

IT CERTIFICATION'S ROLE IN THE IT JOB MARKET

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ABSTRACT

This study examines IT professional certification's role and prominence in the marketplace. IT professional certificates and arguments supporting and negating their role in the marketplace are viewed. Results of a content analysis of IT job ads are reported. The analysis, focusing on education, experience, and professional certification requirements, found that less than 20% of IT job ads mention IT certification.

Keywords: Professional Certification, Job Ads

INTRODUCTION

IT certification seems to be a controversial subject among IT educators. Some hold that their university program turns out well-rounded graduates with a firm understanding of underlying theories and principles, individuals who will be able to adapt to and flourish in a rapidly changing IT environment. It would be constraining and detrimental to focus students' education on a particular hardware or software product that will soon be obsolete. Others strive to provide their graduates with every advantage in the marketplace. So if the market place is requesting certifications, then they should help their students obtain such certification. Still others contend that to achieve true professional status on a par with Accounting, Architecture, Law, or Nursing, certification programs similar to those of other professions are necessary.

This paper's goal is to examine IT certification's role and prominence in the marketplace. IT certification is claimed to be very important for obtaining a job in the computer field. Acquisition of IT certificates is also claimed to be linked to raises and promotions. But what evidence is there to support these claims? A review of the arguments and evidence will be presented below.

To ascertain the prominence of IT certification in the IT job market, an analysis of IT job ads was conducted. An historical perspective is provided by samples of 100 IT job ads obtained from the LA Times using papers from February 1996, 2001, and 2006. An additional 100 February 2006 IT job ads were obtained from Monster.com. These data suggest

that certification appears in less than 20% of all IT job ads.

PROFESSIONAL CERTIFICATION

Professional certification in the IT arena involves extensive testing of an individual's abilities and capabilities in the area being certified. Unlike certification in other professions where the certification process is under the control of a professional body, IT certificates are typically tied to a particular vendor.

Novell with its Certified Novell Engineer (CNE) certificate was the first vendor to offer a formal certification for its network software. When introduced, Novell was the predominate network operating system and accordingly CNE certification was one of the most common certifications.

As Cisco products gained prominence in networks, Cisco Certified Network Engineer (CCNE) certificates gained popularity. The CCNE is both a hardware and software specific certificate. Cisco also offers an advanced CCNE certificate, the CCIE.

The Microsoft Certified Systems Engineer (MCSE) and Microsoft Certified Systems Administrator (MCSA) certificates indicate that the holders have proficiency with Microsoft's Windows environment. Individuals with an MCSE certificate are "certified" as being able to design, implement, and administer Windows operating systems and Windows server systems. Individuals with MCSA certificates can operate and maintain Windows operating systems in a networked environment.

The Sun provides a series of Java technology certifications; Programmer, Developer, Web Component Developer, and Enterprise Architect. As the names imply, these certifications cover specific components of Sun's products. A programmer certification is required before an individual can attempt Developer and Web Component Developer certifications.

A common IT certification not directly linked to a particular vendor is the A+ certification. This certificate is primarily based on hardware. Its examination process first covers a core of hardware

issues and then looks at newer operating systems. Holders of an A+ certificate should be able to install, build, configure, upgrade, troubleshoot, and repair Personal Computers, network connections, and operating system software.

While the above list is far from complete, there being at least 100 relevant professional certifications [10], the certifications listed are fairly common. All but the Java certificates are included in Gabelhouse's [4] list of the top 10 IT certifications.

MARKET ROLE OF PROFESSIONAL CERTIFICATION

In perfect markets where employers and employees both possess perfect knowledge, there would be no role for professional certification. The employer would know whether or not a prospective employee had the skills and abilities to perform the job tasks. Similarly, formal education would be irrelevant. All that would matter was the ability to do the job and compensation would be directly tied to skills, abilities, and performance. Professional certification programs and formal educational programs could exist, but only as vehicles for employees to acquire skills and abilities. We don't live in a world with perfect markets. Employers have a difficult time evaluating job candidates' knowledge, skills, and abilities. In such a market environment, professional certification and educational degrees may convey some information about candidates' knowledge, skills, and abilities.

Knowledge and Skill Signaling

Traditionally, many fields have used formal education degrees and associated grade point averages to convey information about a candidate's knowledge, skills, and abilities. The typical IT job ad indicates that a Bachelor's Degree in Computer Science, CIS, or MIS is required for the listed IT job. But the usefulness of such information may have diminished. When employers hired graduates of a handful of local educational institutions, the employers knew the quality and caliber of each institution's graduates. But educational institutions have proliferated. With high levels of geographic mobility, IT job applicants may have degrees from all over the world. Also, changing student work ethics combined with supposed grade inflation may contribute to employers no longer finding formal education to be a good indicator or signal of an IT job applicant's skills and ability.

