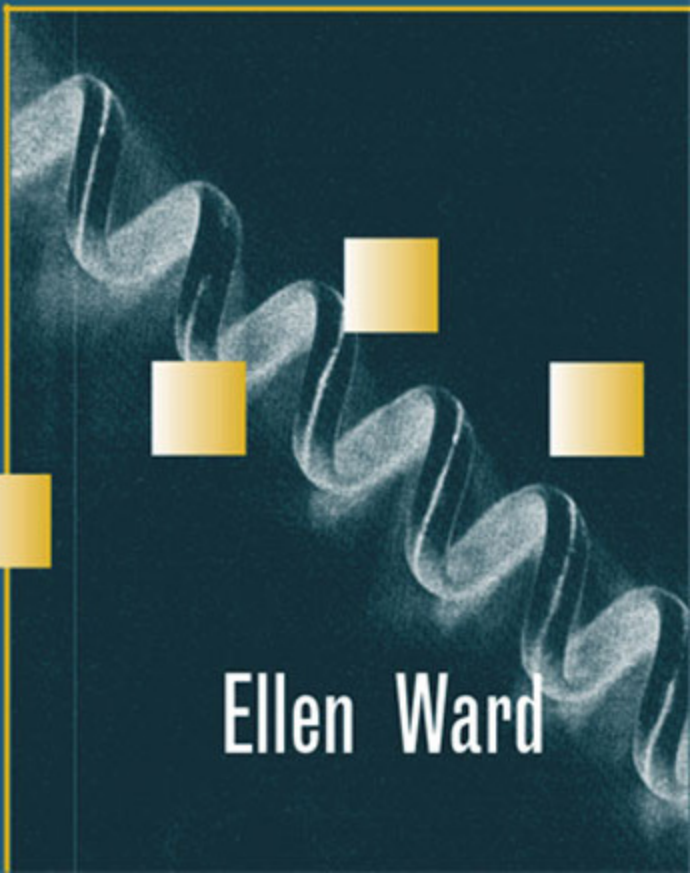
World-Class Telecommunications Service Development



Ellen Ward

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Artech House
Boston • London

Library of Congress Cataloging-in-Publication Data
Ward, Ellen P.
World-class telecommunications service development / Ellen P. Ward
p. cm. — (Artech House telecommunications library)
Includes bibliographical references and index.
ISBN 0-89006-922-0 (alk. paper)
1. Telecommunication. 2. Telecommunication equipment industry.
I. Title. II. Series.
HE7631.W37 1998
384'.068—dc21 98-20083
CIP

British Library Cataloguing in Publication Data
Ward, Ellen P.
World-class telecommunications service development.—(Artech House telecommunications library)
1. Telecommunication
I. Title
621.3'82

ISBN 1-58053-445-7

Cover design by Lynda Fishbourne

International Standard Book Number: 0-89006-922-0
Library of Congress Catalog Card Number: 98-20083

10 9 8 7 6 5 4 3 2 1

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To my father,
Harold Ward

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Acknowledgments

Writing about development turned out to be much more difficult than actually doing development. Throughout this process, though, the areas that were hardest to write were the same ones that were hardest to do inside a telecommunications service provider environment.

I would like to thank those who helped and supported me along the way. First of all, to my friends and former colleagues at MCI and Cincinnati Bell, with whom I shared many a development effort, and who understand the pain, pleasure, and frustration of working complex projects through large organizations. I'd also like to thank the many service providers and industry contacts who shared their thoughts and time during interviews and discussions prior to and throughout the writing of this book.

Many thanks also go to Anne Cullather, who assisted with the reading and provided many valuable comments. And also, to Jack Lyman, for his outstanding administrative support and assistance.

Most of all, to those who offered me emotional support during the months it took to bring this manuscript to completion—in particular, Brenda, Giulia, Madeline, Maribeth, and Michelle—thank you all. Finally, to Dory Winkelman for his on-going encouragement and support.

Introduction

Currently, in the United States alone there are over 400 long distance providers, 300 local service providers, and more than 200 competitive access providers. At last count, wireless providers numbered over 250, cable providers more than 150, and resellers more than 400. Around the globe there are thousands more service providers now operating.

What is so amazing about these numbers is that many of the companies counted within them did not even exist just a few years ago. Now, a steady stream of new Internet providers, new cellular providers, and providers of other types of services join their ranks daily. The growth and convergence within the telecommunications industry is heralding not only a host of new players but an endless set of new product and service possibilities. Telecommunications is now more than a $750 billion worldwide industry, and its outlook for the future is staggering: According to the United States Council of Economic Advisors, in the next five

years, revenue for the combined telecommunications and information services sector could more than double.

In spite of this optimistic outlook, there is another side to this story that is not frequently told. When it comes to getting new services to market, providers across the board are struggling, often over the same kinds of issues. Creating new telecommunications services has never been easy, but it is more difficult now than ever before. For some, the reasons might seem entirely explainable. After all, with technology, regulation, players, and markets all changing at once, it seems only natural that introducing a new service would be more difficult than in the past. However, provider difficulties in development stem from something more than just commotion within the telecommunications industry. The difficulties stem from the industry lacking a set of models for service development that are uniquely telecommunications-based, models that all players and all parts of the service provider world can understand and relate to.

Many providers, recognizing this void, have turned to the outside for help. After all, product development is nothing new. Companies have always developed products. As development is one of the most regularly carried out of all business activities, many would argue that the tasks involved in developing new products are more alike within industries than they are different.

To some degree, this is correct. Companies all face some of the same issues when it comes to development. It does not matter what industry or what product or service is being developed, many of the problems that emerge are classic ones. The literature backs this up. The business books are full of development models and mistakes.

Surprisingly, however, most of what has been studied and written about product development has looked at the challenge from within a manufacturing, as opposed to a services, environment. In spite of our rapid and irreversible movement into a services-based economy, little has been written about development within service-based industries.

Even if good service-based development models were available, these would not provide the telecommunications industry with what it needs. While telecommunications is a service industry, it is a unique service industry. In most service-based industries, services are delivered on an

episodic basis. Think for a moment about the airline industry, or the financial services industry: You take a trip, you place a trade.

Compare those service scenarios to those found in telecommunications. Telecommunications providers sell *managed* communications services, where service delivery is not episodic but continual, and developing services that must be available *7 by 24* (7 days, 24 hours a day) is much different from developing services that are offered episodically.

The point is, the telecommunications industry does not need a reworking of a manufacturing model, or a reworking of some all-purpose services model. It needs service development models designed specifically for this environment, and in this time.

There are things that set this industry apart that make the need for unique models necessary, although it is easy to forget some of those things amid all the chaos. We forget, for instance, the unique heritage of the telecommunications industry and the resulting legacies. One of the oddest indeed may be the strongest testimonial this industry has, and that is the apparent lack of awareness or even curiosity among most people about how it all works. Given the role telecommunications plays in our daily lives, and the position it fills in the world of business and commerce, this should strike any of us as a bit odd, most of all those of us who view the telecommunications system as the single greatest asset of the world economy.

Nevertheless, there is a limited amount of written material on telecommunications service development. This book was written in an attempt to fill some of that void.

World-Class Telecommunications Service Development is centered around a couple of themes. The first of these examines the challenge of developing new products for the telecommunications industry and considers what is involved in becoming a world-class developer (and provider) of telecommunications services. The many aspects of product development—the phases that make up the end-to-end process, the individual tasks, the management, and the organizational issues—are the main focus of this book, but not its main theme.

This book's main theme is that for telecommunications, the process *is* the product. Because telecommunications products exist primarily as a

set of business processes, the challenge in creating new telecommunications products really comes down to understanding what is involved in creating solid systems-based delivery processes. So integrally in fact are the network service and service delivery processes connected that the job of creating the product cannot really be thought of as creating one or the other but rather as creating both to operate together as one.

These areas of service delivery open up a huge set of industry issues, some of which comprise the subthemes of this book. Chief among these are the role of systems and what is involved in developing effective systems-based business processes.

World-Class Telecommunications Service Development has been organized around these themes as well. Part One looks at today's telecommunications services industry and at some of the characteristics that make this industry unique. Part Two puts forth a framework for development that consists of three separate but related perspectives. These perspectives govern all the development activities within a provider environment. The first two of these perspectives involve the product—the network service and the service delivery process, the two parts that make up the finished product. The third perspective—the product development *process* —is the process by which a company brings the two parts of the product together. It is also the process by which a company prepares itself for supporting the product once it is introduced.

Part Three looks at how providers decide what products to build. In this section, issues involved in evaluating, defining, structuring, and packaging the product are considered. Part Four moves on to examine the service delivery process and identifies the individual processes that make up the end-to-end service delivery view and the work involved in defining and linking those processes.

Part Five considers what is at stake in developing systems-based business processes. This section explores some of the issues providers face in integrating and automating their service delivery systems and processes. The direction service providers should pursue to exploit the opportunities available in the market is considered here as well. Part Five concludes with a chapter on *telecommunications management networks* (TMN), which offers the industry perhaps its best model for how information systems should evolve in the future.

Part Six examines what is required within the organization to launch and support the product. This section looks at the last three phases of the development cycle: development, implementation, and launch. (The three earlier phases are covered in earlier sections). These final three phases exist primarily to bring the organization where it needs to be to support the product on a regular basis.

Part Seven concludes with a discussion on organizational issues, or ways organizations can make their development efforts more effective. This section includes chapters on effective team building and rapid development approaches. It ends with some thoughts on what it means to be a world-class service provider.

The challenges the telecommunications industry faces as it moves into the next century will be intense and daunting. Those that enter the category of world-class service providers will be the companies that understand the challenges of service development, and take those challenges seriously. These will be the providers that understand that to gain an edge, they must initiate a deliberate company-wide commitment to improving the product development process now.

Companies that fail to improve their product development capabilities risk nothing less than their future position as competitors in a global market. The market is moving too rapidly, and the world won't wait for companies that fumble with their processes, or fail in their execution. Still, while the risks are high, so are the rewards—both at an organizational and an individual level. For organizations, the rewards come from the enormous opportunities available from being part of one of the greatest growth industries of all time. For those of us involved personally, the rewards include knowing we're playing a part in the most exciting business and societal transformation ever in history.

Ellen Ward,
June 1998

Part I

Opportunities and Challenges for New Service Development in Today's Telecommunications Industry

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1

The Telecommunications Industry—What's Ahead

For many, it is hard to remember that fewer than 15 years ago there was just one telephone company. Back then, and for at least 50 years beforehand, telephone service was considered a staple of life, grouped more or less in the same category as water, gas, or electricity.

In those days, the deal was simple. There was one telephone company, and from that company we expected certain things—basic telephone service, fair prices, reasonably good customer service—and, generally, we got them. By and large, the system worked, and everyone was happy.

It is also hard to remember that as recently as 1994, the *Internet* was not a household word. Just a few years ago it was insider's jargon, a term used mainly by engineers and academicians. Now, however, awareness and direct experience of this medium have grown exponentially, and the Internet and the *World Wide Web* have indeed become household terms.

1.1 Where are we heading?

As the telecommunications industry evolves over the next decade or so, it will undergo a worldwide transformation not only in technology, services, and applications, but in strategic approaches, industry structure, and regulation. This transformation will be profound for those working in these areas but will have a more significant effect on people individually and, even more, on society overall. The amount, quality, and ease with which information is available has caused a marked change in the way we live our lives. In the next 5 to 10 years, that will turn into a sea of change.

Witness alone the impact that the Internet is having on the psyche of people worldwide. In just a couple of years, the capabilities of this medium have expanded many times over, to include sound, video, and a host of new multimedia applications. In fact, some believe that the Internet could become the operating system of the future, with desktop systems, PC operating systems, utilities, and applications relegated to peripheral status.

Under this vision, the Internet would serve as an electronic communications network connecting people, companies, organizations, and systems anywhere in the world. In addition, it would carry every type of electronic information imaginable, including pictures, movies, videos, files, educational programs, and seminars, and it would be intelligent enough to find anything, from people to places to movies to books. Furthermore, it would be a network smart enough to heal itself in the case of an accident and to reroute itself when the loads become too heavy.

How quickly this happens or whether all of it will is impossible to predict. However, no one disagrees that in the next 10 to 15 years, the capabilities of the electronic digital network will be vastly improved over what they are today.

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"In the next ten to fifteen years, the world will undergo one of history's greatest technological transformations. The information 'mega-industry' is undergoing a rapid and fundamental transformation—a metamorphosis precipitated not by any dramatic shifts in consumer needs or desires, but by the sheer force of vast technological change [1]."

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1.2 What's the outlook?

Today's worldwide telecommunications market is valued at $750 billion, and growing rapidly. Revenues in the United States for this sector of the economy are expected to more than double over the next five years. By 2000, revenues for the combined telecommunications and information services industry globally are projected to reach $3 trillion.

As explosive as these growth rates are in the United States and other developed areas, they are a mere fraction of their levels in less developed areas. To appreciate this, one needs only to consider that more than 50% of the world's population has never made a phone call, let alone used a calculator or a laptop computer [1]. The point is, in spite of all the recent growth and what is expected to follow, the information industry is still very young at a global level.

1.3 Reasons for change

By now, any observer of the U.S. telecommunications marketplace knows that the traditional boundaries in which the industry operated over the last 125 years have pretty much come to an end. Passage of the Telecommunications Act of 1996 has broken down virtually all of the old barriers. Among carriers and service providers a veritable free-for-all—for customers and for new services—is now starting to take place. Three major factors are driving the industry to change the way it approaches its business:

1. *Deregulation and privatization:* The 1996 Telecommunications Act is just one of many changes coming from legislatures around the globe. The 1998 liberalization of telecommunications laws throughout Europe, Asia, Latin America, and just about everywhere else is bringing intense competition into a market previously closed to competitive entry. This is forcing the *incumbent local exchange companies* (ILECs) out of their cost-plus, guaranteed rate of return world into a new one driven by profit and loss. Necessity is pushing many carriers out of their once safe worlds into new markets that demand newer services that are attractively positioned and priced.

2. *Globalization:* Opportunities go far beyond just moving into new categories or service or stepping outside the traditional borders. The market is the world now, and many providers want to offer services at all levels—local, long-distance, and international. This new reality of a world market is changing the paradigm of service *and* service provider. Customers are asking for global bandwidth agreements, service-level agreements involving many network providers. This is driving companies to form alliances and consortiums that will allow them to offer one-stop shopping and centralized service management options to their customers.
3. *Internet and new technologies*: The explosion of the Internet continues unabated, growing at a rate of 80% to 100% each year. In early 1997 there were an estimated 18 million computers on the Internet; by 2000 that could grow to 300 million. In fact, 2005 could be the watershed year when data terminations on the network equal voice terminations. All of this is driving demand for an entirely new generation of services—services that respond to user needs for bandwidth-on-demand, and for higher levels of user-to-network and user-to-server processing. The steady and rapid acceleration of wireless users and new forms of wireless technologies is yet another example of the effect new technologies are having on the market.

"We're surrounded by insurmountable opportunity!"—Pogo

1.4 Effect on telecommunications service providers and customers

These new markets, new regulations, new services, and new technologies are changing all the rules and all the models of business. Service providers previously limited to local services now offer domestic long-distance, international, and a wide range of advanced data services.

Likewise, providers of long-distance, international, and advanced data services can now offer local services.

Today, most businesses are simultaneously pushing in two directions. They are trying to lessen the threats to their traditional markets, while entering new growth markets. In an effort to achieve greater economies of scale, telecommunications providers are trying to broaden their technological base and expand their geographic reach, the dynamics of which are creating a strategic necessity to consolidate—through alliances, mergers, and acquisitions.

As the new marketplace unfolds, customers will experience firsthand the blurring of boundaries—between local, toll, and long-distance—and between service types and technologies. The risk to service providers is that this blurring can extend to them as well. The challenge for service providers thus becomes distinguishing themselves to customers in a positive and noticeable way.

Ultimately, it will be those companies that understand the drivers behind these communications services and that possess the core capabilities to translate these drivers into workable service offerings that are most likely to succeed. Those firms that clearly understand what customers want, and that are able to transfer those wants into services that can be consistently delivered onto a large base will be those that can capture, and hold, market growth. Those that continue to struggle, over defining customer expectations and how to meet those expectations, will eventually become the suppliers or adoptees of those that succeed.

1.5 Service and product directions: the bandwidth revolution

With the significant opportunities of the last couple of years—stemming from the evolution of the Internet, the overhaul in regulation, and the overheated merger and alliance activity—possibilities for new service offerings are coming with greater and greater speed. As the need to exchange information expands, the roadways for handling that information must expand as well. Desktop enhancements, interactive video, advances in large scale switching platforms, and the explosion of the

Internet are all driving the need for this intense highway expansion program.

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"With digitization, all of the media become translatable into each other—computer bits migrate merrily—and they escape from their traditional means of transmission…if that's not revolution enough, with digitalization, the content becomes totally plastic — any message, sound or image may be edited from anything into anything else [2]."

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This expansion program is not new, however; it has been in effect for quite some time. In the United States alone, over 10 million new miles of fiber optic cable have been laid in the last 10 years. All segments of the industry—local companies, long-distance companies, competitive access providers, electric utilities, and cable companies—have participated in this building frenzy. Along with new capacity added by established sources along the existing routes, new technologies have also created a significant increase in capacity. The increase in bandwidth as a result of *personal communications services* (PCS), newly deployed satellite systems, and other new technologies is enormous. It is impossible to quantify the increase, but estimates run in the thousand-fold range.

In spite of all the recent and still projected growth, however, not much has changed at the individual consumer level. Today's desktop computer can process information at speeds many million times faster than it did 15 years ago, but today's typical telephone line connection does not offer much more functionality than it did 50 or even 25 years ago. Where does all this bandwidth seem to be going?

1.5.1 Bandwidth summarized

Bandwidth, of course, is capacity—the amount of information that can be transmitted over a network, a switching mechanism, or other type of computing or network device. In land-based telecommunications systems, where the transmission media is typically copper or fiber optic cables, bandwidth is measured in digital terms—as thousands of bits per

second (kilobits), millions of bits per second (megabits), or billions of bits per second (gigabits). In the air-based systems used by international, long-distance, and wireless providers, where transmission occurs over microwave or satellite, bandwidth is measured in cycles per second, as hertz—kilohertz, megahertz, or gigahertz.

Within telecommunications, bandwidth represents the transmission capacity of a service or particular technology. In the equipment world, on the other hand, bandwidth refers to the carrying capacity of the device's bus—the amount of information, or the size of the pathway, that the processor, LAN, or desktop system is able to send or receive. In describing equipment, the bandwidth of a device's bus is typically stated in bytes per second. In telecommunications, however, it is stated either in bits per second or cycles per second (or again, hertz).

1.5.2 Billowing bandwidth?

With personal computers now processing information at speeds as much as 100 times faster than the public network connection typically serving it, the disparity between the network and the equipment connected to it is starting to be acutely noticeable. Given all the expansion within the network, it would seem that this disparity is on its way to being eliminated—evidenced by suggestions over the coming *tidal wave* of bandwidth, over unlimited bandwidth and even the possibility of "free" bandwidth within 10 years time [3].

1.6 The real challenge

The need for more bandwidth at the individual level is certainly becoming more pressing, but the issues involved in delivering that bandwidth to customers go far beyond a matter of what is available within the network itself. In telecommunications, as is true for most other industries, what determines market supply is not what is sitting in the warehouse. It is what the distribution and delivery systems are capable of carrying. The physical distribution systems have to be extended all the way, to the final mile, and more specifically to the doorstep, before customers feel any impact. This is why continued deployment of fiber optic cable, new switching technologies, and even more players in the market will not

individually, or together, substantially change the supply side picture to the customer.

Until both the physical distribution systems and the systems that are used to actually deliver that capacity to the customers are changed, not much at the consumer level will change. Hence, the real challenge facing the telecommunications industry is finding a way to build the distribution systems all the way to the customer *and* creating the delivery systems that can regularly provide customers with the new services and the greater bandwidth that they need.

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[2] Brand, S., in *The Media Lab: Inventing the Future at MIT,* 1986.

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2

The Challenge of Development Within the Telecommunications Industry

With all the opportunities available in telecommunications right now, the pressure to introduce new products to market has never been greater. In the aftermath of many heady high-end deals, revenue targets are growing and market-entry plans are escalating. Telecommunications company executives are looking to their management teams to deliver quick results, and the quickest way to capture market share and build identity is believed to be through a steady program of new product introductions.

Creating new services—across a national infrastructure made up of many disparate parts, where varying state-level regulatory rules govern, different operational support systems reign, and divergent technologies meet—has never been easy. Now, however, with telecommunications

products growing more complex and the telecommunications industry in a total state of flux, the job seems to be getting tougher than ever.

The difficulty providers are facing in delivering new products to market comes down to understanding three separate but related challenges: the challenge of development itself, the challenge of telecommunications service delivery, and the challenges of the telecommunications industry.

2.1 The development challenge

To understand why development is a growing dilemma within most companies, it is necessary to understand what development is and the role that development plays in business. Development is about the future. It is about creating new opportunities—new revenue, new market share, and new customers. It is the opposite of minding the store. It is creating the store.

Taking ideas and turning them into something real—a new product, a new service, a new business partnership, or a new venture—is a creative process, and companies, like individuals, struggle with creative processes. In that sense, development is difficult for every company in every industry.

Fortunately, however, it is not all struggle. The more rewarding side of the development process is the promise for the future that it offers. Creating new services, new business opportunities, and new products is not just part of business, it is the essence of business.

2.1.1 Common problems with development

Since development represents the future of any business, it is understandably an area of great importance to most companies. Why, then, is it so frequently misunderstood?

Companies are often good at handling routine matters but not so good with unpredictable events—and creative processes can be both unpredictable and imprecise. Doing something for the first time is never easy; when you enter uncharted territory, no one is standing there ready to hand you a map.

The uncertainty of development can challenge every aspect of the organization. After all, organizational structures exist mainly to handle

what is already there. The focus of a company's sales, production, billing, and customer service groups is to maintain and grow existing revenue streams, not to create something new. Moreover, the manner in which these groups work, individually and with each other, is more or less set.

Meeting the demands of development forces organizations to work in a different way. People and departments have to shift out of their mindset of watching the store into a mindset of building the store. That means people and groups have to assume new roles—creating new concepts and transforming those concepts into something real. Accordingly, organizations must step into the unknown and manage the risks associated with the unknown.

Development is a cross-functional creative process and the most integrative of all business activities. Doing it right requires more than just getting individuals to work together in a different way. It takes getting the whole organization to work together in a different way.

Given these challenges, it is little wonder that so many organizations continue to struggle and that the product development landscape is littered with so many carcasses. Observed *Business Week* recently, "the new-product-battleground [overall] is a scene of awful carnage… of 11,000 new products launched by 77 manufacturing, service, and consumer-product companies, [only] a little more than half were still on the market five years later [1]."

2.1.2 Categorizing telecommunications: what's being developed?

We have determined that development presents some common challenges to all businesses and industries. But what specific development challenges do providers of telecommunications services face?

When we look at all the different things a company can offer—from hamburgers, to bicycles, to houses, to software—it makes sense that the manner in which products or services are developed will vary substantially from one product (or service) to the next. Within the broadest distinction, between goods and services, the differences are probably the most obvious. Developing a tangible good—something with a solid shape, size, and structure—involves something very different than what is involved in developing an intangible or consumable service.

Part of the challenge any industry faces in developing a new product comes in deciding exactly what it is producing. That can be a problem for telecommunications, because the *what* is not always as concrete as it should be. Is it a product or is it a service? If it is a service, what type of service is it? Telecommunications is part of the information industry, but is it producing goods and services similar to those being produced by other sectors of the information industry?

In referring to development, this book uses the generic term *product development*. In telecommunications, what is being produced is almost always a service. However, the telecommunications industry often refers to services as *products,* especially in the context of marketing and development. Whether it is product or a service, the concepts and approaches involved in doing development effectively apply to either.

2.1.3 A unique service industry

Telecommunications is part of the information industry, but it is unique in that it is the only part of the information industry that is service-based. The converged information industry is now recognized around three broad designations of providers: appliance providers, content providers, and transport providers. *Appliance providers* deliver tangible goods or equipment of one sort or another. This could include telecommunications switching or premise equipment, desktop systems, or mainframe systems. *Content providers*, on the other hand, also deliver goods but of a different sort. Content providers deliver soft goods—software, entertainment, and news. Of the three designations, only *transport providers*—into which telecommunications service providers fall—deliver a service [2].

Transport, or communications, may be a service industry, but it is no ordinary service industry. Most service industries offer services on a discrete basis. Consider, for instance, the airline industry or the financial services industry. You take a trip; you place a trade. Each event is handled as its own episode. Compare that to telecommunications. Service delivery in this industry is not episodic, it is continual.

2.2 The service delivery challenge

Service providers in today's telecommunications environment are delivering managed communication services to their customers—services, in other words, that must be continually managed and maintained. Like its partners in the converged information industry, the telecommunications sector is offering services that are complex and technologically based, but unlike the others, only telecommunications involves a highly complex service delivery process.

When you're developing a service that must be delivered *7 by 24,* the development challenge is different from that faced by other partners in the converged information industry and by providers in the *episodic* service areas. How well that service is offered is part of the offering. For example, in other areas of the information industry, after completing a development process that is, no doubt, complex in itself, these providers *ship* their product. In telecommunications, however, that is not the way it is. For each service sold, a team of people assemble and fall into action, each time carrying out a carefully orchestrated production. It may not be life or death, but pulling off a successful installation is more akin to what occurs when a surgical team comes together than it is to anything occurring anywhere else within the information industry.

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Telecommunications is not the shrink-wrapped, Styrofoam-packed, drop-ship commodity business. It is a business based on people, processes, and complex service delivery systems, all of which must perform consistently, and consistently well, time and time again, each and every time a new service is sold.

▲

In telecommunications, each service installation involves complex handoffs between scores of people with no failures in the process. It is not the shrink-wrapped, Styrofoam-packed, drop-ship commodity business. It is a business based on people, processes, and complex service delivery

systems, all of which must perform consistently well, time and time again, each and every time a service is sold.

2.3 The industry challenge

Thus, service delivery is one of the defining aspects of the telecommunications industry. Another factor that defines the industry and plays directly into the challenge of creating new services is the expectation that phone service will always be there and available for all to use.

The unique heritage of the telecommunications industry, the policy goals and charter that were all part of that heritage, still carry over to today's providers of network services. One of the original goals of the protected monopoly network was to provide *universal service*. This meant that service should be available to anyone who wanted it. Another goal was *interconnectability*—the idea that a subscriber in any exchange should be able to call a subscriber in any other. This meant, and still means, that the telephone system has to exist as part of an integrated and interoperable public network, one that is compatible within a national and international framework and capable of evolving in a consistent and uniform direction.

Because the *public switched telephone network* (PSTN) will always operate in the public domain, interoperability is a central concern for every telecommunications service provider and for every service that is being developed. Any service introduced must be capable of performing consistently within a local, national, and global infrastructure.

2.3.1 Unique demands: interoperability and the role of standards

One could say that the interoperability requirement applies to content and appliance providers as well as to transport providers. However, there is a difference: In telecommunications, the need for interoperability stems from a system of mandates that makes standards more than just a good idea. Content and appliance providers, on the other hand, observe standards that are passed down through the market, not through regulators.

In any case, the organizing principle for telecommunications, and arguably for providers of content and appliances as well, is still that of unification—networks that work together and services, equipment, and content that can freely interact with that network.

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In telecommunications, in order for it to work at all, it all must work together.

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The problem now is that responsibility for establishing standards is not nearly as clear as it was in the past. The monopoly environment conferred upon the monopoly providers responsibilities for establishing standards, whereas today responsibilities are fragmented and oftentimes not clear. The lack of clear ownership for standards is a significant issue for the telecommunications industry. Unfortunately, however, a resolution to this dilemma does not appear imminent. None of that makes the challenge of developing services in an industry where services are based on standards any easier. The issues will be around for awhile, but that does not change one of the immutable law of telecommunications, which is that in order for it to work at all, it all must work together.

2.3.2 What was gained, what was lost

It is impossible to sum up all the gains or the losses involved in moving from the old regulated world of state-sanctioned telephone systems to the competitive free-for-all of today. The gains continue to be tremendous, but they could not have occurred without the strong foundation that was built over the long monopoly period of the telecommunications industry.

What the past provided was rich in many ways. Among the better legacies were the outstanding methodologies and the well-documented and well-planned processes that accompanied any new service introduction. Anyone who was part of the predivestiture Bell system in the United States can recall some of the operational artifacts that enabled a national system of telecommunications to operate:

- The *Red Books* lining the shelves of every business office, which translated and decoded every service, every acronym, and every supported service arrangement;
- The *common language* and *universal service order codes* (USOCs), which standardized and defined discrete service elements in the network and became the *lingua franca* of the industry;
- The old *Methods and Procedures* and the *Bell System Practices* that were issued with every new service introduction or changed service capability.

The methods used to develop services may not have been built toward speed, nor were they built toward anything but one provider per territory. Nevertheless, many of these methods reflect the kind of comprehensive approaches still needed to deliver services across wide coverage areas, involving multiple organizations and multiple business units.

2.4 Where do we go from here?

Where does any of this leave developers of new telecommunications services? We see that there are many factors that make this industry unique—from a historical perspective, a service industry perspective, and an operational perspective. Each of these factors makes the challenge of creating services for the telecommunications industry unique as well. All this is made worse by the fact there is no accepted standard within the industry for how to approach the *process* of developing new services.

The telecommunications industry needs some flexible development models that can support a wide range of service types and business situations. In addition, it needs some tools to bring order to the many-layered business activity known as product development. We turn to look at some of those areas now.

References

[1] "Flops," *Business Week,* August 16, 1993, p. 76.

[2] Sheth, J. N., and R. S. Sosidia, *The Consolidation of the Information Industry: A Paradigm Shift,* International Engineering Consortium, 1996.

Part II

A Framework for Telecommunications Service Development

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3

The Product Development Orientation

THE DYNAMIC and intense nature of today's telecommunications environment places a premium on product development. In many companies, however, product development is still a reactionary event. Instead of being a carefully controlled and well-considered process, too often it is a series of loosely defined and poorly organized steps.

Performing product development effectively involves bringing together a wide set of disciplines, people, and interests, and linking them to a common organizational goal. It includes leading the organization through a complex, multiphase decision process and a development cycle that links new products to the strategy of the business. It also includes the ability to integrate those products into a functional whole, one that the organization can regularly support.

3.1 Competing factors

If all that sounds difficult, it is, and the process is further complicated by all the different directions in which companies are now being pulled. Many of these directions are ones being mandated through deregulation. Others, while not mandatory, are nonetheless critical for survival. In the end, companies must balance the need for developing new products against all of these demands. Some of these demands are discussed in the following:

1. *New rules:* In the United States, the FCC requires ILECs to unbundle their networks and to offer services for resale. In other countries, liberalization programs are putting similar pressures on incumbent carriers. These mandates, which are causing carriers to fundamentally restructure their organizations and operations, are consuming huge resources in most companies. To be a supplier to everyone else, carriers practically have to recreate themselves from the inside out.
2. *New deals:* High-profile deals have become a way of life in telecommunications. Companies that were once competitors are now becoming allies and business partners; territories are being joined; single-nation concerns are becoming multinational concerns. Many of the deals go beyond the traditional. Telecommunications companies are joining forces with media and news organizations, entertainment and publishing companies, and software and equipment suppliers. These moves could reap big rewards eventually, but in the first few years the work of merging with, and learning a new business, often detracts from the job of tending to the core business.
3. *New business structures:* Absorbing the newly acquired entities, revamping the core business, and responding to new directions within the industry have resulted in business structures within telecommunications companies that are in a constant state of flux. Trying to keep costs down while growing the business can be a tough balancing act. The result is organizations that have become more dispersed, more complex, and more specialized. As the internal canvas of the organization expands, the routes

involved in communicating become longer and ever more layered. This reality can play havoc with cross-functional business processes such as product development.

4. *New systems:* It is hard to focus on products when the systems that are the basis of those products are in the middle of an overhaul, and right now every carrier is involved in at least one (and more likely several) major systems projects. Established local service providers are in the middle of upgrading their legacy *operational support systems* (OSSs). *Interexchange carriers* (IXCs), trying to adapt their systems for the next wave, are all involved in big retooling and re-architecting efforts. Developing new products in this environment is a little like trying to paint the inside of a house before the dry wall is up. This isn't a problem for larger providers only; newer and smaller providers are facing equally daunting hurdles navigating their way through all the new systems they must implement just to be in business.

No one would argue the importance of these factors. Many, in fact, are nonnegotiable for surviving in today's environment. Moreover, there is no reason to believe that an abatement to the number of sizable factors will come any time soon. Merging and melding have become part of this industry. The overhaul that has begun will continue for many years to come.

Still, no matter how valid these initiatives are, companies cast their future revenues through their product development efforts. Accordingly, telecommunications firms must somehow find the right balance between these initiatives and developing new products.

3.2 The paradox of product development

Despite the importance that most firms assign to the product development process, few claim to be adept at it.

Then again, becoming adept is not something that just happens. It follows when there is commitment and focus. In many companies, the level of commitment needed to properly carry out product development simply isn't there. This was made clear in a recent informal business survey in

which companies were asked about their product development practices. More than half shared that they had no formal process within their companies for doing product development.

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Product development may be about creating things that are new, but the *activity* of developing new products is not itself new.

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Product development may be about creating things that are new, but the *activity* of developing new products is not itself new. Companies, after all, have always been developing new products. The paradox comes in trying to figure out how something as important and regularly carried out as product development could also be so misunderstood and even mismanaged within companies.

3.2.1 Common problems with product development within telecommunications services environments

These findings fall right into line with what can be found in telecommunications. Some companies have formal processes, but many others do not. Not surprisingly then, most service providers do not rate themselves as being particularly *good* at development.

Consistent with other findings are the types of problems with development that are cited. Most of these are classic management problems stemming from lack of ownership and control, diffused leadership, and insufficient resources. These are problems common to many industries. Along with these are problems caused by a lack of understanding of what customers actually want. These problems include the following:

- *Poor communication across organizational boundaries.* The sheer size of many organizations is a factor that works against itself when it comes to development projects. In the words of at least one director, problems in development are due largely to organizations that have simply grown "too large." Trying to perform a cross-functional business activity when pathways to communicate across

organizational boundaries do not exist can turn into a mission of failure. Without direct channels into the right levels and right areas of the organization, success can be almost impossible.

- *Lack of a regular product development process.* Lack of a regular development process is no less likely in telecommunications than in any other environment. Some companies claim to have a regular process but privately share that no one really follows it. Without a regular process that is consistently followed, it is unrealistic to expect anything other than haphazard results. If success happens at all, it is likely to turn on the skills of the individual project manager. Establishing criteria that track progress at each stage of the development cycle, and managing to standards that all projects must meet, is an implicit part of a regular product development process.

- *Customer requirements not understood, not validated, or not defined.* Beginning development projects without properly defined customer or market requirements is also as common a problem in telecommunications as it is in any other industry. Customer and product requirements oftentimes are never really validated. Instead, they are simply assumed. The other extreme is just as bad. Companies may take what are essentially customer ideas and automatically confer these ideas with the status of requirements. Problems in these areas bleed through every phase of the project. Customer input is a critical part of information gathering, but it doesn't constitute product requirements, and it should not be a substitute for determining product capabilities or a product strategy.

- *Too many projects.* Project overload is perhaps the most common reason service providers cite for their organizations being less than effective in product development. Many times all the projects within a company are essentially competing for the same pool of resources, which means none get the attention they deserve or need. In the end, having lots of projects does not mean more new products will be introduced. Usually it just means that all those projects will be late. The most common reason for an overabundance is that the objectives that come down from the top are not

clear. Another reason is a poor planning function that is unable to align company resources with company priorities.

- *Lack of experienced personnel.* Lack of the right kind of skills can also be a significant cause of difficulties with development. To effectively run a complex, cross-functional business project, companies must employ individuals with the right skills and industry experience. However, many companies, in their eagerness to launch new projects, thrust into the job individuals who lack the experience and leadership skills to get the job done. Because of shortages in personnel within the skill areas needed, companies may feel forced to compromise with less qualified people. This happens most frequently within companies with no formal development process. In those cases, there is a good chance that the scope of development is never truly understood, which means that the skills needed to carry development out are never correctly understood either.
- *Poor linkage to the resources needed to complete development projects.* Another source of problems is a lack of understanding of project dependencies. In addition, even organizations that fully comprehend dependencies experience difficulty in linking these dependencies into a project schedule. Companies will frequently cite systems schedules as being the biggest contributor to this problem. Systems schedules frequently represent the critical path for a project. Consequently, when they aren't properly aligned, it can be impossible to synchronize events and resources to a project launch date. Other times, resources for a project are never actually confirmed or secured but rather are just assumed to be there. Most of these difficulties stem from the lack of an integrated approach to project tracking, and lack of management oversight to track and bring together the elements in the appropriate order and in the right time.

3.2.2 The clearinghouse effect

One of the other ironies of the product development process is how frequently it becomes a clearinghouse for unsolved issues within an organization. Since most organizations are dealing with an overly full plate, it

often takes the focus of bringing a product together for issues scattered across the company to finally come together. Many times, getting inside the *development loop* is the only way to bring into an applied situation issues that until then may have only existed in theory.

This is yet another reason for instituting a regular and formal process for product development. Developing new products forces companies to create integrated solutions to problems. How companies approach product development can thus reflect how they operate in a larger sense. In this regard, product development becomes a microcosm of the organization. It reflects how functional, or dysfunctional, the organization is in solving complex cross-functional problems. It also reflects how adept a company is at putting in place integrated solutions to those problems.

3.3 Product development and the world-class service provider

With all this talk about creative processes, the suggestion that a more formal or regular product development process is needed may sound contrarian, but that is not the case. Creative processes should not and, in fact, cannot be formulaic, because when they are they are not creative. However, they cannot be chaotic either.

The process of regularly creating new service ideas and turning those ideas into working services has to be both creative and orderly. Thus, companies must perform a delicate balancing act, fostering an environment in which ideas and solutions are creatively generated, while maintaining control as they guide their product development projects through their various stages.

