CHAPTER 1

The IT Field

Before diving into your IT job search, you should first be familiar with the tech field and the job market. This chapter helps point you in the right direction. In addition, to help you make informed decisions about an IT career, also covered in this chapter are the hot IT skills needed in the industry and a look into areas that are likely to be a big hit in the future.

General IT Field Information

With literally billions of computers sitting on office desks throughout the world, and the massive networks that support digital communications, there is a huge need for Information Technology (IT) professionals. Companies are in dire need of people who can analyze, design, develop, test, support, and manage IT solutions. This high-demand field is likely to remain so for the foreseeable future. If you're not already working in an IT job, now is the time to put yourself in a position to profit from this hot field. For those of you who are already working in IT, you should take advantage of the many opportunities to pursue a higher-paid position. There are plenty of opportunities for everyone, so don't hold back. Go forward now and prosper!

Job Outlook

The technology job market is back, and analysts predict it is only going to get stronger. Less than ten years after the Internet bubble turned some web CEOs into taxi drivers, competition for IT professionals is once again heating up, and you can be part of it. In fact, while the nation as a whole will see an upswing in tech hiring, up to 24% of CIOs plan to expand their IT departments in some areas of the United States, according to the IT Hiring Index and Skills Report conducted by Robert Half Technology in 2006. Although analysts warn that these trends can change quickly, a sufficient amount of evidence suggests good times are here for a while. The drive for new technology, combined with companies reporting healthy profit margins, paints a rosy picture for IT workers.

Some of what is making the job market outlook in the IT industry so rosy is the baby boomer phenomenon. Every year between now and 2024, three to four million of the 78 million baby boomers born between 1946 and 1964 will celebrate their 60th birthdays, causing a mass exodus of Baby Boomers from the IT workplace. Even though a Baby Boom retirement brain drain seems inevitable, corporate America doesn't seem to be gearing up for it to the extent that they should. A survey by the Novations Group found that while 60% of companies are seeing signs of an upcoming shortage of talent, only 32 percent are actively doing anything about it, such as recalibrating their promotion criteria or rethinking their recruitment strategies.

Again, if you're thinking about getting into the IT industry, or you're already working as an IT professional and want to advance, now is certainly the time!

Education Requirements

For most IT jobs, a college degree is a must. Although it is possible to land some positions without a degree under your belt, a four-year degree is usually required to progress within the IT world. A few years of related real-world experience, certifications, and certificates can function as a substitute for a degree in some cases, but keep in mind that nongraduates typically realize a smaller salary and find it hard to compete with other job seekers who do have higher education. However, don't let that stop you from trying to get into the IT field. It will likely be well worth your time to work at a lower salary at first while completing a college degree. Once you have the degree, you'll have some good practical experience and will be ready to demand awesome pay.

There are several different degree tracks IT professionals follow, including the following:

- **Computer Science:** Computer science degrees concentrate on the study of basic principles and tools used by computer software professionals, including algorithms and data structures, programming languages, numerical and symbolic computation, operating systems, software

methodology and tools, database and information retrieval, and artificial intelligence.

- **Computer Engineering:** Computer engineering degrees deal with analysis and design of computer systems, including the study of basic electronics, digital circuits, computer hardware, algorithms and data structures, programming languages, operating systems, and visualization and robotics.
- **Electrical Engineering:** Electrical engineering degrees concentrate on the study and application of electricity and electromagnetism. Electrical engineering is a broad field that encompasses many subfields, including those that deal with power, control systems, electronics, telecommunications, and computer networks.
- **Management Information Systems (MIS):** MIS degrees focus on the areas of organizations and technology. MIS covers theory, methodology, and hands-on experience to analyze, design, implement, and manage an organization's information technology and information systems.
- **Masters in Business Administration (MBA):** In addition to a masters degree in any of the previously mentioned areas, an MBA is crucial in attaining an upper management position. MBA degrees include many business areas of study, such as accounting, marketing, economics, and business law.

Keep in mind that in the IT field, you should also have the appropriate skills to back up your education.

Skills Requirements

The most important aspect to understand about the IT field is that your technical skills and knowledge are key to getting the higher-paying jobs. Unlike other industries, in IT it's not often who you know, and it usually doesn't matter where you went to school; it's what you know.

