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IDAHO INFORMATION TECHNOLOGY (IT) PROFESSIONAL LICENSING  
GUIDE

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## **IMPORTANT NOTIFICATION**

This licensing guide will give a brief overview of the top Information Technology (IT) professions as well as offer links to education and certification programs that will help you reach your goals. There are three main occupational areas in IT that this guide will address; Infrastructure, Software Development and Programming, and Information Support and Services. This guide will also highlight two career pathways for each occupational area that is popular in Idaho and the Treasure Valley and describe these professions more in depth. There is also a certification and credentialing section that will highlight key certifications that will be useful to have when applying for jobs.

## **1. HOW THE PROFESSION IS ORGANIZED IN IDAHO**

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### **INTRODUCTION**

The profession of Information Technology (IT) in Idaho is an unregulated field. There are credential requirements for many of the fields in IT, but they do not require licensure or registration processes by the state government.

The three main areas of IT this guide will be addressing is as follows:

- Infrastructure
- Software development and programming
- Information support and services

<b>IT Infrastructure positions</b>	<b>Software development and programming positions</b>	<b>IT Information support and services positions</b>
IT Infrastructure Architect	IT Software Architect	Web Developer
IT Infrastructure Engineer	IT Software Business Analyst	Network engineer
Server Engineer	IT Software Developer	Technical consultant.
Network Systems Engineer	IT Software Database Administrator	Technical sales representative
Network Administrator	IT Software Quality Analyst	account manage
IT Infrastructure Tech Support	Software tester.	Sales executive.
Desktop Support	Computer systems analyst	product planner,
<u>Help Desk</u>	Information security analyst	Master scheduler.
<u>PC Tech</u>	IT consultant	Multimedia programmer
Computer user support specialist	Mobile application developer	Computer forensic investigator
Cloud architect	Data Modeler	Health IT specialist

IT is a very innovative field of employment and requires individuals who are able to adapt to changes of the industry. The industry is also highly competitive and even though degrees are not required for most of the careers, it is important to know that a B.S. or B.A. degree might give you an edge in being hired over others.

The Idaho IT Professional Guide is going to provide the following information:

- Provide an overview of in-demand employment information for both IT infrastructure and software development in Boise and Idaho

- Provide information about skills and certifications that can help you prepare for employment
- Share knowledge about US workplace culture and information pertinent to foreign IT Professionals.
- Provide career resources for Idaho employment

## FURTHER INFORMATION

The [Bureau of Labor Statistics Occupational Outlook Handbook](#), has additional information on the wide array of IT Professions in the US. Although this is a broad overview of the process, the specifics on credentials and certifications will be highlighted with links that you can use to learn more information.

## 2. IT INFRASTRUCTURE

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### OVERVIEW

The following roles in IT Infrastructure are organized by hierarchy:

IT Infrastructure Architect: high-level systems analyst who works with chief information officers (CIOs) and other decision-makers to assess needs, design all networks, and choose vendors. Often project-based work, unless the system being created and maintained is very large in scale. In addition to technical, analytical, and project management skills, this role demands constant client contact and excellent communication skills.

IT Infrastructure Engineer: implement architects' projects and have a more permanent role in maintaining systems.

- Server Engineer: works exclusively on the server network by designing and supporting the equipment that provides the operational capacity for an IT system.
- Network Systems Engineer: works on Local Area Network (LAN) and Wide Area Network (WAN) connectivity using equipment (e.g. switches, routers, cabling), protocols and software to connect all networked devices. There has been significant growth in WANs as companies of all sizes connect global offices and support mobile and remote users.

- Network Administrator: manages users on the network and provides some server support. This role is in decline: these responsibilities are usually managed by services such as tech support.

IT Infrastructure Tech Support: implements service request management, incident and problem management, change and configuration management, and user self-service configuration management.

- Desktop Support: trouble-shoots end-user problems with hardware and software and often provides basic server support. This position is the most common within tech support and is an on-site role which involves face-to-face interactions.
- Help Desk: works entirely over the phone/network to help end users. While this work is often done from other countries, there is a growing concern about the quality of remote support and, as a result, companies are offering these jobs in the U.S.. Strong verbal communication skills are essential.
- PC Tech: traditionally handles Install, Moves, Adds, and Changes or IMAC activities, setting up or modifying people's workstations (hardware and software) in an organization. In a difficult economy, companies may try to eliminate this role or use outsourcing on an as-needed basis.