Professional certification can be viewed as signaling an IT job applicant's skills and abilities. The very nature of the certification process results in the certifying agency examining and verifying that certificate holders have met specific knowledge and skill requirements. In an IT environment where rapid technological change is the norm, professional certification may signal that an employee or job applicant is current and proficient with new technologies.

The Case for Professional Certification

Schlichting and Mason claim that certification is "highly important for employment in the computer field" [11, p. 84] because professional certification provides a verification of specific skills through examination on a common body of knowledge. Ortiz cites anecdotal evidence that indicates that certification virtually guarantees a substantial salary increase [9].

Gabelhouse [4] provides considerable evidence of the benefits of certification to the certificate holder. Writing in *Certification Magazine* and using data from a *Certification Magazine* survey, he claims 37% of the respondents received a promotion within the first year after attaining their primary certification, 53% received raises within a year of attaining certification, and 74% indicated that their certification had a significant impact on the magnitude of their salary increase. According to Gabelhouse, the average first year salary increase was 10.2 percent or \$4,477. ROI figures reported by Gabelhouse range from a high of 17.8% for Microsoft's MCSD certificate to a low of 2.9% for Compaq's ASE certificate. Gabelhouse's figures also indicate that in 49% of the cases, the employer paid the employee's certification expenses, in 34% of the cases the employee paid for the certification, and in the remaining 17% of the cases the costs were shared between employer and employee.

Analysis of the Case for Professional Certification

Gabelhouse [4] fails to provide any details of the survey which generated the data reported. One suspects that respondents were drawn from *Certification Magazine's* readership and not likely to be a random sample of typical IT professionals. Schlichting and Mason reference Gabelhouse's figures to support their contentions.

Professional certification is argued to benefit the certificate holder. That would indicate that obtaining a professional certification was an investment in

one's general human capital, skills in demand by many employers. Standard economic theory argues that employees "pay for" general human capital [1]. If the employee does not pay directly, the employee pays indirectly through a lower salary than they could get elsewhere. Gabelhouse's figures indicate that employers contributed to 83% of the certifications obtained. Either most employers foolishly finance their employees' acquisition of skills and then pay that employee a higher salary commensurate with those new skills or those employers paid lower initial salaries because they financed the employee's certification programs. Thus the salary increases reported by Gabelhouse are likely to be exaggerated. Cegielski et. al. [2] and Cegielski [3] provide a different look at the value of certification. Cegielski et al. surveyed 299 end-users of 11 separate networks and found no significant difference in the ability to manage and maintain networks between those with professional certification in networking and those without professional certification. This lack of observable quality differences between those holding certification and those without certification echoes the general findings by Kleiner [6]. Cegielski [3] takes his analysis a step further. He found that when HR professionals made the hiring decision, they tended to rely upon IT certification as an indicator of skill level since they were unable to evaluate a network IT professional's skill objectively. However, when other IT professionals made the hiring decision, IT certification was not highly valued since they could objectively evaluate a network IT professional's skills.

**IT JOB ADS
AND PROFESSIONAL CERTIFICATION**

Content analysis of IT job ads has been used repeatedly to identify IT job skills requirements. Todd, McKeen, and Gallupe [12] traced IT job skills from 1970 to 1990 by looking at the skill requirements set forth in IT job ads. Looking at the time period from 1988 to 2003, Gallivan, Truex, and Kvasny [5] used a similar technique to update the Todd et al. findings. Like Todd et al., Gallivan et al. used print media job ads but went on to compare online job ads to print media ads. They found that "soft skills" appeared more often in online ads than in print media ads. They speculated that this difference might be due to the pricing mechanism whereby print media charge essentially by word count while online job ads are not priced by word count.

To ascertain in a preliminary fashion how prevalent professional certifications are in IT job ads, this study looked at small samples of print ads for IT positions.

Following Gallivan et al., it also looked at online IT job ads to see if there were any systematic differences between print ads and online ads. Unlike the earlier content analysis studies of IT job ads which focused on position titles and desired skills, this study focused on the listed job requirements in terms of formal education, experience, and professional certification.

Job Advertisement Samples

Four small samples of 100 IT job ads were collected. The first sample was drawn from February 2006 copies of the Los Angeles Times. To gain a sense of any trend in IT professional certification, the second and third samples were drawn from February 2001 and February 1996 copies of the LA Times. Since Gallivan et al. found substantive differences between print job ads and online job ads for IT professionals, the fourth sample was drawn from Monster.com also in February of 2006. In these samples, data were collected on the job description and listed education, experience, and certification requirements.

IT Job Requirements Over Time

The results from the three LA Times surveys are reported in Table 1. Depending upon the category of result being reported, NA either indicates that no formal educational requirement was specified, no experience level was specified, or no professional certifications were listed in the job advertisement.

