OBJECTIVES

This chapter steps you through the analysis of the business assessment outlined in Chapter 2, "Planning and Conducting Your Business Assessment." It is one of the key chapters addressing the Analyzing Business Requirements section of the Microsoft-supplied guidelines for the exam.

Analyze the existing and planned business models.

- Analyze the company model and the geographical scope. Models include regional, national, international, subsidiary, and branch offices.
- Analyze company processes. Processes include information flow, communication flow, service and product life cycles, and decision-making.

▶ When you are tasked with designing a strategic solution to a problem, you must understand a broad range of factors that influence that problem. Windows 2000 and Active Directory were designed to wrap around the business model and become a more strategic part of business than any other operating system ever has been. Therefore you must pay very close attention to the business itself. The geographical scope of the company will influence the way you design your Active Directory domains and organizational units, and will play a large role in how you use sites to manage replication traffic. Likewise, company processes define how the company operates in terms of information and communication. The way a company manages information and communication (knowledge) will influence almost all facets of Active Directory design.

Analyze the existing and planned organizational structures. Considerations include management model; company organization; vendor, partner, and customer relationships; and acquisition plans.

CHAPTER 3

Analyzing the Results of the Business Assessment

OBJECTIVES

- In much the same way as the geographical scope of a company influences the design of Active Directory, the organizational structure influences how you organize the objects within the directory to promote ease of administration and delegation of authority. The company's relationships with outside vendors, partners, and customers will determine how external access to the directory is managed, and more importantly, how security of those areas in the directory is implemented. Acquisition plans will roll into the aforementioned access and security areas, and will also present you with scalability scenarios to consider during your design phase.

  Analyze factors that influence company strategies.

  - Identify company priorities.
  - Identify the projected growth and growth strategy.
  - Identify relevant laws and regulations.
  - Identify the company's tolerance for risk.
  - Identify the total cost of operations.

- Whereas the previous objectives have direct influence on Active Directory design, this objective works at a higher level. It is important to identify factors that influence company strategies because the company's goals and objectives are based upon its strategies. The goals and objectives identify where a company wants to be in the future, which has a direct impact on key design scenarios for the directory. If strategy changes, that causes objectives to change, which filter down to your design plans. This is where a risk management plan becomes so important.

OUTLINE

OUTLINE

STUDY STRATEGIES

- Take the necessary time to do Exercise 3.2, which has you view an online seminar focused upon knowledge management. This seminar will help you get a real-world understanding of decision-making drivers, information and communication flow, and other general business-related processes.
- Make sure you have a good general understanding of a digital nervous system. If the text in this chapter is insufficient for you, read the Enterprise Identity white paper mentioned in the additional resources list at the end of this chapter.
- Because the information in this chapter is abstract, it's important that you find something to relate it to. The Electrico case study is a great starting point, but if you're able to take it a step further and relate it to an actual company or client of yours, then you'll be in a better position to comprehend the information rather than just "reading" it.
- Pay attention to the sections on company strategy influences and again relate them to actual companies with which you do business. It's very important that you understand how things like mergers, law, regulations, and risk can affect a company's forward-looking strategy.
- Make sure you read the In the Field sidebars throughout this chapter. They help explain and support technology and processes beyond the scope of the chapter.

INTRODUCTION

Now that we've created the framework for conducting the business analysis, we'll apply it to a real-world situation. This chapter introduces Electrico Corporation, a consumer electronics organization that designs, produces, and distributes consumer electronics products around the world. You'll learn more about Electrico in the case study.

The entire focus of this chapter is dedicated to the framework for performing the business analysis set up in the previous chapter. Quite a bit of material will be derived from the case study. We'll go deeper here than in the previous chapter, and actually step through the analysis and draw some conclusions about the information extracted in the case study.

You may be wondering when we're going to start talking about Active Directory design and get away from this business analysis stuff. We are currently gathering the information we are going to use as input to the Active Directory design process. As stated previously, Windows 2000 and Active Directory are designed with an emphasis on the business. The material we cover in this part of the book will focus largely on *what* you need to understand about the business to effectively design Active Directory to meet both the business and technology needs of the company. The better you understand the areas of business outlined by this and future chapter objectives, the more successful you're apt to be when it comes time to crank out a design.

This chapter is one of the lengthiest chapters in the book, and covers quite a few test objectives. Once we get through this chapter, we'll get moving toward the technology side of the assessment, and then on to the design of Active Directory.

For now, though, let's take a look at the Electrico case study.

CASE STUDY: ELECTRICO CORPORATION

BACKGROUND

Electrico Corporation is an Indianapolis-based consumer electronics organization that designs, manufactures, and distributes consumer electronics products all over the world. Worldwide, Electrico employs about 5,000 people and is operationally managed from Indianapolis with divisions in El Paso (Manufacturing), Seattle (Product Development), Los Angeles (Sales), Buffalo (Shipping), and Chicago (Receiving). Electrico has been trailing its competition in terms of revenue for the past two years despite a steady increase in sales. Consequently, its executives have been studying its two main competitors and have made two distinct findings:

- Both of its main competitors utilize the Internet to sell product and supply their distribution channels with product.
- Both competitors include representatives from their corresponding IT organizations on every key strategic decision they make.

Immediately following these findings, Electrico called an executive meeting in which the following decisions were made:

- For the company to remain competitive, it must start putting an emphasis on technology.
- All IT projects should be outsourced from this point forward so the company can concentrate on its core competency.
- Electrico must rethink its business vision and analyze its business problems.
- Electrico should turn to Microsoft Windows 2000 to help strategically realign the company with IT.

PROBLEM STATEMENT

Electrico's current IT infrastructure consists of Novell NetWare 3.x and 4.x servers, all running in Bindery mode. Its line of business applications resides on an IBM mainframe. It still has quite a few 486 and low-end Pentium computers on the desktop running Windows 95 and a terminal emulation package to access the mainframe. IT has been reluctant to "fix" anything that was not "broken" and consequently has fallen behind the competition. Electrico executives have focused more on the bottom line in the past two years than on the business and now realize how the lack of focus on technology has jeopardized the company. They immediately got the appropriate funding to begin the project. Their goal is to change the way they do business.

BUSINESS ANALYSIS

Electrico has hired WayFront, Inc., a national consulting firm specializing in network and eBusiness solutions, to help take its business to the next level. WayFront understands technology, and more importantly, how to align business with technology to build a symmetric and high-tech business model. WayFront, after only a few days of high-level nontechnical discussions with Electrico, is ready to begin a series of discussions that will enable it to design a business solution to Electrico's problems. The following sections discuss WayFront's approach in detail.

Company Categorization

Before entering a meeting room, WayFront has properly categorized Electrico as a leader in the

continues

CASE STUDY: ELECTRICO CORPORATION

continued

consumer electronics market. Its strengths are its products and customer service, its weaknesses are a lack of direct sales and focus on IT, key benefits its competitors have over Electrico.

From the initial discussions it had with Electrico, WayFront was able to categorize Electrico as a *business-centric* company in terms of its relationship with IT.

No formal meetings between the two companies were needed for WayFront to make these determinations.

The following sections all occur in business meetings between Electrico executives, key line of business representatives, and WayFront consultants and business development managers. These sections are presented in question (WayFront) and answer (Electrico) format.

Business Vision
Purpose: To understand the vision of the company.

[Q]. What is your current business vision?

[A]. (Electrico CEO). It needs to change. It was focused on increasing product quality and utilizing new sales methodologies to increase revenue. After looking bottom line at our competition, we now recognize that we need to focus our attention on technology and how we use it to sell our product.

[Q]. Where do you see your company in 3–5 years?

[A]. (Electrico CEO). I see us struggling if we don't find a solution to our problem. I would like to see us as a company others model themselves after, a company with the right mix of business and IT that maintains product sales numbers double that of what we maintain now.

[Q]. What if your network could become a tool for increasing product quality and promoting new sales methodologies?

[A]. (Electrico CEO). That would be great in theory, but how do you make that happen? (Electrico CIO). Let's not worry about how, let's keep this conceptual. I think that is a great idea.

[Q]. What if you could use the Internet to sell your products all over the world?

[A]. (Electrico CEO). That would probably take care of our revenue problems, but it may create some others in logistics.

[Q]. Logistics are a valid and warranted concern. What if you could use that same technology to create a managed process that both benefits you logistically and does not burn bridges with your current distributors?

[A]. (Electrico CEO). That would be great!

[Q]. One final question. Do you see your competition moving in the same direction, that is, a technology-driven direction?

[A]. (Electrico CIO). I think they're already there with the technology on the front end, but I don't think they've wrapped their entire organization around the same logic.

CASE STUDY: ELECTRICO CORPORATION

Business Goals and Problems
Purpose: To develop a list of goals and business problems.

[Q]. Can you list your goal for this project?

[A]. (Electrico CEO). Our goal… We definitely need to start focusing on technology to help the business along. We can't compete without it. (Electrico CIO). I've seen several Windows 2000 seminars and am impressed with Microsoft's focus on the business in developing this operating system. That's the main reason we are interested in putting it to use.

[Q]. What are your problems in terms of how functional areas of your business operate or interoperate?

[A]. (Electrico CEO). We don't have a central repository to store information. We have information on several Novell servers, the IBM mainframe, in email folders, and on paper. It's too difficult to manage that way. Since the data is stored in so many places, all the different logins are an issue. (Electrico CIO). We don't have an effective communication process either. Several times we've had to scrap product designs because somebody did not communicate flaws efficiently. That's just one example. Our internal IT department is not a factor in our business processes; they react to business needs and are forced to come up with solutions that are not planned or tested. Sometimes they work, but more often than not, they don't, or don't get implemented in time to solve the problem. This is a big cost to our company. (Electrico CEO) And while we're on money, the cost of managing our network is outrageous. (LOB Rep) Our outside sales people have a difficult time keeping up-to-date on marketing materials and other key pieces of information because they are never in the office. They can dial in, but that process is slow and tedious. The same goes for our vendor and partner base. They cannot currently access our system and need to.

[Q]. In a perfect world, describe how you'd like to see your key business processes, such as design of your product, the development of marketing materials for your product, or strategic IT interaction flow.

[A]. (Electrico CIO). In a perfect world we'd be able to share information between teams of developers, designers, and testers on the technical level, and between sales, marketing, and our external partners and vendors on a business level. Our internal processes, such as new employee integration would initiate processes to create network and email accounts, prepare a cubicle or office, and assign a phone extension. Other key processes would be streamlined as well.

[Q]. What if you could create a digital nervous system that not only allowed, but promoted, information gathering, storing, and sharing between any employee in the company?

[A]. (Electrico CIO). I believe you are referring to knowledge management, which is another key technology I've been studying for a while. If we could apply business rules to such a technology, I think we'd be on the right track. Right now, it's just too hard for our user base to locate resources on the network and make use of them.

continues

CASE STUDY: ELECTRICO CORPORATION

continued

Company Organization
Purpose: To discover how the company is managed, and how vendor, partner, and customer relationships are viewed. Also to discover information about mergers and acquisitions.

[Q]. You mentioned your vendors and partners earlier—how does Electrico manage vendor and partner relationships?

[A]. (Electrico CEO). Currently we have a portion of our outside sales organization dedicated to managing the relationship with our vendors. This team devotes 100 percent of its time to making sure our products end up in the distribution channel at the right time, in the right quantity, and so on. Our partnerships are a much smaller part of our business. We currently partner with only one other company. This company provides employees for our manufacturing plants in Mexico. Our corporate HR staff manages this partner relationship from here. There is not a lot of interaction between the two.

[Q]. Do you currently allow partners or vendors to access your network? How about future plans for this?

[A]. (Electrico CEO). No. We have a strict security policy in place that does not allow any external party to access the network. I don't think we'll change that in the future unless we can guarantee security, although we'd like to start using the Internet to do business with vendors and partners.

[Q]. How does your customer service department interact with your customers? Do you see that changing in 3–5 years?

[A]. (Electrico CEO). Customer Service currently uses direct mailings to our customer base to promote warranty registration. They also man an 800 number for customer issues and route calls to the appropriate places, such as product support, billing information, etc. In the future we'd like to expand our customer service center to provide a broad array of product-specific services that are currently handled by the product teams themselves. The problem for the customer service reps has been a lack of information pertaining to the product line.

[Q]. How do you utilize your Web site in the areas of vendor, partner, and customer relationships?

[A]. (Electrico CIO). We dropped budgeting for our Web site when we started having money issues. Consequently, we have nothing more than a static Web site that lists our product line. This site is rarely updated and is currently outdated by three months. We would like to enhance this site to fit the needs of our customers.

[Q]. Describe your high-level company management model.

[A]. (Electrico CEO). We run everything from here. We have an executive board of directors and executive directors for each of our product lines. We also have departmental directors that report directly to me. All of these positions are located here. On the middle tier, we have branch managers, resource managers, and product managers. These positions are spread out around our offices, distribution centers, and manufacturing facilities in the U.S., Canada, Mexico, and

CASE STUDY: ELECTRICO CORPORATION

Europe. Under these positions are "tier three" managers, who play more of a team leader role during projects.

[Q]. Do you see the management model changing in the next 3–5 years?

[A]. Yes. We've been discussing making a few changes, but have not implemented them. We are looking to distribute some managers when we go to a regional operation.

[Q]. Do you plan to grow your business within the next 3–5 years through mergers or acquisitions?

[A]. (Electrico CEO). Yes. We've discussed the possibility of purchasing an Asia-based company to grow our business in that market. A merger with the same company is a possibility if we cannot acquire them.

Geographical Scope and Company Model
Purpose: To find out where the company operations are located. To understand how the company operates within the geographical scope.

[Q]. You mentioned previously how the company was geographically dispersed. Can you elaborate on this?

[A]. (Electrico CEO). Sure. We are headquartered out of Indiana and have a small campus of three buildings there. We have regional operations in Buffalo, Chicago, Los Angeles, Seattle, and El Paso in the U.S., and London in Europe. Our Canadian operation in Vancouver serves as an extension of our Seattle operation, and our El Paso operation serves as a hub for our Mexico plants located in Juarez. We have several smaller operations that report either directly to corporate in Indiana, or to one of the regional headquarters I just mentioned.

[Q]. So it sounds like your company model is best described as a mix between national and regional—is that accurate?

