When you plan infrastructure, you can't just plan a piece at a time and hope it all works together. To be adaptive, your infrastructure planning efforts must become more extensive. They must consider all types of e-Businesstechnology and fit new components into a complete infrastructure solution that can service an entire application. This book explains how infrastructure *patterns* that can help you do a more thorough job of planning appropriate and well fit infrastructure for e-Business applications.

Design an adaptive infrastructure. Your infrastructure shouldn't just meet today's requirements; it should be ready to scale, adapt, change, or grow to deal with challenges already looming on the horizon. With e-Business, change looms more quickly in the future than ever before. Once you identify these challenges, you must face them squarely and start designing for them immediately. This book explains the fundamental concepts of adaptive infrastructure and explains how to identify the major challenges you will face using them for e-Business design goals.

Make infrastructure reusable. A key reason for building an adaptive infrastructure is that many design standards and actual physical components of the infrastructure can actually be reused. Reinventing the wheel for every application only makes your infrastructure increasingly unmanageable and slows down its delivery. This book will explain how to identify key infrastructure patterns within your organization, and how to structure them to leverage a set of reusable adaptive infrastructure services appropriate for e-Business.

Find out what works, and do it. It's important to move from a strategy of "trying everything" to a strategy "finding out what works" and then doing those things repeatedly, while optimizing to improve quality and reduce cost. Much of this requires stronger process and more focus on delivery of working solutions rather than only keeping up with new technology.

Focus on people and process. Many IT people seem to focus on making product choices or architecture choices, while ignoring the people and processes needed to be successful. You can make great technology choices, but if you don't have the right people and processes, your technology choices will be useless and you won't get the success you need from them.

Choose the right technology and products. Of course, striking a balance doesn't reduce the need to always select the best technologies and products for your infrastructure and application delivery needs. This doesn't mean that the latest best-of-breed solution is always the right one for your organization. In e-Business, there is a new best-of-breed every time you turn around, so it will be impossible to stay on top of a strategy that always focuses on best-of-breed products.

Balance immediate needs with long-term goals. Few people have the luxury of stopping the train to redesign the railroad tracks. There simply isn't time to do that in today's fast-paced world, and the costs would be horrendous. To be successful, you must be able to change what you are doing *while you are still doing it*. This theme is repeated throughout this book. You must strike a balance that helps you transform while you are performing. This book will show how to make those balances work out correctly, and it will give you a few specific approaches that may work for you. For e-Business, this means tying infrastructure solutions to new business plans, but with incremental building strategies that only commit new costs as necessary to handle business as it comes in rather than having to buy for purposes that may never materialize.

Understanding Adaptive Infrastructure

Of all the strategies outlined in the previous section, the idea of an adaptive infrastructure lies at the core of this book. Having a truly adaptive infrastructure will give your business the agility it needs and make your job of planning and designing infrastructure easier as time goes on.

A New Way of Thinking

Obviously, developing an adaptive infrastructure isn't something that happens overnight. To create major change within your organization, you must start by changing yourself—by adopting a new way of thinking and a philosophy that will guide you toward your goals.

One way to look at adaptive infrastructure is as a set of components, patterns, and services along with the people and processes necessary to tie them together. These are the key organizing principles that drive much of the content in this book (see Figure 1.3).

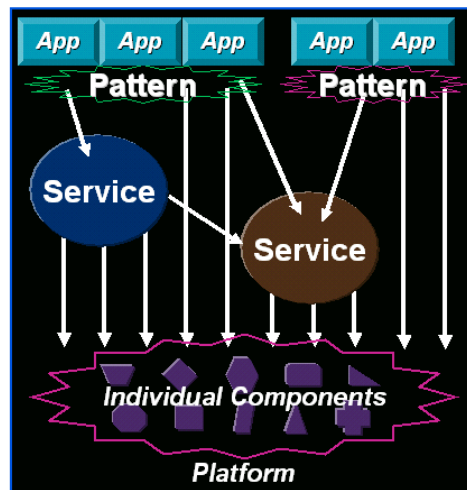


Figure 0.2 Key Organizing Principles for Adaptive Infrastructure

- **Platform** is an organizing concept that groups individual component technologies into technical domains (or layers).

