



Information Systems Overview

The Field - Preparation - Day in the Life - Earnings - Employment -
- Career Path Forecast - Professional Organizations

The Field

How and when companies and organizations use technology are critical to remaining competitive. Computer and information systems managers play a vital role in the technological direction of their organizations. They do everything from constructing the business plan to overseeing network security to directing Internet operations.

Computer and information systems managers plan, coordinate, and direct research and facilitate the computer-related activities of firms. They help determine both technical and business goals in consultation with top management and make detailed plans for the accomplishment of these goals. For example, working with their staff, they may develop the overall concepts and requirements of a new product or service, or may identify how an organization's computing capabilities can effectively aid project management.



Computer and information systems managers direct the work of systems analysts, computer programmers, support specialists, and other computer-related workers. These managers plan and coordinate activities such as installation and upgrading of hardware and software, programming and systems design, development of computer networks, and implementation of Internet and intranet sites.



They are increasingly involved with the upkeep, maintenance, and security of networks. They analyze the computer and information needs of their organizations from an operational and strategic perspective and determine immediate and long-range personnel and equipment requirements. They assign and review the work of their subordinates and stay abreast of the latest technology to ensure the organization does not lag behind competitors.

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Prepared as part of the Sloan Career Cornerstone Center (www.careercornerstone.org)

Note: Some resources are provided by the US Department of Labor, Bureau of Labor Statistics.

Preparation

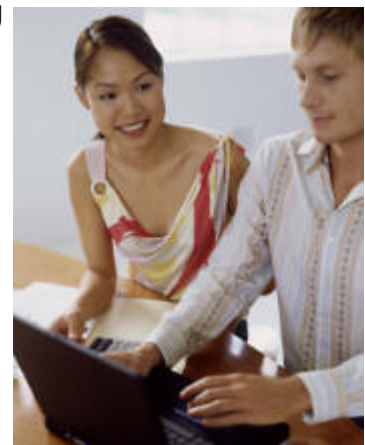
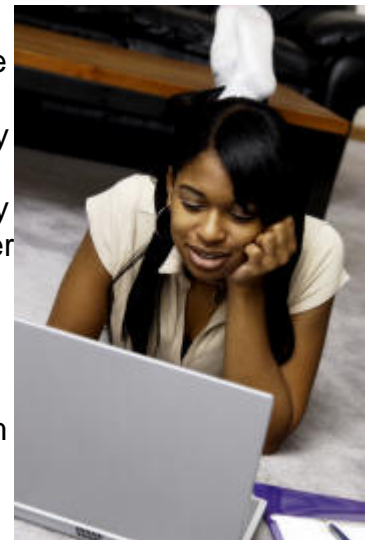
Advanced technical knowledge is essential for computer and information systems managers, who must understand and guide the work of their subordinates yet also explain the work in nontechnical terms to senior managers and potential customers. Therefore, many computer and information systems managers have experience in a computer occupation such as systems analyst; other managers may have worked as a computer support specialist, programmer, or other information technology professional.

A bachelor's degree usually is required for management positions, although employers often prefer a graduate degree, especially an MBA with technology as a core component. This degree differs from a traditional MBA in that there is a heavy emphasis on information technology in addition to the standard business curriculum. This preparation is becoming important because more computer and information systems managers are making important technology decisions as well as business decisions for their organizations.

Computer and information systems managers need a broad range of skills. Employers want managers who have experience with the specific software or technology used on the job, as well as a background in either consulting or business management. The expansion of electronic commerce has elevated the importance of business insight; many computer and information systems managers are called on to make important business decisions. Managers need a keen understanding of people, management processes, and customers' needs.

Computer and information systems managers must possess strong interpersonal, communication, and leadership skills because they are required to interact not only with their staff, but also with other people inside and outside their organizations. They also must possess team skills to work on group projects and other collaborative efforts. Computer and information systems managers increasingly interact with persons outside their organizations, reflecting their emerging role as vital parts of their firms' executive teams.

Computer and information systems managers may advance to progressively higher leadership positions in their field. Some may become managers in nontechnical areas such as marketing, human resources, or sales. In high-technology firms, managers in nontechnical areas often must possess the same specialized knowledge as do managers in technical areas.



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Those interested in a career in information systems should consider reviewing engineering programs that are accredited by the Accreditation Board for Engineering and Technology, Inc. (ABET). ABET accreditation is based on an examination of an engineering program's student achievement, program improvement, faculty, curricular content, facilities, and institutional commitment. The following is a current list of universities offering one or more accredited degree programs in information systems.

