Part **IV**

Workplace Performance The Impact of Information Technology on Individuals Groups, and Organizations

The previous sections described applications of technology to specific business needs and issues related to implementing technology and ensuring its effective use. Part IV turns to the impact of information technology (IT) on work performance and explores organizational and behavioral issues related to the introduction of new technologies. Translating the capabilities of technology into tangible and intangible operating benefits can be examined on many levels: individual tasks and jobs, departmental operations, business processes, organizational structure and culture, and quality of work life. Technology is an important productivity tool, but it is not the only factor or perhaps even the most important factor in improving performance in the workplace. How individuals in the organization effectively *use* technology and the managerial support they have for their activities are important.

Part IV presents considerations for effectively using end-user information systems to achieve organizational goals. It emphasizes the need to evaluate technologies on the basis of their potential for changing the way people work—not simply as a means of automating the tasks they are currently performing. Improving performance is viewed as a process of creating efficient, effective work environments. Integrating technology into the jobs of end users is viewed as a process of managing innovation and change, not simply managing technology.

Chapter 9, "Assessing the Value of Information Technology," asks what performance is and how it can be measured. The definition of *productivity* is examined with regard to its applicability to knowledge workers. Then, current techniques for determining IT benefits and costs are described. These techniques are useful to planners who must cost-justify expenditures. Because of large investments in hardware, software, maintenance, and user training, cost justification is increasingly important in making purchasing decisions. The chapter concludes with an overview of concepts related to Enterprise-wide Information Management.

Chapter 10, "Human Factors: Software, Hardware, and Workplace Design," addresses the interface of people with their work tools and environment. Three key areas are covered: software design issues, hardware design issues, and workplace design considerations. This chapter provides an overview of current research on what is known about these areas, emphasizing the need for ease of use, safety, comfort, and overall well-being of the end user. These issues and considerations can affect performance.

Chapter 11, "Organizational Change," presents theoretical foundations and strategies for introducing new technologies into an organization. The introduction of innovations often requires organizational and work modifications to achieve the intended results. Technology implementers play major roles as change agents and leaders. The chapter takes the stance that implementing organizational changes is a learning process that must be planned and managed carefully.

Chapter 12, "Business Process and Job (Re)Design," examines the relationships among information technology, business process, job design, and performance. When implementing IT, EUIS planners need to consider potential changes at the organizational, work group, and individual levels. This chapter focuses on the transformational nature of IT and effective approaches for (re)designing business processes and jobs. Job design methods that improve performance are described under the premise that it is *people* who are productive, not systems.

Case Study How Ford Motor Company Is Embracing Technological Change

This case focuses on how Ford Motor Company is reinventing its information technology (IT) structure, the strategies used to develop this structure, and the ways technologies are changing how Ford does business.

Introduction

Ford Motor Company is a nearly 100-year-old corporation that is one of the "Big Three" in the automobile industry. Ford is given credit for the invention and implementation of the modem assembly line for producing mass quantities of goods. Now Ford is leading the way car manufacturers are reinventing the industry with information technology and digital networks.

The Facts and Numbers.

Ford's headquarters are in Dearborn, Michigan. It has alliances and independently owned dealerships all over the world. The CEO is 52-year-old Jacques Nasser. In 1998, Ford has $144.4 billion in revenues and $22.1 million of net income. Several layers of management and workers account for most of its 350,000 employees.

Ford's IT Strategy

Ford was four times as profitable in 1998 as any of its big competitors based in the United States, Japan, and Germany. The company has accelerated dramatically the pace of its business, cutting everything from vehicle-development time to the speed at which it deploys new software applications. Ford, however, was not satisfied to rest on its past performances.

CEO Jacques Nasser plans to transform the company from a maker of cars to "a consumer company that offers automotive products and services." What isn't known is how, exactly, Ford intends to make sure its IT function is contributing to the change. Nasser says he recognizes the pivotal role IT must play in Ford's transformation:

"You must integrate IT into the texture of the business." A closer look at Ford's IT operations shows that Nasser and company offer specific strategies for business-technology integration.

