PLUG-IN

B12 Global Trends

LEARNING OUTCOMES

1. Identify the trends that will have the greatest impact on future business.
2. Identify the technologies that will have the greatest impact on future business.
3. Explain why understanding trends and new technologies can help an organization prepare for the future.

Introduction

The core units brought out how important it is for organizations to anticipate and prepare for the future by studying emerging trends and new technologies. Having a broad view of emerging trends and new technologies as they relate to business can provide an organization with a valuable strategic advantage. Those organizations that can most effectively grasp the deep currents of technological evolution can use their knowledge to protect themselves against sudden and fatal technological obsolescence.

This plug-in identifies several emerging trends and new technologies that can help an organization prepare for future opportunities and challenges.

Reasons to Watch Trends

Organizations anticipate, forecast, and assess future events using a variety of rational, scientific methods including:

- ***Trend analysis:*** A trend is examined to identify its nature, causes, speed of development, and potential impacts.
- ***Trend monitoring:*** Trends viewed as particularly important in a specific community, industry, or sector are carefully monitored, watched, and reported to key decision makers.
- ***Trend projection:*** When numerical data are available, a trend can be plotted to display changes through time and into the future.
- ***Computer simulation:*** Complex systems, such as the U.S. economy, can be modeled by means of mathematical equations and different scenarios can be run against the model to conduct "what if" analysis.

Top Reasons to Study Trends	
1. Generate ideas and identify opportunities	Find new ideas and innovations by studying trends and analyzing publications.
2. Identify early warning signals	Scan the environment for potential threats and risks.
3. Gain confidence	A solid foundation of awareness about trends can provide an organization with the confidence to take risks.
4. Beat the competition	Seeing what is coming before others can give an organization the lead time it requires to establish a foothold in the new market.
5. Understand a trend	Analyzing the details within a trend can help separate truly significant developments from rapidly appearing and disappearing fads.
6. Balance strategic goals	Thinking about the future is an antidote to a "profit now, worry later" mentality that can lead to trouble in the long term.
7. Understand the future of specific industries	Organizations must understand everything inside and outside their industry.
8. Prepare for the future	Any organization that wants to compete in this hyperchanging world needs to make every effort to forecast the future.

FIGURE B12.1
Top Reasons to Study Trends

- ***Historical analysis:*** Historical events are studied to anticipate the outcome of current developments.

Foresight is one of the secret ingredients of business success. Foresight, however, is increasingly in short supply because almost everything in our world is changing at a faster pace than ever before. Many organizations have little idea what type of future they should prepare for in this world of hyperchange. Figure B12.1 displays the top reasons organizations should look to the future and study trends.

Trends Shaping Our Future

According to the World Future Society, the following trends have the potential to change our world, our future, and our lives.

- The world's population will double in the next 40 years.
- People in developed countries are living longer.
- The growth in information industries is creating a knowledge-dependent global society.
- The global economy is becoming more integrated.
- The economy and society are dominated by technology.
- The pace of technological innovation is increasing.
- Time is becoming one of the world's most precious commodities.

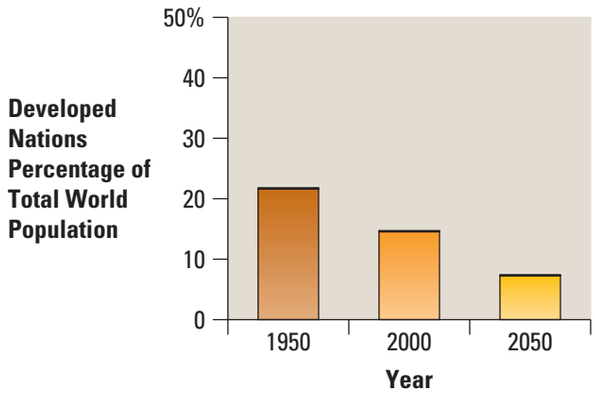
THE WORLD'S POPULATION WILL DOUBLE IN THE NEXT 40 YEARS

The countries that are expected to have the largest increases in population between 2000 and 2050 are:

- Palestinian Territory—217 percent increase.
- Niger—205 percent increase.
- Yemen—168 percent increase.

