ABSTRACT
               The Office of Institutional Research (OIR) at Northern
Virginia Community College (NVCC) analyzed data collected from ads for jobs
in the information technology (IT) sector in the Washington, D.C. area. The
study acquired its data from employment ads in the Washington Post's Sunday
employment sections. The primary purpose of the study was to learn more about
the skill sets being sought in candidates for IT positions. The study
evaluates positions in eight employment categories: (1) database
management/development; (2) graphic design; (3) help desk/technical support;
(4) management positions; (5) network/systems administration; (6)
programming; (7) training/instructional design; and (8) other. The report
analyzes the content of the ads by examining the kinds of skills, education,
and experience employers listed as requirements for IT jobs. A detailed table
is presented that delineates the job offerings according to: (1) position
offered; (2) skills required; (3) education/certification required; (4)
experience required; (5) hardware/software skills required; and (6)
additional notes, such as U.S. citizenship or secret clearance required. The
report finds that the programming category had the highest number of jobs
available, with the lowest number of jobs in management. Forty-two percent of
the ads stipulated a degree or certification requirement. A majority of the
ads stipulated work experience as a requirement for employment. (NB)

BUSINESS NEEDS ASSESSMENT STUDY: NO. 2

SKILLS REQUIRED BY THE INFORMATION TECHNOLOGY SECTOR IN THE WASHINGTON, D.C. METROPOLITAN AREA

Research Report No. 15-00

Office of Institutional Research
Northern Virginia Community College

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2

1

NORTHERN VIRGINIA COMMUNITY COLLEGE

OFFICE OF INSTITUTIONAL RESEARCH

The purpose of the Office of Institutional Research is to conduct analytical studies and provide information in support of institutional planning, policy formulation and decision making. In addition, the office provides leadership and support in research related activities to members of the NVCC community engaged in planning and evaluating the institution's success in accomplishing its mission.

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Table of Contents

SKILLS REQUIRED BY THE INFORMATION TECHNOLOGY SECTOR IN THE WASHINGTON, D.C. METROPOLITAN AREA

List of Figures

5

SKILLS REQUIRED BY THE INFORMATION TECHNOLOGY SECTOR IN THE WASHINGTON, D.C. METROPOLITAN AREA

Executive Summary

To better understand the skills, education, and experience that are required for obtaining jobs in the information technology sector in the Washington, D.C. metropolitan area, the Office of Institutional Research (OIR) at Northern Virginia Community College collected and analyzed data from advertisements for information technology (IT) jobs. The advertisements for IT jobs were selected from Sunday editions of the *Washington Post* - once in February, 2000, and again in April, 2000. OIR compiled and analyzed the data from the information technology job announcements primarily to learn more about the skill sets employers were seeking in candidates for IT positions. In doing so the study also provided information on the types of IT jobs advertised in the local labor market.

The information technology positions selected for analysis were classified into eight major categories: (1) database management/development, (2) graphic design, (3) help desk/technical support, (4) management positions, (5) network/systems administration, (6) programming, (7) training/instructional design, and (8) other.

The following is a brief summary of the findings:

- The Programming category of advertised IT jobs had the largest proportion (22%) of jobs from the two samples. The smallest proportion (3%) of IT jobs from the two samples fell into the Management category.

- Across the eight job categories, 42% of the advertisements stipulated a degree or certification, with a degree being asked for far more often than certification. Of the 66 ads that listed a degree as a requirement, a few of them also called for one or more certifications. The vast majority of jobs, which required a degree, sought candidates with a Bachelor's; only a few specified an Associate's degree or a degree beyond the Bachelor's.

- Degree requirements varied from one job category to another. The highest percentage (75%) of jobs requiring a Bachelor's or advanced degree from the two samples were in the Training/Instructional Design category. Sixty percent of ads for positions in the Network/Systems Administration category called for degrees and/or certification. The lowest percentage (25%) of jobs requiring a degree was in the "Other" category.

- Work experience was a requirement found in a majority of the ads across the job categories. All of the ads in the Training/Instructional Design and Management categories called for work experience. In all other categories except the "Other" category, between 70% and 80% of the advertised positions called for work experience. A need for extensive, broad-based experience was indicated in many of the advertisements.

- Technical skills required for the sampled IT jobs included expertise with a wide range of the tools of technology, including database and networking software, operating systems, programming languages, and business applications. Expertise with HTML, UNIX, SQL,

Windows NT and Windows 95/98/2000, Java, or MS Office were specified most frequently. Employers were often seeking job candidates familiar with a number of different technologies.

- Non-technical skills were also mentioned in many of the sampled IT job advertisements. Of the non-technical skills sought, the most frequently mentioned were oral and written communication skills, followed by interpersonal, customer service, and team player skills. Handling multiple tasks and working independently were among several other skills mentioned more than once.

SKILLS REQUIRED BY THE INFORMATION TECHNOLOGY SECTOR IN THE WASHINGTON, D.C. METROPOLITAN AREA

Introduction

This report presents the results of a study designed to learn more about the skills, the education and training, and the work experience that employers in the information technology (IT) sector in the Washington, D.C. area seek in job candidates.[1] The study also provides an overview of the IT jobs advertised in the local area labor market. By learning more about the kinds of IT jobs in the area and the job skills needed for employment in the IT sector, NVCC will be better able to serve the educational needs of its students and the workforce needs of area employers.

Methodology

To find out about the types of jobs available and the nature of the skill sets job seekers need for employment in the region's information technology sector, OIR compiled and analyzed data from advertisements for IT jobs that appeared in the *Washington Post,* the area's largest-circulation newspaper.[2] One hundred and eighty-two IT job advertisements were drawn from two samples of the *Washington Post's* Sunday employment sections. The first sample of IT job advertisements were randomly selected from the February 13, 2000, *Washington Post* employment section. For this sample, every fifth job was selected from those advertised. The second random sample of IT jobs was from the April 16, 2000, edition of the *Washington Post.* Every tenth job was chosen for this sample.

The IT job advertisements selected for analysis were grouped into the following eight categories:
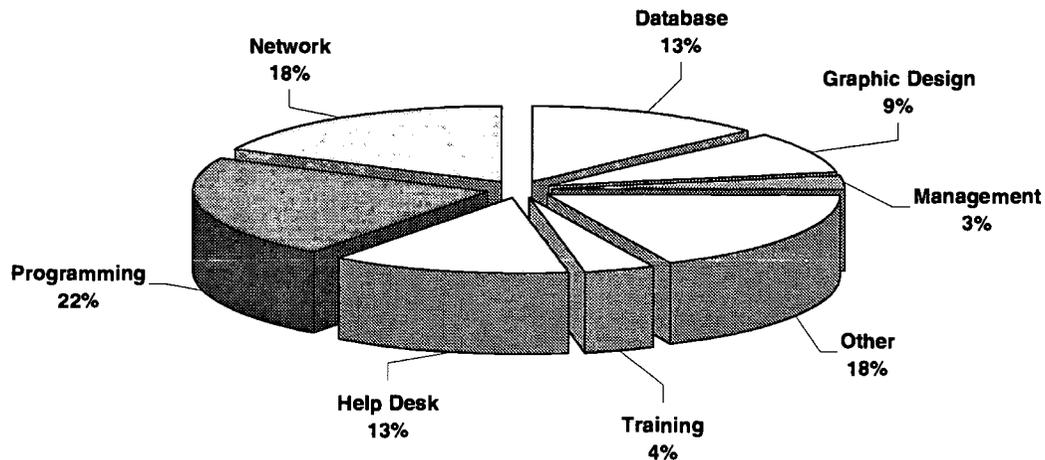- A. Database Management/Development
- B. Graphic Design
- C. Help Desk/Technical Support
- D. Management
- E. Network/Systems Administration
- F. Programming
- G. Training/Instructional Design
- H. Other

Figure 1 shows the eight different categories into which the jobs were grouped. In addition, it shows the proportion of the IT jobs that fell into each of the major categories. The largest proportion of the IT jobs randomly selected fell in the Programming category.

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[1] Washington, D.C. metropolitan area includes Northern Virginia, the District of Columbia, and the Maryland suburbs of Montgomery and Prince George Counties.

[2] Samples for this study were limited to selections from the *Washington Post* after it was determined that employment information in other area newspapers often duplicated what was contained in the *Post.* The *Washington Post* had more extensive technology job listings than other area newspapers.

Figure 1: IT Jobs Sampled from Washington Post Advertisements

Network 18%
Database 13%
Graphic Design 9%
Management 3%
Programming 22%
Other 18%
Help Desk 13%
Training 4%

Analysis of the content of the advertisements began with the construction of a matrix for each sample that shows the skills, education/certification, experience, and hardware/software skills required for each of the advertised IT jobs. Further analysis focused on determining the nature of the skill sets needed for jobs in each of the categories, thereby allowing for comparisons of how the skill, education, and experience requirements differed from one job category to another.

