Onscreen marking: introduction strategy and examiner response

Abstract

Many awarding organisations consider that significant benefits may derive from the introduction of technical systems and services to support assessment processes after an examination has been sat.

The benefits claimed for e-marking systems include: enhanced process control; improved access to wider examiner expertise; enhanced communications and support across the examiner team; richer data on examiner, candidate, item, component and paper performance; reduced time to result; raised marking quality/consistency; reduced administrative error.

However, without close matching of the technical system and the assessment process, and without careful introduction to engage appropriate stakeholders benefits remain theoretical.

This paper begins by describing the objectives of a project carried out by a leading UK awarding body and RM plc to introduce a comprehensive e-marking system suitable for varied response sources and operating from standardisation to awarding.

It describes the approach adopted to solution design, to ensure it was assessment led, setting out the key features of the solution generated together with lessons learnt.

It reports the approach taken to system introduction across a series of 8 examination sessions, ensuring both that a new system could be tested and trialled while also protecting key examination sessions.

Finally it gives an overview of the results of research by the awarding body into examiner attitudes to the system following this approach.

Objectives

A leading UK awarding body had expressed an interest to RM plc to provide a comprehensive electronic marking system that both supported its current high quality delivery of examinations and would allow it to continue to improve the effectiveness and efficiency of standardisation and awarding. For clarification RM does not support awarding nor were the awarding body interested in RM doing so within the system.

In December 2004 RM initiated a project to design a generic solution for e-marking that would enable the awarding body to meet its aims. The main objectives of this project were to:

- Improve the overall efficiency and effectiveness of examination processing;

- Improve the quality of examination processing, including both the quality and accuracy of the marking and the reduction of lost data in the process;

- Demonstrate capability by successful processing of large numbers of examination scripts early in 2006.

The solution was to be developed over a year with the aim of completing a large scale pilot within that time.

Approach to solution design

From the outset there was a deliberate strategy to begin with a "clean room" approach to design where there were no preconceptions of what an e-marking solution should contain. The first stage of the process was to deliver a system that could be used for an April 2005 pilot, deliberately timed to be outside any live examination sessions to avoid potential risks.

The process was centred on frequent and regular contact between groups at RM and the awarding body. This single team included representatives from the following groups who worked together closely throughout the process:

- Project management staff from the awarding body;

- Experienced examiners from the awarding body;

- Project management staff from RM;

- Technical experts in software development from RM.

The first stage in the process was to gather a full set of requirements based on the business needs and operational demands of the awarding body related to the process of examinations. The software development team took a deliberately open-minded approach to this process and encouraged any and all ideas from the examiners and project staff at the awarding body. Once the system requirements were finalised the development of the software began.

The development that took place in February and March 2005 was at a rapid pace because the software development team were keen to gain maximum feedback from the April 2005 pilot. There was also a need to be flexible and include the many new ideas that were raised in the regular teleconferences and face to face meetings throughout the development process.

The April 2005 pilot of the first version of the e-marking system was successful in meeting the following objectives:

- First e-marking trials using a Mark from Image application;

- Demonstrating the suitability of the application to provide on-line marking capability for future pilots.

The pilot began with examiners being given a short introduction before using the system; within a couple of hours they began to discuss the implications and potential further uses. The main questions that were raised related to how the system could be improved to support standardisation and the use of seeded answers as part of this process. This was functionality that had originally been considered for the system but not included as it was felt that it would not be widely accepted by the examiners at this early stage. Another area that examiners said would make the system behave like paper was the ability to include annotations.

The overall feedback from the examiners was that the system had worked well and that they were satisfied that it could be used for on-line marking on a larger scale in future. RM agreed to include the new functionality within the solution and began to develop the second version of the system.

One again the software development team were keen to gain early feedback from the examiners and the awarding body on the new solution. In the summer of 2005 a 2 day workshop was organised at which staff from RM and the awarding body met face to face to review a prototype of the new system. The staff from the awarding body included specialists that understood the quality implications of the developments and who also took a view as to the possible reaction of the regulator.

The software development team had designed an interactive prototype that mimicked their ideas for the final solution. As the system was such a new concept it was important to be able to use this prototype to check that all parties had a common understanding of the functionality and the proposed design. On the first day the interactive prototype was demonstrated to the group and comments noted; that evening the prototype was revised and then shown the following day to gain feedback and consensus. The conclusion from the workshop was that the prototype satisfied 80% of the requirements of the awarding body and an agreement was reached on the development of the remaining 20%. More importantly this process ensured that the awarding body and RM came away with a common vision for the final system.