When attending higher-education schools, make sure you take classes that offer hands-on experience with the technology or area you would like to pursue in your IT career. In addition, you can usually find ways to get even more experience out of the school before you try to get that dream job. For example, you may have to work a lower0-paid position the first few years out of college to gain some experience before getting into a position you really desire. You could also think about entering into a co-op job or internship while in college to obtain more experience quicker. You can also receive additional familiarization with IT areas in your spare time. For example, if you want to land a job as a Visual Basic or C++ programmer, you can typically purchase the programming software at a discounted rate from a local college bookstore and use those tools to get some additional experience at home.

Work Environment

Of course, the work environment varies among the different types of IT jobs; however, most IT professionals spend a majority of their time in an office working in front of a computer and being participants at meetings — discussing topics such as the defining end user functional requirements, potential remedies for network problems, or plans for testing the deployment of a new application. Most IT professionals work at least 40 hours a week, and many have to work additional hours in the evenings and on weekends to meet deadlines or solve unexpected problems. In some cases, especially when the IT system for a company spans multiple cities, IT professionals need to travel periodically.

Better communications technologies and the lower costs of mobile computers have enabled more technology professionals to perform work activities or communications remotely while away from their main office, such as at home or while traveling. In fact, some IT jobs allow you to work by telecommuting.

Earnings

Not only does the growth and stability of IT jobs look good for the future, as discussed earlier, wages for IT jobs are also trending upward. Nationwide, the average high-tech salary grew 5.1% to $69,000 in 2005, a telling leap compared to a year earlier, when it grew at 4.3% according to Economy.com. In addition, while jobs and salaries were increasing, the number of tech-related layoffs was dropping. High pay is not always the most compelling reason to get a new job, but it sure doesn't hurt!

Top Wanted IT Skills

Are you wondering what technology or field you should get into? Want to make sure you get into a hot area? You can start off by reviewing Dice's statistics for most sought-after skills by IT companies, as shown in Figure 1-1.

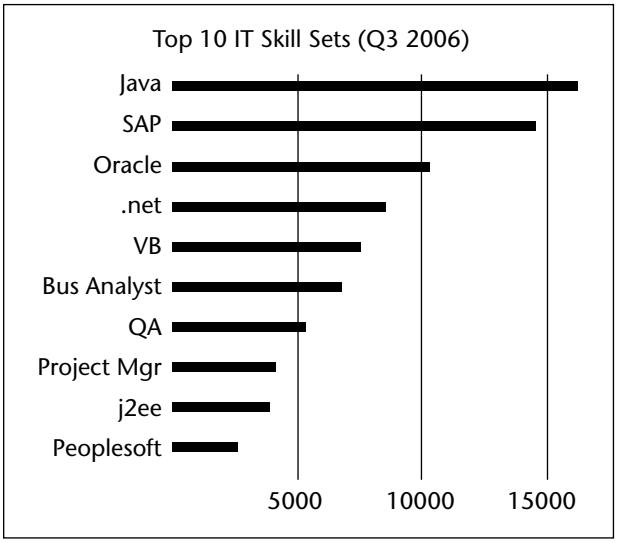

Figure 1-1: Dice's Top Wanted IT Skills.

The following describes each of these skills:

- **Java:** Java is a programming language. It is owned by Sun Microsystems, and is used in Internet applications. For example, Java applets can be downloaded from a web server and run on your computer by a Java-compatible web browser, such as Netscape Navigator or Microsoft Internet Explorer. Java uses a syntax similar to the C++ programming language, but it is enhanced, which makes Java a clean, safe, secure, and object-oriented programming language.
- **SAP:** Systems Applications and Products (SAP) is one of the world's largest inter-enterprise software companies and the third-largest software supplier overall. It is considered the best Enterprise Resource Planning (ERP) solution provider. An ERP system integrates all manufacturing functions, such as product planning, parts purchasing, maintaining inventories, interacting with suppliers, customer service, and order tracking, into a single system.
- **Oracle:** Oracle is a relational database management system (RDBMS) developed by the Oracle Corporation, one of the world's largest enterprise software companies. Other database tools they develop include middle-tier software, enterprise resource planning software (ERP), customer relationship management software (CRM), and supply chain planning (SCM) software.