Examination of the kinds of skills, education, and experience employers listed as requirements for information technology jobs shows some similarities and some differences in requirements among the different IT job categories. They are detailed in the report, which is presented in two sections.

Section 1 describes the kind and nature of requirements for jobs in each of the eight categories, based on data from both samples. The proportion of advertisements that specified degrees and/or work experience is indicated for each category.

Section 2 presents a matrix for each of the two samples, listing each of the advertised IT jobs selected and employment requirements.

9

Section 1: Skill Requirements for IT Positions

The following analysis provides a synthesis of skill requirements from the two samples of information technology positions advertised in the *Washington Post* Classified section. Because the requirements for positions in the IT field vary widely, separate summaries are provided for each of the eight areas sampled: database management/development, graphic design, help desk/technical support, management, network/systems administration, programming, training/instructional design, and "other". These eight categories were further subdivided when the required skills differed significantly among the various positions.

A. Database Management/Development Positions

There were 23 database positions in the sample selected from the *Washington Post* Classified sections. This represented approximately 13% of all advertised IT positions in the two samples.

Within the database category, the position descriptions varied substantially. For this reason, separate analyses are provided for three distinct subgroups: Database Administrator, Database Developer/Programmer/Analyst, and System Administrator.

1) Database Administrator

Over half of the ads required that candidates have knowledge of Oracle. This was followed by Unix, Linux and SQL software. Other software skills that were mentioned included Access, NT Server, Visual Basic, Sybase, DB2, Lotus Notes, HTML, and software facilitating web integration.

The required level of work experience varied among the advertised positions for database administrators. The vast majority of ads (78%) called for candidates with extensive work experience. A college degree did not appear to be an important factor for the database administrator position. Even though some ads sought candidates with a degree, work experience was still a requirement in all but one case. Candidates with specialized technical knowledge in the latest version of software like Oracle and Unix were of foremost importance to employers. According to the ads, successful candidates must possess hands-on experience related to database administration and performance. Good communication skills, personal motivation, and independent working habits could further enhance candidates' prospects in the job market.

2) Database Developer/Programmer/Analyst

This broad subgroup consisted of the following job titles advertised in the samples: Database Developer, Oracle Database Developer, Database Programmer, Sr. Database Analyst, Database Design Analyst, Sr. Software Engineer, QA/Testing Coordinator, Package Software Analyst, and SAP Consultant.

Work experience requirements varied widely across the various job titles. The hardware and software skills that candidates needed also varied among the positions in this category. Some

of the more frequently mentioned skills required of individuals included familiarity with SQL, PL/SQL, or MS-SQL. Each of the following software skills was also mentioned: Oracle, NT or web based NT, and Visual Basic.

In general, for the positions of database developers, database programmers, or database analysts, there was little emphasis on degree requirements for candidates. In a few cases, a Bachelor's or Master's degree was required. In addition to the degree requirements, work experience was still necessary. Analysis of these ads further showed that in-depth knowledge of a variety of the latest software was a major condition for employment. These findings demonstrate an advantage to individuals with an Associate's degree, provided they are able to show at least one year of related work experience to prospective employers.

3) *System Administrator*

This job subgroup encompassed the related job titles of Sr. System Architect, System Administrator, and Database Engineer.

A high level of technical expertise, as well as analytical and design skills were requirements for job applicants in this category. However, the majority of ads in the system administrator subgroup did not specifically stress the need for individuals to have a college degree. Regardless of degree, however, most ads in this category asked for candidates with significant work experience of five years or more. In addition, some of the specific hardware and software skills that candidates should possess included Unix, Oracle, Java, C, Perl, object-oriented programming and data warehousing.

The major software requirements for the database category as a whole are displayed in Figure 2. Even though there was considerable demand for people who work with a wide variety of database, programming and systems software, Oracle database and SQL were among the most frequently required database software skills. Half of all database ads mentioned either Oracle or SQL. Demand for candidates skilled in Unix and Windows/NT networks was approximately equal, with each kind of software mentioned in 25% of the ads. One fifth of all database ads required that candidates were familiar with Visual Basic software (see Figure 2).

Figure 2: Computer Skills Frequently Required for Database Positions
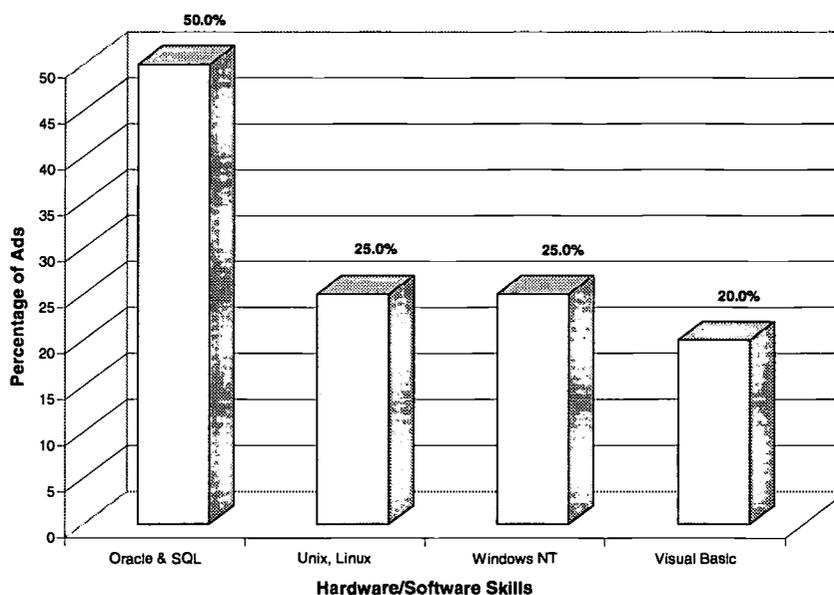
B. Graphic Design

There were 17 positions in the graphic design category representing 9% of the IT ads from the two *Washington Post* employment samples. The graphic design sample was further divided into the two subgroups of graphic designer/artist, and web designer positions. The majority of jobs advertised under this heading were for graphic designers/artists. It is important to note that regardless of the job title, at least 65% of the candidates hired for these positions will be involved in web site design at some level.

1) *Graphic Designer/Artist*

This subgroup comprised the following job titles: Sr. Designer, Graphic Designer, Graphic Artist, Art Director, and Electronic Publisher.

Regardless of degree requirements, over 70% of the ads for graphic designers also required work experience. The levels of work experience ranged from internship experience to 1-3 years' experience. There was no mention of work experience for the graphic artist and electronic publisher positions.

The need for candidates to have specific skills was emphasized in less than half of the ads in this subgroup. The most frequently required skills were web site design plus knowledge of HTML and web-related software. Other ads looked either for a detail-oriented, organized person or for a creative, self-motivated, and committed candidate.

For graphic designers, emphasis was placed on candidates having a college degree (over 70% of the advertisements required a college degree). However, none of the ads for graphic artists required a college degree. In addition to in-depth knowledge of software used in the field, over 45% of the ads for graphic designers/artists sought candidates with a background in web design or the Internet. There was also a high demand for workers with knowledge of specialized software dealing with presentation, illustration, and web design. All except one ad required knowledge of one or more software products. The most sought after software knowledge was PhotoShop and Quarkxpress.

2) Web Designer

This subgroup included the job titles Webmaster, Senior Web Programmer, Internet Production Coordinator, Web Development, Web Designer/Graphic, and Web Assistant. These positions are discussed separately from graphic designer/artist jobs because they pertain exclusively to web design.
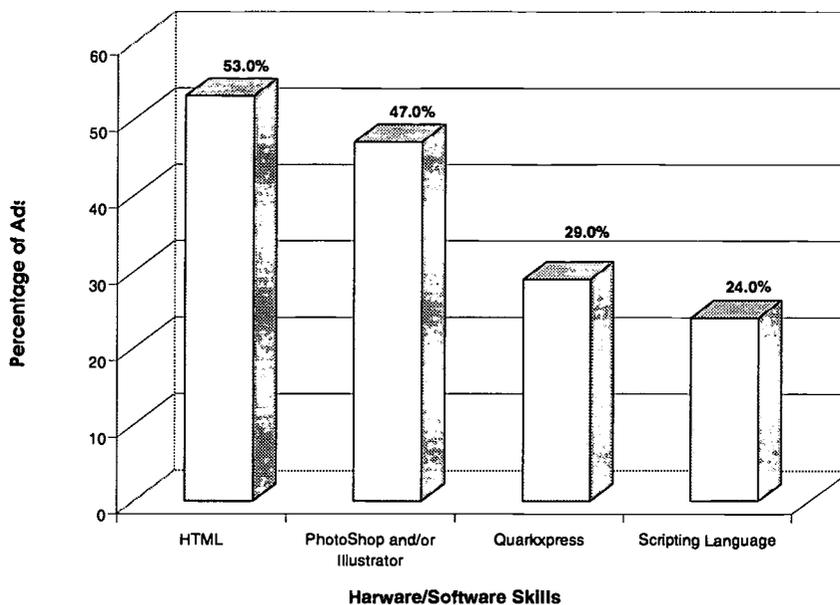
Work experience was required for all except the Web Assistant position. Experience levels varied among the web designer positions ranging from experience with designing web pages to six or more years' experience with Unix/CGI. Besides work experience, the supervisory positions of Webmaster and Internet Production Coordinator also required a Bachelor's degree.

