# BICSI and Certification Programs:
# What we would do differently if we could do it all over again

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## WHY DEVELOP A CERTIFICATION PROGRAM?
There are probably as many reasons to develop a certification program as there are associations out there developing them. Typically the need presents itself, leading to discussions within the association. In BICSI's case, it was a reaction to governmental deregulation that led to our first registration (certification) program. The association felt the need to differentiate qualified individuals to consumers, since the government now allowed anyone to offer this service.

Other reasons for initiating a certification program may include:
* New technologies that have transformed an industry or have created a new one.
* Encouragement by governmental agencies wishing to delegate the oversight role to industry bodies.
* The desire to present a united front, avoiding diverging practices and training process.
* The desire by a growing subgroup within an industry to differentiate themselves from the majority.
* Consumer demand, due to low quality standards within an industry.
* The desire by the association to raise revenues.
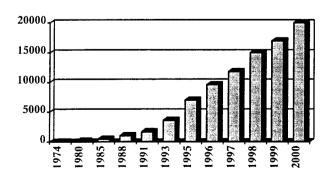* An area of expertise promoted by a specific manufacturer.

## WHAT IS BICSI?
BICSI is a not-for-profit association that focuses on the issues surrounding low-voltage cabling. Founded in 1974, the group grew relatively slowly for the first 10 years. By 1984 the association had grown to 400 members with annual revenues of just over $30,000. The original membership was almost entirely comprised of regulated telephone companies and suppliers.

With the advent of deregulation, the industry was turned on its ear. Many felt that BICSI would disappear, no longer relevant in the new marketplace. The association began to change its focus. In that same year (1984) BICSI unveiled its first certification program. The RCDD (Registered Communications Distribution Designer) sought to provide an industry-recognized credential that stood for quality in the new non-regulated marketplace.

The RCDD program has become the foundation of many of the programs BICSI now offers and is largely responsible for the growth of the association. By the end of this year, BICSI will have over 20,000 members residing in 85 nations and annual revenues in excess of $14 million.

## BICSI Membership Growth

## JUST WHAT IS A CERTIFICATION PROGRAM?

Typically a certification program is a voluntary process. An individual meets eligibility requirements and passes an examination. There is often a limited time period within which this credential is valid, and some form of renewal process. The renewal may entail continuing education or even re-examination.

You may also hear the term "registration." In BICSI's case, this is the term we use, due primarily to lawyer's advice. Back in 1984 we were advised that the term "certification" may entail indemnification by the association as to the performance of the individual covered by the credential. Since 1984 it has become increasingly apparent that the courts do not assume indemnification by the association awarding the credential. Today the term "certification" is more commonly used.

Certification is often confused with licensing. Typically a licensure program is developed by a governmental agency for the stated purpose of consumer protection. These licenses are typically mandatory if you wish to practice your profession within the jurisdiction covered by the license.

Another term, accreditation, usually applies to an educational or training program which trains potential candidates for a certification or licensing program. The role an association plays in accrediting organizations is much different than certifying individuals and should not be confused.

## WHAT OBSTACLES ARE YOU GOING TO ENCOUNTER?

So you've determined the need. You have decided to proceed. What problems are you going to face?

**Change**: It is human nature to resist change. There is a large base of people in any industry who are doing just fine under the present system and will resist any effort to change the status quo. These resistors may take several forms:
- The "Seasoned Pro" who has always done it that way and doesn't need or want any group of upstarts telling him that he is or is not qualified to do what he has done for countless years.
- Manufacturers who wish to sell proprietary systems and fear that a credential will open the door to unwanted competition.
- Your existing members, who may fear that a structured program that endows credibility may encourage new (and potentially strong) competition.

## IS THIS THING GOING TO FLY?

Many people will argue that a complete and detailed feasibility study should be undertaken prior to setting off on the development of a certification. It is hard to argue with their logic. After all, you are about to invest a great deal of time and money on the project.