## **FOCUS ON: COMPUTER HARDWARE ENGINEERS**

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**Job Description:** Computer hardware engineers research, design, develop, and test computer systems and components such as processors, circuit boards, memory devices, networks, and routers. These engineers discover new directions in computer hardware, which generate rapid advances in computer technology. Computer hardware engineers usually work in research laboratories that build and test various types of computer models. Most work in high-tech manufacturing firms.

**Education needed:** Bachelor's degree from an accredited program. Most entry-level computer hardware engineers have a bachelor's degree in computer engineering, although a degree in

electrical engineering or computer science also is generally acceptable. The coursework should provide a solid background of math, science, and computer programming.

**Educational Attainment:** Boise State University's College of Engineering offers a wide variety of degrees through their accredited program. Follow the links for [Electrical and Computer Engineering](#) and [Computer Science](#) for more detailed information.

**Soft skills description:** Hardware engineers are expected to work collaboratively in teams and meet individual deadlines. They also are expected to work evenings and weekends in order to meet deadlines or help clients with problems. A successful hardware engineer will have good social skills, be flexible, and self-motivated. Additionally, hardware engineers must have a high level of analytical, creative, and critical thinking abilities in order to solve problems and develop new innovations.

**Other useful credentials for career:** Some large firms or specialized jobs may require a master's degree in computer engineering. All engineers must continue their learning over the course of their careers in order to keep up with rapid advances in technology. Many large employers, such as IBM, Microsoft, and Intel offer additional certification and continual educational programs.

For a thorough list of certifications relating to computer hardware engineers, follow this [link](#).

**Salary and Career Outlook:** Idaho currently employs nearly 300 computer hardware engineers, mostly in the Boise metropolitan area. Idaho has a below average concentration of hardware engineers compared to the rest of the U.S. and are expected to earn an annual salary of \$99,000. The occupation is expected to grow at a 7% rate between 2012-2022. Most of the growth in computer engineering is expected to come from software development (discussed later).

**FOCUS ON: COMPUTER SYSTEMS ADMINISTRATION**

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**Job Description:** Computer networks are critical parts of almost every organization. Network and computer systems administrators are responsible for the day-to-day operation of these networks. They organize, install, and support an organization's computer systems, including local area networks (LANs), wide area networks (WANs), network segments, intranets, and other data communication systems. Network and computer systems administrators work with the physical computer networks of a variety of organizations and therefore are employed in many industries.

**Education needed:** Although some employers require only a postsecondary certificate, most require a bachelor's degree in a field related to computer or information science. There are degree programs that focus on computer network and system administration. However, because administrators work with computer hardware and equipment, a degree in computer engineering or electrical engineering usually is acceptable as well. Programs in these fields usually include classes in computer programming, networking, or systems design.

**Educational Attainment:** The College of Western Idaho offers an Associate degree in Network Administration, as well as, intermediate and advanced technical certificates. Follow the [CWI link](#) for more information.

Boise State University's Information Technology Management program offers a Bachelor degree and a wide range of courses suitable for this career path. Additionally, the program can work in specific career certifications to cater to student needs. Follow the [BSU link](#) for more information.

**Soft skills description:** This career involves a high level of social interaction involving several different modes of communication between a company's employees and managers regarding computer needs. Employment in this field often requires overtime and off-hour work, so schedule flexibility is important. Critical thinking and problem solving skills are important in order to cater to the individual needs of a business's computer and network capabilities.

**Other useful credentials for career:** Certification programs are generally offered directly from vendors or from vendor-neutral certification providers. Certification validates knowledge and best practices required from network and computer systems administrators. Companies may require their network and computer systems administrators to be certified in the product they use. Microsoft and Cisco offer some of the most common certifications.

For a thorough list of network and computer systems administrator certifications, follow this [link](#).