Additional skills that employers considered important included basic HTML coding, site maintenance capabilities, site administration and layout, content writing, excellent communication skills, and the ability to work in a team environment.

Virtually all web designer positions required candidates to know some form of HTML. In addition, there was also demand for candidates to know a scripting language and to have experience in one or more of the following software: Unix/Linux, Windows/NT, Active Server Pages (ASP), or SQL.

The major software requirements for the graphic design category as a whole are displayed in Figure 3. Over 50% of the ads sought candidates with knowledge of HTML. Forty-seven percent of the ads in this category sought candidates who were familiar with PhotoShop or Illustrator. Familiarity with a scripting language was a requirement for almost one quarter of the graphic design ads. The high demand for HTML shows that the position description for today's graphic design jobs has changed from primarily designing print publications to designing web sites.

13

Figure 3: Computer Skills Frequently Required for Graphic Design Positions

Bar chart showing Percentage of Ads by Harware/Software Skills:
- HTML: 53.0%
- PhotoShop and/or Illustrator: 47.0%
- Quarkxpress: 29.0%
- Scripting Language: 24.0%

C. Help Desk/Technical Support

There were 23 positions drawn from both samples that fell in the Help Desk/Technical Support category. Most of the position titles in the advertisements included the term engineer, technician, technical support, or specialist.

A degree or certification was important for candidates to possess for approximately 50% of the positions in this job category. In particular, 13% of the ads preferred candidates with certification credentials like MCSE or CNE, while 35% of the ads required a degree. In addition, most positions in this group required individuals to have knowledge of specific software such as NT network software, LAN, WAN, Novell Netware, or TCP/IP. Other ads emphasized the need for candidates familiar with PC hardware including knowledge of Dell, IBM, and Hewlett-Packard computers. In addition, the majority of the ads sought individuals with analytical skills as well as skills in communication, customer service, and teamwork.

Seventy percent of the ads sought candidates with work experience. Individuals with considerable work experience in specific environments were much in demand. Most of these ads required several years of work experience in technical support, desktop support, hardware and software installation, or troubleshooting Windows/NT.

Overall, the Help Desk/Technical Support group sought candidates with a high level of specialized expertise in hardware and software installation, configuration, and maintenance in a variety of environments. Compared with other positions in the information technology field, there was more emphasis on candidates possessing a degree and formal education.

Figure 4 presents the hardware and software skills most frequently required for Help Desk/Technical support positions. The majority of ads in this group (59%) required knowledge of Windows/NT network technology, various versions of MS Windows, and MS Office. Local Area Networks, Wide Area Networks, and Novell Netware were also cited in 35% of the ads. In addition, approximately 30% of the ads called for candidates who were familiar with TCP/IP data communication protocol.

Figure 4: Computer Skills Frequently Required for Help Desk/Technical Support Positions
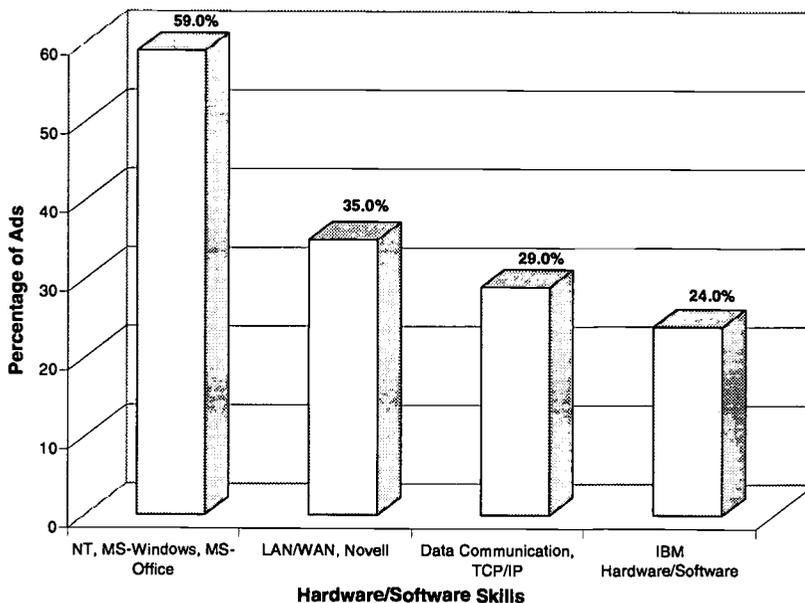
D. Management Positions

The sample for this group was made up of six positions: Director of Infrastructure, Director of Information Systems, Knowledge Management Consultants/Managers, Deputy Director, Marketing Manager, and Project Manager.

Approximately one-third of the positions required candidates with a Bachelor's degree. The remaining ads did not mention a degree or specialized certificate. The required hardware and software skills for these positions were less specific than for most other groups in the information technology field. Management positions required a broad-based background in diverse systems and databases. Each of the advertised positions required a unique combination of hardware and software knowledge that differed from other positions in the group.

For most management positions, it was mandatory that candidates have extensive work experience in one or several areas including data warehousing, mainframe, client servers, and telecommunications networks. In addition to extensive work experience, many of the ads also

required that individuals have general non-technical skills such as interpersonal skills and the ability to adapt to rapidly changing conditions.

Overall, the ads for management positions in the information technology field placed emphasis on extensive work experience in a variety of hardware or software environments. Somewhat less emphasis was placed on candidates having a college degree. Interpersonal skills and adaptability to changing conditions were also requirements of individuals applying for these positions.

E. Network/Systems Administration

There were 32 technology jobs associated with this category. Approximately 33% of the positions were system administration jobs and approximately 15% pertained to web management or administration. Most of the remaining positions had manager, engineer, architect, consultant, assistant, or specialist included in the position title.

Typically, the network/systems administrator positions had stringent educational requirements. Over 60% of the positions in this category required candidates to have a college degree (a Bachelor's or Master of Science degree) and/or professional certification.

Over 80% of all positions in this category required work experience. Ads for supervisory personnel often sought candidates with expertise in a given system plus a number of years' supervisory experience. For the most part, applicants were expected to have years of experience in a great variety of hardware and software products. Nevertheless, it appeared that some positions could be staffed with candidates with less than a Bachelor's degree and up to one year of work experience.

For the network/systems administration category the highest proportion of positions (42%) required individuals to have knowledge of Windows/NT technology, Windows software, and/or Microsoft Office software. As shown in Figure 5, one-third of the positions required candidates to have a background in Unix, Mac, Sun, or Solaris. Another third of the ads sought candidates with a solid background in LAN/WAN and/or Novell Netware. HTML or XML skills were required for more than 20% of the network/systems administration positions. In addition, approximately 17% of the positions required candidates to be familiar with TCP/IP or FTP data communication.