Table 1. IT Job Ad Requirements

	1996	2001	2006
Degree	Educational Requirements		
NA	40%	38%	47%
BS	56%	52%	45%
MS	4%	10%	8%
Years	Experience		
NA	34%	30%	44%
<=2	22%	16%	17%
3-4	16%	19%	14%
5	21%	24%	17%
>5	7%	11%	8%
# Cert.	Professional Certification		
NA	94%	79%	89%
1	4%	12%	6%
>1	2%	9%	6%

For Educational Requirements, the increased percentage of position ads indicating that a Master's degree is required suggests that educational requirements are increasing. In general, it appears that educational requirements were higher in 2001 than in either 1996 or 2006. Recall that 2001 was a period of time when securing an IT job was particularly difficult. It would make sense for employers to be more selective in their recruiting.

Job ads frequently indicate a range of experience, e.g., 2-3 years. In those cases, the lower limit of the range was selected and appears in Table 1. The experience figures suggest that experience requirements in 2001 were somewhat more stringent than in the other years.

In Table 1, it is obvious that the vast majority of IT job listings do not include any professional certification. When professional certifications are indicated, it is not unusual for more than one certificate type to be listed, thus the >1 designation in Table 1. These figures suggest that IT job ads including professional certification were highest in 2001. A Chi-Square test performed on the Professional Certification data in Table 1 was able to reject the null hypothesis of independence. This statistical result indicates that the number of job ads specifying a certification requirement changed significantly over the years. Again, recall that 2001 was a difficult time for finding IT jobs. Employers seem to have reacted by becoming more selective in their recruiting.

One IT job ad that ran in the local paper indicated "Qualifications include Bachelor's degree in Computer Science or related field" while the subsequent ad read "Successful applicant will have MCSE ..." giving the impression that IT job applicants should have either a degree or a professional certification. Looking at the sample data reveals that most IT job ads that require professional certification also require a bachelor's degree. The actual percentages were 68%, 81%, and 75% for 1996, 2001, and 2006 respectively.

IT Job Requirements: Print vs. Online

Comparisons of Print (*LA Times* 2006) and online job ads (Monster.com) appear in Table 2. For Educational requirements, it appears that online ads tend to specify degree requirements more often whereas the print ads are more likely to have degree requirements beyond a bachelor's degree.

Table 2. Comparison of Print vs. Online Ads

	LAT	Monster
Education		
NA	47%	44%
BS	45%	56%
MS	8%	0%
Experience		
NA	44%	22%
<=2	17%	30%
3-4	14%	17%
5	17%	25%
5+	8%	6%
Professional Certificate		
NA	88%	86%
1	6%	8%
>1	6%	6%

For experience job requirements, fewer online ads fail to make any reference to experience as seen in the lower percentage in the NA row. Online ads seem more likely to specify experience of 2 years or less and of 5 years.

Of interest is the similarity between print and online IT job ads in professional certification. The frequencies with which professional certification appears in the ads are nearly identical: 12% for print ads and 14% for online ads. As reported above for the print ads, 75% of the ads specifying a professional certification also specified a bachelor's degree. In the online data, only 60% of the professional certification ads also indicated that a bachelor's degree was required.

LIMITATIONS AND CONCLUSION

Beyond the small sample sizes used in this preliminary study, a limitation is that job requirements, particularly professional certification requirements, may have been missed. In the 2006 job ads, it is quite common for the reader to be referred to a web site. The further information available on those web sites may have contained professional certifications not mentioned in the ads. Surprisingly online job ads also contained references to the company's recruiting web site.

The Monster.com ads sampled all came from the "Computers – software" category. Given that a number of the more common certifications are

network related, the “Computers – hardware” category may have revealed more instances of professional certification. The “Computers – hardware” section was briefly investigated. The frequency of professional certificates in that section did not appear to differ substantially from the frequency in the “Computers – software” category.

Lee [7] points out that Fortune 500 and other large employers now announce their job opening on the corporate career website bypassing both print and commercial online job boards. Consequently most IT job ads appearing in print or on commercial online job boards such as Monster.com are from small to medium sized organizations. If there is a systematic difference in IT job requirements between small and large employers, then the samples used here would be biased. If anything, one might suspect that smaller organizations would rely more heavily on professional certifications as they might not have sufficient expertise in-house to assess applicants' skills.

One thing is certain. In the market for IT skills, job applicants need a reliable mechanism for communicating the extent of their knowledge and skills to potential employers. And employers need to be able to accurately assess applicants' abilities. Formal educational degrees and professional certifications both provide imperfect mechanisms to facilitate the communication between employers and job seekers.

The numbers do not suggest that professional certification is essential to the IT profession. There does not appear to be significant growth in the proportion of IT job ads specifying a professional certification. IT degree programs seem to be producing well rounded individuals with a firm understanding of underlying theories and principles. For these individuals to be immediately productive, that understanding must be applied in a particular hardware and software environment. Professional certification would appear to verify application in a particular computing environment. IT professionals who accumulate professional certificates may be seeking validation of specific skills to complement their formal education, or they may be signaling that they are the type of employee who keeps current with rapidly changing technology. In either case with

substantially less than 20% of advertised IT positions requiring IT certificates, IT professional certification does not appear to be critical to success in the IT job marketplace.

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