IT Certification for the Biomedical Profession

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While general interest in professional certification is cyclic in popularity, there is always an underlying value in pursuing it. We're lucky that in the information technology and biomedical world, there are a number of certifications available to validate our skills and competency. Although the "paper certs" are out there (people who are good at taking tests and not much else) – I feel that anyone who can pass these certification tests cannot help but learn something. I also agree with Stephen Grimes in his Career Center column (September/October, 2002 issue of *BI&T*) Finding and Developing IT Skills, "Since IT has acquired such a dominant role in medical technology, it's essential to develop and maintain IT skills."

In this installment of IT World, we'll examine 2 of the most popular IT certifications. While we'll focus on A+ and MCSE certification, there are many. Check out www.cramsession.com to get an idea of all the kinds of certifications that are out there – whew! Also look at CompTIA's site (www.comptia.com) — there are 12 certifications there alone. The other key web site you should take a look at is www.examcram.com. Keep an eye on this one, the site is changing to www.examcram2.com but promises free practice exams and newsletters that will provide question-of-the-day emails.

As a hiring manager, I always search the resume for certifications. To me, not only is it a validation of skill and competency, it shows that the candidate is interested in personal growth. Having taken the certification path myself, I also know what it takes and what incidental and intangible knowledge you accumulate along the way. For example, I learned how to find reference material and get answers in a just-in-time way. Why pursue certification? Again, it provides personal growth, validates your skills, and also looks great on the resume.

A departmental IT certification strategy may include a hierarchy of IT certification to best support the institution. Consider perhaps three levels — A+, A+ with MCP (a portion of MCSE) and MCSE. In my previous life working in an OEM service organization, we realized the importance of IT certification in "upskilling" or mobilizing all the service-engineering professionals. Since training and education are costly endeavors, we came up with a hierarchical strategy similar to the above. At that time (mid-1998) I identified 25 training sources from 10 vendors that met our requirements. As I was looking at that plan for this column (hoping to re-use this information, or re-purpose it, as we say in the training business) 6 of those vendors are no longer around, 1 has changed its business focus, and only 2 are still viable and can be recommended.

When setting a departmental certification strategy, be sure to include:

- Communication as to the overall strategy or plan. The example in figure 1, while obviously dated, shows a format that can be used to communicate the strategy. This example includes some "local certification" as well as MCSE to get the right skills in the right places.
- Clearly identify who should achieve which levels
- Clearly identify the completion timeframe of when certification is due in your department
- Identify means of certification and level of support (self-study, local colleges, cross-departmental mentoring). Also determine who pays for what – at a minimum, tests are $125 a pop.

A+

CompTIA, the certifying body for A+ certification, has been around for 20 years. The Computing Technology Industry Association is comprised of 13,000 members in

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NT Expert Levels and Training for Service

Action Plan April 27, 1998

Expert Levels - The General Definition

- Level I is a familiarization level that will allow everyone to be aware of NT and be supportable by a higher level. This is an exposure level, maybe come away with some fundamentals.
- Level II is an experienced level with networking, configuration and overall structural knowledge allowing first line self-support capabilities. Basically, NT workstation savviness.
- Level III is an expert level in the vein of Microsoft's Certified Professional program for NT Server and NT Client/workstation. The Core 4.
- Level IV is an industry certification program achieving MCSE credentials and becomes the high level support for the other 3 levels.

Expert Levels - How to Demonstrate Competency and Project Completion Dates

- Level I by August 1, 1998 - can get there by taking and passing Technical Training's NT Assessment test. (60% passing score)
- Level II by January 1, 1999 – can get there by passing NT Assessment test. (75% passing score)
- Level III by May 1, 1999 - Level III is achieved by passing the 4 MCSE core tests. They are:
  1) Microsoft Exam #70-073 - MSNT Workstation 4.0 (note the older version of the test was WIN 95 and may still be available, they haven't announced when that one will be turned off)
  2) Microsoft Exam #70-067 - Implementing and Supporting MSNT4.0 Server
  3) Microsoft Exam #70-068 - Implementing and Supporting MSNT4.0 Server in the Enterprise (a hard one but extremely helpful with the nature of MUSE 5A installs)
  4) Microsoft Exam #70-058 - Networking Essentials (networking hardware stuff like, repeaters, bridges....)
- Level IV by August 1, 1998 - Full MCSE can be achieved by passing the above 4 tests and 2 electives. I recommend 2 of the following:
  5) Microsoft Exam #70-059 - Internetworking w/ MS TCP/IP on MSNT4.0, we're fat with TCP/IP, esp. monitoring - we even advertise our open structure, mostly due to using TCP/IP
  6) Microsoft Exam #70-076 - Implementing and Supporting MS Exchange Server 5
  7) Microsoft Exam #70-087 - Implementing and Supporting MS Internet Information Server 4.0 - up and comers that might bite us in the tail, I predict these to be a big deal by the end of the calendar year (if not sooner).

