Customer Application Story - New South Wales Board of Studies

Cardiff Software ‘s TELEform and CaptureIT (Australia) Pty Ltd –  
Helps New South Wales Board of Studies Earn an A+

Lead in

With the number of students sitting for its public examinations increasing every year, the New South Wales Board of Studies located in Sydney, Australia needed a scalable solution to high volume test processing.

The New South Wales Board of Studies has shown excellent foresight in using cutting edge technology from Cardiff Software to automate the capture of over 29 million examination student responses and marks and selecting a system that can be easily expanded to meet increased volume in the future.

Pull Quote

“The Board of Studies is realizing substantial time and cost savings in data entry, as well as maintaining client satisfaction with an understandably demanding key audience – the students, parents and schools of New South Wales. In addition, the TELEform system represents a technology edge for its users. Since TELEform can read handprint, machine print, check marks and more, it provides a flexible solution for processing both simple and complex forms.” Paul Waite, Managing Director for CaptureIT.

The Business

The New South Wales (NSW) Board of Studies located in Sydney, Australia, was established in 1990 to serve government and non-government schools in the development of school education for years K-12. It provides educational leadership by developing quality curriculum and awarding secondary school credentials, which students need in order to apply to a university.

During November of each year, the NSW Board of Studies manages the administration of the School Certificate (year 10 students) and the Higher School Certificate (HSC) examinations (year 12 students). Each student takes an array of tests that match his or her course of study, with English, Mathematics and Science taken by the majority of all students. Individual examinations can contain a mixture of objective responses, short answer and essay questions.
Like American College entrance exams, the HSC is required for the university application process. However, the tests encompassing the HSC exams are much more comprehensive than its U.S. counterpart and are intended to measure achievement rather than aptitude. There are, in fact, a total of 350 different examination papers for 136 courses. Each student may sit on average 7 separate HSC exams, depending on his or her course of study. The less demanding School Certificate examinations are designed to give “greater meaning and purpose to Year 10 study, promoting continuity between Years 10 and 11 . . . and raising standards and student expectations.” (Excerpted from the “New South Wales HSC and School Certificate Media Guide.”)

The Challenge

Before 1998, the manual process of capturing and scoring approximately one million School Certificate and HSC answer sheets and mark sheets was extremely slow and expensive. By law, test scores had to be tallied and reported within six weeks of the testing dates. To meet this deadline, 7 data entry bureaus were contracted to manually key in the marks from the mark sheets.

Recognizing that the manual process was slow, a 1996 feasibility report recommended the following goals for improving the processing and scoring of School Certificate and HSC examinations.

- Deliver long term cost savings over manual data entry
- Reduce the burden of administering data entry bureaus
- Improve support to staff
- Fast access to accurate test score data

The Solution (1997)

Following the recommendations to the 1996 feasibility report, the NSW Board of Studies decided to pilot an automated solution from U.S.-based Cardiff Software. Using Cardiff TELEform®, the board would have a complete integrated solution for form design, scanning, processing, verifying, printing and data export.

Using the point and click TELEform Form Designer, the Board designed its own forms and produced high-quality, personalized answer sheets for the School Certificate and HSC examinations. Because of the flexibility offered by TELEform, the Board was able to use a combination of response types in designing the answer sheets. Though TELEform automates the processing of hand print (ICR), machine print (OCR), bar codes, check marks and bubbles (OMR), the New South Wales examinations primarily involved choice bubbles hand print and numeric responses.

Short answers and essays are marked using a standardized numeric rating system on marking sheets that are also processed by TELEform. In all cases, forms are scanned in batches of
500 at a central location and processed by TELEform using pre-set business rules. TELEform automatically converts student responses and marks into online data, routing questionable responses and characters to an operator at a “Verification” workstation.

Distributed in Australia through Sydney-based distributor CaptureIT, the Cardiff TELEform solution was adopted across all of New South Wales in 1998 after the huge success of the pilot system in 1997.

