IT Job-Glossary

Robert Half®
Technology

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ABOUT THE *GLOSSARY*

The *Glossary of Job Descriptions for Technology* covers a variety of positions in areas ranging from applications development to help desk and technical support. Information in this booklet is derived from the thousands of permanent and contract placements made through Robert Half Technology and the market knowledge of our recruitment consultants. The *Glossary* also includes a section on the Value of Certifications to help candidates navigate the various certifications available for specific job categories within the technology field. In the years ahead, organisations are likely to place even more value on certifications as a means of differentiating top candidates.

Although the *Glossary* provides an overview of typical responsibilities and skill requirements, variations do occur based on company size, industry, local employment conditions and other factors. For more information, please contact our consultants.

THE IMPORTANCE OF JOB DESCRIPTIONS

Job descriptions help organizations clearly identify key criteria for positions within a company. They also make the CV screening, interview and selection stages more efficient. By clearly defining the requirements for a job opening, hiring managers can better determine the ideal person for the role.

Well-written job descriptions also help job-hunters understand the expectations of the position and enable them to compare their skills with those needed to be effective in the role. Many companies post job descriptions online when recruiting for an open position. This is an opportunity for applicants to customise their CVs and cover letters according to the requirements of the job. Candidates who tailor their job search materials to the needs of prospective employers have a better chance of making it through the initial screening process.

A well-executed job description accomplishes the following objectives:

- Gives candidates a clear idea of what to expect and helps to deter those who are unqualified for the job from applying
- Helps the hiring manager decide on a competitive pay range based on market value for the various responsibilities of the position
- Serves as a tool for setting expectations and establishing objective measures for performance appraisals
- Provides a preliminary idea of how easy or difficult it will be to find someone to fill the opening

The following categories represent a basic template of what a typical job description might include and the specific information it should convey:

- **Position title** – the full title of the job and, if possible, the title of the person to whom the candidate will report
- **General description** – two to three sentences outlining the position's overall responsibilities
- **Key responsibilities** – the specific tasks the applicant will be asked to carry out daily
- **Skills and attributes** – the hiring criteria that will be used to evaluate candidates, such as skills, experience, knowledge or traits required to perform the job
- **Educational requirements** – any degrees, licensing, certification or training that a candidate must have in order to be eligible for the position

The more time spent developing an accurate and detailed job description, the more likely the hiring process will produce positive results.

Chief Information Officer (CIO)

CIOs need broad knowledge of all aspects of IT. They must have strong analytical, strategic-planning and communication skills. The ability to collaborate effectively with other senior managers to define, articulate and champion the ways in which technology requirements relate to the firm's business is critical. A bachelor's degree in computer science, information systems or a related area is expected, and a master's degree is often required by employers. CIOs typically have at least 10 years of managerial experience in IT, though larger firms may require more.

Typical duties include:

- Developing and directing the firm's overall IT strategy
- Working closely with other senior management, including the chief executive officer, chief technology officer, chief operations officer and chief financial officer, to coordinate data systems policies and procedures
- Providing vision and leadership in all aspects of IT management and operations
- Approving all major system hardware and software purchasing decisions

Chief Technology Officer (CTO)

CTO candidates require in-depth knowledge of all aspects of a firm's data technology infrastructure. They also need the tactical managerial skills to lead the IT department in attaining the company's current and future technology goals. They typically have a degree in computer science or a related field and at least seven to 10 years of experience in IT management. In larger companies, the CTO may report to a chief information officer or a chief operating officer. Candidates need excellent interpersonal and problem-solving skills as well as the ability to plan and execute projects within time and budget constraints.

Typical duties include:

- Setting the firm's overall technology standards and practices
- Making recommendations as well as explaining technology solutions to senior management through presentations and advocacy
- Managing the implementation of data systems and monitoring their effectiveness in meeting business unit needs
- Leading and managing a staff of direct reports in functional areas such as systems operations, LAN/WAN architecture, and hardware and software support

Chief Security Officer (CSO)

CSOs need extensive experience in the field of information security as well as state-of-the-art knowledge of this rapidly evolving and critical business function. Employers look for a minimum of a bachelor's degree in information systems or a related field as well as 10 or more years of experience with a focus on information security, compliance and privacy. The position requires excellent judgement and outstanding planning abilities to create and maintain complex security systems. Compliance and security-focused certifications are required.

Typical duties include:

- Managing enterprise-wide security policies and systems
- Developing, implementing and monitoring long-term information security and privacy strategy
- Ensuring the firm meets all mandated security and compliance standards
- Coordinating work with all vendors, contractors and consultants to maintain and enhance data security

Director of Information Technology

The director of information technology position requires a proven track record of leadership in technology management, including excellent communication, analytical and organisational skills. A bachelor's degree in computer science or a related field and five to 10 years of increasing responsibility are typical requirements. Strategic planning and tactical implementation are important attributes for this position as well.

Typical duties include:

- Managing the tactical, overall operations of the IT department
- Working with the firm's senior IT team to help plan and coordinate both short- and long-term systems strategy and implementation
- Liaising between non-technical business units and IT, communicating technical information and plans
- Overseeing the department's hiring, promotion and review processes

Development Manager

Candidates seeking a manager of applications development position need a thorough technical background combined with outstanding managerial and leadership talents. They must have strong oral and written communication skills, project management experience and proven abilities to facilitate multidisciplinary project teams in accomplishing strategic goals. Employers look for a bachelor's degree in computer science, information systems, engineering or related fields. Depending on the size of the department, the company may look for five to 10 or more years of combined development and managerial experience.

Typical duties include:

- Assuming overall management responsibility for all aspects of the applications development department and its staff
- Planning, coordinating and monitoring the progress of development projects to ensure their ongoing alignment with business goals
- Hiring, training, motivating and evaluating staff

Senior IT management, reporting on the status of current projects, identifying issues and assessing their effect, and proactively recommending solutions

Information Technology Manager

Information technology managers need a technical background as well as business acumen and people management skills. Because they direct the work of other employees, these individuals require strong interpersonal and communication abilities. Analytical thinking is also very important as this position often involves problem solving and process development. In addition, a strong customer-service orientation is a must as information technology managers often serve as the final escalation point for high-visibility troubleshooting. Employers look for a bachelor's degree in an IT-related field plus at least five years of experience with the specific types of business systems, hardware and networking services used by the firm. Demonstrated leadership also is required.

Typical duties include:

- Analysing workflow, delegating projects and meeting departmental goals
- Developing and monitoring performance standards
- Providing input on hiring decisions for technical staff
- Implementing and monitoring new projects
- Managing performance of, and delegating projects, to team members

Project Manager

Project managers must have demonstrable knowledge and experience with project management methodologies to work with intricate, multifaceted projects. They need superb communication and interpersonal skills to collaborate with the development team and make project presentations. Employers look for a bachelor's degree in an IT- or business-related field, as well as a background in applications development and five or more years of experience managing complex projects. Project management certifications, such as those from PMI (Project Management Institute), also are highly recommended.

Typical duties include:

- Managing overall coordination of IT applications development projects, from planning through implementation
- Setting project scope, priorities, deadlines and deliverable schedules
- Facilitating discussions and consensus among project stakeholders such as analysts, applications programmers and clients
- Managing and monitoring project budgets and expenditures

Systems Analyst

Candidates for a systems analyst position must be excellent analytical thinkers and problem solvers, as well as effective communicators. They need a broad understanding of, and experience working with, hardware and software systems, including their installation, maintenance and life cycles. Employers look for a minimum of a bachelor's degree in information systems, computer science or a similar field, along with five or more years of experience working with specific applications and/or operating systems.

