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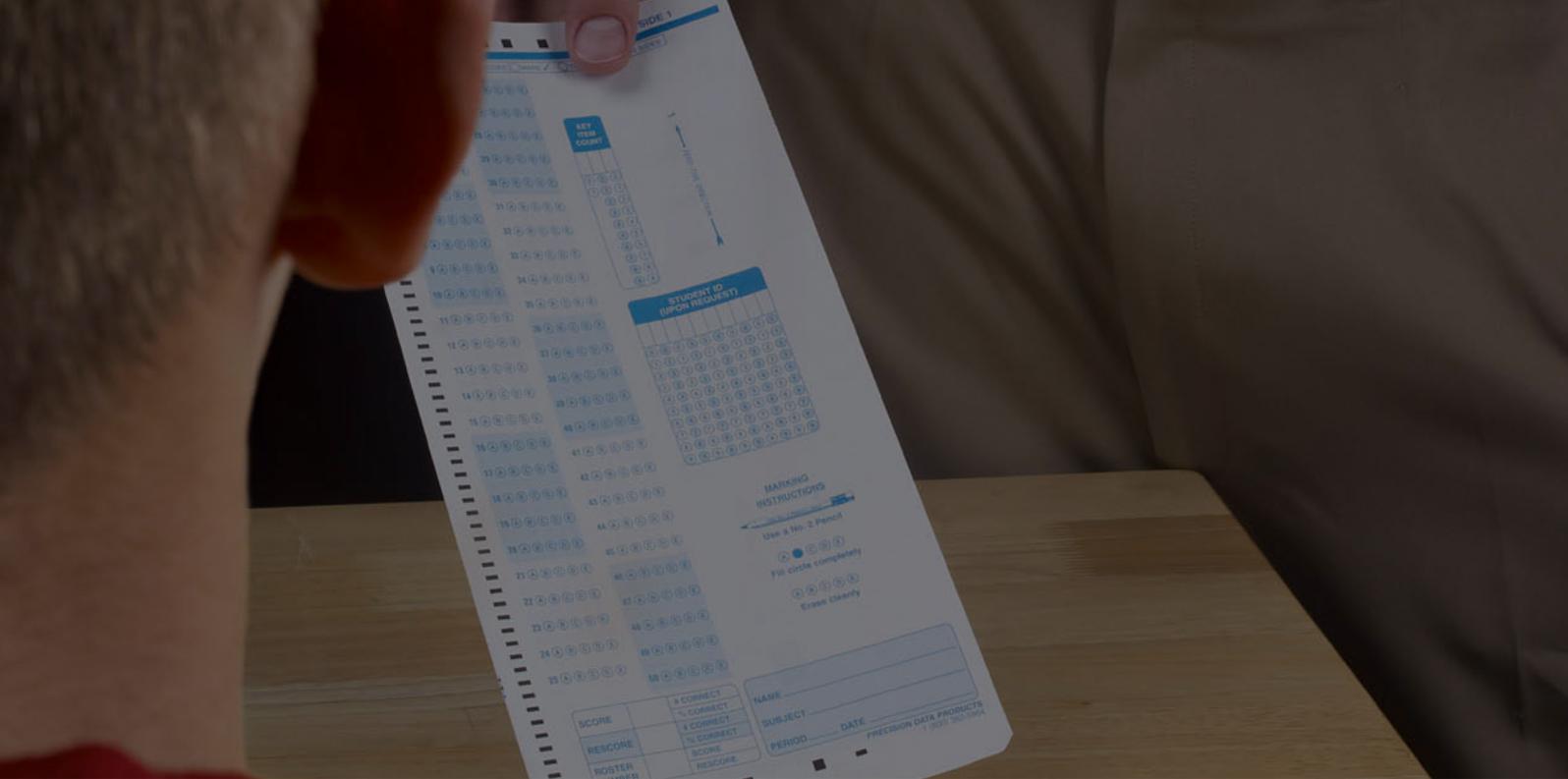
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# COMPUTER-BASED *Testing:* The Wave of the Future *By Adam Andrews, CIEC*

THE DAYS OF THE “**BUBBLE SHEET**” CERTIFICATION TEST ARE NUMBERED.

We have lived in the information age for a generation now, and computers have long been accepted as the most reliable way to store, access and manipulate information. For some reason, though, industry certifying bodies have often clung to the paper-and-pencil examination as the safest way to deliver high-stakes certification tests.

This trend is finally waning, as more and more certifying bodies make the move to computer-based testing (CBT).