16

Figure 5: Computer Skills Frequently Required for Network/Systems Administration Positions
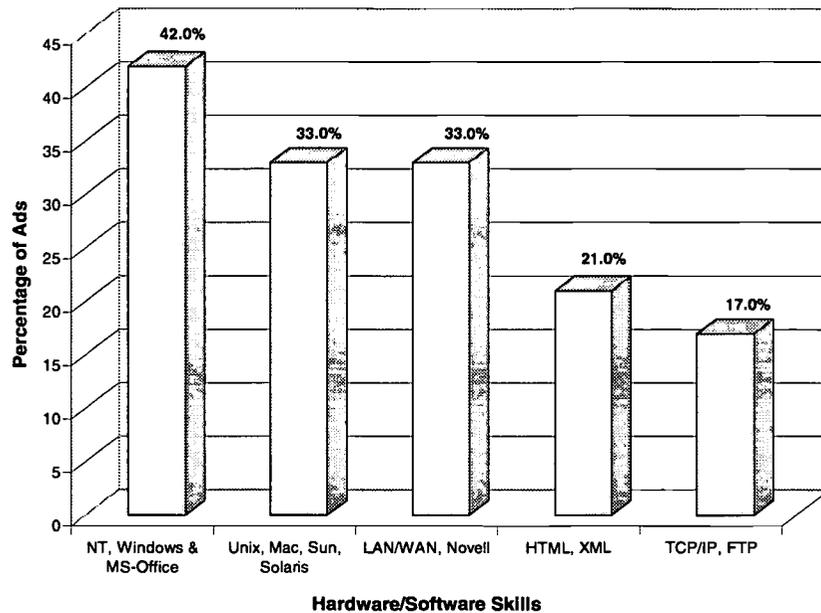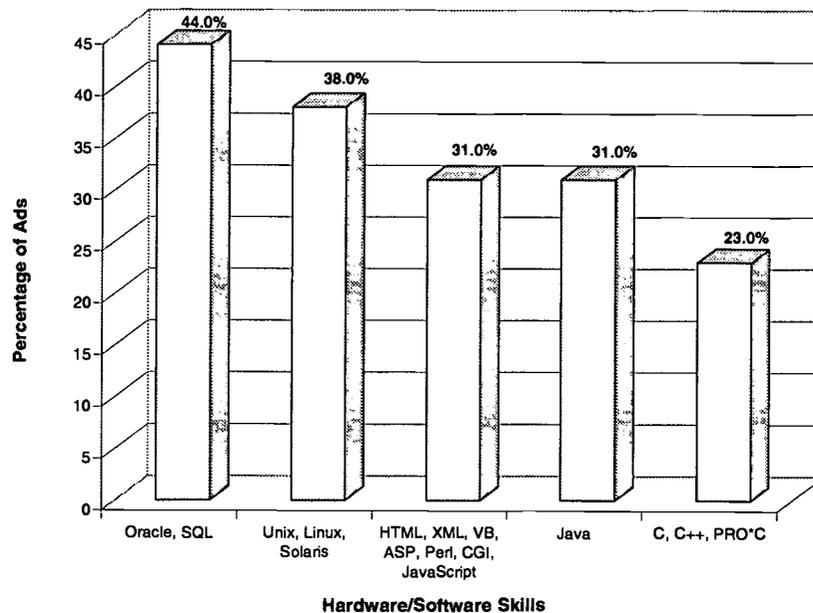

F. Programming

This was by far the largest group of positions that were sampled in the information technology sector. There were 40 ads that were selected in the programming category with a variety of job titles such as Software Engineer, Developer, Programmer Analyst, Tester, and System Administrator.

Approximately one third of the programming positions included in the *Washington Post* samples required individuals to have a Bachelor's or advanced degree in Computer Science or related discipline. Only the opening for a Microsoft Systems Engineer required MCSE and MCP certifications from candidates. The remaining positions did not require a degree or certification.

Candidates applying for programming positions were expected to have experience with database, networking, and programming software. Figure 6 shows that the greatest proportion of programming ads in the sample sought individuals with knowledge of Oracle or SQL (44%). This was followed by 38% of the ads that required individuals to have experience with Unix, Linux, or Solaris. In addition, one third of the ads required candidates with either knowledge of HTML, XML, Visual Basic, Active Server Pages, Perl, CGI, or JavaScript. One third of the ads required experience in Java programming.

Figure 6: Computer Skills Frequently Required for Programming Positions

Seventy percent of the ads for programming positions sought applicants with work experience. Of these ads, 30% required candidates with 1 to 3 years of work experience. The remainder of the ads required work experience of more than 4 years or experience using a wide variety of software products and/or networks. In almost all ads, a Bachelor of Science degree, an advanced degree, or professional certification did not substitute for work experience *per se*, although these did appear to lessen the required number of years of work experience.

There were also vacancies that could be filled by candidates with less than a Bachelor's degree and little or no work experience, provided they possessed the necessary hardware and software knowledge.

G. Training/Instructional Design

This job category included such positions as Teacher/Coordinator, Instructional Designer, Training Coordinator, Technical Trainer, MCSE & CNE Instructor, and Instructor of Information Systems.

The highest proportion of ads for positions in the training category required individuals with experience in Microsoft software (see Figure 7). Seventy-five percent of ads in this group sought candidates with experience in Windows/NT, MS Windows, MS Office software or a combination of these. Half of all ads in this group looked for applicants with a background in Novell Netware or an unspecified database management system (DBMS). A quarter of the ads sought trainers with teaching experience in object-oriented development or telecommunications.

18

Figure 7: Computer Skills Frequently Required for Training/Instructional Design Positions
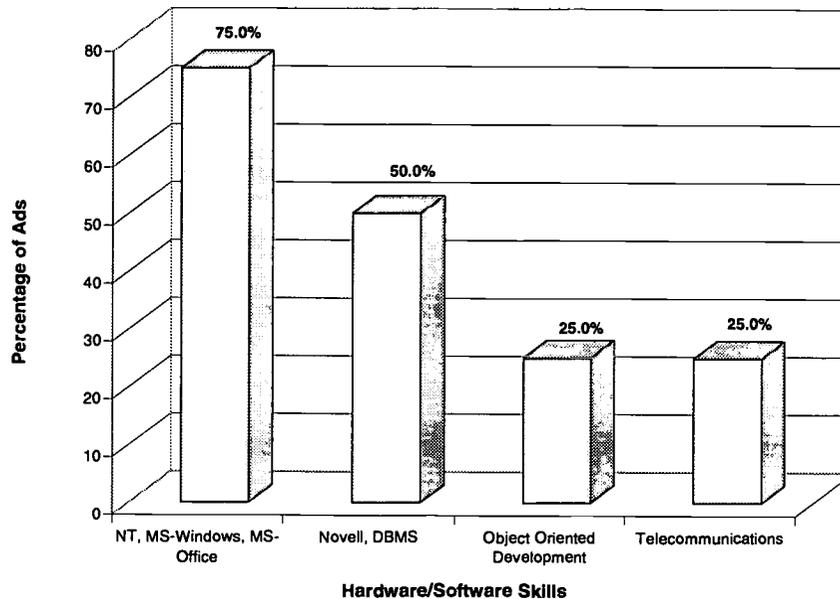
Seventy-five percent of the training/instructional design ads sought candidates with either a Bachelor's, Master's, or Ph.D. degree. A quarter of the ads required the professional certificates MCSE, CNE, or MCSO.
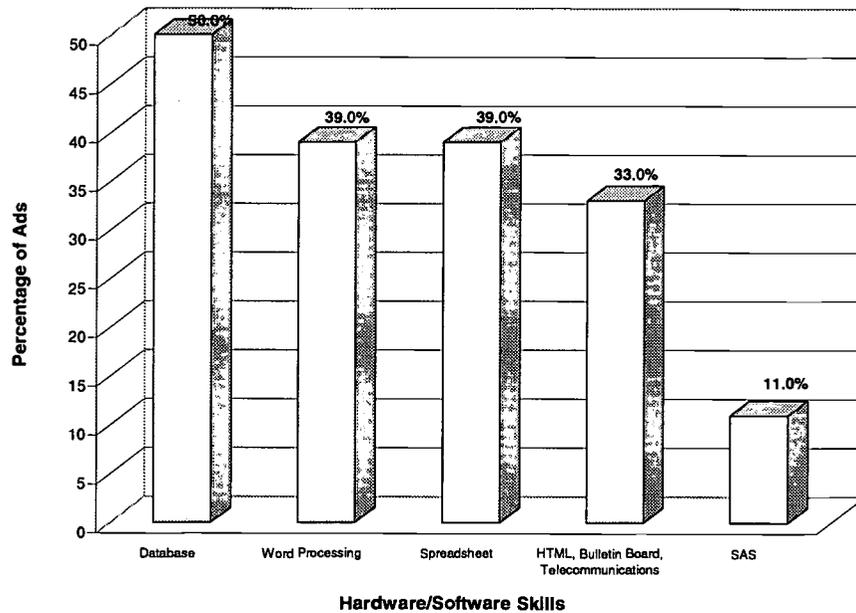
All ads in the sample for this group required teaching experience. Most of the jobs required between two and five years of teaching experience. Among other skills in demand were good written and verbal communication, problem solving and presentation skills, hands-on technical experience, the ability to create technical training materials, experience in curriculum development, and interpersonal skills.

H. Other

There were 33 positions in the "Other" category from the *Washington Post* sample. These positions had a wide array of IT job titles. The vacancies included positions such as Analyst, Project Manager, Government Salesperson, Consultant, Manager, Clerk, Technician, Secretary, Administrative Assistant, SAS Professional, Production Coordinator, PC Equipment Salesperson, Technical Writer, and more.

Ads within this category frequently used generic terms to describe the software experience required of candidates. Figure 8 shows that 50% of the positions advertised under this heading required candidates to have database software skills. Almost 40% of the ads required knowledge of word processing and spreadsheet software. Approximately one-third of the positions needed candidates who could work with HTML code, bulletin boards, and/or telecommunications. Over 10% of the positions were seeking candidates with experience in SAS.

