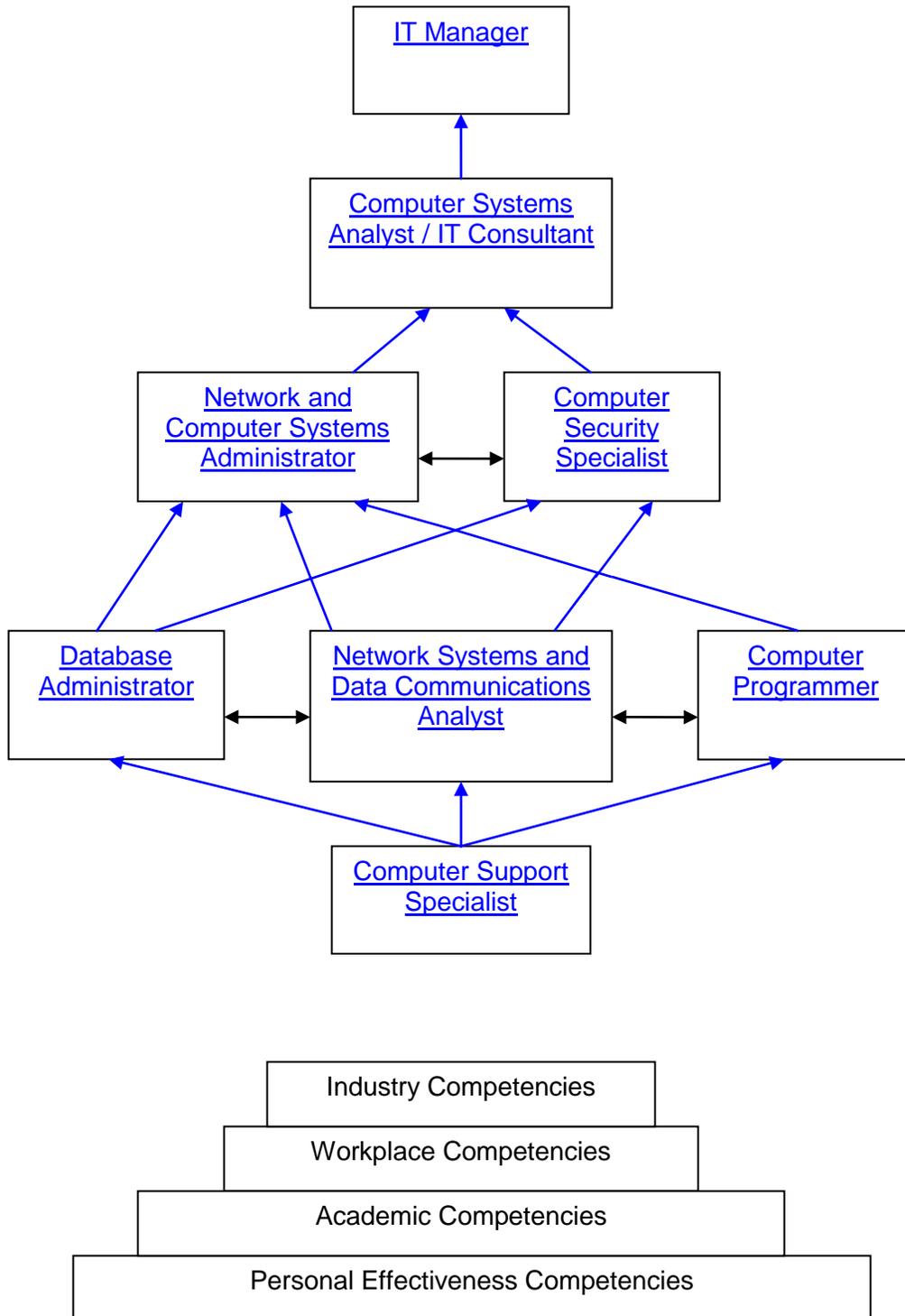


Sample Career Ladder/Lattice for Information Technology

Click on a job title to see examples of descriptive information about the job.

Click on a link between job titles to see the critical development experiences needed to move to that job on the pathway.



