Chapter 1

Beyond e-Business

In the late 1990s, e-Business took the world by storm. The potent combination of the Internet's global connectivity, innovative Web interfaces, and standards such as Transmission Control Protocol/Internet Protocol (TCP/IP) and HTML captured the collective imaginations of business leaders and consumers alike.

e-Business was supposed to revolutionize entire industries, change how goods were purchased, services delivered, and brands defined. Potentially, e-Business impacted every facet of the organization, including business models, processes, applications, staffing, infrastructure, relationships, product development, purchasing, and sales.

Not only was e-Business expected to transform companies and industries, it was supposed to accelerate the rate of change. Business cycles that previously took years were supposed to happen in days. The business and investment worlds' traditional fixation on revenues and profits changed to a focus on time-to-market and "capturing eyeballs" of users on Web sites.

Businesses and government organizations spent huge amounts of money on e-Business initiatives, applications, and infrastructure. By the beginning of 2000, the e-Business mania had resulted in ludicrous stock valuations and a propensity to put the letter "e" in front of everything.

Within another year or two, however, much of the e-Business world came crashing down. Most of the so-called dot-com companies had gone

out of business, stock valuations plummeted, and budgets were cut across industries. e-Business had followed the traditional cycle of overly hyped expectations and excessive spending that is associated with business boom cycles.

Figure 1.1 illustrates the gap that developed between e-Business expectations and reality. The technology investment curve shows how expenditures were even more extreme on either side of the rise and fall of expectations.

Looking from the past to the future, the right side of Figure 1.1 shows that many of the e-Business changes will be permanent and that technology investment will settle somewhere in the gap between boom and bust.

Leading organizations realize that many of the benefits and changes of e-Business are long-term. However, these benefits must be leveraged by the entire organization instead of existing as a separate appendage. This realization merges e-Business initiatives back into broader corporate initiatives. Likewise, e-Business infrastructure will be viewed as part of a larger infrastructure whole.
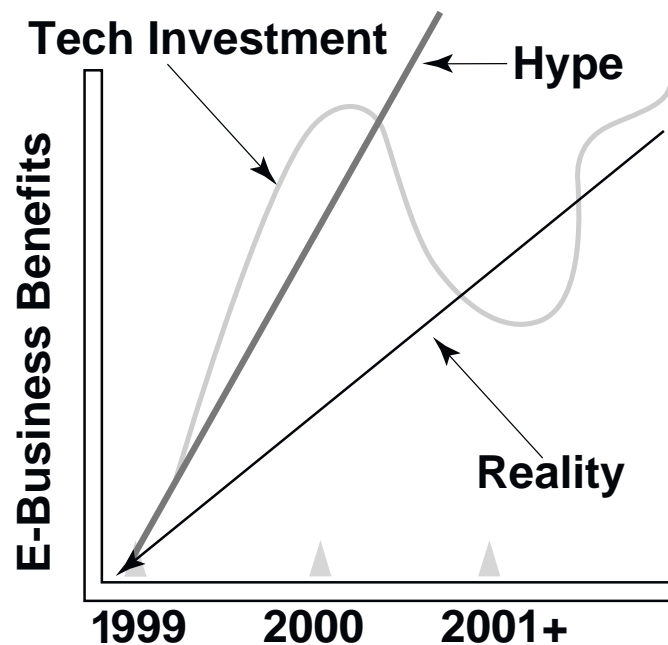

Figure 1.1 The Gap Between e-Business Expectations and Reality

Now that we are thinking "beyond e-Business," competition is not company against company but business chain against business chain. These chains include suppliers, partners, distributors, logistics providers, regulators, and even competitors. Companies can be only as strong as the weakest link in their chain. The winners will be companies that can build up, or tear down, electronic business-to-business (B2B) relationships rapidly and seamlessly.

Beyond e-Business, enterprise borders will change, or even disappear. Leading organizations will provide 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 into your corporate nervous system, including your traditional systems—not just the ones with an "e" in front of them.

In theory, all of this realignment is for the better, removing time and costs from key business processes. If not handled correctly, however, it could be detrimental, undermining your security and overall brand.

In this new era, customer expectations are rising mercilessly in terms of the speed and reliability they expect across all points of interaction. Just as people don't like to wait in line at a store or to be on hold waiting for a call center agent, studies show that Web customers will wait only eight seconds for a page view. Unfortunately, the customers do not care that you have no control over your call volume or their connection speed.