[A]. (Electrico CEO). Yes. (Electrico CIO). Well, from a reporting perspective he's right, but from an infrastructure perspective we operate more like a hub-and-spoke, because all WAN connections come here first. That was a result of explosive growth and poor planning.

[Q]. So it's safe to assume you'll be doing some infrastructure work in conjunction with this project?

[A]. (Both). Yes.

Company Processes
Purpose: To understand company processes as they relate to information and communication flow, as well as service and product life cycles and decision-making.

[Q]. Do your product teams change? If so, how do you manage those teams, communications, and information?

[A]. (Electrico CIO) Our product teams are usually permanent because our products don't change much from one revision to the next. We do, however, appoint short-term teams to conduct research and research analysis. Email is our principal means of communicating the needs of teams back and forth. It works but is inefficient when we need to give the teams access to

continues

CASE STUDY: ELECTRICO CORPORATION

continued

resources they need to do their jobs. We'd like to be able to automate the team creation process period. That would involve providing the team with disk space for collaboration, access to secure documents, access to printers, and additional software.

[Q]. What if you could create virtual teams, provide them with network space to collaborate, an interactive Web interface, and boundless integration (members can be from anywhere in the world)?

[A]. (Electrico CIO). That would fundamentally change the way we do business, which I think we can all agree is a good and needed thing. I'd be interested in seeing a solution concept in a test lab.

[Q]. How do you determine when to replace a certain product from your product line with a new version? How about a line of business applications?

[A]. (Electrico CIO). Good question. Internally, talking about applications replacement, we replace something when it stops working. That is literally how we've made decisions in the past. We recognize that needs to change fundamentally. We have a bit more structure when it comes to our product line. We use a standard product life cycle model to rev our products and have been pretty successful.

[Q]. Do you use any type of decision support system that provides you with the knowledge you need to make decisions? If not, where do you get the information you need to substantiate a decision?

[A]. (Electrico CIO). We do not have any decision support systems in place. It really depends on the type of decision we make as to what we base it from. We trust managers to make fair decisions for, say, vacation time, based on workload, available time the requesting employee has for vacation, the employee's performance—those things. Now if we're making a strategic decision, something that affects the direction of the company, those decisions are made after meetings where we discuss market research, performance (dollar wise), cost (if applicable)—things like that. Information that to us is not readily available, we have to go out and get it.

[Q]. How do you structure your decision-making process? I mean, are there various levels of decision-making before something is approved? Is there veto-ability? How much time does this process take?

[A]. (Electrico CEO) From a high level, we empower our management staff to make some decisions that do not require approval. For those decisions that require approval, we typically use cost to determine who has the final say. Some decisions can be overturned by executive directors or the board, but that rarely happens. Our process is pretty quick. Most decisions are approved within 48 hours, depending on what's being decided.

[Q]. Do you employ any sort of workflow application that applies your business rules and facilitates communication and tracks correspondence?

CASE STUDY: ELECTRICO CORPORATION

[A]. (Electrico CIO). No. We send a bunch of emails to people we know have the final say. In the future, we'd like to look at such a system.

Influences That Affect Company Strategy
Purpose: To see what internal or external instigators will cause the company to change its strategy.

[Q]. Can you list your top three company priorities in order of precedence?

[A]. (Electrico CEO). Our top priority is to increase sales volume and to remain competitive in our market. Second, implement the technology that allows us to do that. Third, educate our staff.

[Q]. What influences would make you change any of these priorities?

[A]. (Electrico CEO). Market conditions influence consumers. If market conditions are such that consumers quit buying our products for an extended period of time, it could cause us to refocus our strategy. Other influences are our competitors and how we match up with them in sales volume reports, technology, mergers and acquisitions, and the law.

[Q]. What are the relevant laws and regulations that influence your strategy?

[A]. (Electrico CEO). There are a plethora of regulations governing the transmission of digital signaling across the airways. There are too many to list, but they drive us nuts because they are constantly changing as new technologies emerge. There are really no laws; you see more laws in the service provider arena, say for a satellite system.

[Q]. Has Electrico ever performed a Total Cost of Operations assessment? If so, where are your problem areas?

[A]. (Electrico CIO). We've never performed a formal TCO assessment, but I can tell you that there is significant cost in the maintenance of the Novell Server network and the client base. We keep increasing our help desk staff to compensate for poor trouble ticket resolution time, but it doesn't seem to help much. We spend a lot of time trying to fix problems that shouldn't have happened in the first place.

[Q]. How much risk are you willing to take to realign your business with IT in mind?

[A]. (Electrico CEO). Obviously we don't want to do anything stupid, but at the same time we have an immediate need to get something in place. We'll sacrifice the money to replace instead of upgrade, we'll accept the risk associated with planning and design so we can do the job right.

[Q]. Where do you draw the line between acceptable risk and jeopardizing the well-being of the company?

[A]. (Electrico CEO). That's a very hard line to draw; I guess it depends on how we feel collectively about a certain risk. I'd like to have a risk management plan in place so we know what to do if we run into something.

NOTE

Tips for the Envisioning Session
One recommendation for the setting of this stage of the analysis is a conference room with a white board. A recommendation for the format is a facilitated discussion between the key design architects and business managers on the solution design team. Executive management should not attend this discussion.

ENVISIONING THE FUTURE

A clear and concise vision provides direction and inspiration for the entire company, if it is done right.

Envisioning the future is probably one of the more difficult things company executives do these days. There are so many things that can influence how people see the future. Remember Year 2000? The Internet? How many corporations anticipated they'd be selling product direct to anyone who wanted it around the world by 1998? How many companies back in the 1920s predicted the stock market would crash and the Great Depression would occur? The point we're trying to drive home is that a good vision is one that takes into consideration things that may influence the strategic direction of the company for years to come.

Electrico stated during the interview process that its vision needs to change. Does it? Your job during the interview process is to listen when appropriate, and ask the right questions when appropriate. You are trying to add value to the business by designing a technical solution that addresses their problems. To do that, you must thoroughly understand both where they are (current state) and where they want to go (vision).

Current State

Electrico stated the following vision during the meeting:

> *"It needs to change. It was focused on increasing product quality and utilizing new sales methodologies to increase revenue."*

Your task is to analyze this quote and the answers to your interview questions and draw some conclusions about the current vision of the company. You may decide you want to make some comments about the vision, but you should remember that some companies may not be open to suggestions about changing it.

In Electrico's case it's pretty easy, since the CEO already told us it needed to change. Our course of action then will be to analyze the answers to our questions from the meeting to determine where Electrico wants to position itself in its industry over the next 3–5 years.

It would be a good idea here to go ahead and break down the company's current vision statement. Even in Electrico's case, this will give us additional insight into the current state of the company. For example, in looking at Electrico's current vision, you can draw two conclusions:

- Electrico is a company dedicated to producing high-quality products.
- New sales methodologies have or will be introduced to the organization.

The second bullet in the preceding list is interesting. You have a vision statement that references *new* methodologies. If you run into something that doesn't quite sit right, like this, you should question the company. After further questioning, Electrico states that they constantly run their sales force through the Miller-Heiman Strategic Selling courses, which have been so effective, they've been added to the company vision.

Now you understand the current vision of the company. Where does it see itself in the next 3–5 years?

NOTE

When discussing network operating systems, the typical life cycle is between three and five years, so you'll see references throughout this chapter to the future as the next 3–5 years.

How Will the Company Change?

More important than the current state is how the company will change in the next 3–5 years. The vision statement identifies specific goals that are required for the continued growth of the company. In this section, you will analyze the information pertaining to the future positioning of the company and draw a conclusion based on that information.

Electrico is sure of one thing—it needs to focus on technology more than in the past if it is to continue to compete in the industry. WayFront, in its analysis, uses this statement as a starting point. During the interview, the Electrico CEO stated that they would struggle if they didn't find a solution to their problems. The

problems were identified as no e-commerce solution, and not enough involvement of IT in strategic business decisions. Already, WayFront can draw a conclusion: *Electrico must involve IT in strategic planning efforts.* Additionally, the Electrico CEO, in setting his sights high, stated he would like to see Electrico as a company others model themselves after with the right alignment of business and IT. A second conclusion can be drawn here: *Electrico wishes to design a world-class business infrastructure, one in which both business and IT collaborate to determine strategic business direction.* Finally, in the same statement, the Electrico CEO states that this alignment of IT and business would double the sales volume that it currently maintains. A final conclusion can be drawn from this statement: *Electrico must utilize the business and IT alignment to double its sales volume within five years.*

"What If?" Analysis

In the case study, WayFront used "What if?"-based questioning to determine the business needs of the organization. The "What if?" question is very effective in a high-level analysis because the sky really is the limit. For example, WayFront asked questions geared at sparking this interest of Electrico and getting them to think in a certain way about the way they do business. Questions such as *"What if your network could become a tool for increasing product quality and promoting new sales methodologies?"* demand a response that usually requires a bit of thinking. In this case, WayFront incorporated Electrico's existing vision into a "what if" question and gave it an IT twist. The response was positive but with a bit of apprehension.

Sometimes companies are reluctant to change anything—especially companies that have been around a while. WayFront was able to detect this apprehension, *"but it may create some problems with logistics"* and roll that consideration into the next question, *"What if you could use that same technology to create a managed process that both benefits you logistically and does not burn bridges with your current distributors?"* The result, something potentially show-stopping, was turned completely around into something positive.

Concluding the Business Vision Analysis

How you perform the analysis of the business vision, or any other section of the business analysis, is up to you. The goal is to take the information you were able to extract from the meeting, organize it, and make sense of it. In this case, we used a conference-room setting with a facilitated discussion format. We took our notes from the meeting, discussed them, and drew conclusions from them. The next step is to take the results of the analysis and put them into a useful format.

Figure 3.1 illustrates how you might organize your findings in the business vision analysis. In Electrico's case, you will present these findings to the executives and come up with a vision for the company moving forward. In all cases, you will take these findings and apply them in your design proposal.

Electrico Corporation. Business Vision Analysis Results

Current Vision Statement:	Focused on increasing product quality and utilizing new sales methodologies to increase revenue.
Conclusions Drawn From Analysis	1. Electrico must involve IT in its strategic planning efforts. 2. Electrico wishes to design a world-class business infrastructure, in which both business and IT collaborate to determine strategic business direction. 3. Electrico must utilize the business and IT alignment to double its sales volume within 5 years.
Future Vision (from analysis of data)	Increase product sales volume by developing and maintaining a world-class relationship between business and IT, and utilizing a top-notch network infrastructure to gather, organize, and manage knowledge.

FIGURE 3.1
Electrico Corporation. Results of business vision analysis.

ANALYZING BUSINESS PROBLEMS

The first step in planning workable solutions is to analyze the business problems and create project objectives. The most efficient way to organize the objectives definition is through the use of a table (see Table 3.1) that maps business problems to project objectives. We will pick up our discussion of the Electrico case study later in this section.

Business Goal

The business goal is usually associated with the overall goal for the project. In Electrico's case, the business goal can be stated as *"To start focusing on technology to help the business along."* It is important to clearly define this business goal, because the goal will serve as strategic direction for the project. The business goal is a statement, and the project objectives both support that statement and address one or more specific business problems.

Problem Analysis

Once you've defined the business goal, the next step is to analyze the business problems and come up with project objectives that address those problems. As an analyst, your goal in performing this analysis is multi-fold: First, you want to understand what your client's problems are. What are the business problems and how can we fix them? In general, what are the client's expectations for the project? Second, you want to begin to look at project scope. What is it going to take to make this project successful? What will the personnel requirements be? How long will the project take? Finally, you want to organize the problems and objectives into short- and long-term categories that address specific business concerns. Typically your longer-term category will consist of anything that addresses ROI or TCO.

The following sections outline the business problem analysis process.

NOTE

Project Reference Just to clarify, we are treating the business analysis as a project that consists of one or more project team members. The client in this case is the business you're assessing, even if the project team is itself a part of that business.

Problem-Objective Table

The first step in performing the business problem analysis is to map the business problem to a project objective. A conference room discussion and a white board are a perfect setting for this activity.

To determine what the business problems are, review your notes from the meeting. On the white board, write down anything you and your project team consider a business problem. Once you have exhausted your notes, remove duplicate problems, condense similar problems into one, and verify with the company with which you're working that these problems are accurate.

The end result of this discussion should be a table such as Table 3.1. Table 3.1 acts as a precursor to the following sections by displaying the problem-objective relationships from the Electrico case study. Keep in mind that this is an Active Directory design book, so issues that do not pertain to that do not appear in this list.

NOTE

Project Objectives At this stage in the problem analysis, we have not yet discussed our project objectives. We have inserted them in Table 3.1 to make it complete, and will discuss how we came up with them in the following section.

NOTE

Direct Problem-Objective Mapping An effective way to address each business problem is to create an objective that addresses that problem. A one-to-one mapping between problems and objectives is recommended wherever possible.

TABLE 3.1

BUSINESS PROBLEM AND OBJECTIVE RELATIONSHIP—ELECTRICO

Business Problem	*Project Objective*
Too many logons are necessary to get to the information needed for a simple task.	Utilize Active Directory and directory connectors to provice a single logon.
Systems do not facilitate adequate communication among departments.	Design the Active Directory structure so that it provides the framework for collaboration and communication.
The cost of managing the network is too high.	Design Active Directory to facilitate simplified network management. Make the MMC a single source of administration.
External users, including Electrico employees, vendors, and partners, cannot get to the data they need in an adequate fashion from outside the company.	Develop a security policy that authenticates employees, vendors, and partners and allows specific access to the directory based on security credentials.
	Create a new remote access system utilizing Virtual Private Networking (VPN) technology.
Employees have a difficult time finding the resources they need from the network.	Use Active Directory to store information about all objects on the network.
There is no way for employees to manage intellectual material.	Prepare Active Directory to incorporate Microsoft Exchange Server 2000 WebStore and Workflow.

Objective Definition Stage

The next step in the business problem analysis is to prepare project objectives to address each problem. To do this, you'll treat each business problem individually, and create an objective to solve that problem. Your objectives will be an extremely high-level selection from your solution set, which in this case is Windows 2000, and more specifically, the Active Directory design subset of solutions. This is where your knowledge of Windows 2000 and Active Directory becomes key.