FIGURE B12.2

Expected Population Decreases in Developed and Industrialized Nations



- Angola—162 percent increase.
- Democratic Republic of the Congo—161 percent increase.
- Uganda—133 percent increase.

In contrast, developed and industrialized countries are expected to see fertility rates decrease below population replacement levels, leading to significant declines in population (see Figure B12.2).

Potential Business Impact

- Global agriculture will be required to supply as much food as has been produced during all of human history to meet human nutritional needs over the next 40 years.
- Developed nations will find that retirees will have to remain on the job to remain competitive and continue economic growth.
- Developed nations will begin to increase immigration limits.

PEOPLE IN DEVELOPED COUNTRIES ARE LIVING LONGER

New pharmaceuticals and medical technologies are making it possible to prevent and cure diseases that would have been fatal to past generations. This is one reason that each generation lives longer and remains healthier than the previous generation. On average, each generation in the United States lives three years longer than the previous. An 80-year-old in 1950 could expect to live 6.5 years longer today. Many developed countries are now experiencing life expectancy over 75 years for males and over 80 years for females (see Figure B12.3).

FIGURE B12.3

Rising Life Expectancy in Developed Countries

Rising Life Expectancy in Developed Countries

Country	Life Expectancy (Born 1950–1955)	Life Expectancy (Born 1995–2000)
United States	68.9	76.5
United Kingdom	69.2	77.2
Germany	67.5	77.3
France	66.5	78.1
Italy	66.0	78.2
Canada	69.1	78.5
Japan	63.9	80.5

Potential Business Impact

- Global demand for products and services for the elderly will grow quickly in the coming decades.
- The cost of health care is destined to skyrocket.
- Pharmaceutical companies will be pushed for advanvances in geriatric medicine.

THE GROWTH IN INFORMATION INDUSTRIES IS CREATING A KNOWLEDGE-DEPENDENT GLOBAL SOCIETY

Estimates indicate that 90 percent of American management personnel will be knowledge workers by 2008. Estimates for knowledge workers in Europe and Japan

are not far behind. A typical large organization in 2010 will have fewer than half the management levels of its counterpart in 1990, and about one-third the number of managers. Soon, large organizations will be composed of specialists who rely on information from co-workers, customers, and suppliers to guide their actions. Employees will gain new power as they are provided with the authority to make decisions based on the information they acquire.

Potential Business Impact

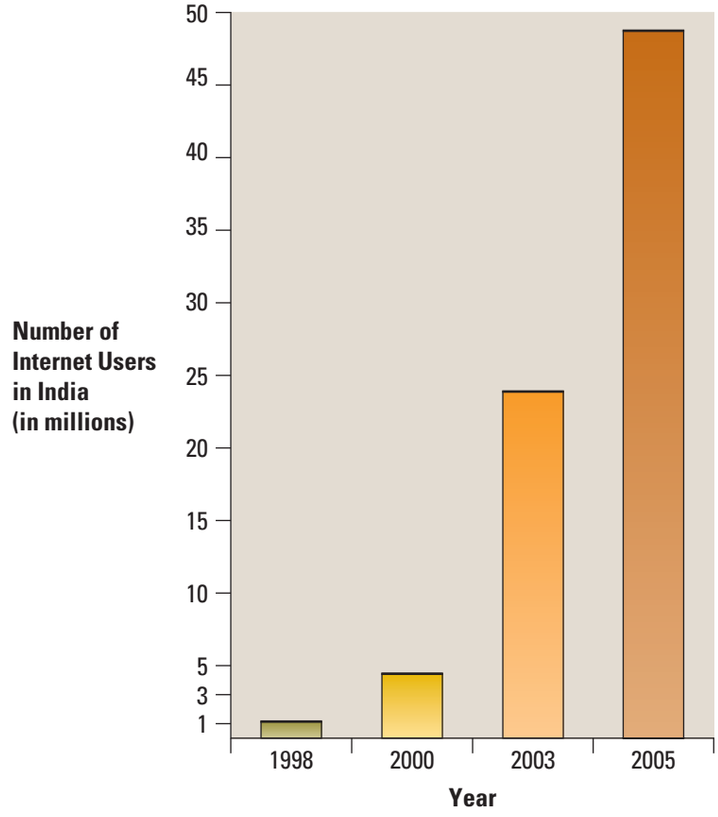
- Top managers must be computer-literate to retain their jobs and achieve success.
- Knowledge workers are generally higher paid and their proliferation is increasing overall prosperity.
- Entry-level and unskilled positions are requiring a growing level of education.
- Information now flows from front-office workers to higher management for analysis. Thus, in the future, fewer midlevel managers will be required, flattening the corporate pyramid.
- Downsizing, restructuring, reorganization, outsourcing, and layoffs will continue as typical large organizations struggle to reinvent and restructure themselves for greater flexibility.