As a result of the success of the workshop and of the collaborative approach of the project RM has adopted similar methods in other projects. Development is centred on gaining a comprehensive understanding of each stage of a process using interactive prototypes. The software developers now more routinely develop interactive prototypes for use in workshops with potential users as an initial part of software development.

Key features of the solution

The solution:

- Interfaces to awarding body systems using commonly used data exchange technologies;

- Provides an interface to allow examiners familiar with paper marking to mark digitised candidate responses;
- Provides messaging and problem management and escalation services to support examiner activity;
- Provides an alternative to traditional standardisation/moderation;
- Allows continuous monitoring of examiner accuracy/quality.
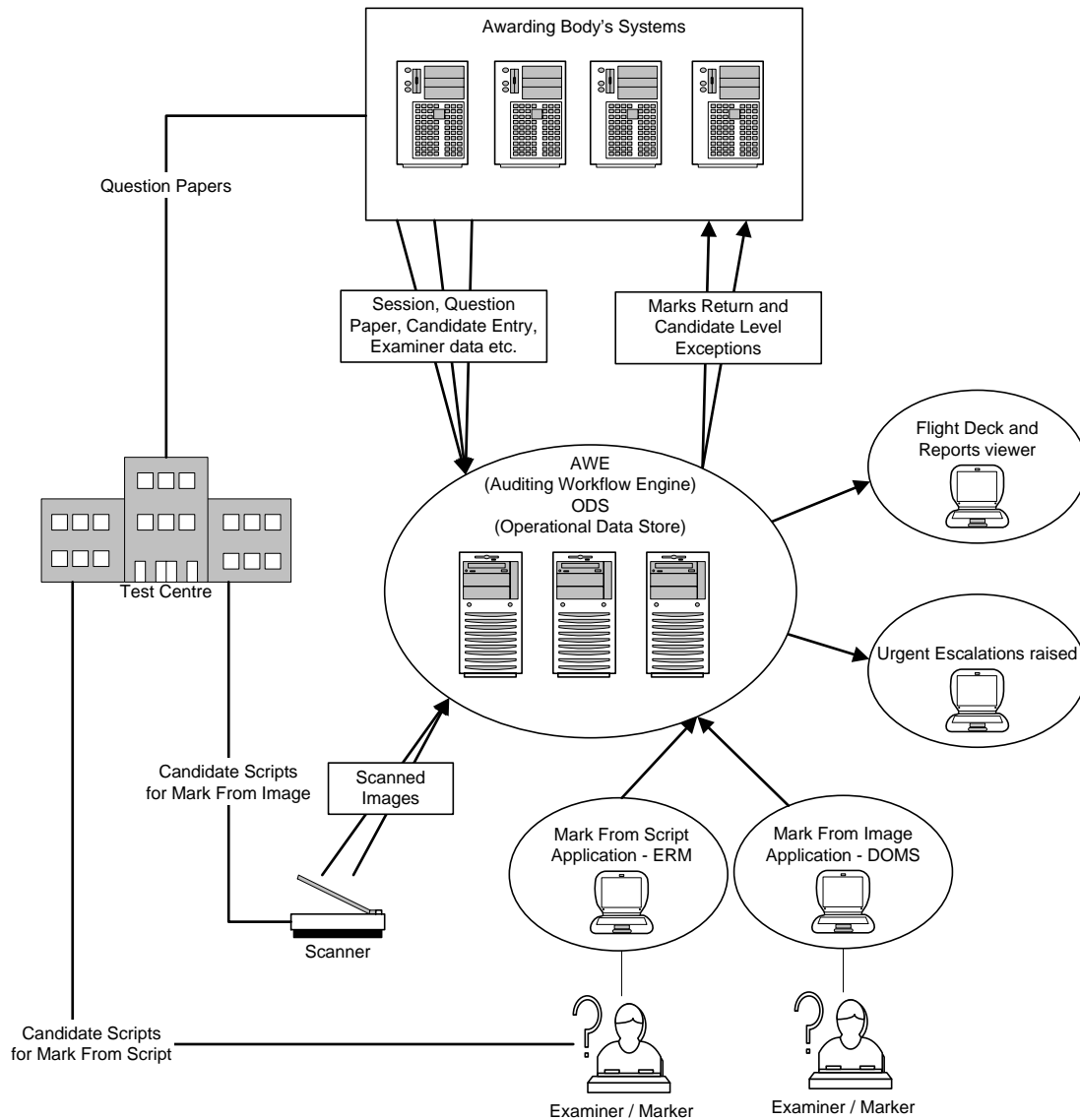
Central to the e-marking system is the Operational Data Store (ODS) which stores all the candidates' scripts and information related to the examinations and the marks returned. This is linked to the Audit Workflow Engine (AWE) which allows general markers and examiners to be monitored by Team Leaders and Principal Examiners. The access allows those supervising to be able to look at information related to individual markers down to item level.