We have examined some of the areas that impede development efforts within companies, but now we will examine factors that contribute to a successful effort. What is really involved in doing product development well, and what differentiates product development as it is carried out in the best organizations from how it is carried out everywhere else?

The world-class service providers of the next generation will be those that pursue product development seriously. These organizations will recognize product development as a complex process—in fact, the *most*

complex process they are likely to undertake. They will have the following factors in common:

1. *Commitment from the top-down.* Commitment for development as one of the company's most important business activities starts at the top and flows to all levels of the organization. The top levels in these companies understand the complexity of product development and involve themselves in the process, establishing clear priorities and guiding the direction of new initiatives. They recognize that cooperation across all areas of the organization is essential for bringing new services together, and they work to facilitate that cooperation. The top levels are a driving force behind improving the effectiveness of product development efforts within their companies.
2. *A flexible and disciplined approach.* World-class companies do not view product development as an ad hoc process. These providers recognize that product development is one of the most strategic activities they conduct and that it requires discipline. However, they also realize that market realities demand processes that can be carried out with speed and agility. Therefore, these companies have a process that is both flexible and disciplined and understand that success follows only when the two are correctly balanced.
3. *Standardized processes.* World-class service providers also recognize the expense of doing development successfully and the even greater expense of doing it unsuccessfully. Therefore, they infuse their product development process with checkpoints and gates, ensuring that the project remains viable through every stage of the cycle. World-class companies also recognize that the importance of development does not permit them to determine standards solely at the individual level; accordingly, they establish company standards and criteria that *all* projects must meet at various points to stay on the development track.
4. *Sustained involvement.* Companies that are successful with development do more than just voice tacit commitment for ongoing efforts; they actively involve themselves in the *process* of development. The right organizational areas and levels are involved at

every stage. Management is present, guiding the project through the problem areas and working and driving solutions. Involvement in these companies is not in reaction to a problem—such as the delay of a launch plan or costs that are over budget—it is sustained throughout the entire process.

5. *A new view*. Service providers that emerge as world-class will be those that have their own views or paradigms for product development, and along with those views their own set of definitions. These definitions will address how the process works, what exactly constitutes a finished product, where responsibility at various points resides, and what constitutes completion at each of those points. The *process* of product development in these companies is not only well-established, it is well-communicated and known to all parts of the organization. These paradigms or views, and the definitions that go with them, become a common language. They provide the company with a common currency for development, around which knowledge and experience can accumulate.

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Views Into Product Development

We closed Chapter 3 referring to the need within companies to develop views on product development that the entire organization can share. Once these common views are established, all parts of the organization—including systems, network engineering, regulatory affairs, and marketing—have a common basis from which to begin working.

Companies do not need views or paradigms that are unusual or highly different. The telecommunications industry operates on standards and on concepts of interoperability, which means that common models are essential in many areas. Companies need views that work within a common telecommunications framework, and reflect an approach that uniquely captures the level of quality they want their products to represent.

4.1 The unraveling world of telecommunications

What is needed are approaches that will work for the emerging world of deregulation—a world, and an industry, made up of hybrid service arrangements, with parts provided from any number of different suppliers. In this realm of deregulation, one carrier provides the local loop that goes to the customer's premise and another supplies the portion that goes to the central switching point. In addition, switching and billing may be carried out by one carrier, while installation and post-sale support are handled by another. Similarly, the customer's premise equipment may be handled by one company, while maintenance is conducted by another. In this world, any number of combinations are possible, and none of the elements necessarily remain fixed for life.

4.2 Three views into product development: the network service, the service delivery process, and the product development process

When approaching the task of creating a new telecommunications service, a company must consider a couple of perspectives. So far, we have talked in broad terms about the business activity of product development and about the need to define and *regularize* the process for development within the service provider environment.

As we started to see in Chapter 2, however, the process of development turns on what is being developed. In telecommunications, the *product* is actually a service that operates on two distinct levels—as a network service and as a set of service delivery processes. The service experience that customers receive crosses both of these levels. Accordingly, the process used to create the product involves integrating these two levels (see Figure 4.1). Sections 4.2.1 and 4.2.2 examine the network service view and the service delivery view, respectively.

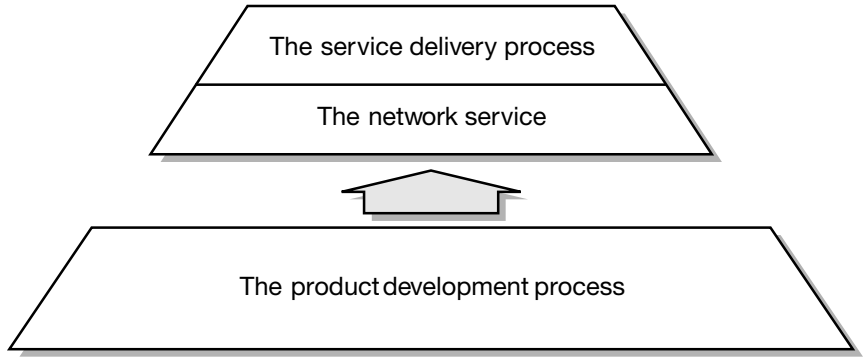

Figure 4.1 The two levels of the telecommunications service product.

4.2.1 The network service view

When a company is evaluating a service concept, it first considers the network service, as this is the actual service the customer will be receiving. This is the *view* with which customers, salespeople, and the market will be most familiar. It is at this level that other service providers will compare their equivalent offerings.

Included in this view are all the capabilities, features, and functions of the service. This view is also represented through pricing and packaging options.

4.2.2 The service delivery process view

As important as the network service are the processes used to deliver that service to the customer. Without these service delivery processes, there is no product. In fact, until these processes are created, the product exists only as a potential capability within the network.

In the most general sense, service delivery can be thought of as one end-to-end process. In actuality, however, it is made up of several distinct business processes, all of which must be closely linked. These processes address every stage a service request must go through, from sales and ordering, to installation, billing, maintenance, and support.

Combined, these two levels represent the finished product (see Figure 4.2). The customer's impression of the service—and, by

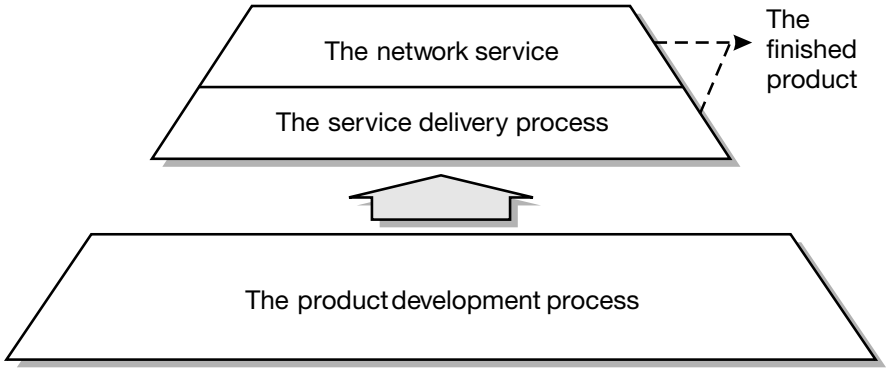

Figure 4.2 The "finished product."

extension, of the company—are formed on what happens at these two levels. This close association between the network service and the service delivery process is one of the elements that make the process of developing products for the telecommunications industry unique from what occurs in others. Another aspect making the process unique is that development teams in telecommunications typically have responsibility for developing the service at both levels.

The service delivery level's closest counterpart in a manufacturing environment would be the manufacturing process that is used to produce a product on the factory floor. In most manufacturing environments, the design of the manufacturing process is normally off-loaded to an area that specializes in designing manufacturing processes. In most telecommunications environments, on the other hand, this task is all part of the same development project managed by a single product development team.

4.2.3 The product development process view

Underneath both of these levels is the product development process, the means by which the company manages a new product development effort. Product development is a management process, but more specifically (as we will discuss in Chapter 9) it is a *strategic* management process. The process, and the full cycle of development, is made up of six overlapping phases. These phases will each be considered in detail in later chapters:

- *Phase 1:* Opportunity analysis;
- *Phase 2*: Definition and feasibility;
- *Phase 3:* Design and testing;
- *Phase 4:* Development;
- *Phase 5:* Implementation and trials;
- *Phase 6:* Commercial launch.

4.3 Telecommunications: is it a product or a process?

The products offered by telecommunications firms are services, but they are services that are managed as any traditional products would be: They have features and capabilities that give them identity, and they are priced, packaged, and promoted as distinct products. More relevant than how to refer to telecommunications products is the question posed earlier: What is actually being developed? Again, it is this *what* that defines the nature of the development activity and determines how the process of development should work.

What is starting to become clear for most telecommunications service providers is that the service delivery process is at the center of it all. It is the service delivery process that shapes the customer experience and determines the volume and scale the organization will be capable of supporting. It is the service delivery process that ultimately determines the provider's position in the market.

Indeed, the service delivery process is so important to telecommunications that it really deserves its own marketing rule. Traditional marketing courses teach that *the package is the product;* in telecommunications, *the process is the product*. What is actually being created with a new telecommunications service is a set of processes.

Needless to say, because this service delivery aspect is so central to the entire telecommunications services environment, company concerns over their abilities in this area are well-placed. Most telecommunications firms are finding this to be where their largest obstacles lie. It is

also where they will find their greatest opportunity for differentiation, favorably and unfavorably.

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Traditional marketing courses teach that *the package is the product;* in telecommunications, *the process is the product*.

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4.4 Infrastructure versus infostructure

It is necessary to understand that the entire information services industry actually exists on two levels—an infrastructure level and an *infostructure* level. These levels, not coincidentally, correspond with the two levels of the product—the network service level and the service delivery level.

Infrastructure, of course, deals with the physical network. It includes everything from the network design, architecture, and technology, to the actual equipment and elements needed to operate the network. Along with the physical assets making up the network—including the switches and transmission systems, the cable, and the duct work—infrastructure also comprises the maintenance and monitoring systems needed to operate it.

Infostructure, on the other hand, is a bit less clear. It is less charted and, in most companies, exists more on a conceptual level than as a discretely recognized layer of the business. Infostructure deals with information—the elements, the structure, and the process by which that information is handled. While the system equipment and components needed to carry and support information are a central part of a company's infostructure, there is more to it than that. Infostructure extends to include the people, the organizations, and the processes that transfer and carry that information.

The importance of the infostructure is that it is within this level or *layer* of business that services are delivered to customers. How good, or how inadequate, this infostructure is determines how well, or inadequately, the service delivery process can be carried out. Many providers realize this and believe that if they can just get this piece of their

businesses figured out—if they can get their internal processes working together properly and their information systems correctly synchronized—they will then be in a position to compete for business successfully in the years ahead.

However, as telecommunications industry insiders are starting to realize, getting this layer right requires a tremendous number of things happening. Moreover, these events go beyond any single telecommunications company; they extend to the industry as a whole. The issues involved do not just surround the industry; in effect, they *are* the industry.

The central issue for the telecommunications industry is not about who merges or partners with whom, and it is not about what transport technology wins out over another. The central challenge is creating the infostructure, within the industry and within companies, so that all of the rest can happen.

The central issue for the telecommunications industry is not about who merges or partners with whom, and it is not about what transport technology wins out over another. The central challenge is creating the infostructure, within the industry and within companies, so that all of the rest can happen.

4.5 How important will service delivery become?

As the telecommunications industry transitions into the next century, more and more often services will be made up of a combination of interchangeable parts. In that world, distinctions at the product level start to fade. Customer ownership will not go to the provider that owns the network or operates the network infrastructure. It will go to the provider that controls the service delivery process—the provider, in other words, that performs service delivery the best. This means that those service

providers intent on capturing the largest amount of market share must focus on mastering the skills of building quality service delivery processes, because it is here where the greatest opportunities for differentiation, and, therefore, competitive advantage, will occur.

That is not to say that differentiation at the product or network service level will not be important. Innovations at the product level are always important; that is where the sizzle and excitement of the industry are found. However, the fact is, telecommunications is not part of the quick change-out appliance industry. It is not an industry of simple upgrades, breathtaking innovations, or throw-away technology. The nature of the telecommunications industry dictates that true innovation happen at a much slower rate. Since the industry is grounded on the principles of universal service and universal access, any new service, for it to be useful, must be available for all to use. Offering a service that is only available to a small base is of limited value to either users or providers.

4.6 Service delivery and operational excellence

Delivering a consistently good service, time and time again, in a predictable and regular manner is a monumental achievement for any organization in any industry. So is leading the industry in product innovations. And so is maintaining close relationships with a highly satisfied base of customers.

In the end, it all comes down to focus. That was the point made by Michael Treacy and Fred Wiersema in their excellent 1995 bestseller *The Discipline of Market Leaders.* The proposition was that each company must choose to focus on one of three *value disciplines.* Those disciplines—product leadership, operational excellence, and customer intimacy—each entail different skill sets. Each requires a different type of organizational focus, and different management styles, to achieve. No company can succeed expecting to be outstanding in all three areas. Accordingly, companies need to focus on the discipline that best matches the goals, culture, and capabilities of the organization [1].

Certainly, mastering what is needed to perform processes over and over again across a huge base of customers is not going to be the right

choice for every company. For service providers intent on capturing the largest amounts of market share, however, it most likely is.

The hard truth is that, in a highly competitive market, it is not permissible to lag in any area—not in service delivery, not in product innovation, and not anywhere else. Parity in products, parity in competencies for delivering service, and parity in a number of other areas are requirements for surviving in any intensely competitive market.

Service providers that decide to pursue a strategy of operational excellence will be those whose mission is to improve the service delivery processes within their companies. For these companies, the activity of product development will rest more on the activity of *process creation* than on *product creation*.

References

[1] Treacy, M., and F. Wiersema, *The Discipline of Market Leaders,* Reading, MA: Addison Wesley Longman, 1995.

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5

The Cycle and Phases of Product Development

Before going behind the two levels that make up the finished telecommunications product—the network service and the service delivery processes—we will review the cycle and the phases of product development.

We pointed out earlier how certain aspects of product development cross industries while others are more industry-specific. The phases within the cycle of product development comprise an area that is more similar than different within industries. Some industries may have cycles that include nine or more phases, but most will have either five or six. What determines the number of phases is either the complexity of the product or service being developed or the way in which the phases themselves are defined. More significant than the number of phases is what

occurs within each phase. This is where an industry, and a company, places its stamp.

5.1 The six-phase cycle for telecommunications service development

The cycle for telecommunications service development we will be covering recognizes six phases (see Figure 5.1).

While the cycle appears as six distinct phases, anyone with experience in this area knows that development is not something that happens in a strictly linear fashion. Development is an interactive and iterative process, and no matter what the model is, phase designations will always appear much sharper than they actually are. The overlapping nature of development might be captured more accurately in the *sashimi* model shown in Figure 5.2 [1]. (*Sashimi* is the Japanese word for raw slices of fish arranged on a plate.)

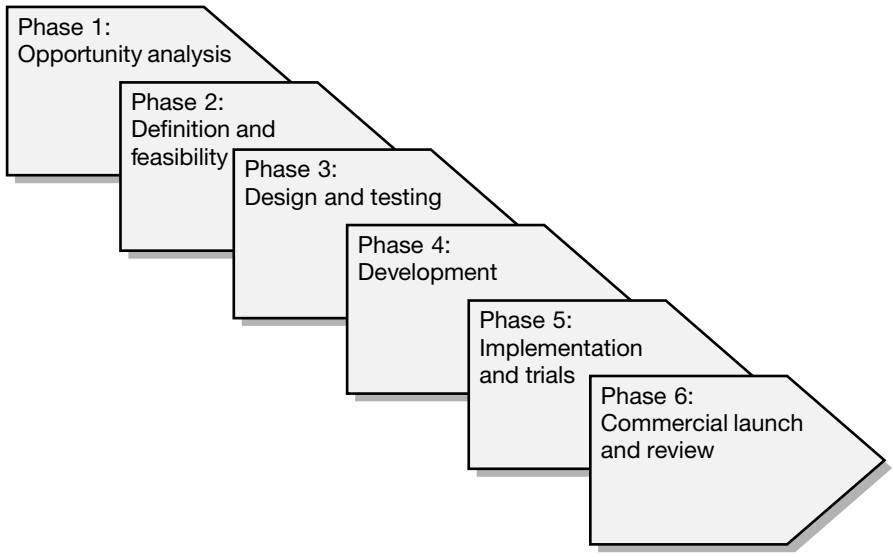

Figure 5.1 The six phases of telecommunications product/service development.

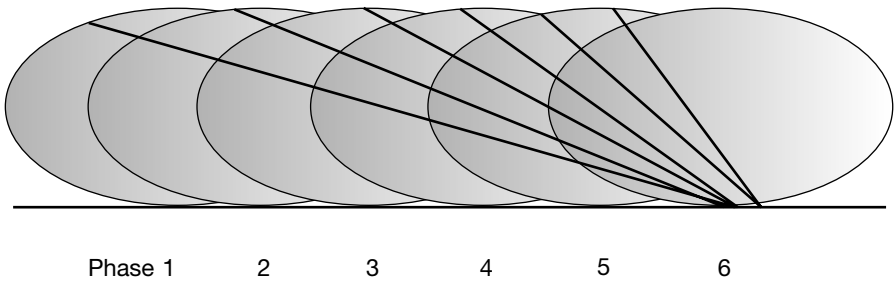

Figure 5.2 The overlapping nature of product development.

5.2 Development as a strategic management process

Product development is one of any company's strategic management processes. Strategic management processes address areas of critical importance to business. Usually they involve large investments of capital and resources and, therefore, large measures of planning and analysis. This certainly applies to product development. Because funding commitments associated with product development are often large and irreversible, careful management and scrutiny is required through all phases.

Part of the reason for establishing distinct phases is to define specific elements that must be present before allowing a project to move on to the next phase. Each phase should represent completion of some measurable criteria. This can include deliverables of many forms, including business cases, prototypes, and successful commercial trials.

These criteria reflect the standards of quality the company expects for itself and for the products it releases.

These *gating* criteria become the basis for managing a project through each of the phases of the cycle. This is important because projects that start out viable may prove to be less so as the development cycle wears on, and starting on the development track should not be reason enough for staying on it. By managing projects against established criteria, companies ensure that only the most viable and potentially successful product ideas remain on the costly track of development.

Phase reviews should not be the only reviews to which a project is subjected. Management reviews should be a regular part of the process.

Projects that undergo intensive joint management reviews only at the end of a phase will not receive the benefits of interactive involvement from across the organization needed to bring about solutions to difficult and substantive issues. Periodic reviews ensure that projects stay on a steady track.

5.3 The six phases summarized

Each of the six phases—opportunity analysis, definition and feasibility, design and testing, development, implementation and trials, and commercial launch and review—are the subject of their own chapters. The following sections briefly describe each phase.

5.3.1 Phase 1: opportunity analysis

In this first phase, companies evaluate product concepts to determine whether there is sufficient reason to believe that a profitable product could be in the making. Concepts that appear viable and potentially profitable proceed into the next phase, where an in-depth feasibility review will occur.

To begin Phase 1, organizations evaluate a working definition of the product to determine whether they have the capabilities to offer and support such a service. Since the development cycle that follows will be lengthy and, in all probability, costly, only those product ideas that represent the best fit and potential for profitability should get through. Key factors for deciding what goes forward should include whether the company has the presence needed in the market to be successful with such a product, whether the company has (or will have, by the time the product is offered) the right capabilities internally to deliver the product, and whether the product could be offered profitably.

To make this determination, a company must conduct preliminary assessments in several areas, including the network infrastructure, the operational support systems, and the overall service delivery capabilities of the organization. While still preliminary, these assessments need to be solid enough for a company to decide whether the product can be offered within given financial parameters. Market position is a key element of this

assessment. Also, initial investigations into sales and distribution channel issues are a normal part of the review at this stage.

Entry into this phase can be liberal, but the gateway out—into the next phase—is conservative. Organizations should develop and approve an initial business case, a preliminary product description, and an area impact statement before moving a project to the next phase.

5.3.2 Phase 2: definition and feasibility

Phase 2 begins with a working definition of the product and ends once input from all groups has been received and the product description has reached its final form. The deliverable of this phase should be the final product blueprint. Companies should define everything the product must include—all features, functions, and capabilities—in as much detail as possible.

The definition that comes out of this phase should represent a product that the organization can achieve and support. To reach this definition, each area of the company—including the network, technical, operational, regulatory, customer service, and billing departments—must assess the product concept from its own vantage point. Lab testing, which is the first level of service testing, begins in this phase.

In addition, companies define and evaluate any new or unique customer support arrangements during this phase. While they will need to identify specific support requirements, they will not determine the *how*—the operational specifics and the way in which the requirements will eventually be delivered—until the phase that follows.

Along with service features and support arrangements, billing requirements must also now be defined. To fulfill this requirement, an organization defines rules for rating, discounting, promotions, and invoicing. Also at this point, a company specifies product structure, defining all components—billable or otherwise—and their relationship to one another. Phase 2 also requires organizations to develop initial marketing forecasts, addressing market-specific sales forecasts and revenue forecasts.

At the completion of Phase 2, companies should issue a final product description (version 1), along with a revised business case, including substantially more detail than was developed earlier. The product

description issued at the end of this phase will serve as the organization's formal *build-to* plan, thus bringing to closure the product's analysis and assessment stage. Now, the design stage is ready to begin.

5.3.3 Phase 3: design and testing

In Phase 3, the project moves into its detailed design phase. This phase exists to bring together the network infrastructure, the operational support systems, and the business processes. Accordingly, the work associated with linking the network *infrastructure* to the systems and services *infostructure* is performed. Arguably, this is the most complex phase, since it requires each of these areas to work together as a whole.

To build the network infrastructure, companies must engineer and design the switching, transport, and interconnection arrangements. With input received from vendors and other groups, organizations finalize network design configurations, identify elements necessary to deliver the service at the network level, and begin procurement arrangements. In addition, they define network elements with respect to the information systems and processes addressing those elements.

For the operational support systems, database design and definition work now begins. System modules and information elements are identified and defined and details of data flow between systems specified. Internal and external interface specifications are analyzed and addressed. *Joint application development* (JAD) sessions begin with OSS developers and the product development team. These sessions, which will continue into the next phase, ensure that the solutions being designed and developed are ones that can be supported by all systems involved.

To develop business processes, companies must integrate systems and processes into a single system of operation. Therefore, they work with each line and support organization to analyze individual processes and link them to function as one end-to-end system. Once a firm has designed, tested, and modified its service delivery processes, it feeds them into an early prototype for initial testing. The integrated testing that begins in this phase will continue through each of the remaining phases, increasing to include more groups, more service arrangements, and more complexity.

Because the network infrastructure, operational support systems, and business processes areas are all so closely tied, the design phase is the most interactive and iterative of the six. In order for the designs from any three of the areas to be sound, they must each develop from a common base, a base that can only form by crossing all three areas.

The collective work of the network infrastructure, operational support systems, and business processes areas in the design and testing phase allows what follows in the next phase to be less of a discovery phase than a doing phase. When the design and testing phase is used to arrive at solutions that link all aspects of the business, the phase that follows operates much more effectively.

5.3.4 Phase 4: development

This is the *doing* or *working* phase of the cycle where the infrastructure and the infostructure of the service are put into place and merged. With planning complete, companies begin work on the production level systems, procure infrastructure equipment, and set delivery schedules. Similarly, organizations procure infostructure systems equipment, assign it, and schedule it for delivery.

The individual pieces are developed now, and each of these pieces are knitted into a whole. Service testing and integration testing take on a larger role as this phase progresses. The testing that occurs in this phase will verify that the service and process designs from the previous phase are workable within the context of an actual production environment. Along with ensuring that the mechanics of the service solution operate in the way they need to, in this phase the project starts its transfer out to the organization at large. Departments now begin to develop the deliverables that they committed to earlier. These deliverables include following through on staffing and training plans, departmental procedures and manuals, technical design and engineering documents, and market support programs. In other words, each organizational department is preparing itself to accept responsibility for the service once it is introduced.

By the end of this phase, organizations should be ready to support the commercial trials that follow. Consequently, readiness verification across functions and across departments to determine whether the

organization can move to trials is one of the most significant aspects of this phase.

5.3.5 Phase 5: implementation and trials

There are two purposes to this phase. The first is to ensure the organization does everything it needs to support the service once it is introduced, and the second is to test the service to ensure it is working in the way needed. This fifth phase is also a *doing* phase but unlike the previous phase, which primarily involved groups closely involved in the development effort, here the entire organization is involved.

From a development perspective, this phase is characterized by a lot of tactical and logistical planning. Plans now transfer to the markets and regions that will regularly support the service. The direction of transfer is generally from the central areas of the business to the outlying areas. Individual departments now implement the plans that were developed earlier. This can cover anything from fulfilling staffing and training requirements to implementing new procedures or business processes. Sales channel operations, field operations, network operations, and other operational groups now begin to absorb responsibilities for the new product.

Central support functions are part of this implementation phase as well. Network planning groups now have to deliver on commitments for equipping the network for the capabilities and capacity levels established earlier. Other areas such as systems planning must also deliver, equipping field units with the tools and equipment they will need to carry out their functions.

The second purpose of this phase, testing, serves to determine the company's actual readiness to operate the service in a commercial setting. Testing may include alpha trials, in which service is delivered into a simulated customer environment, and beta trials, which install service to an actual customer under controlled conditions. A good read-out for how the network service and the service delivery process will function should follow from these trials. Trials also let the organization know how prepared it is to carry out the functions associated with delivering service in an end-to-end manner.

5.3.6 Phase 6: commercial launch and review

Commercial launch is the point at which the lights go on; everything that preceded this phase existed to reach this final point of launch. The most tactical of the six phases, this stage aims to ensure that all areas are collectively *ready*. As in all other areas of the development cycle, readiness is defined through the gating criteria that determine when a project is ready to move into the next phase. In this last phase, of course, these criteria serve as the final gate, determining exactly what the customer will receive.

The main challenge in this phase lies in controlling the large number of groups and the large number of tasks that must come together at once. Typically, tasks need to happen within a tightly condensed time frame. For this reason, companies often revert to a separate launch process to verify that each task and each group is ready within a given market. We will refer to that process as *market certification*.

The length of this phase will depend on the timing and sequence of the launch. If a product is scheduled to be launched into all markets at once, the phase will be short. If a staged rollout has been scheduled, the launch phase will be extended.

Following the commercial launch should be a post-launch review cycle. This review cycle ensures that any unfinished business carrying over from the development cycle is addressed and completed. Once the review cycle is complete, responsibility for the product transitions to a product management group.

References

[1] Takeuchi, H., and I. Nonaka, "The New New Product Development Game," in *The Product Development Challenge: Competing Through Speed, Quality, and Creativity,* Cambridge, MA: Harvard Business Review Press, 1986, p. 25.

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Part III

Deciding What To Build

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6

Phase 1: Opportunity Analysis

With all the new markets, new technologies, and new capabilities available, service providers have more choices in the products they can develop than ever before. However, more choices do not make for easier choices. Sorting through all the possibilities to arrive at the right direction and the right mix of products can be a struggle for any company.

How do companies decide which products are the best ones to develop? This initial phase of opportunity analysis exists to evaluate concepts and decide which of those represent the best choices to pursue. Most companies evaluate concepts against criteria that fall into three areas: market attractiveness, internal capabilities, and profitability.

- *Market attractiveness* deals with questions such as the following:

  How attractive is the product opportunity from a market perspective?

Is the market expanding and, if so, at what rate?

Does the company have the right presence in the market and the right market channels to offer this product successfully?

- *Internal capabilities* deals with areas of infrastructure and infostructure to determine the following:

  Has an evaluation of internal capabilities determined whether the company has the network, the systems, and the delivery processes needed?

  What are the skill sets necessary to offer this product?

  If the skill sets are not available how long, and at what cost, will it take to acquire them?

- *Profitability* considers the financial viability of the product. An evaluation of profitability seeks to determine:

  At what point and to what degree is the product expected to be profitable?

  Are there reasons to offer the product even though it may not appear to offer a profitable return?

6.1 Are these really choices?

These are all reasonable factors to consider in evaluating opportunities. In truth, however, at many companies a large portion of the development work is not really a matter of choice but of necessity. This is certainly the case in start-up environments, but it can occur in established companies as well.

In the early years of entering any new market—whether it be a wireless, Internet, long-distance, or local services market—telecommunications company development efforts are almost always focused on building capabilities rather than products. Before it can offer that first minute of dialtone or connect-time, a firm must first complete an enormous amount of development work. This means that in most organizations product development can be responsible for a wide range of

projects, from simple enhancements to an existing product to company-wide programs involving upgrades of infrastructure or core capabilities. Projects on the development docket may all be *product-related*, but they are not necessarily all products, at least not in the traditional sense. Nevertheless, somewhere beneath every project lurks a product, and that is what mobilizes the organization. It almost always takes a product, as opposed to a mere capability, to drive an organization to deliver something that works as a complete solution.

6.2 Grouping projects into categories

Recognizing the different categories into which a project can fall helps in assessing the scope of the effort involved. Grouping projects makes the dependencies between projects more clear, which makes priorities more clear. This is all part of the task this first phase of the cycle must accomplish.

The need to categorize and develop a hierarchical order for projects becomes clear when one examines the *open systems interconnection* (OSI) reference model. Most telecommunications professionals are familiar with this model (see Table 6.1), which partitions data communications into seven functional layers. In the OSI reference model, each layer provides service for the layer above. As a result, communication occurs in an upward fashion by successfully establishing links at each layer of the protocol.

6.3 The seven-layered telecommunications service development model

The concept behind the seven-layered telecommunications services development model, which is outlined in Figure 6.1, is similar to the OSI model: to deliver capabilities at any of the layers, each of the layers below must first be in place. Unlike the OSI model, however, the seven-layered telecommunications services development model enjoys no formal acceptance (other than what it might receive here). Its purpose is to offer a conceptual view that illustrates the evolution of telecommunications services development.

Table 6.1
OSI Reference Model

Layer		Function
Layer 7	Application layer	Transaction-level processing; all layers are established; communications ready to commence
Layer 6	Presentation layer	Data transformations; specifies format and coding
Layer 5	Session layer	Logging on; transparent recovery from broken connections
Layer 4	Transport layer	First true end-to-end layer; end-to-end error checking and flow control
Layer 3	Network layer	Routing and connecting; information flow control
Layer 2	Data link layer	Establishes frames or cells and detects errors in communication
Layer 1	Physical layer	Electrical and mechanical compatibility

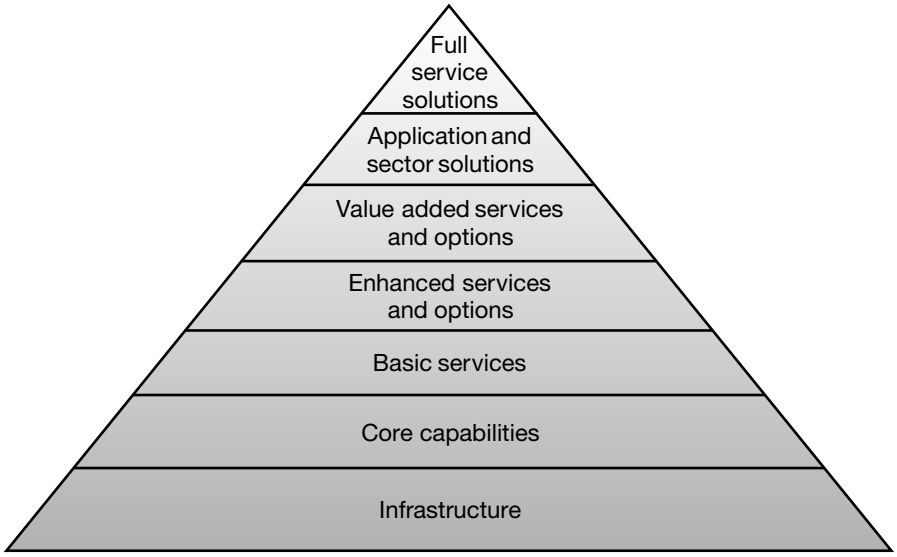

Figure 6.1 The seven-layered telecommunications service development model.

With this model, each service provider is responsible for bringing its own definitions to the layers. In defining each of these layers, a provider

begins the process for creating company-specific views and definitions of product development. The following descriptions offer a general view of each layer.

- *Infrastructure:* Projects in this category typically involve the deployment of physical assets. Projects involving network assets, such as transport, switching, and call processing capabilities, usually entail large outlays of capital and are often determined by associated labor and construction schedules and budgets. Infrastructure projects can include new-to-the-world capabilities, such as a new switching platform or a new transmission plan, as well as regular build-out plans, upgrades, and expansions. Projects in this category are not limited to the physical deployment of assets but include anything involved with connecting those assets into the existing network infrastructure.

- *Core capabilities:* Core capabilities operate on top of the infrastructure and typically provide the company with some type of delivery capability. Core capabilities may generate revenue, although not necessarily in a direct fashion. A core capability project, for example, may comprise a certain type of operator service, one required to operate in a specific market or line of business, but not necessarily directly revenue-generating. Other examples include help desks or support functions, system platforms, and service delivery functions—capabilities that may not be directly revenue-generating but that are, nevertheless, an essential part of the service environment. Like infrastructure, projects in this layer are not necessarily directly linked to specific products. More often, they are shared across the company or across product or service platforms.

- *Basic services:* This category represents the initial set of *must-have* services. These are services that are at the core of a provider's ability to exist in whatever business area it is in. In the local exchange environment, for example, basic services are minimum subscriber-level services, such as *plain old telephone service* (POTS), business line service, or business trunks. In the interexchange or long-distance market, basic services include the basic initial calling plan. For wholesale services providers, basic services

may include either special-access or switched-access feature-group services needed to compete in a specific market segment.

- *Enhanced services and options:* Services in this category typically represent enhancements to existing products, improvements that are introduced after a service provider has secured a position within a given product area. Enhanced services often develop as an outgrowth of a basic service. For example, a new local exchange service provider may decide to move its centrex service *up market* by enhancing its existing centrex package for the large customer market. Other times, however, a product may start out as an enhanced product because the capabilities of the service and the technology used to deliver it position the service that way.
- *Value-added services and options:* This category extends the functionality of basic and enhanced services by adding something extra to the offering. Value-added services are normally offered as options to the primary service, which may either be a basic or an enhanced service. Projects that fall within the value-added category can cover a range of situations, from implementing new network equipment that adds new capabilities, to adjunct processors that enable new features, to optional customer premises equipment that allows packages of services to be offered. At an individual service level, an example of a value-added service might be voice mail or caller ID. At a network systems and services level, examples might include *call management systems* (CMS) or *automatic call distribution* (ACD) systems.
- *Application and sector solutions:* Solutions are developed within this category for a specific industry, sector, application, or use. Services in this category may have begun in some earlier incarnation, perhaps as a custom solution, before being adapted for the mainstream. In this category, the solutions are often packaging and pricing arrangements. These solutions may combine elements from the layers below in a way that appeals specifically to one industry segment or another, or to one specific customer set or another. In other words, solutions in this layer can be derivatives of something that already exists.

- *Full-service solutions:* The top of the pyramid represents the ability to offer complete solutions to customers for a range of telecommunications services needs. These solutions could comprise any number of possibilities, from all elements of the service solution being offered by the provider through their own network and internal capabilities to parts of the solution being provided by a variety of sources. However it is accomplished, it is most important that the solution appears to stem from a single source provider that acts as the sole point of customer contact. This means that one provider should handle all customer sales, service, and support issues; all customer billing functions; and all negotiation and coordination functions with any other supplier or carrier involved in the customer's service.

6.4 Evaluating opportunities using the seven-layered model

The objective of this first phase is to evaluate opportunities to determine which projects show enough merit to justify moving into the full development cycle. Categorizing projects in this way offers a way to see dependencies, but it also more clearly identifies the relative scope of one project to another.

From a development perspective, each of these categories will have some of its own unique characteristics. The length and complexity of the full development cycle can vary greatly from one category or layer to another. For example, projects at the lower layers of infrastructure and core capabilities may never be *launched,* meaning that the last two phases of the cycle—implementation and launch—will not occur. By comparison, projects in the upper layers may involve very few issues of infrastructure and, therefore, be based entirely on matters of infostructure and on negotiating agreements with outside suppliers.

Once there is agreement on what these layers represent, product directions and interdependencies can be discussed more meaningfully. At that point, companies have a basis for discussing the evolution of products and a foundation for the strategies and visions they should be pursuing.

6.4.1 Targeting the layer

Whatever layer a service provider ultimately aspires to reach, there will usually be more than one way to get there. *Super carriers* may aspire toward the top of the pyramid. To reach that layer, a carrier need not depend solely on its own infrastructure or capabilities. Getting there, or to any other layer, can occur through partnering, hybrid service arrangements, resale, or any number of different means. All that is required is for a service provider to somehow craft together the functions that it will need. Success depends on how capable the provider is at creating the appearance of oneness to the customer.

6.4.2 Building, expanding, protecting

Today, many companies are heavily focused on entering new markets, but what is new for one is likely to be established territory for another firm. As a result, even while there is intense pressure to build infrastructure, create core capabilities, and expand into new markets, there is equal pressure to protect what is already there. Holding on to market share means keeping current product lines as bullet-proof as possible. To protect and expand market share, companies must maintain and regularly reinvent their products.

6.4.2.1 Stages of products

In other words, products are always changing, and managing that change is just another part of the development docket in most service provider environments. We have examined the seven-layered telecommunications service model as a way to categorize projects and establish a logical development order. Given that companies also need to keep existing product lines current, it can also be helpful to recognize the different stages that a product can pass through after it has been introduced.

When they are first introduced, products might be designated as either *new-to-the-world* or *new-to-the-company*. In later stages, designations may be referred to as *incremental* or simply *enhancements*. Many times, products will exist in some earlier form before they are implemented as official products (see Figure 6.2). They may exist as custom solutions or *special bids* before they become bona fide products.