19

Figure 8: Computer Skills Frequently Required for IT Positions Classified as "Other"

Chart data:
- Database: 50.0%
- Word Processing: 39.0%
- Spreadsheet: 39.0%
- HTML, Bulletin Board, Telecommunications: 33.0%
- SAS: 11.0%

Y-axis: Percentage of Ads
X-axis: Hardware/Software Skills

The educational requirements for positions in this category were less rigorous than for positions in the Programming, Networking, or Training categories. Only about 25% of the advertised job openings required either a Bachelor's degree or an advanced degree. Some of the advertised positions appeared to be suitable for entry-level candidates. However, just over half of the ads called for work experience and of those, 9 required candidates to have 3 or more years of work experience. Although the overall emphasis was less technical than for other groups in the IT field, a large number of jobs required skills in highly specialized areas such as familiarity with automated cartographic production and federal sales experience.

Approximately 40% of the ads required one or more of the following skills of prospective candidates: written and verbal communication skills, customer service skills, organizational skills, the ability to work independently, and the ability to work as a member of a team. Other ads asked for very specific job-related skills such as procurement and supply chain skills, budget preparation and scheduling, internet/web strategies, understanding web chats, bulletin boards and forums, knowledge of telecommunication, or understanding of business cycles and strategies.

20

Section 2: IT Employer Needs - Expected Skills, Education, and Experience

Sample 1*

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Positions: Database					
Sr. Database Analyst			• 9 Years	• SQ2 • VB • NT Web Based	
Database Programmer	• Multi-User Networked Applications	• Bachelor's	◦ 2 Years in Database Design & Implementation	• Windows NT (P) • Novell (P) • 4GL	
System Administrator	• Database/File Structure			• OOP	
Database Administrator	• Oral And Written Skills • Analytical Ability	• BA/BS in Info. Sys. or Computer Science	• 2 Years in Database Design, Programs, & Query Language	• SMS • Report Writer • Access • Crystal Reports • MIS • Visual Basic • HTML • Web Integration • NT Server	
Database Engineer	• Multi-Dimensional Database Methods	• BS in Computer Science or Related Field	◦ 5+ Years in Database Design, Development and Administration, & Data Modeling/ Warehousing		• Obtain DoD Clearance
Oracle Database Administrator	• Oracle Database Administration		• 3 Years	• Oracle	
Sr. Software Engineer				• Oracle • Pl/SQL • Document Imaging (P)	

* Sample 1 was from the *Washington Post*, 2/13/00.

Note: P = Preferred/Plus

16

21
22

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Database Programmer	• Complex Databases • Object-Oriented Programming			• Visual Foxpro 6.0	
Database Administrator	• Hands-On Database Administration		• 6 Years IT	• Oracle • Remedy Action Request System	• US Citizen-ship
Database Administrator	• Self-Starter • Work Independently		• 2 Years	• Sybase • Oracle	• Secret Clearance Required
Positions: Graphic Design					
Graphic Designer		• Design Degree	• 1 – 3 Years	• Macs	
Sr. Designer		• BFA in Graphic Design	• Work and Internship Experience	• Quarkxpress • Photoshop • Illustrator	
Art Director			• 5 Years	• Pagemaker • Quarkxpress • Illustrator • Acrobat • Frontpage • HTML Coding	
Graphic Artist				• Quarkxpress • Photoshop	
Graphic Designer	• Detail Oriented • Organized • Travel Industry (P) • Understanding of Repro/Printing Process	• Degree in Visual Communications (P)	• Experience with Digital Prep. of 2 – 4 Color Artwork	• Quarkxpress • Illustrator • Photoshop	
Graphics Designer	• Designing Site Architectures • User Interfaces • Intuitive Navigation Skills	Training in: • Photography • Identity Design • Interactive Design • Information Design (P)	• 2 Years Web	• Illustrator • Photoshop • HTML • Web Browsers	

Note: P = Preferred/Plus

23

24

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Graphic Designer	• Site Design and Implementation Experience	• Design Education		• Photoshop • Illustrator • HTML • Flash (P) • Home Site (P) • Fireworks (P) • Dreamweaver (P)	
Graphic Artist	• Spanish/English Speaking (P) • Handle Large Volume of Sites			• HTML • Graphic Design	
Web Assistant	• Basic HTML Coding • Routine Site Maintenance			• HTML	
Web Development	• Site Layout and Administration • Content Writing		• 3 + Years	• Perl • HTML • Linux • ASP	
Graphic Designer		• College Degree		• IIS	
Graphic Designer		• BFA	• 1 Year	• Macs • Powerpoint • Quarkxpress • Freehand • Photoshop	
Positions: Help Desk/Technical Support					
HW/SW Technician				• Win 95, 98, 2000 • NT • Novell • MS Office	
RF Technician	• Analytical Skills • Attention to Details • Wireless, Digital or Telecom (P)		• 3 – 4 Years		

Note: P = Preferred/Plus

18

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Technical Support Rep.	• Written & Verbal Skills • Listening & Interpersonal Skills • Detail Oriented • Organizational Skills • Good Follow-Up	• AA or Equivalent Technical Schooling or Military Experience		• PC • DOS • Unix • Modems • Data Communication	
Computer Specialist	• Deal with Users	• Degree in IST or Related Years of Work Experience	• Minimum of 1 Year	• NT • Windows • Intel Computers • LAN • WAN • TCP/IP (P)	• U.S. Citizen
Help Desk Coordinator	• Excellent Communication Skills • Team Player • Work Well Under Pressure			• MVS • TSO • Sosf • JCL • Ca-7 • Win 95 • IBM Utilities	
Support Technician	• Team Oriented • Self-Starter • Customer Service			• Windows NT • Linux • Unix • Web Server • E-Mail	
IT Specialist	• Relational Database • Report Writing	• AA in Computers/ Business	• 2 – 4 Years of Business Experience	• MS Office • SQL • Windows NT	
Technical Support	• Customer Service			• LAN/WAN	
Communications Engineer	• Fiber Optics • Communication • Networks	• Bachelor's in Engineering or Electrical Technologies or Bachelor's and 2 Years Experience	• Education or 6 Years Experience	• OSI Model • TCP/IP	

27

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Engineering	• Broadcast/Recording Studio Equipment Maintenance • Ability to Troubleshoot	• Bachelor's in Electronics Engineering or Related Field • SBE Cert. (P)	• Education or Equivalent Experience of 3 Years	• Word Processing • Database • Spreadsheet • Auto CAD (P)	
Hardware Engineer	• Schematic Entry • Circuit Card • FPGA Design	• BS	• 2 Years		
Engineering Assistant	• Computer Skills • French	• AA			
Network Technician			• 3 – 5 Years or Technical Training	• IBM Hardware	
Positions: Management					
Director, Infrastructure	• Technical Skills • Network Design & Operations • Managing Variety of Operations Aspect		• 8 – 19 Years in Messaging Tech-Design/Operations	• Microsoft Exchange (P)	
Marketing Manager	• Manage Marketing • Maintain Network & E-Mail	• Bachelor's in Marketing or Related Field	• 2 Years		
Positions: Network/Systems Administration					
Secure Operating System Analyst	• Excellent Customer Service and Verbal Communications • Information Security and Network Devices • Network Monitoring Tools		• 3 Years in Network Systems Administration		
Senior Network Systems Engineer	• Work as a Team with Minimal Supervision • Oral and Written Skills • Write Reports/Paper Presentation Skills	• Bachelor's or Equivalent Work Experience			

Note: P = Preferred/Plus

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
NT Administrator				• NT Server • Novell	
Network Cabling			• Entry Level and Experienced	• Category 5 Fiber • Path Panel • Router • Hub • Voice Installation	
Info. Systems Assistant		• CNE • A++	• 3 Years in System Administration	• Novell • NT • Win 95, 98 • MS Office 97	
Network Administrator	• Detail Oriented • Self-Motivated • Network Hardware • Customer Service Orientation	• Bachelor's in Computer Science	• 2 Years Network Administration	• NT • DOS 7.0 • Win 98 • Outlook	
Multimedia Labs Manager	• Teaching/Training	• BS or Substantial Experience with Multimedia	• In Multimedia Project Development	• Macs • Apple • PCs • Adobe • Macromedia	
Senior Network Engineer		• Minimum of BS in CS or EE; • MCSE and Cisco Certificates (P)	• 5 Years	• LAN/WAN • TCP/IP • NT • Novell	
Web Administrator	• Good Writing Skills	• Communications Background (P)	• 1 Year in Web Site Development	• HTML • Internet Technology	
Systems Support Analyst	• Verbal and Written Communication Skills • Configure and Maintain Workstations • System Admin. Tasks			• Linux • Apache • Netscape Enterprise Server	