- **Patterns** are organizing concepts that facilitate rapid mapping from business requirements to end-to-end infrastructure designs. Patterns structure component selections from many platform layers.
- **Services** are “infrastructure applications” that shift responsibility for certain services out of the application domain into the infrastructure domain. Services provide a set of physically shared components, such as a network or a credit card processing service, that multiple applications can leverage.

The diagram in Figure 1.3 shows that all the elements of adaptive infrastructure work together to support applications in an organized way. If applications are the physical manifestation of real business processes, then all the elements of infrastructure must work together successfully to ensure their flawless performance.

The art of adaptive infrastructure, however, is not to cater to every application on its own terms. This just creates more “stovepipes” within your organization. Instead, you can make both the application and infrastructure development processes more manageable by defining infrastructure “patterns” that you can more effectively manage. These patterns are built on a foundation of key services that you have clearly identified as crucial to your business operation. These services, in turn, are based on individual components working together as part of your adaptive infrastructure platform.

On one level, the first step in building an adaptive infrastructure is to identify and catalog all these elements: the patterns, platforms, and services, along with the people, processes, and packaging that will make your efforts successful. Once you organize your world this way, you can avoid the dilemma of having to start from scratch each time a new application rolls out, asking questions such as “What exactly do I need for service levels?” or “Which component do I select?” Instead, you will have pre-built solutions sets that you can roll out or apply at a moment’s notice, and which will provide your organization with the ultimate in agility.

Everything you need to create an adaptive infrastructure strategy boils down to the six fundamental concepts discussed on the following pages. These concepts set the tone for your infrastructure planning efforts. They form the core strategies of this book and map directly to the remaining chapters that you will be reading.

1. Identify and Catalogue Technologies

If your decision-making attitude is, “I bought from Vendor X, so now everything is solved,” you’re probably thinking the wrong way about the problem. The notion of platforms emphasizes organizing hardware, software, and networking components (technologies) into common application runtime targets that maximize component reuse and systems integration while providing a base level of shared services.

To manage your infrastructure well, e-Business or enterprise, you must first identify and catalog all the components by their functional categories.

By organizing components into categories, you can assess the complexity of managing hundreds of components. This is even more key for e-Business requirements, since so much new technology is impacting design. As you begin the organization process, you will start to see that the components used to deploy applications fit into different layers of stacked infrastructure, as shown in Figure X.

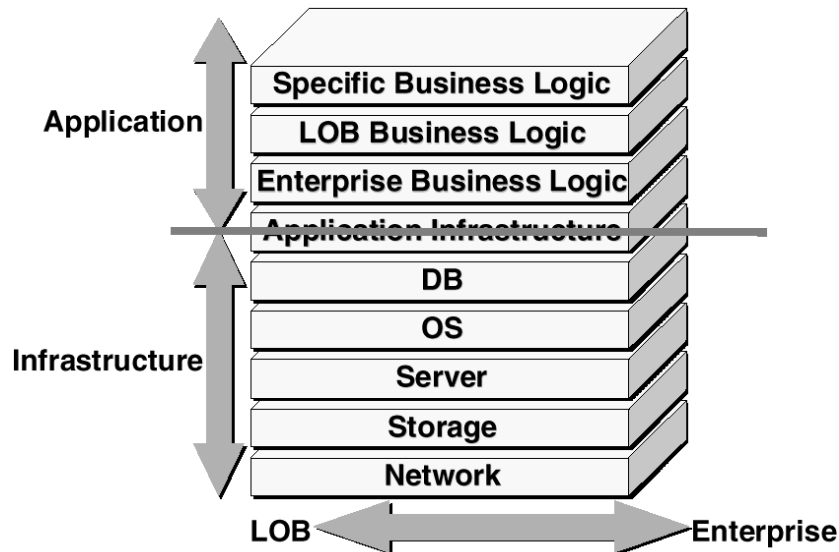


Figure 0.3 The Infrastructure Stack

The component items in the layers below the line (e.g., a particular server) are all purchased, not physically built. In contrast, those above the line may be internally developed, particularly if they represent areas of

potential competitive advantage. In the middleware layer, where these two worlds intersect, systems integration becomes a crucial element.