**Salary and Career Outlook:** The field of Network and Computer Systems Administrators is considered a large occupation in Idaho, employing over 1,400 people. The occupation is estimated to grow over 10% in the next 10 years with 37 expected annual job openings. The majority of the jobs can be found in the Boise metropolitan area, but are also dispersed throughout Idaho. The annual median salary in Idaho is \$61,000.

### **3. IT SOFTWARE DEVELOPMENT**

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This area of IT touches all aspects of the Software Development Life Cycle (SDLC). It centers on creating, testing, maintaining and improving web or desktop software applications or 'Apps' (programs) as well as integrating them with an organization's other software and infrastructural systems. Maintenance is the ongoing support of applications once they are installed.

#### **OVERVIEW**

IT Software Architect: high-level systems analyst or software engineer who works with clients within an organization to do a full survey of needs, consider available resources and business objectives, and make choices about the major requirements for the application. Among others, this will include a choice of programming language (e.g. Java, C#), platform, components of the user interface, and back-end needs that users won't see, such as the database. There are fewer opportunities in this career because it is a senior position.



IT Software Business Analyst: another systems analyst who serves as an intermediary between the main software architect and the developers. However, many companies currently cutting costs will expect the architect and developers to cover this role, which makes this position scarce.

IT Software Developer: builds the application in every detail after the architect creates the blueprint. This position is in very high demand. Development work can be looked at in terms of three aspects of a software application:

- Front-end or user development: all the work that will affect the user interface (UI); anything on display
- Middle development: this is the bulk of development work with a focus on coding/programming
- Back-end: setting up site data storage and retrieval mechanisms through tools such as a SQL server

IT Software Database Administrator: usually involved in occasional high-level database maintenance or troubleshooting. Responsible for reviewing and testing the database before an application is complete; has a higher level of access than developers. This can be a more limited job category since this role is not needed continuously.

IT Software Quality Analyst: thoroughly tests the application for problems and marks these for debugging by developers. This position is declining since the bulk of changes in an application occur before it has been launched. Developers are increasingly being required to manage quality assurance.

## **FOCUS ON: COMPUTER SOFTWARE ENGINEER**

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**Job Description:** Software Engineers are the creative minds behind computer programs. Some develop the applications that allow people to do specific tasks on a computer or another device. Others develop the underlying systems that run the devices or that control networks.

**Education needed:** Software developers usually have a bachelor's degree, typically in computer science, software engineering, or a related field. A degree in mathematics is also acceptable. Computer science degree programs are the most common, because they tend to cover a broad range of topics, especially computer programming. Throughout their career, developers must keep up to date on new tools and computer languages.

**Educational Attainment:** Boise State University's College of Engineering offers a wide variety of degrees through their accredited program. Follow the links for [Electrical and Computer Engineering](#) and [Computer Science](#) for more detailed information.

The College of Western Idaho offers an Associate degree and an Advanced Technical Certificate in Software Development. For more information follow this [link](#).

**Soft skills description:** Software engineers are expected to work collaboratively in teams and meet individual deadlines. A successful software engineer will have good communication skills, be flexible, and self-motivated. Additionally, software engineers must have a high level of analytical, creative, and critical thinking abilities in order to solve problems and develop new innovations.

**Other useful credentials for career:** Some large firms or specialized jobs may require a master's degree in computer engineering. All engineers must continue their learning over the course of their careers in order to keep up with rapid advances in technology. Many large employers, such as IBM, Microsoft, and Intel offer additional certification and continual educational programs.

For a thorough list of certifications relating to software engineers, follow this [link](#).

**Salary and Career Outlook:** Idaho currently employs about 3000 computer software engineers where majority of the jobs can be found in the Boise metropolitan area, but are also dispersed throughout Idaho. The occupation is estimated to grow nearly 15% in the next 10 years with 90 expected annual job openings. The annual median salary in Idaho is \$75,000.

## **FOCUS ON: COMPUTER SYSTEMS ANALYST**

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**Job Description:** Computer systems analysts study an organization's current computer systems and procedures and design information systems solutions to help the organization operate more efficiently and effectively. They bring business and information technology (IT) together by understanding the needs and limitations of both.

**Education needed:** A bachelor's degree in a computer or information science field is common, although not always a requirement. Because these analysts are heavily involved in the business side of a company, it may be helpful to take business courses or major in management information systems. Systems analysts must understand the industry of the company that employs them.