- **.NET:** A term or trade name coined by Microsoft, .NET applies to a collection of Microsoft products and technologies that integrate information, users, systems, and devices to web services.
- **Visual Basic (VB):** Visual Basic is a programming language, developed by Microsoft, used to develop Windows software applications. VB enables developers to create applications that are easy to learn, use, and maintain.
- **Business Analysis:** Business analysis includes the tasks of analyzing the business needs of clients and stakeholders and identifying business problems, defining needs, and proposing solutions.
- **Quality Assurance:** Quality assurance includes the tasks of measuring, testing, and controlling to ensure good-quality work. For example, quality assurance helps eliminate errors and bugs during the development of software applications to prevent defective products during manufacturing.
- **Project Management:** Project management includes the responsibility of planning, coordinating, and controlling a project or group. For example, a project manager may be in charge of a team responsible for developing a new software application.
- **J2EE:** The Java 2 Platform, Enterprise Edition or J2EE for short, is a Java programming platform for developing and deploying enterprise applications, such as web servers, application servers, messaging software, and web services engines.
- **PeopleSoft:** PeopleSoft is a software company, bought out by Oracle Corporation in 2005, that develops software solutions for large corporations and organizations. It focuses on many aspects of business, including HRMS (human resource management), CRM (customer relationship management), and EPM (Enterprise Performance Management).

If you already have skills in these areas, then you have a lot of opportunities waiting for you in the current IT industry. If your skills are somewhat lacking in these areas, then consider getting some applicable training and certifications so that you're better equipped to find the IT job that interests you. Keep in mind that the IT skills described above aren't the only ones available; numerous other subcategories and specializations are also in demand as well. The areas just described are merely the most common.

Technology Careers

Many different areas in the IT field offer career opportunities, such as the following:

- Database development and administration
- Digital media
- Networking devices
- Network infrastructure
- Network security
- System administration
- Enterprise Resource Planning (ERP)
- Programming
- Web development and administration
- Technical writing
- Technical training
- IT management
- Business analysis

These IT concentrations are discussed in the following sections.

To learn more about different IT jobs, see Chapter 2, which contains ideas and information from IT professionals about a variety of different positions. This will give you real-world insight into the day-to-day activities you could expect when working in the IT world.

Database Development and Administration

People in database development and administration are responsible for designing, creating, and supporting database systems to ensure that organizations have secure, reliable, and streamlined database systems to store and retrieve information, such as customer and sales information. Popular databases include SQL and Oracle.

Possible job positions in this area include the following:

- Business intelligence architect (or knowledge architect)
- Database technician
- Database analyst

- Database developer
- Database administrator
- Data architect
- Data analyst

Digital Media

Professionals in digital media design and create digital media, including audio, video, graphics, and animations. Digital media is used in a variety of media outlets, including websites, software, video games, kiosks, and print media.

Possible job positions in this area include the following:

- Multimedia specialist
- e-Learning designer
- Digital media designer

Networking Devices

People working in this area are in charge of troubleshooting and maintaining all devices used on a network, including PCs, PDAs, and peripherals. This work ensures that the users of client devices have reliable network access. They may also manage a small local area network (LAN).

Possible job positions in this area include the following:

- Service center technician
- PC technician
- Help desk technician
- Field support technician
- Customer service technician

Network Infrastructure

Like those who support networking devices, the network infrastructure team works with networks but is responsible for the components that make up the network (such as routes and switches), rather than just the client devices. In addition, these individuals usually have to monitor, maintain, and upgrade the network infrastructure.

Possible job positions in this area include the following:

- Network support technician
- Network analyst

- Network administrator
- Hardware installation coordinator
- Computer operator

Network Security

This burgeoning field of professionals is responsible for ensuring and enhancing the security of a company's networks and systems. They may also be responsible for developing and enforcing security policies and may perform risk assessments, security audits, and network vulnerability assessments.

Possible job positions in this area include the following:

- Network security analyst
- Network security architect
- Network security engineer

System Administration

System administration involves setting up, managing, and troubleshooting systems, such as Unix, Windows, or proprietary systems. For example, system administrators of a Windows system may set up and maintain user accounts, system profiles, and file privileges. Other tasks in system administration may involve monitoring of the system, ensuring optimum performance, and providing technical support and training.