Try to imagine focusing a company of 350,000 employees worldwide on a common goal, and it's hard to keep from comparing the challenge to the old saying about herding cats. For Ford, a four-stage business strategy model has been the answer. The model's stages describe the company's mission, strategy, processes, and infrastructure; that basic model then is reiterated and mirrored, with the appropriate level of detail, at each level of the company. Proceeding downward, each level provides a bit more detail and how-to for achieving the goal or stage above it. For example, the IS and process-leadership group has its own version to mirror the corporate model, and subgroups within the IS organization have their own mirror models, as well. The technical services group, which is the part of the IS organization that provides computing infrastructure such as networks, data center services, global server support, application support, Help Desk, and technology R&D for the entire company, carries the mission statement, "To deliver the best-in-class, highest-quality, lowest-cost technology infrastructure utility, providing the foundation for the company to achieve its business goals and encouraging the creation of new and innovative ways of doing business." George Surdu, director for technical services, says the mission statement reflects again Ford's newly embedded customer focus—the references to quality and cost mean his group must offer levels of service and price them to be competitive with outside providers.

Until recently, Ford had no centralized IT group. Instead, each functional arm or geographical unit of the company developed its own systems as it saw fit. One element of the Ford 2000 vision was to act like a truly global company rather than a company with disjointed units in many countries. The result of Ford's old structure was incompatible systems, which slowed the task of sharing information; that, in turn, slowed the velocity of decision making. So, beginning in 1994, Ford took the first steps toward consolidating its systems groups into a central organization—a plan that culminated in Bernard Mathaisel's arrival in 1996 as Ford's first CIO and executive director of process leadership.

Centralizing IT caused major changes at Ford. For example, the company now has an enterprise technology architecture and a process for identifying which technologies fit in, which need to be replaced, and so on. These standards are adhered to by the business globally. If it isn't in the standards, that technology doesn't get rolled out, although there is a process for identifying exceptional needs. Essentially, all the company's desktop systems are provided by one supplier—Dell Computer Corporation—and Ford uses two

standard configurations for those desktops. The benefits are lower hardware costs, lower support costs, and easier software rollouts because of simplified testing requirements.

"Indeed," says James Yost, Ford's newly anointed CIO and head of process leadership, "a lot of our communication of systems couldn't have been done before the current centralized organization was put in place."

At the same time, though, Ford is careful not to let the desire for standardization squelch the need for different applications around the globe. "They are very careful to leave alone those things they should," says former CIO Mathaisel. Although the U.S. units operate on standardized financial and manufacturing software, for example, Ford groups working in emerging markets such as China tend to run their operations on smaller ERP packages to give them a simpler, consolidated look at their regional business.

Additionally, on February 3, 2000, Ford Motor Company announced that all 350,000 of its employees will be receiving their own home personal computers and Internet access to link to other Ford workers all over the world. The $300 million price tag was peanuts for Ford. The decision was based not on altruism but on a realization that a connected workforce is a more productive workforce. The idea is to open up the flow of information and smash the geographic fiefdoms that traditionally have slowed decision making.

One of the biggest challenges for ongoing business—IT alignment at Ford is that the business is a moving target. The "consumer company" is in many ways still a better description of where Ford is headed than where it stands now. Ford's answer to keeping IT on top of the changes is a group responsible for both IT and process leadership. The group documents corporate processes and acts in a consulting role to help facilitate reengineering.

The group has identified five key areas of its business for focused reengineering efforts: design to delivery, order to delivery, services, manufacturing, and product design. That isn't an exhaustive list of everything the company does, and the more areas the company can target, the faster it can change. However, initiatives of such large scope— like designing a new car or all the steps that turn an order into a delivered vehicle—take several years to design and implement.

A dedicated team is examining and documenting each area. IT—process staff work together with operational personnel to document first the existing processes in a given area. Then they ask a lot of why and what-if questions, functioning in a sort of advisory-consulting role. Lower-level improvements—those of smaller scope than the big five reengineering areas—that can be addressed more quickly are handled as "focused improvement opportunities" that might take a year, or as even smaller increments called "rapids" or "just do its" that might be implemented in a day. Again, the cascading approach allows for thoughtful management at all levels of the enterprise. The little changes don't have to wait for the huge initiatives to be completed, and yet the big-picture processes, where pay-back for the company is greatest, receive the attention they merit. As the reengineering teams identify process changes or best practices, they use the company's intranet to catalog and inform similar business units in other places. Ford has identified and replicated more than 2,700 practices or processes and claims a value of nearly $600 million delivered from best practice replication since August 1996. Another measure of the company's streamlined processes:

Ford is the most efficient auto manufacturer in North America, requiring 35 hours to build a vehicle, compared with 44-plus hours for its U.S. competitors.