Not only are your external customers' expectations rising, so are the expectations of your internal customers and business leaders. They can't watch the news or read a magazine without being reminded about the possibilities when e-Business and traditional concepts are combined effectively.

Why Infrastructure (Suddenly) Matters

The pressure to move beyond e-Business places a great strain on infrastructure components such as networks, security, servers, and middleware. If your front doors aren't robust, highly available, and secure, your company risks major losses.

Innovations such as the Internet, wireless applications, call centers, and even the automated teller machines (ATMs) of the 1980s have 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 infrastructure, not just on your applications.

With the Internet as a common currency in the business world, 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. Now, if your systems fail, the whole world may know. CNN might 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 a reasonably 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 database back-end, what differentiates your effort isn't the application itself, but how quickly you get it running and how well it works. In many cases, these problems aren't application issues; they're infrastructure issues.

As infrastructure becomes more important and increasingly separated from purely application issues, 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 tailored 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 you to develop new applications quickly and to repurpose or upgrade existing infrastructure to support new application requirements.

If you outsource the responsibility for running the infrastructure, your company must have at least one group that makes sure applications can run effectively on the outsourced infrastructure. This group must include infrastructure planners and designers, whose ability to manage separate service providers will be key in making your infrastructure efficient, effective, and agile. Of all the challenges you face in the burgeoning world beyond e-Business, this one is especially crucial.

The Importance of Being Adaptive

Organizations maturing beyond e-Business are no longer concerned about being on the bleeding edge, or being the latest and greatest. They are trying to be leaders in a world where their own competitors are also increasingly both agile and pragmatic. To support this capacity for change from an infrastructure perspective, you simply won't have time to reinvent the wheel or to rebuild your entire information technology (IT) infrastructure from scratch. Instead, you will have to learn how to adapt many of the infrastructure components you already have.

Assuming you don't have the time or resources to replace every system, integrating legacy systems will be a crucial strategy when trying to meet time-to-market deadlines. You must integrate applications with multiple points of interaction, such as Web browsers, interactive voice response units (IVRs), personal digital assistants (PDAs), and mobile phones, so that data is appropriately synchronized and so that various points of interaction represent your brand faithfully.

Early e-Business initiatives focused on the front-end—with applications such as online stock trading, online auctioning, and industry portals. Now, companies that are moving beyond e-Business apply these concepts across the front- and back-ends of enterprise processes.

Therefore, business-to-business (B2B) integration increasingly becomes a key infrastructure solution. Companies are moving beyond electronic document interchange (EDI) and adopting solutions based on extensible markup language (XML) to facilitate the flow of transactions between business processes and across organizations. You will realize the benefits of a fully adaptive approach when your company can easily change business partners or processes without undue cost or conversion time.
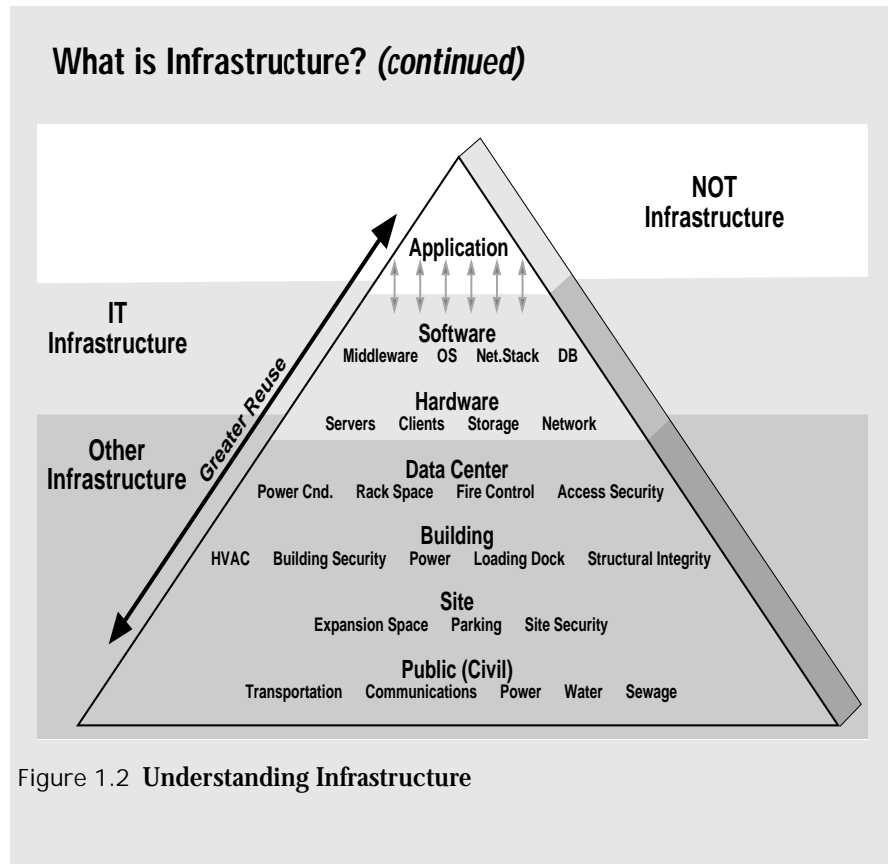
What is Infrastructure?