Approach to system introduction

The success of the April 2005 pilot and the summer 2005 workshop session had generated sufficient confidence in the e-marking system to run a larger trial in November 2005.

There were extensive preparations before the November 2005 trial using regular teleconferences and face to face meetings to visualise the process of initial system introduction and training. Key to this was the involvement of examiners at every stage of the process so that any differences of understanding that might lead to confusion could be noted and dealt with at an early stage. Furthermore each part of the e-marking system was recognised as having equal importance and the process management of the November 2005 trial was critical in ensuring that all parts of the system were thoroughly utilised.

The trial was held in a marking centre with a mix of examiners, general markers and supervisory teams, there were 75 people in total. Physical proximity was important so that both the users' interaction with the system and the system itself could be closely observed. The first stage of the trial was for the Principal Examiner and Team Leaders to meet for 2 days to standardise the material before the examiners and general markers arrived to begin marking. The initial introduction to the system was delivered by face to face training which then quickly moved to practical hands on sessions before the Principal Examiner and Team Leaders began to use the system for their standardisation procedures. From this process came the seeded answers that were fed into the system as part of the standardisation and moderation process.

The examiners and general markers then arrived and, following their training sessions, began marking for 2 days. In all the training on the system took half a day for each group. The training was supplemented by support on site for these pilot sessions to ensure that any issues were noted and then resolved. At all times throughout the pilot the focus was on maintaining the momentum and working to deliver the benefits of innovation from e-marking whilst meeting key business deadlines.

A significant number of the examiners were sceptical of technology and changes to existing paper-based marking of scripts. Following the introductory talk the examiners were given full access to the system and within 30 minutes discussion had centred on the mark scheme rather than how to use the system. This was an encouraging sign that the system itself was already transparent to them.

Research into Examiner Attitudes to the System

As part of their participation in the November 2005 trial, comprehensive questionnaires were handed out to all who participated in the standardisation and marking processes. This section summarises the key findings from the

questionnaires. To keep the paper brief the figures have been approximated (e.g. two-thirds does not mean exactly 66.7%).

The majority of **examiners and general markers** were confident during standardisation, after they had been trained, and this figure rose after standardisation was complete. Almost all of this group found the training very effective, and none needed to refer to the training a lot during marking. Almost all examiners and general markers would be confident or at least willing to use e-marking at home, and over three-quarters would be happy to mark on screen again.

Most of the **Principal Examiners and Team Leaders** felt confident or neutral about e-standardisation, but were confident about using the system after e-standardisation. E-standardisation was felt to be more time-consuming and more difficult for one subject area than traditional standardisation. Two-thirds of this group found the training very effective and most needed to refer to the training during marking. Most Principal Examiners and Team Leaders did not think that mark scheme briefings could be undertaken online and all felt that e-marking would be enhanced by an online discussion of examples of candidates' work. Almost all of this group were ok or confident to use the system at home. There was also strong support for the awarding body's objectives to introduce on-screen marking.

RM has worked hard along with our colleagues at the awarding body to be sensitive to the needs of the examiner community whilst adopting new systems that bring change and a broad range of benefits to the awarding body and the candidates that take the examinations. Examiner engagement is vital. The examiners are a finite, skilled resource. RM wants to take away some of the mundane elements of marking paper and some of the potential for human error.

Not all awarding bodies operate in the same way or are of the same scale. RM is now engaging with other groups and is still able to improve the solution, the monitoring and quality control processes as well as refine the usability. We will continue to watch and learn from each new group of examiners and awarding body experts that we work with.