**Educational Attainment:** Boise State offers degree seeking programs for Computer Systems Analysts through their [ITM program](#) and [Computer Science program](#).

**Soft skills description:** Analysts must interpret complex information from various sources and be able to decide and communicate the best way to move forward on a project. They must also be able to figure out how changes may affect the project. Creative problem solving skills are very important in this field.

**Other useful credentials for career:** Many systems analysts continue to take classes throughout their careers so they can learn about new and innovative technologies. Technological advances come so rapidly in the computer field that continual study is necessary to remain competitive. Computer Systems Analysts can obtain voluntary certification from the hardware and software manufacturers who offer certification programs on their products. Certification is occasionally required for employment.

For a thorough list of certifications relating to computer systems analysts, follow this [link](#).

**Salary and Career Outlook:** The field of Computer Systems Analysts is considered a large occupation in Idaho, employing over 1,000 people. The occupation is estimated to grow nearly 22% in the next 10 years with 39 expected annual job openings. The majority of the jobs can be

found in the Boise metropolitan area, but are also dispersed throughout Idaho. The annual median salary in Idaho is \$91,000 but varies considerably depending on the category of software development.

#### **4. INFORMATION SUPPORT AND SERVICES**

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##### **FOCUS ON: COMPUTER USER SUPPORT SPECIALIST**

Computer user support specialists help coworkers or people who bought their companies' products. They provide technical assistance to computer users by answering questions or resolving computer problems for clients in person, via telephone, or electronically. They may provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.

**Education needed:** Because of the wide range of skills used in different computer support jobs, there are many paths into the occupation. A bachelor's degree is required for some computer support specialist positions, but an associate's degree or postsecondary classes may be enough for others.

Positions that are more technical are likely to require a degree in a field such as computer science, engineering, or information science, but for others, the applicant's field of study is less important. To keep up with changes in technology, many computer support specialists continue their education throughout their careers.

**Educational Attainment:** The College of Western Idaho offers an Associate of Applied Science Degree for Computer Support Specialist, as well as an advanced and intermediate technical certificate. Follow this [link](#) for more information.

**Soft skills description:** Customer service and listening skills are very important in this field. They must be patient and sympathetic when dealing with client needs. Computer Support Specialists must communicate technical solutions in a way nontechnical people can understand. Reason and problem solving skills are very important in order to troubleshoot and resolve a wide range of computer and technical issues customers may have.

**Other useful credentials for career:** Certification programs are generally offered by vendors or from vendor-neutral certification providers. Certification validates the knowledge of and best practices required by computer support specialists. Companies may require their computer support specialists to hold certifications in the products the companies use.

For a thorough list of certifications relating to computer user support specialists, follow this [link](#).

**Salary and Career Outlook:** The field of Computer User Support Specialist is considered a very large occupation in Idaho, employing nearly 2,500 people. The occupation is estimated to grow nearly 17% in the next 10 years with 80 expected annual job openings. The majority of the jobs can be found in the Boise metropolitan area, but are also dispersed throughout Idaho. The annual median salary in Idaho is \$40,000.

## **FOCUS ON: WEB DEVELOPER**

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Web developers design and create websites. There are 3 main employment outlets:

**Back-end web developers** are responsible for the overall technical construction of the website. They create the basic framework of the site and ensure that it works as expected.

**Front-end web developers** are responsible for how a website looks. They create the site's layout and integrate graphics, applications, and other content.

**Webmasters** maintain websites and keep them updated.

**Education needed:** Educational requirements for web developers range from a high school diploma to a bachelor's degree. An associate's degree in web design or related field is the most common requirement. However, for more technical developer positions, such as back-end web developers, some employers prefer workers who have at least a bachelor's degree in computer science, programming, or a related field.

Web developers need to have a thorough understanding of HTML programming. Many employers also want developers to understand other programming languages, such as JavaScript or SQL, as well as have some knowledge of multimedia publishing tools, such as Flash.

**Educational Attainment:** The College of Western Idaho offers an Associate degree and an Advanced Technical Certificate in Software Development, which includes a thorough web development curriculum. For more information follow this [link](#).

