

# **CERTIFICATION: A COMPETITIVE ADVANTAGE IN ANY ECONOMY**

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## **ABSTRACT**

Have you every considered enhancing your career through professional development activities? Most of us say that we're too busy to do our day job let alone anything in addition to it, but what if by doing some "extra" things you could make your job easier, faster, and increase your job satisfaction (and maybe your paycheck)? Certification is one value-added activity. It's commonly defined as formal recognition by an institution that an individual has demonstrated proficiency within and comprehension of a specified body of knowledge at a point in time. Certification is a tool and when utilized to its full potential, can define career paths, contribute to a company's bottom line, and drive product quality and customer satisfaction upwards.

## **Introduction**

*"What certification does is it teaches a person how to do a job. It gives them the skills to immediately be productive or at least to be productive a lot faster than an academic degree."*

Ann Beheler  
Director of Product and Technology Management, Raytheon  
Certification Magazine, August 2001

As an Information Technology (IT) engineer, you worked hard to get your undergraduate degree. You might have even complemented your undergrad studies with an advanced engineering degree focusing on a specialty. Perhaps you stay up late learning the newest programming language. It would only be natural to ask "Why would I become certified?"

As a company competing in this high technology marketplace, one competitive advantage that is needed are employees who will generate products and services more effectively and efficiently. As a hiring manager, you look for individuals who are committed to refining their capabilities and growing. You want them to increase customer satisfaction and maximize your return on investment (ROI). Certification of your software engineering staff cannot help your organization meet its goals...or can it?

We may ask ourselves these questions either as an employee looking for growth and achievement paths or as a manager looking to outfit an organization with knowledgeable engineers. Certification is a tool and when utilized to its full potential, can define career paths, contribute to a company's bottom line, and drive product quality and customer satisfaction upwards.

Certification is commonly defined as formal recognition by an institution that an individual has demonstrated proficiency within and comprehension of a specified body of knowledge at a point in time. It's important to note that certification is not registration or a license. Nor is it proof of competency, a guarantee of performance, or a claim of expertise. It simply means that you have fulfilled the requirements to become certified and that you have passed an exam. Once you become certified, it will be important to maintain your certified status by performing approved recertification activities within a fixed timeframe or retake the exam.

### **Certifications: Benefits and Value**

If you work in the IT industry you probably have heard of the various technical certifications being offered. In the past several years, the number of certifications being offered has skyrocketed. Starting back in 1989 with the trend-setting Certified Novell Engineer (CNE) to the current hot ticket Microsoft Certified Systems Engineer (MCSE), certification is now a buzzword for the new millennium.

Similar to these "product certifications," software engineering certifications focus on qualifying an engineer's ability to understand, apply, and utilize industry defined practices, tools, techniques, and methodologies within the focus of software development. Four of the more widely recognized software quality and test certifications are:

- American Society for Quality's (ASQ) Certified Software Quality Engineer (CSQE)
- Institute of Electrical and Electronics Engineers' (IEEE) Certified Software Development Professional (CSDP)
- Quality Assurance Institute's (QAI) Certified Software Test Engineer (CSTE)
- International Institute for Software Testing's (IIST) Certified Software Test Professional (CSTP)

One thing you will note is that the differences in these certifications' courses of study are minimal and this makes sense. In order to drive software quality, an engineer needs to understand how software is developed in the first place. In order for a software

engineer to develop high quality products, there needs to be a fundamental understanding of what is needed. This “common denominator” information is what comprises the Body of Knowledges (BOKs) for certification programs. Another point is that when we refer to software engineering, we are not so much focusing on the sole skill of software programming, but the collective skills required to define, design, implement, test, and release a software product in its entirety.

Let’s take a look at how certification offers value to both the individuals who seek to be certified and to the organizations that sponsor such individuals.