Note: P = Preferred/Plus

29

29A

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Web Operations Manager	• Design and Technical Expertise • Database Management		• 3 Years	• HTML • XHTML • Java Script • Java • Dreamweaver • Homesite • Photoshop	
Web Developer	• E-Commerce Concepts • Technical Expertise			• C++ • Java • NHTL • XML • Web Development Tools	
Network Systems Administrator	• Effective Communication with Users and Technical Professionals • Training	• College Degree or Equivalent Work Experience in Computer Systems	• 3 – 5 Years	• Windows NT • Windows 95, 98 • Macintosh • DOS • Computer Networks	
System Administrator		• BS in Computer Science, Physical Science, or Engineering	• 3 Years	• Unix • Soi • Rao Systems • Legato Networker	
Web Manager	• Project Management • Coordinate Technical and Design Teams • Manage Staff	• BA	• 5 Years in Web Management • 3 Years in Web Experience	• Atl/Stk Tape Libraries • Web Software • HTML • FTP • Dreamweaver • Fireworks • Adobe • Photoshop • Illustrator	
Web Development Manager	• Communication Skills		• 3 – 5 Years	• Cold Fusion • Perl • Database • Graphics	

Note: P = Preferred/Plus

30

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Positions: Other					
Administrative Assistant	• Word-Processing • Spreadsheet • Database • Team Player • Handle Multiple Tasks				
Senior Acquisition Specialist		• BA/BS • MBA (P) • CPCM • NCMA • DAWIAA	• 5 – 10 Years in Federal IT, Services & Commodities Acquisition		
Analysts				• HTML • Word • Scripting Language (P) • SQL(P)	
Senior SAS Professionals		• Advanced Degree	• Background in Health Studies/Biostat (P)	• SAS	
Production Coordinator	• Interpersonal Design • Communication Skills • Learn New Technologies Quickly • Work Independently	• Degree		• HTML	
Data Center Development Manager	• Budget Preparation and Scheduling	• Degree in Civil Engineering , Electrical Engineering, or Construction Management	• 5 – 8 Years in Data Center Development, Construction, or Real Estate.		
PC Equipment Salesperson	• Retail Experience				• DoD Back-ground Clearance

Note: P = Preferred/Plus

31

32

23

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Product Manager	• Internet/Web Strategies • Writing • Lead Market Research & Analysis	• Bachelor's	• 4 Years in High Tech. Marketing		
Data Analyst	• Customer Service Skills			• Excel • Databases	
Bmet li		• AA or 2-3 Years Experience Servicing Medical Equipment			
Sales Management Analyst	• Strong Computer Skills • Communication and Analytical Skills	• Bachelor's in Business Administration or Related Field (Computer Science Preferred)	• 2 Years	• Access • Excel • Word	
Promotions Coordinator	• Write, Edit, Understand Web Chats, Bulletin Boards and Forums		• Web Based Experience		
Sales Representative	• E-Commerce • Verbal and Communication • Presentation Skills • High Energy		• 3 Years in Print/Online Sales		
Sales	• Strong Phone Skills • Organized			• Microsoft Networking and Training	
Technical Writer	• Writing Technical Documentation	• Bachelor's in English or Related Field		• Robohelp	
Records Manager	• Organized • Detail Oriented	• Law Firm Records Experience			
Project Manager	• Knowledge of Telecommunication • Detail Oriented		• 3 Years in Accounting/Project Management	• Spreadsheet • Database • Word Processing	

Note: P = Preferred/Plus

33

24

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Telesales Representative	• Oral and Written Skills • Understanding of Business Cycle and Strategies		• 2 – 3 Years in Sales/Marketing		
Senior Revenue Analyst	• Communication and Motivation Skills • Work Independently and as a Team • Customer Service			• SAS • SQL • Arbor (P)	
Positions: Programming					
C++ Developer				• Unix • C • C++ • Pro*C • SQL • Oracle	
Application Support Specialist	• 3 GL Stored Procedures		• 3 Years	• Visual Basic • SQL • Access (P) • Crystal Reports	
E-Commerce	• Good Communication Skills	• BS	• 1+ Years in Solid Programming	• Java • C++ • Com • CORBA	
Java	• Full Life Cycle Experience		• Mid - Senior Level	• Java • Javascript • HTML • Unix (P) • Sybase (P)	
Oracle Technician	• Communication Skills • Interview and Assess Customer Needs			• Oracle • HTML • Foxpro • MS NT • Access • Autocad	

Note: P = Preferred/Plus

35

36

25

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Applications Developer	• Developing Software Applications	• BS in MIS, Computer Science or Related Field	• 4 Years	• Power Builder • Pro*C • Oracle	
Programmer Analyst	• Strong Interpersonal Skills • Handle Multiple Projects • Project Management (P)		• 2+ Years	• Visual Basic • Foxpro • SQL • Web Development (P) • Windows NT (P)	
Programmer Analyst	• Database Design, Analysis and Quality Assurance	• Bachelor in Computer Science or Engineering	• 1 Year	• IBM As/400 • Rpg/400 • CI/400	
Programmer	• Experience Creating Queries, Forms and Reports		• 1 – 3 Years	• Oracle • Sybase • Informix • Access • Unix (P)	
Senior Developer			• 10+ Years	• Oracle • Informix • Sybase • Unix/OS Operating System	• Secret Clearance
Tester	• Senior Level Test Case Development and Execution • Experience with Winrunner and Loadrunner Tools • Telecom Industry (P)			• C++ • Unix • Oracle	
VB Programmer		• BS		• VB • SQL • HTML	• U.S. Citizen
Programmers				• Spreadsheet • Word Processing • JCL • 4-5 Database Management Systems	

Note: P = Preferred/Plus

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Programmer			• 2+ Years	• Java 1.2 • J Developer 3	
Unix Administrator				• Unix • Sun Solaris	
Unix Engineer			• 3 – 5 Years	• Unix • Perl • Tkl C+ • PCs • Macs • Netware 4.11	
SQL, VB Development Mgr.	• Interpersonal Skills • Independent Initiative			• VB 6.0 • SQL 7.0 • Java • SAS • ASP • Dcom • Com • Mts • Ms Lis	
Software Engineer	• Teaching/Training • Database/Internet/ Multimedia • Design & Development	• MS in Info Tech.	• 6 Months	• SQL • Visual Basic • ASP • Visible Analyst • Toolbook	
Software Engineer	• Software Development	• BS in Computer Science or Electrical Engineering		• C • C++ • Unix	• Secret Clearance
Positions: Training/Instructional Design					
Instructional Designer	• Writing and Communication Skills • Knowledge of ISD Principles	• Instructional Design or Closely Related Discipline	• 3+ Years		
Technical Trainer	• Create Technical Training Materials		• 3-5 Yrs in Telecom Circuit Design Engineering		

Note: P = Preferred/Plus

27

39

40

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Training Coordinator	• Problem Solving • Presentation Skills • Written Communication Skills	• Bachelor's	• 3 – 5 Years	• Word • Excel • Outlook • Powerpoint • Docsopen • Summation (P) • Legal Key (P) • Win 95	
MCSE & CNE Instructor	• Good Communication Skills • Hands-on Technical Experience	• BS/BA • MCSE • CNE	• 2 – 3 Years in Technical Training		
Instructor of Info Systems		• Ph.D. (P) • Masters	• Business Experience • Teaching Experience	• Object-Oriented Development • Telecommunications • Database Management Systems	
Instructional Designers		• MA, MS, HRO or Adult Ed.	• 5+ Years		
Technical Trainer	• Training • Curriculum Development • Interpersonal/Communication Skills	• MCSE • MCSO • Bachelor's	• 2 Years of Teaching		

41

Note: P = Preferred/Plus

Sample 2 *

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Positions: Database					
Database Developers				■ Oracle ■ VB ■ C++/ODBC ■ Mssq2 ■ RDBMS ■ Unix ■ NT ■ Sybase ■ Informix	■ U.S. Citizen
Database Design Analyst		■ Bachelor's	■ 1 Year		
Relational Database Developer/Administrator	■ Monitor Database Performance ■ Database Development Skills		■ DB2 Exper (P)	Preferred Knowledge of: ■ DB2 Lsx For Domino ■ ODBC ■ IBM's Websphere ■ Notes Integration	
QA/Testing Coordinator			■ Oracle Development Experience	■ PL/SQL ■ Power Builder ■ Unix	
DBA					
Sr. System Architect	■ Excellent Communication Skills		■ 6 Yrs	■ Unix ■ Oracle ■ Java ■ C ■ Perl	
Oracle Database Developer	■ Data Mining and Programming Experience (P)	■ BS/MS in Computer or Equivalent (P)	■ 5+ Yrs in Designing and Maintaining Data Warehouses		

* Sample 2 is from the *Washington Post*, 4/16/00.