THE GLOBAL ECONOMY IS BECOMING MORE INTEGRATED

International outsourcing is on the rise as organizations refuse to pay high salaries for activities that do not contribute directly to the bottom line. The European Union has relaxed its borders and capital controls making it easier for companies to outsource support functions throughout the continent.

The Internet is one of the primary tools enabling our global economy. Internet users numbered 1 billion in 2005 and are anticipated to grow to 3 billion by 2010. One of the primary reasons for the increase in Internet use is the increase in connectivity technology. China's Internet users are growing by 6 percent each month, to 111 million in 2005. India's Internet users reached 50 million in 2005 (see Figure B12.4 for India's statistics). The increase in Internet use is increasing revenues for ebusinesses.

FIGURE B12.4
Growth of Internet Users in India



Potential Business Impact

- Demand for personnel in distant countries will increase the need for foreign-language training, employee incentives suited to other cultures, and many other aspects of performing business globally.
- The growth of ebusiness and the use of the Internet to shop globally for raw materials and supplies will reduce the cost of doing business.
- The Internet will continue to enable small companies to compete with worldwide giants with relatively little investment.
- Internet-based operations require sophisticated knowledge workers and thus people with the right technical skills will be heavily recruited over the next 15 years.

THE ECONOMY AND SOCIETY ARE DOMINATED BY TECHNOLOGY

Computers are becoming a part of our environment. Mundane commercial and service jobs, environmentally dangerous jobs, standard assembly jobs, and even the repair of inaccessible equipment such as space stations will be increasingly performed by robots. Personal robots will appear in the home by 2010. By 2009, artificial intelligence and expert systems will help most companies and government agencies assimilate data and solve problems beyond the range of today's computers including energy prospecting, automotive diagnostics, insurance underwriting, and law enforcement.

Superconductors operating at economically viable temperatures are expected to be in commercial use by 2015. Products eventually will include supercomputers the size of a three-pound coffee can, electronic motors 75 percent smaller and lighter than those in use today, and power plants.

Potential Business Impact

- New technologies provide dozens of new opportunities to create businesses and jobs.
- Automation will continue to decrease the cost of products and services, making it possible to reduce prices while improving profits.
- The Internet is expected to push prices of most products to the commodity level.
- The demand for scientists, engineers, and technicians will continue to grow.

PACE OF TECHNOLOGICAL INNOVATION IS INCREASING

Technology is advancing at a phenomenal pace. Medical knowledge is doubling every eight years. Half of what students learn in their freshman year of college about innovative technology is obsolete, revised, or taken for granted by their senior year. In fact, all of today's technical knowledge will represent only 1 percent of the knowledge that will be available in 2050.

Potential Business Impact

- The time to get products and services to market is being shortened by technology. Products must capture their market quickly before the competition can copy them. During the 1940s the average time to get a product to market was 40 weeks. Today, a product's entire life cycle seldom lasts 40 weeks.
- Industries will face tighter competition based on new technologies. Those who adopt state-of-the-art technology first will prosper, while those who ignore it eventually will fail.