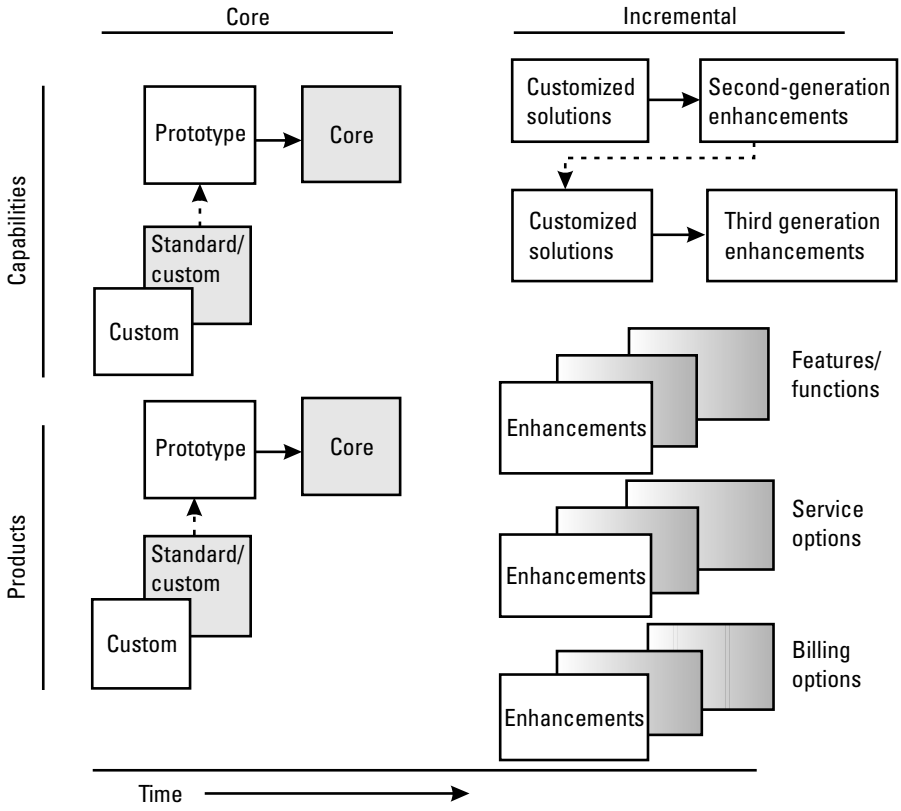

Figure 6.2 Stages and evolution of products.

These *prelife* conditions can apply to the first generation of a product as well as to later generations, and they can apply to products or capabilities at any point along the seven-layered hierarchy. Following this custom-to-standard route is not unusual, and as an approach it is one that can benefit companies in many ways. Installing a solution into some real-life settings before making the decision to create an official product allows a company to validate many aspects of the eventual product. Having the benefit of customer and market experience can significantly reduce the development cycle, and the risks.

6.5 Evaluating opportunities and deciding what goes forward

Categorizing projects, whether by project type or product type, can help a company to understand interdependencies between projects and the scope of what will be involved. In the end though, companies have to select which projects to fund and assign resources to, and which to keep on hold or eliminate altogether.

The product direction the company has chosen to pursue will be a big factor in making this call. That direction, along with the criteria mentioned earlier—of market attractiveness, internal capabilities, and profitability—will determine which projects move forward. Unless there are strong business imperatives or strategic reasons to override these criteria, projects that go forward will generally be those that provide affirmative answers to the following questions:

- Does the product fit with the current product direction?
- Does the organization have what it takes to capably deliver this service?
- Can it be profitably offered?

6.6 Exit criteria for Phase 1/entrance criteria for Phase 2

This first phase is a product funnel. Many ideas will come in, but only a few will go forward. In this phase, companies categorize and evaluate ideas and match them against their needs and business objectives. Initially, ideas may go through an early screening before being submitted to the more detailed business case required to evaluate market fit, internal capabilities, and projected profitability.

Those ideas that offered a strong match in each of these areas would be developed into a first-version business case. From the business case, the decision to go forward or not would ensue. Those concepts that were approved would be developed into initial product descriptions before entering the next phase. Table 6.2 summarizes the stages of the first phase.

Table 6.2

Phase 1 Summary—Opportunity Analysis

Generate New Ideas	**Conduct Initial Screening**	**Conduct Detailed Concept Review**	**Complete Initial Business Case**	**Evaluate and Approve**
Catalog/ categorize ideas	Concept reviews (fit, feasibility, profitability)	Preliminary assessments/ impact summaries by key areas	Funding review	Draft product description developed

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Phase 2: Defining the Product and Determining Feasibility

Once a company has approved an opportunity for development, its objective becomes defining the exact product requirements. This requires getting specific about several things, starting with product details.

Phase 2 is the detailed analysis and definition phase. Just as a dress designer cannot go directly from a sketch to sewing together pieces of a pattern, so it is in telecommunications. In this phase of the cycle, the sketch created earlier now must be turned into a detailed drawing. Everything that will be part of that detailed drawing—from equipment, to technologies, to networks, to people—must now be defined.

There are actually three goals in this second phase:

- Defining the product in as much detail as possible;

- Assessing what it is going to take to deliver the product from within the organization;
- Developing a detailed project plan.

7.1 Finalizing product details: the first goal

Returning to the framework outlined earlier in Chapter 4, the first order of business is to fill in the details for the network service view (see Figure 7.1). The first phase resulted in the development of a working definition; now, however, an actual product blueprint is needed. Accordingly, it becomes necessary to define standard and optional features and functions, establish business rules, and identify interactions or dependencies with other services.

7.1.1 Service performance standards and service level agreements

Once the features and capabilities included in the network service are determined, it is necessary to identify the service performance standards. These standards may not be as distinctly identifiable, but they are every bit as much a part of what the customer is receiving as the features and functions.

Performance standards must be measurable and quantifiable. Thus, they are normally defined in terms of acceptable minimums using established measurement standards. The usual standards are ones addressing *mean time to repair* (MTTR), blocked call attempts, error rates,

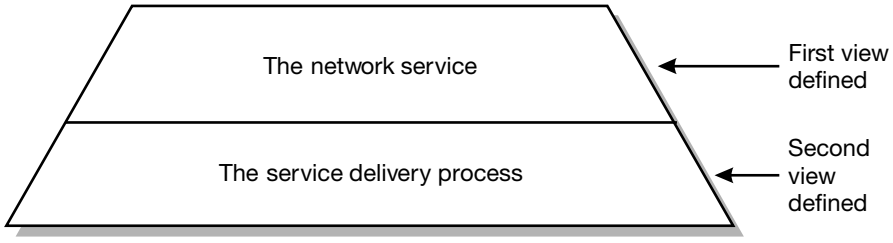

Figure 7.1 Defining the service beginning with the network service view.

and levels of congestion. Depending on the service type, however, service-specific standards may apply as well.

Increasingly, *service level agreements* (SLAs) and performance guarantees are becoming factors in awarding business. This is happening more and more with large customers, particularly for data and broadband services. Most frame relay, SMDS, and ATM services now carry SLAs, covering everything from installation intervals, to guaranteed data delivery rates, to the amount of time it takes to change a configuration. These agreements typically require the provider to pay some penalty if an agreed-upon service level is not met.

Providers are recognizing that service level guarantees are a way to add value and differentiate themselves in the market. Establishing these standards is thus part of what has to occur in this definition phase. Like every other aspect of this phase, however, service standards cannot simply be set or mandated; they need to be determined by working through the levels of the organization responsible for supporting them.

7.1.2 Customer service and service delivery requirements

Customer service and service delivery requirements are also part of this definition phase. Fulfilling these requirements will not occur as a result of the network service but rather as a result of the service delivery processes that underlie the service. Nevertheless, these requirements need to be defined here. The purpose here again is not to figure out the *how* but rather the *what* of customer requirements. (The *how* is the subject of the next two phases and the next several chapters).

The goal should be to define customer expectations in as much detail as possible. Generally this means defining those aspects that are customer-facing. Deciding to provide customers with direct access for order inquiries or providing customers with a special call-in arrangement for trouble reporting are examples.

7.1.3 Clarifying the customer perspective: arraying customer attributes

At this point, the company is distilling the customer perspective, and anything touching that perspective—including features or functions of the service, performance standards, and customer service

experiences—needs to be defined. Crafting this perspective is sometimes referred to as defining customer attributes (see Table 7.1). First attempts at this can often result in a wish-list more than a build-to list. Still, visualizing the ideal is an important part of any development effort. Even if those visions eventually get scaled back by reality, defining the ideal ensures that all elements of the ultimate customer-focused solution are given consideration.

Table 7.1
Arraying Customer Attributes

	Needed Now	Preferred But Not Required	Ultimate View
Service Configurations			
Option 1	X		X
Option 2		X	X
Option 3			X
Help Desk/Customer Service Arrangements			
Third party specialty outsource	X		
Integrated with existing		X	
In-house special function			X
Distribution/Channel Arrangements			
Direct sales	X		X
Supplier/distributor			X
CPE Options			
Equipment arrangement 1		X	X
Equipment arrangement 2		X	X
Facility/Access Arrangements			
Direct "on-net" arrangement			X
Unbundled arrangement	X		

This practice of thinking big and narrowing down occurs in all the phases of the cycle, but it is something that is particularly important in this phase. Reaching a shared view within the organization on what the product will include requires that all possibilities be given initial consideration. Casting these attributes into matrix form helps to drive agreement on what the product *minimums* must be. Finalizing these minimums, however, is not possible until assessments from all areas are made.

7.1.4 Looking outside: competitive market analysis and regulatory assessments

Before turning to internal assessments, it is worth touching on the need for a detailed market analysis of the product. The preliminary analysis conducted at this point in the previous phase now needs to go deeper. Accordingly, an organization should develop detailed comparisons of competitors' offerings—for fit, functionality, price, and packaging. Typically, this involves a study of other service providers' tariffs, but in a world of off-tariff service arrangements that is not always possible. The advantage of studying other service providers' tariffs is that it offers a way to compare capabilities *and* enables a comparison of structure, pricing, and packaging arrangements.

This outside review should also cover regulatory concerns. A regulatory assessment should include a study of issues pertaining to regulatory compliance and how those issues will affect areas such as pricing, billing, and introduction timing. This external regulatory analysis ensures an understanding of the process and the timelines that will govern the introduction of the service during its final phase.

7.2 Assessing what it will take: the second goal

Every bit as important as developing a solid picture of customer product requirements is the need to determine exactly what the organization is capable of delivering. The assessments that each group completes in this phase are the basis for determining the company's capabilities for delivering the planned service.

Even though the detailed design will not begin until after this phase, the assessments that are conducted at this point should be substantive and thorough. While a potentially viable product was indicated at the end of the last phase, it is still possible to discover issues that could change that view. The evaluation occurring in the last phase was, more than likely, based heavily on assumptions. In this phase those assumptions must be either verified or changed.

Sections 7.2.1 to 7.2.6 summarize the functional areas that should be included in a thorough internal assessment. Written assessments, developed by each area to follow a standard company or departmental format, work best because they formalize the activity and ensure a level of consistency within departments and across projects.

7.2.1 Establishing market forecasts and sales capacities

Bringing market forecasts and sales capacities into a single view is one of the best examples of the kind of difficult back-and-forth processes that go on within companies. However, for market forecasting this give and take is necessary. To develop market predictions in a meaningful way, a company must adopt an iterative and interactive approach involving multiple areas of the business.

The problem comes in bringing the different views together. Typically, a marketing group starts the process by submitting a market forecast for the product. This figure usually represents the product's sales *potential.* It can reflect an estimated demand or even just an initial sales target. It does not necessarily reflect anything the company is capable of supporting.

What is needed, therefore, is an alignment of this sales potential to the sales *capacity*, or the number of sales units the company is capable of delivering and supporting. A company determines its capacity by considering several aspects of the business, primarily its network infrastructure but also its systems and processes and the size and reach of the operation.

Unless market forecasts are brought into view with the sales capacity through an approach that involves all areas of the business, the exercise of regularly revising forecasts is not likely to have much of an impact. It is problematic when product forecasts are never really integrated into a larger, centralized view—either because planning and budgeting cycles

are out of sync with the timing of the product development cycle or because an integrated planning function is lacking within the company.

Reconciling these two views is not something that happens just once. It is something that must be regularly revisited, because factors on either side will regularly change. The process of beginning this reconciliation, however, needs to begin in this second phase so that capacity requirements are addressed in time to support the service once it is launched.

7.2.2 Technology and service capability assessments

Most of the time, the technology underlying the product will be obvious; it is likely to be an inherent part of the product. However, even when the technology is clear—for instance, with SMDS or frame relay—it is still necessary to sort through all the options that are available to reach a final view of the product.

This is important, because service providers frequently maintain multiple vendor platforms for switching and for other parts of the network. This requires a service to be verified for each vendor platform on which it is offered.

Most companies aim to reach a uniform service solution that all vendor platforms can support, but that scenario is often impossible. The differences among vendor platforms can sometimes be significant. In fact, they can occasionally be so great that product plans have to be reconsidered altogether. When this happens, providers sometimes face the possibility of offering the service on only one vendor platform. This situation can be advantageous in that it allows for a more manageable and more robust service offering; unfortunately, however, it can also yield a service area with a much smaller footprint.

Trying to equalize technology across multiple vendor platforms can be one of the more difficult areas that service and technology planners face. Their inclination is generally to aim high, defining the service based on the vendor platform that offers the most robust set of features and capabilities. The reality, however, is often just the opposite. Because the issues of managing multiple vendor platforms and multiple versions of technology can be so messy, trying to achieve common ground can sometimes result in offering a service that represents the lowest common denominator.

One of the purposes in the lab testing that begins in this phase is to identify the discrepancies, or deltas, that exist among vendors. More than just identifying these differences, however, the lab testing should address how these differences will be handled. Features oftentimes operate differently on different vendor platforms. Understanding these differences and what they mean to the service should all be part of the technology assessment.

7.2.3 Network engineering and planning

In this area, the focus is twofold: to plan for the capacities necessary to meet the sales forecast and to identify the engineering requirements involved in supporting those capacities. Companies must engineer the network to meet the area-specific forecasts for the product.

Accordingly, they need to identify and assess equipment that they will use to provide the service, particularly the switching and transmission systems. Oftentimes, more than one approach will be feasible, which means that they must also study secondary or alternate arrangements.

Companies also need to evaluate traffic patterns across all areas of the network, identifying both the types of interconnection arrangements needed, and the capacity those arrangements must be prepared to support. For example, the assessment must include any issues pertaining to the *signaling system 7* (SS7) or overlay networks. In short, telecommunications concerns must identify anything associated with transporting traffic within their own network, and to and from other carrier networks.

In addition, while the design stage has still not officially begun, companies conducting this phase of the development process will uncover many design-related issues. Accordingly, firms will begin to narrow down configurations of hardware and dependencies of software and service offerings. Assessing these areas as closely as possible makes the design phase that follows that much easier.

Network maintenance and management issues also arise at this time. This may not be a substantial concern for services that are just variations of existing services. For services based on new technologies, however, the factors involved from a network and fault management perspective can be significant. New technologies bring new requirements to all

levels of the business and the network. Identifying the impacts of these technologies and understanding how they will integrate into the network surveillance and monitoring systems is one of the most critical parts of this network assessment.

7.2.4 Operations analysis

The real work of designing the service delivery process will not begin until the next phase. At this point, however, a preliminary view of the processes' operation starts to emerge. Therefore, companies must identify key assumptions and requirements central to the expected service delivery process and assess impacts on people, processes, and places.

In doing so, they need to consider any new or unique requirements stemming from the planned service. For instance, if a company is developing an advanced centrex service and if successfully offering that service requires that a special service center be established, then investigating the feasibility of various alternatives should be part of this operational assessment. In this situation, a firm should identify such factors as possible locations for the center, skill levels, and staffing requirements. As another example, if a certain type of customer premise equipment is part of the service solution, exploring the sourcing options and recommending the best option would be part of this review.

Any new customer service requirements as well as the areas pertaining to the SLAs discussed in Section 7.1.1 are part of this operational assessment. At this point, companies do not need exact answers but rather a solid assessment of issues and the impacts that are expected to people, processes, systems, and organizations.

7.2.5 Billing and information systems analysis

Since product details may not be finalized until the end of this phase, the assessment for billing and information systems will focus primarily on only those issues that are immediately apparent, such as the following.

- Does the service require a new type of rating mechanism or a new type of billing format? If so, what is it going to take from a systems perspective to deliver on that?

- Does the service have special design criteria that cannot readily be accommodated within the current systems?

To properly assess these areas, a company must establish a clear sense of scope. One of the primary purposes in conducting these assessments is to gauge when the service can be introduced. If meeting a requirement entails adding a new system, understanding the effect that will have on the timeline is important. For example, giving customers direct access to internal systems may be important. However, if meeting that need means that the introduction date will have to slip by eight months, making an informed choice on whether to hold up the launch or defer that requirement until a later release is better than optimistically expecting the systems date to improve.

For the systems assessment, the goal is to size up the job and secure a slot in a future systems release schedule. Because the list of systems projects within organizations is often long, this area becomes the "long pole in the tent." Establishing realistic time frames early on in these areasis essential for managing a project effectively throughout all the subsequent phases.

7.2.6 Identifying product releases

Earlier we discussed how development as a whole is characterized by a process of thinking big and narrowing down. This sums up what this phase is all about. The phase began with a big, rough sketch that now, after careful review from several areas, is becoming a detailed drawing.

Going through this review process entails the addition of many elements and the subtraction of others. What started out as a "must-have" may have turned into a "nice-to-have." The key factor in determining what goes in versus what goes out is almost always time. If getting to market quickly with a product that does not have all the desired capabilities is more important than getting to market late with one that does (which is almost always the case) compromises begin to happen. Consequently, during this second phase products will frequently be scaled back. Still, it is important that the original vision not simply disappear. The assessments that were part of this phase can provide good information on what capabilities will be available when. Accordingly, features that do not make it into this release may be included in a later one. (See Figure 7.2.)

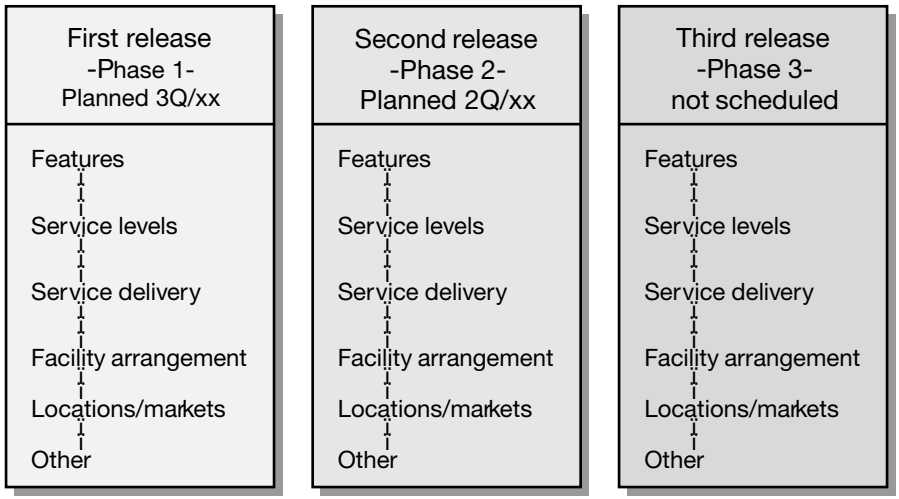

Figure 7.2 Product release planning.

7.3 Developing the project timeline: the third goal

The primary objective of this phase is to create a final blueprint for the product, a blueprint that can be used by all parts of the organization as a *build-to* plan. By reaching this point, the analysis and assessment stage of the project is brought to closure, which means that the design stage is ready to begin.

With assessments complete, the elements of the project start to come together. The assessments or impact summaries that each group develop should include timelines indicating when work will be completed. At a project level, these assessments and timelines are consolidated into a project delivery schedule. This project delivery schedule, which is updated at the end of each phase, provides a detailed plan of the work that must occur in the next phase, showing tasks, owners, due dates, and dependencies. Phases further out in the cycle are included but with less detail than is provided for the current or upcoming phase.

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Phase 2 Continued: Issues of Product Definition and Design

In many service provider environments, it seems to be less and less likely that a service will be installed correctly on the first try. With service complexity on the rise, that dilemma is perhaps understandable. Complex services offer more options, not only for the service itself but for the equipment arrangements that go along with it. All of this leads to a more complicated sales process.

The problem is bigger than that, however. The complications in the sales process ultimately extend into every other aspect of the service. Services that are difficult to sell are also more difficult to order. In addition, they are more difficult to provision, install, bill, and repair.

The way in which difficulties arise is easy enough to see with data services such as SMDS, ATM, frame relay, and *integrated services digital network* (ISDN). However, it is just as likely to apply to services that have

been around awhile. Services such as centrex, 800, and business trunks can all be plagued by a complexity that follows the service through every stage.

8.1 Creating service configurations

What can service providers do to reduce the levels of complexity within their products? The answer in part lies in the way in which features within a service are arranged. To make the service delivery process more streamlined, companies need to design products under a more streamlined approach.

The way in which features and functions are selected, grouped, and packaged are all part of the product's design. *Packaging* might suggest areas having to do with the product's final presentation, but *service level* packaging, which is being considered here, is more than presentation; it is a design decision, one that affects everything that happens to a product.

When a product is intelligently structured, and when the features and capabilities of the product are effectively arranged, every aspect of the service delivery process is made easier. Sales, order handling, provisioning, and billing all improve. Putting effective service arrangements together is the first step toward streamlining the service delivery process.

8.1.1 Taking decisions out and implementing a limited choice approach

The goal in offering any service, complex or simple, old or new, should be to eliminate as many decisions as possible. Every decision, and therefore every step, presents an opportunity for error, and with the number of people involved in the average service, this adds up to a lot of possible mistakes.

The best product designs are based on reduced sets of choices, where a limited number of service configurations is offered and a limited number of options within those service configurations is available. How do service providers implement a limited-choice approach? There is no single solution. One approach involves removing or limiting as many

optional features as possible. Features can be rolled into the standard offering, and values can be preset to the most common or the least restrictive default value.

Under another approach, a company can prepackage service configurations. Offering only a few service configurations that combine the most commonly requested features diminishes the number of scenarios that need to be supported. Using ISDN as an example, the decision could be to default all *basic rate interface* (BRI) service configurations so that every B channel supports both voice and data. For *primary rate interface* (PRI) service, creating a packaged service configuration that has a backup D channel already built in may be the solution.

8.1.2 BRI: an example of the limited-choice menu

This "kiddie-menu" approach might seem at first to be customer unfriendly, but in actuality it is the opposite. This was the experience with the much troubled ISDN basic rate service early on. BRI started out as a tremendously robust capability, and for many years it remained simply that—a capability. Because of BRI's tremendous robustness and flexibility, service providers were unable to successfully *productize* it. The robustness gave way to a design stage so complex that configuration details for a single order could run up to 16 pages!

It is little wonder then that BRI stayed on the shelf for most of its first 5 to 8 years of life. It was not until the telecommunications industry came together around standard, predefined configurations that sales of BRI finally started to take off. Getting to this point, of course, was not easy. It took several years for all of the segments that were part of the BRI delivery chain—the switch manufacturers, the CPE providers, and all the various types of service providers—to finally reach agreement on the contents of these standard service configurations.

The level of agreement that was needed to finally achieve standard product definitions for BRI is not typical of all services. However, the lesson that came out of that experience is still valid: It pays to standardize, even with services that are not overly complex. Too much uniqueness at the service level usually causes problems for customers and providers. For high-volume operations, it kills efficiency.

8.1.3 Where does this leave product differentiation?

This push to standardize could suggest the end of product differentiation, a world in which all products are reduced to one level of sameness. That does not have to be the case, however. Even with as many design decisions taken out as possible, there is still room for a great deal of variation in provider products. When products from different providers are lined up against one another, this variation becomes apparent.

Furthermore, standardization does not suggest the end of customer-specific requirements or the ability to handle unusual requests. Service providers can always address these situations, but they should be treated as exceptions. By offering a smaller number of standard service configurations, providers' focus will stay where it needs to belong: where the greatest service volumes lie. The organization can stay focused on larger issues, such as improving the service standards for this smaller number of service configurations, instead of being diverted into supporting custom arrangements that inherently require higher levels of attention.

In the end, one of the most important *product* differentiators from a customer's perspective is likely to be simplicity and ease of use. The most important *service provider* differentiator is likely to stem not so much from the products themselves but from the areas that surround those products. A combination of stellar delivery approaches and simple but innovative packaging arrangements is much more likely to favorably impress customers than the ability to deliver unusual product capabilities.

8.2 Structuring the product

How then are these packages created? Their creation centers on the way in which services are structured and designed.

Good service design does not start with a package; it ends with a package. It begins with the elements that make up the service. To effectively design a service, one that is capable of delivering customer value, a company must first devolve the service into its structural elements. In other words, before a service can be constructed, it first must be broken down, or deconstructed, into its essential parts.

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Before a service can be constructed, it first must be broken down, or deconstructed, into its essential parts.

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8.2.1 Elements common to all telecommunications products and services

Before the design of the service delivery process can get under way, and even before the development cycle can get into full swing, a service provider must first identify and define each of the elements that underlie the product. This step of defining each of the elements going into the finished product anchors the product, as well as the process of development itself.

Section 8.2.2 discusses five elements common to most individually offered (or tariffed) telecommunications services. They can apply to services catering to any type of customer, from individual subscribers, to business customers, to carrier customers.

8.2.2 The five elements of service definition

Generally, to offer a working service, a telecommunications company must have elements from each of the following categories in place.

1. *Facility:* This is the *access arrangement* used to carry the customer's traffic. It can cover any type of arrangement—including local loops, dedicated or special access lines, and interconnection trunks—and any type of media—including copper, fiber, coaxial cable, wireless, and satellite.

2. *Switched capability:* This is the switched network capability and the physical connections that provide the service's one-to-many or many-to-many calling ability. This also includes the interconnection capabilities that are part of the switched network. Examples include any number of switching platforms, such as Class 3, 4, or 5 switches; X.25 or ATM switches; and internet switching nodes.

3. *Service:* This is the *actual service* or *service category* being offered, represented by the service configurations that are offered to the customer receiving service. Examples include a virtual network service, a centrex or business trunk service, an Internet service, or cellular service.

4. *Usage:* This represents the *time on-net* and the method used for calculating and charging for that time. Such methods range from simple straight-time rating schemes to complex multilocation, multitiered pricing schemes. The usage category can also cover advanced carrier level pricing arrangements.

5. *Features:* This category can include *any and all features* available for the particular service, standard or optional. These can either be specific to the service or available to all services.

8.2.3 Using the five elements to structure a product

The idea here is that services do not have to be built from scratch. Chances are that most of the elements needed to develop a new service already exist, albeit in some other form or arrangement. What is new for one service may actually just be a new arrangement of something else.

Organizing the elements of service in this way ensures that all possibilities are identified and eliminates confusion on what specifically the product may include. Consider Table 8.1, which shows a local or long-distance business trunk. This example is based on all elements being supplied by the service provider's own network.

8.2.4 Dependencies of elements

This menu approach can also be useful for revealing dependencies between elements of service. Services are frequently dependent on certain types of facility arrangements or usage plans. For example, the *service* of *asymmetrical digital subscriber loop* (ADSL) can only be matched with one of two types of *facility arrangements*.

Also, while most services will include elements from each of the five categories, others will not. A special access *service*, for instance, might not require *usage* or offer any *feature* options whatsoever.

Table 8.1
Five Elements of Service

Facility	Switched Capability	Service	Usage	Features/ Options
Analog	Switch Mnf. A	Serv. Config. 1	Plan A (unlimited usage)	Network features
Digital (T1/T3)	Switch Mnf. B	Serv. Config. 2	Plan B (measured with minimum usage)	Network management features
38 GHz wireless		Serv. Config. 3	Plan C (advanced, data fixed-tier usage)	Billing and reporting features

8.3 Link to unbundling

One of the results of the Telecommunications Act of 1996 in the United States is that incumbent carriers have been forced to unbundle their networks into individual network elements. This initiative was designed to allow newer competitors to order individual network elements from carriers that have been in business for some time. The result is that services offered to customers can now be comprised of elements coming from multiple carrier networks.

One of the objectives in unbundling was to make the owners of the physical network transparent to the recipients of the service. Theoretically, a service made from unbundled parts should behave identically to one provided entirely from a single provider's network. Thus, telecommunications companies face the challenge of figuring out how to meld pieces from different provider networks together while creating the impression that only one service provider is involved.

Creating this impression requires the service provider of record (the provider from which the customer has purchased service) to assume all customer-facing functions, including sales and service, billing, and trouble handling. How these functions are assumed is, of course, between the service provider of record and the sources from which they are served. The functions can either be assumed directly, outsourced through

subcontracting or partnering arrangements, or handled with some combination of both tactics.

In the unbundled environment, service providers need to rethink and re-engineer virtually every business function—including ordering, billing, provisioning, and repair. Both sides of the supply relationship—the incumbents required to offer their network elements for sale and the customer's service provider of record—are facing this dilemma.

The effect of unbundling on service developers is a substantial increase in the number of options available for constructing a service. The number of possibilities within each of the five categories increases to include elements from other provider networks. Using the example of the business trunk again, Table 8.2 shows how things might appear when unbundled elements are added.

8.3.1 Resale versus unbundling

One of the other results of telecommunications deregulation in the United States is resale. Unlike the unbundling scenario where multiple providers can be involved in supplying elements of the network, with resale there are usually just two: the provider that operates the network (referred to here as the network provider) and the new provider, or *reseller*. The new provider is simply reselling the network provider's service but offering it under its own company name and brand identify.

In a resale situation, the functions associated with maintaining the network stay with the network provider. The network provider has responsibility for engineering the service and for installing and maintaining it. The reseller assumes most or all customer-facing functions—sales, billing, and customer service—and acts as the intermediary between the customer and the network provider. The reseller is responsible for working through the network provider to make sure all network delivery and service functions are being addressed. As with unbundling, how a reseller accomplishes these functions is an individual matter. Either they can be assumed directly or arranged through a secondary source.

For this reason, resale is somewhat simpler than unbundling. With unbundling, each element has to be individually ordered, whereas with resale the network service is ordered complete from the network provider. With unbundling, a service provider is creating a new product,

Table 8.2

Five Elements of Service (Business Trunk With Unbundled Elements)

Facility	**Switched Capability**	**Service**	**Usage**	**Features/ Options**
Owned/ Operated by Service Provider:	Owned/ Operated by Service Provider:	Owned/ Operated by Service Provider:	Available From Service Provider:	Available From Service Provider:
Analog	Switch Mnf. A	Serv. Config. 1	Plan A	Network features
Digital (T1/T3)	Switch Mnf. B	Serv. Config. 2	Plan B	Network management
Wireless 38 GHz	—	Serv. Config. 3	Plan C	Billing/ Reporting
Unbundled:	Unbundled:	Unbundled:	Unbundled:	Unbundled:
Supplier A	Supplier C	Supplier E	Supplier G	Network features
Analog	Supplier D	Supplier F	Supplier H	Network management
Digital (T1/T3)	—	—	—	Billing/ Reporting
Wireless 38 GHz	—	—	—	—
Supplier B	—	—	—	—
Analog	—	—	—	—
Digital (T1/T3)	—	—	—	—
Wireless 38 GHz	—	—	—	—

albeit with parts from other providers' networks, whereas with resale, a new service is not being created. Instead, a new relationship, between the reseller and the customer and between the reseller and the network provider, is being created.

Because it does not involve the creation of a new service, resale is also simpler from a billing perspective. Under resale, the network provider offers the resold network service at a set price, a price somewhat below the tariffed rate offered to the general public. The reseller then sets a

customer price that is a function of what was paid to the network provider.

Pricing under unbundling is more complicated since it is a function of many more elements. Each network element is its own transaction, with its own price. The provider offering the service to customers has to reconcile all these different pricing elements and still price the service at a level that is acceptable to the market and to customers.

8.3.2 The seven elements of unbundling and the five elements of telecommunications services

The model developed in the United States by the *Federal Communications Commission* (FCC) for unbundling has recognized seven elements, as listed below. The process for defining these elements, as of this writing, is still in progress.

1. The network interface device;
2. The loop (also known as the link);
3. Switching;
4. Interoffice transport;
5. Signaling network and databases;
6. Operator services/directory services;
7. Operational support services.

The purpose of examining both the seven elements of unbundling and the five elements of telecommunications services is to point out that both perspectives need to be considered within the larger context of the service provider's business.

It would be nice if the two approaches aligned with one another, but that is not going to happen. This is because the two perspectives are at opposite ends from one another in the distribution spectrum. The perspective of unbundling is the network operator's world. More specifically, it is the world that needs to exist, per the FCC, to support the coming wholesale environment. Unbundling creates an environment

in which trading arrangements between network operators can occur. In contrast, the five-element service model looks at the world from the customer or product end. It defines the elements that underlie a finished product.

Unlike unbundling, there are no mandates telling service providers how they must structure the elements underlying their services. The five-element model simply offers an approach for bringing consistency to the services offered by a provider.

8.3.3 The impact of unbundling on providers and developers of service

Unbundling represents nothing less than a complete overhaul of the infostructure world of service providers. Moving into a world that recognizes wholesale, retail, and resale requires that parts of the network that did not previously exist as discrete elements now become individually recognizable. For this to happen, companies need to reconstruct the entire network at an informational level.

Needless to say, the industry-level negotiations required for this to happen are enormous. However, they pale in comparison to work required at the systems level once negotiations are complete. The job of unbundling, for the most part, is being handed to system developers to address. These groups must figure out how to dismantle the infostructures within their companies to support the mandates of unbundling. At the same time, systems groups need to reconstruct their company infostructures to support all the market imperatives that are necessary to stay competitive, such as resale.

The manner in which these two views, of unbundling and service development, are reconciled is something that will have to be determined at the individual service provider level. One possibility for convergence of the two perspectives could come from *telecommunications management network* (TMN). TMN is a model for both the elements of the network and for the environment of managed services within the provider world. TMN is being used successfully within various parts of the industry as a model for information and element exchange. We will take a look at TMN in Chapter 14.

8.4 Product structure and service delivery

Where does all this leave developers of new services? As companies move down the path of unbundling in the years ahead, the five-element model can be a useful tool for guiding the definition phase of a product in an environment that includes a multitude of players. Unbundling allows a mix-and-match model for service development to emerge. The problem is that unless a structure is established within the company for the handling of all these elements, the result at a service level could end up with many confusing versions.

The other danger is that with all these new initiatives, instead of products becoming less complex they run the risk of becoming more so. As telecommunications services become increasingly composed of other network operators' parts, complexity can quickly reach a level that is unworkable unless a company has a clear way to manage the pieces.

Having a standard structure that all products must follow brings a degree of order and consistency to products. When the structure of products become more standard, the benefits flow directly to the processes of service delivery and to the systems that support those processes.

8.5 Exit criteria for Phase 2/entrance criteria for Phase 3

To bring the second phase to closure, the draft product description developed at the end of the last phase will now be revised, becoming a *build-to* or implementation document. Companies will continue to add details at each phase that follows. At this point, however, with the product requirements fully established and the organization supporting those requirements and what is needed to deliver them, the detailed design work of the next phase can begin.

Along with the implementation product description, exit criteria for this phase includes written feasibility or impact statements from each affected area, a revised business case, and a project delivery schedule. The project delivery schedule should establish the entire project timeline, with deliverables for each of the phases identified. Table 8.3 summarizes Phase 2.

Table 8.3

Phase 2 Summary: Definition and Feasibility

Finalize Product Details	**Finalize Product Structure**	**Assess Internal Feasibility**	**Determine Product Release Plan**	**Issue and Approve**
Analyze competitive offerings Analyze market requirements Finalize features and capabilities	Define service configuration and packages Identify service elements Define business rules	Network Technology Operations Regulatory Systems Service delivery	Define product phases	"Build-to" product description Revised business case Impact statements Project delivery schedule

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Part IV

The Service Delivery Process

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9

The Process and Processes of Service Delivery

As we discussed in Chapter 8, before a company can design a network service, it must define each of the elements underlying the service. So it is with service delivery. Before the end-to-end service delivery process can be designed, each of the areas underlying that process must be defined. This chapter examines each of those underlying processes.

9.1 The process view

Frank King, a former IBM and Lotus software executive, once said, "Customers don't care about the plumbing, just the water that flows through it [1]." Nowhere is this more true than in telecommunications, where the

network plumbing can resemble a labyrinth, and the work involved in running that labyrinth a never-ending cascade of processes and subprocesses. For all that, customers do not care how it works—only that it works.

A lot has been written in recent years about *processes*—what they are, what role they serve in business, and, most importantly, how to improve them. Much of the activity occurring a few years back grew out of the concepts of re-engineering, which stressed the need for companies to dramatically revamp the way they handled their end-to-end activities. In the United States, these notions spawned a minor revolution in parts of the corporate sector. Companies began to feel an urgent need to better understand the processes at the core of their operations. In the drive to remain competitive, many companies, including quite a few telecommunications service providers, started to analyze in great detail the work going on within their core business areas. Breakthrough teams were formed to analyze approaches and to improve processes and, in some cases, totally re-engineer them.

9.1.1 What is actually meant by a *process*?

A process is an interrelated series of activities that combine to address a single business function. Where a function says *what,* a process says *how.* Billing is a business function. The *function* is to produce bills, along with some other related activities. The *process* of billing includes the systems, the people, and the steps needed to carry out that function. What makes a process a process is that there is predictability to the steps and activities involved, and there is a routine order in the way in which the inputs and outputs are linked.

Processes are nothing new to business; they are the core of every company's operation. What is new is the attention processes are getting, and in the case of the telecommunications industry, that attention is well-placed. Running a network and delivering service can involve hundreds, or even thousands, of processes. Providers intent on achieving operational excellence recognize that success will depend on how well the processes that support service delivery are defined, linked, and integrated into the business.

9.2 Types of processes

Everyone in telecommunications will agree on the importance of processes to the operation of business. What they do not always agree on are which processes are most important.