We'll start the objective definition with the list of problems from the white board. For each problem, we must identify a solution, an objective that addresses the problem. In the case of Electrico, we came up with six problems (refer to Table 3.1). Because Table 3.1 already lists the project objectives, we'll discuss how we came up with them.

Problem #1: Too many logons are necessary to get to the information needed for a simple task. Over the years, Electrico has added systems "just in time" to get the job done. Consequently it has ended up with quite a few systems that do not communicate with one another. A side effect of this situation is the number of times a user must authenticate to a different system to get the information he needs. At Electrico, it's possible that a user would need to log in to the Novell network, the IBM mainframe, and the email package just to find one piece of information. To alleviate this problem, it needs a unified directory with a single logon. No need to go any further. You have your objective. **Objective #1: Utilize Active Directory and directory connectors to provide a single logon.**

Problem #2: Systems do not facilitate adequate communication among departments. More often than not, you'll find that organizations do not communicate well. We'll all probably go to our graves trying to get to the root cause of that problem. What we can do is provide a more robust environment that promotes (and sometimes demands) good communication. There will always be that human factor around to ruin everything, but there is nothing we can do about that. We know from our meeting that Electrico in part blames its systems for inadequate communication. To *help* resolve Electrico's communication problems, we need to provide a platform that promotes collaboration, team communication, messaging, and

conferencing, all of which cannot be provided by Active Directory in and of itself. This is an example of a case in which you'd want to promote the integration of additional technology that addresses this problem. Microsoft Exchange 2000 provides not only messaging and scheduling capabilities, but also a world-class knowledge-management platform, which just happens to address all of the above issues.

So, in summary, we draw our objective in the form of providing a platform that promotes collaboration and communication. **Objective #2: Design Active Directory structure so that it provides the framework for collaboration and communication.**

Problem #3: The cost of managing the network is too high. This is another area that hinders the efficiency of businesses. When you get right down to it, bottom-line costs drive how, and how well, businesses perform. A company without an IT focus, such as Electrico, tends to treat its IT department as a cost center, a necessary evil that just frankly costs the business too much money. Businesses are starting to come around now and realize the benefit of strategic IT involvement in the core business. This, among other things, changes the way they look at IT costs. Once they begin to reap the benefit of technology in the core business operation, the whole cost center thing seems to disappear. Another side of this is when the IT infrastructure is such that management becomes a costly operation. Such is the case with Electrico: It has too many systems to manage and hence has compensated by hiring additional staff. Its goal is to reduce this cost, yet better its internal system, a goal that proper implementation of Windows 2000 and Active Directory should resolve. **Objective #3: Design Active Directory to facilitate simplified network management. Make the MMC a single source of administration.**

Problem #4: External users, including Electrico employees, vendors, and partners, cannot get to the data they need in an adequate fashion from outside the company. This problem is complex. When you step back and look at why the problem exists, you'll see there are two problems: the company security policy and the remote access services. For that reason, this problem is addressed using two objectives: one that addresses security, and another that addresses remote access. In terms of security, Electrico's long-standing company security policy states that non-employees simply

NOTE

Importance of Microsoft Exchange
Because Exchange is out of the scope of this book, we can't go any further into it, but do recommend you understand its capabilities, as they are a great complement to Windows 2000.

do not get access to the network—period. With the information age in full swing, Electrico needs to be persuaded a bit to revise their security policy to allow partners and vendors access to the information they need access to. With Windows 2000 Public Key Infrastructure (PKI), Kerberos Authentication, X.509 Certificates, IPsec, and other encryption protocols, it is possible to open only specific doors on the network for specific users, therefore keeping confidential company information protected. The remote access services in use by Electrico are old, slow, and antiquated. This inhibits the external sales employees from getting the information they need when they need it. So we must architect a new remote access system to alleviate this problem. **Objective #4: (Security) Develop a security policy that authenticates employees, vendors, and partners and allows specific access to the directory based on security credentials. (Remote Access) Create a new remote access system utilizing Virtual Private Networking (VPN) technology.**

Problem #5: Employees have a difficult time finding the information and resources they need from the network. This problem is a gruesome side effect of growth in several areas. As the company grew, additional systems were added to address growing business needs. Although on the surface these systems got the job done, underneath they began to create minor problems for the users. The users had to go to several locations to find the resources they were looking for. As the company grew, these problems became larger. Now the problems are so big, they're starting to reverse the benefit of the additional systems. You can address this problem by utilizing Active Directory as your resource repository—that is, publishing all network resources to a single searchable directory so users can easily find and use them. **Objective #5: Use Active Directory to store information about all objects on the network.**

Problem #6: There is no way for employees to manage intellectual material. This problem is another one of those problems that arises from rapid, uncontrolled growth. Smaller organizations have the ability to manage information well, because there are usually one or two people generating that information and they manage it themselves. When you get into larger organizations, this process becomes less manageable because you have several people and systems responsible for generating information, and those who use the information may have nothing to do with putting it together. Microsoft has invested in significant research into the development of knowledge

and how to manage it. While Active Directory and Windows 2000 do not specifically perform functions that allow you to manage knowledge, Exchange 2000 does. This is yet another use for Exchange in the Electrico environment. The Windows 2000 Active Directory design for Electrico should consider the integration of Microsoft Exchange 2000's WebStore and workflow functionality.

The Active Directory design that will promote the incorporation of these technologies is the design itself—that is, highly structured domains and organizational units, and well-planned security groups. **Objective #6: Prepare Active Directory to incorporate Microsoft Exchange Server 2000 WebStore and Workflow.**

NOTE

More About Exchange You can read more about the Microsoft Exchange WebStore and Workflow functionality at **http://www.microsoft.com/exchange/prodinfo/2000/default.htm**.

IN THE FIELD

PROJECT SCOPE AND TEAMS

Once you've defined your project objectives, you should start to think about the scope of your project. For most large projects, you'll create more than one project team, and you should begin to define those teams as the project objectives and scope become clear. The scope of a project defines its boundaries (what will and will not be done). Windows 2000 scopes generally will be large, since many corporations will wrap infrastructure and hardware upgrades in with them. Moreover, it's not uncommon to build different project teams for DNS design, Active Directory design, security, training, rollout, and more. A word to the wise: Begin your team building and resource planning early in the process.

COMPANY ORGANIZATION

Analyze the existing and planned organizational structures. Considerations include management model; company organization; vendor, partner, and customer relationships; and acquisition plans.

The analysis of the company organizational structure is where things are going to start getting complicated and even a bit abstract. When discussing the organizational model relative to Active Directory, everything seems to tie in some way to everything else. A change in one area filters through dependent areas and, before you know it,

you can have a mess on your hands. The goal here is to get the right information to do the design. This section uses parts of the Electrico case study to demonstrate a pseudo real-world look at company organization. Before we start, take a step back and think about what we really need to accomplish here in this section. Your goal in performing this analysis is to understand the management model; vendor, partner, and customer relationships, and merger and acquisition plans of the business so you can adequately design Active Directory to satisfy the current and future needs of each.

Existing and Planned Management Models

The existing and planned management models of the organization play a key role in the design of the Active Directory security groups, organizational units, sites, and potentially delegation of administrative control. Having a good understanding of the current and planned management models will allow you to design a solution that both satisfies the existing needs, and has the ability to scale up or down with company growth or cutbacks.

The first step in performing this analysis is to extract the key information about the management model from the meeting notes. The key statements about the company management model at Electrico are as follows:

- "We run everything from here." All key decisions are made from the corporate headquarters.
- "We have an executive board of directors…," "We also have departmental directors…," "On the middle tier… These positions are spread out…," "Under these positions are 'tier three' managers…"
- "We are looking to distribute some managers when we go to a regional operation."

These bullets give us a high-level view of the management model as it exists now, and what the future holds. In performing an analysis on this information, you want to ask yourself questions such as the following:

- Does the management model coincide with the geographical scope of the company? (Geographical scope will be discussed in the next section.)
- What roles do different levels of management perform and does this impact the design concept for Active Directory?
- What role does the management model play in Active Directory security policies? Will there be a need for delegated control to management?
- How will changing the management model impact the design of Active Directory?
- What special considerations must be given to the executive management and board of directors?
- How does the IT management model integrate with the rest of the company? What special considerations will IT management need?

You may need to set up additional meetings with the company to discuss the management model in more detail, specifically to see how it plans to incorporate its managers into the directory. You may find that IT management is the only division of the management model that needs to be considered; however, other companies will incorporate other areas of management—hence the complexity. In any case, the end result of this analysis should be a requirements specification for Active Directory design with the company management model in mind. Furthermore, your specification should include a section on how the management model is expected to change, and how those changes will impact the design. Enter change, risk, and problem management. If these areas are not something you've dealt with in the past, get to know and understand them now because they will be your saving graces throughout this process.

NOTE

Change, Risk, and Problem Management Detailing change, risk, and problem management is out of the scope of this book. These areas of project management will be referred to throughout this book. It is highly recommended that you understand these processes and where they fit into the design process. Check the "Suggested Readings and Resources" list at the end of this chapter for reading material on these subjects.

In examining Electrico's management model, we see a relatively complex, multi-tiered management model that is spread out across the geographical scope of the company, as illustrated in Figure 3.2. Keep in mind that, although complex, Electrico's model has been simplified quite a bit so we can effectively convey the materials in this section.

Different companies will incorporate different levels of management into Active Directory design. In most cases, including Electrico, IT management and administration (discussed in detail in Chapter 4, "Analyzing the IT Administration Model") will be the focal point for your design, and other areas of management will provide input for security policies, delegation of control, vendor and partner integration, and merger and acquisition planning. The remaining subsections in this section describe the analysis of these areas.

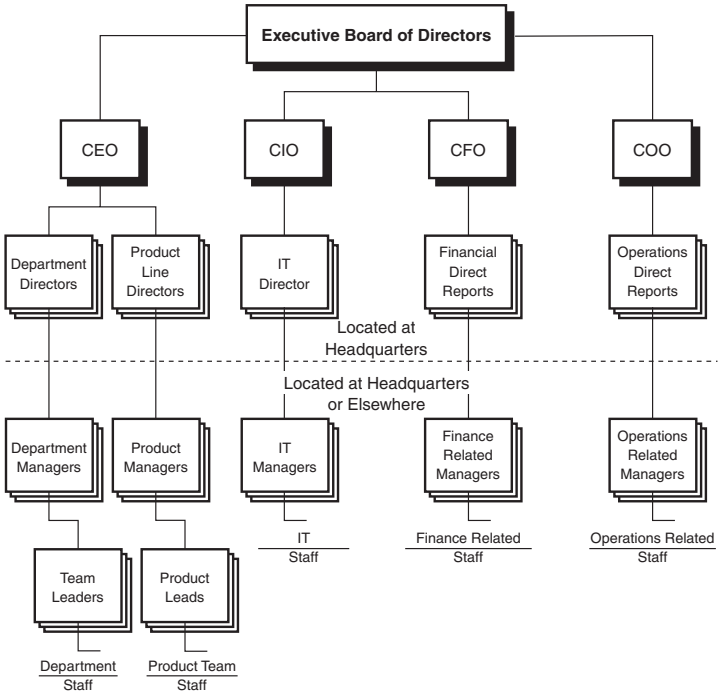

FIGURE 3.2
The Electrico management model.

Existing and Planned Vendor, Partner, and Customer Relationships

We're going to take a bit of a diversion in discussing this section. The digital nervous system, Microsoft's initiative to digitize the DNA of a company, presents us with an interesting view of vendor, partner, and customer relationships, as well as employee-to-employee relationships. The Community Management module of the digital nervous system discusses utilizing the Internet as a medium to facilitate these relationships. We'll discuss the Electrico vendor, partner, and customer relationships in the context of Community Management. You'll find later in the chapter that another digital nervous system module, Identity Administration, is used to discuss the key company processes within Electrico.

The explosion of the commercialized Internet has increased the need for efficient collaboration between a company and its key vendors, partners, and customers. The concept of a digital community promotes the use of the Internet to allow vendors, partners, customers, and even employees to quickly find and share the right information at the right time. More importantly, using the Internet to facilitate this collaboration means that it can be done from anywhere in the world, any time of the day. Of course, these relationships must be managed.

Digital community management manages relationships between internal and external identities. For example, an employee of Electrico may need to access a resource inside the company firewall from the outside. Because she is an employee, she is granted access through an authentication process to her resource, whereas a vendor, based on a PIN, may not even see the logon window to attempt to log on to an internal resource. This is an example of authentication, one of three components of community management: authentication, rendezvous, and authorization.

Authentication

Authentication, in general, is a verification process. Within Windows NT, it gives you access to network resources based on your user ID and password. Within the digital nervous system, it verifies your *identity*. Electrico has a strict policy against allowing vendors and partners access to their network because of security concerns.

Authentication securely identifies identities through the use of a username and password, or other set of security credentials.

Windows 2000 supports MIT v5 Kerberos authentication, X.509 certificate authentication, PKI (Public Key Infrastructure), and smart-card authentication mechanisms. This comprehensive set of digital authentication processes provides top-notch security to the internal network. Active Directory can use any of these authentication mechanisms to validate users and provide access to all valid resources within the company network (inside or outside the firewall).

With the explosion of eBusiness over the past few years, cases like Electrico's are becoming the minority. More companies are extending their internal networks to the Internet to allow vendors and partners to exchange information electronically.

NOTE

Extranets The process of extending an internal network to the Internet is called creating an extranet. *Extranets* are Web-accessible portions of a company's secure internal network. These portions do require authentication. Web access to a messaging server (Outlook Web Access to Exchange) is an example of an extranet.

IN THE FIELD

THE APPLICATION OF AN EXTRANET

There are a variety of uses for extranets. One of the more popular is that of Virtual Private Networks (VPNs), which are extensions of the corporate network that use a secure connection over the Internet to allow authenticated access for users with credentials. Many companies are replacing costly remote access services (RAS) with VPNs for a number of reasons. At the top of the list is cost. A company with a bank of 200 modems to support remote access can replace all 200 modems with a single (albeit fast) connection to the Internet and a VPN router or OS service. All that's then required for remote access through the VPN is access to the Internet and a VPN client. This solution proves to be much more cost effective over the long run than the traditional dial-in RAS connection. Vendors, partners, and customers can take advantage of extranets to gain limited access to the company information specific to their needs.