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Sample Career Ladder/Lattice for Information Technology

IT Manager
Job Title
IT Manager
Job Level
Management-level (Supervisory)
Job Description
<p>Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Tasks:</p> <ol style="list-style-type: none"> 1. Manage backup, security and user help systems. 2. Consult with users, management, vendors, and technicians to assess computing needs and system requirements. 3. Direct daily operations of department, analyzing workflow, establishing priorities, developing standards and setting deadlines. 4. Assign and review the work of systems analysts, programmers, and other computer-related workers. 5. Stay abreast of advances in technology. 6. Develop computer information resources, providing for data security and control, strategic computing, and disaster recovery. 7. Review and approve all systems charts and programs prior to their implementation. 8. Evaluate the organization's technology use and needs and recommend improvements, such as hardware and software upgrades. 9. Control operational budget and expenditures. 10. Meet with department heads, managers, supervisors, vendors, and others, to solicit cooperation and resolve problems.
Education
A Bachelor's degree is the minimum formal education required for this occupation. However, the position may require a Master's degree or a Ph.D.
Workforce Preparation
Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training.
Work Experience

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Sample Career Ladder/Lattice for Information Technology

Many positions require more than five years of experience. Extensive skill, knowledge, and experience are needed for this occupation.
Licensure/Certification
Various certifications available.
Salary
\$97,000
Employment Outlook
21-35% over the next 10 years, representing faster than average growth.

[Return to Career Ladder/Lattice Graphic](#)

Computer Systems Analyst / IT Consultant
Job Title
Computer Systems Analyst/IT Consultant
Job Level
Management-level (Supervisory)
Job Description
Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. May supervise computer programmers. Tasks:
<ol style="list-style-type: none"> 1. Provide staff and users with assistance solving computer related problems, such as malfunctions and program problems. 2. Test, maintain, and monitor computer programs and systems, including coordinating the installation of computer programs and systems. 3. Use object-oriented programming languages, as well as client and server applications development processes and multimedia and Internet technology. 4. Confer with clients regarding the nature of the information processing or computation needs a computer program is to address. 5. Coordinate and link the computer systems within an organization to increase compatibility and so information can be shared. 6. Consult with management to ensure agreement on system principles. 7. Expand or modify system to serve new purposes or improve work flow. 8. Interview or survey workers, observe job performance or perform the job to determine what information is processed and how it is processed. 9. Determine computer software or hardware needed to set up or alter system. 10. Train staff and users to work with computer systems and programs.
Education
Usually requires a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need several years of work-related experience, on-the-job training,

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Sample Career Ladder/Lattice for Information Technology

and/or vocational training.
Work Experience
A minimum of two to four years of work-related skill, knowledge, or experience is needed for this occupation.
Licensure/Certification
Various certifications available.
Salary
\$68,000
Employment Outlook
21-35% over the next 10 years, representing faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Computer Systems Analyst to IT Manager

A Bachelor's degree is the minimum formal education required for the position of IT Manager. However, the position may require a Master's degree or a Ph.D. Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training. Extensive skill, knowledge, and experience are needed for this occupation. Many IT Manager positions require more than five years of experience.

1. Define the goals of the system and devise flow charts and diagrams describing logical operational steps of programs.
2. Develop, document and revise system design procedures, test procedures, and quality standards.
3. Prepare cost-benefit and return-on-investment analyses to aid in decisions on system implementation.
4. Specify inputs accessed by the system and plan the distribution and use of the results.
5. Supervise computer programmers or other systems analysts or serve as project leaders for particular systems projects.
6. Utilize the computer in the analysis and solution of business problems such as development of integrated production and inventory control and cost analysis systems.
7. Evaluate data processing proposals to assess project feasibility and requirements.

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Sample Career Ladder/Lattice for Information Technology

Computer Security Specialist
Job Title
Computer Security Specialist
Job Level
Mid-level (Non-supervisory)
Job Description
<p>Plan, coordinate, and implement security measures for information systems to regulate access to computer data files and prevent unauthorized modification, destruction, or disclosure of information. Tasks:</p> <ol style="list-style-type: none"> 1. Train users and promote security awareness to ensure system security and to improve server and network efficiency. 2. Develop plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure and to meet emergency data processing needs. 3. Confer with users to discuss issues such as computer data access needs, security violations, and programming changes. 4. Monitor current reports of computer viruses to determine when to update virus protection systems. 5. Modify computer security files to incorporate new software, correct errors, or change individual access status. 6. Coordinate implementation of computer system plan with establishment personnel and outside vendors. 7. Monitor use of data files and regulate access to safeguard information in computer files. 8. Perform risk assessments and execute tests of data processing system to ensure functioning of data processing activities and security measures. 9. Encrypt data transmissions and erect firewalls to conceal confidential information as it is being transmitted and to keep out tainted digital transfers. 10. Document computer security and emergency measures policies, procedures, and tests.
Education
Usually requires a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training.
Work Experience
A minimum of two to four years of work-related skill, knowledge, or experience is needed.
Licensure/Certification
Various certifications available.
Salary
\$60,000
Employment Outlook
36+% over the next 10 years, representing much faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Computer Security Specialist to Computer Systems Analyst / IT Consultant

The position of Computer Systems Analyst / IT Consultant usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Confer with clients regarding the nature of the information processing or computation needs a computer program is to address.
2. Interview or survey workers, observe job performance or perform the job to determine what information is processed and how it is processed.
3. Provide staff and users with assistance solving computer related problems, such as malfunctions and program problems.
4. Develop plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure and to meet emergency data processing needs.
5. Coordinate implementation of computer system plan with establishment personnel and outside vendors.
6. Perform risk assessment and execute tests of data processing system to ensure functioning of data processing activities and security measures.