I would only caution, however, that you can find yourself evaluating the program in such detail that technology and the opportunity may pass you by. Under the best of circumstances, the process of developing a program will take a great deal of time (in my experience about 2 years). So don't fall victim to "paralysis by analysis." NOCA (the National Organization for Competency Assurance) estimates that it costs from $10,000 to $20,000 to conduct a thorough feasibility study. BICSI has never spent anywhere near this amount. You do, however, need to do or consider the following:

1. Are your motives pure? Are you developing this program for the good of the industry, or to protect your turf?
2. See if someone is already doing the job. Are there already programs in existence that you can work with?
3. Circulate your plans throughout the industry and see who objects. Better to counter the resistance early on. This will allow you to incorporate valid objections into the program. It is often tempting to conduct a poll. I have found, however, that in most cases people do not know what they want or will need.
4. Determine how many candidates you might expect, and determine if you have the infrastructure in place to handle the paperwork and testing.
5. Be realistic. This will be a slow process and may take years to gain credibility.

## THE MILLION AND ONE DETAILS.
If you are still determined to proceed, there are countless details that must be determined.
- What form will the examination take? Will it be written? Hands-on? A combination?
- What format will it be? Computer generated and graded? Multiple choice? Essay? Practical? Theoretical? Will you include graphics, color, video, audio, etc.?
- How much will it cost? How much can potential candidates afford?
- Where will examinations take place? One central point? Around the nation? Via the Internet?
- Will you offer practice tests? Self-study aids?
- What language will you use? Will you offer international versions?
- What eligibility criteria will you require? Will it be experience? Or education?
- Who will conduct and grade the exam? Staff? Volunteers? Instructors? Outside vendors or testing agencies? Colleges or universities?
- Security. Who will have access to the question database? What process will you use in ensuring the exams do not "go astray?"
- Who will write the questions? Volunteers? Staff? Outside contractors?
- What will constitute a passing grade?
- Will candidates be informed as to their score? Or will it be pass/fail?
- What happens when someone fails? How are they notified? What if they challenge the result? How long will you maintain their file? How many times can they retake the examination? Are there fees for this?
- What happens when the candidate passes? What do they receive (certificate, stamp, uniform patch, etc.)? How quickly will they be notified? How will renewals be handled?
- Are there standards of conduct associated with the program? Are they voluntary or will you create an adjudicating body?
- How will you deal with people representing themselves as having completed the certification process, when in fact they have not?

The above just scratches the surface. You will need to form a committee who will be responsible for overseeing all aspects of the examination process. They can endeavor to answer most of these questions. Rest assured, however, that even the most thorough planning will not anticipate all the variations and situations you will encounter. Be prepared to be flexible as you roll the program out.

The NCCA (National Commission for Certifying Agencies) urges that the oversight body be completely independent of the trade or professional association whose members are affected by the program. This safeguards against potential conflicts of interest.

## GUESS WHAT. THERE'S MORE TO THIS THAN JUST WRITING AN EXAMINATION.
We have found that, while the credential is the foundation, there are many associated elements that must be addressed in tandem. These include:
- Written documentation. What materials will form the pool of information from which questions are drawn?
- Education. Do programs exist that will help candidates prepare for the examination?
- Continuing education, including conferences, that will support the successful candidate and provide the foundation for renewal.

## AND NOW, A WORD FROM OUR LAWYERS.
As with everything in our modern-day lives, creating a certification program is not without risk. There are many potential opportunities to encounter legal action. The more successful the program, the greater the risks. You must be aware that:
- Certification programs should not be used as a device to limit competition or fix fees or prices. Eligibility restrictions must not be so harsh as to effectively prohibit new practitioners from entering the field.
- Certification programs should incorporate standards that reflect existing technology and practices within the industry.
- Fees should not be structured in such a way as to effectively prohibit some applicant groups from participating.
- Due process guidelines should be outlined as part of the candidate information materials and strictly followed by the association. Sample guidelines are available from the NCCA (National Commission for Certifying Agencies, the accrediting arm of NOCA).

