



Document Management and Workflow Systems

## Case Study

# Automation of the Student Admission Process at the University of Maryland

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Each year, over 36,000 students attend the fall semester at the University of Maryland. In order for a student to attend in the fall, the Admissions Office must receive the student's final application papers no later than December 1 of the previous year. During this peak period, UMD receives about 10,000 freshman applications, 20,000 graduate applications, and 5,000 transfer applications. Of the total applications received, UMD eventually welcomes about 40%, filling slots opened by graduating and transferring students. In 2001, admissions were processed manually, with a typical application requiring an average of four weeks to complete the approval process. In 2002, admissions processing was automated using the Optix® Document Management and Workflow System, with per-application processing time reduced to an average of 72 hours. This remarkable improvement provided benefits to the University in the form of labor savings as well as providing a much faster response to the applying students. In today's higher education marketplace where universities must compete for quality students, fast response to an application conveys a valuable image of caring and efficiency, helping UMD remain in the competitive forefront.

*“Optix provided a massive improvement over our previous paper process”*

Steve Edwards,  
Director of Administrative and Enterprise Applications, Office of Information Technology,  
University of Maryland



Admission applications consist of multiple paper and electronic documents. While some of these (including the primary application) may be filled out and submitted online via the web, many exist only in paper form. A new freshman application typically has the following document types:

- Application Part 1
  - Primary student information (4 pages)
  - Residency Document (2 pages)
- Application Part 2
  - Activity Sheet – sports, clubs, honors participation
  - Niche – Student supplies written answers to three questions
  - Essay – Student writes on one of three topics
- High School Transcript
- Test Scores (SATs, etc)
- Two Teacher Recommendations
- Counselor Recommendations

International students must also supply visa documentation and a Statement of Finances.

The primary application and supporting documentation must be received no later than December 1. With few exceptions, an admissions application is not considered complete and ready for evaluation until all documentation has been received and brought together.

## The Paper Trail

In the past, a folder was created for each student and became the eventual receptacle for all incoming documents in either original or copy form.

Incoming documents were sorted, the student identified, and the paper manually placed into a folder. Incoming forms from the web were batch printed for inclusion. In addition, information from the document was entered into UMD's Student Information System, which kept track of which documents had been received, as well as recording basic student information such as Student ID Number (SID), Name, and Date of Birth (DOB).



The paper-based system had improved through the years, but as with any system of its size and complexity, it had limitations. Folders containing either the original or a copy of the student application had to move along the approval chain, which consisted not only of Admissions offices, but also of various departments, colleges, honors programs, and other organizations.



The number of external offices involved made the process of entering data into each office's data system, collection of processing fees, and evaluating the applications excessively long and challenging. An average of four weeks was required to process a typical application up to the point of being able to generate an acceptance letter to the applying student.

In 2002 UMD decided to develop a system that could automate the capture of incoming application documents and help automate and streamline the admissions and evaluation process.

## System Requirements

The existing Student Information System (SIS) was designed and developed in-house by UMD IT personnel. Because this system met the basic data entry needs of the various evaluating offices involved with admissions processing, it was decided to build upon this foundation by integrating third party document capture and workflow software.

By 2002, Optix had been in use at UMD for over 5 years, primarily in applications requiring long-term archival document capture. Based on information supplied by Mindwrap about Optix Workflow, paper document capture, electronic data capture, web access, and API-level integration, it was decided to expand the existing UMD license to encompass additional Optix modules in order to develop the new automated system.

The new system was required to:

- Integrate with the existing SIS system. The SIS would remain as the primary data repository for student information, with key values (SID, Name, DOB) used to index and retrieve documents from Optix;
- Provide high-speed paper document capture and indexing. Paper scanning efficiency would be improved using patch cards whenever possible;
- Provide automated electronic document capture and indexing. Commonly known as COLD, this technology allows incoming electronic documents (such as web forms) to be automatically indexed and stored without scanning;
- Use workflow to automate the movement of applications along the various evaluation tracks.

With only minimal training by Mindwrap personnel, teams from UMD's Office of Information Technology (OIT), Administrative and Enterprise Applications (AEA) and Technical Services and Support units along with representatives from the Office of Undergraduate Admissions, the Office of International Education Services, the Graduate School, Financial Aid, and Records and Registration designed and developed the system. Programming of the interface between the mainframe based legacy SIS system and the new Sun-based Optix system required two months. An additional four months were needed for project management, hardware procurement, and implementation.

### The Automated System

The new Optix system is deployed on a Sun Enterprise 250 platform running Solaris and the Oracle RDBMS. Optix index and query screens as well as workflow routes were developed by UMD using Optix tools. Index data from paper scanning and electronic COLD processing are recorded in Oracle tables managed by Optix. These are minimal index records consisting of a Student ID, Name, and DOB. Batch software developed by the UMD team subsequently reconciles data between the existing mainframe SIS system and the Optix/Oracle system, flagging the SIS records with which documents are received. When all required documents have been received, the SIS system notifies reviewers that applications are available for processing.



Incoming paper is scanned on one of two Fujitsu 4099 high-speed duplex paper scanners using Optix drivers. Images are compressed using CCITT G4 compression and stored in industry standard TIFF files. Prior to scanning, documents are sorted by type into batches.