<ul style="list-style-type: none"> • Drexel University, College of Information Science & Technology • Gannon University • University of Houston-Clear Lake • Illinois State University • Jacksonville State University • James Madison University • Kennesaw State University • Lock Haven University of Pennsylvania • University of Maine • Metropolitan State College of Denver • University of Nebraska at Omaha 	<ul style="list-style-type: none"> • New Jersey Institute of Technology • University of North Florida • Pace University • Quinnipiac University • Robert Morris University • University of Scranton • Slippery Rock University • University of South Alabama • University of South Carolina • Utah State University • Virginia Commonwealth University • Wright State University
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Day in the Life

Computer and information systems managers need strong communication skills. They coordinate the activities of their unit with those of other units or organizations. They confer with top executives; financial, production, marketing, and other managers; and contractors and equipment and materials suppliers.

Tasks

The duties of computer and information systems managers vary with their specific titles. Chief technology officers, for example, evaluate the newest and most innovative technologies and determine how these can help their organizations. The chief technology officer, who often reports to the organization's chief information officer, manages and plans technical standards and tends to the daily information technology issues of the firm. (Chief information officers are covered in a separate Handbook statement on top executives.) Because of the rapid pace of technological change, chief technology officers must constantly be on the lookout for developments that could benefit their organizations. They are responsible for demonstrating to a company how information technology can be used as a competitive tool that not only cuts costs, but also increases revenue and maintains or increases competitive advantage.



Management information systems (MIS) directors manage information systems and computing resources for their organizations. They also may work under the chief information officer and plan and direct the work of subordinate information technology employees. These managers oversee a variety of user services such as an organization's help desk, which employees can call with questions or problems.

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MIS directors also may make hardware and software upgrade recommendations based on their experience with an organization's technology. Helping ensure the availability, continuity, and security of data and information technology services is the primary responsibility of these workers.

Project managers develop requirements, budgets, and schedules for their firms' information technology projects. They coordinate such projects from development through implementation, working with internal and external clients, vendors, consultants, and computer specialists. These managers are increasingly involved in projects that upgrade the information security of an organization.



LAN/WAN (local area network/wide area network) managers provide a variety of services, from design to administration of the local area network, which connects staff within an organization. These managers direct the network and its computing environment, including hardware, systems software, applications software, and all other computer-related configurations.

The Workplace

Computer and information systems managers spend most of their time in an office. Most work at least 40 hours a week and may have to work evenings and weekends to meet deadlines or solve unexpected problems. Some computer and information systems managers may experience considerable pressure in meeting technical goals within short timeframes or tight budgets. As networks continue to expand and more work is done remotely, computer and information systems managers have to communicate with and oversee offsite employees using modems, laptops, e-mail, and the Internet.



Earnings

According to the US Department of Labor, Bureau of Labor Statistics, earnings for computer and information systems managers vary by specialty and level of responsibility. Median annual earnings of these managers is \$101,580. The middle 50 percent earn between \$79,240 and \$129,250. Median annual earnings in the industries employing the largest numbers of computer and information systems managers is as follows:

Computer systems design and related services	\$109,130
Management of companies and enterprises	\$105,980
Data processing, hosting, and related services	\$105,200
Insurance carriers	\$102,180
Colleges, universities, and professional schools	\$83,280

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The Robert Half Technology 2007 Salary Guide lists the following annual salary ranges for various computer and information systems manager positions: Chief Technology Officer (CTO), \$101,000-\$157,750; Chief Security Officer, \$97,500-\$141,000; Vice President of Information Technology, \$107,500-\$157,750; Information Technology Manager, Technical Services Manager, \$62,500-\$88,250. In addition, computer and information systems managers, especially those at higher levels, often receive employment-related benefits, such as expense accounts, stock option plans, and bonuses.

Employment

According to the U.S. Department of Labor, Bureau of Labor Statistics, computer and information systems managers hold about 264,000 jobs in the United States. About 1 in 4 computer managers worked in service-providing industries, mainly in computer systems design and related services. This industry provides services related to the commercial use of computers on a contract basis, including custom computer programming services; computer systems integration design services; computer facilities management services, including computer systems or data-processing facilities support services; and other computer-related services, such as disaster recovery services and software installation. Other large employers include insurance and financial firms, government agencies, and manufacturers. The following is a partial list of employers of Information Systems Managers:



Services Companies

- Automatic Data Processing
- Computer Sciences Corporation
- Electronic Data Systems Corporation
- First Data Corporation
- IBM
- Microsoft

Insurance Companies

- Aetna, Inc.
- AIG
- Allstate Insurance Company
- Chubb Group of Insurance Companies
- General Casualty Companies
- Munich American Reassurance Company
- Prudential Insurance Company
- State Farm Insurance Company
- Transamerica Reinsurance

U.S. Federal Government and State and Local Affiliates

- Department of Energy
- Department of Defense
- Federal Bureau of Investigation
- Federal Emergency Management Agency
- NASA
- National Institute of Standards and Technology
- US Navy