TIME IS BECOMING ONE OF THE WORLD'S MOST PRECIOUS COMMODITIES

In the United States, workers today spend around 10 percent more time on the job than they did a decade ago. European executives and nonunionized workers face the same trend. This high-pressure environment is increasing the need for any product or service that saves time or simplifies life.

Potential Business Impact

- Companies must take an active role in helping their employees balance their time at work with their family lives and need for leisure.
- Stress-related problems affecting employee morale and wellness will continue to grow.

- As time for shopping continues to evaporate, Internet and mail-order marketers will have a growing advantage over traditional stores.

Technologies Shaping Our Future

The following technologies are changing our world, our future, and our lives.

- Digital ink
- Digital paper
- Teleliving
- Alternative energy sources
- Autonomic computing

DIGITAL INK

Digital ink (or electronic ink) refers to technology that digitally represents handwriting in its natural form (see Figure B12.5). E Ink Corporation, headquartered in Cambridge, Massachusetts, has developed a proprietary technology called electronic ink, which provides significant advantages over other display technologies. E Ink was founded in 1997 to advance electronic ink, develop applications, and create markets for displays based on this unique technology.

FIGURE B12.5
Digital Ink

Potential Business Impact

- Digital ink has broad usage in many applications, from point-of-sale signs in retail stores, to next generation displays in mobile devices and PDAs, to thin, portable electronic books and newspapers. E Ink has collaborated with various companies like Lucent Technologies to produce reusable paper with digital ink.
- The ultimate dream of E Ink is ***RadioPaper,*** a dynamic high-resolution electronic display that combines a paperlike reading experience with the ability to access information anytime, anywhere. RadioPaper will be thin and flexible and could be used to create an electronic book or newspaper with real pages.

DIGITAL PAPER

Digital paper (or electronic paper) is any paper that is optimized for any type of digital printing. In some ways, digital paper is produced much like a sheet of paper. It comes from a pulp and the finished product has the flexibility to be rolled into scrolls of "paper." However, the major difference between paper produced from a tree and paper produced in a laboratory is that information on a digital paper sheet can be altered thousands of times and not degrade over time (see Figure B12.6). Digital paper offers excellent resolution and high contrast under a wide range of viewing angles, requires no external power to retain its image, is extremely lightweight, costs less, and is remarkably flexible, unlike computer displays.

Macy's department store was the first company to experiment by placing digital paper signs in the children's section at a New Jersey store. As the company spends more than $250,000 a week changing its in-store signs, such renewable signage could prove highly desirable. A networked programmable sign will run for two years on three AA batteries (see Figure B12.7).