Field Service Plan

- Level I - All field (minimum)
- Level II - DSA (District Systems Analyst) level support staff and specific product specialists.
- Level III - All Systems DSA, and Site Planning personnel.
- Level IV - All RSAs (Regional Systems Analyst) and QSICs (QS System Installation Coordinator)

Tech Support Plan

- Level I - This is the minimum level for all phone support and selected hardware repair staff.
- Level II - TS phone support Level II (minimum) - this includes:
  Carts/Stress Department
  RSS – min. level for all
  CathLab Department - Senior support staff only
  Monitoring Department – min. level for all
- Level III - Includes:
  Monitoring phone support - 2 key TSEs
  Systems h/w repair - 1 key repair tech, all systems phone support
  Imaging - 2 Senior TSEs
  CathLab - 1 key Senior TSE
- Level IV - Key systems phone support (2 by 8/1/98 and 2 by 5/1/99).

Figure 1- *Although this is obviously dated – the general scheme/strategy contains all the needed details and the format can be reused. It clearly identifies, who, what and when. Department leaders can then track status and success (in order to throw a big party when the whole plan is complete).*

89 countries and identifies itself as the leading global IT trade association. Its certifications are vendor-neutral. With regard to the A+ certification, Comp-TIA's web site proclaims:

"Those holding the A+ certification have a broad base of knowledge and competency in core hardware and operating system technologies including installation, configuration, diagnosing, preventive maintenance and basic networking."

A+ is a recognized and valued certification level for IT support folks. One thing for your department to consider is becoming an A+ Authorized Service Center. Certify at least 50 percent of the techs, pay a $100 annual fee, and you're there.

There are many places to get the lowdown on A+ certification. Type the words A+ certification in your web search engine and you'll see! Probably one of the most authoritative references on the subject is authored by Michael Meyers (not the same Austin Powers/Wayne's World Mike Myers). His book, in its 4th edition – *A+ All-In-One Certification Exam Guide* – is comprehensive, relevant and well written. "This book rocks" says one of the reviews at Amazon.com, where you can get the hardcover for $42.

The basic self-study routine is direct test preparation. Find a practice exam (or 2) and start taking the test. You'll find out that you may already know a lot about the subjects – Core Hardware and Operation System Technologies. Check the site for complete test details at www.comptia.com. Especially study the questions that you don't do well on – an accelerated learning technique (as we say in the training business). Form a study group at work to research the questions that no one knows the answer to. You'll learn a lot and also have a certification to show in the end.

See also Eugene Okeeffe's "Inside Certification" column in the November/December 2002 edition of *BI&T* for more information on A+ certification and try the practice questions.

Certification Training Support Examples

Globalknowledge (www.globalknowledge.com) provides classroom-based training for A+ & Microsoft certification on a regional basis. Check the web site for a complete listing of cities and schedule. The company provides the equipment in hands-on intensive sessions.

One of the things I like about Learning Tree International (www.learningtree.com) is that it has many IT related courses also delivered regionally that allows flexibility in your plans to certify or to configure your own list of courses for a "local certification" for your department.

Lessons Learned

Take heart! When I pursued my Novell network certification (first CNE then MCNE) I re-member having no difficulty with the Networking Technology course (as it was called at the time). I was attending a weekend classroom-based course at a local college with 2 of my pals from work. My cohorts were usually a bit ahead of me in taking and passing the various tests. When it came to one of the first tests, Networking Technology, they reported having a difficult time.

At the time, this exam was a comprehensive 3-hour test that included looking up jumper settings on network interface cards. Both of my classmates said that they barely finished in the 3-hour time limit and passed the test by the thinnest of margins. When I took it, I seemed to breeze right through. I finished so quickly that I started to second-guess my initial answers when reviewing the test before "turning it in" (hitting the submit button). After a while I decided to hit submit and get it over with.

As it turned out, I had finished the test in 38 minutes and nearly aced it. So when it came to the first Admin exam – I thought I had it made. My fellow students had passed this adaptive test with ease — in a matter of minutes. Based upon the Networking Technology experience, I thought, well, this ought to be a cinch! I flunked my first try (tests were $160 a shot at that time; they're $125 now) by just a few points.

So, I pulled out my credit card and said, "Line it up again!" I flunked a second time. I went home thinking that this must be an anomaly in the time-space continuum; I'd bone up a little tonight and try again tomorrow. When I flunked the next day I knew I had to buckle down and concentrate. I managed to pass the following week. I was lucky that my company was backing up my continuing education, but I felt so bad about flunking that I didn't turn the expenses for the first 3 attempts (as far as I can remember).

Everyone has a different skill set and what's easy for some is difficult for others. I worked a lot on circuits and general hardware so the technical aspect was easier for

me. My friends worked in network administration: login scripts, user access, network printer control and security, so that part was easier for them. Two lessons — always study the test material and keep plowing through the tough parts until you understand them.