Job positions in this area are usually called system administrator or system admin.

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is a business management system that helps companies manage the important parts of their business, including planning, manufacturing, sales, and marketing, through a common corporate database. Well-known ERP software providers include SAP; Oracle, which now includes PeopleSoft; and BAAN.

Possible job positions in this area include the following:

- ERP business analyst
- ERP solutions architect
- ERP reporting expert
- ERP technical architect

Programming

Programming involves authoring, maintaining, and updating computer code that makes up partial or entire software applications for internal use or for products. Popular programming languages include C, C++, Basic, and Java. Programming is needed for multiple types of platforms and operating systems, such as Windows, Palm, Linux/Unix, and proprietary systems.

Possible job positions in this area include the following:

- Systems analyst
- Software quality assurance specialist
- Software architect
- Software application support
- Software developer (or programmer)
- Operating systems specialist

Web Development and Administration

Web development and administration, like programming, involve writing code; however, this area concentrates on developing only Internet-based applications. Keep in mind that these application aren't just used over the Internet but can also be run on individual PCs or networks.

Possible job positions in this area include the following:

- Webmaster
- Internet systems administrator
- Internet site designer
- Internet security specialist
- Internet network specialist
- Internet e-commerce specialist
- Internet database specialist
- Internet application developer

Technical Writing

Technical writing includes the design and authoring of documentation for technology products and services. For example, technical writing is needed to create user guides and manuals for consumer- and enterprise-level products such as computers, software, and other computing devices.

The most prominent job position in this area is technical writer. Another related position is technical editor.

Technical Training

Technical training involves preparing and performing training related to a given aspect of IT. This support can be performed for internal employees or offered to a company's customers. Some of these professionals are employed full-time by larger companies, while others may work as consultants.

Possible job positions in this area include the following:

- Technical trainer
- Training specialist
- Training developer

IT Management

IT management, such as project management or director positions, typically involves overseeing and being responsible for a team or project. This usually includes the planning, monitoring, directing, and controlling of a defined project. Critical to the success of any project are its specifications, such as scope, deadlines, budgets, and resource availability. Project managers usually serve in this capacity for the duration of a single project, whereas directors usually stay indefinitely to manage all the projects given to their team.

Keep in mind that some companies have program management positions, which manage a group of related projects. In addition, most companies have a chief information officer (CIO) or chief technology officer (CTO) who oversees all IT areas within the company.

These types of management positions are typically needed throughout all the different IT areas described. Companies looking for management support are seeking individuals with knowledge and experience in the given area.

Possible job positions include the following:

- Project manager
- Program manager
- Director
- Chief information officer (CIO)
- Chief technology officer (CTO)

Business Analysis

Professionals in this area determine the needs and requirements of the company to aid in IT decisions and direction, and may also include creating policies and procedures. For example, a business analyst will research and evaluate whether installing a wireless network would be feasible according to the company's needs, considering the benefits, the costs, and the ROI before determining whether it would be a wise business decision.

Possible job positions in this area include the following:

- Requirements analysis
- Business planning and analysis support

Future Wanted IT Skills

To stay ahead of the crowd, it is important to keep abreast of new technologies, especially those predicted to become widely adopted in the future. Not only does this help you keep a job with your existing employer, it also prepares you for moving on and staying competitive with your peers.

The following sections discuss a few growing areas in the IT field worth your consideration. Bear in mind that the tech field is likely the most rapidly changing one you could enter — exciting, challenging, and, most important, competitive. In addition to investigating other areas and technologies, keep your skill set up-to-date to ensure that you are well positioned when making career decisions.

Wireless Networking

Behind the alphabet soup of wireless network technologies and standards is a long list of interesting career opportunities. Looking for a growth market? This is it. How can you tell that wireless networking is hot? Just pop open your laptop and log on to the Internet. Maybe you're at home using your personal wireless network (or your neighbor's). Maybe you're at the office, or in an airport, or in a hotel lobby, or even on a park bench. In the near future, we're going to expect access to a wireless hotspot virtually everywhere we go. As Frank Derfler, a connectivity expert who writes about networking for *PC Magazine*, puts it, "Wireless networking is beyond ubiquitous, it's mandatory!" Of course, someone has to design, implement, and market all that mandatory infrastructure. Maybe that person is you. If you're interested in networking, it's absolutely vital to keep up with every fast-moving twist and turn in the technology. Of course, as Derfler points out, "You also need a solid foundation of networking knowledge and experience."