Rendezvous

More and more companies are setting up eCommerce storefronts on the Internet to sell their wares direct, and provide rich information to their customers. They are providing areas for customers to get information and support, send comments, or download updates

to products. Connecting vendors, partners, and customers to these resources, or to each other, is called rendezvous, the second component of community management.

Simply stated, *rendezvous* is the process of allowing people to connect to resources and other people. Rendezvous can play an important role in vendor, partner, and customer relationships because it provides a simple method for them to locate the resources they need to locate. You can think of rendezvous in the context of a simple address book—a resource to which all users have access, and which provides a method of connecting them to one another.

Active Directory provides the foundation for rendezvous in its support for Internet standard protocols such as DNS and LDAP. Through the use of these protocols, a company can populate and expose specific attributes of its internal directory to the extranet for use by validated vendors, partners, and customers.

Authorization

The final component of community management is authorization. *Authorization* uses a person's identity and context (both discussed later in this chapter) to grant access to resources. Do not confuse this process with authentication. In the context of a digital nervous system, *authentication* verifies your identity, and authorization uses that identity information to grant access to resources. Authorization is what ensures the security of the internal network and network resources. Authorization works side by side with provisioning (also discussed later in this chapter) to ensure that an authenticated user has access not only to the tools to do her job (provisioning), but also the access to resources (authorization) she needs to do her job.

Very important to the digital nervous system is a consistent security model. Active Directory provides this model, mainly by its ability to support a single logon and its ability to pass logon credentials to a requesting application. For example, Ken logs on to Windows 2000 and Active Directory Kerberos authenticates him. When he needs to access another system, perhaps an Active Directory aware database system that requires authentication, Active Directory simply passes Ken's logon credentials.

Electrico

With community management and the digital nervous system in mind, we'll now resume the analysis of Electrico's case study and see how a digital nervous system can be leveraged to better manage vendor, partner, and customer relationships.

The following bullets from the Electrico case study contribute to our analysis of its vendor, partner, and customer relationships:

- No partners or vendors are permitted to access Electrico's network because of a strict security policy. Plans to modify that policy hinge on how technology can ensure security. Electrico would like to begin using the Internet to do business with vendors and partners.
- Electrico uses an internal customer service department to provide phone-based service to its customers. It has plans to enhance this area of the company to provide additional services without requiring the aid of product teams.
- A portion of the outside sales organization currently manages the relationships with Electrico's vendors.
- Electrico's HR department manages the relationship with its only partner, which provides the company employees for its Mexico-based manufacturing facilities.
- Electrico currently has a static, out-of-date Web site that displays information about its products. They have dropped budgeting for the management of this site. They would like to pick back up with the site and tailor it to customer needs.

In Electrico's case, we need to examine a few different areas of Active Directory design. First is the customer service organizational unit. Currently the customer service department manually handles service calls covering a wide range of topics. It cannot provide detailed product support because of the lack of training and pertinent information about the products. Electrico has existing plans to expand the department, and provide it with the information needed to provide product support. This means that the department as a whole will need access to specific information across OU boundaries

in Active Directory. Setting up Active Directory security groups and providing sufficient permissions to product information for those security groups will allow customer service access to that data. Additionally, if Electrico created an extranet and incorporated the aforementioned digital nervous system processes, it could allow breakthrough support via its extranet and allow the customer service representatives to collaborate with customers, vendors, and partners.

The second area is in the vendor and partner relationship realm. Electrico currently uses outside sales staff to manage its vendor relationships, so when creating the OU design in the directory, you must consider this additional duty. This additional duty requires the specified sales individuals to have access to the information they need to provide to vendors, so simple permissions will probably handle this requirement. As Electrico looks to the future, it would like to utilize the Internet as a means to manage vendor relationships and provide for electronic data interchange (EDI). Among other things, this creation of an extranet is going to require Active Directory integration, management, and most definitely a security policy, all of which define a digital nervous system. The most common way to incorporate an extranet with the LAN and the Intranet is to create a demilitarized zone (DMZ) and locate all extranet servers on the DMZ. Figure 3.3 illustrates a simple DMZ.

The final area of consideration is the company Web site enhancements to provide customers with a rich, interactive, and functional experience. The relationship between the Web site and Active Directory lies in the services Electrico chooses to provide its customers, as well as vendors, partners, and employees. Remember that community management and its core components—authentication, rendezvous, and authorization—extend Active Directory to the Internet and provide the same level of security as inside the firewall. Electrico's chief concern about a functional Web site with access to internal data was security. You need to pick up on that and identify Active Directory and accompanying services as solutions to this problem.

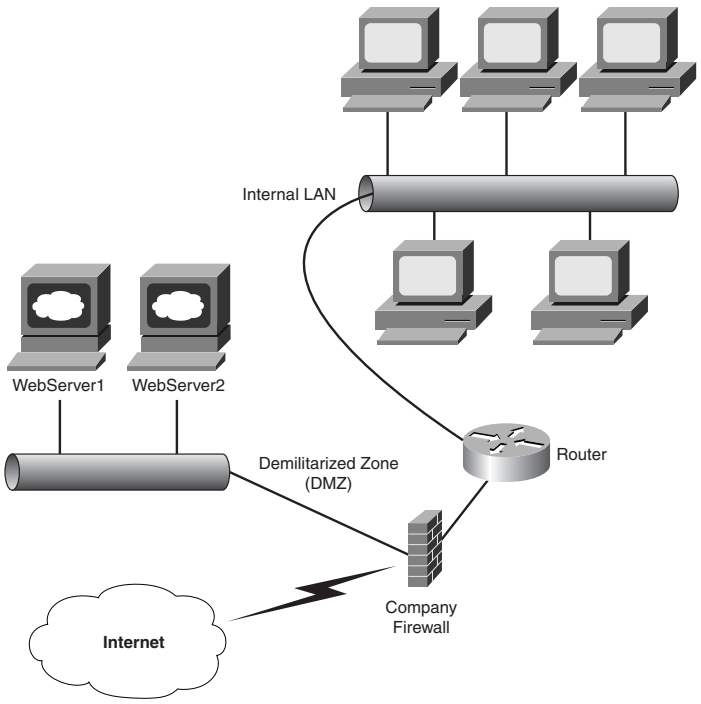

FIGURE 3.3
A simplified view of a Demilitarized Zone (DMZ).

Expected Areas of Growth

Growth within a company typically occurs in three areas: internal through new hires, mergers with other companies, and acquisitions of other companies. In a majority of cases, internal growth does not affect the design of directory services, as new employees usually hire into the functional business model. Consequently, the two major types of growth you need to be aware of in your design are mergers and acquisitions.

IN THE FIELD

GROWTH BEYOND THE BUSINESS MODEL

It is important that you not rule out internal growth from becoming a factor in Active Directory design. While it is true that most companies—especially well-established companies—do not grow rapidly enough internally to affect Active Directory design, there are cases in which this is not true. Consider the "dot com" industry. Many start-ups begin by offering a single service and then, if successful, grow rapidly to offer a much wider variety of services. Of course, one of the measurements of success is the company's ability to scale and do so rather quickly and easily. The methodically planned Active Directory structure will enable these organizations to grow vertically within the business model, as well as horizontally to extend the business model.

Mergers

It seems like every time you turn on the news, you're hearing about some multi-billion dollar *merger* between two gargantuan companies. Step back and think for a minute how big a job the IT organizations of those two companies have in front of them. Let's just say sleep deprivation comes to mind! In fact, if you've ever been a part of a large merger, you'll recall that the standardization of line of business systems, email, and even the network operating systems didn't happen overnight; in fact, it probably didn't happen for months or even years after the merger was final. The two companies probably went about business as usual for a while, just like nothing ever happened, and waited for the long, slow process of standardization to take place. How the two companies interoperate during this convergence time is what we're analyzing here.

Before Windows 2000, when two companies merged, how did they facilitate communication across the company? How did employees from one company access resources on the other company's network? How did they exchange email? What if one company was Windows NT and the other was NetWare? These are just some of the questions the IT organizations of each company had to answer. Microsoft recognized the stress IT organizations, and businesses in general, had to endure during a corporate merger. They designed Windows 2000 and Active Directory to simplify the interoperability and migration

aspects that typically make up the IT end of a merger. As you plan the Active Directory design for a merger, keep the following in mind:

- **Domain and OU design.** Design the domain and OU structure such that additional domains and OUs may be added without affecting the "original" ones.
- **Synchronization and migration toolset.** Know your "merger" toolset with Windows 2000. These are your synchronization and migration tools. Windows 2000 provides four main interoperability tools:
  - *NetWare integration and migration tools.* Windows 2000 includes tools to both integrate with, and migrate from NetWare. The integration tools provide for up to two-way synchronization of Active Directory and Novell's NDS. The migration tools provide a method to migrate NetWare users, groups, and volumes to Windows 2000.
  - *Services for UNIX.* The goal of Services for UNIX (SFU) is to provide a comprehensive set of tools to help bridge the gap between UNIX and Windows for users and administrators.
  - *Services for Macintosh.* Windows 2000 services for Macintosh provide Appleshare-compatible directory authentication and file and printer sharing capabilities using the Appletalk protocol.
  - *Single sign-on for host systems.* Through the use of SNA server and Windows 2000, you can provide integration with host systems using the RACF and ACF-2 security protocols.
- **Third-party tools and utilities.** There are several companies offering synchronization and migration utilities for Windows 2000. Entevo, FastLane, and Mission Critical all offer migration utilities that facilitate a managed and phased migration process.
- **Meta directory solutions.** Meta directories will sit atop an organization's differing directories, such as the ERP directory, Active Directory, Novell NDS, and Exchange Directory, and provide a single point of administration to all directories. This

ensures that all directories are "in synch" with one another. Microsoft acquired ZoomIT Corporation specifically to enhance its meta directory product Via.

- **Directory consolidation.** Consolidation is essentially moving the "identity" information from one directory to another and upgrading the applications to a version supported by the target directory (presumably Active Directory). Exchange 5.5 to 2000 is a good example of this.
- **Standards.** Always keep development of standards near the top of your list. This is a longer-term objective, but one that you'll need to begin addressing as soon as the two companies announce the merger.

NOTE

Even More About Exchange There are several references in this book to Microsoft Exchange. One of many good resources for additional Exchange information is the official Exchange Web site at **`http://www.microsoft.com/exchange`**.

Acquisitions

Acquisitions activity refers to one company purchasing another. Typically the purchasing organization will integrate the other organization into its network. The bullets listed for mergers in the previous section also apply to acquisitions. Additionally, you should consider the following issues for acquisitions, which will be discussed at length in Chapters 10, 11, and 12:

- **Domain model integration.** Determine whether the acquired company will be integrated into the existing domain structure, or will become a new domain.
- **Active Directory sites.** Depending upon connectivity to the newly acquired company, you may need to consider controlled Active Directory replication through the use of sites. This of course comes after the domain model integration.

IN THE FIELD

PLAN FOR ORGANIZATIONAL CHANGE

One thing mergers and acquisitions are sure to bring about is change. Change is a nemesis to some and is welcomed by others. How companies cope with change—whether they proactively plan for it or just react to it—often determines success or failure. The following excerpt is from an excellent Microsoft TechNet article, "MS Solutions Framework: Managing Organizational Change."

continues

continued

"In other words, the organizations that succeed at change do so by considering the people who are affected by, will have to live with, and are often crucial to effecting the change in question. Even better, not only does managing the human aspects of an organizational change initiative help ensure the successful implementation and use of the technical solution, it sets the groundwork for implementing future solutions…"

You should read that entire article if you're planning M&A strategies, or if your organization is simply restructuring or facilitating some other form of change.

COMPANY OPERATING SCOPE

Analyze the existing and planned business models.

NOTE

A Handle on the Basics This section assumes that you have a basic understanding of sites and subnets, and Active Directory replication. If you don't, the chapters in Part IV, "Designing a Directory Service Architecture," cover both topics at length.

The operational scope of the company defines how it distributes and manages its resources. It plays a key role in both the physical and logical design characteristics of Active Directory, namely, in the design of sites and subnets, placement of operation masters, administration, and replication. In this section, we'll utilize our meeting notes with Electrico to determine how the company is geographically dispersed, and how the company operates relative to its geography.

There are two parts to the geographical scope of a company; where the offices are located, and how they are interconnected. The latter aspect will be discussed in more detail during the analysis of technical requirements in Part III, "Analyzing Technical Requirements." In this chapter, however, we are more concerned about discovering *how* the company operations are organized *within* the geographical scope. This *how* characteristic is called the company model, and is typically one of regional, national, international, subsidiary, or branch office. We'll first discuss the geographical scope of the company, then how the company operates within that scope.

Geographical Scope

Arguably the best way to visualize the geographical scope of an organization is to draw it on a piece of paper. Figure 3.4 shows a diagram drawn according to the Electrico geographical scope.

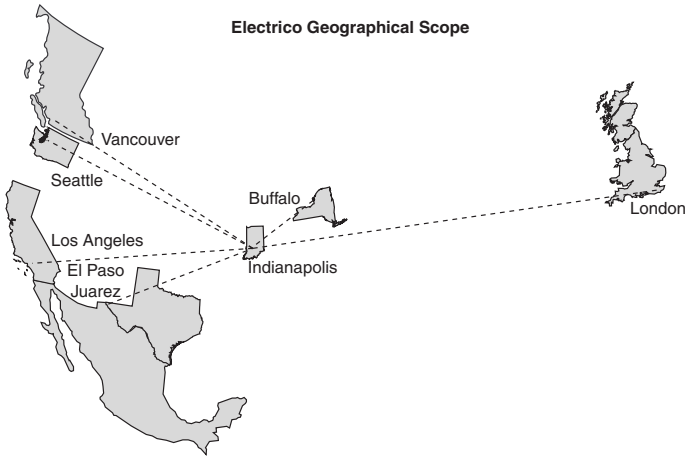

FIGURE 3.4
The geographical scope of Electrico.

You can immediately assert that Electrico *physically* is an international company, because it has operations outside the United States. The next step is to assign a number to each location on the diagram. This number should roughly correspond to the number of employees at each physical location. That number of employees has a direct impact on how you structure your Active Directory domains. For example, if Electrico had 50,000 employees at its Mexican manufacturing facility, 25,000 in El Paso, 30,000 in LA, and 40,000 in Seattle, and you wanted to use a regional domain structure, that would be 145,000 people in the single western region domain, which may work just fine, but imagine replicating that many objects across the WAN links! This example exaggerates a bit (by 140,000!) on the number of people Electrico employs, but gets the point across. Figure 3.5 shows the updated diagram.