The Implementation: Getting Better Over Time (1998 – the present)

Since its adoption in 1997, the NSW Board of Studies data capture system has been upgraded several times with new versions of Cardiff TELEform, with ever increasing benefits and reductions in processing time.

For example, in 1999 the TELEform system processed 63 percent more forms than in 1998, one week ahead of the 1998 schedule. According to Dr. John Bennett, Director, Information Services for the New South Wales Board of Studies, TELEform enabled the NSW Board of Studies to do in three hours what formerly took 7 data entry bureaus an entire day to accomplish.

At the close of the 1999 project, Dr. Bennett said, “We operated 24 hours a day. Staff worked in four six-hour shifts. In one two-day period, more than 200,000 forms were processed. This performance surpassed our expectations and has maintained a high level of accuracy. After automatically processing each form, TELEform presents the actual image of the form and highlights questionable entries for quick operator attention. This enables operators to quickly verify questionable entries rather than spending several minutes manually re-keying.”

In 2000, even though test volume decreased slightly, the volume of transactions captured (test responses and marks) increased from 26 million to 29.5 million. Despite this 13 percent increase, “the capacity of the system far exceeded the number of forms being delivered each day from the marking center,” said Dr. Bennett. In fact, the Board no longer had to operate 24-hour shifts as they had the previous year.

The Key to NSW’s Board of Studies’s Success: Keeping Up with Technology

Today the TELEform solution consists of just 15 PCs with 11 verification operators. The complete system includes an IBM Netfinity server, 2 TELEform Scan Stations, 1 Kodak 7520 scanner, 1 Bell & Howell 8125D scanner, 12 TELEform Readers and 11 TELEform Verifiers, with TELEform Enterprise version 7 running on a central NT server.

The increase in performance has in part been due to changes in scanning technology and improvements in the Cardiff TELEform software, which takes advantage of a higher compression aspect to create smaller files that move much faster throughout the network.
Image clarity has also improved, increasing recognition rates and making it easier and faster to verify questionable responses. In fact, TELEform can now do in just one hour (down from 3 hours in 1999) what formerly took 7 data entry bureaus an entire day to accomplish.

**The Benefits**

*Client Satisfaction*

In 1999, using TELEform to capture responses and marks faster and more accurate than ever before, and combined with the bringing forward of the examination period, students for the first time ever were able to get their HSC examination results before Christmas.

According to Paul Waite, Managing Director for CaptureIT, “The Board of Studies is realizing substantial time and cost savings in data entry, as well as maintaining client satisfaction with an understandably demanding key audience – the students, parents and schools of New South Wales. In addition, the TELEform system represents a technology edge for its users. Since TELEform can read hand print, machine print, check marks and more, it provides a flexible solution for processing both simple and complex forms.”

*Scalability and Future Growth*

The NSW Board of Studies will be able to continue to leverage its initial investment in the TELEform solution because of the solid foundation that it has established, upon which future growth and increased demands for test processing will be easily handled.

Said Muir Mathieson, a Senior Consultant employed by the Office of the Board of Studies, who is responsible for the design and implementation of the system, “The decision to go with TELEform looks better every year. The Form Designer allows us to control the design and production of our own forms, and the ability for the system to scale to meet very high volume requirements allows us to manage our investment in the system.”

*Reduced Labor Costs and Return on Investment*

The TELEform solution has provided the NSW Board of Studies with a substantial reduction in costs associated with the testing cycle. Combining this with the fact that nearly 400% more data is captured in less time than before TELEform was used, a return on investment was realised in the first year.

*Future Directions*

In the years ahead, the NSW Board of Studies hopes to install remote scanning stations to improve logistics by reducing the physical movement of paper forms and further reduce total processing times. They will also continue to take advantage of the opportunities TELEform has presented to re-engineer processes to vastly improve efficiency.

But no matter what future technology brings, one thing is certain, the NSW Board of Studies is at the forefront of technology-driven solutions to meet the educational needs of its community.