FIGURE B12.6
Digital Paper

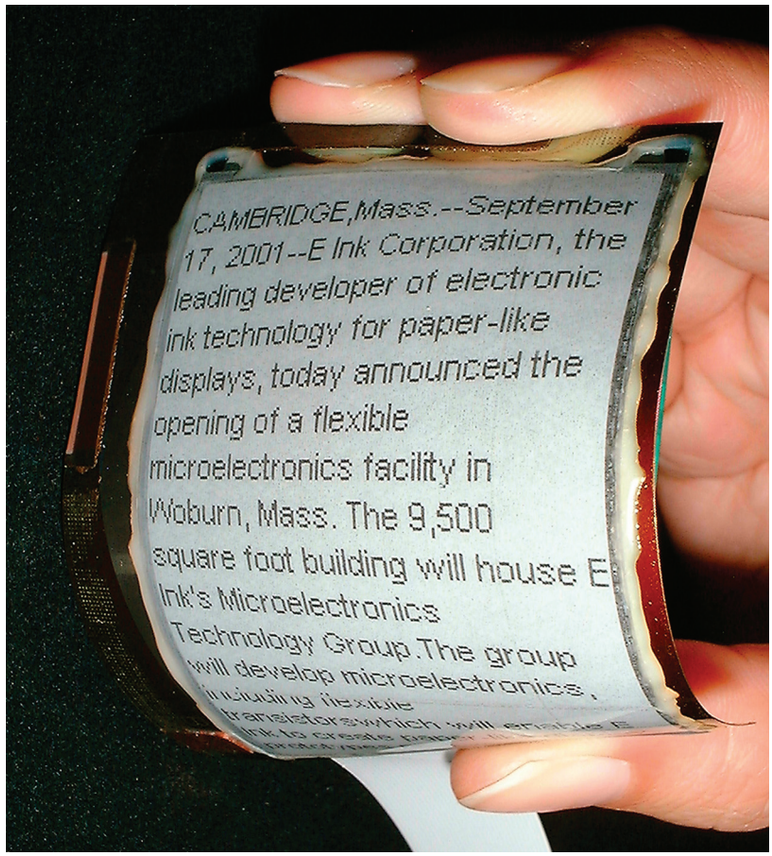


FIGURE B12.7
Digital Paper Sign Example

Date	Technology
April 1996	MIT's Media Lab starts work on electronic paper prototype.
April 1997	E Ink is founded to commercialize MIT's electronic paper displays.
May 1999	E Ink debuts Immedia electronic paper display products.
November 2000	E Ink and Lucent Technologies demonstrate first flexible electronic products.
December 2000	Gyricon Media is spun off from Xerox PARC.
February 2001	E Ink teams with Philips Components to develop a high-resolution display for smart handhelds.
March 2001	Gyricon introduces digital paper technology.
June 2001	Macy's is scheduled to test digital paper for in-store signage use.
Late 2001	E Ink/Philips handheld prototype is delivered.
2004/2005	E Ink electronic paper handheld devices becomes available to users.
Mid-2000s	Possible debut of E Ink's RadioPaper wireless electronic publishing technology.

FIGURE B12.8
Digital Ink and Digital Paper Past, Present, and Future

As a laboratory prototype, digital ink and digital paper have been around for some time with demonstration of the technologies often leading to wild predictions about ebooks and enewspapers (see Figure B12.8).

Potential Business Impact

- Digital paper is driving a new wave of innovation in the content distribution field. Paperlike displays will replace newspapers, magazines, and books since they will be almost as manageable as paper and allow display resolution close to print.
- The concept of a reusable paper product is an environmentally sound idea considering that a major portion of the world's paper goes to printing newspapers, magazines, pamphlets, and so on.

TELELIVING

Lifestyle changes will emerge as computers develop capabilities that are more sophisticated. ***Teleliving*** refers to using information devices and the Internet to conduct all aspects of life seamlessly. This can include such things as shopping, working, learning, playing, healing, and praying. Even today, homes, autos, and work environments are wired into intelligent networks that interact with one another. Each year, 4 billion chips are embedded in everything from coffeemakers to Cadillacs.

Potential Business Impact

- In the future, people will move through a constant stream of information summoned at the touch of a finger. They will interact with life-size images, data, and text in homes and offices. The days of hunching over a computer will be gone.
- The ***virtual assistant (VA)*** will be a small program stored on a PC or portable device that monitors emails, faxes, messages, and phone calls. Virtual assistants will help individuals solve problems in the same way a real assistant would. In time, the VA will take over routine tasks such as writing a letter, retrieving a file, and making a phone call.
- Robotic salespeople will take on human appearances and have the ability to perform all tasks associated with a sales job.

FIGURE B12.9

Wind Power—An Alternative Energy Source

ALTERNATIVE ENERGY SOURCES

By the end of the decade, wind, geothermal, hydroelectric, solar, and other alternative energy sources will increase from their present level of 10 percent of all energy use to about 30 percent. Worldwide wind-power generating capacity grew by 6,500 megawatts in 2003, the fastest rate of growth yet recorded and 50 percent more than the previous year (see Figure B12.9). Nuclear plants will supply 16 percent of the energy in Russia and Eastern Europe by 2010. New sources of carbon fuels are frequently being discovered and more-powerful extraction methods are being developed, thereby keeping supply up and costs down.