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Sample Career Ladder/Lattice for Information Technology

Network and Computer Systems Administrator
Job Title
Network and Computer Systems Administrator
Job Level
Mid-level (Non-supervisory)
Job Description
<p>Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet system or a segment of a network system. Maintain network hardware and software. Monitor network to ensure network availability to all system users and perform necessary maintenance to support network availability. May supervise other network support and client server specialists and plan, coordinate, and implement network security measures. Tasks:</p> <ol style="list-style-type: none"> 1. Diagnose hardware and software problems, and replace defective components. 2. Perform data backups and disaster recovery operations. 3. Maintain and administer computer networks and related computing environments including computer hardware, systems software, applications software, and all configurations. 4. Plan, coordinate, and implement network security measures to protect data, software, and hardware. 5. Operate master consoles to monitor the performance of computer systems and networks, and to coordinate computer network access and use. 6. Perform routine network startup and shutdown procedures, and maintain control records. 7. Design, configure, and test computer hardware, networking software and operating system software. 8. Recommend changes to improve systems and network configurations, and determine hardware or software requirements related to such changes. 9. Confer with network users about how to solve existing system problems. 10. Monitor network performance to determine whether adjustments need to be made, and to determine where changes will need to be made in the future.
Education
Usually requires a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training.
Work Experience
A minimum of two to four years of work-related skill, knowledge, or experience is needed for this occupation.
Licensure/Certification
Various certifications available.
Salary
\$60,000
Employment Outlook
36+% over the next 10 years, representing much faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Network and Computer Systems Administrator to Computer Systems Analyst / IT Consultant

The position of Computer Systems Analyst / IT Consultant usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Perform risk assessments and execute tests of data processing system to ensure functioning of data processing activities and security measures.
2. Train users and promote security awareness to ensure system security and to improve server and network efficiency.
3. Confer with clients regarding the nature of the information processing or computation needs a computer program is to address.
4. Interview or survey workers, observe job performance or perform the job to determine what information is processed and how it is processed.
5. Recommend new equipment or software packages.
6. Test, maintain, and monitor computer programs and systems, including coordinating the installation of computer programs and systems.

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Sample Career Ladder/Lattice for Information Technology

Computer Programmer
Job Title
Computer Programmer
Job Level
Mid-level (Non-supervisory)
Job Description
<p>Convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. May program web sites. Tasks:</p> <ol style="list-style-type: none"> 1. Correct errors by making appropriate changes and rechecking the program to ensure that the desired results are produced. 2. Conduct trial runs of programs and software applications to be sure they will produce the desired information and that the instructions are correct. 3. Compile and write documentation of program development and subsequent revisions, inserting comments in the coded instructions so others can understand the program. 4. Write, update, and maintain computer programs or software packages to handle specific jobs such as tracking inventory, storing or retrieving data, or controlling other equipment. 5. Consult with managerial, engineering, and technical personnel to clarify program intent, identify problems, and suggest changes. 6. Perform or direct revision, repair, or expansion of existing programs to increase operating efficiency or adapt to new requirements. 7. Write, analyze, review, and rewrite programs, using workflow chart and diagram, and applying knowledge of computer capabilities, subject matter, and symbolic logic. 8. Write or contribute to instructions or manuals to guide end users. 9. Investigate whether networks, workstations, the central processing unit of the system, or peripheral equipment are responding to a program's instructions.
Education
Usually requires a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training.
Work Experience
A minimum of two to four years of work-related skill, knowledge, or experience is needed for this occupation.
Licensure/Certification
Various certifications available.
Salary
\$63,000
Employment Outlook
0-9% over the next 10 years, representing slower than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Computer Programmer to Network and Computer Systems Administrator

The position of Network and Computer Systems Administrator usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed for this occupation.

1. Collaborate with computer manufacturers and other users to develop new programming methods.
2. Consult with and assist computer operators or system analysts to define and resolve problems in running computer programs.
3. Perform systems analysis and programming tasks to maintain and control the use of computer systems software as a systems programmer.
4. Confer with users to discuss issues such as computer data access needs, security violations, and programming changes.