Note: P = Preferred/Plus

29

43   44

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Package Software Analyst			▪ Experience as Technical and Functional Analysts	▪ Oracle ▪ SAP ▪ Peoplesoft	
Database Administrator			▪ Very Experienced Database Administrator	▪ MS SQL ▪ Interbase ▪ Oracle ▪ Linux	
SAP Consultants			▪ 1-3 Yrs SAP ▪ 1-3 Yrs Software Design or Development Experience		
Database Administrator	▪ Technical Expert for SQL Server Issues		▪ Experience with Database Development ▪ 3+ Yrs Performing SQL Server ▪ Database Administration in NT Environment	▪ SQL ▪ Oracle ▪ Unix	
Database Administrator		▪ BS Degree			
Database Developer	▪ Good Analytical & Communication Skills			▪ Access ▪ VB ▪ GIS (P)	
Positions: Graphic Design					
Senior Web Programmers			▪ 6+ Yrs. Exper with Unix/CGI ▪ 2+ Yrs. Dynamic Database Web Sites	▪ Unix/CGI At Least 2 of the Following: ▪ Java ▪ Javascript ▪ DHTML ▪ SSI ▪ PHP ▪ MS SQL	
Internet Production Coordinator		▪ BS Degree	▪ Excellent HTML Authoring Skills	▪ HTML	

Note: P = Preferred/Plus

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Web Designer/Graphic			▪ Web Page Experience	▪ HTML ▪ Photoshop ▪ Windows NT	
Webmaster	▪ Excellent Communication Skills ▪ Ability to Work Well in Service-Driven Team-Oriented Environment	▪ Bachelor's	▪ 2 Yrs. with Internet Technologies or Server Management ▪ Experience with Database Design & Active Server Pages ▪ Experience with Graphics (P)	▪ SQL (P) ▪ Scripting Languages (P)	
Electronic Publisher	▪ Creative ▪ Smart ▪ Self-Motivated ▪ Committed				
Positions: Help Desk/Technical Support					
Technician		▪ MCSE (P)	▪ Technical Support Experience	▪ PC Hardware & Software ▪ LANS ▪ WANS ▪ Win OS	
Desktop Support Specialist	▪ Support & Troubleshoot NT		▪ 2+ Yrs. in Desktop Support & Installing Hardware & Software	▪ Solid PC Knowledge ▪ TCP/IP ▪ Oracle	
Help Desk Specialist II	▪ Solid Communication Skills ▪ Strong Customer Service Attitude		▪ 2 Yrs.	▪ Windows & NT Networks ▪ Outlook 98 ▪ Novell ▪ McAfee Anti-virus ▪ Office 97	
Data Center Technicians	▪ Computer/Network Hardware Troubleshooting				

Note: P = Preferred/Plus

31

47   48

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Computer Engineers	• Maintain, Support, & Configure PC's, Network Servers, & Mainframes	• Degree	• Or Equivalent Experience		• Need or Able to Get Top Secret Clearance
On-Site Techs	• Good Interpersonal Skills		• 3 Yrs. Hardware Knowledge	Preferred Hardware Knowledge of : • Dell • IBM • Compaq • Hewlett-Packard • OS Knowledge • Windows NT • Experience • Experience Repairing HP Printers (P)	
Tier II Engineers	• Install, Test, & Support PC & Notebook Workstations	• MCSE	• 1-3 Yrs.	• Windows NT/95/98 • MS Office 95/97 • MS Outlook • MS Explorer	
Systems Asst.	• Excellent Customer Service & Troubleshooting Skills • Business Environment Skills		• 1 yr. Experience in Desktop Support • Hands-On Knowledge of NT		
Computer Specialist			• User Support for Hardware & Software • Developing MIS System		
Micro Support Analyst	• Excellent Interpersonal & Communication • A Sense of Urgency • Team-Oriented	• CNE (P)	• 1-2 Yrs. Troubleshooting Windows 95/NT	• TCP/ICP (P) • McAfee (P) • Netware 4.1	

Note: P = Preferred/Plus

49

50

Positions: Management

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Knowledge Management Consultant/ Managers			Experience with: ■ Business Intelligence ■ Data Warehousing ■ Metadata Management	■ Familiarity with CA/ Platinum/ Sterling Products (P)	
Deputy Director			■ Exper. Managing Multi-Faceted IT Operation Including: ■ Mainframe ■ Client Servers ■ Extensive Telecommunica-tions Networks		
Director of Information Systems	■ Superior Interpersonal Skills ■ Ability to Adapt to Rapidly Changing Conditions	■ Bachelor's Degree	Experience in: ■ Supporting Windows ■ Operating Systems ■ MS Office ■ Managing Networks Including Windows NT, Netware, Lotus Notes ■ Video Conferencing (P)	■ HTML ■ Javascript ■ Database to Web Integration	

51

52

Note: P = Preferred/Plus

33

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Project Manager			■ 10+ Yrs. Managing Employees Knowledge of : ■ Project Planning ■ Requirement Analysis ■ Applications Development ■ Publication & Information Dissemination Applications	■ Legacy Systems	
Positions: Network/Systems Administration					
Network Administrator		■ MCSE or A+ or Equivalent Experience		■ NT 4.0 ■ PC Hardware Skills ■ FTP ■ MS Mail ■ Exchange ■ Unix	
Network Security Administrator		■ Masters in Computer Science, Electrical Engineering, or Closely Related Field	■ 5 Yrs. in Operation & Installation of Security Systems ■ 2 Yrs. Management Experience		
System Administrator			■ 2-3 Yrs. Unix	■ IBM AIX ■ Workstations ■ X Windows ■ VFS ■ NIA ■ DNS ■ TCP/IP	
Telecom Specialist			■ Telecom Engineering Support		

Note: P = Preferred/Plus

Position	Skills	Education/Certification	Experience (Number Of Years)	Hardware/Software Skills	Notes
Systems Integrator		• MCSE	• Experience Installing, Integrating, & Maintaining NT 4.0 Server • 5 Yrs.		
Associate Systems Analyst	• Extensive Knowledge of Unix Based Operating Systems & Applications		• 1 yr. with Unix Based System		
Deputy Program Manager	• Strong Interpersonal & Communication Skills • Extensive Client-Site Work & Direct Customer Interface	• Bachelor's Degree	• 7-10 Yrs. in Strategic Info Management Consulting Work • 5 Yrs. in Open Systems Development Project Management		
Network Admin Specialist	• Troubleshooting Skills/Experience	• CNA	• Experienced in Novell/NDS Environment	• Windows 95 • Netware 4.11 File Servers	
Microsoft Consultants		• MCSE • MCSD • Bachelor's Degree (P)	• Experience with BackOffice Products • Designed & Implemented Large Scale NT Networks • 2 Yrs. Experience		
Telecommunications Specialists	• Circuit Design • Frame Relay • ISDN • Switched Network				

Note: P = Preferred/Plus

55

56

35

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Systems Administrator	• Strong Written, Oral, & Organizational Skills • Strong Analysis & Troubleshooting • Learn New Applications Quickly	• BS in CS or IS	• Or Equivalent Experience	• Novell Windows NT Server • NDS • Domain Configuration • Windows 95 • MS Office • Major COT Packages • Unix (P)	
Network Engineers	• Good Oral & Written Skills • Experienced in Network Engineering	• BS in Computer Science or MIS • CISCO Cert (P)	• 5 Yrs. in Network Design, Operations, & Testing in WAN Environment		• U.S. Citizen • Have Security Clearance
Desktop/Network Manager	• Friendly Attitude • Desktop Applications Support/Training Configuration	• CNE • College Degree	• 3 Yrs. in Network Administration		
Data Networking Product Manager		• Bachelors or Masters in Electrical Engineering, Computer Science or Equivalent	• Experience with IP/MLPS Networking • 6+ Yrs. in Design of Fiber Optics or Data Communication Systems		
Network Architect		• BA/BS	• 4+ Yrs. in Consulting Technology • 2+ Yrs. in Network Management/Design/Implementation	• NT • Sun • WAN • RF	

Note: P = Preferred/Plus

36

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Senior NT	• Juggle Multiple Tasks • Work Independently	• MCSE (P)	• Extensive NT Back Office Experience • Project Lead Experiences • Hands-On Production/ Operation Experience	• NT 4.0 • DHCP • Exchange 5.5 • WINS • SQL • RAS • TCP/IP • Web Servers/IIS • Solaris (P)	
Positions: Other					
Analyst	• Excellent Written & Oral Communication Skills	• BS in Business	• 1-4 Yrs as Business Analyst	• MS Word • MS Excel • MS PowerPoint • MS Outlook	
Systems Analyst	• Procurement & Supply Chain Skills				
Admin Support/ Wordprocessor					
Technical Writer			• 3+ Yrs with Full Life Cycle Documentation	• Word	
Govt. Salesperson			• Federal Sales Experience		• U.S. Citizenship or Legal Resident • Must Pass DoD Background Check
Project Manager			• Experience in Telecommunications Industry (P) • 3 Yrs Experience		