The processes involved in running a business can range from the simple to the complex, from those that occur within a single business function to those that are cross-functional and span numerous departments, disciplines, and systems. Some business processes occur only occasionally and are executed over a number of months; others occur more regularly and are carried out hundreds of times a day. Launching a new product, for instance, is a process that occurs only once, or at least only once per product introduction. Installing that product, however, involves a set of processes that are conducted every time the product is ordered.

The following distinctions can be useful for understanding the types of processes most businesses deal with on a regular basis. These distinctions are not ones that apply strictly to telecommunications; they apply to any industry (see Figure 9.1).

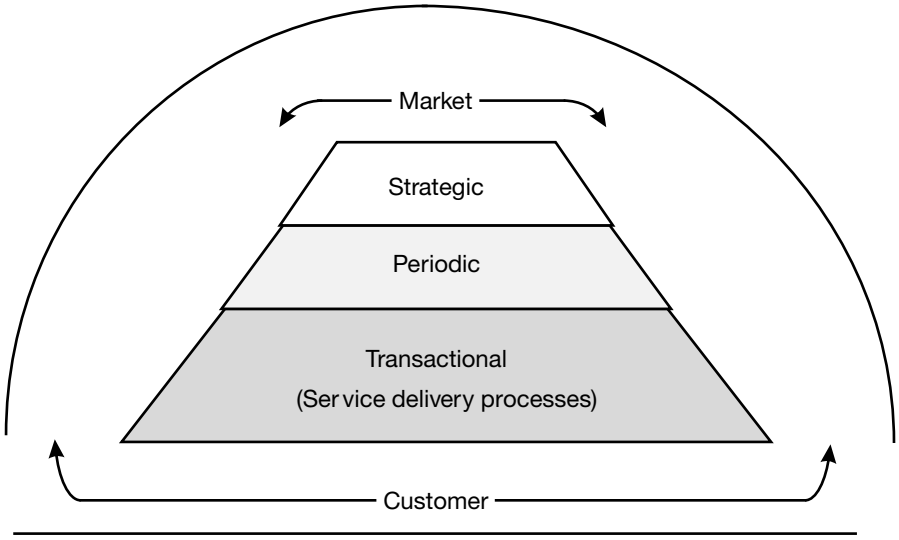

Figure 9.1 Types of business processes.

- *Strategic processes* are directed to the market at large. These are processes focused on preparing the company to acquire new customers, new markets, and new lines of business. Strategic processes do not usually occur with great frequency and do not always involve large numbers of people. Because of the importance they have on the future of the business, these are processes characterized by a large measure of planning and analysis. Product development, as indicated earlier, is a strategic process. Other examples could include processes for building a new switching center, entering a new geographic market, or entering a new line of business.
- *Periodic processes,* in comparison, are more operationally focused; they exist to serve routine aspects of the business. These processes occur with regularity, although not necessarily too often. They may occur as needed or at regular intervals, such as quarterly or annually. These processes may not have strategic significance to the organization but are nevertheless essential to the everyday operation of the business. Ordering a switch addition or upgrading or augmenting facilities are examples of periodic processes. Filing a tariff change when prices need to be updated is another.
- *Transactional processes* are associated with transacting customer business. These are the day-to-day processes of business, such as order entry, inventory management, billing, and trouble handling. All customer-facing activities fall into this category, as well as many other customer-affecting activities routinely occurring behind the scenes. Within telecommunications, all the areas involved in service delivery are transactional. These are the *repeatable and sustainable* processes of business.

Since strategic and periodic processes are not customer-facing and do not occur with great frequency, problems in these categories are slower to be revealed. Moreover, since neither is involved in production-level functions, there is more room for flexibility. This contrasts sharply to what occurs with transactional processes, such as those of service delivery. The volume of orders that most service providers install in a single week and the regular support involved in maintaining a large base of installed services means that the processes of service delivery will be

carried out thousands of times in any given week. The *repeatable and sustainable* aspect of transactional processes represents a much different challenge, and a far more difficult standard to meet, than anything else an organization is likely to be handed.

9.3 The seven functions (and processes) of service delivery

So what are these processes that underlie service delivery? There is no universally accepted view of what areas specifically fall within the term *service delivery* just as there is no universally accepted view of what falls with the term *customer service*. The seven areas below, however, are common and essential to delivering and supporting telecommunications services (see Figure 9.2).

1. *Acquisition and sales:* This function addresses all the activities involved in acquiring new customers and new business. It includes lead generation and prequalification activities, proposal development, and pricing quoting. It also includes preliminary service design and contract preparation.
2. *Order entry/order handling:* All tasks associated with converting a customer request for service into a firm order are found within this function. This includes finalizing customer design details so that a firm order can be created and any customer notification activities, such as firm order confirmations that occur after the order has been submitted. In addition, order creation, order tracking, and all archiving activities are part of this function. In sum, any step or stage an order goes through, from the time it is created to the time it is delivered and accepted by the customer, falls within this area.
3. *Provisioning:* Provisioning addresses the design of the facility, switched-based and software controlled network. All design and layout work associated with engineering a new service, at both the facility or circuit level and at the switch or services level are included in this category. Record-keeping and assignment

Figure 9.2 The seven functions and processes of service delivery.

activities, such as facility administration, physical network assignments, and number plan assignments, are included here as well.

4. *Installation:* This function incorporates all the physical work associated with installing and activating the service to the customer location, as well as any work performed remotely or in advance of the actual service turn-up. Installation includes all preservice testing and any steps needed to render the service complete (as defined by the provider) and acceptable by the customer. Depending on the service definition, this function may also include installation and coordination of premise equipment.

5. *Billing:* Billing encompasses all activities required to render a customer invoice. Included is any work associated with calculating and applying rates, promotions, term plans, or quantity discounts. All related functions associated with the accounts receivable, such as account qualification, credit verifications, and collection activities are also part of this function.

6. *Network management and trouble handling:* This function incorporates everything needed to maintain the service to the operational and service standards established. Network management covers a broad range of maintenance and monitoring activities from performing proactive surveillance and fault detection, to tracking reporting troubles, to dispatching field personnel, to full-service restoral after network outages. This function is both proactive and reactive; it includes responsibilities for all network problems.

7. *Fulfillment:* Fulfillment includes any post-sale and post-installation customer activities. Such activities include the delivery of training or reference guides to customers and the performance of regular follow-up procedures. Any communication with the customer or programs that might be introduced after the service is installed, such as promotions, upgrades, or changes to service, would also fall within this functional area.

These functions, and the processes that support them, are all either customer-facing or service-affecting. Having processes in place for each

of these functions thus becomes a gating factor in determining whether a product is ready to be released. In other words, these functional areas must work together as an end-to-end process in order for the second half of the finished product, service delivery, to be complete.

9.4 Customer service and reporting

Some may question whether customer service should be identified as one of the functions of service delivery. Customer service is not a discrete business function but rather a grouping of functions. It is a philosophy of business, reflecting the need to offer customers approaches to their service needs that are sensible and efficient. Departments that handle customer service normally function as intermediaries; they exist so that customers can deal with one group instead of multiple groups each supporting a different functions.

Similarly, reporting is not a discrete function of service delivery or any other area of business; it is a byproduct that can result from any function of business. Reports of any type—including network performance reports, accounts receivable reports, and service order jeopardy reports—are all necessary products of the process that surrounds the function.

9.5 Looking at the processes that underlie service delivery

The purpose in stepping through these functions is not to dissect any individual process, or even to look at the end-to-end service delivery process in detail. Rather it is to identify those functions that are both common and essential to delivering and supporting services on a regular basis.

The many processes involved in service delivery are each complex. That is why this *other* part of the finished product is so much more difficult to nail down than the view we considered first, the network service. In fact, as the project enters the third phase of design and testing, it is fairly common to begin experiencing a sense that the project is growing beyond what was originally intended.

We have summarized the seven functions for which processes must be created. At this point we need to figure out where, and how, to approach this sizable job of designing the processes of service delivery. This becomes the focus of the third phase of the cycle, which we turn to now.

References

[1] Churback, D., "Sell the Water, Not the Plumbing," *Forbes,* May 10, 1993.

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10

Phase 3: Designing Process Requirements

As customers, most of us do not think too consciously about service delivery. We experience service delivery as a continuum, or a series of steps that leads to one intended place or another. Thus, the temptation when we approach service delivery can be to think in terms of one end-to-end process. However, as we discussed in Chapter 9, there are actually several discrete functions within service delivery, and that means that several sets of processes need to be developed.

The challenge comes in designing those processes so that they join together in a way that creates the *appearance of seamlessness* at the customer level. This involves going back and forth between the whole and the parts of service delivery, a process that is an element of any design effort, telecommunications or otherwise.

10.1 Relational flow of processes

In Chapter 9, service delivery was shown to consist of seven discrete processes. These appeared sequentially, left to right. In actuality, however, they do not occur in a direct sequence but rather as they appear in Figure 10.1. Only the first four processes occur in sequence; the other three—billing, trouble handling, and fulfillment—each depend on the four that precede them and are not themselves linked in any particular order.

10.2 Ordering the processes: where to start

The customer may experience service delivery in the order shown in Figure 10.1. However, that is not the right order in which the process requirements should be worked. Service providers should ideally start at the center, with installation. After all, the first goal for the entire service delivery process has to be installing the service correctly. From the perspective of the full process, everything either flows to or away from that point.

In other words, determining what is needed to correctly build the service at the network level has to be the first area of focus. Figuring out

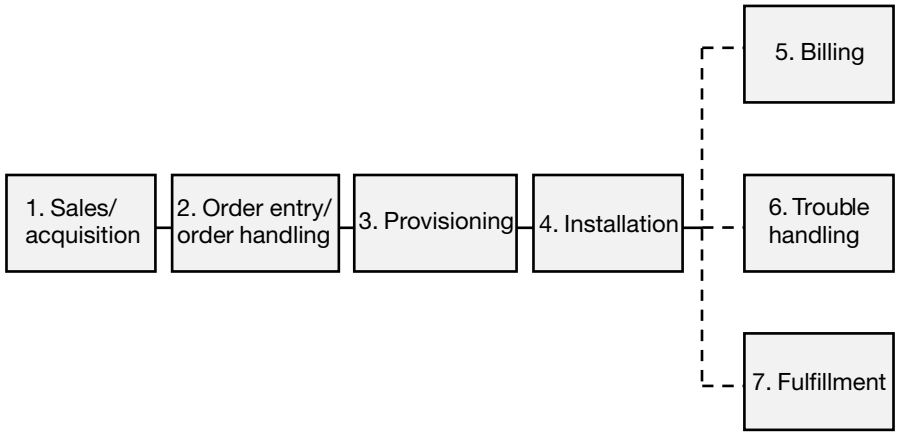

Figure 10.1 Relational flow of processes.

how to bill for it, which we will discuss later, comes next. Once the requirements needed to build the service at the network level are understood, determining what the outlying processes require becomes a lot easier. The best sequence for working the processes is shown in Figure 10.2.

In Figure 10.2, four areas are shown to comprise the *core* of service delivery: installation, provisioning, order handling, and billing. The arrows show that the requirements that are developed for installation, provisioning, and billing flow into the requirements for order handling. The purpose of order handling, in other words, is to support the needs of these two areas.

These areas are then where telecommunications service providers should place the greatest amount of effort for designing the process. As shown in Figure 10.3, the design effort actually works in reverse order from the way in which the customer experience will occur.

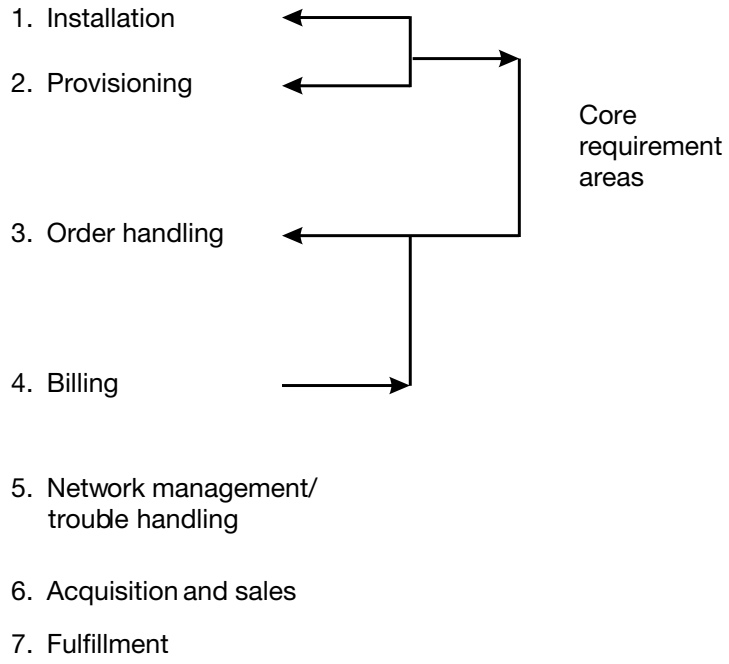

Figure 10.2 Order for working process requirements.

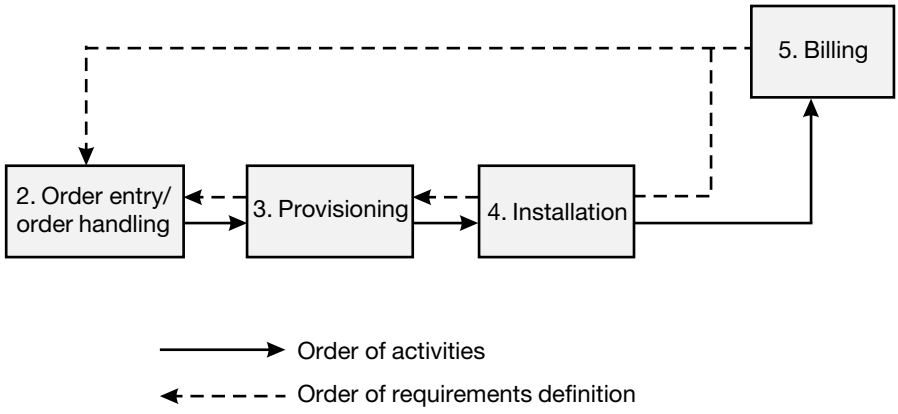

Figure 10.3 Order of activities.

10.3 Process area requirements

Sections 10.3.1 to 10.3.5 quickly examine some of the issues in creating process requirements for each area.

10.3.1 Installation and provisioning

The advantage of starting with installation is that field technicians normally require some fairly standard information to install a service—information that will come from three or four regular sources and that is processed in a set order. Identifying and sequencing these inputs often occurs rather quickly. It takes much longer to define what actually goes into these inputs.

This step of identifying inputs and outputs, which will be discussed in more detail in Chapter 11, is central to designing a process. Looking at the inputs and outputs of each functional area explains why process requirements need to be worked in reverse order. As shown in Figure 10.4, the outputs from one process become the inputs to the next. In other words, the inputs to installation are the outputs of provisioning.

10.3.1.1. Validating inputs: going to the source

Provisioning, the source for most of the information needed to install the network service, is being used here broadly to address work that may

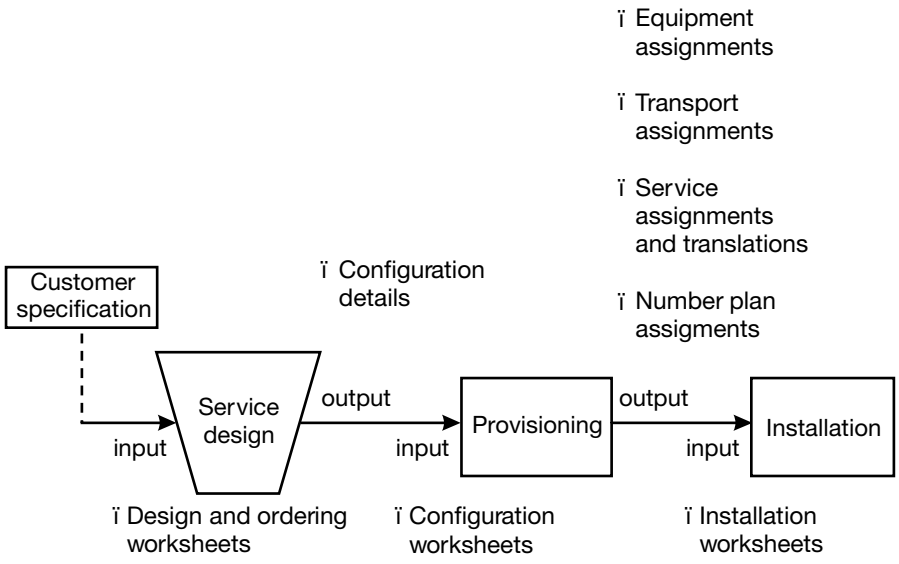

Figure 10.4 Flow of process inputs and outputs.

actually be performed across a number of areas—including circuit provisioning, database provisioning, and services provisioning.

How well the service installation occurs turns largely on how well a company understands and engineers the outputs of the provisioning process. These provisioning outputs can be numerous and include equipment assignment worksheets, design layout records, and service design worksheets. To effectively engineer the processes of provisioning and installation, a company requires knowledge about the details of the network service and about the relationship of information to the stages of that process. Going directly to the source is the most reliable way to obtain this information. In this design phase, systems developers and product developers should create services from the network, at the switch level. People in these areas should configure the switch and other parts of the network, validate the data, and verify the exact points at which the data must come together.

Validating data and the sequence of data is essential to designing an effective delivery process. Unfortunately, though, the validation process does not always happen. Much of the time, information received by

product and systems developers is two or three times removed from the source. Either because these groups lack the authority to enter the areas they need to, or believe it unnecessary, this first-hand verification often does not occur. The results show it, too. Frequently, the everyday work activities involved in creating a service at the network level are never really understood by the people engineering and designing the processes. This lack of knowledge flows into every area of the service delivery process. The worst result of this hands-off approach is weak systems requirements.

10.3.2 Order handling and service order design

If the first goal of service delivery is to install the service, and the second is to bill for it, then the purpose of the service order is to fulfill requirements for both of these functions. Companies can begin to develop service order requirements once they have collected the information needed by installation and provisioning, but these requirements cannot be completed until billing requirements are known as well.

As shown in Figure 10.5, the service order drives what happens in billing and in installation and provisioning. In short, the job of the service order is to deliver what these two areas need. This is important to keep in mind, because attempts are frequently made to try to turn the service order into something more, such as, for example, a collection device for marketing purposes or a design and configuration tool. These attempts should be resisted. Anything that does not directly feed what is needed to install or bill the service should be eliminated since it will protract, and make less efficient, the service order process.

10.3.2.1 Service design

In Chapter 8, we discussed the importance of reducing service complexity and pointed out that one of the ways to accomplish that is to eliminate as many design options as possible. While that remains the goal, odds are that some type of design stage will still be required for the service before it can be ordered.

Service design is not a distinct process but rather a stage that occurs between sales and order entry. Normally the responsibility of

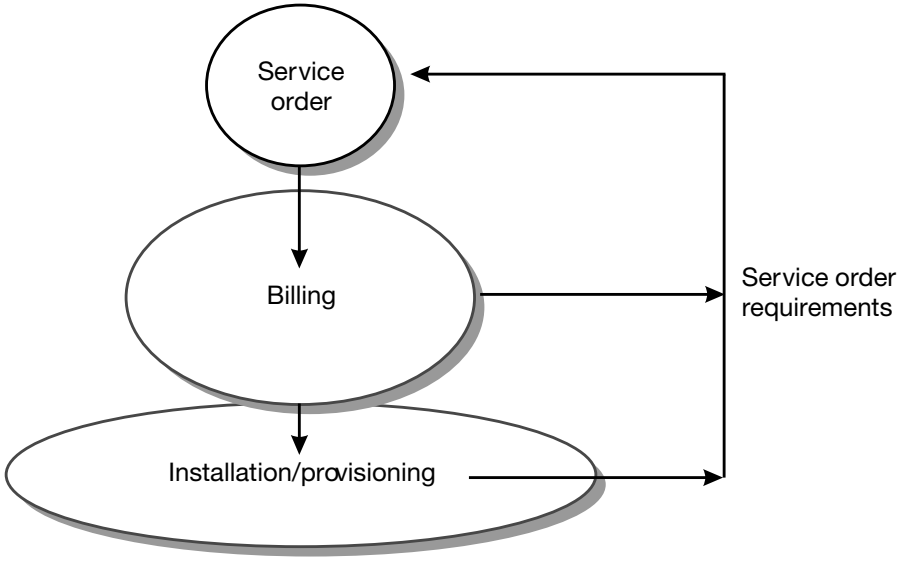

Figure 10.5 Requirements flow; service order design.

a salesperson or a technical consultant, service design can either be addressed through a manual design or electronic design approach, or it can be built into the order entry system itself. The problem with using an order entry system for designing a service is that design requirements in this environment do not always receive the attention they need. After all, the primary purpose of an order entry system is to handle orders, and in most companies, that is sufficient. From a systems and organizational perspective, the effort required to process, report, and archive tens of thousands of service orders through delivery intervals that can last anywhere from a couple days to a couple weeks is usually enough without adding service design requirements to the mix.

It makes sense to address service design separately from order entry. As shown in Figure 10.6, the tools that are needed to design and price a service can operate in front of the order entry function. How this is handled is a matter of systems and systems design. Service providers can establish separate modules for service configuration and design that feed into order entry, or they can establish separate systems altogether.

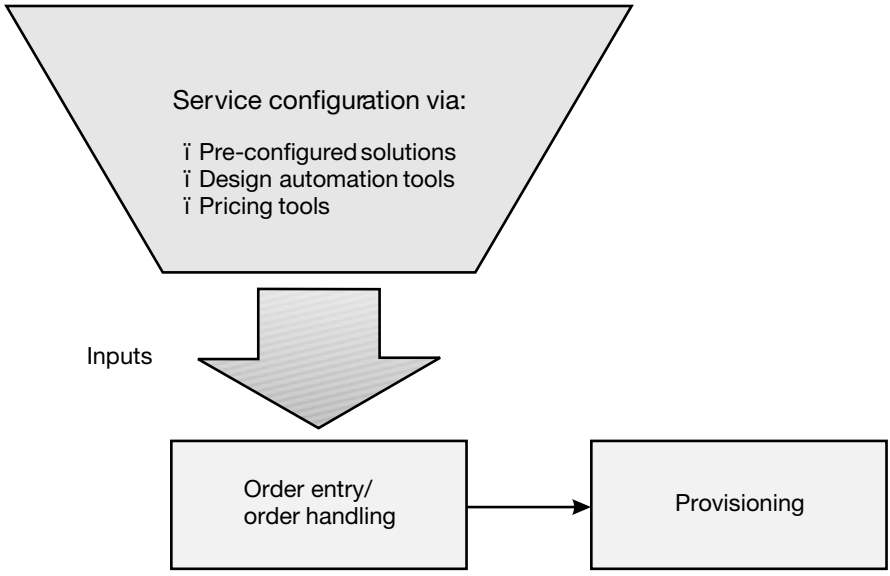

Figure 10.6 Service design stage.

10.3.3 Billing

Understanding billing requirements begins by understanding the relationship between service orders and billing. The typical relationship of service orders to the customer billing account is a many-to-one relationship, illustrated (in a simplistic way) in Figure 10.7. From a billing perspective, service orders can be thought of as flowing upward to feed billing. Systems in both areas share much of the same information and update each other on events on either side. For example, the service order system needs to know when a new account must be established, and it learns this through links it has to the billing system.

Unlike some of the other service delivery processes, billing is entirely systems-driven in most companies. Unless a completely new billing system needs to be developed, process requirements in this area will fall into one of two categories: business rules or interface specifications. Business rules deal with the service itself, addressing the relationship of service elements to one another and how those service elements may be combined. Business rules also deal with areas such as rating, charging, and discounting, which must be translated into terms a billing system can

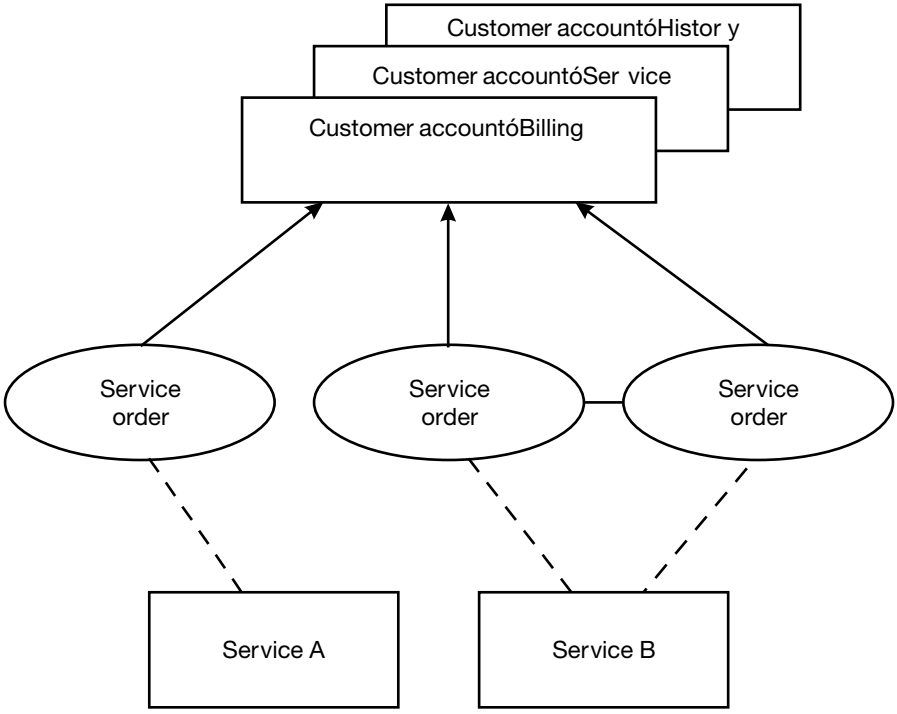

Figure 10.7 Relationship of service orders to service activities and accounts.

understand. Interface specifications, on the other hand, deal with the system-to-system issues and requirements (how, for example, order entry will communicate with billing to exchange data, or how billing will communicate with various database systems to obtain records).

Since it is an automated process, the inputs to billing will almost always be received as feeds from other systems. What typically triggers billing are *events*—events reported by other systems. A service order due date could be a trigger to set up a temporary billing record, for instance. Entering an order completion code might then send another trigger to convert the temporary billing record into an billable event. In other words, billing process requirements are driven by the rules, requirements, and interface specifications of the systems that govern those processes.

10.3.4 Network management and trouble handling

The focus so far has been on the core service delivery processes—installation, provisioning, and order entry and billing. The three remaining areas—trouble handling, sales, and fulfillment—may not be categorized as *core*, since they do not directly impact the primary goals of installation and billing and because they are not nearly as process-driven as are the other four core areas. However, they are no less important to the quality of the service delivery process.

Network management and trouble handling are critical areas for every service provider. How well service providers manage their network and how capably they respond to problems are crucial to retaining customers. However, compared to other functions, a provider's capability in network management and trouble management is based less on the inner workings of the process than it is on the more qualitative aspect of diagnosing network problems accurately and in a timely fashion.

Still, the process behind the function is important. In this area, process requirements primarily focus on two aspects: administration and diagnosis. *Administration* refers to the provider's ability to handle trouble tickets and respond to issues in a timely and effective manner. The systems that track and record customers reporting problems and the processes used to dispatch, follow up, and resolve these problems play a large role in determining a provider's capability to perform this function. *Diagnosis,* in contrast, deals with the provider's ability to correctly identify the cause of a problem. The systems and reporting tools that support the provider's network play important roles in how readily and accurately the provider can identify a problem. However, the process behind diagnosis is based more on the judgment of the individuals involved and the ability of those individuals to properly eliminate causes for network problems than on the hand-offs involved between systems and people and information.

The *process* of network management resides then more in the administration than the diagnosis area. Accordingly, developers of service must focus on administration when they define requirements for network management. Making sure trouble reports are logged, prioritized, and monitored to a timely completion is key. In designing the process of trouble handling and network management, service providers need to focus

on ensuring that information gets to the right area when it is needed. Beyond that, how well the function is performed rests with the abilities of the people doing the job.

10.3.5 Sales and fulfillment

Sales and fulfillment are both functions of sales but sit at opposite ends of the service delivery spectrum. Of all the areas of service delivery, sales and fulfillment are the least process-driven. Neither of these functions involve complex operational processes; instead, they turn on the effectiveness of those who are doing the job. Although the work involved in selling can be difficult and require great skill, it happens at the individual level, not at an organizational level where systems and complex processes rule. Consequently, the implications of how well the process works for these functions are not nearly as significant as they are for the other core areas.

Service providers are mainly concerned that the activities surrounding sales be made to operate as well as possible, and even more that the processes following sales occur smoothly. The service design issues just considered, therefore, are typically of great importance to a sales organization. Sales organizations are likely to push for better design and configuration tools and better pricing tools. Beyond this, efforts to improve the sales process will mainly focus on improving access to databases, qualification tools, referral tools, and competitive information. After that has been accomplished, the process only works as well as the people doing the job.

The same holds true for fulfillment. Process requirements for fulfillment are normally specified at the individual project level, not at the level of the product itself. For example, a product may, at some point in its life, be targeted for a follow-up campaign. Another may be selected for a special retraining program. How these requirements are fulfilled becomes a matter of how the individual program to handle these goals is designed. Having access to information may be an essential element of the overall fulfillment capabilities of a company, but this is a need that can span many functions and purposes. As in sales, how well a company performs its different fulfillment activities will turn more on how creative and effective those designing the programs are than on any process-related aspect.

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Phase 3 Continued: Tools and Techniques for Process Design

In Chapter 8 we considered the notion of deconstructing a product to arrive at its structure. This same deconstructionist approach must now be applied to service delivery. Before service delivery can be engineered into an end-to-end view, it first needs to be taken apart and examined.

This is all part of what must occur within this third phase of design and testing. The functions inside each process must be examined, with their order determined and analyzed in relation to other functions. This analysis into each process area must cross several levels of the business—the systems, the processes, and the operations. In this chapter, we examine some techniques that can be useful for mapping and designing processes for product development.

11.1 Why map processes?

Designing a service delivery process is never a matter of just specifying to others what must be developed. It is a negotiation, and as with any negotiation, designing a cross-functional business process involves give and take. Possibilities are tempered against realities, and there is a process of learning and adjusting under way.

Processes are mapped to establish how work is performed. Just as an organizational chart reveals hierarchies and functions, a process map reveals functions, dependencies, and order. Process maps establish where things are and where things need to be. As a result, problem areas become easier to see, and areas where control points are weak or coverage is lacking are quickly revealed.

In addition to confirming how work is performed, process maps can be used to forge agreements across groups necessary for a process to operate efficiently. Most important of all, though, process maps validate the most critical aspect of the entire telecommunications services delivery chain: what will be involved in automating and integrating the pieces of the process. This is an aspect we will begin to consider in Chapter 12.

11.2 Deciding what to map

When planning a new service, developers need to review each of the seven areas identified in Section 9.3. Most of the time, systems and processes will already be in place. There will, of course, be times when developers need to create an entirely new system or new process, but more commonly they will simply need to adapt an existing process to the job at hand.

In this sense, the work of product development is to identify which areas require attention and to devise a plan in which necessary steps are taken. Still, identifying what is needed can be a sizable task. The seven process areas may provide a starting point, but developers must organize the work required within each area before they can address it. Following the steps below can help developers to identify activities and the scope of what is typically required to define process requirements for a new service.

- *Step 1:* Identify core processes;
- *Step 2:* Identify subprocesses and tasks for each core process;
- *Step 3:* Identify and align inputs and outputs for each subprocess;
- *Step 4:* Identify interdependencies of core processes, subprocesses, and tasks;
- *Step 5:* Identify and define sequence, steps, and data;
- *Step 6:* Model process;
- *Step 7:* Test, validate, and calibrate.

11.3 What does process design include?

The seven steps listed above combine process requirements definition and process modeling or mapping. Both are central to what companies must consider when they design a service delivery process, and since the two are so closely related, they are often considered together. For the purposes of designing a delivery process for a new service, however, it is best to start by thinking about each separately.

Process requirements definition, or the *process functions,* addresses the activities that each process area must perform and the inputs and outputs associated with each activity. Process mapping or modeling, or the *process flow,* addresses the sequence those activities or functions need to occur.

11.3.1 Identifying process functions: the input-process-output chart

Service providers define process functions by looking at each step within a process area, describing in logical terms exactly what must occur, and identifying each input and output associated with that step. The *input-process-output* (IPO) chart shown in Figure 11.1 is a general purpose tool that can be used for many tasks, including product development. By examining each activity discretely, it becomes easier for a company to identify and organize requirements. By identifying process functions first, the next step of identifying the process flow can happen more quickly.

Input	Process/Subprocess	Output
System query (into system x) for current prospects based on parameters selected	Prospecting/lead generation	Lead list reports; Online response to query
Query to system using address/location/switch center parameters	Qualification	Online response to query
Customer and service parameters (via design and configuration tool)	Service design	Service configuration output report
Request for standard price quote (on-line via system x) Request for special bid pricing (via special pricing procedure and forms)	Price quoting	Online response to query Special bid pricing Response package
Input to proposal generator: 1. Service design tool 2. Pricing tool 3. Proposal parameters	Proposal development	Formal proposal Service design Pricing summary Feature/benefit summary
Agreement to proceed Service design, pricing finalized	Contract preparation	Printed Contract

Figure 11.1 Sales/acquisition high-level IPO chart.

The main purpose of the IPO chart is to identify the inputs and outputs associated with each step. Inputs and outputs can take several forms, including online queries or responses from a system, written or electronic forms, service orders and invoices, and standard reports. The example in Figure 11.1 shows what might appear on an IPO chart for sales, in which six separate process steps have been identified.

In an actual development situation, the development team would define in detail the logic and the process steps involved within each function or activity. Similarly, development teams would specify requirements and the layout of each input and output.

One of the advantages of using the IPO chart for product development is that no special knowledge is required—other than the ability to think analytically and organize events logically. Once a company develops requirements using the IPO chart, it can enlist process engineering teams or system developers to translate these requirements into whatever other representations may be needed. Another advantage of the IPO chart is that it allows service providers to view current modes of operation separately from future modes. The difference between the two can be the basis for negotiating what becomes the *build-to* requirements for service delivery.

11.3.2 Identifying process flows

There are several techniques for mapping process flows; the best technique to use depends on what objective must be accomplished. Because there are so many groups involved, the objective of product development has to remain general and broad-based: to forge a common vision about how the service delivery process will operate for a particular service. What is needed at this point is a common understanding about the elements of information, the sequence and owners of that information, and the tasks for which those owners are responsible. Once this understanding is established, groups are in a position to work more independently and can focus on fulfilling their own particular project deliverables.

More detailed process modeling or mapping tools may be appropriate for other areas of the business, but for product development, the process-oriented modeling approach usually works best. Approaches that look mainly at the function of information, such as *integrated definition*

modeling (IDM) or *object-oriented modeling* (OOM), are more appropriate for engineering information systems and processes. IDM, for example, focuses on activities and functions (it groups activities into design cells), but it does not take things to the next level, which is to design the actual process. OOM, on the other hand, looks at processes from the standpoint of the specific information involved, identifying business objects and grouping those objects by attributes and classes. Objects are then linked in terms of organizational components and design.

Process-oriented modeling, in comparison, concentrates on identifying the core elements intrinsic to the process. Its focus is on sequence and order and the steps involved in getting from one point to the next. Process-oriented modeling is less abstract and therefore more useful for the general purposes of product development.

Once the different modeling approaches are completed, they can be blended into examples and brought to the user level for a response. Use-case examples and other types of approaches combine the more familiar process-oriented view with an integrated systems view. Working up examples provides users with a range of ordinary or even unusual situations to which they can respond.

11.4 Mapping processes for new services

Experienced systems analysts and methods and operations analysts will rely on all these tools to devise systems and company-wide processes. The goal in product development, however, is at once more general and more specific: to define the functions that each process area must support so that the new service can be offered. At this level, the aim is to answer the questions of *how* and *in what order*. Once a company identifies the elements and the flow of the process, it can consider the question of *who*.

Again, the underlying goal is to pull the elements of service delivery together so that each area can begin its own area-specific development effort. The process map for sales shown in Figure 11.2 enables that goal. The steps of the process are laid out in the sequence in which they need to occur. Companies can now start to fill in the details, identifying systems and listing major issues and dependencies. Firms can add departments and eventually even positions as the details of the process are developed.

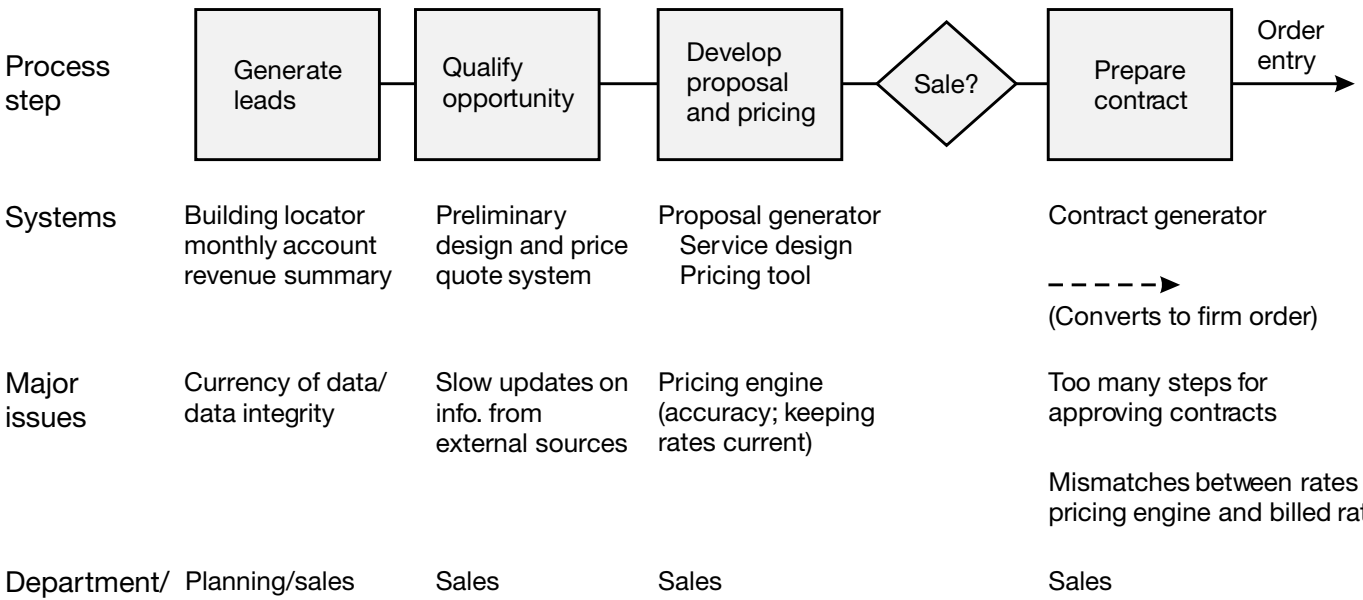

Figure 11.2 Sales process map.