Boise State University offers a Bachelor degree in Information Technology Management that will prepare web developer for employment opportunities. For more information follow this [link](#).

**Soft skills description:** Web development requires a great deal of concentration with the ability to sit at a computer and write code for long periods of time. Being detail oriented and creative are also a necessity in order to fulfill client needs in a timely fashion.

**Other useful credentials for career:** Throughout their career, web developers must keep up to date on new tools and computer languages. For a thorough list of certifications relating to web development, follow this [link](#).

**Salary and Career Outlook:** The field of web development is considered a large occupation in Idaho, employing 800 people. The occupation is estimated to grow nearly 20% in the next 10 years with about 30 expected annual job openings. The majority of the jobs can be found in the Boise metropolitan area, but are also dispersed throughout Eastern and Northern Idaho. The annual median salary in Idaho is \$38,000.

## **FOCUS ON: INFORMATION SECURITY ANALYST**

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Information security analysts plan and carry out security measures to protect an organization's computer networks and systems. They install and use software, such as firewalls and data encryption programs, to protect sensitive information. Additionally, they train staff on how to use security software and properly use computers to prevent security problems. IT security analysts are heavily involved with creating their organization's disaster recovery plan, a procedure that IT employees follow in case of emergency.

**Education needed:** Information security analysts usually need at least a bachelor's degree in computer science, programming, or a related field. As information security continues to develop as a career field, many schools are responding with information security programs for prospective job seekers. These programs may become a common path for entry into the occupation. Currently, a well-rounded computer education is preferred.

Employers of information security analysts sometimes prefer applicants who have a Master's of Business Administration (MBA) in information systems. Programs offering the MBA in information systems generally require 2 years of study beyond the undergraduate level and include both business and computer-related courses.

Information security analysts generally need to have previous experience in a related occupation. Many analysts have experience in an information technology department, often as a network or systems administrator. Some employers look for people who have already worked in fields related to the one in which they are hiring. For example, if the job opening is in database security, they may look for a database administrator. If they are hiring in systems security, a computer systems analyst may be an ideal candidate.

**Educational Attainment:** The College of Western Idaho offers an Associate of Applied Science in Information Security and Digital Forensics, as well as, an Advanced Technical Certificate in Information Security and Digital Forensics. For more information, follow the [link](#).

Boise State University offers a bachelor's in computer science with an emphasis in cybersecurity. For more information, follow the [link](#). They also offer a bachelor's in Information Technology Management in which information security is incorporated into the program, although it is not emphasized. For more information, follow the [link](#).

**Soft skills description:** Information security analysts need excellent analytical and problem solving skills in order to assess risk, improve protocols, uncover and fix flaws in computer systems and networks, and respond to security alerts. They are detailed oriented and inventive in order to anticipate information security risks and implement new ways to protect their organization's computer systems and networks.

**Other useful credentials for career:** There are a number of information security certifications available, and many employers prefer job candidates to have one. Certification validates the knowledge and best practices required from information security analysts. Some are general information security certificates, such as the Certified Information Systems Security Professional, and others have a narrow focus, such as penetration testing or systems auditing.

**Salary and Career Outlook:** The field of information security analysts is considered a small occupation in Idaho, employing 200 people. The occupation is estimated to grow over at a very fast 35% in the next 10 years, with 10 expected annual job openings. Nearly all of the jobs can be found in the Boise metropolitan area. The annual median salary in Idaho is \$85,000.

## **5. IN-DEMAND IT CERTIFICATIONS AND SKILLS**

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The following lists are the most popular IT certifications and skills employers are looking for. These certifications and skills do not represent all certifications and skills available and are not required, but rather reflect the types of certifications and skills employers' desire.

### ***In-Demand Certifications***

#### *A. Cross Industry Certifications In-Demand*

Network certifications cover automated business processes and the most popular network certifications are from Cisco Systems and Microsoft. Cisco Systems and Microsoft certifications are important for systems and network engineers only, as these jobs typically require these certifications.

Cisco Systems Career Certifications: Cisco Systems offers five levels of network certification for its network. The certification levels range from Entry, Associate, Professional, Expert, to Architect.