Note: P = Preferred/Plus

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Order Reporting Analyst		• BA/BS in CS	• 3-5 Yrs in Relational Database Structuring • 2-3 Yrs in SQL Query Development	• MS Access • MS Excel • SQL • Visual Basic • Basic Database Architecture • Cognos/Power Play	
Technical Consultants					
Program Manager	• Manage Simultaneous Projects		• 15-20 Yrs Exper with Federal Govt. Programs • Successful Proposal/ New Business Development Exper.		
GIS Technician		• HS Degree	• 1 Yr. in Automated Cartographic Production, Civil Engineering, Cadastral Map Drafting, Thematic Color Separation, GIS Data Maintenance, Geography or Specialized Training in Arcinfo, Arview, Autocad, etc. • 1 Yr. in GIS Production Environment		
Marketing/Business Development Mgrs.					
Health Care Consultants					

Note: P = Preferred/Plus

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Production Control Clerk		■ 2-3 Yrs IBM JCL			
Executive Secretary	■ Good Writing & Editing ■ Oral Communication ■ Interact Effectively with Others		■ Experience in Administrative Processes and Practices	■ PCs ■ Software	
Positions: Programming					
Senior Software Engineer			■ Experience in Real Time Computer Graphics Programming ■ Network Programming (P) ■ System Administration (P) ■ Visual Simulation (P) ■ Game Development (P)	■ IRIX (P) ■ SGI Performer (P) ■ Maya/MEL (P) ■ Unix (P) ■ Linux (P) ■ Windows (P)	■ U.S. Citizen-ship (P)
Unix Admin	■ Configure & Troubleshoot Network Name Services such as NIS & NIST		■ 3-5 Yrs. SGI, IRIX, & Sun Solaris		■ DoD Clearance
Programmer/Analyst		■ Bachelor's Degree in Computer Science	■ 6 Mo. as Programmer/ System Analyst ■ 1 yr. Experience	■ Java ■ C++ ■ 3 Tier Software Design & Implementation Strategies ■ SQL ■ Unix ■ Netscape	
UNIX System Administrator				■ UNIX or Solaris	
UNIX/Sun			■ 4 Yrs. with Unix		
Cold Fusion Developers					

Note: P = Preferred/Plus

39

63

64

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
IBM ALC Programmer	▪ Strong Batch Job & Dump Analysis Skills		▪ 5 Yrs. with MVS/ESA, JCL, CLIST, TSO/ISPF, ENDEVOR, & IBM Utilities ▪ Exper. with PCDOCS (P)		▪ U.S. Citizenship or Legal Resident
Production Control Coordinator			Experience. with: ▪ Automated Scheduling Software ▪ Operating Systems Utilities ▪ 3-5 Yrs. in DOS/VSE/ESA Environment	▪ JCL	
Systems Analyst	▪ Strong Written & Verbal Communication Skills		▪ 5 Yrs. in Systems Analysis ▪ Exper with System Modeling Tools & Object Oriented Methodology (P) ▪ Familiarity with Microsoft Development Environment (P)		
Developer/Programmer		▪ BA/BS	▪ 7+ Yrs. Experience	▪ Java ▪ HTML ▪ Windows ▪ Netscape ▪ ESQL ▪ C ▪ Informix	▪ U.S. Citizenship or LPR Status
Java Programmer	▪ Good Oral & Written Communication	▪ BS/BA in Computer Science	▪ 1 yr. of Java, JDBC, RMI, CORBA, & Full Time Cycle Client Server		

Note: P = Preferred/Plus

40

65

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Sr. Java Developers			▪ 2 + Yrs. In Java Development	▪ UML ▪ EJB ▪ JSB ▪ Java 1.2 ▪ JDBC ▪ RMI ▪ SQL ▪ HTML	
Senior SAS Programmers		▪ Advanced Degree Background in Health Studies Research or Biostats or Epidemiological Applications or Other Statistical Programming Experience	▪ 8+ Yrs. of Technical & Leadership Experience	• SAS	
Project/Program Managers				▪ Java ▪ EJB ▪ CORBA ▪ C++ ▪ Com ▪ Dcom ▪ MTS ▪ ATL ▪ SQL Server ▪ Ariba ▪ Broadvision ▪ OpenMarket	
Microsoft Systems Engineers		▪ MCSE and MCP	▪ Exper in Microsoft Systems Development or Software Development or NT Administration or Internet Development		

Note: P = Preferred/Plus

41

Position	Skills	Education/ Certification	Experience (Number Of Years)	Hardware/ Software Skills	Notes
Java Programmer			▪ Design & Build Networks	▪ Java ▪ EJB ▪ J2EE ▪ XML ▪ Web Client ▪ Server Development ▪ WebLogic ▪ BEA ▪ Middleware	
Unix Support				▪ Unix ▪ TCP/IP ▪ Internet ▪ DNS ▪ Solaris	
Mainframe Programmers			▪ Strong IBM Mainframe Skills	▪ COBOL ▪ CB2 ▪ CLISTS ▪ JCL	▪ U.S. Citizen-ship
Java Developer			▪ Web Development		
Web Programmer	▪ Project Management Skills (P) ▪ Technical Writing Skills (P)	▪ BS in CS or Related Field	▪ 1-3 Yrs. with Internet Related Programming & Technologies	▪ HTML ▪ CGI ▪ Perl ▪ Java ▪ Oracle (P) ▪ Access (P) ▪ SQL Server (P) ▪ ASP (P) ▪ XML (P)	
Software Engineers	▪ Good Communication Skills ▪ Ability to Work Independently		▪ 2 Yrs. Programming	▪ MS SQL ▪ SQL ▪ VB Seagate ▪ Crystal Reports ▪ ASP ▪ Active X ▪ Cold Fusion	▪ U.S. Citizen-ship or Perma-nent Resident
Positions: Training/Instructional Design					
Teacher/Coordinator	▪ Teaching		▪ Teaching Exper		

Note: P = Preferred/Plus

42

Summary

This report presents an analysis of the skills, education, and work experience that information technology (IT) employers in the Washington, D.C. metropolitan area are seeking in job candidates, as indicated by their advertisements for IT jobs in the *Washington Post.* Samples of IT jobs advertised in the 2/13/00 and 4/16/00 editions of the *Washington Post* were gathered and examined, to provide information about the kinds of IT jobs being advertised and the skill sets employers expect from job seekers. One hundred eighty-two advertisements for job openings were selected for analysis.

The skill sets required for the advertised positions varied greatly from one job to another. Two of the most common requirements across the categories were for technical expertise in one or more areas and work experience. Some jobs called for non-technical as well as technical skills, with oral and written communication skills being those most frequently mentioned in the advertisements that were analyzed.

Many of the advertisements indicated that candidates were required to be familiar with several types of hardware and/or software. Some of the more frequently mentioned software products included HTML, Oracle, UNIX, SQL, Windows NT, Windows 95/98/2000, and MS Office. The technical skills and experience being sought varied depending on the job category. Technical support, network administration, database management, and programming positions often required candidates with expertise in such technologies as Windows NT, LAN/WAN, Novell, UNIX, and Oracle. Graphic design positions placed more emphasis on candidates with HTML and PhotoShop or Illustrator skills and experience.

Across the job categories, a majority of the jobs required work experience, often of several years' duration. Advertisements for programming and management positions often required extensive work experience in specific areas. The majority of the training/instructional design positions required candidates to have past teaching experience. In general, for positions examined in this report, graphic design jobs required the least amount of work experience.

The educational requirements for IT jobs varied among the advertised positions. Less than half of the advertisements required candidates to possess a degree; many required software or systems specialization. Advertisements for instructional positions, network/systems administration positions, and programming positions sought candidates with degrees ranging from a Bachelor's to a Ph.D. Some technical support and graphic design positions required candidates to have degrees or certifications in specific software products. In contrast, job openings in database-related areas placed less emphasis on candidates' degrees and more importance on their work experience.

71

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To achieve this mission, the following strategic goals for 1999-2001 are established:

I.   Sustain and Strengthen Academic Quality and Teaching Excellence.

II.   Enhance the Quality of Services to Students.

III.   Expand the Integration of Technology in Instruction and Administration.

IV.   Increase Access to College Programs and Services.

V.   Improve the Quality of Institutional Communication.

VI.   Strengthen Programs That Help Build a World Class Workforce.

VII. Promote Responsiveness to Diversity of Students and Employees.

VIII. Strengthen and Develop Additional Linkages with Community Groups.

IX.   Integrate College Planning and Facility Requirements.

X.   Enhance the Overall Wellness of Our Working and Living Environments.

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