When the process map is combined with the detailed descriptions of functions, inputs, and outputs resulting from the IPO chart, groups should have most of what they need to deliver on their area-specific commitments.

11.4.1 Process design example 1: one wireless provider's experience with sales and acquisition

One reason to map a process is to understand it; another is to improve it. Laying out the tasks and functions in the order in which they will occur allows problem areas to emerge.

This was the case with a certain wireless service provider as it mapped its sales qualification process. The provider's qualification process had grown cumbersome and time-consuming. Worse, it was fraught with errors. The firm knew that improvements were needed before it could release its next service.

Furthermore, the provider knew that qualifying a wireless opportunity was always going to be more involved than qualifying a conventional wireline service. However, it understood that if the qualification process took more than two days longer than the wireline equivalent, it would be risking the sale. To move through the qualification process quickly and accurately, the company would require tools that drew from three separate database sources: a license management system, which showed where licensing was in effect; a building administration database, which identified preapproved buildings; and a street access referencing system, which mapped *vertical and horizontal* (V&H) coordinates to a geographic grid that displayed spectrum ranges by area. The company had identified each of these sources as inputs during the process requirements and mapping exercises.

Inaccuracies in the data and timing lapses were causing some of the problems. More often, however, problems were due to the fact that the service provider was handling the steps involved by hand. On top of that, even when the data was right, reaching the correct conclusion on whether a customer could be served through a wireless connection required a level of knowledge and interpretative skills not typically found among salespeople.

The solution was to develop a front-end tool that could interpret the three inputs together in the correct order. The result was that salespeople were able to accurately qualify 90% of all opportunities without assistance from engineers, a 50% improvement over the past. In addition to the qualification tool, the company developed a new set of automated design and configuration tools. These tools prompted salespeople to supply all required design inputs, displayed allowable values, and returned descriptive error messages. Once an accurate configuration was developed, a salesperson could generate a summary report for the customer listing all pertinent technical and design details of the service being proposed.

Later, this design tool was linked directly to the ordering system. Salespeople then were able to automatically convert customer-approved proposals into firm orders. This meant that service orders were generated directly from design criteria used in developing the final sales proposal. Over time, the spectrum management system was also linked, which allowed the company to keep capacity inventory up-to-date.

11.4.2 Process design example 2: using the access server request to study process requirements

Another way to study process requirements is to examine an existing process that works and to emulate it. One of the most effective processes known in the telecommunications services environment is the one surrounding the *access service request* (ASR).

Many on the carrier side of telecommunications in the United States are familiar with these *American National Standards Institute* (ANSI)-recognized forms that carriers use to order access services from one another. The ASR, however, is more than just a set of forms; it is a process that extends into every service provider environment in the United States. Because of its wide use, the ASR offers a good example of what is involved in developing a complex set of processes spanning the full gamut, from service ordering to service design, service delivery, and even, by extension, billing.

Studying the processes that underlie the ASR can furnish service providers with a glimpse into the type of process issues that are involved when numerous organizations, groups, and systems are part of a process.

In the world of the ASR, a carrier customer that wishes to order service submits an initial inquiry to a carrier provider with the goal of determining whether service or facilities are available prior to starting the rather involved cycle of service design and ordering. If the response comes back positive, the carrier customer then submits an ASR to the carrier provider. This ASR is a lengthy set of forms that includes details specified by the type of service being requested. The carrier provider then returns a *preliminary firm order commitment* (PFOC) and begins the service design stage. The PFOC is eventually converted into a *firm order commitment* (FOC) that establishes firm dates for the installation and for each of the intermediary activities preceding the installation. At the completion of the design stage, which is one of the most critical of the intermediary activities, the carrier provider sends a *design layout record* (DLR) to the carrier customer.

The process continues from there, executed in many more steps than those just summarized. The point in going through this is not to detail the process, but rather to show that the ASR process is highly involved yet also highly predictable. The inputs and outputs on both sides of the process are complex, but these inputs and outputs are established and known to everyone involved. Carriers can each determine their own intervals for the time they require to complete each step, but neither the steps nor the inputs or outputs will change. One carrier for instance may allow 48 hours to issue a PFOC, whereas another allows 72.

There is not much forgiveness in the ASR processes, but then there really cannot be. When a process crosses as many organizations (and the numerous groups, functions, and systems within those organizations) as this one does, the process has to be exact—and the controls rigorous. The ASR process works, but its implementation and the ability of individuals to follow the process present organizations with an ongoing challenge.

In spite of language and forms that are unfriendly and require special knowledge to interpret, the ASR is still one of the better examples within the telecommunications industry of what is needed at a process level to deliver a network service—complex or otherwise. The level of detail found in the ASR process does not vary much from what is required to deliver a service at any level. Whether all parts of the service are delivered from a provider's own network, or multiple networks are

involved, to properly request, design, and deliver a service necessitates the receipt—in a set order—of a certain type of information.

11.5 Testing and prototyping

Mapping process requirements is an important part of devising effective service delivery processes, but ultimately what is designed has to be put to some real-life tests. After all, business processes are not maps, diagrams, or methods; those are just tools used to represent them.

The goal behind all of these tools and exercises is to create a service that can be delivered and that can work on a repeatable and sustainable basis. At the end of this third phase, the service delivery process is linked with the network service and tested as a complete solution. The testing that occurs in this phase is far more limited than what will occur in the fifth, when the full complement of systems, groups, and processes will be involved. At this point, the solution is tested within controlled conditions inside the company. For example, employees may be asked to accept a trial service in their homes. The objective of such a testing arrangement is to ensure that the service that is about to be developed is workable from a network and a service delivery perspective.

11.6 Phase review: exit criteria for Phase 3/ entrance criteria for Phase 4

At the conclusion of this third phase, the design of the service delivery process is brought to closure. What needs to be developed in the next phase is now clearly defined. Process requirements for each area are developed, inputs and outputs are defined and designed, and processes are mapped and validated. Following a successful prototype and trial, the service should be ready to move into the fourth phase—development. Phase 3 is summarized in Table 11.1.

A central element of the entire design effort is, of course, systems, which we turn to in Chapter 12.

Table 11.1

Phase 3 Summary: Design and Testing

Finalize Network Designs	Identify Process Requirements	Map Processes	Prototype Solutions	Finalize All Design Outputs
Configure and design (switch facility, interconnection, and other transport)	Identify process areas	Design process flows	Conduct lab tests	Finalize product design definition
	Define linkages and dependencies between processes	Link and integrate process flows to systems requirements	Develop working model and conduct first in-house trials	Finalize service delivery design definitions
	Identify inputs and outputs		Adapt/revise process maps	
	Analyze process to system requirements			

12

Integrating and Automating the Service Delivery Process

Knowing what the processes are and in what order they should be implemented is all well and good, but the more pressing issue within organizations is figuring out how to implement these processes in a way that enhances and accelerates service delivery. Companies are well aware that if they want to cut out time and beat the competition at the end-to-end game, they have to improve the linkages that exist between processes.

Clearly, service providers need systems to effectively link processes, and to deliver a competitive advantage, systems must do more than just support processes; they must create a chain of value. That is the challenge service providers face with full-service automation: creating systems that are tightly integrated with the business environment and the network. Such systems should anticipate and correct problems before they occur,

and generate information as it is needed. Most importantly, systems need to do all of these things with a minimum number of people.

12.1 Integration and full-service automation

To meet this challenge, companies have to integrate their operations across three levels of their business: the process level, the systems level, and the network level. Integration at the *process level* has to do with reaching agreements on the information that will pass from one function or organization to another and the expected behaviors of each. Integration at the *systems level* involves making it possible for information to be exchanged among systems, even if one is a mainframe, another a midlevel processor, and another a desktop computer [1]. Integration at the *network level* involves the ability to transport services and functions across the network, whether that network is owned and operated by a single provider or held by multiple providers.

The goal in all these areas is to achieve a system of operation in which service information can flow through automatically end-to-end—an environment, in other words, in which the network and the management systems running that network can communicate to the service delivery systems in a logical and process-oriented way. Companies that succeed in linking all these levels will be best able to capture and keep market share. These will be the companies able to create services quickly and to keep those services up-to-date when market conditions change.

12.2 Current state of affairs

Unfortunately, the environment described in Section 12.1 is unlike most service provider environments, in which the linkages between levels are far from smooth or efficient. Hand-offs between the network and the operational support systems are likely to be poor, and agreements between organizations on how processes and functions will be carried out tend to be incomplete or inadequate.

The problem is not due to lack of progress in any of the three business areas; the problem is that progress at the process, systems, and network levels has been slow and uneven. Arguably, advances have been the

greatest in the network area. Network monitoring and self-healing capabilities have been steadily improving for several years now. Today, many areas of network management are substantially more automated and proactive than they were even a few years ago. The same goes for inventory and tracking capabilities. Most classes of network equipment can monitor their own capacity levels, engineering themselves for the conditions they must support. Not only is this information enhancing the value of the network, it is allowing it to be maintained and operated with fewer people.

Progress has occurred in the process area as well. Most companies are better understanding work flows and more specifically identifying problems. In many cases, these advances result in more streamlined work flows, with better hand-offs between departments and organizations.

Where progress has notably been the slowest is in the systems area. Although companies are starting to better understand the issues involved in taking systems to where they need to be, the effort involved in addressing those issues remains enormous.

In any case, arriving at full-service automation rests on progress in all three areas. To link the levels effectively, all must be on common ground. Thus, providers' greatest challenge is finding the common ground where the network, the processes, and the systems can all meet and operate.

12.3 The network to systems link

Historically, the network has always advanced first, followed by the systems area, which usually adapts in a series of stages. While this is still the case, companies seem to be feeling the disparity between the network and the operational support systems more deeply. This is partly due to the large investments companies have been making in network and plant over the last several years. Driven by the convergence of services at the transport level and service providers' desire to enter new geographic markets and new lines of business, investments in network and plant have reached unprecedented levels over the last 10 years. During any period this build-up would signal the need for large corresponding investments in systems. Now, however, given the way the network is evolving, the need is becoming particularly pronounced, and it goes far beyond a simple matter of catch-up.

12.3.1 The arrival of the intelligent network

Since the network is evolving in a direction that is fundamentally different from how it evolved in the past, the rules for supporting the network are also changing fundamentally. Connectionless circuits, private virtual circuits, cell addresses, and SONET technology are all changing the way service configurations are viewed and established. No longer are connection paths established as fixed one-to-one arrangements; networks can now dynamically establish connection paths to support one-to-one or many-to-one arrangements (see Table 12.1).

Overall, the network is moving in direction that is more dynamic and virtual. For most new services, bandwidth is variable. Capacity, or the speed of the connection, is determined on a per-call basis, along with the network route. Not only is the capacity and the route of a call dynamic, the elements used to create a service are dynamic as well. Service definition is growing far more flexible, with elements that can be arranged and rearranged in real time.

12.4 The systems to network link

While the capabilities of the network are becoming more robust, exploiting these capabilities requires systems that can keep up and align with these realities. The systems needed now not only must be populated

Table 12.1
Network Directions

Area	Traditional	Recent	Emerging
Infrastructure	Analog Voice	Digital	ISDN, B-ISDN, AIN SONET, X.25 packet networks, PCS/wireless
Basis of systems	One circuit = one telephone number	One circuit = many telephone numbers	Many-to-many virtual circuits, Internet, bandwidth-on-demand
Network topology	Point-to-point	Multipoint/multiple multinode systems	SONET ring, TCP/IP, Internet, client-service

with new types of information, they must be equipped with new knowledge. To exploit the capabilities of the network, both the network and the systems have to *think* in the same terms.

There are many reasons why these two areas of business are out of sync in most companies. The usual lag of systems to the network, the unprecedented build-out of the network in recent years, and the direction of the intelligent network are all part of it. However, the most significant reason, and the most substantial obstacle, resides in the systems that currently operate most provider organizations.

12.4.1 A look back: the legacy of legacy systems

For the majority of incumbent wireline providers in the United States, most of the core systems now in place were systems originally developed by Bellcore or AT&T. These systems, which support the core *operations, administration, maintenance, and provisioning* (OAM&P) functions, were all introduced on mainframe processors using proprietary interfaces and procedural programming techniques. Many of these applications, such as the *trunk inventory record keeping system* (TIRKS), the *computer system for mainframe operations* (COSMOS), *loop facility assignment computer system* (LFACS), and *memory administration for recent change* (MARCH), have been in place for well over twenty years.

These systems were fine for what they did and for the times in which they were developed to work—a period of regulation and monopoly, where the industry operated on a stable model with a stable number of operating partners. Technology was different then, too. After all, until the mid-1980s, communication was still mostly analog. The standard was one phone line and one telephone number. The network was based primarily on copper loops, hard-wired transmissions, and fixed switch addresses.

12.4.2 The reaction: short term solutions and quick fixes

Difficulties with the legacy systems first began to show up when service providers tried to implement services using the newer network concepts. Early attempts at implementing ISDN-based services in the late 1980s revealed numerous problems in provisioning, tracking, and recording. To support the virtual channel arrangements of ISDN, systems had to

recognize associations of data at a higher order than what was possible within the legacy systems.

While these difficulties were first revealed with ISDN, they applied to all types of advanced services. Broadband services in particular—including frame relay, SMDS, and ATM—required relationships different from what the legacy systems could address. However, as demands for these services continued to grow, providers seemed to have little choice but to work with what was already there. In the years that followed, providers implemented hundreds of nonintegrated or semi-integrated systems in an attempt to work around the limitations of these legacy systems.

12.4.3 The current legacy

Most of these solutions operated as customized fixes to the core OAM&P systems. The problem was that many of the approaches that began as temporary measures became embedded in the systems procedures themselves. What resulted was a hodgepodge of inconsistent technology, applications, and data types, all of which added more complexity and cost to the operation.

Thus, in many cases, these solutions fixed some of the more specific needs that existed but at the price of integrity. Companies began to pass critical design information in faxes or e-mail messages, or simply as remarks in the comments section of an order. For certain services, systems were no longer processing information, they were merely moving it from one destination to the next. The biggest problem, however, was that these stop-gap measures were treating as exceptions something that was fast becoming the norm.

12.4.4 System drivers

The point is that the legacy systems in the incumbent wireline environments and in other environments were not developed for the types of services being introduced today, nor were they developed for anything other than internal use. The systems needed today must be able to support virtual and intelligent networks, where concepts of one-to-many and connectionless service are the standard. Furthermore, they must

support an environment that allows services to be created in real time, where network elements can be recognized individually at the systems level.

Today's systems must also be able to support a trading environment involving multiple suppliers, where suppliers can be buyers as well as sellers. In other words, as the telecommunications industry and network become more open, the systems that serve the network and the industry must become more open too.

12.5 The systems to process link

So far, we have discussed systems and processes as separate entities and have made some distinctions between the two. The fact is, however, that the line between systems and processes gets fuzzier all the time. This is not something that is occurring only in the telecommunications environment. Indeed, in just about every business and every industry, systems have become so central to the operation that they can no longer can be viewed as just supporting the process; they *are* the process.

This is easy enough to see in telecommunications. Systems in this industry are not just monitoring and tracking the processes, they are dictating how the work is done. Indeed, systems and processes have become so intertwined that distinctions often seem rather academic. That is why this book uses the broader term *infostructure,* which incorporates the systems, the processes, and the people.

12.6 Where systems need to be heading

In spite of the blurring between systems and processes, and in spite of the many reasons why systems and networks are out of sync in most companies, staying competitive still requires service providers to challenge themselves in this area of service delivery. The complex nature of today's telecommunications environment demands that systems strategies be brought into alignment with the direction of the network, the direction of services, and the direction of the industry. However long or difficult that process is to complete, movement in that direction must start now.

Customers are behind all of this need for change. They are pressing for greater levels of customization in the services they expect and in their dealings with providers. They are demanding calling plans and billing arrangements that can be tailored to their specific needs. Moreover, they want services that can be activated immediately and reconfigured automatically, and bandwidth that can be made available on demand.

External pressure is further intensifying this need. As the shift to the wholesale-retail-resale world gets more fully under way, providers on either side of the supply chain are all are focusing on finding economies within their operations. To achieve any economies at all, information must flow easily from one organization and one function to the next. To operate efficiently, processes need to be fully automated. Like the network and the industry overall, what is needed at the systems level is a model that is distributed as well as modular. Like the software that operates the network and the support systems, the architecture for the elements of network services have to exist within a relational view.

12.6.1 The provider's view: vertically integrated systems and services

Most importantly, systems need to move in a direction that is modular, layered, and relational and that conforms to the network and to the industry. In the United States, that means conforming specifically to the regulations of the FCC. More generally, it means conforming to a direction supporting the vertical integration of services.

This vertical orientation offers a way to manage business issues separate from service delivery issues, and service delivery issues separate from network issues (see Figure 12.1). Some might argue, correctly, that this vertical orientation is what existed in incumbent provider organizations for many years previously. The difference, of course, is that those systems were closed. Access from the outside was not possible, at least not easily. The orientation, moreover, was far from flexible.

Service providers intending to maximize their opportunities in the market recognize that achieving this vertical orientation is critical. This vertical orientation supports the structure of the wholesale-retail-resale world. Separating information into layers allows companies to manage

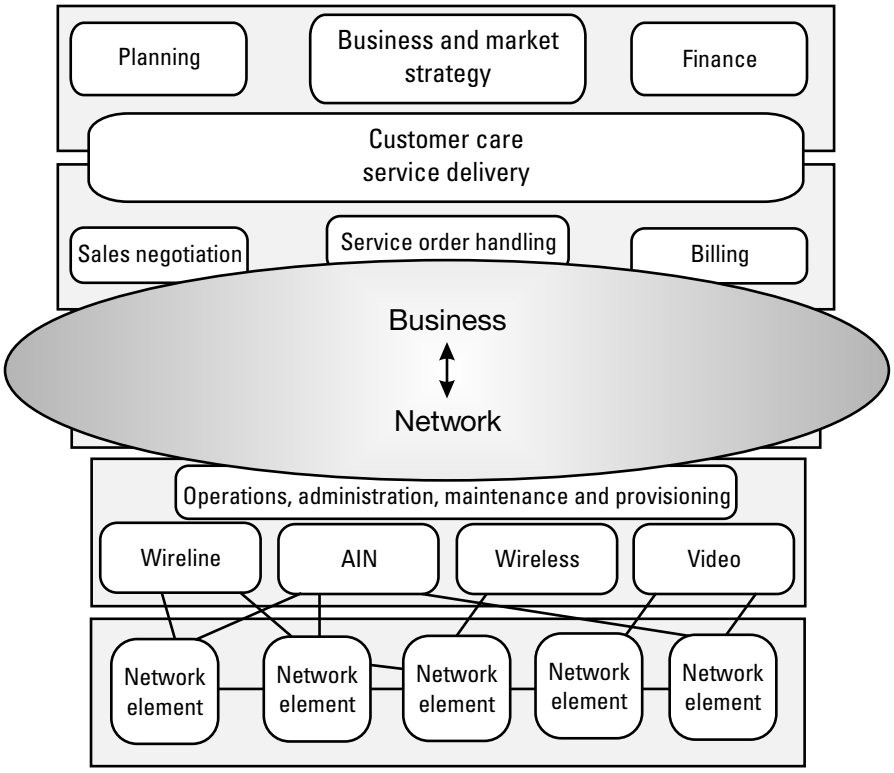

Figure 12.1 Vertically integrated services and solutions. (*Diagram adapted courtesy of* Manchester International Incorporated, Dallas, Texas.)

the layers more independently. Access from the outside can then be controlled and defined.

12.6.2 The customer's view: horizontally integrated services and solutions

Customers may be the driving force behind this, but their perspective differs from that of providers. Looking to reap the rewards of an open market environment, customers want the freedom to fashion their own solutions and pull elements from the best of all worlds. This is especially true for customers in the large national and multinational segments.

These customers are looking for virtual networks that blend carriers and cross domains. They want global agreements covering everything from billing plans and pricing terms, to service-level guarantees (see Figure 12.2). Most of all, they want services that operate and perform uniformly—services that appear to be coming from one provider even though several may actually be involved. To meet this expectation, service providers must make their information consistent at the customer level.

Trying to deliver on these expectations is the main driver behind the standards needed at the provider-to-provider level, a topic that will be looked at in Chapter 13. This is not only a pressing need for providers but for the telecommunications industry overall. Before the new environment can be fully realized, agreements and interface standards have to be established in many more areas than there currently are.

12.7 The challenge for providers: integrating and linking the pieces

Creating this level of virtuality across networks and across systems is not something that providers will accomplish easily. Linking the network to the business processes and the organizational objectives requires that vertical linkages be established at every level—from the *advanced intelligent network* (AIN) or network level to the OAM&P and billing systems level, to the workforce management levels, and the business and corporate levels.

Adapting and creating infostructures around this vertical-horizontal orientation can require companies to adopt an entirely new view into systems. Still, until the vertical links on the inside are in place, the horizontal links to the outside will be difficult to accommodate.

12.8 The payoff: process integration leading to full-service automation

As providers create these linkages at the systems level and the process level, full-service automation starts to transform from a vision into a reality. With linkages established, intelligence can travel upward and out into

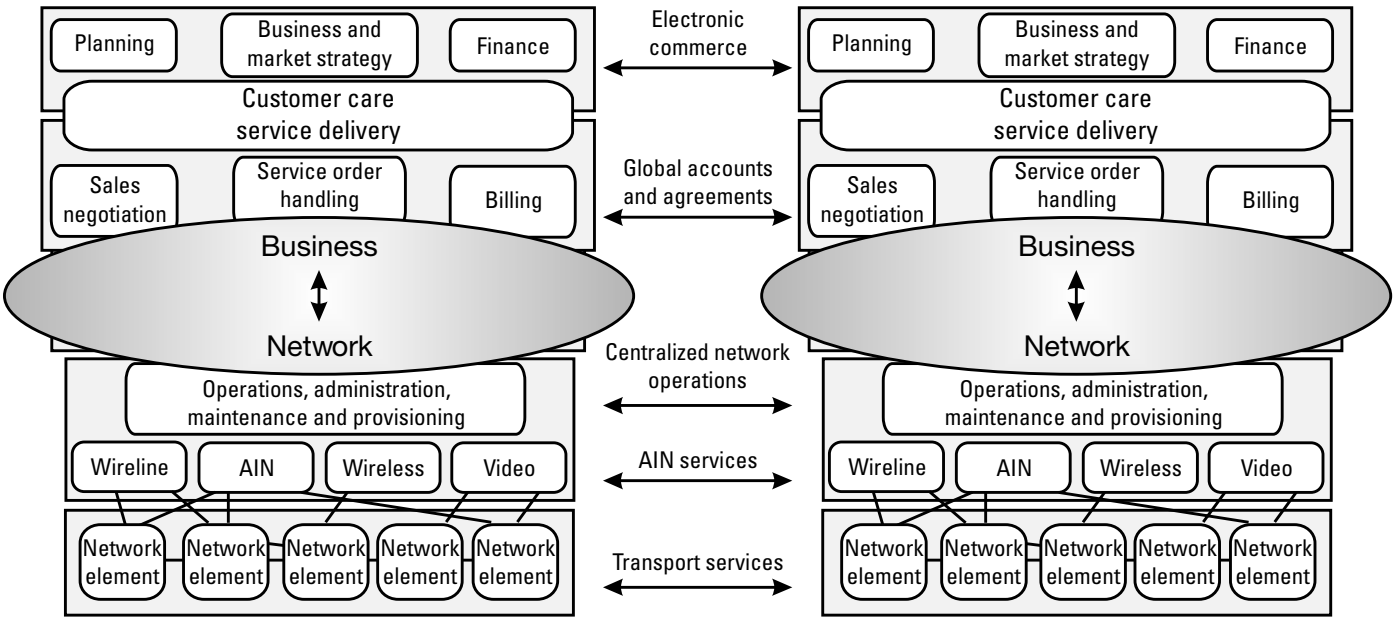

Figure 12.2 Horizontally integrated services and solutions. (*Diagram adapted courtesy of* Manchester International Incorporated, Dallas, Texas.)

new domains. Systems and applications can exchange information across levels in a consistent and meaningful way. Virtual networks and customized services become possible, as do SLAs that cross broad areas of services and broad geographic territories.

Single source providers and *one-stop-shopping* arrangements emerge as possibilities under this scenario, along with global service agreements, global pricing, and global billing plans. For this to happen, however, systems need to sit *above* the network elements and the data they supervise. Just as data should be kept separate from application code, systems should operate separately from the elements of the network and the elements of service.

This all points to a modular approach in which elements and levels can develop independently but in harmony with each other. At this point, distinctions between OSSs, *business support systems* (BSSs), and AINs begin to fade. Systems start to develop based on the needs of a specific function, not as a result of any particular system architecture. Order and sequences of tasks are no longer fixed. Accordingly, tasks can be implemented based on the requirements of the service or the service provider.

In such an environment, telecommunications as an industry could move down a very different path, following a direction similar to that taken by the airline industry. As the industry becomes more stratified, the services a provider has to offer become a function of the levels that provider is able to traverse or manipulate. One type of agent, for instance, might be authorized to resell only existing packages whereas another might be authorized to assemble parts from a range of carrier networks. The authority needed to customize could be a function of what is granted through the different ordering systems to which a provider is given access. However, all of this can only occur within an environment of established telecommunications industry standards, an environment in which elements of information have achieved a uniform order that all providers and suppliers can embrace.

References

[1] Adams, E. K., and K. J. Willetts, *The Lean Communications Provider: Surviving the Shakeout Through Service Management Excellence*, McGraw-Hill, 1996, p. 74.

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Part V

Issues and Approaches to Process Development

13

The Environment of Service Creation and Delivery

Now that we have had a glimpse into the environment in which services will be offered, we can discuss some of the challenges telecommunications providers must overcome before they can operate in this mix-and-match world. In Chapter 8, we examined service combinations that can result from unbundling and resale, and in Chapter 12, we considered some of the broader implications the new telecommunications industry direction is having on systems. Systems are indeed a major issue in every company, but the issues that stem from systems are really coming from something much larger—the expanding role of suppliers. Supplier relationships are at the heart of the new telecommunications industry mode, and these relationships are changing every aspect of the industry.

13.1 The new trading environment

Suppliers are no longer playing peripheral roles to service delivery; they are becoming partners to the process. However, it is more complicated than that. Suppliers are also competitors, and this creates enormous issues not normally found in either a competitor relationship or a supplier relationship.

Consider how this expansion of suppliers is changing things: before a supplier relationship can begin to function, the service provider and supplier must set agreements on every aspect of the operating relationship. From the lofty to the mundane, issues that need to be discussed range from interjurisdictional bonding to intralata pricing, from service-level agreements to service ordering practices. When one considers the difficulties most providers face just putting their own department-to-department agreements in place, the fact that these supplier agreements are taking longer to craft than anyone would like should come as no surprise.

13.2 Establishing processes with outside suppliers

We have seen that the business environment of telecommunications actually operates on two levels—the network level and the systems and processes level, or on the infrastructure level and the infostructure level. Building the service delivery process involves creating linkages between these levels (see Figure 13.1). To operate effectively in a multiple supplier environment, the levels must be linked on the inside, with connections established to the outside world as well.

With the number of situations that are possible within an environment made up of hundreds of trading partners and suppliers, the scope of what is required to build effective processes increases dramatically. Inside a provider's own organization, there are at least seven processes that underlie the end-to-end service delivery chain. By adding one outside supplier, a provider can expect the number of processes and system interfaces to double. When 50 or 100 suppliers are added, the

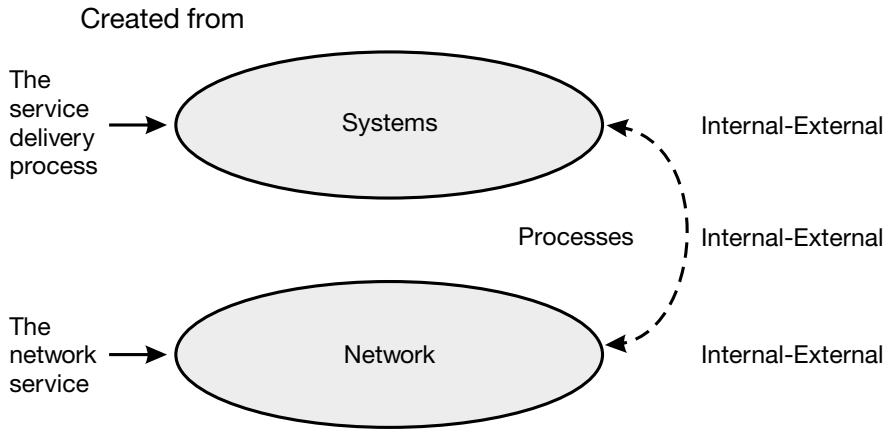

Figure 13.1 Linking the network to systems.

potential increase in processes and system interfaces becomes impossible to quantify.

There used to be, after all, just one service provider, and that service provider had responsibility for every aspect of the service. Now, however, multiple providers are involved, each supplying a part of the solution (see Figure 13.2). The service provider of record (A) may be responsible for the switching capability, but at either end of the service there could be two other suppliers (X and Y). Between the switching nodes could be yet another (Z). This means four carriers through which changes to a service must be coordinated, four carriers to bill and consolidate charges onto the customer's invoice, four carriers with which to negotiate service-affecting problems, and four carriers with which to maintain records—all for just for one customer service arrangement!

As the number of suppliers expands, the number of service arrangements multiplies and so therefore does the number of transactions and individual processes (see Figure 13.3). One service provider estimated that to support its portfolio of products, it had to maintain 16,000 different pricing plans in the area of billing alone. With expansion programs and plans to offer new resale and unbundled services, it projected this number could triple or even quadruple in the next couple of years.

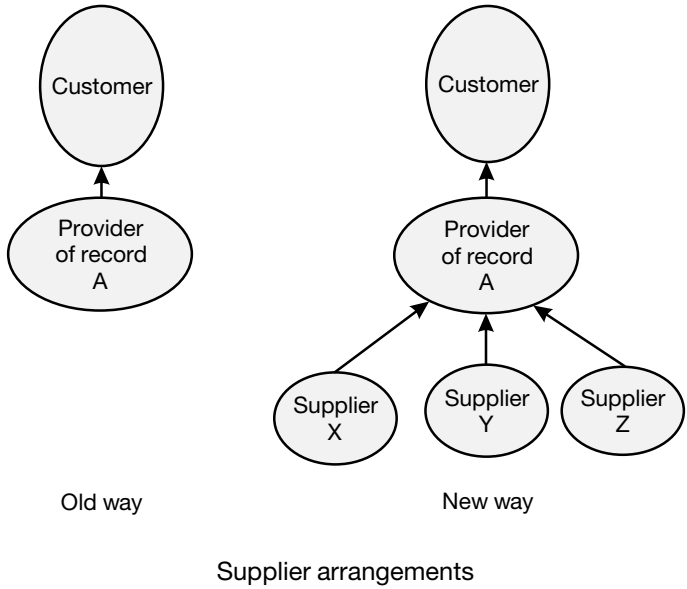

Figure 13.2 The new service provider environment. (*From*: [1] with permission from the McGraw-Hill Company.)

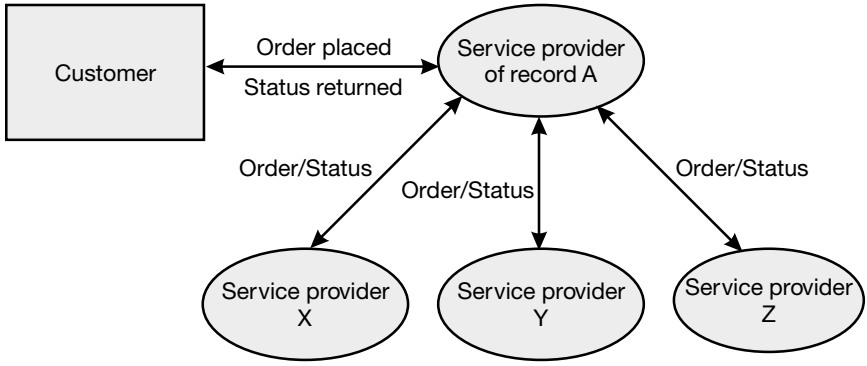

Figure 13.3 Service order activity. (*From*: [1] with permission from the McGraw-Hill Company.)

13.2.1 Suppliers as competitors

All of this becomes a lot more difficult when a supplier is a service provider's competitor. Any supplier-subcontractor relationship involves risks,

since commitments are being made to customers based on agreements made by another party. What if the other party does not deliver? What if it fails to meet the dates and the terms and conditions set forth? What if the prices go up? When that supplier is a firm's competitor, these concerns can take on a much different meaning.

Much of the difficulty with telecommunications trading partnerships right now stems from the notion of *unwilling suppliers*—suppliers that are not choosing to do business with another company but are being forced to by decree. The pressure is particularly fierce in the United States for the incumbent wireline carriers, which are required to enter into agreements with their competitors. Complying with the FCC interconnect regulations requires incumbents to negotiate individually with each potential reseller of wireline services—their competitors, in other words. Because of the potential conflict of interest, many providers are separating their businesses so the supplier part remains separate from the part dealing directly with end customers. The aim in these cases is to ensure that practices are fair and to facilitate the negotiations necessary to move more quickly into the new environment.

13.3 Implementing supplier-level agreements on systems and processes

Regardless of whether a supplier is an inside group or an outside group, a friend or a foe, the service delivery focus in a multiple-provider environment is still about trying to achieve some common goals. It still comes down to streamlining and reducing the number of steps to the fewest possible, correctly understanding those steps, and working out the interdependencies of data, work flow, and work groups. In other words, it still comes down to systems and process-level integration.

For processes to function effectively, all sides of the transaction have to be in agreement on how the process will work. In addition, all sides have to be capable of supporting whatever agreements are forged. How these accords are reached is partly a provider-to-provider activity, partly an industry-wide activity. Regulatory bodies usually hand down policy directions, but it is up to providers and the telecommunications industry

at large to hammer out the specifics involved in creating processes that can actually be implemented.

In the United States, reaching agreements on how systems and processes will interconnect is more than just a good idea, it is a federal mandate. The FCC's regulations for interconnection require incumbents to give competitors the same type of access to their OSSs as the incumbents have themselves. This policy aims to protect new competitors from being shut out of new markets by virtue of not having access to information. The goal however does not address any of the specifics. Turning this policy goal into something functional is far more involved than anyone might have anticipated.

At issue are the many systems interfaces involved. No provisions were made for standardizing interface arrangements at the provider level or the system level. This is leaving companies that want to offer services nationally with the daunting task of trying to adapt their systems to support literally hundreds of interfaces from the different incumbent OSSs to which they need to connect. In the absence of any formal standards, providers are coming up with interim approaches and private agreements. However, these interim arrangements present their own challenge: Any company that wants to enter new markets will now be forced to spend millions developing interfaces that could change in a couple of years.

13.4 Process development through standards and automation

There is no way around it: Building processes that are economical and efficient within an environment of multiple suppliers requires that agreements be established at several levels of the telecommunications industry. Agreements are needed on how information will be exchanged, on what information will be exchanged, on how a process will be carried out, and on how systems will interface with one another. Because there are benefits to all sides, the impetus to link and automate processes is there as well. Pulling costs out of the process, cutting out time, and improving the flow of information are goals every service provider and supplier claim to share.

13.5 Obstacles to progress

Why then is progress not happening any faster? The major obstacles to progress are the following:

1. *Delays in industry agreements:* Without telecommunications industry agreement on some of the key areas, companies cannot be sure of what they should be developing. Temporary agreements allow things to start, but until agreements are codified, many companies consider themselves to be in a holding pattern. In the United States, critical areas such as unbundling still do not have firm definitions or agreements. The 1996 Telecommunications Act created a detailed outline and clear directions for how the industry would operate in the future, but many aspects of how agreements would be reached or how standards would be established were left open. Unlike the old environment, in which monopoly providers had responsibility for setting standards and forging agreements with other providers, much in this area is today still up for grabs.
2. *Lack of systems interface standards:* It is becoming clearer every day that a provider's quality of service depends on the quality of the interfaces it has to systems both inside and outside the organization. Poor interfaces mean slow business processes, which means that customers have to wait longer for service. The solution will ultimately come through *electronic bonding* approaches. Electronic bonding involves creating interfaces that allow suppliers (which includes competitors) to interconnect to OSSs on the outside. Electronic bonding will pave the way for suppliers and providers to share and exchange information with one another. Before that becomes a reality, however, telecommunications industry standards must be established to address how information will be transferred among systems.
3. *Insufficient control and security:* With ILECs being forced to open their networks *and* their OSSs to trading partners who also happen to be their competitors, concerns surrounding security and control are of paramount importance. The challenge is a dual one, of arranging access in some cases and restricting it in others.

Distinctions in this environment between the network and the operating environment become critical. Controls are needed to limit what companies have access and what types of information can be accessed. The place where these issues need to be addressed is within systems. Unfortunately, however, systems in most provider organizations are not currently capable of this level of access and control.