One last thing you'll want to be aware of when you analyze the geographical scope is growth potential. Use dotted lines to indicate future expansion.

NOTE

Network Topology If you have a network topology diagram at this stage of the business assessment, use it to analyze the geographical scope of the company.

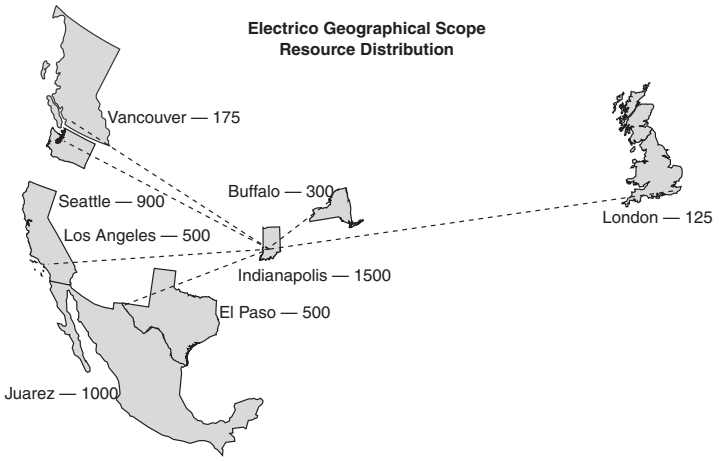

FIGURE 3.5
Electrico's distribution of resources.

Company Operational Model

Large international companies are more apt to run their businesses by geographical scope than a local company is. If you think about it, you wouldn't want to run an international company solely from the United States; there are just too many factors that affect how businesses operate oversees that differ from the U.S. Figure 3.6 shows the geographical scope of Electrico, along with its operational divisions. You can see that the operational divisions of Electrico are all located in the U.S., even though there are manufacturing and distribution facilities internationally. These international facilities are managed locally because of international differences, Foreign Trade Zone policies, and time differences, but report back to specific operational divisions in the US, so they really operate as pseudo-branch offices.

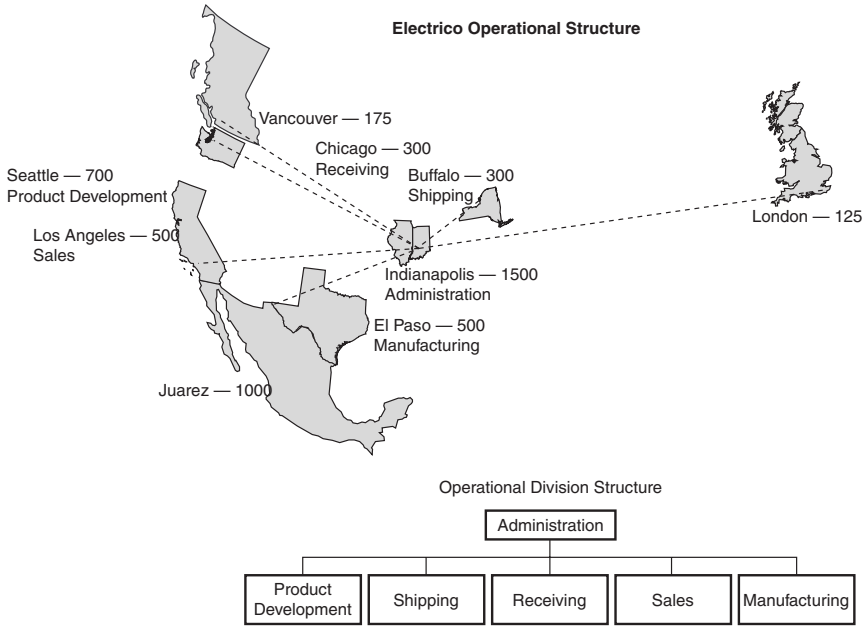

FIGURE 3.6
Electrico's operational environment.

There are many different ways a company can divide and manage its resources throughout its geographical scope. This simple, yet effective, method for mapping out both the physical locations and the operational divisions should work across the board with minor modifications. Additionally, you'll want to consider the connectivity between physical sites in terms of available bandwidth and performance requirements before you begin your design. These technical factors are discussed in detail in Part III of this book.

IN THE FIELD

THE APPLICATION OF GEOGRAPHICAL SCOPE

The geographical scope of operations determines the physical structure of Active Directory. As you will read in Part IV, Active Directory sites define the physical structure by acting as a replication boundary.

continues

continued

With Windows NT, administrators had two choices when faced with connecting two physically separate locations: Join the same domain across the WAN link, or create a new domain in the remote location. Windows 2000 provides a means to abstract the physical layer altogether in its implementation of sites. A site can contain multiple domains, or a domain can be part of multiple sites—in other words, sites are implemented independently from the logical structure of Active Directory. The two sites separated by a WAN link can be split into two separate sites and remain part of the same domain. Replication traffic can be scheduled for off-peak hours using site links.

The following sections describe the popular company operational models, which are typically based on geographical scope, bandwidth/connectivity, and how resources are managed. With each model, we'll decide what type of Active Directory design best fits the model.

National Model

The *national* model is best described as a hub-and-spoke model with no endpoints on the spokes. In other words, all administration and management of company resources is controlled centrally at the company hub, or headquarters. The Active Directory single domain model would fit well with this company because it would allow centralized administration of all aspects of the directory.

Subsidiary Model

Subsidiary companies are usually companies that a parent company creates. For example, suppose a large computer integration firm on the up-and-up decides it wants to focus its business practices in four areas. Consequently, it splits the company into four new companies, each with a specific focus on technology. This is relatively common in the computer industry. The new companies are likely wholly owned subsidiaries of the parent company. Typically, these companies operate under their own names and have their own management staff and executive directors. Usually, a board of directors sits atop all four companies, forming an "umbrella." In this case, there are a couple of options for Active Directory design. First, and probably the best, design for running separate (yet not separate) companies is a multiple tree forest design. This will allow for

disjoint namespaces for each tree (company), but still allow for mediated cross-company communications and resource sharing. Alternatively, if the same namespace is desired, you could use a single tree with four second-level child domains. Figure 3.7 illustrates these two options.

Branch Office Model

The *branch office* operational model is very similar to the national model in that there is typically a hub-and-spoke model. With the branch office model, however, the spokes have endpoints, meaning that the branch offices stand on their own and are not completely run by the central hub. The recommended Active Directory configuration for the branch office operational structure is a single domain with organizational units for each branch office. This way an administrator could delegate administrative control to the branch level with relative simplicity.

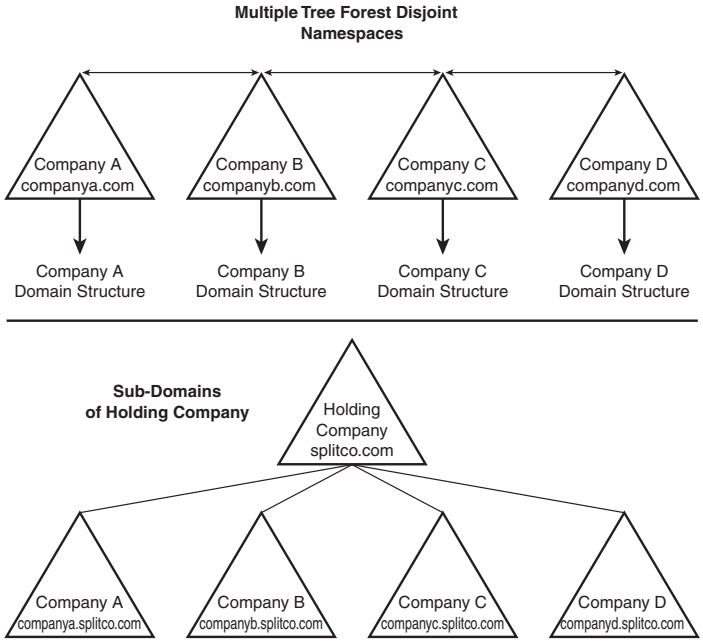

FIGURE 3.7
Two options for capturing your domain-sub-domain relationships.

Regional Model

If a company splits its operations out regionally, such as Electrico, a couple of options for the Active Directory design exist. First, a single domain could be used with organizational units making up the regions and "sub" organizational units within each region comprising the branch office locations. This configuration is recommended if the company wishes to centrally manage the directory. If decentralized or hybrid control is desired, then a multiple-branch tree, much the same as in the second part of Figure 3.7, could be used, with the regions being the second-level domains. Microsoft recommends that, for efficiency, the number of second-level domains does not exceed six.

International Model

If the company operates as a true international company, you should design Active Directory according not only to the operational and IT administration structure, but also with international differences in mind. To support international differences, Microsoft recommends that multiple domains be used. The second part of Figure 3.7 illustrates a domain model that would suit an international company.

When you reach the technical parts of this book, you will find information supporting the above recommendations. Chapters 10 and 11 specifically address the structuring of Active Directory.

Key Company Processes

Analyze the existing and planned business models.

We're going to utilize the digital nervous system vision again, this time to discuss key company processes.

The explosion of the commercial use of the Internet *has* fundamentally changed the way businesses operate; it has fundamentally changed the way we communicate and exchange information. Think about it, five years ago when you went to purchase a used car, what did you do? If you're like most people, you picked up a copy of *Wheels and Deals* and made some phone calls. Now think about how you'd handle that same process today. Chances are you'd hop onto

the Internet, search for used cars in your area, and get all the information about the car you need. You can even buy the car over the Internet and have it delivered to you if the information you've read is satisfactory to you. Needless to say, the Internet has become an extremely valuable tool.

When we talk about key company processes, we are talking about how a company communicates, how it manages and exchanges information, and how it makes key decisions. Microsoft has invested an extraordinary amount of money researching how businesses manage intellectual knowledge. That research resulted in the digital nervous system initiative. Microsoft's vision for a digital nervous system is that computerized processes will allow a company to perceive and react to its environment, sense competitive challenges, and organize timely responses. How well a company reacts to the changing business will be a direct reflection on the health of its internal digital processes. We'll address some key areas of the digital nervous system vision in the following sections.

Information and Communication Flow

Microsoft develops great software, but how it uses, manages, and distributes information is a fundamental key to its success. Information is not just white papers, TechNet articles, and slide decks; in fact it is much more than the tangible objects we typically associate it with. We'll focus on information and a company's digital nervous system as we discuss information and communication flow in business.

The core unit of a digital nervous system is a digital identity. A digital identity simply represents a person and his associated attributes. In today's enterprise business, a person's digital identity is represented separately in every directory in use by the organization. It's represented once with one set of attributes in the Windows NT SAM, once in the HR SAP module with another (different) set of attributes, once in Exchange with yet a different set of attributes, and again in any application that requires its own directory database. Furthermore, the attributes from each directory, such as last name and phone number, overlap. The pain is obvious. Every time something changes with that person's identity, all of these directories must be updated.

Enterprise Identity Management

The concept of Enterprise Identity Management represents a holistic approach to managing an organization's digital nervous system. It is a vision that represents the future of how a business processes knowledge, information and communication, and identity data within a unified directory system. It is a core function of a digital nervous system and is comprised of the following three modules:

- Identity Administration
- Community Management
- Identity Integration

NOTE **Enterprise Identity Management** If you want more information on Enterprise Identity Management, please see the Microsoft TechNet article "Enterprise Identity Management Solutions with Windows 2000 and the Active Directory."

We'll discuss only identity administration in this section. We discussed community management previously regarding managing vendor, partner, and customer relationships. We will not discuss identity integration in the context of this chapter; however, the concept of identity integration will arise in Chapter 14, "Planning for Coexistence," when we discuss Active Directory integration with disparate directory systems.

NOTE **Understanding What Comprises the Digital Nervous System** A digital nervous system is not any one software, hardware, or process. It is a combination of people, processes, and technology that together form a unified structure for identity management within an organization.

Identity Administration

Identity administration represents the blending of businesses' relationships with their employees, technical infrastructure, and business processes. Its goal is to align identity management with business processes; so, for example, when an employee moves from one business unit to another within a company, her identity is simply moved within the company's digital nervous system, and she inherits all the necessary rights, permissions, software, and items like a cell phone, pager, new office extension, and more, automatically. Identity administration is composed of three major functions: existence, context, and provisioning. When the Electrico CIO stated that he'd like to automate the creation of short-term project teams, he was referring to a process that existence, context, and provisioning would manage well.

Existence

When a person is hired, a typical organization will immediately add that person to the HR module of its Enterprise Resource Planning (ERP) system. That user will report to his boss, get assigned to a cube or office, and usually wait for a phone extension, computer, cell phone, pager, network account, email account, and probably a slew of other accounts he will need to perform his job. He has to wait because organizations, unless extremely organized and communication happy, do not flush information about a new hire through the channels quickly or efficiently.

The existence function within the Identity Administration module of a digital nervous system refers to a single entry point to the digital nervous system. A typical company will utilize its HR system as the point of identity creation, although depending on the company's processes, it may use any number of other systems. Regardless of the starting point, the existence process is responsible for ensuring, for example, the new employee has everything he needs to do his job. It triggers account creation in the messaging system and NOS, in database packages, it sets rights, permissions, grants dialup access, and fires off requests for additional devices, such as a cell phone or Palm Pilot. All of this is automatic, transparent, and is triggered by simply creating a new account in the directory system specified as the entry point.

Through the combined use of Active Directory, ZoomIT technology, and business rules, you can create the existence process and make it totally transparent across the company.

In the case of existence, Active Directory provides the hierarchical structure, security, group policies and IntelliMirror technologies, and MMS provides business rules that sit atop Active Directory and define the flow of information throughout the enterprise. MMS also provides the meta-directory technology that allows Active Directory to integrate with various other directory systems.

There are two important items in the Electrico case study that apply to this section. We'll introduce them here and carry them throughout the rest of the discussion of identity administration. These items are outlined here:

NOTE

ZoomIT Microsoft acquired ZoomIT Corporation and is coordinating quite a bit of its digital nervous system initiative around its capabilities as a meta directory. You can find several informative articles on what is now Microsoft MetaDirectory Services (MMS) by searching for MetaDirectory at Microsoft TechNet.