The term *wireless networking* encompasses many concepts, including local area networks (LANs), wide area networks (WANs), and even personal area networks (PANs), that are implemented with short-range Bluetooth technology. The most familiar technology is Wi-Fi — although Wi-Fi is not a technology per se but a wireless solution that conforms to the IEEE 802.11b or 802.11g standards. The consistency of 802.11b, its rapidly plunging costs, and its easy implementation have taken it from nowhere to everywhere in less than 10 years.

802.11b was followed by 802.11a, a faster but incompatible standard that has found some traction but has been overtaken by a third standard, 802.11g, which has five times the throughput of 802.11b but is backwardly compatible with all that legacy 802.11b equipment.

But that's not the end of the story. Designing wireless networks is like painting bridges: The job is never done. In January 2006, the IEEE ratified yet another standard, 802.11n, which promises increased range as well as 10 times the throughput of 802.11g and 40 times the throughput of 802.11b. "Wireless networking is at the point where it is eliminating the need to wire new houses and businesses with Category 5 cable. Last year, a Cat 5 cable drop in every room was mandatory in every building plan. This year that's so 'last year,'" Derfler says. Also on the horizon is WiMAX, which could represent another quantum leap in wireless range and speed.

Chicago, Philadelphia, San Francisco, and Denver are but a few of dozens of cities that have put out RFPs to construct massive wireless networks — in the case of Chicago, a network that would cover a whopping 228 square miles. While it's unclear if or how cities would charge for access, governments clearly feel that this kind of easily available connectivity is vital to keeping local economies humming. Proposals will be coming in from phone companies, local and national Internet service providers, and custom integrators, all of which are good places to keep an eye out for newly available positions in network design and management.

On a much smaller scale, wireless networks need to be installed in private homes, offices, hospitals, hotels, and more. Everyone from The Geek Squad to local cable companies are getting in on the act. Small wireless LANs are relatively easy to set up (hence their rapid proliferation), but those low barriers to entry mean that while getting started may be a snap, it's harder to follow through with professional finesse. Derfler sees career opportunities there. "Anyone can install a wireless network access point badly in just a few minutes," he says. "Then professionals have to spend hours making it safe, secure, and reliable."

The bottom line? All the indicators are pointing up, and anyone with a decent amount of networking experience should pay attention to all the action in the wireless world. We may not be able to see wireless networks, but we're all going to feel the impact of their power in the years to come.

AJAX

Do you want to create web pages with maps that scroll, or informational balloons that magically appear when needed? What about writing an online e-mail client for your business that acts just like Outlook on a PC, right down to the keyboard shortcuts? Web applications that act like desktop applications are in great demand.

To add more punch to web pages, developers are increasingly turning to an emerging technique called AJAX, which is shorthand for *asynchronous JavaScript and XML*. The term was coined by Jesse James Garrett, an information architect, in an essay he published last year titled "AJAX: A New Approach to Web Applications." Today, AJAX applications are employed on sites as diverse as Amazon.com, Flickr, Netflix, Salesforce.com, and Yahoo!, not to mention the internal websites of numerous companies.

The AJAX poster child, however, is arguably Google Maps. Online map aficionados may remember how map sites used to work: They would display a static map image, and shifting the map's focus, or zooming in or out, required clicking the relevant link and then waiting for the page to reload. With Google Maps, however, you can drag a map in any direction with your mouse cursor, or immediately zoom in or out.

While that fluid user experience is common for desktop applications, until recently it just wasn't available on Web pages. In short, AJAX creates all sorts of possibilities for developers, not to mention requests from companies demanding "more interactive" web applications.

One reason for AJAX's popularity is because it can create eye-popping websites with unforeseen levels of interactivity, including drag-and-drop capabilities and fluid zooming.