Chapter 2 provides more detail about these layers and the organizing principles behind categorizing and managing component technologies.

2. Develop Reusable Infrastructure Patterns

One important way to resolve some of your problems is to simplify complexity wherever you can. And the best way to do that is to identify patterns within your infrastructure that can be supported, augmented, nurtured, and reused to ensure success. Using these end-to-end sets of infrastructure components (from many platform layers), you can clarify and unify technology, planning, and operational processes, as well as personnel experiences.

It's a losing proposition when you react to the wide variety of application development requests by trying to maintain expertise in every different type of infrastructure that might be needed to support an endless variety of applications. To make things more manageable, select a few key patterns to build your expertise around, and then use these patterns to support business projects in a repeatable way that makes things easier and less expensive for everyone. In other words, simplify and prioritize.

To this end, Chapter 3 introduces a set of nine key patterns typically found in IT infrastructure, but focuses on the two patterns most essential to e-Business: the Web Publish pattern and the 3/N-Tier Transact pattern. A later chapter called "Refining Design" will examine each component and include relevant services to build end-to-end infrastructure designs for e-Business cases – specifically for cases where outside users are accessing internal systems.

3. Develop Adaptive Infrastructure Services

The next step in organizing your infrastructure thinking is to structure components from platform layers into various classes of services to be used by patterns. A service exists when someone delegates the responsibility for performing a process to a service provider. A service provider can be any person or system that can perform a service. In the outside world, service providers include people such as bank tellers and plumbers.

In the e-Business world, the concept of service provider is well known: we already have Internet service providers (ISPs) and application service providers (ASPs). However, you may be called on to provide services within your own intranet/extranet environment, and thus become a service provider to the rest of the organization.

Unlike a component, which is only technology-focused, an adaptive infrastructure service is a shared set of technologies that is implemented once with a common set of processes and people skills to be reused by multiple applications. While these services are not the whole end-to-end set of infrastructure for an application, they can be reused by such infrastructure patterns similarly to any other component (except these are shared).

To be truly efficient and reusable, services must be decoupled and become separate processes from the person or system that interacts with them. By defining services in this way, you can start removing the stovepipes from your e-Business infrastructure.

The network itself is an ideal example of the concept of adaptive services. Today, no one thinks of the network as part of an application; it's a service on which the application runs. No one builds a unique network just to host a single application. Not too long ago, however, such an arrangement was painfully common.

Now most organizations use a single network service, namely TCP/IP, to support all applications. e-Business has just made this even clearer. While there are still dedicated networks for specialized applications, such as the wireless networks used in the package delivery industry, they are relatively rare.

4. Use Good Tools In Well Designed Processes

Once you have identified patterns, platforms, services, organizational issues, and old problems that must be fixed, you should sit down with a robust set of tools and processes and start the journey back toward organization and clarity:

Infrastructure Pattern Matching (IPM). If you're an infrastructure planner, what the business really wants from you—in addition to credibility and leadership—is the ability to estimate the cost, schedules, and risks associated with new projects. Infrastructure Pattern Matching (IPM) helps by providing systematic answers to three fundamental questions: who are the users, where are they, and what work is being

performed? Answering these questions helps you define service-level commitments, analyze costs, and identify the core technology issues that affect application scalability.