One driving IT change at Ford is its ConsumerConnect strategy. A group of individuals assembled to change the way consumers purchase vehicles. To help plot the strategy, in 1999 Nasser hired a young executive from General Electric, Brian Kelley, to oversee Ford's push into the new era. Kelley began bringing in other non auto executives, blending them into teams with younger Ford executives. Some older Ford executives, meanwhile, quietly retired. Creating a younger management team seems to have been part of Nasser's strategy. "Now, we're in the age group with people in the Internet era," he says. "We talk the same language." The new team sees themselves as a kind of Alpha squad, here to lead change and help make the cultural difference required to bring Ford into the twenty-first century.

Traditionally, when customers wanted to buy a car, they looked in the newspaper, went to the dealer, haggled over the price, and then left with a car they may or may not have wanted. Customers now can log on to *www.ford.com* and design their own car. The site allows customers to choose a model and add options as desired. When they are finished, an estimated bill is calculated. The site also allows customers to examine different financing scenarios by changing rates and down payments. Once customers have chosen "their" car and financing, they can then input their zip code and find the nearest dealer. The problem is the dealer may have other plans for the car the customer likes.

This is where Consumer Connect improves the process. Ford's goal within two years is to allow individuals to build their own car on the Web, provide them with financing opportunities, and deliver the car to them. The benefits are that customers get the car they want and Ford doesn't build inventory that may take days and millions of dollars to move. Although this sounds great, what about the dealer? The Internet is making some dealerships uneasy. Some have gone as far as successfully lobbying state lawmakers to keep new Internet cars out of their state. However, carmakers are fighting back with innovative partnerships and are providing dealerships with incentives to sell and distribute Internet cars.

To accomplish technological changes, Ford formed several alliances. Oracle is doing the heavy lifting on the software and databases needed to swap information and conduct transactions seamlessly. Cisco, which signed on as a partner on February 9,2000, will provide much-needed networking expertise. Microsoft Corporation's CarPoint, an auto sales and information Web site, will help Ford develop a build-to-order service. Internet service provider UUNet, PC maker Hewlett-Packard, and middleman PeoplePC signed on to put Ford's sprawling workforce online, starting in April of 2000.

Other tech partners are helping Ford get closer to its customers. Online powerhouses Yahoo! and Priceline.com, along with Denver-based call-center wizard TeleTech, will design systems that deliver highly personalized warranty, loan, repair, and customized services based on more detailed knowledge of driver lifestyles and buying habits. "It could give us a bird's-eye view of what consumers want out of a car before we build it," says Ford design chief J. Mays.

Meanwhile, ConsumerConnect and Ford's Visteon auto-parts unit are teaming up to wire future Fords for e-mail and news, voice-recognition systems, and satellite phone services that will, says Kelley, "turn the family car into a Web portal on four wheels." The payoff: a whole array of new services in a marketplace where basic car prices are declining. Better yet, Web services and phones can be sold on a subscription basis, generating monthly fees that keep cash flowing into Ford's coffers for the life of the car.

Reinventing IT structure is a huge task, but one that Ford has embraced .head-on. The change will meet with some resistance, and the cost is huge. However, Nasser remains determined. The risk of not embracing the change could be much more costly.

Sources: Adapted from Holstein, William J., "The Dot Corn within Ford," *U.S. News & World Report* (February 7,2000); Holstein, William J., "Let Them Have PCs," *U.S. News & World Report* (February 14, 2000);
Kerwin, Kathleen, Marcia Stepanek, and David Welch, "At Ford, E-Commerce Is Job 1," *Business Week* (February 28, 2000); Slater, Derek, "Alignment Check," *CIO* (November 15, 1999). *www.ford.com.*

CASE STUDY QUESTIONS

1. Ford has operations all over the world, and they claim to have two standard configurations for desktop computers. What are some of the considerations (e.g., software, hardware, languages) in configuring the desktops across multiple countries?
2. Ford has created a centralized IT group. How might the group gather information from users of the technology to know their needs?
3. All employees of Ford are given a personal computer and Internet access for $5 per month. As IT manager in charge of implementing this program, address the following questions. Should employees be required to accept the computers? What software applications should Ford distribute with the computers? Should Ford provide training for the computers? If so, how might the training be delivered? Should other family members be allowed to use the computer? Should Ford enforce any restrictions on the use of the computers? How might Ford deal with separation of employment issues?
4. Ford's goal is to have consumers design, finance, and eventually purchase autos online. Who do you think will be the primary users of this new way of purchasing vehicles? Will dealerships be eliminated, or how might dealerships still play a role in the purchasing of a new car?
5. Visit the Ford Web site at *www.ford.com.* Use the sight to design a vehicle, choose financing options, and find a dealer. After your visit, list the benefits to the customer and to Ford. Also, give your suggestion about things you would add to the Web, site to benefit the customers and/or Ford.