MCSE

There is also a wealth of information available for Microsoft's MCSE. Microsoft Certified Systems Engineer is certainly as well recognized as A+. Microsoft's web site does a great job in certification materials and explanations: www.microsoft.com/traincert/mcp/mcse. The MCSE path is 7 exams — what they call the "Core 5" and 2 electives. Be sure to check out the web site for details. If you choose to get the classroom-based training in your neighborhood, be sure that Microsoft certifies the training center. Microsoft Certified Technical Education Centers (Microsoft CTECs) must have Microsoft Certified Trainers (MCTs), official curriculum, and stay in touch with the ever-changing certification scene. That changing scene, keeping the certification fresh, applicable and viable, is one of the reasons MCSE carries so much weight in the industry.

Do a web search on MCSE and you'll also find a wealth of material. You name it — books, practice tests, exam cram techniques, instructional videos, CBT and classroom-based instruction. The cool part is that Microsoft doesn't care if you read the book, saw the movie, or sat in class, if you can pass their tests, they will certify you to industry standards and let you use their corporate logo on your business cards and represent them on service calls. Which is also why they work so hard in keeping the tests current.

I think that setting certification goals to meet a departmental strategy is a good idea. However, the means in which the MCSE training occurs should be an individual endeavor. The "newbies' probably should go through the classroom-based training. Certified training centers must have the appropriate lab equipment and the newbie ought to make use of all available lab time. In addition, you'll get a chance to meet other folks on the same track and get some personal networking to boot. Be sure to learn from best practices.

It can be expensive though, ~$10K in some areas. The more experienced folks could probably make use of the CBT, guided exam crams or other step-by-step type manuals. When you pursue self-based training, be sure to set deadlines for yourself. For example, I know that I need lots of control and discipline. I set a date for when I will take the test. Then divide the number of pages in the instruction manual (or whatever source you're using) by the number of days to the test deadline. You may get to 8 to 12 pages per day. Some days you will not get to it, other days you will plow though many pages – either way you'll have a benchmark to track against. Leave yourself a week or so to review before the test, take practice exams, or join an exam cram party.

As mentioned earlier, part of your departmental plan may include MCP certification. This is nothing more than passing 1 of the 7 tests in the MCSE track. Be sure to choose something that is applicable to your IT installation and within the track that you would choose if pursuing MCSE, that way you'll have 1 done already.

Although using the knowledge these certifications represent comes with experience, certification accelerates the learning curve or experience curve. It also validates your IT skill and identifies you as one who likes to stay current in his or her job. I've mentioned a few recommendations, some which have been successful for me in the past. I also want to hear from you — please email your observations, comments and best practices in IT certification to jkabachinski@wi.rr.com.

Adaptive Testing

Adaptive Testing has been around for 20 years. There is a very complicated scheme for developing an adaptive test — for all the grim details, visit the Microsoft web site and get the adaptive testing white paper.

In general, each adaptive test has a maximum number of questions and a cut score (number of points needed to pass the test). You will be presented a question, based on a learning objective or competency that carries a certain weight or number of points. If you answer incorrectly, you will be presented an easier question for that objective, but it will carry fewer points.

This continues on for a few levels until the next objective. If you get the first question correct, you get the maximum number of points for that objective—and you move on to the next. So you see the game, you have a certain number of questions in which to get the passing number of points.

In order to allow students to enter Medical School as soon as they have completed this program, the program is structured to start in a Summer semester and to run through the following Fall and Spring semesters.Â Note that additional fees in the amount of about $300 will be added in the summer semester for the certificate. We strongly recommend that U.S. citizens fill out the FAFSA (Free Application for Federal Student Aid). Texas residents with demonstrated financial needs through completion of the FAFSA application may be eligible for the University of Houston Graduate School Fund, to help defray the cost of tuition and fees. Admission Requirements. The list below represents the required criteria for consideration for admission. All applications receive a holistic review. Engineers typically require a type of professional certification, such as satisfying certain education requirements and passing an examination to become a professional engineer. These certifications are usually nationally regulated and registered, but there are also cases where a self-governing body, such as the Canadian Association of Professional Engineers. In many cases, carrying the title of "Professional Engineer" is legally protected.Â Biomedical engineers often simply possess a university degree as their qualification.Â As with many engineering fields, a bachelor's degree is usually the minimum and often most common degree for a profession in BME, though it is not uncommon for the bachelor's degree to serve as a launching pad into graduate studies. Biomedical engineer jobs and careers. Biomedical engineers analyze and design solutions to problems in biology and medicine.Â How to Become One: Biomedical engineers typically need a bachelorâ€™s degree in biomedical engineering or bioengineering, or in a related engineering field. Some positions may require a graduate degree. Salary: The median annual wage for biomedical engineers is $91,410. Job Outlook: Employment of biomedical engineers is projected to grow 5 percent over the next ten years, faster than the average for all occupations. Increasing numbers of technologies and applications to medical equipment and devices, along with the medical needs of a growing and aging population, will require the services of bio...