Typical duties include:

- Analysing systems hardware and software problems and developing technical solutions
- Translating user and/or systems requirements into functional technical specifications
- Writing and maintaining detailed systems documentation, including user manuals and technical manuals
- Liasing between developers and end users to ensure technical compatibility and satisfaction

Applications Architect

Applications architects require a high level of technical expertise combined with excellent planning, coordination and communication skills, as well as the ability to work in teams. Practitioners must have experience with relevant development tools and specific application and system architecture, in addition to a strong understanding of object-oriented design. A bachelor's degree in computer science or information systems is normally required, and a master's degree is highly desirable. Employers seek a minimum of eight years of related work experience and often look for specific software skills such as Asynchronous JavaScript and XML (AJAX), C#/C++ and Linux/Apache/MySQL/Perl/PHP/Python (LAMP). Expertise in the design, development and deployment of enterprise-level N-tier architecture in a Microsoft .NET or Java Enterprise Edition framework often is required.

Typical duties include:

- Designing major aspects of the architecture of an application, including components such as user interface, middleware and infrastructure
- Providing technical leadership to the applications development team
- Performing design and code reviews
- Ensuring that uniform enterprise-wide application design standards are maintained
- Collaborating with other stakeholders to ensure architecture is aligned with business requirements

Business Systems Analyst

Business systems analysts should have a solid understanding of business functional areas, business management issues and data analysis. Exceptional written and oral communication abilities are required. Leadership, initiative and advanced computer skills, including programming experience, also are integral. Employers often seek at least a bachelor's degree and several years of computer applications and business experience. For more technically challenging positions involving complex business systems, a master's degree with a specialism in information systems may be required.

Typical duties include:

- Analysing complex business problems and assessing how automated systems can be implemented to solve them
- Formulating and defining the objectives and scope of business systems
- Gathering data and analysing business and user needs in consultation with both business managers and end users
- Providing IT support for regulatory and compliance activities
- Recommending hardware and software procurement to support business goals

Customer Relationship Management (CRM) Business Analyst

Employers seek CRM business analysts with proven analytical and problem-solving capabilities, as well as extensive technical and functional experience with specific CRM systems. Because CRM business analysts liaise between IT and business groups, strong interpersonal and communication skills are essential. Employers also may require a demonstrable understanding of sales, marketing and other business processes. CRM business analysts must be able to anticipate the organisational effect of process changes. A bachelor's degree in a computer- or business-related discipline is typically required, as is thorough knowledge of the employer's existing CRM applications.

Typical duties include:

- Translating business requirements into user and functional requirements
- Conducting root cause analysis in support of process improvements
- Planning, conducting and directing the analysis of complex business issues to be solved with process changes and information systems
- Working closely with business users to resolve ongoing functional issues

Customer Relationship Management (CRM) Technical Developer

Candidates for CRM technical developer positions must be able to work creatively and analytically in a problem-solving environment to develop, enhance and maintain CRM solutions. They also need strong interpersonal and communication skills to collaborate effectively with business analysts, developers and other stakeholders. A bachelor's degree in a computer-related field is typically required. Specific programming and technical requirements vary widely by position, but generally emphasise multiple years of development experience with the employer's existing CRM solutions (e.g., Oracle, Microsoft, SAP).

Typical duties include:

- Programming and documenting CRM solutions
- Preparing code reviews and documenting development and testing
- Working with other IT teams to ensure that appropriate infrastructure, policies and procedures are in place to support the custom application environment
- Providing technical application support to business, quality assurance and end-user support teams

Developer/Programmer Analyst

Developer/programmer analysts must have strong analytical and problem-solving capabilities. They must understand and conceptualise applications from both a technical/programming perspective and a business point of view. Because they deal with both technical personnel and business managers/administrators, as well as participate on project teams, they need strong interpersonal and communication skills. Excellent programming abilities in common languages and frameworks such as C#/C++, Java Enterprise Edition/AJAX and Microsoft .NET are needed for the coding aspects of the position. Most employers look for at least a bachelor's degree in computer science, information science or management information systems, and relevant job experience.

Typical duties include:

- Analysing business application requirements for functional areas such as finance, manufacturing, marketing or human resources
- Writing code, testing and debugging software applications
- Recommending system changes and enhancements
- Documenting software specifications and training users

Enterprise Resource Planning (ERP) Business Analyst

For ERP business analyst positions, employers seek candidates with a demonstrable ability to translate business requirements into ERP solutions. Because ERP business analysts work closely with colleagues in technical and business departments, strong interpersonal and communication skills are essential. Project management experience may also be required. Specific technical requirements vary by employer, but strong technical and functional knowledge of the employer's preferred ERP solutions is a must. Candidates should also have a thorough understanding of business processes, as well as an IT- or business-related bachelor's degree.

Typical duties include:

- Analysing and defining ERP systems, functions, and business process and user needs
- Performing functional configuration and maintenance for ERP systems based on changing operational and business needs
- Researching transactional issues, identifying root causes and driving resolutions
- Creating documentation such as policies, procedures, workflows and user guides

Enterprise Resource Planning (ERP) Technical/Functional Analyst

Candidates for ERP technical/functional analyst positions must be able to analyse complex processes, identify areas for improvement and recommend solutions. In addition to technical and functional ERP expertise, employers seek strong written and verbal communication skills and the ability to interact productively with business users. A bachelor's degree in a computer-related field is typically required. Additional technical requirements vary by position, but typically include several years experience working closely with the employer's preferred ERP solutions.

Typical duties include:

- Completing technical service requests and providing continuous business application support for ERP software and legacy systems
- Helping to define, analyse, develop, implement and document new systems, customised programs and databases to meet business needs
- Helping to upgrade and implement ERP software
- Assisting application owners in developing test scripts, policies and procedures

Enterprise Resource Planning (ERP) Technical Developer

ERP technical developers must be able to quickly identify and analyse technical problems in ERP applications, assess their potential effects, and help design solutions. Employers typically seek candidates with experience of implementing ERP systems over multiple life cycles, as well as the ability to work with business teams to support their requirements. A bachelor's degree in a technical or business-related field, or equivalent experience, is generally required. Technical requirements vary, but often include in-depth knowledge of the employer's existing ERP solutions and related applications.

Typical duties include:

- Performing analysis, design, coding, data migration and testing for ERP production and development environments
- Implementing ERP enhancements to support changes in business processes
- Providing ERP application break-fix support
- Working with various business teams to gather requirements and support business

Lead Applications Developer

Candidates for lead applications developer positions need a solid background in applications programming and experience leading a technical team. Employers look for a bachelor's degree in computer science or a related field along with three to five or more years of experience in technologies such as Visual Basic .NET, PHP, C#/C++ and Microsoft .NET framework development. In addition, individuals need several years of proven success as a team leader, as this role requires directing and motivating co-workers and working closely with other managers while multitasking and prioritising resource needs.

Typical duties include:

- Leading a development team in the design, development, coding, testing and debugging of applications
- Coordinating the effective use of the development team's time and ensuring efficient communication between team members and other IT functional areas
- Providing feedback and suggestions for process and product improvement
- Acting as a technical mentor and advisor for the development team

Technical Author

Technical writers must possess the ability to communicate complex information clearly and concisely. They need excellent interpersonal skills to elicit detailed facts from subject-matter experts (for example, applications developers), in addition to advanced writing and editing skills. Technical writers also need to be adept in document creation using applications such as Adobe FrameMaker, RoboHelp and Acrobat, and Microsoft Word and PowerPoint. Employers' requirements vary depending on the complexity of documentation needed but usually include a bachelor's degree in English, journalism or information sciences, plus several years of experience in a technical setting.

Typical duties include:

- Documenting the specifications, design, features and operation of applications
- Writing and editing user manuals, help systems and other technical documents
- Designing and formatting documents using document creation software
- Interviewing applications developers and other technical resource personnel to ensure the accuracy of all information presented

Director

Director-level positions, typically found in a consulting services environment, assume a senior-level management role. As a result, this position requires a seasoned professional with outstanding judgement as well as leadership, interpersonal and communication skills. It also calls for strategic thinking, for decision-making authority, and taking formal responsibility for meeting business-unit goals. Candidates need strong project management experience and the ability to monitor and manage multiple initiatives concurrently, as well as excellent staff management skills. Employers often seek a master's degree, such as an MBA or other relevant graduate degree. In addition, 10 to 15 years of significant business experience, including leadership positions in consulting and project management, are typically required.