4. *Absence of scaleable architectures:* There is also the issue of what it will take to get systems ready once agreements are finally reached. As we have seen, the systems that stand behind most provider organizations were never designed to work in this mix-and-match, plug-and-play world. On both the supplier side and the customer side, the systems are not nearly large enough or robust enough to handle the new requirements. The are not scaleable, because they were never designed for that purpose. Thus, incumbents face two expensive choices. They can either completely redesign their legacy OSSs to support unbundling or start over with new systems. Many believe that the right choice is to start over, but the realities of time and money prevent many providers from abandoning an investment that even with the right approaches would take years to recreate. To protect these investments, many incumbents have decided to try to work with what they have. Either way, what is involved to support the volumes anticipated is a major re-engineering effort.

References

[1] Adams, E. K., and K. J. Willetts, *The Lean Communications Provider: Surviving the Shakeout Through Service Management Excellence,* McGraw-Hill, 1996, p. 51.

14

Telecommunications Management Network

With product and systems development efforts now so closely tied, groups in both areas are finding themselves frequent companions to the same projects. Although the two groups may frequently work together, they do not always see eye-to-eye. The systems orientation can be very different from the product orientation. Each group can have its own way of seeing things, its own concepts, and its own terms.

Earlier we examined two models for categorizing projects and defining product elements. The seven-layered model for telecommunications service development, discussed in Chapter 6, categorized projects under a building block approach in which services evolved with each layer. The five-element model for telecommunications service definition, discussed in Chapter 8, identified elements common to most telecommunications services. While these models can be used by anyone involved in a

development effort, by no means do they provide every group with all that is needed to design and develop a new service. As the telecommunications services landscape expands and the struggle to cross expanding domains only gets larger, what is needed is a model that can bridge disciplines and viewpoints—one that can bring the product view in line with the systems view—to be used by systems developers, product developers, network developers, and other groups.

14.1 Telecommunications management network: a room with a view

TMN offers such a view. TMN was developed by the *International Telecommunications Union* (ITU) as a model for managing the communications services environment and has been endorsed by such organizations as Bellcore, the Network Management Forum, and the European Telecommunications Standards Institute. TMN allows the services environment to be viewed from several perspectives: from a logical or business perspective, from a functional perspective, and from a perspective of standard interfaces. Moreover, it offers a framework in which elements within the communications services environment can be viewed and the relationships between elements can be understood.

TMN's layered approach (see Figure 14.1) reflects the direction of the telecommunications industry and supports the horizontal and vertical orientations discussed in Chapter 12. As with any model, an interpretation of TMN is based on the perspective of the person or group using it. Players can align with layers based on their competencies or areas of focus. Equipment suppliers, for instance, may align with just one layer while service providers offering a full range of services will align with all of its layers. TMN illustrates that it takes all the layers working together to deliver service and to operate a service provider organization.

It would require more than one chapter to do justice to TMN, which is a subject unto itself. We examine it here to show that it offers a way to bring different disciplines and constituencies. Service providers of any type, software developers, equipment manufacturers, regulators, and product developers can establish common ground within the framework

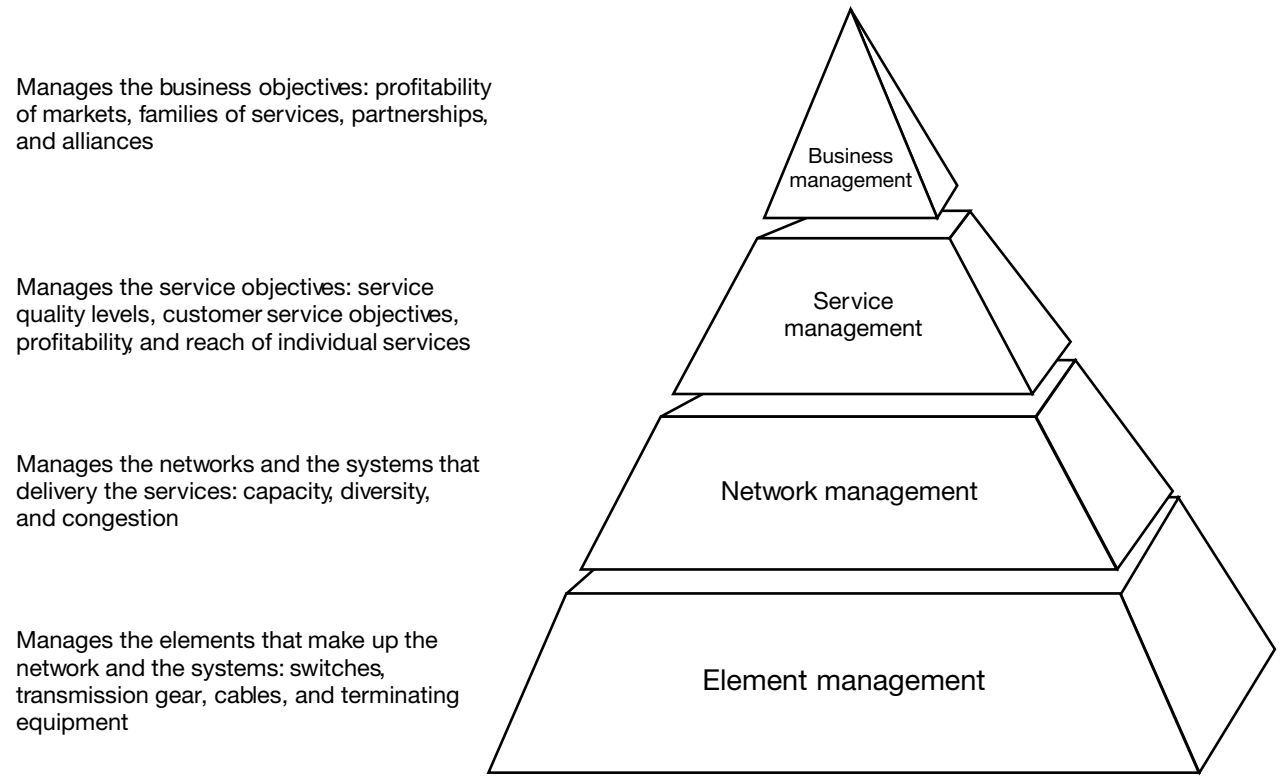

Figure 14.1 The four management layers of TMN. (*Adapted from:* [1].)

of TMN. By establishing that common ground, work in each of these areas can occur more efficiently and independently.

14.2 TMN basics

Currently, TMN exists primarily as a model for system developers. The practical benefit of TMN is that it offers a way to break down the complexity of the service provider's world into more understandable pieces. Like all pyramid designs, TMN is based on a value chain: each of the layers build on the layers below. Sections 14.2.1 to 14.2.4 examine how each of the management layers of TMN are defined, beginning at the base and working upward.

14.2.1 Element management layer

Element management deals with the individual elements that make up the service infrastructure and infostructure. This goes to the lowest level of equipment, components, devices, and data. Keeping track of what is there and what is in use is all part of this layer's function. For example, in addition to tracking whether a particular circuit card is available, it must also know whether that circuit card is plugged in and activated within the switch. Along with tracking and monitoring, this layer is responsible for taking corrective action in cases of element failure.

The types of issues that come up at the element management layer can include any of the following:

- Is there a specific component causing a failure within the network?
- Is the switch blocking calls to a specific area code or NNX?
- What is the origin of a certain type of alarm?
- What's the blockage level of one of the servers?

Increasingly, the line between the element management and the network management layer that sits above it is blurring. As network equipment becomes more intelligent, self-reporting and self-correcting capabilities are becoming common. Chances are good that a piece of

equipment will now be able to monitor its own components. In spite of trends in that direction, this layer will not be fading away. Whether the job of monitoring a particular element is assumed by some piece of network equipment or network system is not the issue; that it is being addressed somewhere is. That is the job this layer has.

14.2.2 Network management layer

The focus of this second management layer is to maintain the health of the network. The more commonly recognized elements of the service infrastructure—the switches, the multiplexors, and the terminating equipment—are all found here. So are the systems used to manage, track, monitor, and configure those elements. In this layer, systems are usually at the receiving end of the data. The network and its components generate information on how the network is doing, and that information is then transferred to network management systems for synthesis and display, usually at high levels.

From a services perspective, this layer is where service-level performance is monitored. It is where access to customers on service-level information is granted. If, for instance, a service offering includes giving customers direct access to real-time network information, making sure that information is current and accurate is just as important to the service as the performance of the network itself. The information in this layer, in other words, is the mirror into the service-level guarantee. Within this layer the following types of issues are addressed:

- Are there enough individual switches to handle the calls that are coming in over the various trunk routes?
- Where are the pinch-points in our network?
- What are the number of hits our servers are taking, and when are the peak times?
- Is the network configured properly and are the systems in place to handle a backup and recovery situation adequately?
- Are the routing tables in sync with the recent set of NNX additions?

14.2.3 Service management layer

At the service management layer, information at the product and customer service level comes together. This is where the systems intelligence resides for delivering information to all groups and all points, when and where it is needed. The goal in this layer is to make the connection between the performance of the service and the expectations of the customer receiving those services. Stated somewhat differently, service management exists to support the processes of service delivery and to create a positive customer experience. The issues the service management layer would address include the following:

- Where are the choke points in our processes?
- What points or areas within each of the processes are the most costly?
- Can we intercept problems with the customer experience before they occur? Can we stay a step or two ahead of what our customers know and need?
- Can we extract information about our customers and about specific products within our portfolio that can pinpoint problem areas or areas of improvement?
- How are each of the days needed to install a service spent? Where in the process can days be eliminated?

It is in the service management layer where the uniqueness of the telecommunications world comes into play. This is where the linkages we have discussed—at the systems and the process level—are either established or not.

14.2.4 Business management layer

The business management layer pulls data from all the layers below to answer questions pertaining to the overall running of the business. Companies pose strategic issues, such as what markets, what service categories, and what partnership arrangements to pursue, at this level. From a systems perspective the tools needed are the cornerstone business

applications—financial, accounting, product and revenue tracking systems, and administrative systems. Such systems could apply to any industry. The business management layer is positioned to answer these questions:

- Where are our greatest threats geographically, and where are our greatest opportunities?
- In what area of our business are we the strongest (or weakest)?
- How are the fundamentals of the business looking (revenues, margins, earnings per share)?
- How is the overall portfolio performing? What categories are strongest (or weakest)?
- How do we stack up against the industry metrics (number of employees, number of customers, and size of the installed base)?
- How are costs by service category distributed?

14.3 TMN and product development: where to focus?

Throughout this book, we have cited service delivery as the pivotal area for service development. The challenge comes in linking the pieces of service delivery together and meshing them into a workable system that can be carried out on a repeatable and sustainable basis. With TMN, however, we see an orientation not specifically aimed at development or delivery but rather, as the name implies, on the *management* of network services.

TMN does not offer an approach specifically aimed at helping developers work through the phases of new service development. Instead, it offers a way to classify the elements within both parts of the service solutions—the network service and the service delivery process. Once those elements are known, TMN has within it an approach that allows the elements to be linked so they function together as a whole (see Figure 14.2).

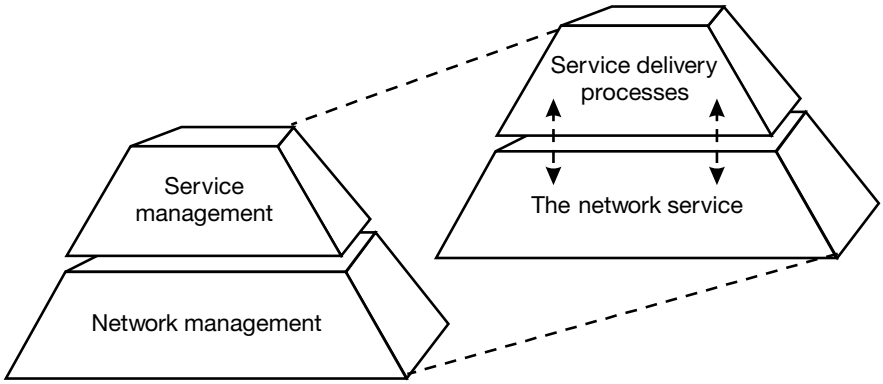

Figure 14.2 Product definition and TMN. (*Adapted from:* [1].)

14.4 Service management and service delivery

All the layers of TMN are important, but most providers are now focusing on the service management layer. The reasons for this focus include the following.

1. *Service management is implicitly about delivery processes.* The layers below service management, while essential to the delivery of service and to the operation of the network, focus on discrete aspects of the business. The systems and tools that operate the two bottom layers tend to rely on data that is only once removed from the source. Because of that, the processes associated with these layers are often less complex. At the opposite end, with the business management layer, processes are almost entirely systems-driven. The data in this layer is likely to be several times removed from the source, especially when it comes to service-based data. The functions that systems must perform at the business management layer are often associated with tabulation and analysis. In contrast, the systems at the service management layer must address the repeatable and sustainable functions of service delivery.
2. *The service is the solution.* Finding the right match between business objectives and layers is simple when a company is in a

specialized part of the delivery chain. For example if a business supplies transmission cable, it had better understand the element management and the network management layers. Similarly, a business that supplies network monitoring and management systems needs to understand not only the element and network management layers, but also the relationship of the information flowing between those two layers. For a business that delivers a managed network service, getting all the pieces right is part of the solution it offers; in fact, it is the biggest part. How well this end-to-end service delivery flow occurs is determined by how well the service management layer is engineered and defined.

3. *Service management is where all the linkages occur.* The creation of linkages between the network and the systems, the systems and the processes, and the processes to the people is determined in the service management layer of a business. If flow-through provisioning and full-service automation solutions are to be offered, they will be offered based on work within this layer. The linkages at this layer establish the value of the service. More importantly, because these linkages represent the human capital involved, they also determine the profitability of the service.

4. *Service management remains the least understood area.* Issues intrinsically become more complex the higher up the chain one goes. As the element and network management layers start to become more defined in most organizations, the next frontier is service management. Linking the parts and processes of service management and delivery into a well functioning system requires comprehensive knowledge about the daily operation of the telecommunications services business. Niche players may be able to know just a slice of the business, but a business that offers a managed network service must understand each of the layers.

5. *Connections to the outside will be determined at the service management layer*. The all-important linkages to the outside world will be determined within the service management layer. How proprietary or open this layer is relative to the other layers will determine how difficult or easy it will be for carriers to interface with

one another. Agreeing on the elements, their meaning, and numerous embedded process-related aspects will significantly affect the time frames and portability of solutions extending beyond the service providers' own environment.

14.5 Why look at TMN?

TMN may exist primarily as a model for systems and software developers, but the approaches found within TMN are ones that apply to many areas of the telecommunications industry. When TMN is combined with other development tools, organizations have a way to define and craft services that all groups can understand.

Looking at TMN alongside another approach such as the seven-layered telecommunications service development model reveals that constructs from different points of view can come together (see Figure 14.3). Layers for these models do not map directly, but the concepts travel in similar directions. For example, developing services at the higher end of the telecommunications services chain, where value-added services and full-service solutions appear, might require nothing new at the lower layers. The service's development might actually occur entirely at the service management layer. A good example would be MCI's Friends & Family® service, a product based entirely on billing capabilities linking customer calling records at a group level. The network service for this product was not new; the billing and packaging arrangements were.

14.6 Mapping the service definition and the service delivery process into TMN

The idea of mapping constructs applies to other aspects of development as well. Once the five elements of service—the facility, switched access, service, usage, and features—are defined, the job of translating those definitions into ones that work within the appropriate layers of TMN becomes easier (see Figure 14.4). It is similar with the seven customer-facing processes of service delivery. Once the process requirements have developed to a point at which each of the inputs, outputs, and flows are

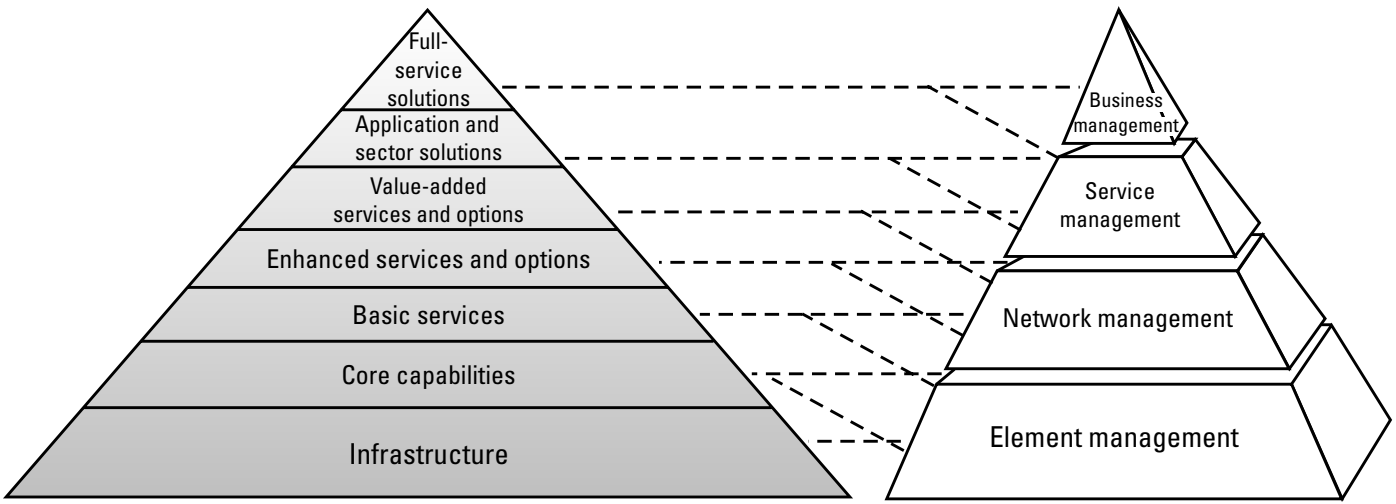

Figure 14.3 Mapping TMN to other models.

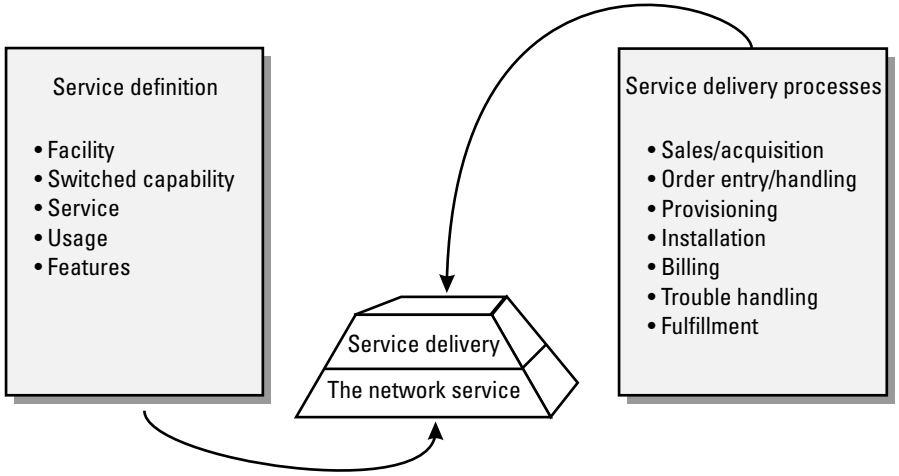

Figure 14.4 Mapping service parts to TMN.

defined, designing the processes at a systems level becomes more manageable. Data elements can be sifted from the input and output requirements documents. The logic, sequence, and interdependencies of steps can be extracted from each process and developed within the context of the systems architecture and process flow.

14.7 Impediments to progress with TMN

The value of models is that they bring order out of chaos, by organizing complex information in a way that is meaningful and easy to understand. Accordingly, TMN offers a way to understand where parts of the network and the service solution reside and where different systems or applications should reside. Somewhat ironically then, one of the criticisms of TMN is that it is too complex.

Implementation of TMN within the provider environment can indeed be complex, although the model itself is not. There are many reasons why TMN implementation has proven difficult. As is true for so many areas of the telecommunications industry, progress with TMN is tied to standards and agreements, and what is required to move TMN

forward in this sense is not happening any more quickly here than it is anywhere else.

Because the pace of establishing definitions and standards has been slow, some have questioned the role and value of TMN. A lot of work remains to define certain areas of it. Moreover, its acceptance within the industry has been far from complete. In some areas, in fact, resistance to the very notion of it has been strong. In summary, the following factors stand as impediments to the progress of TMN.

1. *Inconsistent standards:* Lack of standards is an issue with TMN, but the larger issue is inconsistent standards. In Chapter 13, we discussed that in the United States, access to incumbent systems is a requirement, but how that access is arranged has still not been completely defined. For practical reasons, this access has to be based on common standards, and standards, whether involving hardware or software, cannot be decided unilaterally. By necessity, standard setting has to involve vendors, equipment manufacturers, software and system developers, and service providers. Once standards are finally decided, implementation of those standards can serve as another source of problems. As so often occurs with vendor implementation of standards, consistency and timing can yield constant difficulties. Vendors may claim compliance with a standard when, in reality, they are only delivering a portion of the standard. Furthermore, vendors frequently implement options differently. In this environment, de facto standards determined by vendors holding positions of primacy in the market are often what rule.
2. *The fear of commodity status:* Some players are concerned with the amount of standardization going on within the telecommunications industry. With everything open and predefined, they fear, differentiation is lost. Arguably, this concern is most acute among equipment manufacturers, which worry that open standards will create a commodity market. For those providers and suppliers that recognize that quality can never be commoditized, this fear does not register. Standards are an inescapable part of this industry and are, in no way, at odds with differentiation. In fact,

TMN offers freedom from commodity status, as it fosters an environment in which systems are built around approaches that embrace technology insulation. With TMN, elements and functions can be kept separate from applications and from the systems that operate those applications. The agility that is gained can boost a provider's competitive position.

3. *Protection from privacy:* There is also the very real issue of privacy and how to protect it. Along with fear of commodity status is the fear in some areas of consorting with the enemy. This fear is playing out in resistance to standards and delays in reaching agreements. The need to protect certain types of information deemed strategic and confidential is a critical need and one that must be addressed before significant progress will happen. This is a concern that involves the regulatory, legal, business, and strategic areas of the telecommunications industry. Until these concerns are adequately addressed, progress will be seriously hampered.

References

[1] Adams, E. K., and K. J. Willetts, *The Lean Communications Provider: Surviving the Shakeout Through Service Management Excellence,* McGraw Hill, 1996, p. 28.

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Part VI

Preparing for Market

15

Phase 4: Into Development

We return now to the phases of the development cycle, which we last left in Chapter 11. There we determined that one of the payoffs of a good design phase is the ability of groups to work more independently. Unlike the previous phases that were characterized by a lot of analysis and deliberation, in this phase the focus is on building the solution. This fourth phase is more of a *doing* than a *thinking* phase.

As the design plan comes down from the shelf and work starts to spread across the organization, maintaining standards for quality across a broadening base of people and groups becomes the new challenge. Each of the parts that make up the solution must come together—but not just as a collection of parts. They must come together as a system of capabilities, operational methods, people, and practices.

Both a transformation and a transfer occur in this phase. The concepts and designs developed in the previous phases now transform into production-level capabilities. As part of that transformation, ownership

for the project starts to transfer from the development team to the parts of the organization that will eventually support the product.

15.1 The expanding role of project and team management

To manage a project successfully, a company must establish clear goals, drive an expanding team of people toward achieving those goals, and develop a project schedule in which all of that can happen. While greater independence for the groups involved is possible in this phase, the project's successful completion requires groups to work interdependently. This interdependency and teamwork is the job the project management team has to forge.

This is important because there is a natural tendency for projects to slow down as they increase in size. With more people and groups involved, communication paths have to extend further, and new issues will inevitably arise. Delays can be almost normal in this situation. The danger, however, is that if delays become too normal, the project will falter. After all, given enough time everything—including organizations, players, markets, and business goals—will change. Pretty soon, commitments change too.

It is not about trying to prevent change but rather reaching the destination point within a schedule that limits change. Success in the next two phases, of customer trials and commercial launch, is more assured when this phase stays within its original time frame. By focusing groups on a clear target—the customer trials that follow—the project can gain the momentum that it needs to carry it through to the launch.

Getting ready for the trials is a major focus of what occurs in this phase. As activities move closer to commercial launch, coordinating and setting in motion all the myriad details to prepare for trial and launch requires a supreme level of project management and control. Managing the project effectively requires that groups providing input to the schedule be as realistic as possible with their commitments and their time estimates. To complete projects involving an expanding roster of players, activities, systems, and markets, optimism is vital. Wishful thinking is a waste of time. The key to managing the project successfully is to find the

critical path. The schedule needs to be constructed around that critical path—whether it resides with systems, the network, a regulatory ruling, or any other element—and communicated to everyone involved.

15.2 When is a product developed? Establishing criteria for readiness

Each provider decides for itself what criteria determine the end of a phase. For this phase, the criteria intrinsically represent a provider's definition of what it means to be ready to support commercial service. Organizations define service readiness in many ways, but generally three areas are involved: First, the service must be capable of being delivered from the network. Second, the service delivery processes and systems must be functional. Third, the organization must be capable of performing all functions associated with regularly delivering and supporting the service.

The standards companies use to determine when a product is ready for market will be a combination of company-specific and product- or category-specific standards. Generating a clean bill or being able to process a service order through all the stages might be a standard all products must meet before being released. On the other hand, conforming to a certain type of network reporting or being able to support a specific network monitoring and diagnostic capability might be an expectation that only products in a particular category must meet. These criteria should be established at the start of this phase. Unless they are, there is no guarantee that all groups will be aiming at the same target.

15.3 The first level of readiness: delivering the network service

When a service is ready at the network level, it has been activated, tested, and documented. This means that all capabilities and features can be turned up within the network, that the service has been tested under a range of situations, and that all documentation has been developed. The readiness of a service also includes validating arrangements with other

carriers. The interconnection and other type of carrier arrangements specified in the last phase now have to be implemented, tested, and documented.

While this is a generic description that applies to any type of network service, the fulfillment of this description will vary considerably based on the service being developed. All telecommunications services emanate from the network, but as shown in the seven-layered model of telecommunications services development, project characteristics vary greatly depending on the layer in which a project is contained. Projects at the lower layers almost always require significant work at the network and infrastructure level, while those at the higher layers typically do not.

When a new platform is being introduced, every aspect of the project will be more complex and more lengthy. A company planning a new switching or services platform may need to form vendor selection committees. Vendors are often directly involved in the definition, design, development, and implementation phases of new products or capabilities. The time required to procure, install, activate, and test network equipment must be factored into the project timeline. For new platforms, these time frames often constitute the critical path.

For services higher up in the seven-layered model, readiness at the network level may require little more than developing new network procedures and ensuring that capacity levels are there to the support the forecast. In contrast, services at the middle layers may be based on platforms that are already there but will still represent services that are new for the company. Service introductions in these layers frequently require extensive development of network and software.

15.3.1 Criteria for readiness at the network service level

Once all network capabilities are activated, lab testing begins, starting with the provider's own network and equipment and progressing to include outside suppliers. The goal is to test as many suppliers of network services and equipment as possible. Clearly, covering all possibilities and combinations is not realistic, but incorporating as many arrangements into the lab test plan as is feasible should be the goal.

Ultimately, readiness comes down to preparedness, and the documentation developed at all three levels—network, service delivery, and

organizational—is a reflection of the company's level of preparedness. Documentation at this point, while preliminary, should nonetheless be substantive. At the network level, documentation should address technical design plans and standards, interface specifications, circuit layouts, and service and equipment arrangements. In addition, planning and engineering documents should be developed and proceeding through the final stages of peer review and acceptance.

15.4 The second level of readiness: delivering on the service delivery processes

Being ready at the second level occurs when each of the seven processes of service delivery—sales, order entry and handling, provisioning, installation, billing, network management and trouble handling, and fulfillment—can be carried out using the regular systems, people, and processes of the delivery chain. All of these functions must be carried out in an end-to-end fashion, with the hand-offs between information, tasks, and functions occurring as they will within a production environment.

Since service delivery is tied so directly to systems, readiness at this level typically comes down to the status of systems. With the possible exception of platform introductions, the critical path from this point forward almost always lies with systems. In this fourth phase, companies need to develop systems to a point at which service can be delivered, albeit on a limited trail basis.

Just like product development, systems development is a highly interactive process. Getting to where a system model functions properly can take several iterations of design, validation, and testing. Properly integrating the pieces requires a series of *joint applications development* (JAD) sessions, in which different systems platform groups come together to review the development and design approaches being used. Sessions like these ensure that development, modeling, applications, and integration testing are occurring within the context of an end-to-end systems view.

Systems integration testing must cover every stage the service order will go through: ordering to installation, billing, and post-installation follow-up. Once the systems groups have completed testing, user groups

become involved. User groups are normally involved early on with modeling screen formats, validating information, and verifying process logic. At this point in the cycle, companies issue test orders that simulate actual situations using preproduction systems. Final approval on whether these systems are adequate to proceed into trials should come from both the user groups and the systems groups.

15.4.1 Criteria for readiness at the service delivery level

As in the network service level, readiness at the service delivery level is determined through activation, testing, and documentation. Service providers must activate and test systems and processes to function in the way needed to support the service. In addition, they must document systems and processes for user organizations and systems organizations.

All seven processes should be in place before a company moves to customer trials. In actual practice, however, that does not always happen. When market demand for a new service is building, pressure to begin trialing before all areas are in can be intense. Deciding to trial with parts of the process missing is not a wrong decision if those parts can be worked around and if arrangements are made to cover those areas later in the trialing period. Billing capabilities may not need to be fully in place at the start of trials, as long as they will be by the time the trial concludes. At minimum, customer trials should not begin until processes for order handling, provisioning, installation, and trouble handling are in place. Working around these processes may be possible, but the value of a trial is questionable without them.

The documentation in this area will be a good indicator of how thoroughly service delivery is understood. Accordingly, service providers should update process maps to reflect the processes, systems, and functions as they are expected to occur. In addition, companies should develop general business practices, along with methods and procedures documenting how the service will be sold, ordered, provisioned, installed, billed, and repaired.

The user groups that will be supporting the service once it is introduced are those that determine whether to go forward. This

determination depends on the confidence these groups have with the systems they will be using and on whether the information they are receiving from systems and other groups is solid enough to allow them to carry out their roles effectively. This determination will also be based on whether groups believe they have the know-how to install and maintain the service properly.

15.5 The third level of readiness: organizational preparedness

Again, one of the objectives of this phase is to start transitioning ownership from product development to the departmental groups supporting the service. Succeeding in this objective requires a delicate balance at the project management level between empowerment and control. Ownership of the *project* still rests with the development team, but the expanding scope of project deliverables dictates that control be handed to the groups that will eventually support the service.

Being ready at this level means several things: Departmental plans for staffing, training, and procedure development should all be well along. Each department must now adapt the general practices, methods, and procedures developed for the service for their own specific use. In addition, service providers now finalize marketing decisions on how the product will be priced and offered. They must also prepare the external environment. The analysis of regulatory requirements begun earlier is now completed—tariffs are modeled, filing schedules are established, and filings are made.

Much of the focus in this third area is on planning for the last two phases. Launch plans become firm. Markets and the sequence of implementation are finalized. Marketing and sales groups complete the communications and training plans conducted in the final phases. In addition, the detailed analysis necessary to set final pricing, revenue targets, and commissioning schedules gets under way. Channel plans are finalized and work with outside vendors is coordinated around the scheduled launch plan.

15.5.1 Criteria for readiness at the organizational level

All of this leads to the organization deeming itself ready to begin commercial trials. Given the growing number of groups involved, as the product nears the implementation stage it usually becomes necessary to hold a series of *all-hands* meetings. These meetings guarantee a way to track deliverables and progress and to make sure understandings remain in check. Pulling all disciplines together at regular points facilitates faster turnaround and ensures that issues are not being overlooked. It also builds momentum. The specific focus of these meetings is to ensure each group has prepared itself to support the trials. These preparations and support plans are, in fact, the main criteria for determining readiness in this last area.

15.6 Phase review: exit criteria for Phase 4/ entrance criteria for Phase 5

Phase 4 aims to develop the product within the network infrastructure and the service delivery infostructure to a point at which commercial trials can begin. It also prepares the organization to support a commercial service. Before proceeding to Phase 5, service providers will have successfully installed and tested all features and functions within an actual network setting. In addition, they will have verified capacities as capable of supporting the initial sales forecast. Similarly, companies will have verified that service delivery functions work in the manner outlined in the design phase or as agreed to by a consensus of user-level organizations and product development and systems development personnel.

The criteria established in each of the three areas will be the basis for determining whether the project proceeds to the next phase. Departments should provide some form of formal consent indicating their ability to support the trials that follow. Table 15.1 summarizes Phase 4.

Table 15.1

Phase 4 Summary Development

Develop Network Service	Develop Service Delivery Systems	Develop Other Deliverables	Develop Market and External Deliverables	Conduct Final Review
Prepare network; procure equipment and software; activate and test service within network	Develop and trial use-case and other prototype models; place simulated test orders	Develop departmental support plans; staffing, training documentation, methods/ procedures	Finalize pricing	JAD review for systems
Coordinate with outside vendors and suppliers	Develop integrated systems and JAD plan	Develop and document departmental procedures	Model and schedule tariff filing plan	All-hands walk through
Develop engineering guidelines and documentation	Develop systems and process documentation		Finalize communications plan	Implementation authorization (to proceed to trials)

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Phase 5: Implementation and Trials

How do companies ensure that only services of high quality are being introduced? Clearly, a significant part of doing so lies in properly defining, structuring, and developing the service. At this point in the cycle, however, with all of those aspects already decided, quality will be determined by the way a provider implements the service into the market.

Implementing quality services across a landscape that may stretch for hundreds or even thousands of miles is no easy task, which is one of the reasons why the commercial trials in this phase are so important. Trials determine whether the service will work in the way it should and whether the organization can support the service in the way necessary. Moreover, trials provide companies with essential information on what they need to introduce the service properly.

This is important because how products begin life can determine much of what follows. Products that start off with technical difficulties can create lasting problems for companies. The negative impressions that are created can stay around long after the problems get solved. Products that get off to a good start, on the other hand, enter life with a built-in advantage. These are the products salespeople want to sell and that customers want to buy. Furthermore, they are the products that build confidence and pride in a company.

16.1 Building quality in

Because this initial period is so important, companies need to do everything they can to make sure quality is being built into a product at every level. Not only must the product be technically sound and commercially viable—functioning as it should and delivering the capabilities sought by customers—its introduction and support plans have to be sound as well.

Companies that build quality into their products view a product and its implementation and support plans as a whole. They take responsibility for integrating all the elements into a coherent system—a system that functions to deliver the product effectively *and* to deliver outstanding value to customers. These products have something more than quality; they have integrity.

How do companies build in this level of quality? The answer once again lies in having a managed process and in having a system made up of checks and balances. The road to commercial launch has to include mandatory stops that check a product against criteria all products must meet. Chapter 15 briefly discussed some of those criteria as well as what it means to be *ready*. At that point, however, readiness was cast in terms of what was needed to move into customer trials. While the criteria for supporting customer trials corresponds to what is needed to support a full-service implementation, the two are not identical. For one thing, the experience of customer trials can alter the criteria for readiness, causing the criteria to become more refined. Another issue that must be considered is scale.

The challenge in this phase is to translate the experience of customer trials into a plan that can be scaled across an entire service area. Service

providers need a system within a system, one that takes over once the service is developed. The project's needs have changed. The project now takes on a different focus, with many more groups involved, and functions and coverage areas rapidly expanding and converging. Keeping all of this straight is more a matter of effective project management than it is effective product development.

That is not to say that the players or the management of the development effort have to change, although they sometimes will. It means that as the characteristics of the project change, the approach to managing the project must change. The previous phases focused on crafting the solution and on ensuring that the elements of the service were present and could be arranged and delivered as a system. In this phase, the focus is on crafting a tactical and logistical plan to deploy the service across a broad service area.

16.2 Customer trials

Before going into the details of the implementation plan, we will examine the other aspect of this phase, customer trials. Trials are not just limited to this fifth phase; they can happen any time. Indeed, it is best when they happen early and often. Many service providers now wisely push for prototypes within 90 days of project initiation. Early prototypes eliminate speculation and help reveal issues more quickly. Concepts that do not make sense can be weeded out before costs start to mount. Most of all, though, organizations gain valuable experience by prototyping concepts early on. The benefits of this experience extend into every stage of the project.

In Phase 5, however, the trials have a different purpose: They determine whether the organization is ready to support a commercial service. These dry runs often point out significant problems a company must address before going commercial.

Customer trials hold up a mirror for the company to see how it is doing. They also dovetail naturally into the implementation planning part of this phase. The information that trials provide feeds directly into the detailed implementation plans each department is now responsible for producing.

16.2.1 Types of trials

Like every aspect of development, the type and extent of trials is determined by what is being introduced. Testing and trialing are often limited when a service introduction involves only an enhancement to an existing service. New capabilities and platforms, on the other hand, involve more extensive testing and trialing.

For new services, two types of trials are normal. *Alpha trials* install services into simulated customer settings under a variety of situations. Once installed, these services are tested against a call test bed to ensure that all call types and as many network scenarios are being checked as possible. Alpha trials use the same systems, personnel, processes, and procedures that will be used once the service is introduced. While systems at this point may be *preproduction,* they should still be able to support all the stages an order will go through once it is commercially introduced.

In alpha testing, groups from within a company may be established to play the part of customers. Such alpha test teams evaluate the service and the individuals and groups involved. These teams are responsible for providing feedback and a full read-out once the trial concludes. Other times, companies will use outside sources to conduct the alpha trials. Outside sources offer benefits such as greater objectivity, measurability, and control, but if the source that is used does not have the right experience or trust of people within the organization, benefits can quickly disappear.

Beta trials, in contrast, install services into actual customer environments. Customers agree beforehand to the terms and conditions of participating in a trial group. Such terms and conditions usually include agreeing not to hold the company liable for delays or difficulties in the installation and providing feedback at points along the way. In exchange, customers usually receive a grace period of free service or service at reduced rates.

16.2.2 Commercial trial read-outs: determining departmental readiness

Verifying that the service works and that each of the seven service delivery processes can be carried out is one measure of readiness trials can produce. However, if companies want to ensure that they are properly prepared for supporting a commercial service, they need more rigorous

measurements than simply surviving a trial. The following are issues companies must understand, resolve, and measure before moving into the final phase of launch. (The alpha and beta trials provide data points on many of these areas, but going through the process of considering these issues specifically is still necessary.)