- Be truthful in your representations of testing procedures and content. Tell not only what the program covers, but what it does not cover (if there might reasonably be confusion on that matter).
- Do not disparage other programs or those who are not certified.
- Rely on objective and preferably quantified data as indicators of competency. Essays, for example, are inherently subjective.
- Extend reasonable accommodation to candidates with disabilities.
- Protect all your logos, publications, and other materials (registered trademarks, copyright, etc.)
- Develop confidentiality policies and procedures for candidate and test information.
- Develop security procedures for all examination-related materials as well as confidential files.

Basically, make sure you have consulted with a knowledgeable attorney as part of your development process.

## SO HOW DOES ALL THIS WORK IN PRACTICE?

Like most things, the real world is often quite different and distinct from theory.

In theory, you should have an obvious and apparent need. The industry is fully behind creating a certification program. You have unlimited funds and resources, as well as a team of lawyers standing by. You conduct a feasibility study. You create a business plan. You outline a marketing plan. You form a committee to oversee the process and they quickly identify all issues and come to full consensus (during their first meeting). You then write a completely fair and objective examination based solely on industry-best practices, establish a fair and reasonable passing mark, and maintain flawless records.

In reality you will only anticipate about half the problems. You will have limited resources and time, and you will be lucky if your committee agrees upon what to order for lunch during their first meeting. But don't despair, it will get better.

BICSI was fortunate in developing the RCDD program. We had few resources and a vague plan. But we did have time. The RCDD program was first rolled out in 1984. However, the credential did not gain widespread acceptance until about 1994. By then we had managed to work almost all the bugs out of the system.

In 1996 BICSI identified the need for another certification program. With the advent of highly complex cabling systems (for high-speed data), we found that the industry's historic installation practices were no longer sufficient. We determined that a certification program for the craftsperson was now required. In creating this program we hoped to put into practice what we had learned from the RCDD program.

## HOW BICSI CREATES A CERTIFICATION PROGRAM.

### Step 1: Determine the need.

As mentioned earlier, I am not a big fan of formal feasibility studies. I feel they are generally used to provide justification for what you were planning to do all along. The time and money can be better spent. If the leadership of your association is paying attention, they are probably in the best position to determine the need for a program.

### Step 2: Create a DACUM.

This is a term that you have probably not heard before. The term "DACUM" is short for "Develop a Curriculum." It is essentially a formal Job/Task Analysis. The process goes something like this.
1. Identify a panel of industry experts. These experts should reflect the industry segment that is being targeted by the certification program. You should have representation from the various factions within the industry, as well as a good mix of geography and corporate size. The number may vary, but we try to identify about a dozen or so for the group.
2. Identify an impartial facilitator. We have had very good luck with an organization called the National Occupational Competency Testing Institute (NOCTI). NOCTI is a not-for-profit association that assists in this process. They do, however, charge a fee (about $5,000 last time we did one).
3. You gather your panel, along with the facilitator, and lock them in a room for about three days. The purpose is to identify all the elements that go into the practice which you are attempting to certify. What tools do you need to know how to use? What basic skills are required (i.e., reading of English, basic mathematics, etc.)? What steps are involved in the practice? Through the help of a program developed by NOCTI, the facilitator quantifies all the data.

4. Identify a second group of industry experts to validate the results of the first group's efforts. These individuals may be drawn from a slightly different pool of candidates. For example, when we developed our installation program, the first group was drawn from front-line installers. The second group was drawn from their supervisors.

5. Have the second group meet with the facilitator. The purpose of this exercise is to validate the original findings. By taking this step, you minimize the risk of error. In any group, one persuasive individual can dominate and deflect results. This avoids such a situation and adds credibility to the process.

### Step 3: Form your oversight committee and answer those countless procedural questions.

As mentioned earlier, the NCCA recommends that you create a completely separate organization to administer the certification program. BICSI has not taken this path. We handle this through a committee (which reports to the Board of Directors). We are conscious of the potential conflicts-of-interest (particularly when it comes to education), and seek to minimize them through restrictive internal policies.

For example, no instructor or staff member working on educational programs has access to any of the questions on the examination. This minimizes the risk of creating exam preparation courses that simply teach the examination.

Security is also a primary concern. We have extremely tight restrictions designed to ensure the security of the database and the exams. The computers that are used to create the examinations are isolated, both physically and electronically, from any other computers (and are not linked to the outside via modems).