Typical duties include:

- Establishing and maintaining relations with clients' senior-level managers
- Developing overall practice strategy, tactics and goals
- Managing the consulting staff, including headcount, final hiring and firing decisions, and staff development and mentoring
- Performing engagement analysis and making recommendations and presentations to the consulting firm's senior management on new business opportunities and expansion of the firm's consulting practice and client base
- Working with third-party vendors

Practice Manager

The practice manager position requires extensive IT experience combined with outstanding leadership, communication, presentation, customer service, analytical and project management skills. Individuals must possess excellent business and financial savvy, as well as experience with resource allocation and profit-and-loss management. As a minimum, a bachelor's degree in business or an IT-related field is required, while an advanced degree may be preferred. Employers typically look for 10 years of IT industry experience with at least five years in a technical consulting management role. Candidates also must be willing to travel.

Typical duties include:

- Developing project scope, goals and strategic plans for delivering company products and services to clients
- Managing, recruiting, evaluating and mentoring a team of project managers and consultants
- Managing and meeting engagement booking and revenue targets
- Identifying, developing and managing client relations, in addition to meeting with client management for project support and presentations
- Working with third-party vendors

Project Manager/Senior Consultant

Project managers/senior consultants need a combination of subject-matter expertise and project management skills. They must possess excellent communication, interpersonal and team leadership abilities, as well as the capacity to work with cross-functional teams to accomplish overall project goals. Employers seek at least a bachelor's degree (a master's may be preferred) in computer science, management or an IT-related discipline; specific consulting subject-matter expertise; and at least five years of experience managing projects from inception to completion. A project management certification is strongly preferred.

Typical duties include:

- Developing and managing project specifications, technical design and requirements
- Setting project timelines, milestones and deadlines
- Coordinating work with cross-functional team leaders and monitoring and reporting on project status
- Assigning tasks to staff consultants and supervising work

Staff Consultant

Candidates for a staff consultant position need excellent analytical, problem-solving, customer relations and communication skills, along with the ability to work well in a team. They must have industry-specific expertise as well as project-oriented IT experience. A minimum of a bachelor's degree in computer science, business or a field related to the area of consulting is expected. Several years of business experience plus two or more years of consulting experience – including full-cycle project implementation – are typical requirements. Extensive travel may be required.

Typical duties include:

- Assisting with project planning and requirement specifications
- Developing prototypes and alternatives with other team members
- Executing and delivering projects within time and budget constraints
- Understanding client needs and developing and maintaining excellent client relations

Senior IT Auditor

Senior IT auditors are responsible for developing and managing complex audits of an organisation's information systems. They must have in-depth knowledge of business processes as well as process controls and risks, and understand how these relate to relevant IT audit procedures. These professionals have experience working with a variety of technology platforms and must be familiar with performing network, web, database and technical audits. These positions commonly require a bachelor's degree (a master's degree may be preferred) in computer science, information systems, business or a related field and an average of five years' relevant experience in IT auditing. A Certified Information Systems Auditor (CISA), Certified Information Security Manager (CISM) or similar designation is strongly preferred.

Typical duties include:

- Establishing objectives and procedures for audit review of computer systems
- Developing and implementing testing and evaluation plans for IT systems and controls to gauge conformity with industry standards of efficiency, accuracy and security
- Presenting written findings and recommendations to senior management
- Providing independent verification applicable Sarbanes-Oxley, VBasel II, Insolvency II compliance and similar regulations

IT Auditor

IT auditors must have broad knowledge of the technical infrastructure and architecture of computer systems as well as exposure to a variety of platforms such as operating systems, networks, databases and enterprise resource planning (ERP) systems. These professionals must possess excellent interpersonal skills, including communication, presentation and leadership abilities. Employers typically seek at least a bachelor's degree (a master's degree may be preferred) in computer science, information systems, business administration, finance or a similar field. A Certified Information Systems Auditor (CISA) accreditation also may be required.

Typical duties include:

- Testing and evaluating IT systems and controls for conformity with industry standards of efficiency, accuracy and security
- Providing independent verification of compliance with statutory requirements and similar regulations
- Recommending for systems operations and process improvement
- Developing risk-based audit plans

Database Manager

Database managers must have an in-depth understanding of all aspects of database technology. Employers generally look for applicants with at least a bachelor's degree and five years of experience in an Oracle, Microsoft SQL Server, IBM DB2 or similar environment, along with several years' experience in a technical management position. Database managers need to be creative, analytical thinkers who can not only lead a team of database professionals, but also effectively communicate, plan information system strategy and present to senior IT managers.

Typical duties include:

- Maintaining and supporting a company's database environment
- Providing input to a chief technology officer or chief information officer regarding company data standards and practices
- Developing and managing departmental budgets
- Making personnel decisions and work assignments
- Managing capacity planning, disaster recovery and performance analysis

Database Developer

Database developers need a thorough understanding of relational database theory and practice. They must be analytical and adept at problem solving. They should also be good communicators. A bachelor's degree in computer science or a related field often is sought, although database experience can be substituted with some employers. Familiarity and experience with major enterprise database programs such as Microsoft SQL Server, Oracle or IBM are essential, and professional certification (Microsoft Certified Database Administrator or Oracle 10g Database Administrator Certified Professional, for example) in these programs is a plus. Since many web applications now use databases, experience in Internet technologies also is valuable.

Typical duties include:

- Developing database objects and structures for data storage, retrieval and reporting according to project specifications
- Implementing and testing database design and functionality, and tuning for performance
- Providing support to database administrators and interfacing with business users to ensure the database satisfies business requirements
- Designing and developing back-end database interfaces to web and e-commerce applications

Database Administrator

Candidates for the database administrator role need a strong technical foundation in database structure, configuration, installation and practice. Employers seek individuals with knowledge and experience in major relational database languages and applications such as Microsoft SQL Server, Oracle and IBM DB2. At least two years of post-secondary education is typically required. Professional certifications from Microsoft, Oracle and others are also valuable. Effective database administrators must have keen attention to detail, a strong customer-service orientation and the ability to work as part of a team.

Typical duties include:

- Managing, monitoring and maintaining company databases
- Making requested changes, updates and modifications to database structure and data
- Ensuring database integrity, stability and system availability
- Maintaining database backup and recovery infrastructure

Data Analyst/Report Writer

Strong analytical, quantitative and problem-solving abilities are required for this position, along with thorough knowledge of relational database theory and practice. Employers look for a bachelor's degree in computer science, information systems or a related field, plus several years of experience working with major database platforms such as Microsoft SQL Server, Oracle and IBM DB2. In addition, excellent communication skills and the ability to work both independently and collaboratively with data systems teams is required.

Typical duties include:

- Analysing complex data systems and documenting data elements, data flow, relationships and dependencies
- Developing automated and reusable routines for extracting requested information from database systems
- Compiling detailed reports using data reporting tools such as Crystal Reports, and making recommendations based on their findings
- Working in partnership with business analysts, data architects and database developers to build data transactional and warehousing systems

Data Architect

Candidates for data architect positions require a high level of analytical and creative skills, along with in-depth knowledge of data systems and database methodology, design and modelling. They must be able to communicate effectively to plan and coordinate data resources. Working knowledge of network management, distributed databases and processing, application architecture, and performance management is highly valued. Employers generally seek a bachelor's degree in computer science or a related field, as well as experience with Oracle, Microsoft SQL Server or other databases in various operating system environments such as Unix, Linux, Solaris and Microsoft Windows.

Typical duties include:

- Understanding and evaluating business requirements and translating them into specific database solutions
- Creating data design models, database architecture and data repository design
- Working with the systems and database administration staff to implement, coordinate and maintain enterprise-wide data architecture
- Providing leadership in establishing and documenting data standards
- Creating and testing database prototypes

Data Modeller

Data modellers must possess excellent data analysis and problem-solving skills, and be able to both communicate effectively and work as part of a team. Employers normally request a bachelor's degree in computer science, IT or mathematics in addition to several years of relevant data management experience. Candidates should be familiar with data modelling tools and methodologies and be knowledgeable in database system applications, stored procedures and data warehousing.