Periodic and Annual Processes. Having structured, repeatable processes with concrete outputs or deliverables will make a difference in terms of the speed, quality, and cost of everything you do. Chapter 4 will show you how to organize two kinds of processes that you will execute on a repeated basis. One is periodic or *strategic* infrastructure planning to review your standard infrastructure patterns and services on a regular annual cycle. The other is per-project or *tactical* infrastructure planning, which is done for each application or new technology being introduced into the organization. Chapter 5 will actually take you through a pattern design process, much as META Group does in workshops it conducts for its clients. The goal is to design a reusable blueprint for future e-Business infrastructures, yet do so in a way that gets at least one project planned as well.

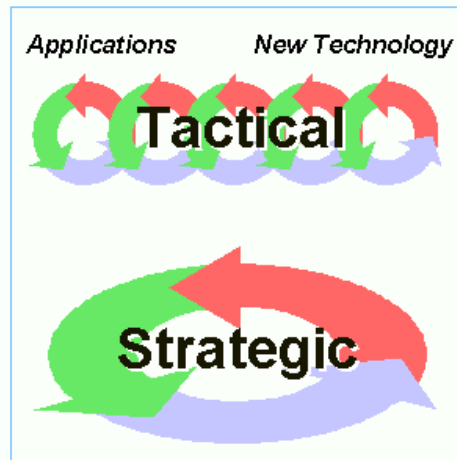


Figure 0.4 Tactical Versus Strategic Processes

With a robust set of tools and a well-defined set of processes, your team will be able respond to application support requests in repeatable, structured way in a matter of hours, rather than in weeks or months. In the process, you will generate enormous credibility for the adaptive infrastructure concept and for your whole e-Business organization.

Portfolios. Anyone who uses Quicken or Microsoft Money knows that half the battle in financial management involves keeping your planning portfolios up-to-date. Waiting until tax time to update your portfolios can be extremely painful. The key is to apply discipline and a set of easy-to-use tools to continuously update your portfolios. The portfolio concept is also an important tool of infrastructure planning, as shown in Figure 1.8. Infrastructure portfolios keep you organized as you identify, catalog, and manage your patterns, platforms, and services on an ongoing basis.

Infrastructure Portfolios

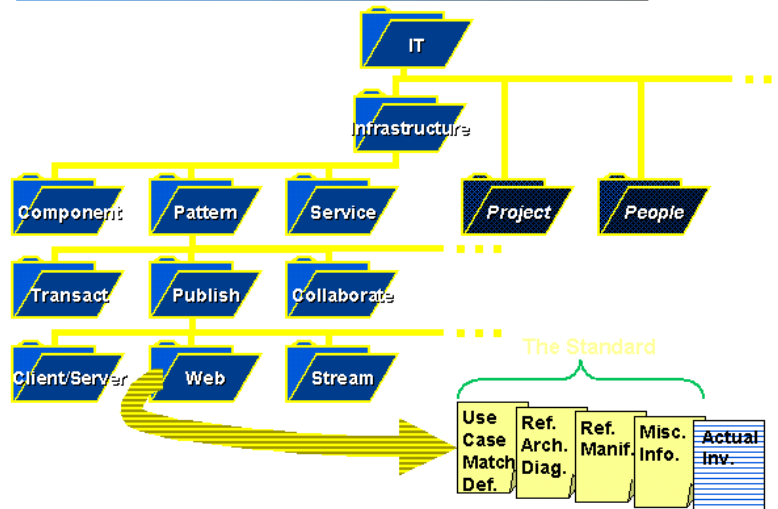


Figure 0.5 The Concept of Portfolios

Once you develop a set of infrastructure portfolios, people will know where to find all the details about a pattern, for example, when they need it.

5. Get Organized

For infrastructure planning to work, it has to be more than just a “good idea.” It has to become an essential part of your business.

The only realistic way to incorporate infrastructure planning into your business is to create new roles and responsibilities, job titles, and even new groups or departments where necessary. Someone must own the

processes of infrastructure planning and development, and make sure that it gets done.