## ISSUES WITH THE PAPER-AND-PENCIL MODEL

Anyone who has an industry certification is doubtless familiar with the traditional testing experience. Candidates who have just finished a certification class reconvene in the classroom for a test. Paper test forms are distributed by a proctor to the entire class at once. Each candidate fills in answers on a bubble sheet or circles choices on the test form itself. At the end of the session, the proctor collects the completed tests and delivers them to the certifying body, either by hand or by mail.

Potential problems with the paper-and-pencil model have long been obvious, and certifying bodies have developed procedures to mitigate these problems. The first risk is that since the test is delivered at the same time and place as the training course, the

course provider may have access to the test forms. If he does, he may compromise the integrity of the test by revealing its contents to his students.

Certifying bodies concerned about this problem usually use independent proctors to deliver their exams. This practice can help ensure that certain classes do not have an unfair advantage over other groups. However, since the impartiality of a proctor is hard to verify, this practice does little to protect the integrity of the exam.

A second obvious problem with paper-and-pencil tests is cheating, since candidates take the test in groups in the same room. To combat this, certifying bodies usually use several different forms of a single exam for every test session—essentially, separate exams that cover the same content but present the material in different ways.

This work-around is cumbersome for the test provider because it requires a separate exam development process for each test form. It also makes psychometric analysis more labor intensive by requiring a separate study of each test form after the exam is administered. Some studies suggest that because of these difficulties, paper tests are revised less often than computer-based tests and may be less responsive to industry trends in the long run.

The final and most serious problem with the paper-and-pencil method is that the security of a paper test form during transit cannot be guaranteed. Was the test form stolen and copied during the last exam administration? No one can really know for sure. In the present age of easy access to information, the test could show up



on the Internet tomorrow, destroying the certifying body's investment and cheapening every certification based on that test.

## ADVANTAGES OF COMPUTER-BASED TESTING

With the advent of Internet technology, CBT has emerged as an attractive alternative to the paper-and-pencil model.

Broadly speaking, the term "computer-based testing" could apply to any situation in which a test is taken at a computer. In the world of industry certification, however, the term usually refers to a testing model that has the following characteristics:

- 1 Certification exams are stored on a central remote server maintained by a third-party testing company independent of training course providers;
- 2 Candidates log in to the server via computer from a secure location operated by the testing company; and
- 3 The testing company processes exam results and delivers them to the candidate and the certifying body simultaneously.

CBT offers several advantages to the test taker. Since it is most often delivered by a third-party testing company, CBT allows candidates to schedule exams at a time and place of their choosing. Rather than traveling to a central location to attend an annual exam with 500 other people, candidates for a CBT exam can often take tests in their hometown. Many of the most prominent CBT companies have secure testing locations in most major cities around the world.

CBT also eliminates human error in the grading process, resulting in more reliable test results. Plus, most CBT applications can deliver exam scores to the candidate immediately, eliminating the frustrating wait for scores that sometimes takes weeks with paper-and-pencil exams.

CBT offers advantages to the certifying body as well. Certifying bodies that have chosen to implement their exams via CBT cite many reasons, but three are most prominent: security, psychometrics and independence.

CBT offers these powerful security features not available with paper-and-pencil tests:

- There is no test form to get lost or stolen.
- Tests are kept on secure servers, accessible via encrypted passwords.

- Candidates take them singly rather than in groups with no opportunity of copying or stealing test items or answers.
- Exam topics, items and distractors can be electronically randomized so that no two test administrations are exactly alike, making cheating impossible and eliminating the need for separate forms of the test.
- Most importantly, test forms never pass into the hands of candidates, proctors or course providers, so their integrity is verifiable.

CBT also enables certifying bodies to run psychometric analyses of their exams more accurately and efficiently than ever before. This is because a computer-based test captures raw data at the moment the test is administered, eliminating the need for subsequent data entry. With no need for copying test results from a stack of ScanTron cards, psychometricians can get right to work analyzing data. Third-party CBT providers also commonly offer basic psychometric functions as part of their service contracts, making it possible for small certifying bodies to offer state-of-the-art examinations.

Perhaps the most important advantage of computer-based testing is the distance it creates between training course providers and test administrators. By putting exam delivery in the hands of an independent third party, certifying bodies can prevent course providers from "teaching to the test." In this way, they can make defensible claims about the integrity of their exams and their certification programs.

Perhaps CBT will always have critics. In an age of voice recognition software, some folks still prefer a No. 2 Ticonderoga with a pink eraser. For industry certification programs, though, the risks of hanging on to an outmoded paradigm are growing every day. Soon, the paper-and-pencil exam will be a liability to certifying bodies and candidates alike. Meanwhile, the advantages of CBT are simply too significant to ignore.

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