Typical duties include:

- Analysing organisational data requirements and creating logical and physical models of data flow
- Interviewing key project stakeholders, documenting findings and making detailed recommendations
- Working with database administrators and reporting teams to ensure the availability of standard and ad hoc data reporting in a production environment
- Addressing data quality issues with clients and management

Data Warehouse Manager

The data warehouse manager role requires an in-depth background in database theory and practice combined with hands-on experience in data warehousing technology. Managers should have excellent analytical abilities as well as project management experience. Proficiency in warehousing tools and architecture is a must, as is technical proficiency in database languages and applications such as Oracle, Microsoft SQL Server and IBM DB2. A bachelor's degree in computer science or the equivalent, five or more years of experience in a data warehousing environment and three or more years in technical personnel management are typical prerequisites.

Typical duties include:

- Designing, developing and maintaining data warehouses and data mart systems
- Working with database developers, administrators and managers to ensure that data systems conform to enterprise data architecture and strategy
- Developing and implementing strategies for gathering data from operational databases as well as third-party vendors to include in the warehouse
- Providing leadership in managing technical resources as well as staff

Data Warehouse Analyst

Data warehouse analysts must have excellent research, analysis and problem-solving skills, as well as good oral and written communication abilities. A bachelor's degree in computer science or a related field, extensive knowledge of relational database theory and three to five years of work experience in database systems are typical employee prerequisites. Employers also seek candidates with experience of data modeling and architecture. A professional certification in a database application such as Microsoft SQL Server or Oracle is also valuable.

Typical duties include:

- Collecting, analysing, mining and leveraging data stored in data warehouses
- Researching and recommending technology solutions related to data storage, reporting, importing and other areas
- Working with business analysts to translate data requirements into logical data models
- Defining user interfaces for interacting with data warehouses and data marts

Business Intelligence Analyst

Candidates for business intelligence analyst positions need a strong background in all aspects of database technology with an emphasis on the use of analytical and reporting tools. Employers seek a bachelor's degree in computer science, information systems or engineering as well as several years of experience with database queries, stored procedure writing, and OLAP and data cube technology. Excellent written and oral skills are a must.

Typical duties include:

- Designing and developing enterprise-wide data analysis and reporting solutions
- Reviewing and analysing data from multiple internal and external sources
- Communicating analysis results and making recommendations to senior management
- Developing data cleansing rules

Senior Web Developer

Companies hiring senior web developers seek individuals with extensive experience in all phases of the web application development life cycle, as well as an excellent understanding of customer needs and business strategy. Candidates should have expertise in developing multiplatform, distributed applications and object-oriented programming. In addition, they should be adept at working in a team and mentoring junior colleagues. Sample code and web links to sample work are often requested. Employers normally seek a bachelor's degree in computer science, electrical engineering or a related field, plus a minimum of five years of experience working with a mix of web technologies such as AJAX, Adobe Flash, JavaScript, SOAP and HTML/DHTML.

Typical duties include:

- Providing creative vision and managing the planning and implementation of web-based applications
- Coordinating and communicating cross-functional activities between product development, marketing, product management and other teams in bringing new applications online
- Diagnosing and fixing bugs found by quality assurance testers
- Overseeing application coding and providing technical expertise and mentoring to other developers
- Increasing online exposure through search engine optimisation best practices

Web Developer

Web developers should have in-depth knowledge of Internet protocols and applications in addition to a solid understanding of business strategy. They need strong communication skills and the ability to work both individually and as part of a team. Employers typically seek individuals with a bachelor's degree in computer science or a related field, plus at least several years of web-related experience. Work experience can sometimes be substituted for the educational requirement. Sample code and web links to sample work are often requested. Candidates should be well versed in web technologies and tools such as AJAX, ASP, ColdFusion, JavaScript, SOAP, HTML/DHTML, LAMP and others.

Typical duties include:

- Gathering business requirements and developing specifications for web-based applications
- Providing technical assistance to web administrators
- Integrating websites with back-end systems such as databases
- Writing test plans and test results

Web Administrator

Candidates for web administrator positions need a thorough understanding of web technology and the Internet. They should be experienced in working with firewalls, intranets, domain name services, servers, and the related hardware and software required to administer a website. Familiarity with web services, TCP/IP, FTP, HTTP and HTTPS, LDAP and similar Internet protocols is also required. A bachelor's degree in a computer-related field and at least two to three years of experience in a web administration role are standard requirements, although additional experience in web-related positions may sometimes be substituted for formal education. In addition, web administrators should have excellent communication and customer-service skills and the ability to work well in a team.

Typical duties include:

- Installing, customising, updating and maintaining corporate internal and external web pages and sites
- Creating and analysing reports on web activity, number of hits, traffic patterns and similar performance metrics
- Monitoring customer feedback and responding to enquiries
- Recommending network, server and related equipment, and software upgrades and improvements

Web Designer

Web designers must be creative and possess excellent design and conceptual skills combined with in-depth knowledge of the technology and software applications used to create web pages. They need to be familiar with HTML, XHTML, XML, JSP, CSS, PHP, AJAX and similar web protocols as well as the following Adobe web page and design applications: Photoshop, Illustrator, Acrobat, Dreamweaver and Flash. The ability to multitask and adapt to changing priorities and new technologies also is essential. Employers may require a bachelor's degree in fine arts, graphic design or communications, but often are more interested in three or more years of design and production experience and a strong portfolio of web designs.

Typical duties include:

- Working with design teams, marketing staff and developers to create a consistent and compelling visual style for a company's website
- Designing and formatting web pages
- Testing and troubleshooting web page features
- Creating artwork to appear on web pages

Electronic Data Interchange (EDI) Specialist

EDI specialists should have a solid background in information systems technology and working knowledge of data communication protocols. They must be detail oriented with excellent problem-solving skills and the ability to work independently. A bachelor's degree in computer science or a related discipline is normally required. In addition, employers typically look for several years of IT-related experience, plus three or more years with EDI system administration, design, analysis and development.

Typical duties include:

- Implementing and monitoring EDI systems, including data mapping, translation and interface
- Coordinating relations with and serving as liaison to internal users, vendors and other external partners with respect to data interchange standards
- Performing system testing and quality control checks
- Developing and maintaining EDI documentation

E-Commerce Analyst

E-commerce analysts must possess a strong background in Internet technologies along with excellent communication, interpersonal, analytical and problem-solving skills. They also should be familiar with business and marketing concepts and comfortable making recommendations based on strong attention to detail and strategic thinking. Employers typically seek a bachelor's degree in business, computer science, marketing, economics or a related field, plus a minimum of three years of professional IT experience, including work in web-related functions.

Typical duties include:

- Analysing business and user requirements and making recommendations regarding the design and development of web-based e-commerce solutions
- Coordinating work with web designers and other technical specialists for the implementation of e-commerce websites
- Training and mentoring colleagues on Internet strategy and best practices
- Testing and evaluating e-commerce site performance and monitoring site analytics

Messaging Administrator

Messaging administrators must be detail oriented with excellent problem-solving, communication and documentation skills. They should have hands-on experience working with the hardware and software components of messaging systems such as Microsoft Exchange, Outlook, Active Directory and Lotus Notes, plus BlackBerry and other handheld devices, and a strong understanding of virus protection. Messaging administrators must be comfortable in a fast-paced environment with rapidly changing technology. A bachelor's degree in computer science, computer information systems or a related field, plus two to three or more years of experience working with the messaging systems used by the employer are standard requirements.