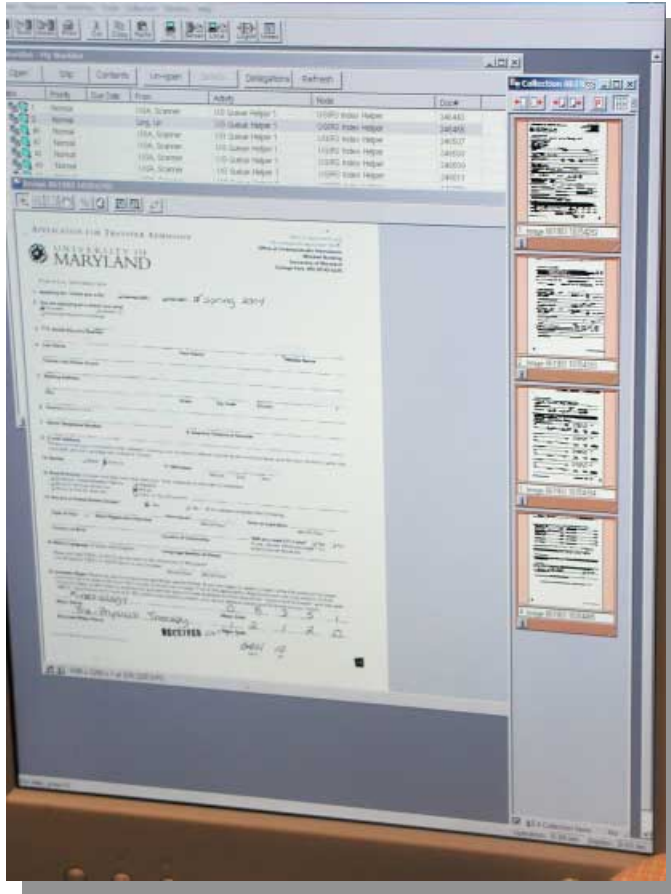
Pre-printed barcoded patch cards are inserted into the document stacks prior to scanning. Patch cards are used not only to separate individual multipage documents, but also provide scan-time instructions to Optix for setting batch

numbers, document types, and scanner settings. Optix displays thumbnails of each page scanned in real time to provide a quality check on the incoming images. Operators can therefore easily tell when images are too light or too dark without having to open the full pages.



Scanned documents are automatically placed into a workflow route designed by UMD using Optix tools. The documents are routed to a pool of index operators equipped with dual screens – one screen displays the SIS application and the other screen displays the documents stored in Optix. The use of dual screens – while not required by either Optix or SIS – helps the operators to visually separate the documents contained in Optix from the index data contained in SIS. Much like an email inbox, an operator opens the next Optix work item to be processed, viewing the newly scanned pages, and entering any required data into the SIS system. Operators also check for and take actions based on exceptional conditions. As an example, the student application indicates the source of transcripts that will be sent. This source is encoded into SIS. When a transcript arrives, it must match the source indicated by the student. If the application still requires a transcript – or other documents and information are pending – the operator places the application package into a suspended condition awaiting further data. Once all required documents have been received, the operator indicates that the application is ready for evaluation.

Applications received electronically via the web are processed automatically using Optix COLD. UMD-designed templates - created using Optix form tools - allow incoming documents to be automatically indexed and stored without operator intervention. This saves the large amount of manual keyboard data entry, printing, and paper handling required under the old paper-based system.



The SIS integration developed by UMD allows data transfer between the two systems. The mainframe-resident integration module performs actions against the Sun-resident Oracle tables used by Optix. Index data from the SIS system can populate skeleton records in the standard Oracle tables used by Optix, while index data captured by Optix is used to set “document available” flags in the SIS system. Once an application package is flagged as complete and ready for evaluation, the SIS system notifies applicable reviewers.

Reviewers – also equipped with dual screens – access application data in the familiar SIS system while viewing application documents in Optix. Because the documents are completely electronic, no actual paper or folders are moved. Reviewers indicate approval or rejection of an application to the SIS system which formats and batch prints acceptance or rejection letters to the students.

Just how fast is the new system?

On the Monday after Thanksgiving in 2001 – under the old paper-based system – 11 bags of mail were delivered to Admissions. Some of these applications were unable to be processed until the new year. On the Monday after Thanksgiving in 2002 – under the new system – 25 bags of mail were delivered to Admissions and thousands of Web applications were received. By mid-December, all had been completed.

*“Using Optix, we decreased the turnaround time for processing an application from four weeks to 72 hours.”*

Dave Alderson,

Project Manager, OIT/AEA  
University of Maryland

## **Future Plans**

The University will soon migrate to a Sun 480 platform to obtain more horsepower for future applications. These plans include:

- Deployment of Optix Web to enable browser-based processing from anywhere;
- Deployment of a new accounts payable support system developed using Optix Java API's. The new system allows browser-based users access to the existing AP system while enabling display of scanned invoice documents in Optix;
- Enhancements to the existing admissions process to allow for increased flexibility in the prioritization of applications through the processing line.

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