No one on the committee has access to more than a small portion of the examination (just the sections he/she is writing). The exams leave and are returned in custom manufactured security envelopes. Each exam is individually computer generated, drawing from a pool of several thousand questions. As a consequence, if 100 candidates were sitting for an examination, each would have a different set of questions (with some overlap) in a different randomly assigned order.

I would love to say that all the answers to all the procedural questions come from a deep analysis of the scope and content of the program and the industry, but that is not always the case. Pricing, for example, is often determined by what the market will bear, rather than the true cost of administering the program. If no one is willing to pay more than $50 to take the examination, it really doesn't matter that it costs you $65 to administer it.

### Step 4: Determine the documentation from which the exam is drawn.

You may be extremely fortunate and have available well-written, comprehensive documents from which to draw questions. In our case, we have had to write manuals for each of the programs we have identified. The DACUM serves as an excellent blueprint from which to draw in this development process.

It is vital that you identify your documentation. If you remember back to the legal disclaimer, assume that everyone in the world is waiting to sue you. If you can point to specific documentation, and let the world know that you are asking questions from that document, your life will be made much easier. People will still argue that the answer should have been "C" and not "B", but you can remind them that the exam is asking what it said in the book, not how the practice is done in their world (which may be quite different than your own). Be sure, however, to maintain references to specific passages when creating the questions. We actually maintain page and edition numbers within the question database.

### Step 4(a): Create educational courses.

The primary mission of our association is education. We, therefore, offer approximately 250 courses around the world each year. As part of our development process, we utilize the DACUM to create a curriculum of courses addressing the subject matter outlined during the process. This is not a required step within the certification program development process, but we have found it leads to a well-rounded program.

Bear in mind, however, that there are potential conflicts here. Many will argue that it is inherently unfair for an entity to create both an examination and a course that helps candidates prepare to pass that examination. It takes quite a bit of disclosure and credibility for the industry to believe that you are not simply teaching the exam in a wanton attempt to generate revenues.

### Step 5: Write the examination.

In this process as well, the DACUM serves as the guiding document. The DACUM not only outlines the steps and content of the program, but it also indicates the amount of weight that should be given to each item. By following this blueprint, those writing the exam can balance the questions to give an overall test that reflects the relative importance of the various topics.

For example, if you are generating a 100-question examination, perhaps 20 questions might be drawn on subject "A", but only 5 questions on subject "B".

In order to avoid the subjective nature of examinations, we require that all questions be multiple choice or true/false. We also require that each question be directly referenced to a document that is available to potential candidates. We then inform all candidates that the entire content of the exam will be drawn from those documents.

Many people have made a career of the science of writing test questions. The field is known as psychometrics. I do not profess to be an expert in psychometrics, but it would not be a bad idea to contract with someone who is at some point during your development process (the earlier the better). NOCA has a database of potential consultants as well as other valuable resources. Of particular value in creating the examination is *Certification: A NOCA Handbook* ($100 from NOCA).

The issues you need to address (with or without an expert's help) are:
1. **Validity** – does the exam measure what it purports to measure? A formal job/task analysis should help establish the validity of the questions.
2. **Avoiding Bias** – typically this refers to questions that reflect an age, gender, race, or religious bias. But the bias might also target corporate background. In our industry, for example, those trained through the Bell system have very different experiences and biases than those who came into the industry through an MIS education.
3. **Reliability** – a test is supposed to measure the candidate's knowledge. Reliability is the degree to which the results of testing are free from errors of measurement. For example, if a candidate took an exam 10 times, would he/she score in the same range each time?

Some more basic (and less theoretical) challenges come down to the use of language and the construction of questions. Can you read them? Do they make sense? Is every correct answer "B", or have you mixed them up a bit? Are all the long answers the correct one (since it is harder to write a short correct answer than it is to write a short wrong answer)?

## Step 6: Set your passing score.
Like everything else in this process, many will claim that there is a science to determining the passing score for your examination. To my untrained eye, this appears to be more an art than a science.