Another reason for AJAX's popularity is that it doesn't require developers to learn another language or vocabulary. Instead, it makes use of a web developer's existing skill set. "The reason why Ajax is such a popular choice is that it leverages the native capabilities of the browser," observes Dave Crane, senior developer/architect at HistoricFutures.com and co-author of *Ajax in Action* (Manning Publications, 2005). In other words, developers who have previously created web applications can build AJAX applications using their "existing skills in HTML, CSS (cascading style sheets), and JavaScript."

Web 2.0 Mystique

Web 2.0. It's the buzzword of the year, the subject of business magazine cover stories, the great hope for the ultimate revival of Silicon Valley. Its name even suggests a sort of second coming. But when we talk about Web 2.0, what, exactly, are we talking about? Is it truly the "next big thing"? More important, does it offer promising career paths for developers?

Web veterans who were burned once before and are now wary of marketing hype are taking a close look, trying to determine whether the services, sites, and products associated with this wave are the real deal, and whether the Web 2.0 movement is destined to deliver new and interesting challenges for experienced web developers.

A Web 2.0 site or application is one that not only delivers compelling and specific services or content, but also invites the participation of its users to add to, interact with, edit, share, and improvise on the features or the content. By involving users, the whole becomes greater than the sum of the parts, and new kinds of value are created. If you've ever used a Google map, you get the idea.

One of the underlying common denominators of most Web 2.0 apps is AJAX, a loose collection of programming techniques that adds the user interactivity that makes Web 2.0 sites so compelling. With AJAX, much of the code is handled on the client end, allowing for much more interactive applications. As an evolutionary step up from JavaScript, it can be a challenge for developers who are more used to traditional JavaScript programming.

Can you handle it? The likely answer is yes. If you're fluent in HTML, XML, and CSS, and have strong experience with JavaScript, you can probably conquer AJAX with some studying and practice. As Nathan Oostendorp, Front-End Architect for SourceForge.net Group, puts it, "Most of the programmers I know who use AJAX learn exclusively online, although not from a single particular source. But remember that 'AJAX programming' is really mostly 'JavaScript programming.'"

John Clyman, a programming expert and a principal of Seattle-based Cascadia Labs, agrees, and sees AJAX as part of a progression. Raw HTML is pretty easy. XML/XHTML requires slightly more discipline. Getting good with CSS requires some practice. "JavaScript is a real programming language that you can do a lot with," he says. "Doing serious AJAX is probably closer to writing traditional web apps where you need some real programming skill, but there are a bunch of prefab toolkits around that simplify the task." Clyman adds that "a really simple AJAX widget might take a day or less, but doing something amazing like Google Maps probably takes months of hardcore efforts."

If you're interested in applying your programming skills to building the future of the Internet, you should have plenty of opportunities to do so. Today, sites and services that qualify as Web 2.0 abound, and more are coming on the scene every day. Internet marketing guru Seth Godin, who is famous for his trend spotting, has counted a whopping 937 Web 2.0 sites, which he tracks at www.alexaholic.com/sethgodin, including everything from Adaptiveblue.com to Zvents.com. Ranking the list by traffic, his top five .coms are MySpace, eBay, YouTube, Wikipedia, and Orkut. A look at the career pages at some of the top sites on Godin's list will give you a great idea of just what you'll need to make the cut at a high-profile Web 2.0 site.

Another fun way to experience the scope of Web 2.0 sites is web2logo.com, a site at which you can search Web 2.0 companies by category and learn more about them, while it simultaneously presents you with all their strangely similar logos.

In the end, for all the hype around Web 2.0, perhaps it's nothing more than the next small step on the long evolutionary path that the Internet is taking. As the editor of *PC Magazine,* Lance Ulanoff, says, "Web development lives on a continuum of new ideas. We're in the logical phase for our time, and the next one is whatever should naturally follow." Ulanoff doesn't claim to know for sure what that next one will be, but it seems inevitable that whatever it is, someone will try to call it Web 3.0.

Summary

Don't forget the following points made in this chapter:

- The job outlook and pay in the IT area looks great.
- Along with obtaining a college degree, concentrate on developing and enhancing your technical skills, which are really your greatest assets.
- Consider getting into the hot areas in IT by researching the Top Wanted IT Skills.
- Keep current. Stay abreast of new or developing technologies and areas expected to be hot in the future.