What does the term "infrastructure" really mean? In the physical world, infrastructure often refers to public utilities, such as water, electricity, gas, sewage, and telephone services. Often, these utilities are layers of a total structure. As shown in Figure 1.2, that total structure includes e-Business infrastructure. Each layer has the following characteristics:

- 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.

The notion of separate ownership and lifecycles is crucial to the concept of infrastructure. e-Business repeated many of the traditional battles over ownership of applications and infrastructure between line-of-business groups and central IT departments.

In many companies, marketing ran the e-Business function, but was not typically involved in the daily routine of system upgrades and maintenance. Instead, they asked IT to take over responsibility for keeping the applications running. In organizations that are maturing beyond e-Business, IT does more than just keep things running. They own the entire lifecycle and fix broken processes by applying IT best practices to make them better.

What is Infrastructure? *(continued)*

Figure 1.2 Understanding Infrastructure

The Clash of Cultures

So you want a more adaptive infrastructure but don't know how to make it happen? IT people realize all too well how difficult selling infrastructure improvements into the organization can be. In companies with less enlightened management, any IT department trying to create an adaptive infrastructure encounters two common yet fundamental reactions.

Stability is good. People often feel it's good to have an infrastructure that is stable, unchanging, and predictable. While this goal is admirable, an infrastructure must also be flexible, even breakable, to be fully leveraged by business. Existing e-Business applications are often unstable, and infrastructure is often the culprit. In the world beyond e-Business,

making infrastructure more stable, but still flexible, requires a careful balance between structure (standards) and innovation (adaptability).

Infrastructure costs are bad.   Business usually regards infrastructure as a cost to be minimized or as a necessary evil. Until recently, however, e-Business costs were exempt from this problem: No budget was too large if the project was e-Business. In the post e-Business world, companies are scrutinizing projects carefully to make sure they deliver true business value and an adequate return on investment (ROI).

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 support business strategy, even if only making it possible to take customer orders, the organization will see value in it.

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 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 rift occurs, the business units might decide to support their own application development projects using outside consultants, without considering whether the infrastructure is in place to support the planned applications.

Not surprisingly, this disjointed style of solution delivery often creates applications that don't 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 and dependencies of a shared network infrastructure within the organization. e-Business was no different; its larger-scale issues simply put more pressure on IT to get things right for all applications, rather than just one at a time.

In e-Business, each new application tended to be based on the "latest and greatest" solution, which required endless and extensive variations in infrastructure. This approach was counterproductive and tended to increase the complexity of managing the entire infrastructure. The need to support every variation often leads to mediocre support at best—or expensive and ineffective outsourcing at worst.

In the world beyond e-Business, given the renewed interest in affordability, business must make choices about what really makes a differ-

ence, and then IT must deliver it. This situation is actually better for infrastructure planners, since vague goals are replaced by specific projects with explicit service level requirements, which in turn should make planning easier.

What's the Solution?

Obviously, with pressures coming from so many directions, you need an organized way to handle everything. This book provides a number of strategies to help you cope, but in a nutshell here are the key concepts:

Plan your infrastructure end-to-end.　When you plan your infrastructure, you can't just plan a piece at a time and hope it all works together. An adaptive infrastructure requires more extensive planning efforts. Chapter 3 explains how infrastructure *patterns* can help you do a more thorough planning job.

Design for adaptiveness.　Your infrastructure shouldn't just meet today's requirements; it should be ready to scale, adapt, change, or grow to deal with challenges on the horizon. Once you identify your challenges, you must face them squarely and start designing for them immediately. A later section of this chapter explains how adaptive infrastructure works.