One method of achieving this is to gather a large group of candidates (or more appropriately, guinea pigs) to sit for the newly created exam. This can be a bit tricky, since you do not yet know what the passing score will be; all the candidates will be taking part in a very unclear process. You may encounter protests from those you determine have not passed. Anyway, you then analyze the results. You might have pre-determined that 40% (or 60%, whatever) of the raw candidates who sit for the exam should pass. If this is the case, then you simply pick the number that would provide that result. Pretty subjective if you ask me. I would not want to defend that process in court.

Another method is to gather a group of people who have been determined to possess the knowledge required under the certification program (how you do this is anyone's guess). Have them take the exam. Then take the median score as the passing mark. Theoretically, the median score of a group of clearly competent candidates should produce a valid "cut score." This seems a bit more defendable.

I have also had it explained to me that there is another (much more scientific) method of determining cut scores. It involves a complicated evaluation of the job/task analysis to determine the "need-to-know" data. All this goes into a matrix which I don't pretend to understand and, if I follow the process correctly, it gives you a very scientific answer that supports what you were going to do anyway. If you think you are likely to wind up in court, it might help to have this ammunition.

## Step 7: Maintain good records.
Aside from the legal considerations, your records are vital to the success of the program. If the program is successful, consumers will be calling you to validate a particular individual. If you confirm someone who is not certified, or fail to confirm someone that is... you are looking at serious potential litigation.

Additionally, we track each response to each question to determine if a particular question is poorly written or confusing. If 75% of those answering that question answer it wrong, we may have a problem. If the correct answer is "B" and 60% of those responding answer "C", the question or the answers might be misleading. Again, the records provide concrete information that motivates the committee to action and justifies their remedies.

**Step 8: Prepare for renewals.**
Before you certify your first candidate, you should be well underway in preparing for renewals. If you have determined a continuing education requirement, you must determine which courses will qualify. How will you notify candidates of these courses? Are they readily available? How will you track the courses each individual has completed? What proof will you require?

If you are requiring re-testing as part of the renewal process, then you need to re-determine many of the same questions you asked in creating the original examination. Do you take the same exam again, or is there a modified version? If it is modified, then go back to step 1 and start the process all over. You have effectively created a new certification program.

Be sure to inform all potential candidates of the renewal requirements before they ever take the examination. Ideally the renewal requirements are spelled out in detail in the original application. There is an implied (or very real) contract with the candidate. You cannot change the requirements mid-stream without some serious consequences.


**CONCLUSION:**
Bear in mind that the entire process will be time consuming and expensive. BICSI's installation program, for example, took over two years and $700,000 to develop. However, the program has generated over 7,000 exams during its first three years in existence and over 4,000 students through a one-week training program.

As you can see, there is quite a bit involved in creating an effective certification program. Not only do you need to identify the need, you need to determine the skills, knowledge, and competencies upon which the examination will be based. You then need to create a fair and defendable examination and process. You must administer it consistently and maintain its credibility. Each step (or misstep) can land you in court. It is quite a daunting task.

Fortunately there are skilled people out there who can help. Resources include:

**For certification information:**
National Organization for Competency Assurance (NOCA) and
National Commission for Certifying Agencies (NCCA)
1200 19th Street, NW, Ste 300
Washington, DC 20036-2422
Phone: 202/857-1165  FAX: 202/223-4579
Web Address: www.noca.org

1.Browning, A, Bugbee, A, and Mullins, M. *"Certification: A NOCA Handbook,"* NOCA, 1996

**For licensing issues:**
Council on Licensure, Enforcement and Regulation (CLEAR)
403 Marquis Avenue, Ste 100
Lexington, KY 40502
Phone: 606/269-1286  FAX: 606/231-1943
Web Address: www.clearhq.org

**For testing standards:**
American Educational Research Association (AERA)
1230 Seventeenth Street, NW
Washington, DC 20036
Phone: 202/223-9485  FAX: 202/775-1824

The National Occupational Competency Testing Institute (NOCTI)
500 North Bronson
Big Rapids, MI 49307
Phone: 800/334-6283