- Electrico uses short-term research and analysis teams when they prepare to revise a product from their product line. The creation of these teams is manual, as requests flow through email. A waiting period exists before the team is created, then disk space for collaboration, access to secure documents, access to printers, and additional software all must be manually configured for each member of the team.
- Electrico is interested in a workflow application to facilitate communications at several levels within the organization.

Before a short-term research team can become productive, an administrator must create shared disk space and apply security for each user in the group. He then must distribute software manually to every member of the group, and make sure each can connect to additional network resources.

By creating a digital nervous system for the organization, this process can be streamlined into only a couple of steps by changing the context of the existence of each user on the team, and allowing business rules to handle the rest.

Context

The second function of Identity Administration is context. *Context* refers to the management of a person's digital identity.

A person is constantly moving throughout the company, whether it's from one physical location to another, on and off project teams, or as a result of promotions or changes in job role. This movement represents a change in that person's context. The context function within the digital nervous system is based on these types of parameters, so when a person requires fundamental change, updating the context ensures the enterprise environment responds to those changes by providing the person whatever it is he or she needs. For example, if a person's job role changes and that person now needs access to additional software and a color printer, his or her context is updated to reflect that, and the digital nervous system is able to respond to those needs.

Active Directory provides the mechanism to build the framework of a digital nervous system. Using the hierarchical structure, security groups, and group policy, you can create the context for a user. MMS provides Active Directory with the ability to detect changes in

identity information and react according to business rules. With these technologies in place, when a user, for example, moves into a new job in a different location, the administrator needs to simply move the user object in Active Directory to the new location, which changes the context of the user, which changes the user's identity, which triggers business rules, which applies the appropriate security and group policies to the user in his or her new location. Group policies deliver the software the user needs and he or she can immediately access the appropriate resources needed to do the new job.

You can see now how, in Electrico's case, changing the context of each team member's identity by, say, adding them to a new group called "Product X Research," triggers business rules that can provide the team members with access to shared disk space, network resources, and the other necessities they need to do their job. But *how* does it all work?

Provisioning

Provisioning is the process of dynamically providing users with the software, permissions, and other tools they need to do their job. It is based on a person's digital context.

The Active Directory design features that promote provisioning are, again, its hierarchical structuring, security policies, and group policy. Additionally, provisioning promotes the use of the IntelliMirror suite of technologies, as well as Quality of Service. MMS plays a critical role with its business rules, giving Active Directory the ability to detect certain changes and take action according to these business rules.

Workflow

We've discussed the need to automate the creation of research teams for Electrico, but have not addressed its needs for workflow, or have we? One would typically associate workflow applications with the intranet and messaging solutions. But if you look at a digital nervous system, it can be argued that, when you add MMS business rules to Active Directory, you have the foundation of a workflow process. In fact, Active Directory does provide the identities required for workflow, and a workflow designer being packaged with the Exchange 2000 messaging and collaboration platform provides the robust functionality to create workflow applications.

Decision-Making

A benefit of streamlined business processes—especially the management and dissemination of intellectual capital (information and knowledge) across the enterprise—is enhanced, well-informed decision-making. A digital nervous system provides a structured environment in which information and communication flow is enhanced numerous times over, and knowledge about people, places, and things (users, locations, and resources) is stored in one location. This enhanced management of knowledge has been proven in many case studies to not only enhance, but speed up the decision-making process.

The Electrico executives state the following about their decision-making processes:

- When questioned about how they make decisions to upgrade or replace software, Electrico says they replace it when it no longer works.
- Electrico does not use any decision support system. They trust managers to make fair HR-related decisions. They spend time in meetings, doing research, and collecting information to make strategic decisions.
- When determining who has final decision power, Electrico bases that determination on the amount of money a particular decision will cost the company.

When a company does not have the knowledge to make informed decisions, it typically makes bad ones. When you perform your business analysis, the key thing to understand about the company's decision-making is what information they base decisions upon. In Electrico's case, how they make decisions is heavily based on trust in some areas, and time-consuming research in others.

As stated earlier, knowledge management is the cornerstone to enhancing the decision-making process. The ability to get the right information in the right format in the right amount of time could have a large impact on the decision itself. Take for instance the stock market: Before computers, pagers, cell phones, and all the other devices from which we get up to the millisecond (a bit exaggerated) stock prices, all we had was the newspaper to rely on for stock information. Granted, back then stocks didn't fluctuate quite as much as

they do now, but, if you looked in the Tuesday morning paper and saw that 3M was selling for $3.00 per share, by the time you called the broker and requested a purchase Tuesday afternoon, the price may have already gone up to $50.00 per share. Today, you have next-to-real-time updates and can make an enhanced decision to buy quickly. Information is in the right place at the right time.

Because decision-making sits atop knowledge, information, money, communication, and a slew of other influences, your goal in enhancing the decision-making process is to enhance some or all of its influential areas. We discussed knowledge management a bit and how Exchange 2000 provides an "engine" of sorts for efficient storage of knowledge, or intellectual capital. We discussed information and communication flow in the context of a digital nervous system. We are now going to discuss the influences that can lead a company to change its strategies (a decision). All of these areas directly affect how a company makes decisions.

Product and Service Life Cycles

How efficiently a company manages its core network products and services is playing more of a role than in years past. The product and service life cycles define an end-to-end view of services, rather than the traditional rotation of hardware and software. Business processes rely on the underlying infrastructure to provide services to enable a job to be done. These services consist of tools or products, such as a word processor or spreadsheet. If these tools are unavailable, essential jobs don't get done.

Consider the explosion of businesses relying solely on the Web for income. What happens if their Web servers go down? Remember eBay and that dark 24 hours they went through back in early June 1999? Their stock dropped 9% that day. Because eBay at that point was servicing about 600 million hits a month on their auction site, being down for one day cost them about 20 million hits, probably some very important customer loyalty, and who knows how much money.

Where does eBay's moment in the negative spotlight fit in with the product and service life cycle? Well, when its systems went down, the company was trying to launch a revamped version of its site because the life cycle of the original eBay had "expired."

Today, society exists in a just-in-time (JIT) world that changes very quickly. This world is made of people, processes, and technology, which all must coexist as one cohesive unit. People cannot function without process. Process cannot function without technology. Technology cannot function without people—well, theoretically at least! This blend of people, process, and technology is illustrated in Figure 3.8.

The service and product life cycle outlines how people, processes, and technology work together to provide end-to-end services for the organization. Figure 3.9 illustrates the service and product life cycle.

How a company managed its service and product life cycle before Windows 2000 is probably not how they handle it with Windows 2000 and Active Directory. Software installation and maintenance utilities, such as Group Policy and the IntelliMirror technologies, not only change the way software is installed; they also change the planning, deployment, production (management) and retirement of software. Electrico currently uses reactionary tactics to retire, plan, and deploy new applications and services throughout its enterprise. This methodology is rarely successful, and from a TCO standpoint, can be very costly in the area of help desk support.

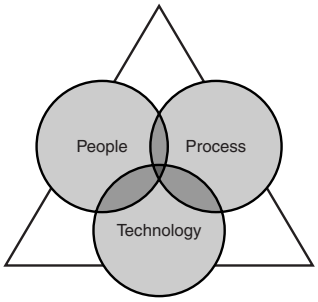

FIGURE 3.8
A cohesive unit can be formed by people, process, and technology.

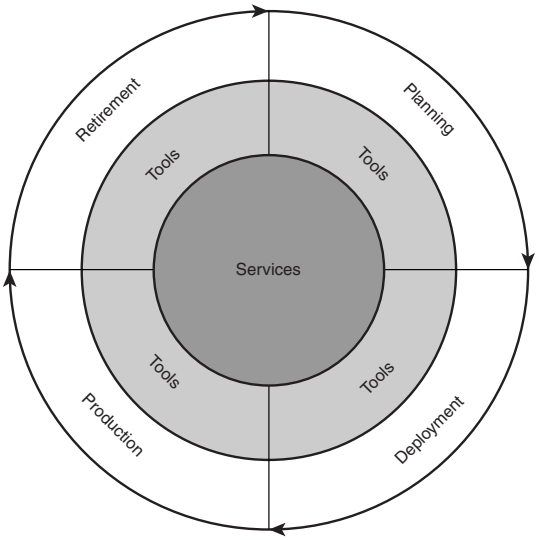

FIGURE 3.9
The service and product life cycle.

Two new features of Windows 2000—the Windows Installer, and Software Installation and Maintenance—are designed to help companies overcome challenges in deploying and managing software in the enterprise.

Windows Installer

The Windows Installer uses a new file format (.msi), which replaces the traditional setup.exe. MSI files deliver a higher level of sophistication to software and installation maintenance. The Windows Installer yields the following three advantages:

- **Custom installations**. The administrator may opt to leave items such as clip-art out of an installation package. The "clip-art" option will still be visible within the application, but will have to be automatically installed the first time a user selects it.

NOTE

More Windows Installer There are also Windows Installer versions for Windows NT 4.0 and Windows 9x, but with those versions you do not have the added benefit of coupling with the Windows 2000 software installation and maintenance utilities.

NOTE

Requires Windows 2000 on Servers and Clients Software installation and maintenance features are only available when both the server and client computers are running Windows 2000. This is because Windows 2000 uses group policy objects to function.

- **Resilient applications**. If a critical file is inadvertently (or maliciously) deleted, the application will automatically reinstall that file from the installation source without interrupting work.
- **Clean removal**. Applications are removed safely without damaging any other applications by removing shared files.

Software Installation and Maintenance Technology

Software installation and maintenance technology allows you to deploy and manage software centrally through the use of Group Policy, without ever having to visit the desktop.

Software installation and maintenance aligns very closely with the service and product life cycle, as detailed in Table 3.2.

IN THE FIELD

PLANNING GROUP POLICY

As you begin to structure your Active Directory domains and OUs, consider one key fact about group policy. Group policy objects can be created only at the site, domain, and OU levels within the directory. Designing an Active Directory that will support group policy objects is a crucial step in the design process. If you have, for example, an Active Directory structure that consists of a single site, a single domain, and no OUs, you will not easily be able to distribute custom software packages to specific groups of users. By creating an OU structure and strategically placing users within that structure, you have much more flexibility when assigning or publishing software through Group Policy.

TABLE 3.2

SOFTWARE INSTALLATION AND MAINTENANCE IN THE SERVICE AND PRODUCT LIFE CYCLE

Life Cycle Phase	*Software Installation and Maintenance Function*	*Description*
Planning	Package acquisition	You must have an .msi (package) file before you can deploy. Three options exist for package acquisition: • Obtain from vendor • Create your own (re-packaging) • Use a .zap file. ZAP files are loosely related to Windows .INI files and are used when .msi files are not available. ZAP files may only be used to *publish* applications, not *assign* them.
	Package modifications	Similar to installer (.msi) files, but with an .mst extension. A modified package file allows you to create custom installations of applications for specific usage scenarios.
Deployment	Application assignments	When administrators use Group Policy to assign applications, the applications appear (to the client) as if they were installed on the computer, but are not installed until the user attempts to open an associated file, or invokes the program through desktop or Start menu shortcuts.
	Application publishing	When administrators use Group Policy to publish applications, this is transparent to the user. Users can install the published application through add/remove programs (such apps show up as available software) or by document invocation.
Maintenance	Maintenance (general)	Applying upgrades and redeploying software is simplified greatly for published or assigned apps. Administrators can use the application assignments or publications to apply service pack upgrades, and so on.
Removal	Forced removal	Software is removed from a computer automatically. Forced removal is mandatory.
	Optional removal	Gives users the ability to uninstall an assigned or published application from their computers.

COMPANY STRATEGY INFLUENCES

Analyze factors that influence company strategies.

Every company should be able to identify factors that cause its operations to change, shift focus, or otherwise influence its forward-looking strategy. Some companies are very good at dynamically shifting focus in strategic areas based on some market indicator.

Some companies have tunnel vision and don't pay close enough attention to the very influences that end up driving them into the ground.

This section discusses the analysis of factors that influence company strategies. We'll utilize Electrico once again to bring to light some real-world scenarios.

Conducting an Influence Interview

When you discuss factors that influence company strategies, you should use an open discussion session with as many stakeholders from the company as possible. This ensures that all major areas in which a company strategy may be influenced will be adequately represented. These five strategic areas of business will be the focus of the following sections:

- Company priorities
- Growth
- Tolerance for risk
- Laws and regulations
- Total Cost of Operations

You might be wondering how these areas pertain to Active Directory design. Remember that Active Directory was developed by Microsoft to wrap around the strategic business needs of the organization. Factors that influence strategic change within a company drive the need to strategically realign Active Directory with business. This will become more prevalent in the following sections.

Company Priorities

What are company priorities? In layman's terms, they are the most important "things" to a company. The identification of company priorities during your business analysis will help you determine the underlying network capabilities needed to support those priorities. It's just like anything else: You have to know what you're planning for before you can plan for it.

There are several ways to determine a company's priorities. You can simply ask what they are, conduct an interview, use a survey, take a vote—it's not too difficult. The difficulty will come in determining which takes precedence over the others. Depending upon the size of the audience, you'll come up with several *opinions* of company priorities, and you'll need to have company executives sort them out and *prioritize* them for you.

In our case study with Electrico, we asked for the top three priorities. Electrico responded with the following:

- Increase sales volume and remain competitive in our market.
- Implement the technology to do so (remain competitive).
- Train our staff.

Whether you'll be able to come up with a prioritized list like this is debatable. Some organizations will easily be able to list three or more priorities; others will need quite a bit of help.

Once you have the top priorities identified, you can begin the decomposition process and determine the best way to support each one. Electrico, for example, wishes to implement the technology that will support increased sales volume and allow them to continue to compete in their market place. We already know that in order to do that, they're going to have to take their business to the Web, because that is where their competition is having them for lunch. Where you would become so important to the success of Electrico is right in the middle of priorities number 1, 2, and 3. It is going to be *your* directory design that allows them to take their business to the Web and hence *your* design that allows them to increase sales volume and remain competitive in their market, and generally *your* design that aligns the business and its needs of the company. It's essential to make sure your Active Directory design properly aligns with company priorities.