Make infrastructure reusable.　A key reason for building an adaptive infrastructure is to make design standards and the physical components of your infrastructure reusable. Reinventing the wheel for every application only makes your infrastructure increasingly unmanageable and slows time-to-market. This book explains 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 the post e-Business era.

Find out what works, and do it.　It's important to move from a strategy of "trying everything" to a strategy of "finding out what works," and then doing those things repeatedly, while optimizing to improve quality and reduce cost. Much of this approach requires stronger processes, more focus on delivery of working solutions, and a little less focus on 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 tech-

nology 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. Chapter 4 discusses people and process issues in considerable detail.

Choose the right technology and products. Of course, striking a balance doesn't reduce the need to select the best technologies and products for your infrastructure and application delivery needs. The latest best-of-breed solution isn't always the right one for your organization. The IT world presents a new best-of-breed product every time you turn around, so it's 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 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*. You must strike a balance that helps you transform while you are performing.

This book shows you how to make the balancing act work correctly, and it provides a few specific approaches that might work for you. These recommendations include tying infrastructure solutions to new business plans, using incremental building strategies, and committing to new costs only as needed to handle incoming business opportunities—not buying for opportunities that never materialize.

Understanding Adaptive Infrastructure

Having a truly adaptive infrastructure gives your business the agility it needs and makes your job of planning and designing infrastructure easier as time goes on. The concept of adaptive infrastructure is discussed in greater detail in another book in this series, *The Adaptive Enterprise*. However, the following discussion will acquaint you with the basics.

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 to guide you toward your goals.

Look at adaptive infrastructure as a set of components, patterns, and services, along with the people and processes necessary to tie them

together. These organizing principles are the key principles that drive much of the content in this book (see Figure 1.3).

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

- Patterns are organizing concepts that you can use to quickly match business requirements with end-to-end infrastructure designs.

- Services are "infrastructure applications" that shift responsibility 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 how all the elements of adaptive infrastructure work together in an organized way to support applications. If applications are the physical manifestation of real business processes, all the elements of infrastructure must work together successfully to ensure their flawless performance.

Having an adaptive infrastructure doesn't mean that you cater to every application on its own terms. This approach only creates more "stovepipes" within the organization. Instead, you can make both the application and infrastructure development processes more manageable by defining consistent and repeatable "patterns" that you can manage
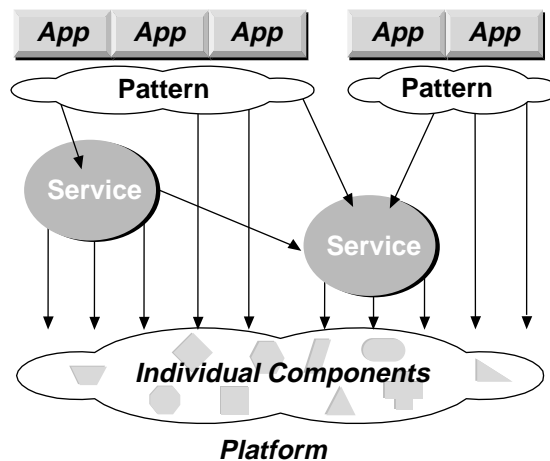

Figure 1.3 Key Elements of Adaptive Infrastructure

more effectively. 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 infrastructure components working together as part of an 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 the problem this way, you can avoid the dilemma of having to start from scratch each time a new application rolls out. Thus, you can avoid asking yourself questions such as "What exactly do I need for service levels?" or "Which component do I select?" Instead, you have pre-built solutions that you can tailor at a moment's notice, providing your organization with better agility.

Everything that 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 and form the core strategies of this book.

1. Identify and Catalog 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. To manage infrastructure well, you must first identify and catalog all your IT *components* into functional categories: common application run-time targets. These targets should maximize component reuse and systems integration and provide a base level of shared services.

By organizing your hundreds of components into categories, you can make them much easier to manage. Most components tend to fit rather neatly into the layers of stacked infrastructure identified in Figure 1.4.