### **Value To The Employee**

There are several ways to advance your career including, but not limited to, affiliations, meetings, conferences, speaking, writing, teaching, and continuing education. Maintaining your employability and staying competitive in the IT industry and this marketplace require lifelong learning. A common driving force for an engineer to achieve certification is that the knowledge gained and practiced on the job will, in effect, make your job easier.

A lot of software professionals have formal backgrounds in areas other than software development. They might have fused some technical skills with some domain experience and find themselves constructing, managing, or marketing software products. So how can an individual develop an understanding of common knowledge needed to perform their job responsibilities? Becoming an Electrical or Software Engineer, for example, is well defined, comparatively speaking. Thousands of universities across the world offer degrees in both, but avenues for advanced studies are limited. It hasn’t been until very recently that software quality and test engineering have become their own professions. The applicable certification programs offer a defined course of study that focus on “real world” knowledge to be utilized on a daily basis. These certification programs identify a vast BOK that can be used for furthering career growth. Even if certification is not one of your career goals, these BOK “roadmaps” can be helpful in shaping your career path.

Some software quality and test engineers learn on the job what it takes to do their job. Often, their formal education does not help them prepare for their current job responsibilities. Many engineers have burned themselves out while trying to develop a successful software product. This includes the software engineer who might have worked several 60+ hour weeks to develop code that became “shelfware” because it didn’t meet the customer’s needs, or the software quality engineer who gave up trying to convince the development staff that they need to prevent defects as opposed to simply finding problems through testing. By leveraging the knowledge learned via the certification programs’ BOKs, you can develop your skills to become more efficient and effective on the job.

In addition to making your job easier and defining a career path, becoming certified grants you a mark of achievement. Achievements and recognition motivate us. Becoming – and staying – certified is one way to demonstrate your lifelong commitment to the profession. One of the distinctions of being certified is that you are among a peer group of industry professionals. As a member of this community, you are integral to the review and ongoing discussions of updated BOKs. Your professional opinion is valued and sought after.

It has also been stated by several certifying boards that individuals who achieve certification have enjoyed monetary benefits. The data to support this claim is derived from annual salary surveys that are conducted. The increased compensation may take the form of a salary increase, bonus, and/or promotion.

Lastly, certification makes your resume stand out and may give you a competitive edge over your peers when applying for a position. Employers are starting to recognize these certification programs and are incorporating them into the qualifications for their applicants.

### **Value To The Employer**

Nowadays, getting products and services to market “better, faster, cheaper” has become a mantra. Companies know that there is no time to “reinvent the wheel.” How can you get your staff to work more efficiently and effectively? One answer is by education or training. However, simply sending employees to training classes doesn’t ensure that they will apply what they have learned. One alternative to institutional education is certification. Some of the aforementioned certification programs have requirements that include years of work experience. This criteria complements hands-on experience with a baseline of knowledge. This baseline helps employees “talk the same talk” by providing a common vocabulary and knowledge base.

Certification programs expose your staff to a diverse BOK that extends beyond your organization’s four walls. They capture a breadth of topics from process engineering, quality engineering, project management, configuration management, and others. Having individuals validate, use, and retain their knowledge adds value to a company’s bottom line. The “learning curve” time saved can contribute to higher quality products and increased customer satisfaction. Moreover, companies that support certification programs demonstrate their commitment to quality.

Additional benefits that companies enjoy by having certified employees include:

- Increased development capabilities to release products faster
- Stronger sense of community among software quality and test professionals
- Increased employee retention through the encouragement of continuing education and lifelong learning

Recruiting new talent is becoming more and more difficult. While the number of available candidates has increased, finding candidates with the right skill set hasn’t. Certification is an indicator of a candidate’s knowledge base and commitment to the profession. Nevertheless, certification, like other achievements, is not a tell-all. It is only one indicator and should be used with other indicators when evaluating people for positions. According to Barbara Hanscome of Software Development magazine, “Certification can be used as a tool to help differentiate people who are knowledgeable from people who claim they are knowledgeable.”