- The Entry-level CCENT (Cisco Certified Entry Networking Technician)
- The Associate-level CCNA (Certified Cisco Network Associate)
- The Professional-level CCNP (Certified Cisco Network Professional)
- (LAN and WAN)



- The Expert-level CCIE (Certified Cisco Internetwork Professional)

Microsoft Career Certificates: Microsoft offers three levels of network certifications for its network. The certification levels range from Associate, Expert, to Master.

- The Associate-level MCSA (Microsoft Certified Solutions Associate)
- The Expert-level MCSE (Microsoft Certified Solutions Expert)
- The Master-level MCSM (Microsoft Certified Solutions Master)

### **In-Demand Skills**

While the following skills and technologies are helpful for jobseekers to have, these skills are not required and the technologies are most useful for jobseekers to learn via internships or other hands-on experience. While helpful, theoretical knowledge alone is not enough, because an individual will be competing with others who have hands-on experience.

#### *B. Cross Industry Skills In-Demand*

Software and Web Development: Software and web development are the most desired skills in demand. While there are no universal recommended certifications in the development field, there are many skills and programs an individual can acquire on their own, including coding and mobile application development.

- For Software Developers:  
[C/C++](#) coding languages
- For Web Developers: At the moment, important technologies to learn are HTML5 and other various programming languages such as Java and Python.  
Knowledge of mobile application programs such as [Android Certified Application Developer](#) and [MCSD: Windows Store Apps](#) are suggested to develop mobile applications on iPhone and Android devices.

Cloud Computing Position: The ability to provide applications and services over the internet from all over the world, is another skill in demand.

[Amazon Web Services](#)

[Oracle](#)

Business Management: Knowledge of Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) skills are in high demand across the IT system. CRM systems manage a company's interactions with current and future customers while ERP systems integrate internal and external management of information across an entire organization. Popular CRM and ERP programs include

[Red Hat](#)

[Salesforce.com](#)

## **5. IMPORTANT LINKS**

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### GENERAL OCCUPATION INFORMATION:

- Several articles on IT are available from the [Occupational Outlook Handbook from the Bureau of Labor Statistics](#) under Professional Occupations

### FACE-TO-FACE USER COMMUNITIES:

- IT-related groups currently hold regular meetings in Idaho via [Meet Up](#)

### JOB SEARCH TOOLS:

- [Salary](#) research tool
- [Job board gathering posts](#) from multiple job sites, including tech sites: Dice and ComputerJobs.com (set up filters and email alerts to minimize your time online).

## **6. TIPS FOR IT PROFESSIONALS**

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### KNOW MARKET RATES AND OPPORTUNITIES

Research job titles and salaries for your field.

## ACCEPT CONTRACT AND TEMPORARY WORK

This will give you an opportunity to see and be seen in a variety of workplaces, which can often lead to permanent job offers.

## KEEP UP WITH TECHNOLOGY

Be able to describe every current technology you've used: how, where, and when.

## PROVIDE TECHNICAL REFERENCES

- Use an IT manager, rather than a Human Resources manager, as a reference from an earlier job: the IT Manager will be able to communicate more specific technical details about your work.
- Get a 'portfolio' together - ask earlier employers for permission to show applications you developed for them.

## BE PROFESSIONAL

Technical skills are easy to verify. In interviews, therefore, concentrate on your professional appearance and behavior, your ability to communicate, and your organization and preparedness.

## MINIMIZE TIME ONLINE

Internet job boards can waste time and are not as important as making face-to-face connections through networking or temporary and contract work. If you do use job boards, look for specialty sites (an IT-specific job board). Make sure you target your resume carefully and take the time to respond only to close matches. You can also use a site like [www.indeed.com](http://www.indeed.com) to search job postings across many job sites. Another method is to set up email alerts for key words and filters (e.g., salary, distance) to target your job search.

## NETWORK

Look for area meetings of different user groups: C#, SharePoint, Content Management Systems. The site [www.meetup.com](http://www.meetup.com) has many active groups, most at no cost, that bring together not just IT but business owners; you can also organize your own group.

## ASSOCIATIONS

**Career & Technical Educators of Idaho**

<http://ctei.org/about.html>

**Association for career & Technical Education**

<https://www.acteonline.org/>