- At the *network level,* it is necessary to determine the following:

  Did the service work as expected?

  Were any issues or dependencies identified that could cause the service to perform improperly in certain situations?

  Did all features work properly?

  Could all call types be completed?

  Were difficulties with feature interactions or with other equipment or network services encountered?

- At the *service delivery level*, it is necessary to determine the following for each of the seven processes:

  Were sales and service representatives able to accurately complete the service order and any work orders that resulted?

  Was the company able to install the service using the information provided through the sales and ordering process?

  Once an accurate order was developed, were systems able to process that order through all the stages?

  Was information passed correctly between systems?

  Did the systems reject inaccurate orders?

  Did the systems in each specific area perform their functions properly?

  When a planned or unplanned outage occurred, were personnel, systems, and processes functioning at the level needed?

  Was the company able to generate an accurate customer invoice?

- At the *customer level*, it is necessary to determine the following:

  Did customers voice any specific or recurring problems?

  What ratings did customers give the service experience?

  Were groups able to resolve network problems quickly and effectively? If so, were they able to do so within the committed time frame?

  Did the invoice satisfy the customer?

- Other factors that should be considered include the following:

  Were dealings with other carriers handled properly? Did the arrangements go in on time and as agreed?

  Was the documentation accompanying the product clear and accurate?

16.3 Developing the implementation strategy

The typical implementation strategy for introducing a new service can involve thousands of elements coming together at close to the same time. Even with an implementation involving relatively small service areas, lining up the pieces so that they arrive at the same point at the same time can sometimes resemble a *pinzer* military attack plan.

Many activities have to come together within an implementation plan (see Figure 16.1). By this time, the repeatable and sustainable processes of service delivery have been in the planning and development stages for several phases. Implementation for these areas, therefore, normally becomes an extension of work going on for probably several months. For other areas, involving processes that are not repeatable, the scenario is different. The activities associated with regulatory and communications planning, for instance, will only be carried out once for each commercial market launched. Once these plans are executed, unless things change, the work is finished.

The project management function, which is embedded into the role of product development, makes sure that each area involved in the

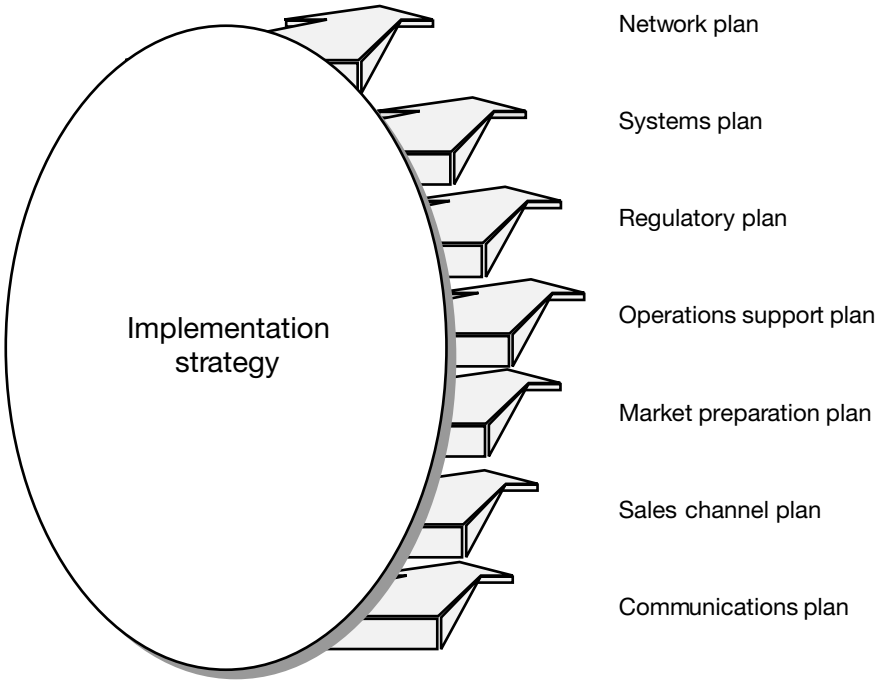

Figure 16.1 Area plans within the implementation strategy.

implementation has developed complete and logical plans and that each area is on track to implement those plans on schedule.

16.4 Area-specific implementation plans

At this point, a person within each area needs to act as a facilitator and coordinator, adding value by tying the pieces together. Working with lead personnel from each area, the focus of the project is to coordinate the plans and to ensure that all the plans reach the destination point in the right order.

Implementation plans in each area should address specifics—the what, when, and where of staffing, equipment deploying, release schedules, systems schedules, and scores of other details. Each plan needs to be made into its own project schedule, managed by the lead in that area.

Area plans then roll up to the project delivery schedule, which is managed by product development. These plans should include the following:

1. The *network plan* outlines all details for the deployment of the network—what equipment will be delivered, what capacities will be available, and where and when this will happen. Specifics on switch releases, upgrades, and software loads are identified in the network plan, along with any interconnection or special build plans. The dates these elements will be delivered and all network-wide translations completed is part of this area's project schedule. This plan also outlines the operational support program for the network and for network engineering.
2. The *systems plan* also details deployment schedules—what equipment will be delivered, what applications systems will be available, and where and when this will happen. In addition, the systems plan includes the dates systems will be installed, tested, and released and dates and details for completing systems-level training. The systems plan also outlines any systems and staffing support programs.
3. The *regulatory plan* includes sample tariffs for each service area in which the service will be offered. The regulatory plan consists primarily of the schedule of filing dates by locations along with any area-specific considerations that need to be followed. The schedule identifies expected intervals for tariff approvals and regulatory contacts by area.
4. The *operations support plan* outlines tasks, deliverables, dates, and owners associated with operational support requirements. These requirements will be developed as a result of the supportability review meetings (discussed in Section 16.5). Staffing and training, equipment deployment to the field, operational support functions and procedures—and the dates they will be brought to closure—are detailed within the operations support plan. Together with the network plan, the operations support plan ties the network support functions into a single support arrangement.
5. The *market (and product) plan* defines global plans for the product and outlines how those plans will be deployed into specific

markets. This plan is used to define sales and revenue forecasts for the product overall and for each market area into which the product will be sold. Final pricing and introductory promotions for each market and any special conditions, rules, or arrangements are detailed here as well. The market support plan, which outlines requirements for training and branch office support, is also part of this plan.

6. The *sales channel plan* outlines the launch date and the specific launch plans for each channel. Plans for staffing, training, commissioning, and support are detailed here. In addition, the plan establishes sales and revenue quotas by channel a list of area contacts and coordinators.
7. The *communications plan* outlines the promotional and advertising plans for the product. This includes any public relations activities and press releases, advertising campaigns for print and other media, and sales collateral. The communications plan also details an agenda for external communications and any internal communications for the company, its field units, or branch offices.

16.5 Checkpoints and supportability reviews

Experience shows that it often takes reaching the implementation and trials phase before the work involved in introducing a service gets the attention that is required. The transfer of ownership begun in Phase 4, from the product development team to the specific departments and line organizations, is an objective of Phase 5 as well. The two elements of this phase—which involve conducting customer trials and carrying out the detailed implementation requirements within each area for product launch—force individual departments to step up to the work involved in preparing for commercial service.

To manage the implementation and launch effort effectively, a company must assign representatives from each of its work areas. These representatives, which are discussed further in Chapters 18 and 19, must take ownership for all activities in their areas. This need can be most critical in engineering and operations, areas that are particularly prone to

problems. The functions associated with engineering and operations are large in number, and they involve large geographic areas. Difficulties can be exacerbated by organizational structures that do not bring the engineering and operations areas together until the vice-president level or even higher. Furthermore, solutions to engineering and network operations issues often require numerous groups within each of these areas to work together. The issues involved can often be complex, and without a facilitator who can cross into the different areas, agreements on solutions can be hard to reach.

Operations supportability reviews are one way to pull these areas together. Periodically holding supportability or checkpoint reviews that are led by a facilitator provides a forum to resolve issues that cross multiple organizations. These reviews, which typically begin in the fourth phase of development and continue until the actual launch, keep understandings in check and ensure that progress is on track.

16.6 Phase review/summary

The objectives of this phase, which are summarized in Table 16.1, are to complete a series of successful customer trials and to prepare departments for implementing a service commercially. A customer trial can succeed on the first try, but it may take several tries before a service performs satisfactorily in a trial. The key to success is having a managed process that measures the experience of customer trials against criteria that all products must meet.

The same is true for implementation plans. Each department should produce a detailed plan, with dates, owners, and deliverables, outlining what it must complete to implement the service in its area. The schedules that underlie each of these plans are used to create the launch strategy and plan, discussed in Chapter 17. The decision to move into the sixth and final phase of launch is based on the successful outcome of the customer trials and the successful completion of each of the area-specific implementation plans.

Table 16.1

Phase 5 Summary—Implementation and Trials

Prepare for Customer Trials	**Conduct Customer Trials**	**Develop Area Implementation Plans**	**Develop Implementation Strategy**	**Conduct Checkpoint Review**
Establish trial criteria (customers, locations, and measurement criteria) Review/verify roles and activities	Alpha trials and read-outs Beta trials and read-outs Additional trials (as needed)	Network Systems Regulatory Operations support Market preparation Sales channel Communications Develop initial area checklists	Coordinate and verify implementation plans by area	Operations supportability reviews (by area) Departmental approval to proceed to launch

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17

Phase 6: Launching the Service

What must service providers do to ensure that a product's critical first months go as smoothly as possible? Part of the answer lies in the launch plan itself. The other part lies in the less visible areas that come immediately after the launch.

Showcasing a product is an important part of the launch effort. Giving a product a good debut creates excitement in the market and is the just reward for a well-run development effort. However, if a successful launch is not backed by a well-orchestrated support plan, any benefits can go quickly down the drain. If the organization is not properly prepared, or if there is an air of confusion surrounding the product, customers and salespeople will quickly grow cynical.

To do Phase 6 properly, companies need a tight tactical plan—a plan that brings together, for each market, the right pieces in the right order and the right alignment. In addition, they need a support plan that ensures that the product is being closely monitored in its critical early months. In

the end, preparedness and attention will be the primary ingredients for success in this initial period.

17.1 Determining the launch strategy

In Phase 5, we examined the area implementation plans that each group is responsible for developing. The area implementation plans define the work needed in each area to support commercial service. During Phase 5, these plans are not tailored to any particular market; they are developed at a global level. At this point, companies need to bring these plans down to the individual market level.

The strategy in this phase then is operating on two levels, a global level and a local level. Area plans need to be worked into an overall launch strategy, but plans also need to be particularized for each local market, with *local* meaning the actual market locations where the service will be introduced. In that sense, all launches—just like all politics—are local. Waging a successful launch effort involves taking the global perspective and adapting it to the needs of specific markets.

17.2 Determining the launch sequence: where to launch first

Many factors—including geography, regulatory conditions, market conditions, and sales and distribution channels—weigh into the decision on where to launch and in what order to launch. Often the key factor in determining the launch sequence and strategy is the size of the service area being addressed. Service areas can be as large as a country or a state or as small as a city or a single switching node. However large or small the affected service area may be, the plan needs to be adapted to that scale and level. See Figure 17.1.

With the growing number of people and groups involved in the development process, half the battle of waging a successful launch comes to keeping the plan under control. Trying to coordinate and consolidate the separate schedules of the twenty or more groups involved in the typical launch plan can quickly turn into an impossible task, not only for the

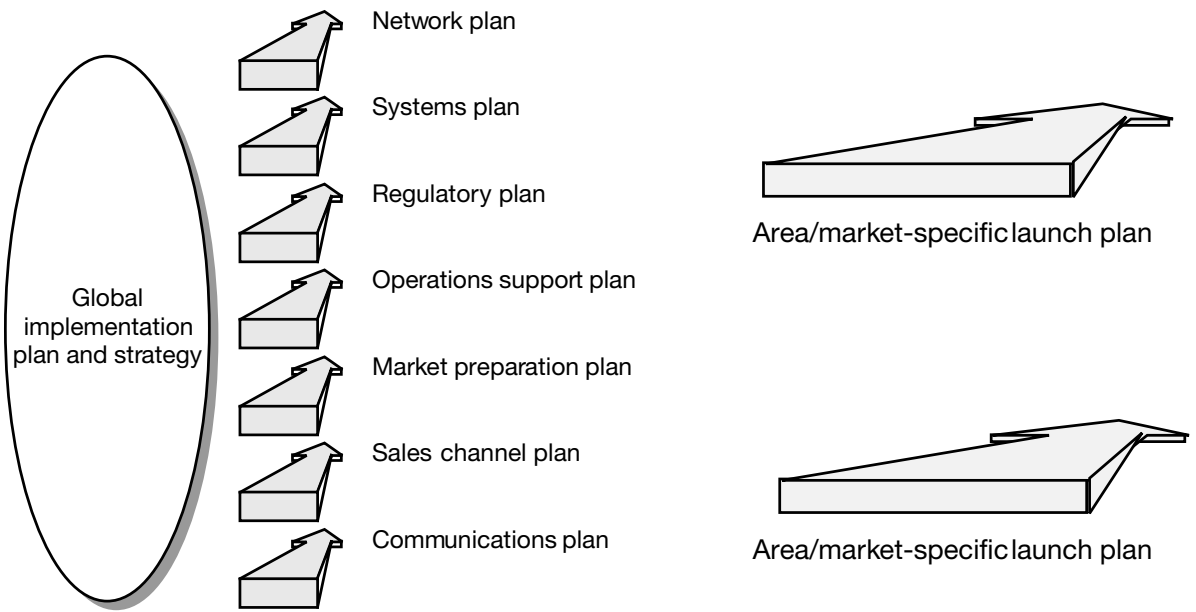

Figure 17.1 Global to market-specific implementation plan.

person trying to arrange the schedules but for the groups that must perform the work.

Trying to juggle issues such as the following often leads to the decision to launch a service through a staged introduction plan.

- Can certain aspects of training overlap, or can they at least be shared?
- Can vendors be at various sites at the same time, or must visits be staged to each location in a serial fashion?
- Where do resources need to be at different points?
- What is the status of the different regulatory approval processes?

Most service providers would prefer to launch under a single *flash* schedule, in which all markets get turned up at once. Such a schedule is more efficient for the customer as well as for the provider. All groups get the same information at the same time, and costs and confusion are minimized. For many projects, however, flash introductions are simply not practical. Either because the service area is too large or because multiple distinct markets are involved, the scope of work becomes too much to handle all at once.

17.3 Localizing the launch plan

Just as service providers would prefer to launch the service in all markets at once, most would also like to launch the same service in all markets. It certainly would make life easier to offer a single service—with the same pricing, packaging, and operational characteristics—in every market in which it was being offered. Unfortunately, however, the realities of the telecommunications marketplace rarely make that possible. Between the different regulatory environments and the different market factors in each area, most services have to be customized somewhat for each market into which they are offered.

This is not as true for long-distance services as it is for local services and for most types of international and wireless services. In spite of what the future might hold, the telecommunications market is still a

patchwork of balkanized states, in which different rules, regulations, and prices apply. Adding to this uneven regulatory landscape, each market has its own competitive factors that must all be addressed. Making things even worse, the way in which the service operates and is therefore implemented varies by service area as well, since switching and service platforms for the same generic service can vary by service area.

The local launch plan must address these market particulars. Moreover, to manage the product on an ongoing basis once it is introduced, companies must stay current on these market-specific factors. Service platforms are upgraded, regulatory environments evolve, and market conditions change. All of these changes must be managed after the product is launched. Pricing, in particular, can be a highly active area, especially for certain kinds of services. For international services, keeping the different country plans, rules, and pricing current is much more than a launch activity, it is a way of life. These in-life management responsibilities will be examined in Chapter 21.

17.4 Swat teams and market operations

Whether the service area involves a state or a country, a province or a city, implementing these many area launch plans can be a highly resource-intensive effort for most companies. That is why some providers have established centralized market operations groups. Working with the area or local branch support functions, these groups ensure that all aspects of the implementation and launch plan are being covered. They collaborate and coordinate with the local groups on activities such as training, equipment delivery, regulatory filings, and communications planning.

This type of arrangement is often the only way to introduce a new service into a series of markets in quick succession. Not only is it more efficient, it improves quality. Trying to become skilled at something that is only performed occasionally is hard to do. Market operations groups can efficiently convey expertise about the product and the implementation requirements for that product to the local groups. This transfer of knowledge ensures a level of conformity and quality for the service and for those who support it.

17.5 Market certification

To handle all this rapidly expanding work, companies need to have a process to handle the details associated with getting individual markets ready to launch. *Market certification* is the process by which launch activities are monitored and tracked through to completion. It is also the process by which a company manages its quality standards. The idea behind market certification is that all markets should be at a consistent level of preparedness—in terms of centralized functions and local support functions—before the launch of a service.

The area implementation plans developed in the last phase must include launch checklists. These checklists identify all the tasks, activities, and deliverables that will be due from each area prior to launching the service in any specific market. Taken together, the checklists from all areas represent what is needed to render a market *ready-to-launch*. Summarized below are examples of the types of items that might appear on area checklists.

1. *Network/Infrastructure:* Integrated call testing plan complete; personnel trained; and procedures development complete. In addition, capabilities and correct quantities installed, tested, and working for the following areas:
   - Switching equipment;
   - Interconnect arrangements;
   - Local transport (hub or local equipment connections);
   - Data terminating equipment.

2. *Systems:* Integrated systems testing for targeted market complete; users trained on equipment and OSS procedures. In addition, deployed into each market, tested and working:
   - Server or processors;
   - Networking equipment and networking arrangements (LAN and internet/intranet services);

- OSSs conditioned and released for local market:

  Acquisition/prospecting/proposal and pricing;

  Order entry/order handling;

  Circuit provisioning/central services provisioning;

  Field operations installation and support systems;

  Trouble reporting and dispatching systems;

  Service bureau and customer care systems;

  Billing and accounts receivable systems.

3. *Regulatory:* Tariffs filed, with approval targeted to coincide with launch date. Tariff rates and effective dates coordinated with billing and financial systems.
4. *Operations support plan:* Supportability review meetings scheduled and completed. Test service successfully installed. Local operations and support personnel staffed and trained to support the following:
   - Customer care (order entry and order handling; service bureau functions);
   - Network provisioning;
   - Network engineering;
   - Field services installation and repair force;
   - Second- and third-level field and engineering support;
   - Trouble management and field dispatch.
5. *Market (and product) preparation plan:* Product conditioned and priced for local market. Area-specific product characteristics defined. Product and market support plan communicated.
6. *Sales channel plans:* Sales channels staffed and trained for new service. Pricing tools and design tools in place. Compensation plan

finalized. Product introduction or kick-off meetings scheduled and held. Documentation and sales collateral issued to channels.

7. *Communications plan:* Advertising plan finalized; drop dates scheduled. Public relations and external communications plans developed and scheduled. Internal communications plans developed and scheduled.

While each department or area has initial responsibility for developing its own checklist, the final contents of these checklists should not be entirely department-driven. Checklists should represent a level of quality and consistency driven by the *organization*, not by individual departments with their own notions of what quality represents.

17.6 Prelaunch countdown

The items on the area checklists will be the subject of a series of prelaunch countdown meetings that typically begin 60 to 90 days before the scheduled launch. As the launch date draws near, the final checkpoint for deciding whether to introduce a product should come in the form of a test order issued into each area. Since the alpha and beta trails that occurred earlier probably involved only a couple of select markets, placing a test order into each market ensures that local area personnel have an opportunity to participate in an actual service installation. This guarantees that the procedures, systems, and training that are all part of the area implementation and support plan are verified before an actual customer situation is encountered. Successful installation of the test service, along with completion of all items on the checklist, serve together as the final checkpoint for launching into a market.

17.7 Phase 6: summary

Unlike the phases that came before, the final phase of launch brings the project down to the tactical level of deployment in each of the service areas. This phase is complete when all market certification criteria have

been met and when all departments, through their department heads, have formally approved supporting commercial service in a particular market. Table 17.1 summarizes Phase 6.

Involvement will be at its highest level when the first few markets are launched. Depending on the launch schedule, launch activities may become more routine as each subsequent market is added. That can be one of the benefits of a staged launch sequence. As the launch plan is repeated for each new market, the launch process improves.

As we will discuss in Chapter 18, the final decision to launch may be deferred to a higher level review board. Also, any work carrying over after the launch will be addressed as part of a series of post-launch reviews, considered in Chapter 21.

Table 17.1

Phase 6 Summary

Coordinate Launch Activities	**Develop Area-Specific Launch Plans**	**Initiate Market-Certification Program**	**Final Launch Decision**	**Launch Individual Markets**
Finalize market introduction sequence	"Localize" launch plans for each market	Define launch "readiness" criteria	Obtain departmental approval to proceed	Execute launch plan, carry out launch activities in each market
Coordinate activities by area to market introduction schedule	Coordinate area-specific activities to each market	Finalize area checklists	Receive senior-management approval to proceed	Identify all carry-over activities for post-launch review
		Develop certification schedule and manage areas to completion		
		Issue and install test orders to target markets		

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Part VII

Product Development Inside the Organization

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18

Organizing for Product Development

If you ask any CEO the question, "How important is product development to your company's success?" chances are the answer will be "very." But if you then ask, "Where does responsibility for product development reside?" there is a good chance that details will be scant. There may be a name or two mentioned, or a couple of departments identified, but specifics on how products are developed are not likely to be quickly forthcoming.

Not surprisingly, then, if you go the level where product development is actually carried out and ask the question, "How good is your company at developing new products?" you are likely to hear "not very." If you push for reasons, chances are that you will hear at least one of the following responses:

1. "No one is clearly in charge."

2. "There is a lack of commitment and focus about product development."
3. "The organizational structure is not set up to support the functions."
4. "There is no clear process."

So far, we have discussed in detail this last area—the need for a clear development process. Just as important as having a clearly recognized process for development is having an organizational structure in which that process can effectively be carried out. When the right levels of the company are involved, overseeing and contributing to the process of development, and when the right groups are in alignment with one another, the development process is far more likely to produce the kind of results that most companies expect.

18.1 Structure follows strategy

Anyone who has been around the telecommunications service provider environment awhile knows that product development as an organizational entity is still a relatively recent phenomenon. Not so long ago, development in many organizations was just one of the things for which a marketing department was responsible. Along with the four Ps—product, price, promotion, and place—just about every aspect of a product, from development to introduction, maintenance, and eventually retirement, fell within a single marketing group's charter.

Then again, the telecommunications service environment of the not so recent past wasn't exactly a hot bed of product innovation either. All that is now changing as telecommuniations companies focus on the growing imperatives of effective market and product planning. Those companies that have committed themselves to a particular product strategy know that their organizational structures have to follow their strategies. If the strategy is to enter a large number of markets rapidly, a structure to cover the targeted areas had better be in place. On the other hand, if the strategy is to go deep into only a few areas, the expertise and structure for that to happen had better be there as well.

18.2 Taking inventory

As we discussed in Chapter 17, many service providers have set up groups such as market operations to go *on location* when a market is being turned up. Others have established separate swat teams to deal with channel issues specifically. Approaches such as these can assure the front lines of sales and distribution much better support than they would otherwise receive were they to rely solely on groups from headquarters such as product management or product marketing.

The point is, to be successful with development, companies have to recognize the activities that are involved in designing, developing, and introducing a new service. Providers need to be specific as well as realistic about what each group and function is responsible for delivering. Expecting more from a group than it is capable of providing only degrades an effort. Moreover, being too general or failing to understand the activities that are a normal part of the development cycle only positions a project for failure.

18.3 Product development: bringing order to disorder

So far, we have described product development as a strategic management process, as a series of defined phases, and as an organizational learning process. Within all of these perspectives, the message has been the same: To perform development effectively, companies must adopt a disciplined process—a process characterized by standards and, to some degree, standardization. This discipline is reflected in the practices, in the criteria, and in the organizational structures that support the process.

This discipline is quite important, as development is a business activity that can be naturally beset by disorder. A disciplined approach that has some level of standardization is not a backdoor attempt to create bureaucracy but rather a way to create order. Given the growing disorder within the industry, having that order on the inside becomes essential.

While maintaining order and discipline are important, staying competitive also requires speed and agility. The companies emerging as world-class recognize that this need for speed and agility cannot interfere

with the discipline required to do the fundamentals properly. Accordingly, these companies have learned how to successfully strike a balance between discipline and order, and speed and agility.

World-class service organizations have learned how to successfully strike a balance between discipline and order, and speed and agility.

18.4 Product development as an organizational entity

By now it is probably clear that development is perhaps the most matrix-managed of all business activities. By the time a development project runs its course, just about every department, group, and function within the organization will, at one point or another, have been involved. The challenge organizations face is finding an approach that enables such a large number of groups and disciplines to function in a way that produces good and timely results.

Certainly, establishing a product development function is an important first step, but it takes more than naming a group to create an effective development function; it takes leadership and leadership coming from the right levels. To tie the pieces and the process together effectively, the right groups *and* the right levels must be invested. Both have to be invested in the process as well as the outcome.

18.5 A higher order

Forging solutions to problems that cross jurisdictional boundaries is where some of the greatest difficulties with development lie. As is often the case in matters involving jurisdictional boundaries, it will frequently be up to the local authorities to determine who is in charge. All of this is made more difficult by the direction in which many companies are now moving. As companies grow beyond their traditional borders to broaden

their reach and scope, organizations are becoming more and more fragmented. Instead of resembling a unified nation, many are operating like a collection of independent states.

This fragmentation can cause problems all around, but for development, where communication and cooperation across groups is so critical, the problems can be particularly acute. Without a higher level authority, attempts to forge agreements crossing divisional or even departmental or group boundaries can turn into a lot of wasted time and effort.

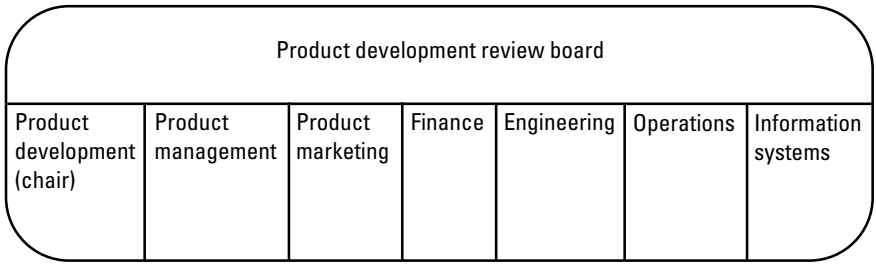
18.5.1 Oversight and control

Expecting managers at the first or second level of the business to forge agreements with projects that involve multiple divisions or vice-presidential groups is not realistic, yet that is the implied expectation inside many provider environments. In some provider environments, product development has become so overdelegated, and senior management so far removed from the operational levels of the business, that even when these levels are asked to help, they are often unable to add much value.

Setting the stage for cross-organizational collaboration may be the single most important step senior management can take to stimulate effective product development within their organizations [1]. Breaking down the barriers that exist across organizations, building consensus around common goals, and creating a collaborative work environment are the ways in which management teams actively involved in the development process add value to their organizations. For the process to function effectively, senior-level involvement cannot just come in at the extremes, when a crisis is looming or a success is ready to be celebrated. Oversight and control have to be a regular part of the process.

18.5.2 Senior-management project review board

Guiding the process of product development and shaping projects along the way is the function of senior management. Those companies that have established senior-management review boards are way ahead of the game in this regard. Typically comprised of vice-presidents from each of the key areas (see Figure 18.1), these review boards exist to provide regular



Senior development review board:

- Sets the strategic product direction, establishes priority, and evaluates opportunities;
- Reviews projects on a periodic basis and at the completion of each phase;
- Provides approval for continuation into the next phase (phase gate);
- Authorizes and aligns resources to match project;
- Oversees project efforts to ensure that similar projects are handled in a similar manner;
- Resolves cross-functional and cross-organizational issues.

Figure 18.1 Senior review board.

oversight to a project. They actively work to resolve open issues that cross areas and contribute regularly to the quality of decisions made.

Officially, these review boards act as the formal gating point, either providing a project with the go-ahead to proceed to the next phase of the cycle or remanding the project back to complete work still required. However, these review boards' greatest contribution may stem from their less official acts. By working through the real-life issues involved in getting the organization to function as an integrated unit, these review boards create an environment in which teamwork is visible and actually works. This becomes an important indicator of how successful the company will be with product development. As one member of a development effort recently put it, "If senior management can't master the issues of product development as a team, how can they expect anyone lower in the organization to?"

Along with performing the official gating functions and working issues pertaining to individual projects, the other value senior-management review boards bring to the process stems from their ability

to drive integration of core activities within the organization. New products offer a natural opportunity to identify issues involving many areas of the operation. A new service, for instance, may reveal a need for closer alignment of the engineering and operation functions at a higher level of the company. By having the right players in the right frame of mind, these decisions are much more likely to happen quickly.

Broader initiatives, such as the need to more fully integrate systems across functions, will surface regularly when a new product is being developed. By remaining actively involved in each of the phases of development, senior management can anticipate needs of the business before they become too pressing. Having the right audience in the right position drives issues of importance across the fabric of the company. Over time, the processes of service delivery are certain to improve, and the direction of the company will become more closely aligned with successful product delivery approaches.

18.6 Lining up the pieces and identifying the gaps

As an organization identifies the functions needed to carry out development, it is common to find gaps or to discover that everything necessary to wage a solid effort is not all there. For example, functions may only be partially accounted for, and staff or expertise in key areas may be insufficient or missing altogether.

Identifying these gaps and trying to fill them is a regular part of any business planning cycle. When it comes to performing product development effectively, one of the functions commonly missing is that of process engineering. This is an area, and a need, that goes unnoticed in many companies. Either it is overlooked entirely, or it is simply assumed to be covered somewhere else. Systems developers believe that it is the product developers' job to engineer processes, while product developers believe the responsibility belongs with systems. Line organizations, meanwhile, may not be sure where the job belongs, but they are certain that the duty belongs anywhere but with them.

18.6.1 Identifying the need

The need to define *process engineering* and what it does is part of the problem, and it is why the gap continues to exist. Organizations may know, although perhaps only intuitively, that they have a need in this area known simply as *processes.* What they are not so sure of is what they must do to address this need.

At issue is the obligation to address systems-based business processes—those processes that have been designed and engineered using approaches that are based on systems. Some providers have responded to this broad-based need by establishing *process owners.* By assigning an owner, companies believe that they can address all the issues associated with the process—including the systems, the functions, and the departments—in a holistic way. How likely it is that this approach will actually result in substantive process improvements within the organization, however, is debatable.

Whether the process that needs to be addressed is trouble handling, provisioning, or even more broadly *service delivery,* assigning a process owner alone seldom gets at the crux of what really is needed. That is not to say that there are not some processes that lend themselves to the concept of a single process owner. Processes contained within a single department or single functional area are natural candidates for ownership by the department or area in charge. However, it is not these areas that are causing the greatest difficulties for providers. It is the areas that are not so easily claimed, those that cross organizational boundaries, functions, systems, and even other processes, that are the source of most of the difficulties.

18.6.2 Answering the need

As telecommunications service providers become more aware of how process-driven their businesses are, they must come up with a more meaningful response to the dilemma of process improvement and process engineering. Because the issues that need to be addressed do not confine themselves neatly to a single organization, system, or function, the solution will not come by simply anointing a group with a title or assigning ownership for this area to a group that already has too many responsibilities.

Like so many areas of the telecommunications industry, the answer to this need lies in a hybrid approach that integrates all the aspects of the problem. Developing effective systems-based business processes involves every area of the business—the systems, the business processes, the network, and the people. The solution will only come from an approach in which all these aspects are considered.

The organizational challenge is to determine where responsibility for driving solutions that cross all these levels of the business belongs. Product development may seem like a natural candidate, but it really is not the best choice. Product development will no doubt be a key contributor of ideas and information, but organizations are usually better served when product development as an organizational entity stays focused on driving solutions to market opportunities from within the business.

Systems development may be closer to where the responsibility belongs, but it is not necessarily the best place either. Roughly 20 years ago, when processes were embedded directly into systems, responsibility for engineering processes fell to the systems development organizations. Working closely with staffers with titles such as *methods analysts,* systems personnel would complete a detailed methods and process design stage, followed by a systems build stage. Today, however, many systems organizations are operating in a different mode. They perform more of a support role, filling requirements developed by groups other than themselves. Systems organizations often now look to the line organizations or to the product development team to analyze the process and develop the detailed process flows. Then, systems organizations build to these specifications.

More often than not, the problem is that the necessary level of analysis never actually occurs. Either those tasked with developing process requirements lack the right skills, or there is no clear understanding of what is needed, or both. Since the need within the organization is not well-understood, it is never adequately addressed. Consequently, the problem without a name just gets bigger.

18.6.3 Process engineering is the need (and the answer)

It is necessary to start by recognizing the type of process engineering support that is required. Analyzing requirements for systems-based business

processes and effectively devising processes that span the entire breadth of the organization are not skills that are easily obtained. To do so, it takes experience and expertise in the right areas, a certain type of focus, and a large measure of time. What is needed within telecommunications right now is roughly akin to what manufacturing environments require when they set about designing a factory floor. Manufacturing industries refer to factors involved in this process as *operations analysis* and *operations engineering*. These descriptions accurately capture the essence of what manufacturers need, which is a focus on the content, flow, and uses of information, as opposed to the systems that are used to carry and store that information. For telecommunications, the best way to refer to this process for now may be *engineering the infostructure*.

Whatever it is called, to do it well requires a solid grounding in systems *and* operations, *and* a solid grounding in the industry. To devise systems-based business processes that effectively work together for the repeatable and sustainable hands-on processes of service delivery, it is essential to understand the business threads that underlie the telecommunications services environment. This knowledge of the industry and of how the business processes need to operate is indeed more important than any specific knowledge about systems.

Earlier, we discussed how the line between systems and processes grows blurrier each day. Understanding the threads that underpin processes, which in turn underpin systems, takes a combination of analytical skills, systems skills, organizational skills, and industry experience. Not only are these not an easy combination of skills to find, they are not an easy combination of skills to develop internally either. Still, acquiring these skills, however that happens, is essential because a provider's success in the service delivery area depends on them.

References

[1] Dimancescu, D., and K. Dwenger, "World-Class New Product Development," AMACOM, 1996, p. 65.

19

Building Teams That Win

Now we must determine what companies can do to ensure that the teams charged with creating new products have the best chance to succeed. We have discussed the phases of development and the need for following a disciplined process. In addition, we have examined the role of systems and where the systems function needs to head to capitalize on future opportunities. In Chapter 18, we considered the importance of having the right structure at the right level of the organization to drive the process through all its phases.

All of these areas are important, but in the end it is not processes, phases, systems, or structures that create new products. It is people—people who work together effectively, as a team.

19.1 Teams: the new unit of business

As organizations continue to flatten under downsizing, rightsizing, consolidations, and mergers, teams are emerging as the new unit of business. Teams are being used for every purpose imaginable, and in many cases, they are doing the work once done by departments. They are formulating strategies, negotiating agreements, developing new systems, new processes, and, of course, new products.

This growing reliance on teams only makes sense: Assemble the right group of individuals to focus on a specific objective, then disassemble the group once the objective is complete. In setting up teams, companies are creating temporary organizations—or virtual organizations—that offer the benefits of speed, flexibility, and efficiency. The greatest benefit companies receive in using teams, however, can come from what teams leave behind. Successful teams leave in their wake more than just a finished project; they leave behind a body of knowledge. They can cross-fertilize the environment with ideas and skills and create an atmosphere in which talents and new approaches are constantly being honed.

19.2 Winning development teams

Teams may be the growing trend in business, but the mere fact that businesses are using teams more often does not mean that teams are more productive than they were in the past. This is an important point for development, which has always relied principally on teams. Development, indeed, is the quintessential team activity of business.

How good an organization is at building effective teams plays into many areas of business, but it most directly plays into how successful the development function within the organization will be. Giving development teams their best chance for success is, therefore, a primary concern of any organization wishing to optimize the effectiveness of its development effort.

Successful development teams have many factors in common with teams that are successful in other business pursuits. These common elements include the following:

1. *Committed and capable resources:* Teams that deliver successful results are made up of players having the time, skill, and commitment to be effective in their roles. These are the teams that move quickly and skillfully through the decision points that are a normal part of any complex project. To contribute substantively on issues and to craft solutions to complex problems, teams need more than enthusiasm. They need players with knowledge about their specific areas and about the business overall—players who are comfortable representing their areas and taking ownership for work in their areas.
2. *Focus:* Successful teams start with a clear picture. They are not floundering or chasing dreams. Instead, from the beginning, they are directed to pursuing goals that represent a good match between the strategy and the capabilities of the company. When the direction is clear, a sound solution is more likely to develop quickly, and that means that the project is more apt to hold together through all six development phases. Keeping the initial team small helps in this regard. With fewer players, focus is less likely to wander.
3. *Leadership:* To effectively integrate elements of a project into a coherent system, a team needs a solid grounding in the internal capabilities of the company and a clear understanding of the market. Good development leaders, therefore, usually straddle the line between marketers and engineers. To lead an effort effectively, the team's project aspects have to be managed along with the organizational and people aspects. It takes strong leadership to juggle all the groups and personalities that must assemble within a typical development project. In development, authority cannot always be granted. Sometimes it has to be assumed.
4. *Clear expectations:* Not only do winning teams determine early on what the eventual solution will include, they quickly determine what the key deliverables must be. Teams that produce winning results are driven by more than just a vision, they are driven by a commitment to deliver on the specific objectives due at each step along the way. Those on the team are all on board with these

commitments; they know what they are and what they have to do to fulfill them. These expectations are clearly communicated to all the levels of the organization.

19.3 Assembling the product development team

The virtual team approaches now common to so many areas of business have always been at the center of product development. In structuring the product development team, it is best to establish a system of area leads. Normally somewhere around the end of the first phase, a core development team is assembled. Made up of members from each of the key areas (see Figure 19.1), the team must, as its first order of business, come up with the core solution. The team has to decide what specifically the planned product or service will include.