Typical duties include:

- Implementing, administering and maintaining e-mail and groupware systems, including associated servers, operating systems, and backup and recovery programs
- Troubleshooting and fixing system problems and service requests, and providing high-level technical support for unresolved helpdesk issues
- Formulating and documenting standard procedures for messaging system administration
- Identifying areas for enterprise-wide system improvements and upgrades, including trending analysis and capacity planning
- Planning, documenting and testing appropriate messaging-related disaster recovery and/or business continuity systems

Network Architect

Individuals pursuing this position need an extensive background in all aspects of networking technology. They must possess excellent written and oral communication skills along with strong interpersonal and leadership abilities. Employers generally seek a bachelor's degree in a computer-related field along with at least seven years of experience with network operating systems such as Cisco, Novell and Windows Server. Network architects should also have experience working with routers, switches, cabling and other essential network hardware. A networking certification from sources such as Cisco, Microsoft or Novell also is highly valued.

Typical duties include:

- Assessing business and applications requirements for corporate data and voice networks
- Planning, designing and upgrading network installation projects
- Establishing and maintaining backup, version control and viral defense systems
- Troubleshooting network architecture and making recommendations for system fixes and enhancements
- Making recommendations for leveraging network installations and reducing operational costs

Network Manager

Companies hiring network managers seek candidates who have experience working with data and voice networking, along with excellent operational knowledge of network hardware and software. In addition, network managers need outstanding interpersonal, management, and oral and written communication skills, as well as the ability to multitask. Employers look for 10 or more years of experience in a networking environment combined with at least several years of experience managing technical personnel. A Microsoft, Cisco or similar professional certification also is valuable.

Typical duties include:

- Directing day-to-day operations and maintenance of the firm's networking technology
- Collaborating with network engineers, architects and other team members on the implementation, testing, deployment and integration of network systems
- Providing reports to IT management regarding network system performance, use and compliance
- Managing and mentoring a staff of network technicians

Network Engineer

Network engineers must be detail oriented and have in-depth knowledge of networking hardware and software. A bachelor's degree in computer science or electrical engineering and five or more years of experience in areas such as network design and implementation, LAN/WAN interfacing, security, Internet protocols and TCP/IP, and server and network infrastructure are typical job requirements. A professional certification, such as the Cisco Certified Internetwork Expert (CCIE), is also highly desirable.

Typical duties include:

- Engineering enterprise data, voice and video networks
- Establishing and operating network test facilities
- Maintaining a secure transfer of data to multiple locations via internal and external networks
- Working with vendors, clients, carriers and technical staff on network implementation, optimisation and ongoing management
- Providing high-level support and technical expertise in networking technology, including LAN/WAN hardware, hubs, bridges and routers

Wireless Network Engineer

Candidates for the position of wireless network engineer need strong analytical and problem-solving skills, and must be knowledgeable about all aspects of network technology. A background in wireless equipment, standards, protocols and WLAN design is considered ideal. Candidates also must be effective communicators to collaborate successfully with network technicians, vendors and managers. Employers typically look for a bachelor's degree in computer science, engineering or a related field (or equivalent work experience) plus five or more years in LAN/WAN engineering and design work, including several years specialising in wireless technologies such as WiFi, WiMax and WAP. Professional certifications such as the Certified Wireless Network Professional (CWNP) also are valuable.

Typical duties include:

- Researching, designing and implementing wireless networks, including all engineering specifications and resource requirements for network hardware and software
- Making recommendations for wireless network optimisation, additions and upgrades to meet business requirements
- Conducting and documenting RF (radio frequency) coverage and site surveys
- Documenting network infrastructure and design

Network Administrator

Network administrators need solid technical skills and experience with a variety of network protocols, software and hardware involved in LAN and WAN operations. The position requires strong troubleshooting, analytic and diagnostic skills along with good communication abilities. In addition, firms may require the individual to be on call 24/7 in case of network failures or emergencies. While some employers prefer a bachelor's degree in computer science or information systems, five or more years of work experience as well as professional certifications offered by Microsoft, Cisco and others often can be substituted.

Typical duties include:

- Administering the operation of all LAN/WAN-related network services according to company policies and procedures
- Coordinating and implementing network software and hardware upgrades
- Troubleshooting and resolving LAN/WAN performance, connectivity and related network problems
- Administering LAN/WAN security, antivirus and spam control measures

Pre-Sales Engineer/Technical Sales Engineer

Candidates seeking a position as a pre-sales/technical sales engineer need proven technology skills, combined with outstanding interpersonal and teamwork abilities. They should possess strong written and verbal communication skills, attention to detail, and analytical and problem-solving capabilities. A positive, service-oriented personality is required as these individuals will often meet with clients or potential clients as part of the sales team. Many positions require a substantial amount of travel. Employers generally seek a bachelor's degree or equivalent combination of education and work experience in engineering, information systems or business administration, depending on the product or service being sold. Five years of industry experience, including two or more years in sales engineering or consulting work, are typically required.

Typical duties include:

- Collaborating as a member of a sales support or account team by participating in customer presentations as the technical expert
- Determining technical requirements to meet client goals and acting as the liaison between the firm's sales/business development and engineering groups
- Responding to RFIs (requests for information) or RFPs (requests for proposals) from current or potential customers with technical details of proposed solutions
- Coordinating the transition between pre-sales specifications and implementation engineering on awarding of contracts

Telecommunications Manager

Telecommunications managers should have an extensive background in telecommunications practice, including hands-on experience with associated hardware and software. They should have excellent communication, staff management, problem-solving and organisational abilities. Employers generally seek a bachelor's degree in a related field along with a minimum of five years of telecommunications experience plus two or more years as a supervisor or manager.

Typical duties include:

- Overseeing a team of analysts and technicians who support a firm's telecommunications infrastructure
- Managing the telecommunications budget and analysing expenditures for cost containment
- Evaluating equipment vendors, building relationships with service providers, and coordinating equipment installation, relocation and removal
- Researching and making recommendations to IT management related to telecommunications systems upgrades, improvements and long-range strategy

Telecommunications Specialist

Telecommunications specialists need a detailed understanding of telecommunications theory and practice. They should have solid technical skills as well as interpersonal and organisational abilities. Employers may seek an associate's degree in electronics or a related field but are equally interested in several years of hands-on experience with communications equipment. Experience working with the specific hardware used in the company's telecommunications system, as well as with cabling and transmission test equipment, is highly valued.

Typical duties include:

- Installing, configuring and maintaining voice, data and video equipment
- Installing and testing cabling
- Investigating and resolving trouble ticket items; making necessary equipment repairs
- Resolving circuit issues
- Maintaining system logs and records

Manager

An in-depth background in computer operations combined with supervisory experience is required for the position of operations manager. Managers should have excellent planning, project management and problem-solving skills, along with superior communication and interpersonal abilities. A bachelor's degree in a computer-related field or equivalent work experience is a standard requirement. Firms normally seek a minimum of five years of operations experience with three or more years of managing technical personnel.

Typical duties include:

- Directing and managing the daily activities of the computer operations department
- Supervising a staff of computer operators and other technicians, assigning their duties and preparing performance reviews
- Analysing system malfunctions or technical problems and resolving these to ensure uninterrupted operations
- Coordinating operations information and activities with other IT managers

Computer Operator

Computer operators need to be detail-oriented team players with good analytical and troubleshooting skills. Candidates also must possess the ability to multitask. They should have a strong service orientation and be able to maintain a flexible work schedule. Employers seek candidates with a good working knowledge of the hardware and operating system environment used by their firm. A formal post-secondary education often is less critical than several years of related work experience, although system certification is a valuable asset.

Typical duties include:

- Operating and monitoring mainframe computer equipment and peripherals
- Performing system backups
- Identifying equipment problems and initiating corrective action
- Keeping required logs and system records according to departmental procedures

Mainframe Systems Programmer

Systems programmers must possess experience with mainframe computer programming languages and applications development. They should be analytical problem solvers with good communication and organisational skills and have the ability to work individually and as part of a technical team. Typical requirements include a bachelor's degree in computer science or a related field, plus three to five years of work experience in developing complex systems in a mainframe environment. Additional work experience can sometimes be substituted for the educational requirement.