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Sample Career Ladder/Lattice for Information Technology

Network Systems and Data Communications Analyst
Job Title
Network Systems and Data Communications Analyst
Job Level
Mid-level (Non-supervisory)
Job Description
Analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. Perform network modeling, analysis, and planning. Research and recommend network and data communications hardware and software. Includes telecommunications specialists who deal with the interfacing of computer and communications equipment. May supervise computer programmers. Tasks:
<ol style="list-style-type: none"> 1. Maintain needed files by adding and deleting files on the network server and backing up files to guarantee their safety in the event of problems with the network. 2. Monitor system performance and provide security measures, troubleshooting and maintenance as needed. 3. Assist users to diagnose and solve data communication problems. 4. Set up user accounts, regulating and monitoring file access to ensure confidentiality and proper use. 5. Design and implement systems, network configurations, and network architecture, including hardware and software technology, site locations, and integration of technologies. 6. Maintain the peripherals, such as printers, that are connected to the network. 7. Identify areas of operation that need upgraded equipment such as modems, fiber optic cables, and telephone wires. 8. Train users in use of equipment. 9. Develop and write procedures for installation, use, and troubleshooting of communications hardware and software.
Education
Usually requires training in vocational schools, related on-the-job experience, or an Associate's degree. Some may require a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Work Experience
Previous work-related skill, knowledge, or experience is required.
Licensure/Certification
Various certifications available.
Salary
\$62,000
Employment Outlook
36+% over the next 10 years, representing much faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Network Systems and Data Communications Analyst to Network and Computer Systems Administrator

The position of Network and Computer Systems Administrator usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed for this occupation.

1. Identify areas of operation that need upgraded equipment such as modems, fiber optic cables, and telephone wires.
2. Test and evaluate hardware and software to determine efficiency, reliability, and compatibility with existing system, and make purchase recommendations.
3. Work with other engineers, systems analysts, programmers, technicians, scientists and top-level managers in the design, testing and evaluation of systems.
4. Confer with users to discuss issues such as computer data access needs, security violations, and programming changes.
5. Perform risk assessments and execute tests of data processing system to ensure functioning of data processing activities and security measures.
6. Train users and promote security awareness to ensure system security and to improve server and network efficiency.

Critical Development Experiences: From Network Systems and Data Communications Analyst to Computer Security Specialist

The position of Computer Security Specialist usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Design and implement systems, network configurations, and network architecture, including hardware and software technology, site locations, and integration of technologies.
2. Identify areas of operation that need upgraded equipment such as modems, fiber optic cables, and telephone wires.
3. Monitor system performance and provide security measures, troubleshooting and maintenance as needed.
4. Set up user accounts, regulating and monitoring file access to ensure confidentiality and proper use.
5. Work with other engineers, systems analysts, programmers, technicians, scientists and top-level managers in the design, testing and evaluation of systems.

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Sample Career Ladder/Lattice for Information Technology

Database Administrator
Job Title
Database Administrator
Job Level
Mid-level (Non-supervisory)
Job Description
Coordinate changes to computer databases, test and implement the database applying knowledge of database management systems. May plan, coordinate, and implement security measures to safeguard computer databases.
Tasks:
<ol style="list-style-type: none"> 1. Develop standards and guidelines to guide the use and acquisition of software and to protect vulnerable information. 2. Modify existing databases and database management systems or direct programmers and analysts to make changes. 3. Test programs or databases, correct errors and make necessary modifications. 4. Plan, coordinate and implement security measures to safeguard information in computer files against accidental or unauthorized damage, modification or disclosure. 5. Approve, schedule, plan, and supervise the installation and testing of new products and improvements to computer systems such as the installation of new databases. 6. Train users and answer questions. 7. Establish and calculate optimum values for database parameters, using manuals and calculator. 8. Specify users and user access levels for each segment of database. 9. Develop data model describing data elements and how they are used, following procedures and using pen, template or computer software. 10. Develop methods for integrating different products so they work properly together such as customizing commercial databases to fit specific needs.
Education
Usually requires a Bachelor's degree.
Workforce Preparation
Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training.
Work Experience
A minimum of two to four years of work-related skill, knowledge, or experience is needed.
Licensure/Certification
Various certifications available.
Salary
\$63,000
Employment Outlook
36+% over the next 10 years, representing much faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Database Administrator to Network and Computer Systems Administrator

The position of Computer Systems Administrator usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Develop data model describing data elements and how they are used, following procedures and using pen, template or computer software.
2. Develop methods for integrating different products so they work properly together such as customizing commercial databases to fit specific needs.
3. Identify and evaluate industry trends in database systems to serve as a source of information and advice for upper management.
4. Modify existing databases and database management systems or direct programmers and analysts to make changes.
5. Plan, coordinate and implement security measures to safeguard information in computer files against accidental or unauthorized damage, modification or disclosure.
6. Write and code logical and physical database descriptions and specify identifiers of database to management system or direct others in coding descriptions.
7. Modify computer security files to incorporate new software, correct errors, or change individual access status.