What's more, infrastructure planning roles must be clearly separated from traditional roles related to application development. Separating the roles allows each group to focus on its particular strengths, particularly if they offer a shared service with separate lifecycles.

- **Infrastructure developers** can be responsible for designing, implementing, and managing the interfaces between enterprise-wide resources and the infrastructure shared by multiple applications.
- **Application developers** provide project-related interface requirements to the infrastructure developers who ensure that interfaces are implemented efficiently, securely, and with management controls.

At a group level, having a team of infrastructure planners and developers can create priorities across an array of infrastructure projects. They can make sure that infrastructure standards, including components, patterns, and services, are in fact available and more importantly reused for particular application development projects. Such a group can also identify potential areas for reuse, not only of technologies, but also of project management methodologies, documentation, and some of the processes and people involved.

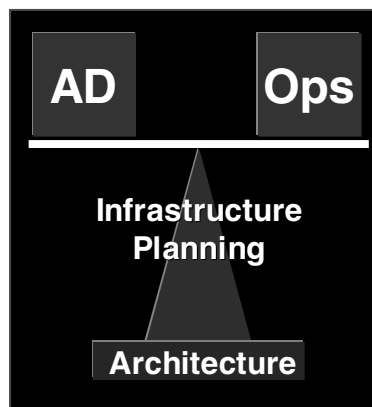


Figure 0.6 Balancing the Organization

Within this more refined focus, infrastructure planning professionals will be able to recognize when unique components are required, and what they will cost. Planners can maintain a longer-term view of infrastructure requirements (e-Business and/or enterprise), and understand the cost/return dynamics of infrastructure building. They can also shift the focus from an emphasis on particular technologies to continuous improvement of the delivery process.

Later sections of this book give further detail on how to organize people and processes into distinct roles and responsibilities that work for e-Business as well as enterprise requirements.

6. Describe Value Through Packaging

You can learn all the engineering principles, design methodologies, and pattern approaches that you want. You can create your own infrastructure development group and achieve perfection in all your processes. But if you can't sell your approach to the business and show the value of what you're doing, then all is for naught.

Business unit managers who hold the purse strings must understand the *value* of what you are proposing. Only when they see value will they be willing to loosen the purse strings and give you the investment dollars and management support that you need.

One of the most important techniques you can use to sell the value of adaptive infrastructure to upper management is the concept of an "infrastructure product." This product is an ongoing, reproducible, and repeatable set of services that your e-Business organization can deliver into the business.

For example, in a retail environment, line executives will sign on much quicker for a world-class system that sustains a particular retail function than they would for a world-class systems administration function. Retail executives will always be more interested in, and see more value in, the in-store process. So your emphasis should be on packaging and pricing infrastructure products that support those efforts. Don't just solve your own infrastructure problems; solve your customer's problems too. At the very least, make a connection that shows how the work you must do to fix your own problems will also end up solving their problems.

In addition, business leaders often have specific applications that they will pay extra to see delivered well, such as SAP, collaborative engineering, or accounting). Once you have the quality-of-service issues covered, you

can create premium subscription services for applications, while ensuring that these services are handled in a premium fashion. Such applications can then justify additional expenses such as online backup and around-the-clock support, because of the extra charges involved.

Once your organization accepts the concept of infrastructure as a set of packaged products and services, infrastructure planning becomes an ongoing process of refinement. It becomes more a matter of adding to the service levels offered to the business. As you add more infrastructure and applications, the entire conglomeration starts behaving in an almost organic fashion. The objective is to optimize ongoing investments, while maintaining a balance between what the infrastructure delivers and what applications require.

Developing an Adaptive Range

Understanding exactly what is “adaptive” about adaptive infrastructure can be a complex task. There are a number of dimensions involved in quantifying the flexibility or adaptive range of infrastructure, as shown in Figure 1.10 below.