Finally, employers that value certification demonstrate a level of commitment similar to the commitment employees make to achieve certification. Through your

support of certification programs you prove to your employees that you are serious about their professional development. This contributes to employee retention and satisfaction. Not only are you growing your individual employees, but also you are growing other areas of your organization. You are enhancing your staff's ability to work together. In fact, managers are more committed than ever toward certification and training by paying for their employees' certification, putting their "money where their mouth is."

If this isn't reason enough, similar to how a college or university highlights the degrees of its professors, imagine being able to promote the credentials of your staff. This can be a competitive advantage for your organization when a customer is making a decision, say, to outsource its testing needs.

### **Certification Program Specifics**

There are two general types of certification programs: one that is organization-based and one that is vendor-based. We will cover only the organization-based programs in this article. The vendor-based programs, while of merit, are too product-specific for an overall software quality or software test certification.

The organization that has been certifying individuals since 1968 is the American Society for Quality (ASQ). The ASQ certification that is most applicable to the software quality profession is the Certified Software Quality Engineer (CSQE) (see Table 1). The longevity of ASQ certification programs (85,000+ certified with 10+ different certification) gives this certification a high degree of credibility and increased acceptance.

A newcomer to the certification market is the Institute of Electrical and Electronics Engineers (IEEE) with their Certified Software Development Professional (CSDP) certification. The IEEE is well known in the industry for their software engineering standards and their entry in the software quality certification category makes them a credible contender.

Another organization that has certified individuals since 1985 is the Quality Assurance Institute (QAI). The QAI certification that is most applicable to the software test profession is the Certified Software Test Engineer (CSTE) (see Table 1). QAI has one of the most relevant and software test-centric BOKs for their certification program on the market.

A fourth organization is the International Institute for Software Testing (IIST). The IIST certification that is most applicable to the software test profession is the Certified Software Test Professional (CSTP). Candidates have to take and pass ten (10) courses within five (5) years in order to be certified, making this an unique education-based certification program.

All certification programs have a Body Of Knowledge (BOK). The BOK is created by practicing industry professionals and periodically updated to reflect changes in the profession. For example, ASQ's Certified Software Quality Engineer (CSQE) requires expertise within the following areas:

- General knowledge, conduct, and ethics
- Software quality management

- Software engineering processes
- Program and project management
- Software metrics, measurement, and analytical methods
- Software verification and validation
- Software configuration management

The IEEE's Certified Software Development Professional (CSDP) certification entails knowledge in:

- Business practices and engineering economics
- Software requirements
- Software design
- Software construction
- Software testing
- Software maintenance
- Software engineering management
- Software configuration management
- Software engineering processes
- Software engineering tools and methods
- Software quality

QAI's Certified Software Test Engineer (CSTE) BOK covers:

- Test principles and concepts
- The tester's role in software development and acquisition
- Test management
- Build the test environment
- Risk analysis
- Test planning process
- Test design

- Performing tests
- Defect tracking and correction
- Acceptance testing
- Status of testing
- Test reporting

IIST's Certified Software Test Professional (CSTP) domain consists of:

- Principles of software testing
- Test design
- Managing the testing process
- Test executions and defect tracking
- Requirement definitions, refinement and verification
- Test automation
- Static testing

