
Computer and Information Systems Managers

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Significant Points

- Employment of computer and information systems managers is expected to grow faster than the average for all occupations through the year 2016.
- Many managers possess advanced technical knowledge gained from working in a computer occupation.
- Job opportunities will be best for applicants with a strong understanding of business and good communication skills.

Nature of the Work

In the modern workplace, it is imperative that technology works both effectively and reliably. Computer and information systems managers play a vital role in the implementation of technology within their organizations. They do everything from helping to construct a 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. This requires a strong understanding of both technology and business practices.

Computer and information systems managers direct the work of systems analysts, computer programmers, support specialists, and other computer-related workers. They 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.

The duties of computer and information systems managers vary greatly. *Chief technology officers (CTOs)*, for example, evaluate the newest and most innovative technologies and determine how these can help their organizations. The chief technology officer 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. Once a useful tool has been identified, the CTO must determine an implementation strategy and sell that strategy to management.



Computer and information systems managers supervise other information technology employees.

Management information systems (MIS) directors or information technology (IT) directors manage computing resources for their organizations. They often work under the chief information officer and plan and direct the work of subordinate information technology employees. These managers ensure the availability, continuity, and security of data and information technology services in their organizations. In this capacity, they oversee a variety of user services such as an organization's help desk, which employees can call with questions or problems. MIS directors also may make hardware and software upgrade recommendations based on their experience with an organization's technology.

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.

Work environment. Computer and information systems managers spend most of their time in offices. Most work at least 40 hours a week and some 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 with short deadlines 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.

Like other workers who spend most of their time using computers, computer and information systems managers are susceptible to eyestrain, back discomfort, and hand and wrist problems such as carpal tunnel syndrome.

Training, Other Qualifications, and Advancement

Computer and information systems managers are generally experienced workers who have both technical expertise and an understanding of business and management principles. A strong educational background and experience in a variety of technical fields is needed.

Education and training. 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.

Some universities offer degrees in management information systems. These degrees blend technical subjects with business, accounting, and communications courses. A few computer and information systems managers attain their positions with only an associate or trade school degree, but they must have sufficient experience and must have acquired additional skills on the job. To aid their professional advancement, many managers with an associate degree eventually earn a bachelor's or master's degree while working.

Certification and other qualifications. Computer and information systems managers need a broad range of skills. Employers look for 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 and, consequently, 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.

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 worked as a systems analyst, for example, or as a computer support specialist, programmer, or other information technology professional.

Although certification is not necessarily required for most computer and information systems manager positions, there is a wide variety of certifications available that may be helpful in getting a job. These certifications are often product-specific, and are generally administered by software or hardware companies rather than independent organizations.

As computer systems become more closely connected with day-to-day operations of businesses, computer and information systems managers are also expected to be aware of business practices. They must possess strong interpersonal, communication, and leadership skills because they are required to interact not only with staff members, but also with other people inside and outside their organizations. They must possess team skills to work on group projects and other collaborative efforts. They also must have an understanding of how a business functions, how it earns revenue, and how technology relates to the core competencies of the business. As a result, many firms now pre-

fer to give these positions to people who have spent time outside purely technical fields.

Advancement. Computer and information systems managers may advance to progressively higher leadership positions in the information technology department. A project manager might, for instance, move up to the chief technology officer position and then to chief information officer. On occasion, some may become managers in non-technical areas such as marketing, human resources, or sales because in high technology firms an understanding of technical issues is helpful in those areas.

Employment

Computer and information systems managers held about 264,000 jobs in 2006. 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.

Job Outlook

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 change. 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

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016		Change, 2006-16	
			Number	Percent	Number	Percent
Computer and information systems managers	11-3021	264,000	307,000	43,000	16	

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

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. (See the statements on computer programmers, computer software engineers, computer support specialists and systems administrators, computer systems analysts, and computer scientists and database administrators elsewhere in the *Handbook*.)

Job prospects. 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 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.

Earnings

Earnings for computer and information systems managers vary by specialty and level of responsibility. Median annual earn-

ings of these managers in May 2006 were \$101,580. The middle 50 percent earned between \$79,240 and \$129,250. Median annual earnings in the industries employing the largest numbers of computer and information systems managers in May 2006 were 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

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.

Related Occupations

The work of computer and information systems managers is closely related to that of computer programmers, computer software engineers, computer systems analysts, computer scientists and database administrators, and computer support specialists and systems administrators. Computer and information systems managers also have some high-level responsibilities similar to those of top executives.

Sources of Additional Information

For information about a career as a computer and information systems manager, contact:

➤ Association of Information Technology Professionals, 401 North Michigan Ave., Suite 2400, Chicago, IL 60611.

Internet: <http://www.aitp.org>