Potential Business Impact

- China, Asia, India, South America, and Russia are modernizing their economies, which increasingly use large amounts of energy.
- The cost of alternative energy sources is dropping with technical advances. This growing competition from other energy sources will help limit the price of oil.
- The imminent deregulation of the energy industry is expected to create a huge spurt of innovative entrepreneurship, fostering a wide variety of new energy sources.
- Oil will remain the world's most important energy resource. However, in two or three decades a declining reliance on oil will help reduce air and water pollution. By 2060, a costly but pollution-free hydrogen economy may become possible.

AUTONOMIC COMPUTING

Autonomic computing is a self-managing computing model named after, and patterned on, the human body's autonomic nervous system. Autonomic computing is one of the building blocks of widespread computing, an anticipated future computing model in which small—even invisible—computers will be all around us, communicating through increasingly interconnected networks. Many industry leaders, including IBM, HP, Sun, and Microsoft, are researching various components of autonomic computing. However, autonomic computing is not an overnight revolution in which systemwide, self-managing environments suddenly appear. As described in Figure B12.10, autonomic computing is a gradual evolution that delivers new technologies that are adopted and implemented at various stages and levels.

Potential Business Impact

- The complex IT infrastructures of the future will require more computer automation than ever before. Autonomic computing will be used in a variety of areas that include security, storage, network management, and new redundancy and fail-over capabilities.
- Autonomic computers will continuously seek out ways to optimize computing. In the autonomic environment, computers will monitor components and fine-tune workflows to achieve system performance goals.
- Autonomic computers will be able to "self-heal." In the event of a component failure, an autonomic computer will be able to diagnose the failure and develop a workaround that allows the computer to continue with its functions.

Level	Technologies Implemented
Level 1: Basic	The starting point where most systems are today, this level represents manual computing in which all system elements are managed independently by an extensive, highly skilled IT staff. The staff sets up, monitors, and eventually replaces system elements.
Level 2: Managed	Systems management technologies can be used to collect and consolidate information from disparate systems onto fewer consoles, reducing administrative time. There is greater system awareness and improved productivity.
Level 3: Predictive	The system monitors and correlates data to recognize patterns and recommends actions that are approved and initiated by the IT staff. This reduces the dependency on deep skills and enables faster and better decision making.
Level 4: Adaptive	In addition to monitoring and correlating data, the system takes action based on the information, thereby enhancing IT agility and resiliency with minimal human interaction.
Level 5: Autonomic	Fully integrated systems and components are dynamically managed by business rules and policies, enabling IT staff to focus on meeting business needs with true business agility and resiliency.

FIGURE B12.10
Evolutionary Process of Autonomic Computing

- Autonomic computers will be able to "self-protect." Protection for computing resources primarily takes the form of fighting off invasive viruses and security intrusion attempts.

PLUG-IN SUMMARY

Organizations that can think ahead will be prepared to take advantage of all the new opportunities that rapid social and technological progress is creating. Trends shaping our future include:

- The world's population will double in the next 40 years.
- People in developed countries are living longer.
- The growth in information industries is creating a knowledge-dependent global society.
- The global economy is becoming more integrated.
- The economy and society are dominated by technology.
- The pace of technological innovation is increasing.
- Time is becoming one of the world's most precious commodities.

Technologies shaping our future include:

- Digital ink
- Digital paper
- Teleliving
- Alternative energy sources
- Autonomic computing

KEY TERMS

Autonomic computing, B12.10
Computer simulation, B12.2
Digital ink (or electronic ink), B12.7
Digital paper (or electronic paper), B12.7
Historical analysis, B12.3
RadioPaper, B12.7
Teleliving, B12.9
Trend analysis, B12.2
Trend monitoring, B12.2
Trend projection, B12.2
Virtual assistant (VA), B12.9

CLOSING CASE ONE

Autonomic Railways

Canadian Pacific Railway (CPR), based in Calgary, Alberta, Canada, is one of the largest railway systems in North America. With more than 14,400 miles of rail line in Canada and the United States, this $2.6 billion (U.S.) transportation company serves virtually every major industry, from the resource-based industries of the West to the manufacturing bases and consumer markets in central Canada and the northern United States.