In this figure, notice that the dividing line between applications and infrastructure intentionally runs through the center of the application infrastructure layer. Components in the infrastructure layers are all purchased, not physically built, such as a particular server. Components in the application layers could be developed internally, particularly if custom development would provide a 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. For a complete component catalog, see Appendix A.
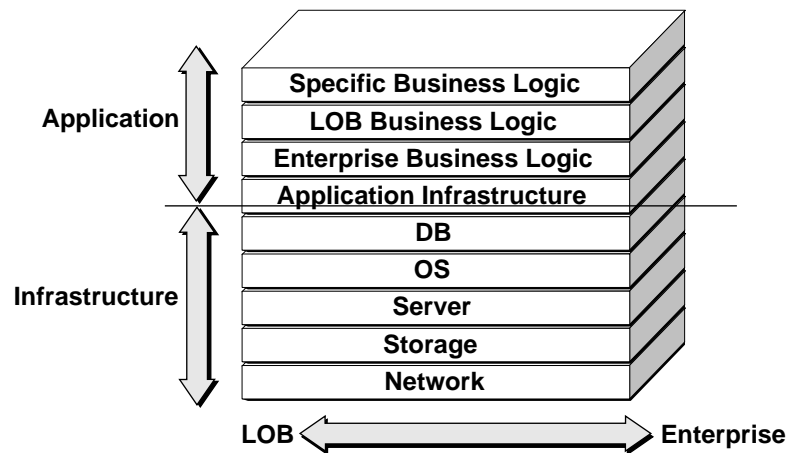
Figure 1.4 The Infrastructure Stack

2. Develop Reusable Infrastructure Patterns

One important way to resolve some of your problems is to simplify complexity wherever you can. The best way to simplify is to identify modular *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 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, 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.

Chapter 3 introduces a set of nine key patterns typically found in IT infrastructure, but the chapter focuses on the two patterns most essential to bringing e-Business into the next era: the Web Publish pattern and the 3/N-Tier Transact pattern. Chapter 4 explains how to refine design for these key patterns. The remaining chapters in this book provide considerable detail on refining each of the e-Business pattern designs for the new era.

3. Develop Adaptive Infrastructure Services

The next step in organizing your infrastructure is to organize components from platform layers into *services.* A service exists when someone delegates the responsibility for performing a process to a service provider.

In the outside world, service providers include people such as bank tellers and plumbers. In the e-Business world, Internet service providers (ISPs) and application service providers (ASPs) were quite common. As the world moved beyond e-Business, surviving providers were integrated with traditional telecom and outsourcing service providers into broader, more financially stable shared service providers. Within your own company, your IT department might also be considered a provider of infrastructure services.

Unlike a component, which is focused on technology only, an adaptive infrastructure service is a shared set of technologies, along with a common set of processes and people skills. This combination is implemented once and reused by multiple applications. While a service may not represent the entire end-to-end infrastructure for an application, it can be reused by infrastructure patterns like any other component.

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, evolving toward the new era.

The network itself is an ideal example of this concept. 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 made this concept even clearer. Some networks dedicated to specialized applications still do exist, such as the wireless networks used in the package delivery industry. However, these types of dedicated networks 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 credi-

bility and leadership—is the ability to estimate the cost, schedules, and risks associated with new projects. 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, predict costs, and identify the core technology issues that affect application scalability.

Periodic and Annual Processes.   Having structured, repeatable processes with concrete outputs or deliverables makes a difference in terms of the speed, quality, and cost of everything you do. Figure 1.5 shows two kinds of processes that you will execute on a repeated basis. One is periodic or *strategic* infrastructure planning, used to review your standard infrastructure patterns and services on a regular cycle, such as annually. The other is per-project or *tactical* infrastructure planning, which is done for each application or new technology being introduced into the organization.

   The last four chapters of this book take you through a pattern design process for each of the major components. The goal is to design a reusable blueprint for post e-Business infrastructures, yet in a way that gets at least one project planned as well. With a robust set of tools and a well-defined set of processes, your team can respond to application support requests in a repeatable, structured way within hours, rather than weeks or months. In the process, you will generate enormous credibility for the adaptive infrastructure concept and for your whole IT organization.
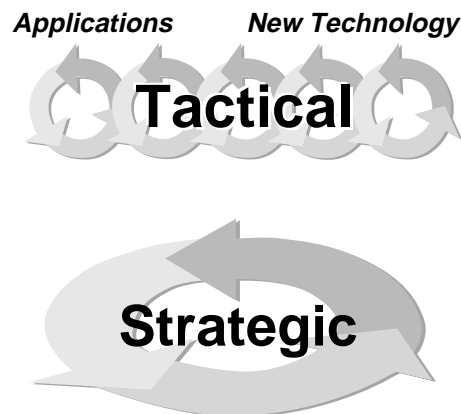

Figure 1.5 Tactical Versus Strategic Processes

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.