Critical Development Experiences: From Database Administrator to Computer Security Specialist

The position of Computer Security Specialist usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Approve, schedule, plan, and supervise the installation and testing of new products and improvements to computer systems such as the installation of new databases.
2. Develop standards and guidelines to guide the use and acquisition of software and to protect vulnerable information.
3. Modify existing databases and database management systems or direct programmers and analysts to make changes.
4. Plan, coordinate and implement security measures to safeguard information in computer files against accidental or unauthorized damage, modification or disclosure.
5. Select and enter codes to monitor database performance and to create production database.

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Sample Career Ladder/Lattice for Information Technology

Computer Support Specialist
Job Title
Computer Support Specialist
Job Level
Entry-level (Non-supervisory)
Job Description
<p>Provide technical assistance to computer system users. Answer questions or resolve computer problems for clients in person, via telephone or from remote location. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Tasks:</p> <ol style="list-style-type: none"> 1. Answer user inquiries regarding computer software or hardware operation to resolve problems. 2. Enter commands and observe system functioning to verify correct operations and detect errors. 3. Install and perform minor repairs to hardware, software, or peripheral equipment, following design or installation specifications. 4. Oversee the daily performance of computer systems. 5. Set up equipment for employee use, performing or ensuring proper installation of cables, operating systems, or appropriate software. 6. Maintain records of daily data communication transactions, problems and remedial actions taken, or installation activities. 7. Read technical manuals, confer with users, or conduct computer diagnostics to investigate and resolve problems or to provide technical assistance and support. 8. Confer with staff, users, and management to establish requirements for new systems or modifications. 9. Develop training materials and procedures, or train users in the proper use of hardware or software. 10. Refer major hardware or software problems or defective products to vendors or technicians for service.
Education
Usually requires training in vocational schools, related on-the-job experience, or an Associate's degree. Some may require a Bachelor's degree.
Workforce Preparation
Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers
Work Experience
Previous work-related skill, knowledge, or experience is required.
Licensure/Certification
Various certifications available.
Salary
\$41,000
Employment Outlook
21-35% over the next 10 years, representing faster than average growth.

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Sample Career Ladder/Lattice for Information Technology

Critical Development Experiences: From Computer Support Specialist to Database Administrator

The position of Database Administrator usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Prepare evaluations of software or hardware, and recommend improvements or upgrades.
2. Modify existing databases and database management systems or direct programmers and analysts to make changes.
3. Review procedures in database management system manuals for making changes to database.
4. Test programs or databases, correct errors and make necessary modifications.
5. Work as part of a project team to coordinate database development and determine project scope and limitations.

Critical Development Experiences: From Computer Support Specialist to Network Systems and Data Communications Analyst

The position of Network Systems Data Communications Analyst usually requires training in vocational schools, related on-the-job experience, or an Associate's degree. Some may require a Bachelor's degree. Employees in this occupation usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. Previous work-related skill, knowledge, or experience is required.

1. Modify and customize commercial programs for internal needs.
2. Prepare evaluations of software or hardware, and recommend improvements or upgrades.
3. Supervise and coordinate workers engaged in problem-solving, monitoring, and installing data communication equipment and software.
4. Consult customers, visit workplaces or conduct surveys to determine present and future user needs.
5. Test and evaluate hardware and software to determine efficiency, reliability, and compatibility with existing system, and make purchase recommendations.

Critical Development Experiences: From Computer Support Specialist to Computer Programmer

The position of Computer Programmer usually requires a Bachelor's degree. Employees in this occupation usually need several years of work-related experience, on-the-job training, and/or vocational training. A minimum of two to four years of work-related skill, knowledge, or experience is needed.

1. Conduct office automation feasibility studies, including workflow analysis, space design, or cost comparison analysis.
2. Develop training materials and procedures, or train users in the proper use of hardware or software.
3. Prepare evaluations of software or hardware, and recommend improvements or upgrades.
4. Read technical manuals, confer with users, or conduct computer diagnostics to investigate and resolve problems or to provide technical assistance and support.
5. Supervise and coordinate workers engaged in problem-solving, monitoring, and installing data communication equipment and software.

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