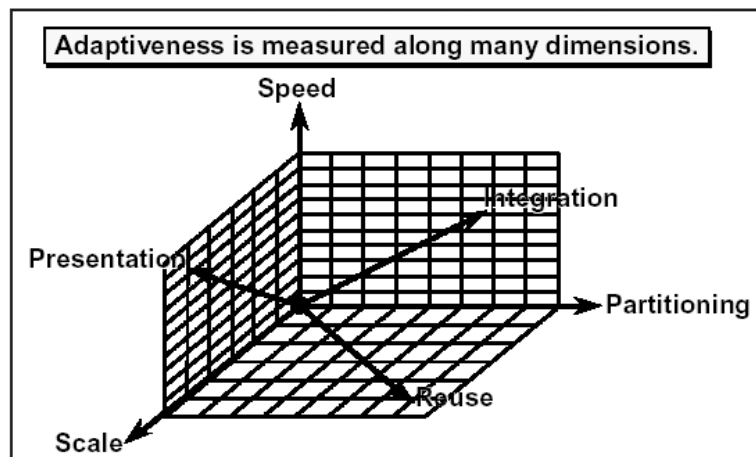


Figure 0.7 Measuring Adaptive Range

One measurement certainly will be cost. Everyone wants a fixed, low cost but, how you deliver it is the real problem. Speed is the next measurement that attracts the most attention. Speed refers to the

timeliness with which e-Business can respond to and implement the business processes that users want. However, speed is really a derivative measurement. Certainly, buying more powerful hardware will increase the transaction rate, but infrastructure isn't equipped with a speed knob that can be turned up or down as needs dictate. To increase speed, other dimensions must be addressed:

Scalability. You can build in some headroom (adaptive range), so that boxes and boards don't have to be swapped when increasing the number of users for an application. That is a relatively easy though often expensive way to be adaptive. Later sections of this book will highlight best practices that can be used to achieve scalability without spending too much up front, primarily by assuring that incremental scalability is a feature of the architecture and technology choices..

Presentation. Another dimension that affects virtually every e-Business organization is presentation: the way information is presented to users or business partners. Historically the presentation layer has shown little adaptiveness. Organizations now spend great time and effort converting more traditional 2-tier, fat-client applications into Web-based applications.

Unfortunately, designing Web-only presentation solutions is equally limiting. Other presentation methods, such as personal digital assistants (PDAs) and interactive voice response (IVR), can't support a full-page Web display and will require completely new expensive and time-consuming development efforts. Even though wireless options are currently on the wane (out), voice integration is still going strong, particularly with speech recognition to make answering menu systems via phone as easy as saying "1, 2, 3." If these benefits are important to the organization, then design should make sure these benefits can be achieved without significant infrastructure replacement and without rewriting code.

Presentation independence alone, however, doesn't guarantee sufficient adaptability. Infrastructure planners should be very focused on the front end, but if the application-to-application integration issues aren't addressed simultaneously, the result is taller "stovepipes," or applications resistant to the adaptive infrastructure concept.

Partitioning. The ability to partition functionality and complexity within the infrastructure is another benefit of adaptability. If the infrastructure cannot be effectively partitioned, the resulting complexity will spread throughout the organization and eventually become unmanageable. For total success, you must effectively manage the interfaces between

applications and between infrastructure components, both for the enterprise and for applications used by external partners.

Integration/reuse. Infrastructure integration and reuse are also measures of adaptability. The typical organization requires a dramatic increase in the reuse of infrastructure code, other technology components, and skills to increase adaptability and speed of deployment. Reusable code is the opposite of legacy code. Whereas legacy code can be difficult to maintain, enhance, and integrate, the most adaptive code is bought, rather than built.

All these factors – requirements, service levels, and more -- contribute to the adaptability of an organization's infrastructure. This book will discuss many of these issues in more depth.