Typical duties include:

- Designing logic, writing code, testing and debugging mainframe computer applications
- Installing and implementing programs and upgrades
- Diagnosing and resolving system problems with other technical team members
- Documenting procedures for mainframe configuration and operation

QA/Testing Manager

QA/testing managers have an extensive background in assurance methodologies and procedures along with excellent written and oral communication, problem-solving, organisational and presentation skills. Employers typically look for six or more years of experience in QA along with several years of technical managerial experience and a bachelor's degree in information systems, computer science or a related field.

Typical duties include:

- Managing a group of quality assurance analysts/testers and directing their work
- Establishing quality assurance and/or quality control policies in accordance with best practices and defining benchmarks and measures
- Preparing budget and staffing plans and recommendations
- Ensuring proper coordination and collaboration with technical teams

QA Analyst/Tester

Candidates for QA analyst/tester positions must have excellent problem-solving skills along with keen attention to detail and outstanding written and oral communication abilities. A bachelor's degree in computer science or a related discipline with several years of experience in a QA environment are typical requirements, although work experience can sometimes be substituted for formal education.

Typical duties include:

- Developing and executing software test plans
- Identifying and facilitating issue resolution with functional and technical groups
- Managing software beta test programs
- Documenting test results

Data Security Analyst

Data security analysts must possess a thorough understanding of all aspects of computer and network security, including areas such as firewall administration, encryption technologies and network protocols. Analysts need strong oral and written communication, analytical and problem-solving skills, as well as excellent judgement and self-motivation. They should be able to multitask and work well under pressure. It is important that candidates keep abreast of industry security trends and developments, as well as applicable government regulations. Employers generally seek a bachelor's degree in a computer-related field along with three to five or more years of practical data security experience. A professional certification such as the Certified Information Systems Security Professional (CISSP) is also an asset.

Typical duties include:

- Performing security audits, risk assessment and analysis
- Making recommendations for enhancing data systems security
- Researching attempted breaches of data security and rectifying security weaknesses
- Formulating security policies and procedures

Systems Security Administrator

Systems security administrators must demonstrate technical knowledge of data systems security procedures and familiarity with systems hardware and software. They should have good communication skills and the ability to work well in a team. It is important that candidates keep abreast of industry security trends and developments, as well as applicable government regulations. A bachelor's degree in computer science or a related field plus several years of computer systems and security-related experience are typical requirements for the job, although relevant work experience can sometimes be substituted for a university degree.

Typical duties include:

- Creating, modifying and deleting user accounts
- Monitoring systems security and responding to security incidents
- Participating in security systems testing
- Ensuring integrity and confidentiality of sensitive data
- Preventing and detecting intrusion

Network Security Administrator

Individuals interested in a network security administrator position need a strong technical background, including working knowledge of network management protocols, networking architecture, authentication practices and security administration. It is important that candidates keep abreast of industry security trends and developments, as well as applicable government regulations. They should also have excellent troubleshooting and communication skills. Employers typically seek a bachelor's degree in a technical field along with three to six years of relevant experience.

Typical duties include:

- Implementing network security policies and procedures
- Administering and maintaining firewalls
- Managing, monitoring and updating virus-prevention systems
- Monitoring security advisory groups to ensure all necessary network security updates, patches and preventive measures are in place
- Performing intrusion detection analysis
- Preventing and detecting intrusion

Information Systems Security Manager

The position of information systems security manager requires an individual with a strong technical background in systems and network security, along with excellent interpersonal and leadership abilities. Superior analytical and problem-solving skills, as well as excellent written and verbal communication skills, are also essential. It is important that candidates keep abreast of industry security trends and developments, as well as applicable government regulations. Employers normally seek a bachelor's degree in information systems, computer science or a related discipline (or an equivalent combination of education and experience) along with five or more years of systems and network security experience. One or more years of managerial experience may also be required. Industry certifications such as the Certified Information Systems Security Professional (CISSP) or the CompTIA Security+ also are commonly sought by employers.

Typical duties include:

- Providing leadership, guidance and training to information systems security personnel
- Reviewing, implementing, updating and documenting company-wide information security policies and procedures
- Managing security audits, vulnerability and threat assessments and directing responses to network or system intrusions
- Ensuring fulfilment of legal and contractual information security and privacy mandates, including providing executive management with compliance reports and audit findings
- Preventing and detecting intrusion

Product Manager

Product managers need a blend of business and marketing talent combined with technical knowledge. They should have excellent communication skills, including the ability to deal effectively with both technical staff and business/sales professionals, as well as a capacity for seeing the big picture in terms of product life cycle. Requirements include a bachelor's degree in computer science or business, plus five or more years of experience in software product management. For some positions, an MBA is highly desirable.

Typical duties include:

- Coordinating work with software engineers and developers to define product requirements
- Working with sales and marketing to define customer needs, market potential, competitive analysis and marketing strategy
- Writing product information materials to brief sales personnel on product features and benefits
- Assisting with trade show presentations of the product

Software Engineer

Candidates for a software engineer position should have broad information systems experience. They should be adept at working in a team and possess excellent communication and problem-solving skills. Most jobs require a minimum of a bachelor's degree in computer science, electrical engineering, computer engineering or a related discipline. Several years' experience in specific programming languages, such as C#/C++, Java or Visual Basic .NET, depending on what the employer is using, is also valuable.

Typical duties include:

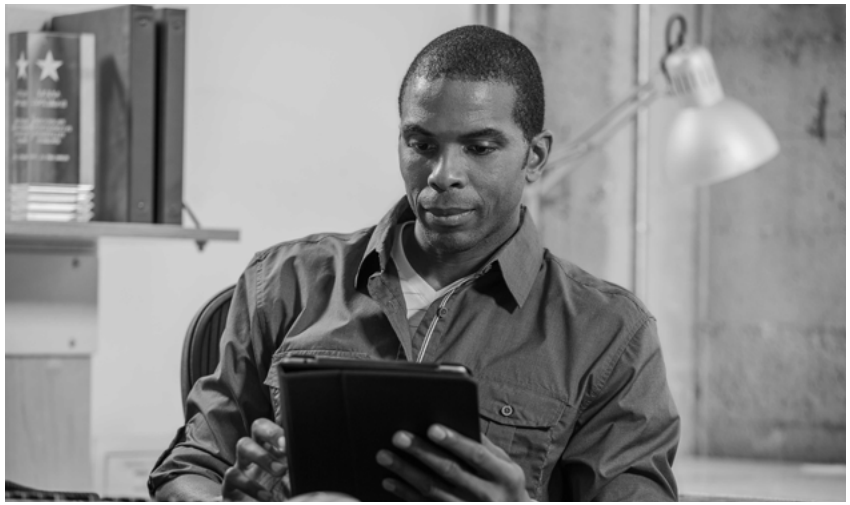
- Designing and creating engineering specifications for software programs and applications
- Working with quality assurance to develop software test plans
- Collaborating with hardware engineers to assess and test hardware and software interaction
- Implementing a specific development methodology
- Documenting software specifications

Software Developer

Software developers need to be detail oriented and have excellent problem-solving and analytical abilities. They should have good communication skills and be able to work both independently and as part of a development team. Employers normally require a bachelor's degree in computer science or a similar field but may accept a two-year technical degree if combined with several years of practical experience. Equally important are programming skills in languages and frameworks such as C#/C++, HTML, Java/Java Enterprise Edition/J2EE, Microsoft .NET and SQL Server. A minimum of two to three years of programming experience is a typical requirement. Complex projects may call for additional years of demonstrated achievement.

Typical duties include:

- Coding, testing and debugging programs according to computer engineering specifications
- Modifying, expanding and updating applications
- Communicating with a team that includes analysts, engineers and quality assurance testers in order to coordinate and document application development and testing
- Developing software prototypes



Manager

Managers of technical support services need extensive experience with supported software and hardware, as well as excellent interpersonal, business management and customer-service skills. The position also requires strong leadership skills. Employers typically seek a bachelor's degree in information systems or a related discipline with at least five years of operations and support experience, plus three or more years in a managerial role. Professional certifications such as the Microsoft Certified Systems Engineer (MCSE), HDI Support Centre Manager certification or experience with the Information Technology Infrastructure Library (ITIL) also are valuable.