Figure 1.6 shows how the same portfolio concept can be applied to infrastructure planning. Infrastructure portfolios keep you organized as you identify, catalog, and manage your patterns, platforms, and services on an ongoing basis.

Once you develop a set of infrastructure portfolios, people will know where to find all the details about components, patterns, or services, as they are needed.

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
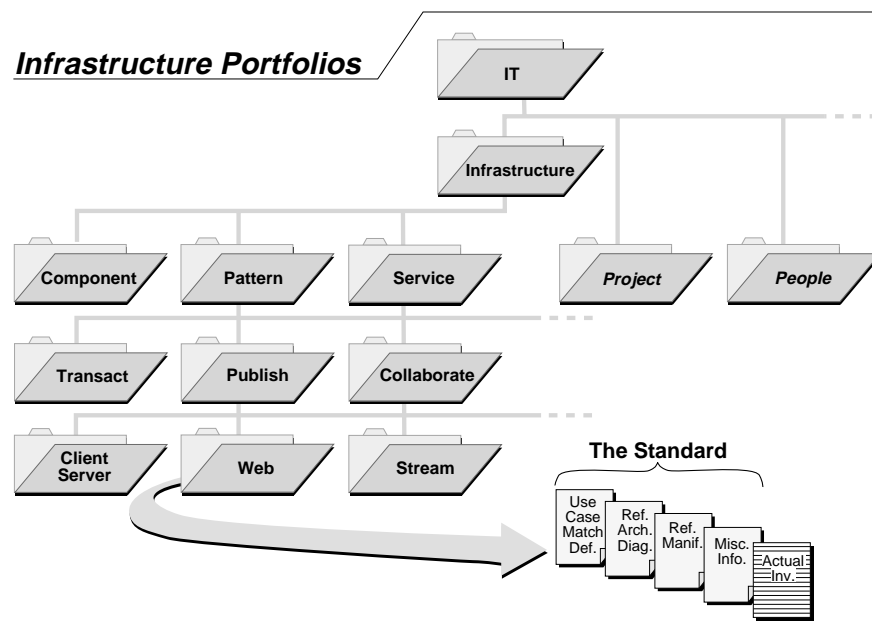

Figure 1.6 The Concept of Portfolios

infrastructure planning and development processes, and make sure that these processes are performed regularly as needed.

What's more, infrastructure planning roles must be clearly separated from traditional roles related to application development and operations. Figure 1.7 shows how separating these roles provides a certain balance to the organization and allows each group to focus on its own strengths, particularly with regard to shared services having separate lifecycles.

- Infrastructure developers are responsible for designing, implementing, and managing the interfaces between enterprisewide 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 help prioritize an array of infrastructure projects. They can make sure that infrastructure standards, including components, patterns, and services, are available and reused correctly for application development projects. This group can also identify potential areas for reuse, not only of technologies, but also of project management methodologies, documentation, and the processes and people involved.

Within their more refined focus, infrastructure planners can recognize when unique components are required, and what they will cost.
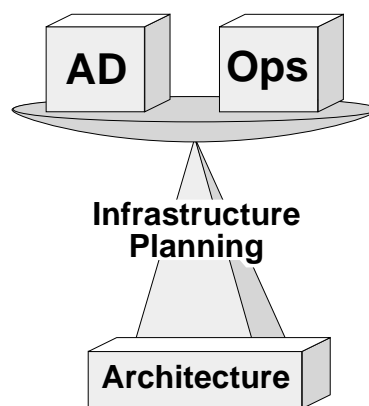

Figure 1.7 Balancing the Organization

Planners can also shift the focus from an emphasis on particular technologies to continuous improvement of the delivery process.

Chapter 4 gives more detail on how to organize people and processes into distinct roles and responsibilities that work well in traditional processes, in e-Business projects, and in the world beyond e-Business.

6. Describe Value Through Packaging

You can study a wide array of engineering principles, design methodologies, and pattern approaches. You can create your own infrastructure development group and achieve perfection in all your processes. But you'll never fully succeed unless you can sell your approach to the business and show the value of what you're doing.