IN THE FIELD

ACTIVE DIRECTORY DESIGN TO PROMOTE SALES

One option for Active Directory design to support increased sales volume comes directly from our discussion about a digital nervous system. Your design itself won't increase sales, but your design to support more informed decision-making, ease of administration,

continues

continued

and in general a more cohesive enterprise will allow the company's employees to focus on their jobs rather than on getting to the information they need, or fixing computer-related problems. Active Directory is there to provide services to the employees when those services are required. If the design falls short or does not provide these services at the right times and places, the company will be hard pressed to increase sales.

Issues Surrounding Growth

A company's growth through mergers and acquisitions or through new hires can cause it to drastically shift focus rather quickly. Knowing the growth potential of a company and, more importantly, the growth strategy of a company, will help you prepare an Active Directory design that scales with the business.

A growth *strategy* can be loosely defined as how a company plans to utilize its growth. For example, CompanyA and CompanyB compete head to head in the computer systems integration market. They both do hardware breakfix, desktop support, network design and integration, product sales, and education. CompanyA merges with a large Value Added Reseller (VAR), and CompanyB acquires a company specializing in security. After a year, CompanyA has dropped its services and education divisions, and has become integrated with the VAR. CompanyB is still going strong in its original areas, and has added a huge focus on security. This example illustrates how growth through mergers and acquisitions can totally change a company's strategies (the case with CompanyA), or shift or widen them (the case with CompanyB).

Your understanding of the future growth plans for the company plays a critical role in the design of Active Directory. Using the preceding example, if you knew at design time that CompanyA would merge with the VAR, you would have designed Active Directory according to merger plans with the VAR. You might have gone as far as to investigate the VAR's internal systems to determine how best to prepare CompanyA for the merger. For CompanyB, you might have incorporated business unit OUs into the design, so the security company's network could have been collapsed into a single OU within CompanyB.

Tolerance for Risk

Risk. How much of it is a company willing to take? Where does it come from? What are its consequences? These are just a few of the questions you will be faced with when you begin to talk about risk. We are not developing a risk management plan here; we are looking at risk as a factor that may influence company strategy.

Many areas, such as business operations, organization, and infrastructure, may influence a company's tolerance for risk. For example, during your business and IT analysis, you determine that SlowPipe, Inc. has an existing 56K WAN connection between Site1 and Site2. Site1 performs all management tasks for Site2, so therefore your Active Directory design calls for only one domain. Your plan to control replication traffic using Active Directory sites was shot down by SlowPipe management because it wants the local domain controller in Site2 to be constantly up to date for LDAP lookups. This situation (though a bit corny) presents an interesting situation. SlowPipe will not replace the 56K line, yet they expect to replicate uncompressed domain information across it while continuing to work efficiently from Site2. The risk they are not willing to take is the expenditure to update that line. Good faith from you in this case would be to document this situation and submit it to SlowPipe management as an issue that may reduce Site2 productivity once implemented. You could classify this case as a high tolerance for risk in terms of replication and latency for Site2, or low tolerance for risk in terms of the cost of replacing the WAN connection.

NOTE

Risk Management Planning
Developing a risk management plan is a task that is typically subordinate to the project plan. We will not develop one here but want to point out its importance. You can read more about developing a risk management plan for Windows 2000 projects in the Microsoft TechNet article *"Creating the Windows 2000 Vision/Scope Document and Risk Management Plan."*

Laws and Regulations

Depending on the business, laws and regulations pertaining to business operations may come into play. Identifying these pertinent laws and regulations will help you determine how to implement certain features of your design.

An international company, for example, must contend with laws regulating strong encryption. It is illegal in some foreign countries to use 128-bit encryption in any application, including an operating system. This alone may influence your design in the area of group policy objects assigning or publishing strong encryption software, such as Internet Explorer.

It would be nice if all laws were as easy to identify as the strong encryption law. The fact is, they're not, especially for technologists and even business people not familiar with the company's line of work. Because of this, it is highly recommended that you extract this information from a company's lawyers. The lawyers should be able to come up with a list that is relevant to the company's business. From this list, you'll need to figure out how these laws might, or do, influence the company, and roll that into your design.

Total Cost of Operations

NOTE

TCO Assessment Is a Complex Topic Assessing the TCO for an organization is an extremely time-consuming and detailed task. We will not perform a full TCO analysis in this book. If you would like to read some good information on TCO, see the Microsoft TechNet article *"The MS TCO Model: Applying the MS Solutions Framework to Reduce TCO."*

If you try hard, you can tie just about anything we've discussed in our business analysis back to money. That shouldn't be too big a surprise; its effective use is what makes a company thrive. A buzzword you've undoubtedly grown accustomed to is *TCO*. Total Cost of Operations (or Ownership) is a comprehensive model that helps managers understand the direct, budgeted costs and the indirect, unbudgeted costs associated with a particular asset throughout its life cycle.

Microsoft and Interpose developed a three-pronged approach to TCO. It encompasses people, processes, and technology (sound familiar?). The goal is to balance and coordinate improvements between people, processes, and technology to help make businesses operate more cost effectively, while maintaining or increasing profitability.

Performing a TCO assessment may influence company strategies in many ways. It may uncover costs that can be immediately eliminated, allowing a shift in budgeting to other areas of the business. Conversely, it may uncover areas of the business that are grossly under budgeted, causing the company to take appropriate action.

Goals for a TCO Assessment

Some companies choose to invest very little money in underlying IT infrastructure, and receive very little value in return. Other companies invest gobs of money in IT, and the return on that investment makes every dime worth it. On the other hand, there are those companies that invest very little money in IT, but get an excellent return,

and those who invest gobs and get nothing. Common to all businesses, strategic IT expenditures should accomplish at least one of the following goals:

- Increase the organization's profits by driving down costs.
- Maintain profits by protecting revenue or avoiding future costs.

You can examine these goals in terms of value creation. How does the business expect to gain capital on these expenditures? Table 3.3 describes four different types of value creation.

TABLE 3.3

VALUE CREATION 101

Value Creation	*Description*
Value restructuring	Value restructuring refers to using a technology solution to restructure the way a company does business, resulting in fundamental improvement.
Value acceleration	Value acceleration refers to using a technology to realize benefits now, rather than later.
Value linking	Value linking refers to the snowball effect the added benefits in technology in one area can have on another area.
Flexibility	Flexibility refers to planning and deploying technology that will support future growth.

Flexibility is a key type of value creation to take away from this section. Designing flexibility into Active Directory will help the company avoid future costs associated with growth or changed strategies. For example, if you had a small startup expected to grow rapidly over the next year through acquisitions, then you'd design the infrastructure for that company so it would support the added growth of not only people and traffic, but also the associated technology. The same design principles apply to Active Directory—design growth and scalability into Active Directory from the beginning, and you can avoid future and costly redesign effort.

CHAPTER SUMMARY

KEY TERMS

- envisioning
- current state
- Miller-Heiman
- "What if?" analysis
- business process
- business problem
- project objective
- Problem-Objective table
- community management
- authentication
- rendezvous
- authorization
- geographical scope
- operational model
- digital nervous system
- Enterprise Identity Management
- digital identity
- identity administration
- existence
- context
- provisioning
- Windows Installer technology
- Software Installation and Maintenance technology

Performing the analysis of the business requirements is a crucial step in determining the needs of business, and mapping those needs to your Active Directory design. There are several ways to conduct your business analysis, including roundtable discussions, surveys, "what if" scenarios, and meetings with key stakeholders. You should consider using a combination of these methods, and any others you see fit to extract and analyze the information below:

- Envisioning the future
- Business problems
- Company organization
- Company operating scope
- Key company processes
- Company strategy influences

The envisioning process is one of the more difficult tasks business executives face, not because it's inherently difficult, but because there are so many factors that influence direction. In your analysis of business vision, you must understand the current state of the company before you analyze the vision. You can't get to point B if you don't know where point A is.

Business problems are problems the company has now that they want to fix: problems that cost money, or problems with process, law, directory services, and information and communication flow. Once you understand a problem, you can create an objective to help the business overcome that problem. In your analysis of the business problems, make sure you define the business goals first, so you know where you are going. These goals should be in line with the vision. Then you address the current problems. The best way to get an overall understanding of the types of problems within a business is to talk to as many people as possible. Once the company is satisfied that all major problems are noted, you analyze them, taking into account what you know about the business, and create objectives for strategically solving those problems. This phase may run the length of the business analysis.

CHAPTER SUMMARY

Analyzing the organizational structure of the business may become a bit abstract relative to the Active Directory design. Relating the business management model to the design of Active Directory is a very difficult task, especially for large organizations spread across the world. To tackle this process, look at the geographical scope of the company and analyze how management works within that scope. Determine whether business management (that is, management outside of IT) even needs to be considered in the design of Active Directory. If so, determine the role management will play. Vendor, partner, and customer relationships also need to be considered for current and future integration with Active Directory. Consider using the Community Management module from the digital nervous system initiative to encourage organizations to standardize authentication, rendezvous, and authorization processes for internal employees as well as external partners, vendors, and customers. Finally, extract and analyze information pertaining to the expected growth of the company. Companies may grow in a number of ways, including internal hiring, mergers, acquisitions, and the formation of conglomerates, subsidiaries, and more. Having knowledge of an upcoming merger before you roll out Active Directory will not only give you the ability to plan that into your design, but will also save the companies involved thousands—even millions, in some cases—of dollars in re-engineering down the road.

The operating scope of a company defines how it distributes and manages its resources. There is the physical geographical scope of the company to consider, as well as the operational model the company uses within that scope. Understanding the geographical scope of the company will help you determine the domain structure and where your well-connected and not-so-well-connected sites are. The operational structure (such as national, regional, and branch office) within the geographical scope will help you understand how the company is managed, where resources are located, and so on. It will provide insight for the design of Active Directory, specifically in areas like domain design, international considerations, Active Directory sites, and more.

A company's key internal processes impact several areas of the Active Directory design. Consider using the Enterprise Identity

KEY TERMS

- Total Cost of Operations (Ownership)
- value creation
- value restructuring
- value acceleration
- value linking
- flexibility
- strategy influences

CHAPTER SUMMARY

Management module within the digital nervous system initiative to encourage the business to standardize and unify its directory services across the board. Processes like information and communication flow, service and product life cycles, and decision-making define how a business operates. Consider the implications of changing processes to align with Windows 2000 and Active Directory design initiatives. Also consider the implications of changing processes.

There are many factors that influence a company's strategic direction. Factors such as growth, money, laws and regulations, risk, and so on need to be addressed during the analysis. These items should be addressed relative to their ability to change the strategic positioning of the company. After these factors are identified, they should be communicated to all stakeholders and should be incorporated into the design planning process.

APPLY YOUR KNOWLEDGE

Exercises

3.1 Identify Business Analysis Components

In this exercise, you will examine several statements from a business analysis discussion and associate them with the appropriate phase or phases of the business analysis.

Estimated Time: 5 Minutes

1. Review the statements in Table 3.4. Associate each statement with a business analysis phase from the right column by connecting them with a line. Each statement will be associated with exactly one phase.
2. Compare your answers with the correct solution shown in Table 3.5.

TABLE 3.4

DATA FOR COMPLETING EXERCISE 3.1

Statement	*Business Analysis Phase*
"We'll need a solid method for authenticating and authorizing partners so we can properly distinguish them from customers."	Envisioning
"Our strategy may change if the merger happens."	Business problem analysis
"A single point of entry and management is optimal. That way, when someone moves to another department, or gets married for that matter, we have only one place to make changes."	Company organization
"We have offices in the U.S., Europe, Asia, and the South Pacific."	Company operating scope
"Right now, we can't communicate efficiently because of the number of systems that don't talk the same language."	Key company processes
"If the market continues to grow at this rate, we'll continue to grow the breadth of our business. Otherwise, we'll focus on our successes, and build them in depth."	Company strategy influences

APPLY YOUR KNOWLEDGE

TABLE 3.5

EXERCISE 3.1 SOLUTION

Statement	*Answer*	*Business Analysis Phase*
"We'd need a solid method for authenticating and authorizing partners so we can properly distinguish them from customers."	Company organization (vendor, partner, and customer relationships)	Envisioning
"Our strategy may change if the merger happens"	Company strategy influences (growth strategy—merger)	Business problem analysis
"A single point of entry and management is optimal. That way, when someone moves to another department, or gets married for that matter, we have one place to make changes."	Key company processes (information and communication flow)	Company organization
"We have offices in the U.S., Europe, Asia, and the South Pacific."	Company operating scope (geographical scope)	Company operating scope
"Right now, we can't communicate efficiently because of the number of systems that don't talk the same language"	Analyzing business problems	Key company processes
"If the market continues to grow at this rate, we'll continue to grow the breadth of our business. Otherwise, we'll focus on our successes, and build them in depth."	Envisioning	Company strategy influences

3.2 Understand Knowledge and Information Flow

In this exercise, you will visit the Microsoft seminar online Web site and watch a presentation on Knowledge Management. The purpose of this exercise is to support the sections on information and communication flow, decision-making, and company processes with application-level information. This is an optional exercise.

You must have Internet access to carry out this exercise. In addition, a sound card and speakers are needed to hear the audio portion of the online seminar.

Estimated Time: 45 Minutes

1. Open your Web browser (we recommend Internet Explorer) and navigate to:

   `http://www.microsoft.com/Seminar/1033/20000224kmsolutionshh1/seminar.htm`

2. Once the embedded Windows Media Player initializes, click the Play button.
3. Enjoy the presentation and think carefully about how the points raised during the seminar relate to topics covered in this chapter!

3.3 Analyze Customer Relationships

In this exercise, you will walk through a sample strategic business interview focused on extracting the organization's views on vendor, partner, and customer relationships. You should read through this exercise and record answers appropriate for your own business, to get a feel for the type of information that should be discussed during such an interview.

APPLY YOUR KNOWLEDGE

Estimated Time: 5 Minutes

1. On the average, would you say that the 80/20 rule applies to your external customer base? (80% of your business comes from 20% of your customers.)

   _____

   _____

   _____

2. What is your main form of communication with your customers?

   _____

   _____

   _____

3. Do you maintain communications with customers after a sale? If so, how? Do you have a lot of return buyers?

   _____

   _____

   _____

4. Do you have business partners? If so, how do you engage them?

   _____

   _____

   _____

5. Do you allow your business partners access to internal company knowledge? If so, how? Is this process secure?

   _____

   _____

   _____

6. Do you allow your customers access to internal company knowledge? If so, how? Is this process secure?

   _____

   _____

   _____

7. What is your vision for customer relationship management moving forward? How do Active Directory and the concept of a digital nervous system fit in with this vision, if at all?