Other Firms

- 3M Worldwide
- Abbott Laboratories
- Accenture
- Best Buy Corporation
- Bristol-Myers Squibb Company
- CNN
- Dow Chemical Company
- DuPont
- Federal Express
- Ford
- Genentech
- General Electric
- General Motors Corporation
- GlaxoSmithKline
- Honda
- Johnson & Johnson
- LL Bean
- Lands End
- Lockheed Martin
- Merck & Company
- Merrill Lynch & Co.
- Procter & Gamble Company
- QVC
- Siemens Automotive Corporation
- Toyota
- UPS

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Career Path Forecast

According to the U.S. Department of Labor, Bureau of Labor Statistics, the increasing use of technology in the workplace is projected to lead to faster than average growth in this occupation. Due to employment increases and because of the high demand for technical workers, prospects should be excellent for qualified job candidates.

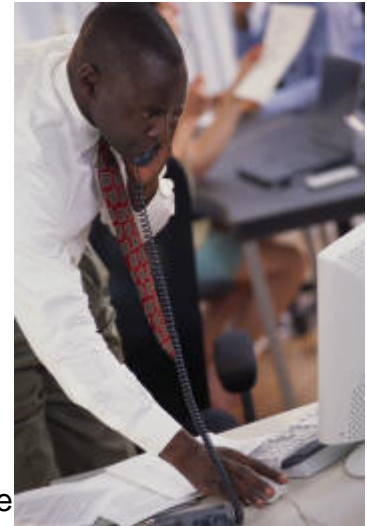
Employment of computer and information systems managers is expected to grow 16 percent over the 2006-16 decade, which is faster than the average for all occupations. New applications of technology in the workplace will continue to drive demand for workers, fueling the need for more managers.

Despite the downturn in the technology sector in the early part of the decade, the outlook for computer and information systems managers remains strong. To remain competitive, firms will continue to install sophisticated computer networks and set up more complex intranets and websites. Keeping a computer network running smoothly is essential to almost every organization.

Because so much business is carried out over computer networks, security will continue to be an important issue for businesses and other organizations. Although software developers continue to improve their products to remove vulnerabilities, attackers are becoming ever more complex in their methods. Organizations need to understand how their systems are vulnerable and how to protect their infrastructure and Internet sites from hackers, viruses, and other attacks. The emergence of security as a key concern for businesses should lead to strong growth for computer managers. Firms will increasingly hire security experts to fill key leadership roles in their information technology departments because the integrity of their computing environments is of utmost importance. As a result, there will be a high demand for managers proficient in computer security issues.

With the explosive growth of electronic commerce and the capacity of the Internet to create new relationships with customers, the role of computer and information systems managers will continue to evolve. Workers who have experience in web applications and Internet technologies will become increasingly vital to their companies.

Opportunities for those who wish to become computer and information systems managers should be closely related to the growth of the occupations they supervise and the industries in which they are found. Prospects for qualified computer and information systems managers should be excellent. Fast-paced occupational growth and the limited supply of technical workers will lead to a wealth of opportunities for qualified individuals. While technical



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workers remain relatively scarce in the United States, the demand for them continues to rise. This situation was exacerbated by the economic downturn in the early 2000s, when many technical professionals lost their jobs. Since then, many workers have chosen to avoid this work since it is perceived to have poor prospects.

Workers with specialized technical knowledge and strong communications skills will have the best prospects. People with management skills and an understanding of business practices and principles will have excellent opportunities, as companies are increasingly looking to technology to drive their revenue.

Professional Organizations

Professional organizations and associations provide a wide range of resources for planning and navigating a career in information systems. These groups can play a key role in your development and keep you abreast of what is happening in your industry. Associations promote the interests of their members and provide a network of contacts that can help you find jobs and move your career forward. They can offer a variety of services including job referral services, continuing education courses, insurance, travel benefits, periodicals, and meeting and conference opportunities. A broader list of professional associations is also available at www.careercornerstone.org.



► **Association for Computing Machinery** (www.acm.org)

Founded in 1947, ACM is a major force in advancing the skills of information technology professionals and students worldwide. Today, its 80,000 members and the public turn to ACM for the industry's leading Portal to Computing Literature, authoritative publications and pioneering conferences, providing leadership for the 21st century.

► **Association for Women in Computing** (www.awc-hq.org)

The Association for Women in Computing is a non-profit professional organization for women and men who have an interest in information and technology. The Association is dedicated to the advancement of women in the technology fields.



► **IEEE Computer Society** (www.computer.org)

With nearly 100,000 members, the IEEE Computer Society is the world's leading organization of computer professionals. Founded in 1946, it is the largest of the 39 societies of the IEEE.

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