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," which is an ongoing, reproducible, and repeatable set of services that your 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 will for a world-class systems administration function. Retail executives will always see more value in their in-store processes. 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. Once you have the quality-of-service issues covered, you can create premium subscription services for applications, while ensuring that these services are actually handled in a premium fashion. Such applications can then support additional IT 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.

Measuring the Benefits

Understanding exactly what is "adaptive" about adaptive infrastructure can be a complex task. Figure 1.8 shows the various measurements used to quantify the agility and range of your adaptive infrastructure.

Scalability. Scalability means building in some headroom so that your infrastructure doesn't have to be changed repeatedly as the user base for an application increases. Scalability is a relatively easy but potentially 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 independence. Another dimension that affects virtually every organization is presentation: the way information is presented to users or business partners. Historically, the presentation layer has shown
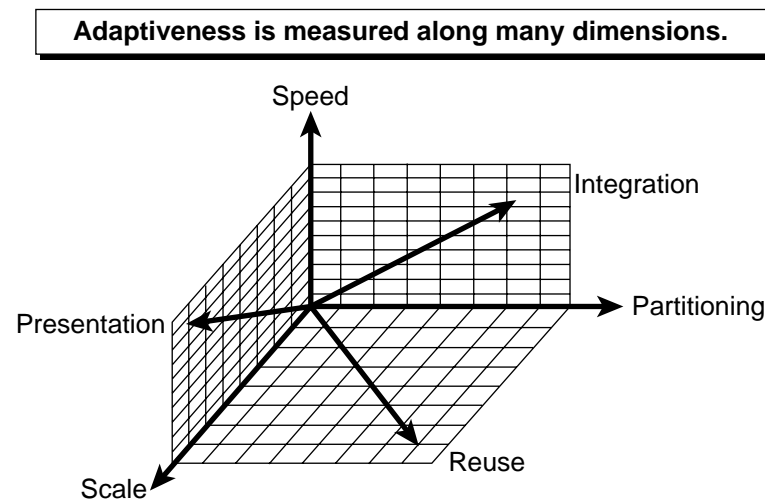
Adaptiveness is measured along many dimensions.

Figure 1.8 Measuring Adaptive Range

little adaptability. Organizations now spend much time and effort converting more traditional 2-Tier, "smart PC" applications into Web-based applications.

Unfortunately, designing Web-only presentation solutions is equally limiting. Other presentation methods, such as wireless devices (mobile phones or PDAs) and interactive voice response units (IVRs), can't support a full-page Web display and will require expensive and time-consuming development efforts. If consistency across multiple points of interaction is important to your brand, your designers should make sure it can be achieved without significant infrastructure replacement efforts 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 with applications that don't fit 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 partitioned effectively, the resulting complexity spreads throughout the organization and eventually becomes unmanageable. For success, you must manage the interfaces between applications and between infrastructure components effectively, both for applications used within the enterprise and for those 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 most legacy code is difficult to maintain, enhance, and integrate, the most adaptive code has clean, well-documented interfaces. These interfaces enable bits of code to be changed or added without requiring major changes in other code.

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.

Summary

The following points summarize what's been discussed in this introductory chapter.

- ■ Success depends on having an appropriate focus. You should focus on delivery of infrastructure products, not technological prowess. Any IT organization will find it difficult to differentiate itself based on how effectively it handles systems administration. Delivering basic technology services is like having the lights come on when you hit a switch. The real value you can provide is not in making the lights work, which is expected regardless, but in delivering sharable support services for applications in a way that promotes reuse, cost savings, and agility. This approach means planning for the future, not just 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, services, and processes. Then you should look for ways to reuse assets and expertise while emphasizing consistent delivery through people and process improvements. As an example, you might consider hosting a Web service internally so that your business units can share infrastructure resources such as network, server, middleware, and security. Or, you might add value by moving e-Business applications to a chosen outsourcer effectively and efficiently.

- ■ Developing adaptive infrastructure requires cultural change. Successful implementation of adaptive infrastructure will change the relationship between business users and IT, 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.

- ■ IT should team with the business in developing strategic investment priorities for infrastructure beyond e-Business. The typical IT department can develop a suitable infrastructure plan anytime. 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. The concept of reuse does not apply just at the application level. Instead, you must foster reuse at the interface level, among application components, and through directly shared, infrastructure-focused services. A number of adaptive infrastructure concepts facilitate reuse, including adaptive infrastructure services, infrastructure pattern matching, predictive cost modeling, and the role of the infrastructure planner.**