   _____

   _____

   _____

8. How do you communicate with your product vendors? How does your future vision differ from the current process, if at all?

   _____

   _____

   _____

9. Do your employees take part in collaborative online discussions with vendors? With partners? With customers? With other employees?

   _____

   _____

   _____

APPLY YOUR KNOWLEDGE

10. Who are your main competitors and how do they manage vendor, partner, and customer relationships?

_____

_____

_____

Review Questions

1. In which phase of the business analysis should community management be discussed?
2. What is the role of a digital nervous system in an enterprise environment?
3. What has Electrico been forfeiting because of the lack of focus on aligning business and IT goals?
4. Which five areas of business should be your focus when you hold the discussion on the key company influences that affect strategy?
5. What are the two major types of growth you should focus on when performing the business analysis?
6. What should be the end result of every business problem identified in the business analysis?
7. If your company centralizes all of its business operations to a headquarters office, but has locations around the country, which operational model does your company have?
8. What are the four phases of the service and product life cycle?
9. In which phase of the business analysis will you analyze the information pertaining to the future positioning of the company?
10. Which area of company management will typically become the focal point for your Active Directory design in terms of management and administration?

Exam Questions

1. You are the CIO for a major communications firm. You wish to distribute your IT budget in the most effective way possible. Which of the following goals (at a minimum) should strategic IT expenditures accomplish?

   A. Increase the organization's profits by driving costs down.

   B. Maximize return on investment.

   C. Keep the company on the leading edge of technology.

   D. Incorporate the best hardware, software, and services into the organization.

2. You are a consultant contracted to assist in the strategic development of a company's digital nervous system. You wish to describe the vision of a digital nervous system in the context of service and product life cycles. Which three items should you refer to as one cohesive unit when explaining the service and product life cycle?

   A. Technology

   B. Finances

   C. Hardware

   D. Software

   E. People

   F. Processes

APPLY YOUR KNOWLEDGE

3. How would you describe the interview process in the Electrico case study in terms of how it was approached to extract information? (Choose two.)

   A. There was too much involvement from high-level executives and not enough representation from other functional areas within Electrico.

   B. Representation of Electrico personnel was adequate, but the question pool could have been larger and more detailed.

   C. Functional area (such as departmental and product) management should have been the only representation from Electrico for this meeting.

   D. Electrico attorneys should have been present at the interviews from the very beginning.

4. You are a project manager in charge of driving the upcoming Windows 2000 migration for your client. Because of project volume, you wish to begin assembling the appropriate project resources as soon as possible. At which point in the business analysis should you start to develop project teams according to scope?

   A. Before the business analysis starts.

   B. Immediately after you've concluded the business analysis.

   C. You should not consider project teams or scope until long after the business analysis.

   D. Immediately after you've defined your project objectives.

5. You are a consultant for Emmitt Corporation. The IT director is considering an upgrade to Windows 2000. Currently, his major challenge is managing software once it has been installed on user desktops. Which one of the following statements could you make about the advantages Microsoft Windows Installer technology could yield to address the IT director's challenge?

   A. MSI allows you to assign applications, publish applications, and manage applications.

   B. MSI provides for custom installations; self-healing, resilient applications; and clean and safe removal of software.

   C. MSI provides an opportunity for administrators to add custom graphics, subscribe to channels, and recompile the code.

   D. MSI allows you to provide support INI files for setup.exe, force the destination location for installs, and automatically complete the name and organization fields during setup.

6. You are a business and technology consultant for a large consulting firm. XYZ Corp. has engaged you to design Active Directory for its new Windows 2000 infrastructure. You have not worked with XYZ Corp. before. What should you do before you have your first face-to-face meeting with XYZ Corp.? (Choose three.)

   A. Determine XYZ Corp.'s competition.

   B. Categorize XYZ Corp. relative to its IT staff.

   C. Analyze the problems identified by XYZ Corp.

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D. Categorize XYZ Corp. relative to its market.

E. Prepare your project teams for the initial meeting.

F. Analyze XYZ Corp.'s digital nervous system.

7. You have just completed the analysis of SpeedSearch Corporation's network in preparation for a massive Windows 2000 upgrade. You recommend that they roll out Windows 2000 Professional on all workstations and Windows 2000 Server on all member servers so they can start to reap the benefits of some new features. What type of value creation have you just provided SpeedSearch?

   A. Value linking

   B. Value acceleration

   C. Flexibility

   D. Value restructuring

8. You are a consultant for a high-level network and eBusiness firm. The CEO for a century-old manufacturing company has approached you about a problem. The cost of managing his 19 different directory systems has begun to take its toll and he is worried that high-tech competitors will shut out his company unless it acts fast. The company already has Windows 2000 in place. What technology would you recommend the firm invest in to help alleviate the CEO's concerns?

   A. It should invest in upgrading all directory services to versions that support Windows 2000 and Active Directory.

   B. It should invest in developing a digital nervous system using Active Directory and MMS (ZoomIT) technology to create digital identities with a single point of administration.

   C. It should invest in development of a parallel system that would contain a purpose-built proprietary directory application for the entire company.

   D. It should invest in Active Directory connectors to connect all 19 directories to Active Directory and use Active Directory as the single point of administration.

9. You are the design consultant for a manufacturing corporation. During your business analysis, you discover that the executive team does not allow financial reports to be published on the company intranet because they are concerned that individuals other than those intended might intercept the data. Consequently, the financial reports must be hand-delivered to each executive team member on a weekly basis. What is this behavior an example of?

   A. The company's low tolerance for risk driving its internal processes.

   B. The company's high tolerance for risk allowing internal processes to function smoothly.

   C. The company keeping a close eye on cost.

   D. The company following its own internal laws and regulations.

10. You are the Web administrator for your company. Your company wishes to provide secure access to a secure subset of information for its vendors, partners, and customers. The solution must be accessible from the Internet, must be encrypted,

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and must integrate with the Active Directory security model. Choose the best possible implementation scenario for this task.

A. Create an intranet for the vendors, partners, and customers, and require that they authenticate to Active Directory before gaining access.

B. Create an extranet for the vendors, partners, and customers, and require that they authenticate to Active Directory before gaining access. Assign a certificate to the extranet and require 128-bit encryption.

C. Create an extranet for the vendors, partners, and customers, and require that they authenticate to Active Directory before gaining access.

D. Create an intranet for the vendors, partners, and customers, and require that they authenticate to Active Directory before gaining access. Assign a certificate to the intranet and require 128-bit encryption.

Answers to Review Questions

1. Organizational structure. Community management is an Enterprise Identity Management module within the digital nervous system. It focuses on providing a framework for implementing and managing the authentication, rendezvous, and authorization operations for outside resources, such as vendors, partners, customers, and other employees. See "Existing and Planned Vendor, Partner, and Customer Relationships."
2. A digital nervous system represents a leap toward digitizing company processes, such as information and communication flow; vendor, partner, and customer relationships; and more. See "Key Company Processes."
3. Money. The cost of maintaining internal systems, the help desk, and reactionary implementations of hardware and software is driving the TCO through the ceiling, and the ROI through the floor. See "Total Cost of Operations."
4. Company priorities, growth, tolerance for risk, laws and regulations, and TCO. These five areas cover a majority of factors that influence company strategies, although this may not be an exhaustive list. See "Company Strategy Influences."
5. Mergers and acquisitions. These two areas of growth are going to be the ones you need to watch out for. In mergers you'll typically combine the infrastructures of the two companies, and in acquisitions you may replace or combine the infrastructure of the acquired company with that of the acquiring company. See "Issues Surrounding Growth."
6. A project objective. Once you have good representation of the existing business problems, you and your project team prepare project objectives to address those problems. See "Analyzing Business Problems."
7. National operational model. More often than not, you can categorize a company's operational model as national if they use the hub and spoke configuration. Typically there will be a hub, or headquarters that manages everything, and

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satellite offices around the country that report back to the headquarters. See "Company Operating Scope."

8. Preparation (Planning), Deployment, Production (Management), Removal (Retirement). Names in parentheses represent different terminology for the same phase. See "Product and Service Life Cycles."
9. Envisioning. Understanding a company's vision for the future is just one step in understanding the company and how you can help it prepare for the next 3–5 years, or longer. See "Envisioning the Future."
10. IT Management. Most companies don't include areas of management outside IT for directory administration. This does *not* mean you can ignore them in your design. Business processes such as information and communication flow include all management divisions and may affect the directory design. See "Existing and Planned Management Models."

Answers to Exam Questions

1. **A.** At a minimum, strategic IT expenditures must strive to increase revenue by driving down TCO. Maximizing ROI is an attainable by-product of this. C and D refer to tactical IT expenditures more than they do strategic expenditures, and are therefore not considered correct in the context of this question. See "Total Cost of Operations."
2. **A, E, F.** In today's just-in-time society, change occurs rapidly. For this reason, people, processes, and technology must work together to plan for and cope with change. Finances by definition support people, processes, and technology. People, processes, and technology use hardware and software. See "Product and Service Life Cycles."
3. **A, B.** When we conducted the interview with the CEO, CIO, and LOB representatives, we thought we had an adequate representation of Electrico personnel. By the time we got into the analysis, we realized we needed to organize some more meetings to extract specific information. C is not correct because we do need executive representation. D is not correct because only a small portion of the interview required input from attorneys. See "Case Study: Electrico Corporation" and "Analyzing Business Problems."
4. **D.** You should start preparing your project teams and scope after you've defined the project objectives. This way, you have a general idea of the types of specialized talent (Exchange, Active Directory Design, SMS, Infrastructure) you need on your teams. If you attempt to define your teams before any analysis, you will end up changing them several times as you discover what it is you'll actually be focusing on. If you wait until after the entire business analysis, your project teams will have to re-discuss business requirements. See the In the Field sidebar named "Project Scope and Teams."
5. **B.** The Windows Installer technology provides the following three benefits:
   - **Custom installation.** Administrators may choose to leave optional components uninstalled until first use.

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- **Resilient applications.** If an application is missing a file required to execute, such as a DLL, it will download it from the installation point in the background.
- **Clean and safe application removal.** Applications are removed without causing damage to other applications.

Option A describes a couple of group policy functions, which "enable" Windows Installer technology in the enterprise, but are not a benefit of it. Option C describes Internet Explorer customization using the IEAK, which is unrelated. Option D describes the automated setup of Windows 2000 Professional using the setup information manager, and is also unrelated. See "Windows Installer."

6. **A, B, D.** Before you set foot in the door at XYZ Corp., you need to do a bit of research on the company as a whole. Use the Internet or other tools to determine its line of business so you can categorize it relative to its market (manufacturing, distribution, electronics, or the like). You also, if possible, should make an initial assumption as to its relationship with IT, mainly determining whether it is business-centric, IT-centric, or hybrid. Finally, determine its chief competition. You cannot successfully analyze business problems (answer C) until you've discussed them with XYZ Corp. (while this can happen over the phone, it typically does not). Additionally, you cannot build project teams (answer E) until you have solidified project objectives and determined scope. The analysis of a digital nervous system (answer F) definitely requires your being on-site and heavily involved in company processes. See "Case Study: Electrico Corporation" and "Analyzing Business Problems."
7. **B.** Value acceleration, which occurs when you apply strategic technology to receive benefits now instead of later. Rolling out Windows 2000 on workstations and member servers will allow SpeedSearch to begin to use some of the new Windows 2000 features immediately. Value linking refers to the act of benefits spreading from one area to others. Flexibility refers to providing technology that will support future growth. Value restructuring refers to fundamental restructuring in the way a company operates. See "Total Cost of Operations" and Table 3.3, "Value Creation 101."
8. **B.** They should invest in Active Directory with MMS (ZoomIT) technology to create digital identities within the digital nervous system. Answer A is incorrect because it is improbable that all 19 directories in use would have upgraded versions that support Active Directory. Answer C is incorrect because the use of a proprietary directory application is a step in the opposite direction—Microsoft is very big on standards-based development. Answer D is incorrect because it is impossible to use Active Directory connectors to connect all other directories to Active Directory, because very few connectors actually exist. See "Information and Communication Flow."
9. **A.** Because the executive team is uncomfortable posting financial reports on the intranet, they have a low tolerance for risk in that area. This means that using the intranet to distribute the report—which is much easier and more cost effective than the current way—is a risk they're unwilling to take. Answer B is incorrect because it states the exact opposite—that the company has a high tolerance for risk and therefore would

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not have a problem posting the report. Answer C refers to cost, and could be a factor in the decision to manually distribute the report, but since over the long run a manual distribution would cost more with postage, distributors, and time, this answer is not considered correct. Finally, internal laws and regulations (typically implemented policies and procedures) are typically a reflection of an organization's tolerance for risk. See "Tolerance for Risk."

10. **B.** The Web administrator must create an extranet, require authentication to Active Directory, and to enable encryption, assign a certificate to the extranet. The Kerberos authentication protocol contains extensions for Public Key Infrastructure and can therefore authenticate Internet users via X.509 certificates to Active Directory. The definition of an extranet involves extending an intranet outside the firewall, and therefore answers A and D are incorrect. Answer C fails to include a certificate for encryption and therefore falls short of satisfying the requirements. See "Existing and Planned Vendor, Partner, and Customer Relationships."

Suggested Readings and Resources

1. Microsoft TechNet Articles.
   - MS Solutions Framework: Risk Management.
   - MS Solutions Framework: Managing Organizational Change.
   - Network Services Architecture Strategic Plan for XYZ Communications.
   - Planning for Windows 2000 in the Enterprise.
   - Identifying Windows 2000 Features that Meet Enterprise Goals.
   - Enterprise Identity Management Solutions with Windows 2000 and the Active Directory.
   - Creating the Windows 2000 Vision/Scope Document and Risk Management Plan.
   - Business Opportunities with Windows 2000
   - Planning, Deploying, and Managing Highly Available Systems.
   - Aligning Business with IT Goals.
2. Gates, William H. III. *Business @ the Speed of Light*. Warner Books, 1999.
3. Cone, Boggs, and Perez. *Planning for Windows 2000*. New Riders, 1999.