Increasingly, you must describe the value proposition for infrastructure directly to the business users in terms of the discrete service levels that they want delivered. By turning to a discussion of service levels, you can influence business users to consider more than just the immediate impact of a single application. You must convince the business to consider the value of adaptability, because it will take more money, effort, and time to deliver than single implementations.

The Importance of Reusability

Of all the concepts discussed so far, reusability is really the most crucial. The patterns, platforms and models used to create an adaptive infrastructure all depend on reusability. Without an effective approach to this issue, it will be difficult to apply the additional rigors of specifying pattern components and creating predictive cost models.

Reuse isn't simply a matter of being thrifty or making do with whatever hardware happens to be lying around the shop. In fact, reuse often involves just the opposite: weaning business units away from archaic legacy systems that are no longer cost-effective and replacing flawed applications or integrating them with other applications within the enterprise.

The biggest challenge when implementing a reuse policy is getting people used to the new policy and getting them to fund it appropriately. It's difficult to tell business executives that their infrastructure requirements are physically impossible, or that they can't have an application because it's too difficult to support.

Many business units have the financial and human resources to subsidize non-standard implementations, but they don't. Instead, the E-Business or regular IT department ends up absorbing the extra expense to support the deviation, or devoting extra resources and effort to making sure it works properly. This will keep happening until you present errant business units (or separate e-Business planning groups, LOB or corporate) with either a reasonable alternative or a bill for the extra time and effort. If the business units only encounter half-hearted resistance from e-BusinessIT, then you will probably spend most of your time doing ad-hoc support and you can forget about creating an adaptive infrastructure.

Reuse policies are both a logical precursor to and an integral part of implementing adaptive infrastructure techniques. Designing reusability well requires that you leverage all the concepts introduced here, particularly patterns and services. Once your organization is ready for reusability, or actively practicing it, then you are ready to implement an adaptive infrastructure.

SUMMARY

To summarize what's been discussed in this introduction chapter:

Success depends on the appropriate e-Businessinfrastructure focus. Your focus should be on solution or e-Business infrastructure product delivery, not technological prowess. Any organization will find it difficult to differentiate itself based on how effectively it handles its systems administration. Delivering basic technology services is like having the lights come on when you hit a switch. The real value proposition for e-Businessinfrastructure professionals – whether focused on e-Business or not -- is not making the lights work, because this is expected regardless. Instead, the real value proposition is delivering sharable support services for applications in a way that promotes reuse, cost savings, and agility. This is planning for the future, not only catching up to current requirements.

An “infrastructure product” mentality helps simplify options and drive competencies. Thinking in terms of infrastructure products leads to a delivery mentality. Creating tangible infrastructure products reduces the amount of uncertainty. You should focus on core infrastructure patterns and services (and even processes) and look for ways to reuse pattern and service assets and expertise while emphasizing consistent delivery

with people and process improvements. e-Business centric products could include a Web hosting service for internal business units to share significant portions of infrastructure (network, server, middleware, security, etc.). Or, it could be the service of moving such applications to a chosen outsourcer effectively and efficiently.

Developing adaptive infrastructure requires a change in culture and relationships. Successful implementation of adaptive infrastructure will change the relationship between business users and e-BusinessIT, but it should also change a key piece of IT culture, the application developer community. Your efforts will create a new class of workers: infrastructure planners and developers who will have application developers as their customers.

The ultimate goal is for e-BusinessIT and business to develop strategic investment priorities together, particularly for e-Business infrastructure. The typical e-Business IT department can develop a suitable infrastructure plan at a given point in time. Developing a plan that reflects and accommodates developments within the business, and then updating and managing that plan, will require close coordination with business managers.

Reuse is the linchpin of adaptive infrastructure. Substantive reuse is impossible only at the application level. Instead, reuse must be fostered at the interface level, among application components, and grounded in direct shared and therefore infrastructure-focused services. A number of adaptive infrastructure concepts are designed to facilitate reuse, including adaptive infrastructure services, infrastructure pattern matching, predictive infrastructure cost models, and the role of the infrastructure planner.