Area leads report to a project leader, typically assigned from the product development area. Sections 19.3.1 and 19.3.2 discuss these different roles.

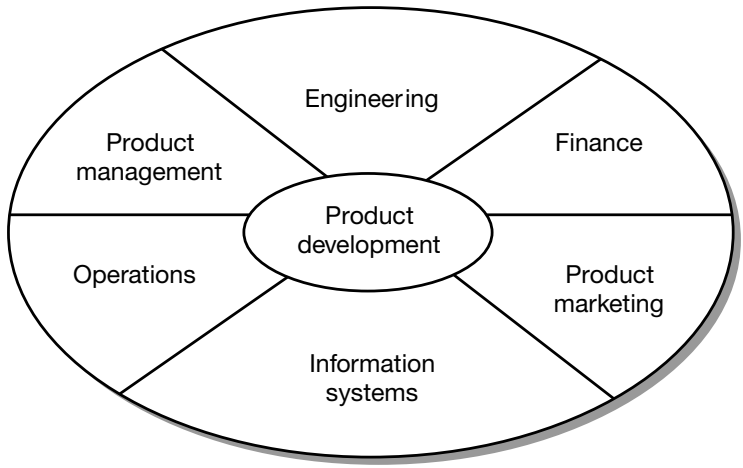


Figure 19.1 Core product development team.

19.3.1 Team roles: the area lead

The job of the area lead is to take responsibility for an entire department, function, or area. It means taking ownership of the quality of the work effort and the deliverables for that area as well. To perform this role effectively, area leads need sufficient knowledge about their areas to identify issues, resolve conflicts, and contribute to the solution of problems.

Area leads should be capable of independently chairing subcommittees, arranging subject-matter experts, identifying conflicts, and escalating issues as appropriate. They must be prepared to act, in other words, as liaisons to other groups within their areas. Within operations, for instance, an area lead may work with five or six separate functions. These could include regional managers who have responsibility for first-line operations in the field or staff personnel with responsibility for developing the methods and procedures for those regions. It might also include each of the groups with responsibility for second- or third-tier network support and for the staff personnel that serve those support functions. The same is true for information systems, although to an even greater degree. An information systems area lead might work with five or six major subsystems, each of which can have its own underlying functions.

19.3.2 Team roles: the project leader

Even with a well-defined project in hand, team success or failure depends on getting the project through each of the six phases, and in many cases, that will hinge on the person directing the project. The role of the project leader is to take ownership for the whole. To manage the whole effectively requires knowledge about each of the parts and an understanding of how those parts must connect together into a whole.

Project leaders have responsibility for navigating the project through all its stages and for the eventual outcome. This requires being able to manage the details of the project—its schedule, tasks, and dependencies—as well as the team members and groups that are part of that project. Leading an effort successfully means knowing when to escalate, and knowing when to assist. Involving the right levels of the company in the right way is also part of the job.

Along with managing the details of the project, the project leader's role includes carving out a vision. Articulating expectations clearly and

motivating the team toward successful completion of a goal is arguably the most important part of the job. Accordingly, effective project leaders have the planning and organizational skills needed to link the business with the direction of the marketplace. Project leaders must be able to push the organization in a way that integrates the business strategy, the product concept, and the project.

19.4 Summary

Clearly, these descriptions represent the ideal for development team arrangements. However, teams are often unable to produce the kinds of results they would like. Chapter 20 examines some of the reasons for this dilemma.

20

Approaches to Team Building and Rapid Development

Since the composition of the team is so crucial to the success of the project, it is essential to select individuals for the team who have the right skills, interest, and time. But what happens in most telecommunications services environments? Are individuals selected because they have the right skills, commitment, and experience to carry out their responsibilities, or are they picked as one might for jury duty, simply because their names came up? Is the team beginning its mission with a clear sense of purpose and the right level of organizational backing, or is it just hoping it will find both somewhere along the way?

20.1 Why development teams fail

The answers to these questions explain why development teams often do not produce the results that are expected. Development teams fail for the same reasons they succeed: They fail when those on the team lack the right skills, experience, and commitment for doing the job right. They fail when there is no clear focus, and when there are no clear expectations on what the project should produce. Most of all, they fail because they were never set up to actually succeed.

The two main reasons development teams do not succeed are: failure to receive top-down support, and failure to establish at the outset what the project is expected to achieve. It does not matter how valiant the efforts of those on the team. If either of these elements are missing, the project will have little chance of succeeding.

That was the lesson one project leader learned in trying to bring a new wireless service to market. After numerous attempts to get one of the team members to take ownership for his area, a discussion took place between the two. During the discussion the team member shared that in his view, and that of his manager, his role was that of a *customer*. Both he and his manager saw his role as making sure issues pertaining to their area—field operations—were getting properly resolved. Indeed, they were so secure in this view that they were ready to withhold consent for moving into customer trials until all their needs were met. Other than offering occasional advice and pointing out areas that had been overlooked, neither saw himself as having any particular responsibilities on the project.

This situation may sound a bit extreme, but to anyone who has ever been part of a development team experience, it is not uncommon. Problems with development often begin when support is never officially obtained and is instead simply assumed. When responsibilities are never specifically defined but rather are left open to interpretation, problems are sure to arise.

The situation is worsened when support from the top is never officially received. This can leave projects in somewhat of a "tin cup" position, always begging for resources or relying on favors to get work done. Lacking support from the proper levels, such projects never operate from

a position of legitimacy. They may get off the ground, but with less than a full team of players, they return to Earth pretty quickly.

20.2 Skunkworks: going around the system

With enough of these experiences, a legacy of failure forms within the organization, a legacy that begs for a response. This occurred in one service provider environment recently. This provider had a recognized process for development, but the process had grown ineffective because support from the right levels could never adequately be obtained. One product champion in this company decided to try a different approach. Realizing that plans to introduce a new frame relay product would never materialize in an acceptable time frame if the current approach was used, he secured the backing of a senior-level sponsor to try a different approach.

This product champion, who became the project leader, received approval to form a special team within the company to create the frame relay solution. People from five key areas were assigned to work on the solution full-time. In three weeks, the team had evaluated three sets of options and narrowed their choice down to one; in six weeks, they had met with all of the operational groups and devised crude sets of process maps and systems requirements; in twelve weeks, they were trialing their first customer. The senior executive sponsoring the project became the rallying force at her level, pushing her peers into decisive action and ensuring they were available for decisions and reviews at critical points along the way. The product was offered on a limited basis after six months, and by nine months, it was available in all of the most heavily concentrated service areas.

20.3 Skunkworks as a way to break the mold

Sometimes breaking the mold is the only way to get the system to change. Most companies realize this and know that meeting the more pressing demands of business requires them to try untested approaches. The experience of the above provider in developing a frame relay solution went

beyond just shaking up the process; it became the new mold within the company for development. All aspects for how future projects were run changed. Most noticeable were the changes that occurred in the systems area. Until this project, systems had operated in somewhat of a sacred zone. The de facto rules surrounding systems were so set that they were hardly worth challenging. One of the strongest of those rules was that all systems had to be developed in house.

Meeting the goals for this project, however, meant that systems had to be up and running in six months. This effectively ruled out any in-house possibilities. The frame relay team immediately began to work closely with the systems lead to evaluate outside solutions. The evaluation centered on meeting basic requirements for the key functions of order entry and provisioning. The systems vendor selected did not meet every want and desire identified, but it did meet something even more valuable: It offered a workable solution that could be implemented within six months and that would meet all basic needs for the first two years. If the vendor's plan for expanding the solution had not yet materialized in two years' time, the service provider determined, the benefits of getting into the market quickly still outweighed any costs or risks involved with changing out the system.

20.4 The new mold: rapid development

This company had experimented with a rapid development approach that produced highly positive results. The provider was able to enter a market in the early stages of rapid growth and consequently capture a large base of significant customers.

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Development processes, or any business processes for that matter, should never be so rigidly constructed that they cannot be quickly adapted to fit new situations. The key comes in finding the right balance—between flexibility and order, stability and agility.

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When does it make sense to challenge the molds for development? One answer would be always. Development processes, or any business processes for that matter, should never be so rigidly constructed that they cannot be quickly adapted to fit new situations. The key comes in finding the right balance—between flexibility and order, stability and agility. Processes should never be wholly disregarded; they should, however, be flexible enough to adapt to a range of situations.

The idea behind rapid development is to condense and collapse the phases of the cycle to produce high-quality results in rapid time. Rapid development can go by a variety of names, including *integrated product development* and *skunkworks*—after the original effort waged at Lockheed Aircraft in which engineers worked feverishly to develop American's first jet fighter plane. Whatever it is called, the idea is still the same: The structured approach to development must give way to concurrent and overlapping phases, with an emphasis on fast planning and early decision making. Work is characterized by intense communication and information gathering among team members.

20.5 Implementing a rapid development approach

What situations call for a rapid development approach? Again, some would say all, and for many companies, that is indeed the right answer. There is nothing that says that all projects cannot be worked under a rapid development approach. The real issue is how many. The company in the frame relay example was able to put a limited solution in the market in six months and was trialing its first group of customers in three. Had it put all projects on that path, however, there is a good chance that none would have been any better off than before.

The results and quality are almost always better when fewer projects are controlled carefully than when more are controlled loosely.

By focusing intensely on a single area and allowing those assigned to dedicate themselves fully to one objective, companies can often produce astounding results. However, they have to be willing to pick and choose carefully. In many cases, companies would be better off handling fewer projects and submitting each to the more intense efforts of rapid development than they would continuing to juggle scores of projects concurrently. The results and quality are almost always better when fewer projects are controlled carefully than when more are controlled loosely.

This is especially true for introducing products into explosive markets. In high-growth markets, quick entry with a solution that is less than perfect is more important than getting there late with one that includes everything.

20.5.1 Seven elements of rapid development

The factors that constitute a good development environment under a rapid approach do not differ much from what is best under a traditional approach. The main difference is the level of attention the project will receive.

Generally, the best environment for development has all members of the effort located in the same area. This is especially important for rapid approaches. The exchange of information and fast turnaround of ideas and tasks are essential for maintaining momentum and for producing accurate and timely results. Other steps service providers should take to create a development environment that fosters success include the following:

1. *Establish a clear picture of the project's deliverables early on.* Rapid development projects need to take off quickly. Fumbling with requirements and negotiating with a lot of groups delays the effort. Accordingly, project teams should freeze requirements early on and stick with delivering a basic product. They can defer product enhancements until later.

2. *Assemble a heavy-weight team.* Fast results are much more likely with a strong and impassioned leader at the helm and a handful of well-respected members from each of the key disciplines. Team members and the project leader should be freed of commitments

that interfere with their ability to participate actively in the project. A strong team will make better decisions faster, which is important since bad decisions made early on carry major consequences later in the cycle. The result of these decisions may not show up until later, in the prototyping or trialing phase, and at that point, it can be very difficult to change the course of things.

3. *Provide the necessary levels of organizational support.* Projects on an accelerated plan not only need to be selected carefully, they need to commence with the full backing and resources necessary for successful implementation. Decisions in this environment have to be made quickly, which means that senior-level management must be available to lend support when needed. Having to get behind an overcrowded executive calendar will delay the project—often in ways that can be critical. Timely and regular reviews are important, but being available to work with issues as they come up is just as important.

4. *Think outside the box.* Projects on a rapid development path must have the freedom to pursue alternative approaches. Solutions to problems should be open-ended, not predetermined by virtue of an existing approach. When the proper analysis shows an alternative approach makes sense, the alternative must be allowed. Alternative approaches may include accelerating the planning and approval window for purchases, or going to an outside source for something traditionally supplied internally. As long as the payoffs are there, solutions that involve elements outside the norm—whether for equipment, software, special task groups, or anything else—should be open to consideration.

5. *Empower the team.* Instead of constantly being expected to refer decisions back to senior management, the team must be empowered to make decisions and negotiate arrangements across as many boundaries as possible. Accordingly, the team should be invited to come up with new approaches and new roles, and required to put forth complete recommendations. In addition, companies should allow entrepreneurial attitudes to prevail. This builds a stronger sense of pride, ownership, and commitment. In the end, all of these elements are infused into the product.

6. *Set a 90-day deadline for the first pilot.* The rapid development path should include a "do-or-die" mentality for deadlines and completion. Moving quickly through the analysis, requirements, and definition stages is a normal expectation in this environment. Conducting the first prototype within 90 days of project initiation keeps things fresh and immediate as does the expectation that team members get as close to the actual work as possible. Team members should be the opposite of hands-off; they should perform each of the work-level functions during the pilot stage themselves. This not only saves time, it validates the quality of the information and knowledge base being developed.
7. *Integrate.* Coming up with a solution that operates as an island is not much of a solution. Rapid development teams should be allowed to look outside the usual flows, but whatever is developed must be capable of being integrated into the company without adding excessive cost or complexity. New solutions can involve new elements but they should not require a new company structure to support. In other words, whatever is developed—the service, the process, or the organizational channels—must be able to integrate into the company fabric.

20.6 Systems: the rapid development dealbreaker?

Unfortunately, there are disadvantages to the rapid development approach. Furthermore, companies may face obstacles in their attempts to implement a rapid development process.

The hurdles to rapid development can be many, but they are most likely to stem from the area of systems. We have discussed how systems can be the long pole in the tent for many product release schedules, and we have seen why that is so. Competing effectively in the new world order has left many companies scrambling to rebuild their infostructures. Given the intensity of these efforts, systems projects across the board are experiencing delays, all of which are exacerbated by the noble efforts within many systems organizations to try to avoid the mistakes of the past.

Fearing a backlash from the past, many systems organizations are now determined to do things right. They want to develop systems that are intelligently engineered, and that address today's environment and the environment that is emerging. They want to take the time to analyze the problems correctly and to come up with solutions that are scaleable for the rapid growth that lies ahead.

The problem is that many times the *right* solutions are years away. These are years that carry a tremendous cost in terms of market opportunities lost and organizational experience never gained.

What does this do to development projects, particularly ones that are on a rapid development path? The conflicts between systems and marketing organizations are becoming significant, and the problem seems to be worsening in organizations that allow themselves only two choices. Those choices usually come down to either waiting for the shiny new building or patching up the old house.

There are alternatives, however. Given the pressure on both sides, turn-key solutions can offer a viable solution, especially for the short term. The general mindset with systems, however, involves taking a longer view. The problem can be that systems, just like organizations, quickly become outdated. The time required to develop a new system does not necessarily pay off when the environment has changed by the time that system is ready to be introduced. Changing out, or even disposing of a system, after 24 months is a bargain if what has been gained is experience about an application, a set of business processes, or a new service. Gaining a foothold in an explosive market can indeed be payoff enough. Moreover, those initial 24 months, or whatever time is involved, can benefit companies by providing a far more astute understanding of the actual system requirements.

In search of the perfect solution, companies can sometimes let go of a good option. There are times when moving into temporary housing makes more sense than either patching up the old house *or* waiting for the shiny new building.

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21

Beyond Product Launch: Completing the Development Cycle and Managing the Product in Life

In chapter 17, we last left the product in as it was about to be launched. Launching the product is indeed the main event: It is the culmination of six phases of work and the target the whole effort has been aiming to hit. Getting to this point would therefore logically appear to be the end of the line, but as it turns out, it is not. Bringing the cycle to conclusion takes more than just getting the product to the launch pad and blasting off.

Even the best orchestrated launch efforts can result in products that go to market with a bumpy start. In spite of efforts to ensure that products being launched have everything in place, development cycles will continue to get squeezed. That means that products will continue to be

launched before they are absolutely perfect. When this happens, companies need to follow several steps to ensure that the product just introduced does not stay in a permanent state of incompletion.

21.1 Holding a post-launch review

Analyzing and reviewing a product once it is launched is every bit as critical to the success of the development effort as each of the activities that came before. Service providers that aim to get maximum mileage from their development machines are the ones that put their projects through a thorough review cycle once they have been introduced. This is necessary for any industry at any time, but it is especially necessary for the telecommunications industry today. With service providers pulled in so many directions at once, unless a disciplined approach to the post-launch review process is followed, the new product may never actually get into orbit.

Holding a post-launch review for every project is important for two reasons: First, it provides the organization with a chance to reflect on what worked and what did not. Second, it formalizes the status of the product just launched and sets up a process for tracking any remaining work.

The first of these reasons is critical, because it provides an organization with the means to learn through its experiences. Critiquing the full cycle, and not just the most recent events, ensures that all issues that contributed to the project's success, or failure, are being considered, including the following.

- What were the chief causes of the project's success?
- Where were the main points of delay, and what contributed to those delays?
- Did the *process* of development help or hinder the project?

By looking at the entire cycle, companies can recycle successes into the next project and avoid mistakes.

The second of these reasons, itemizing remaining work, is of course every bit as important. No matter how well a company conducts the

development effort, it must carefully manage a product through the critical introduction period for the product to achieve its potential. Tying up loose ends has to be considered part of the development cycle. Formalizing this process ensures that the right questions are being asked. (Are the line organizations up to what's required to handle the new service? Did the training they receive turn out to be adequate, or is more still needed? Is the service operating in the way it should?) In the hurry-up mode of many implementation and launch phases, it is often wrong to assume that everything happened as needed.

21.2 Post-launch product evaluation

This second purpose—to track open issues on the product just launched—focuses on issues that are more immediate to the product's initial success. Again, tending to areas that carried over from the implementation and launch has to be considered part of the development cycle. This could seem a direct contradiction to what was discussed in Chapter 16, where the need to establish consistent quality standards for products was stressed.

Last-minute deferrals and compromises would suggest a lapse of standards, but that is not always the case. By the time any new service development project reaches the final phase, it involves scores of components. Each component—whether an on-site training program, a software upgrade, or an equipment deployment plan—has its own project schedule, with the development schedule being a roll-up of all the different schedules that underlie it. Coordinating these schedules so that they all reach the finish line by a certain date is a worthy goal, but actual experience shows that that almost never happens. Certainly anyone who has had a house built, which is a much smaller undertaking, can understand this situation: Moving day may have been scheduled well in advance, but suddenly it is here. One contractor is still on site completing work; another is waiting on materials. The job is not complete, but the move must proceed.

All projects have a critical path determined by components that have to be in place in order for the launch to go forward. However, there can be many other components that, while eventually necessary, may not be

critical for launching. Deciding to proceed without all necessary components in place does not have to be an irresponsible decision. It is only irresponsible when there is no effective plan to follow-up. When that occurs, requirements deferred have a way of becoming requirements denied.

21.3 Requirements deferred

When the launch proceeds without all components in place, mechanisms have to exist to ensure that all components are eventually delivered. This inventory and tracking function is standard protocol for post-launch reviews and one of reasons for holding these reviews. Keeping track of the status of all deliverables is simply an extension of the development process.

This is easy enough to see with elements that were committed but not delivered on time, but what about areas that are less *hard,* or even areas that were not specifically committed for delivery? General concerns over volumes, scaleability, and quality of support are not necessarily as easy to track as, for example, delivery of an applications support package might be.

In some environments, tracking these issues stays with product development for some period after the launch. More commonly, however, with the crowded list of *must-have* projects stacking up, product development teams are usually quickly assigned to address the next project. This means that whatever is not done inside the formal development cycle will be inherited, although not always knowingly, by the line organizations and the product management groups that follow.

Whether this approach is good or bad is debatable, but it has nevertheless become the norm in many provider organizations. Companies believe that by limiting involvement of product development teams shortly following the launch, they allow the teams to return to what they do best: managing the development of new products. The upshot is that ownership transfers quickly after the launch to the line organizations for day-to-day support and to product management for product life cycle support.

While this approach has its merits, it only works when the organization realizes the scope of what may remain once a product is launched.

Success also depends on whether the organization has a process and structure in place to ensure that requirements deferred do not become requirements denied.

21.4 In-life management

The issue now becomes one of ownership, and of roles and responsibilities. Without clear ownership, these post-launch areas often drift so that they are never adequately addressed. This can be one of the downsides of transferring responsibility for the product so quickly. This occurred in one service provider environment after it introduced a voice-mail service. The service introduced was based on a new platform that turned out to have some serious problems. These problems went beyond the foibles typical of a poor product introduction. Without a product champion with the necessary skills and organizational backing to forge solutions to problems that crossed many areas of the business, this product floundered. Retirement came early. The legacy that grew out of this experience was that voice mail was a loser service for this company. It was never clearly determined what caused the early demise because too many factors contributed to the problem.

The point is, once a project is removed from the intense spotlight of development, a structure has to exist for managing the service. A product's post-launch requirements may not carry the same level of urgency as what was needed before, but the type of attention and effort necessary to correct problems is not too different from what should occur within the prelaunch development cycle.

One solution would involve keeping the project inside the formal development loop a bit longer. However, this can cause product management and marketing groups to be stuck between conflicting sets of interests. Both of these groups are typically eager to accelerate the introduction schedule for a new product. On the other hand, they can find themselves inheriting any unfinished business that was not done before the launch.

In any case, it is important to determine whether any of these groups, acting alone or with the help of others, can effectively reach into the organization deep enough and across enough levels to forge solutions to

the kinds of problems that often carry over. The best solution usually lies in a strongly managed in-life product management program that monitors a product through the critical early period and all the stages that follow. In other words, companies need to develop a program that provides products with the same level of attention in-life that they received in the development cycle.

21.5 Product infancy and the post-launch product plan

Whatever gaps, deficiencies, and process problems are identified through the post-launch review must be worked into a post-launch product plan that is shared with the senior-management review board. In effect, this plan becomes a product performance plan. Developed jointly by product development and product management, the product performance plan aims to identify all open areas, owners, and completion dates. It is managed jointly by product development and product management for the first few months after the launch. Normally around 60 to 90 days after this plan is developed, a product will formally be transitioned to product management. This transition is usually accompanied by a closure report listing the status of any remaining open items.

21.6 In-life product development

The areas that are not so clearly identifiable cause the biggest problems in new products, including the following:

- Processes that do not mesh together well;
- Service installations that are fraught with problems or delays;
- Customers that are unhappy with their bills or their service in general.

Problems such as these represent a failure of the development effort. Whatever the reasons for their occurrence, they fall now within the scope of in-life product management. Fixing these problems, not surprisingly,

requires the same type of effort that should have occurred within the development process itself.

In comparison, the issues that carry over from development efforts that are successful in their mission are focused more on maximizing the product's potential and keeping the product current. Is the product meeting the revenue and unit goals established? Should the product be refocused to adhere to changing conditions in the outside world? Enhancing the product, keeping it current, and driving it to achieve peak levels of performance are the functions that product management groups should be addressing. Managing the product in-life is all part of the product management charter.

21.7 Portfolio management

As companies become better at developing and managing a mix of products, and as product portfolios expand, the need for managing the whole takes on greater importance. The role of portfolio management is to provide oversight and planning to all products in the mix and to direct the overall product strategy of the company (see Table 21.1). This entails adopting an integrated view, one that brings together issues that impact several disciplines, including product development, marketing and management, network and technology planning, and finance.

21.7.1 Formulating the strategic product direction

Balancing the pieces and directing the whole is the job that portfolio management must orchestrate. The focus of portfolio management is less on individual products than it is on positioning the company, through its product line, to seize market opportunities and exploit internal capabilities. To do that, portfolio management has to keep a finger on the pulse of the market, follow trends in areas of technology and customer preferences, and balance all of that against the capabilities and objectives of the company.

New product initiatives need to be evaluated against all of the areas outlined in Chapter 6, which discussed the need to establish a clear strategic product direction and to make the tough choices on what products, what technologies, and what directions to pursue. From the position of

Table 21.1
Portfolio Management Charter

Product Analysis and Prioritization:
Assesses the performance of the product using various standard tools
Directs and leads the product to improve the short term performance objectives
Manages product through all the various life cycle phases, up to and including withdrawal
Portfolio Positioning:
Arrays and analyzes services in terms of standard variables such as bandwidth, market and customer segments, and capabilities
Identifies gaps and overlaps within the portfolio
Portfolio Strategies:
Directs the overall portfolio strategy
Articulates the company strategy and translates that strategy into a product direction
Identifies specific product areas and strategies that need to be pursued

product development, it is often difficult, if not impossible, to pull together all the views across the organization that contribute to these types of strategic directions. The job of portfolio management is to pull these different perspectives together and to incorporate those perspectives within the context of a larger corporate view.

Portfolio management also performs an integrated planning function that brings together technology, capabilities, external factors, budgets, and resources. By integrating these perspectives, a company has a better chance of directing itself into areas in which it is likely to be successful.

21.7.2 Managing the mix

Understanding the product mix and keeping the mix in balance with company visions and strategies is the formidable responsibility portfolio management carries. Along with directing the corporate strategies for products and markets, portfolio management is also responsible

for monitoring individual products against a wider set of performance measurements.

As the product moves through its different stages, the function of portfolio management is not to micromanage products. Instead, portfolio management aims to give product management groups the feedback, and in some cases the report card, that can be used to direct the product in the way that is most appropriate. Each of the stages of a product—from the initial introduction stage to growth, maturity, saturation, and, eventually, decline—call for different strategies and responses. Knowing where a product is in its life cycle can be a major factor in determining the levels of funding and resources that are appropriate. Products in the declining stage, for instance, are not likely to be good candidates for development funding. However, just because a product is not growing does not mean it is not a solid performer. This is clear enough when considering products in the early stages. Early stage products may be a long way from achieving peak profitability, but because the outlook is strong, nurturing and investing wisely are usually the best strategy.

21.8 Directions and life-cycle management

In the course of their lifetime, products move into different quadrants or stages, and sometimes movement can occur very quickly. Accordingly, it is important to notice when a new technology suddenly takes off, or a service starts to be replaced by another. Understanding where services are in relation to one another makes the job of assigning resources more manageable. Seeing these trends also helps determine in which direction to point the ship (see Figure 21.1). After all, it is not just product directions that need to be decided, it is also the direction of the company—and its capabilities.

The balancing act companies must carry out when the list of development projects is long is often a difficult one. It does not always get easier after the analysis, but when the pie is only so big, it is necessary to make the right funding and resource decisions to yield the best returns. Having a sense of how far into the future those returns might be can make the job of divvying up the pie a little more manageable (see Table 21.2).

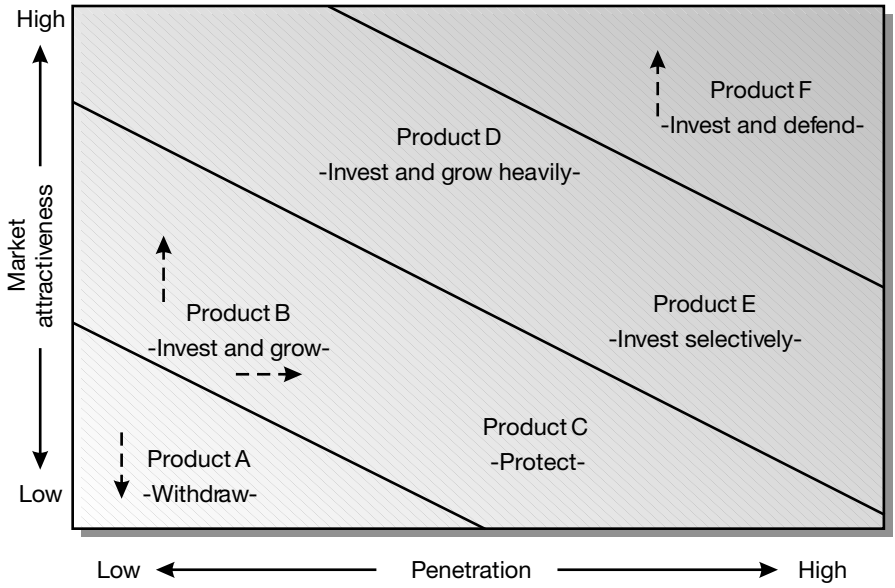

Figure 21.1 Portfolio directions.

Table 21.2
Portfolio Resource and Funding Priorities

Product/ Service	Strategy	Market Priority	Development Priority	Funding Priority
Frame relay	Grow market share as rapidly as capabilities will support	High	Medium	High
ATM	Enter select markets aggressively	Medium-high	Medium-high	High
800/Inbound services	Enhance and differentiate existing offering; invest in new markets where necessary	Invest and grow	High	Medium
ISDN	Drive incremental sales; increase volumes; develop new service packages for secondary markets	Invest and grow	High	High

Table 21.2 (continued)

Product/ Service	Strategy	Market Priority	Development Priority	Funding Priority
Centrex	Drive incremental sales; defend customer base; target large customers selectively	Manage and grow selectively	Medium	Medium
POTS	Defend customer base by migrating customers to other services; implement pricing actions to retain customers	Harvest	Low	Low
VPN	Target large customer base selectively	Manage and grow	Medium	Medium

21.9 Portfolio drivers

Ultimately, the charter is to optimize the company's portfolio to meet customer needs and expectations and to improve the company position overall. Improving the company position includes directing the portfolio toward higher levels of efficiency. This might lead to a decision to manage fewer platforms, or to make greater use of shared assets by, for example, reducing the number of existing service programs or billing plans. The vision, in other words, could be a broad one: to drive company capabilities in a direction toward managing fewer platforms.

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The World-Class Service Provider

WHAT DOES IT TAKE to be a world-class service provider? We have covered a lot of territory on this development journey, so it probably makes sense to close with a review. We began by looking at telecommunications as an industry and at some of the factors that make this industry unique—unique among industries and unique even among service industries. We considered how some of these *uniqueness factors* play out in the development of new products and services and how these factors make the challenge of development in the telecommunications industry fundamentally different from that found anywhere else. Within the span of the development cycle, we stopped at each of the phase markers to consider key aspects of each phase. Along the way, we examined some operational issues as well as management and organizational concerns that fall within the cycle—and challenge—known as new product development.

Now, why is any of this important? Why is understanding the challenge of product development, in this industry and in this time, so important to service providers? Is it because five years from now service providers will be living and dying off the products they develop today? Or is it because this area alone, in large measure, could determine whether a company is even around then?

These are certainly reasons enough. However, the real reason, which is decidedly less draconian, is that it is hard to get better at something that is not well-understood. And developing new products, despite being an activity that has been carried out for a long time, is not something particularly well-understood within most service provider environments.

This matters because of the way the telecommunications industry is evolving. It is a global industry, and to play in a global industry—whether in just one corner or around the globe—companies have to do many things right: They need to partner successfully with others, globally, regionally, and locally. They also need to improve their operational efficiencies and find ways to scale their operations into vastly expanded environments. In addition, they need access to capital and a strong base of employees that are empowered and highly skilled. On top of that, they need to master the skills involved in creating new service concepts efficiently and effectively.

We do not hear much about this last area, however. Instead, it is the high-profile moves—the mergers, the acquisitions, the global partnerships, and the high-end deals—that are grabbing all the attention.

No question, these moves are important. Forming the right partnerships, building the right alliances, acquiring the right pieces are all strategically necessary moves for providers right now. However, there is more than that hanging in the balance. These external moves may succeed in temporarily sweeping in wide swaths of territory, but they will not ensure providers a sustained position in a hothouse market. Soon, it will not be only providers that face tremendous opportunities; customers will have opportunities to change as well. Once the dust settles, the choices customers make are more likely to be based on what has been going on inside the provider environment than on anything happening on the outside.

Sustaining a position in a competitive market will require vast improvements to the core operation, something many providers have been

engaged in for several years now. These core operations are represented through the processes of service delivery. In the emerging market, service delivery will become the key differentiator. How well a provider carries out the processes of service delivery, and how competent it is in understanding the elements and translating those elements into intelligently engineered systems-based processes, will, to a large degree, determine success. It is through this area of service delivery that a provider's ability to satisfy customers will be determined. It is also in this area where the size of the service territory a provider aspires to, and holds, will be determined.

Providers will need core competencies and core capabilities to succeed. Product development, as a set of organizational skills, is a core *competency*. Service delivery, as the centerpiece of the service provider operating environment, is a core *capability*. These two areas will form the most noticeable basis for differentiation among service providers.

In other words, the nuts and bolts of business have to be at the center of the business strategy. This means that the players that succeed in the first part of the next century will be those that have currently committed to strengthening these core areas of their business.

To move their organizations in this direction, telecommunications service providers can take the following steps.

- *Make product development the central focus of the enterprise.* Product development is not something that can be acquired through an acquisition strategy; it has to be learned and developed from within. The way an organization develops outstanding products and creates the types of leaders needed for the future is to make product development a central focus of the enterprise. It should not only be those directly involved in developing new products who understand how the process works. All parts of the organization should be familiar with the way products are developed. As more people within the organization become development-literate, better results are sure to follow.
- *Make product development a process that is both disciplined and flexible.* Companies have to work hard at striking this balance between flexibility and discipline in their development processes. Creative processes can never be entirely driven by discipline, but neither

can they be driven solely by passion. The importance of sound fundamentals, in areas pertaining to design principles, financial accountability, and market accuracy, need to be balanced against an environment that is volatile and dynamic. Flexibility and speed are important but only when they coexist within a process that is sound and disciplined.

- *Regularly benchmark the process itself.* Development is not a cheap affair. By any measure, the investment is significant, and analyzing the process in which development investments will be made is necessary financially. Companies that derive the best returns from the development investment are the ones that analyze their processes constantly. They compare what they are doing with what's going on in other industries and with their peers in the service provider world. They measure, they document, and they regularly recalibrate, all of which lead to a never-ending spiral of improvements.
- *Formalize continual improvement into the process.* To get maximum payoff from development experiences, companies need to make sure that each project is building on the successes of the past. Making the post-launch review a formal part of the process ensures that lessons are recycled immediately into the next project. Becoming more proficient at development means that best practices replicate past successes. What worked in the last project should get recycled into the next. What did not should immediately be analyzed and either reworked or cast aside.

The common theme here is one of attention, with a focus on continual improvement. The Japanese term for this is *kaizen*. For companies and people alike, it is not something that is easy to do. It is almost always more enticing to move on to something new than it is to work on improving something that is already in place.

However, to think that what is being improved is simply a process would be to miss the point. As the knowledge level on product development increases within the company, what is gained can be strategically more important than any single product being added to the line-up. What is gained goes beyond building a competency in a crucial area. New products, after all, are still a fountain of renewal for any company. By

committing to a company-wide process of improvement in the way a company develops its products, the company gains not only the skills involved in doing this better but a sense of vibrancy and confidence as well.

The following are other things companies can do to get the most out of their development effort and to renew the engine and the people who are part of the effort:

- *Choose people carefully and place strong leaders at the top.* The strategic importance of product development necessitates that the people assigned are ones who are capable of carrying out the work. Meeting the operational challenge that is at the heart of survival requires that management teams be willing—and able—to go below the surface. A hands-off approach in this area simply will not do. Successfully leading projects that cross all parts of the organization takes comprehensive knowledge of the industry and the internal operations of the business. Industry diversity is great, but when a lead person for a service development effort was last seen managing the launch of "light 'n' lively"® yogurt, the effect on the organization can be demoralizing.
- *Keep and reward employees.* If teams are the new unit of business, and projects are the new unit of work, project leaders that manage teams effectively and deliver successful and timely project results should be the organization's next leaders. It does not do the organization much good if the experience being gained walks out the door or moves to another area where those skills are no longer utilized. Without appropriate incentive to stay, the competencies cultivated are likely to be lost. For skills to accrue, the experience and skills that are being developed need to recycle back into efforts that follow.
- *Implement projects selectively.* Improvement in product development should not be measured solely by reduced cycle times, nor should it be judged by the number of new products released. Speed to market and reduced development cycles are worthwhile goals, but the larger goal should be to produce more successful products in a more efficient manner. Sometimes implementing fewer projects

> with greater attention to each makes more sense than producing a raft of mediocre offerings. Moreover, nothing inspires like success, and building a reputation for delivering winning products, even if the number is small, can go much further than flooding the market with goods that just fade away.

These are just a few of the areas that will characterize companies that become the world-class service providers of the next generation. Gaining an edge in telecommunications service provision will be a big job, and no single formula exists for finding success. Each service provider will have to find its own approaches for creating new services and for getting the day-to-day delivery functions right.

The turbulence ahead means that not everyone will survive. Competition will be intense, international, and, for the most part, unrelenting. Improving the core and mastering the skills of product development are not jobs that can be accomplished overnight. At the same time, however, companies cannot take too long at this either, because to lose position in a field as oceanic as the telecommunications market is to risk nothing less than one's future position in a global economy.

Just as there are no single solutions, there are no safe havens in the telecommunications industry either. Mastery of product development and day-to-day delivery functions will not alone lead companies to the sparkling waters ahead. Still, regardless of the outcome of any particular company, the ride is going to be an interesting one for those who stick around. Indeed, MCI, one of the industry's biggest players, perhaps summed it up best when it said, "Is this a good time or what:-)?"®

List of Acronyms

ACD automatic call distribution

ADSL asymmetrical digital subscriber loop

AIN advanced intelligent network

ANSI American National Standards Institute

ASR access server request

BRI basic rate interface

BSS business support system

CMS call management systems

COSMOS computer system for mainframe operations

DLR design layout record

FOC firm order commitment

IDM integrated definition modeling

ILEC incumbent local exchange company

IPO input-process-output

ISDN integrated services digital network

ITU International Telecommunications Union

IXC interexchange carrier

JAD joint applications development

LFACS loop facility assignment computer system

MARCH memory administration for recent change

MTTR mean time to repair

OAM&P operations, administration, maintenance, and provisioning

OOM object-oriented modeling

OSI open systems interconnection

OSS operational support system

PCS personal communications services

PFOC preliminary firm order commitment

POTS plain old telephone service

PRI primary rate interface

PSTN public switched telephone network

SLA service-level agreement

SMDS switched multimegabit digital service

TIRKS trunk inventory record keeping system

TMN telecommunications management network

USOCs universal service order codes

V&H vertical and horizontal

VPN virtual private network

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Ellen Ward has been in the information and communication services industry for almost 20 years. Her career has spanned numerous areas, from positions in operations and systems analysis, to management positions in sales, marketing, strategic planning, and product development. Formerly she was with MCI and Cincinnati Bell Telephone, where she was responsible for introducing several new service platforms, including ISDN.

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