Typical duties include:

- Managing the daily operations of a firm's helpdesk and support services
- Managing staff, including hiring, training, scheduling work assignments and conducting evaluations
- Monitoring response times, evaluating user satisfaction levels and recommending improvement
- Evaluating and managing technical support systems hardware and software and recommending upgrades or changes
- Negotiating, writing and reporting on internal and external service level agreements

Desktop Support Analyst

Candidates for a desktop support analyst position should have extensive experience with desktop hardware, software applications, operating systems and network connectivity. They must be customer service oriented and proactive in anticipating and resolving problems while maximising efficient use of computing resources. A bachelor's degree in a computer-related field and three to five years of experience installing and supporting PC and laptop hardware and software are standard requirements, although some employers are willing to substitute work experience for formal education. Additional requirements may include professional certifications from entities such as HDI (Desktop Support Technician or Support Centre Analyst), CompTIA or Microsoft (Microsoft Certified Professional or Microsoft Certified Systems Administrator).

Typical duties include:

- Maintaining an inventory of installed software, managing software licensing, and creating policies and procedures for upgrades
- Working with hardware and software vendors to verify timely product delivery and ensuring that new equipment is installed and ready to operate on schedule
- Analysing and recommending hardware and software standardisation
- Creating user accounts and managing access control based on company policies

Systems Administrator

Systems administrators should possess strong problem-solving, analytical and communication skills in addition to in-depth technical knowledge of the employer's systems hardware and software. Employer requirements vary depending on system complexity, the types of operating and network systems being supported and the size of the organisation. While some employers require a bachelor's degree in computer science or a related field, others may accept an associate's degree or technical training certificate. Three to five years of experience working with the specific types of hardware and software systems used by the company are generally required. Professional certifications such as the Microsoft Certified Systems Administrator (MCSA), Microsoft Certified Systems Engineer (MCSE) or the Sun Certified System Administrator (SCSA) may be commonly sought by employers.

Typical duties include:

- Installing operating system software, patches and upgrades
- Analysing, troubleshooting and resolving system hardware, software and networking issues
- Configuring, optimising, fine-tuning and monitoring operating system software and servers
- Performing system backups and recovery
- Conducting server builds

Systems Engineer

In addition to in-depth technical knowledge of the employer's software and hardware, systems engineers need advanced analytical, troubleshooting and design skills. The ability to communicate with technical and non-technical users is also essential. Employers may require extensive knowledge of the development process, including specification, documentation and quality assurance. Because of the broad range of demands systems engineers must meet, candidates who have demonstrated strong project-planning skills often hold an advantage. Employers generally prefer candidates with five or more years of experience working with the specified hardware and software systems and a bachelor's degree or equivalent experience.

Typical duties include:

- Developing, maintaining and supporting technical infrastructure, hardware and system software components
- Performing installation, maintenance and support of system software/hardware and user support
- Configuring, debugging and supporting multiple infrastructure platforms
- Performing high-level root cause analysis for service interruption recovery and creating preventive measures

Helpdesk (Tiers 1, 2 and 3)

All help desk personnel need excellent problem-solving, communication and interpersonal skills, along with patience, a positive, customer-friendly attitude and the ability to work in a team. In addition, they should have a strong technical understanding of the various hardware, software and networking systems being supported. Employer requirements depend on the helpdesk position level. Tier 1, an entry-level position, normally requires less than two years of work experience and may require an associate's degree or completion of coursework at a technical college or university. Tier 2 positions typically require two to four years of work experience and may require a bachelor's degree or a two-year degree and additional, equivalent work experience in a helpdesk setting. Tier 3 positions often require four or more years of helpdesk experience, a bachelor's degree in computer science or a related field and/or professional certification, such as HDI Customer Service Representative or Support Centre Analyst or the Microsoft Certified Systems Engineer (MCSE) designation.

Typical duties include:

Tier 1

- Taking initial telephone or e-mail enquiries and troubleshooting and managing relatively simple hardware, software or network problems that can be resolved in five minutes or less
- Recognising and escalating more difficult problems to Tier 2 support
- Logging call activity

Tier 2

- Resolving more complex issues requiring detailed systems and applications knowledge; these issues have been escalated from Tier 1 support and may require five to 15 minutes to settle
- Using judgement and making the decision to generate a trouble or work order ticket for issues that cannot be resolved via telephone or e-mail and will require an on-site visit to the user's PC or workstation

Tier 3

- Researching and resolving the most difficult and complex problems that other helpdesk levels have been unable to resolve
- Analysing and identifying trends in issue reporting and devising preventive solutions
- Mentoring other helpdesk personnel on hardware and software problem analysis and resolution

Instructor/Trainer

Candidates for an instructor/trainer position require a combination of in-depth subject-matter expertise plus excellent communication and presentation skills. They must be able to explain sometimes difficult technical material clearly and patiently to students of varying levels of proficiency. Candidates should be outgoing and comfortable working with diverse groups of people while maintaining professionalism at all times. A bachelor's degree in a related subject area may be preferred by some employers. Breadth of technical knowledge and one to five or more years of training experience are also required. Certification, such as a Microsoft Certified Trainer (MCT) designation, can also be useful.

Typical duties include:

- Determining training objectives and developing a course curriculum
- Creating course materials, handouts, instructional aids, audio visual materials and similar teaching aids
- Conducting classroom training
- Testing and evaluating student performance

PC Technician

PC technicians need excellent problem-solving and customer-service skills, as well as thorough knowledge of PC hardware, software and network connections. Employers look for relevant training, which may include an associate's degree or completion of coursework through a technical college, as well as hands-on experience working with PC hardware and software. One to five years of experience may be required depending on the complexity of the position. Professional certification, such as the CompTIA IT Technician or Microsoft Certified Professional (MCP) designation, also provide important skills validation and may be required.

Typical duties include:

- Installing, configuring and maintaining desktop and laptop PCs and peripherals such as printers
- Installing and configuring application and operating system software and upgrades
- Troubleshooting and repairing hardware and network connectivity issues
- Removing old equipment and performing data migration to new machines

Business Continuity Analyst

Individuals interested in a business continuity analyst position need excellent analytical, organisational, communication and documentation skills. A background in project management and/or business or systems analysis, and in-depth knowledge of a business sector, such as finance or securities, is considered ideal. Employers typically seek five or more years of experience in IT-related positions along with several years of business continuity planning experience. A minimum of a bachelor's degree in computer science or a related field is a standard requirement.

Typical duties include:

- Analysing critical business functions and defining the scope and effect of disaster scenarios
- Designing, planning and implementing an enterprise-wide business continuity plan
- Analysing existing systems and recommending redundant, fault-tolerant solutions to ensure business continuity and duplication of all critical data
- Devising, scheduling and implementing business continuity tests and analyzing results
- Documenting business continuity and business continuity procedures, and making presentations and recommendations to senior management
- Ensuring that the firm and its data systems comply with regulations such as the Sarbanes-Oxley, Basel II, Insolvency II compliance and similar regulations.

For managers hiring technology professionals, certification is important. But how much value should be placed on it? The answer isn't always clear and frequently depends on the needs of the technology department.

The certification advantage

Certification provides an employer clear evidence of an individual's familiarity with a particular technology or practice. Certification also shows initiative on the part of the applicant because the individual has invested the extra effort to obtain it. In addition, some employers view certification as essential to a lifelong learning process.

The role of experience

Certification is of greatest value when it is accompanied by practical work experience. For example, a job candidate who possesses a Microsoft Certified Database Administrator designation is highly marketable, but one who has spent five years working with Microsoft systems and has a track record of completing projects on time and under budget is eminently more desirable to prospective employers than someone who has a certification but no experience. Therefore, employers should hire IT professionals whose certifications reflect their skills and interests and reinforce their experience.