Shippers expect fast, reliable services and on-time delivery of goods. As a result, CPR designed many programs—from improving asset management, to strengthening service reliability, to accounting for fluctuating costs—to help it respond to market forces with agility and ease. Val King, manager of IT security for CPR, explains that security management is an essential element in the delivery of these on-demand services. King said, "We must protect our operations from technology attacks, while providing our customers easy, reliable access to information and services online."

The goal of the company's IT security team is simple: minimize risk while optimizing user satisfaction. Yet the team's greatest challenges are lack of resources and tight budgets. "We had to look to technology to help us accomplish our goals," explained King. CPR collaborated with IBM to deliver solutions that are both automated (they can control a defined process without human intervention) and autonomic (they can sense and respond to conditions in accordance with business policies). As a result, IT employees can deliver consistent, reliable service levels at reduced costs since they collaborated with IBM using autonomic computing resources such as Tivoli Risk Manager, Tivoli Access Manager, Tivoli Identity Manager, and Tivoli Decision Support. "The automation of processes through the intelligent self-managing features of Tivoli software can help companies respond to threats more quickly," King said. "The benefit is that organizations can strengthen the resiliency of their environments even as the number of security events increases."

CPR is realizing measurable results from its implementation of Tivoli Security Management solutions and King sees the already-realized benefits as only the "tip of the iceberg." Some of the notable ROI from CPR's investment in Tivoli Security Management solutions include:

1. **Improved productivity**—The IT security team spends less time managing security incidents with Tivoli Risk Manager. The IT staff also expects to spend less time on reporting because data from the various security monitors will be integrated.
2. **Reduced costs**—The application development team estimates that a centralized security model helps accelerate development time. The help desk organization reports a reduction in user calls, due to the password-reset capabilities of Tivoli Identity Manager.
3. **Increased business resiliency**—Using Tivoli Risk Manager, Tivoli Enterprise Console, Tivoli Decision Support, and Tripwire, a data integrity assurance solution from Tripwire, Inc., CPR tests show that if an attack shuts down a service, administrators can get systems back online much faster.
4. **Improved audit compliance**—Before the implementation of Tivoli Access Manager for ebusiness, security staff would need to look at each system or application to see if it properly applied security policy. Now, security policies are consistent enterprisewide.

Questions

1. Which of the trends shaping our future discussed in this plug-in will have the greatest impact on CPR's business?
2. Which of the trends will have the least impact on CPR's business?
3. How are the functions of autonomic computing providing CPR with a competitive advantage?
4. How can CPR take advantage of other technological advances to improve security?

CLOSING CASE TWO

Wireless Progression

Progressive Corporation is the fourth-largest automobile insurer in the United States with more than 8 million policyholders and net premiums of $6.1 billion. Progressive offers wireless web access to holders of its auto insurance policies, a move that analysts have said fits the company's reputation as a technology leader in the insurance industry and its emphasis on customer service.

Customers can use their web-enabled phones to get price quotes, report claims, locate nearby independent agents by ZIP code, and access real-time account information through the company's website. Progressive also has the ability to push time-sensitive data to policyholders via wireless connections, instantly delivering information about an auto-recall notice to a customer's cell phone.

As a cost-saving measure, and in keeping with a corporate tradition of internal development, Ohio-based Progressive decided to build its own wireless applications. Policyholders simply have to type Progressive's web address into their phones or connect to the site through search engines that specialize in wireless ebusiness.