Table 1 provides a comparison of various elements of each software quality

	SOFTWARE QUALITY CENTRIC		SOFTWARE TEST CENTRIC	
Certification	CSQE	CSDP	CSTE	CSTP
Organization	ASQ	IEEE	QAI	IIST
First started certifying	1996	2002	1996	2000
Total number of active certifications <sup>1</sup>	2,295	207	2,000+ <sup>3</sup>	245+ <sup>6</sup>
Work Experience	3 – 8 yr.	4 1/2 yr.	0 – 6 yr.	1 yr.
Exam	(1) 4 hr., 160 multiple choice	(1) 3.5 hr., 180 multiple choice	(1) 4 hr., true/false, multiple choice, essay	(10) short essay exams (within 5 yr.)
Type	Open book	Closed book	Closed book	Closed book
Exam Dates	June, December	Spring, Fall	March, June, September, December	Monthly
Certification Costs (est.)				
Exam Fee <sup>2</sup>	\$180 – \$285	\$350 – \$450	\$250	\$5,190 – \$5,390 <sup>7</sup>
Study Materials	\$50 – \$250	\$50 – \$250	\$100 – \$200	Included
Exam Preparation Course	\$400 – \$1,200	\$600 – \$1,800	\$300 – \$700	Included
Travel	\$0 – \$1,000	\$0 – \$50	\$0 – \$100	\$0 – \$2,000
Total	\$180 – \$2,735	\$350 – \$2,550	\$250 – \$1,250	\$5,190 – \$7,390
Passing Score	73% (550/750)	Unknown	75% (in each of 4 parts)	80% (each course)
Recertification period	3 yr.	3 yr.	3 yr.	3 yr.
Recertification credits	18 RUs	30 PDUs	120 CPEs	10 EUs
Average Salary Increase	10.6% <sup>4</sup>	N/AV	19% <sup>5</sup>	N/AV
For More Information	www.asq.org	computer.org	www.software certifications.com	www.softdim.com

**Table 1. Comparison of Software Quality and Test Certifications**

<sup>1</sup>As of 12/31/02

<sup>2</sup>Higher fee is for non-members

<sup>3</sup>As of 2/18/03

<sup>4</sup>Salary Survey, ASQ Quality Progress, December 2002

<sup>5</sup>QAI CSTE brochure, all active CSTEs, 1997-2000

<sup>6</sup>As of April 2003, ~2,700 students are currently enrolled in the CSTP program

<sup>7</sup>(2) 5-day Test Professional Weeks @ \$2,595/wk. – \$2,695/wk.

**Table 1. Comparison of Certification Programs**

## Recertification

Obtaining certification begins the journey of lifelong commitment to the profession. Recertification is the “maintenance” part of certification. Remember the “at a point in time” part of the definition of certification? If you want to remain certified, you will need to periodically perform various “certification enhancing” activities within a set period of time. While qualifying activities vary from certification to certification, the following are typical activities that will earn you recertification credit:

- Continuing education/courses/tutorials
- Attend or present at seminars/conferences
- Professional meetings
- Committees
- Publishing
- Speaking engagements, presentations

Some organizations will give you the option of retaking the exam instead of professional development activities. Due to difficult nature of the exams, this typically is not a popular choice among the recertification applicants.

### How to Prepare

Once a decision has been made as to which certification program you want to pursue, the next step would be to determine whether or not you qualify to sit for the exam. If so, fill out the application form and submit it to the organization. If there is a doubt, they will make the final determination whether or not you qualify to sit for the exam. Once you’ve been accepted, the preparation phase begins. Resolving to pass the exam the first time is a great goal and therefore making the necessary time and effort to ensure that this happens is wise. A combinational program of formal education and self-study greatly increases your chances of success. Self-study can consist of additional textbook reading or courses. Depending on your level of skill and experience, the quantity of additional studying will vary from person to person. It’s generally recommended to start preparing months before the exam date.

Some organizations offer an exam preparation course. These are usually accelerated, refresher courses that walk (and test) you through the parts of the BOK. Typically, they assume that you *already* know the BOK subject areas prior to taking the course. Since this is usually not always the case, a program of self-study and/or additional courses taken before or concurrently with the exam preparation course may be advisable. Maximizing your study program months before the exam date, taking practice questions, and studying additional material will all significantly increase your odds at passing the certification exam – the first time.

## Summary

Certification can be a win-win for both employees and employers. Candidates enjoy the personal and professional benefits that come with being certified and companies reap the business rewards from certified employees. Research the certification programs mentioned in this article and start preparing for the exam of your choice. Soon you and your company will join the community of professionals dedicated to software quality and test.

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