IT managers want to hire individuals with a track record of successful projects. Consequently, they seek candidates who not only possess the right technological skills but also know how to put those skills to practical use to deliver timely, quality results.

The following pages list common technology certifications for various job categories. You can use this information to assess job candidates or help develop the skills of your current technology team. Certification titles are subject to change, so please check with the administering organisation for more information.

Common technology certifications

JOB CATEGORY	JOB TITLE/CERTIFICATION
Applications/ Software Development	IBM Certified Application Developer (CAD) Microsoft Certified Applications Developer (MCAD) Microsoft Certified Application Specialist (MCAS) Microsoft Certified IT Professional (MCITP) Microsoft Certified Professional Developer (MCPD) Microsoft Certified Technology Specialist (MCTS) Microsoft Certified Solution Developer (MCSD) Sun Certified Business Component Developer (SCBCD) Sun Certified Developer for Java Web Services (SCDJWS) Sun Certified Java Associate (SCJA) Sun Certified Java Developer (SCJD) Sun Certified Java Programmer (SCJP) Sun Certified Mobile Application Developer (SCMAD) Sun Certified Web Component Developer (SCWCD)
Data/Database Administration	Adobe Certified Associate (ACA) Adobe Certified Expert (ACE) Certified MySQL Associate (CMA) Certified MySQL Database Administrator (CMDBA) Certified MySQL Developer (CMDEV) Microsoft Certified Architect (MCA) Microsoft Certified Database Administrator (MCDBA) Microsoft Certified IT Professional (MCITP) Microsoft Certified Master (MCM) Microsoft Certified Technology Specialist (MCTS) Oracle 10g Database Administrator Certified Associate Oracle 10g Database Administrator Certified Professional Oracle Certified Associate (OCA) Oracle Certified Professional (OCP) Oracle PL/SQL Developer Certified Professional Red Hat Certified Datacentre Specialist (RHCDS)
Internet and E-Commerce	Certified Internet Webmaster (CIW) Microsoft Certified Technology Specialist (MCTS) Oracle 9i Web Administrator Certified Associate Oracle 9i Forms Developer Certified Professional Sun Certified Web Component Developer (SCWCD) ZEND Certified Engineer (ZCE)

Common technology certifications

JOB CATEGORY	JOB TITLE/CERTIFICATION
Networking/ Telecommunications	Certified Wireless Network Professional (CWNP) Cisco Certified Design Associate (CCDA) Cisco Certified Design Professional (CCDP) Cisco Certified Entry Networking Technician (CCENT) Cisco Certified Internetwork Expert (CCIE) Cisco Certified Internetwork Professional (CCIP) Cisco Certified Network Associate (CCNA) Cisco Certified Network Professional (CCNP) Cisco Certified Voice Professional (CCVP) CompTIA Convergence-Unified Communications CompTIA Network+
Project Management	Certified Associate in Project Management (CAPM) Certified Business Analysis Professional (CBAP) CompTIA Project+ Information Systems Professional (ISP) Information Technology Certified Professional (ITCP) Project Management Professional (PMP)
Quality Assurance (QA) and Testing	Certified Software Business Analyst (CSBA) Certified Software Process Engineer (CSPE) Certified Quantitative Software Process Engineer (CQSPE) Certified Software Tester (CSTE) Certified Internet Webmaster (CIW) Certified Software Test Analyst Program (CSTA) Microsoft Certified Technology Specialist (MCTS) Oracle 9i Web Administrator Certified Associate Oracle 9i Forms Developer Certified Professional Sun Certified Web Component Developer (SCWCD) ZEND Certified Engineer (ZCE)

Common technology certifications

JOB CATEGORY	JOB TITLE/CERTIFICATION
Security	Associate Business Continuity Professional (ABCP) Certified Business Continuity Professional (CBCP) Certified Business Resilience Manager (CBRM) Certified Ethical Hacker (CEH) Certified Information Systems Security Professional (CISSP) Certified Information Security Manager (CISM) Certified Information Systems Auditor (CISA) Cisco Certified Security Professional (CCSP) CompTIA Security+ EC-Council Certified Security Analyst (ECSA) EC-Council Computer Hacking Forensic Investigator (CEH) Red Hat Certified Security Specialist (RHCSS) Security Certified Network Architect (SCNA) Security Certified Network Professional (SCNP) Security Certified Network Specialist (SCNS) Systems Security Certified Practitioner (SSCP)
Systems Administration	Apple Certified System Administrator (ACSA) Certified Novell Engineer (CNE) Citrix Certified Administrator (CCA) Citrix Certified Enterprise Administrator (CCEA) CompTIA Network+ CompTIA Server+ Master Certified Novell Engineer (MCNE) NetWare Certified Novell Administrator (CNA) Microsoft Certified IT Professional (MCITP) Microsoft Certified Professional (MCP) Microsoft Certified Systems Administrator (MCSA) Microsoft Certified Systems Engineer (MCSE) Microsoft Certified Technology Specialist (MCTS) Red Hat Certified Architect (RHCA) Red Hat Certified Virtualisation Administrator (RHCVA) Red Hat Certified Engineer (RHCE) Red Hat JBoss Certified Application Administrator (JBCAA) Solaris Sun Certified Network Administrator (SCNA) Sun Certified System Administrator (SCSA) VMware Certified Design Expert (VCDX) VMware Certified Professional (VCP)

Common technology certifications

JOB CATEGORY	JOB TITLE/CERTIFICATION
Technical Services, Helpdesk and Technical Support	Apple Certified Support Professional (ACSP) CompTIA IT Technician CompTIA Remote Support Technician HDI Customer Service Representative HDI Desktop Support Technician HDI Knowledge-Centred Support Principles HDI Support Centre Analyst HDI Support Centre Director HDI Support Centre Manager HDI Support Centre Team Lead ITIL Microsoft Certified Desktop Support Technician (MCDST) Microsoft Certified IT Professional (MCITP) Microsoft Certified Professional (MCP) Microsoft Certified Trainer (MCT) Microsoft Certified Systems Administrator (MCSA) Microsoft Certified Systems Engineer (MCSE) Microsoft Certified Technology Specialist (MCTS) Red Hat Certified Technician (RHCT)

Free and discounted training to prepare for certification

Robert Half Technology understands the need for continuous education to keep pace with the rapid changes in technology. That's why we are pleased to offer our registered candidates a free online training programme and access to world-class tools to enhance their skills and earn certifications on the latest technology.

- Our free online training programme with SkillSoft is available to candidates once they have fully registered with Robert Half Technology and have received a login and password from a Robert Half Technology recruitment consultant. Our programme includes access 24 hours a day, 7 days a week to over 8,000 online courses from Microsoft, Oracle, Cisco and other technology leaders.

WORKING WITH ROBERT HALF TECHNOLOGY

Robert Half Technology is a leading provider of highly skilled technology professionals on a contract and permanent basis. Businesses of all sizes and in nearly every industry call on us to find the staff needed to help grow their operations.

Robert Half Technology offers benefits to the businesses we serve:

We have the best reputation in the staffing business. Our company once again was listed on FORTUNE® magazine's "World's Most Admired Companies". (March 18, 2013). Nine out of 10 of our clients and candidates say they would recommend us to their colleagues.

We custom match professionals to your needs. With more than 100 offices worldwide, we can leverage the size and strength of our team to find experienced professionals for your projects. Our in-person interviews, technical skills evaluations and selected reference checks allow us to custom match highly skilled candidates to your business needs.

We can fill your needs fast. In periods of rapid change, you need to be able to respond quickly to workload fluctuations. Our candidate database includes more than 900,000 highly skilled IT professionals, and many of the candidates we represent are available to start working immediately.

We represent highly skilled candidates. Experienced professionals want to work with Robert Half Technology because we are committed to advancing their careers and offer free access to thousands of online training courses.

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