Stephen Williams, president of the Insurance Institute of Indiana, a nonprofit trade association that represents insurers in that state, said it's "not uncommon for Progressive to be on the cutting edge with its use of technology." If Progressive is starting to take advantage of the wireless web, other companies could follow its lead, he added. Jeffrey Kagan, an Atlanta-based wireless technology analyst, called Progressive "the Nordstrom's of insurance because of its emphasis on customer service." The addition of wireless access to its website "is a simple but smart way to use technology" to further improve the company's service, Kagan said. Progressive.com leads the insurance industry in consumer-friendly innovations. It was the first auto insurance website (1995), first to offer online quoting and comparison rates (1996), first to offer instantaneous online purchase of an auto policy (1997), and first to offer after-the-sale service (1998).

The Progressive.com website leads the insurance industry in consumer-friendly innovations and functionality. Progressive.com was recognized as one of the "top 10 websites that work" by *InfoWeek Magazine* and was named to the Smart Business 50 by *Smart Business Magazine* for successful use of the Internet to enhance and expand its business.

Questions

1. Which of the trends shaping our future discussed in this plug-in will have the greatest impact on Progressive's business?
2. Which of the trends will have the least impact on Progressive's business?
3. What other forms of advanced technology would you expect Progressive to deploy in the near future?

MAKING BUSINESS DECISIONS

1. Identifying and Following Trends

What's Hot.com is a new business that specializes in helping companies identify and follow significant trends in their industries. You have recently been hired as a new business analyst and your first task is to highlight current trends in the ebusiness industry. Using the Internet and any other resources you have available, highlight five significant trends not discussed in this text. Prepare a PowerPoint presentation that lists the trends and discusses the potential business impacts for each trend.

2. Reading the Ink on the Wall

IPublish.com is an ebook-only imprint publisher. While large publishers find that ebooks are not selling as expected, IPublish.com continues to report positive growth. However, IPublish.com feels threatened by digital ink and digital paper inventions that seem to be revolutionizing the publishing environment and endangering the global paper industry. You have been hired by IPublish.com to develop a strategy to embrace this new technology. Create a detailed report listing the reasons IPublish.com needs to support these two new technologies.

3. Pen Pal

StyleUs is a digital pen that writes on ordinary paper printed with a unique dot pattern almost invisible to the naked eye. A tiny camera in the pen registers the pen's movement

across a printed grid and stores it as a series of map coordinates. These coordinates correspond to the exact location of the page that is being written on. The dot pattern makes up a huge map of tiny distinctive squares, so small portions of it can also be given specific functions, such as "send," "store," or "synchronize." When a mark is made in the send box with the digital pen, it is instructed to send the stored sequence of map coordinates, which are translated into an image. The result is an exact copy of the handwriting displayed on the computer, mobile phone, or received as a fax anywhere in the world.

Analyze this new technology and identify how it might affect the digital ink or digital paper market. Be sure to include a Porter's Five Forces analysis of the market.

4. Less Is More

Your organization is teetering on the edge of systems chaos. Your systems administrator is stressed beyond tolerance by too many systems, too many applications, too few resources, and too little time. The scope, frequency, and diversity of demand are causing greater risk than anyone dares to admit. Automating (and reducing complexity of) the operating environment is critical for your business to survive. Research autonomic computing and write a report discussing how this technology can help an organization gain control over its systems.

5. Fly Pentop Computer

BusinessED specializes in creating new and innovative software for education in the business market. Danny Henningson, founder and president of BusinessED, is interested in developing educational products using digital paper and digital ink. Danny has hired you as the vice president of research and development and is excited to hear your ideas for new products. Your first assignment is to study the Fly Pentop computer (www.flypentop.com) and decide how you can apply this type of technology to the business arena.

6. Alternative Energy

With energy costs on the rise, many U.S. homes are turning to homegrown energy solutions. Your friend Cole Lazarus has decided to start a business offering such solutions. Cole would like your help developing his business. Begin by researching the Internet and find different ways that you could design a home with its own energy sources. Create a document listing the different sources along with advantages and disadvantages of each source.