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ABSTRACT

This paper describes the admissions process at Washington State University, Pullman, Washington. Document imaging and automated workflow technologies have completely transformed the admissions process at Washington State University. All application material is stored in imaged form, and the admissions staff members use automated workflow to process applications electronically. This paper describes the improvements in processing efficiency and customer service that has been achieved and describes ideas for future enhancements. (Author/SLD)

Streamlining the Admissions Process with Imaging and Workflow

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Document imaging and automated workflow technologies have completely transformed the admissions process at Washington State University. All application material is stored in imaged form, and admissions staff use automated workflow to process applications electronically. In this session, WSU shares the vast improvements in processing efficiency and customer service that they have achieved and their ideas for future enhancements.

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Introduction

Washington State University (WSU) is a Research I land-grant institution. Founded in Pullman in 1890, WSU is Washington's only statewide university with three branch campuses, 11 regional learning centers, and an extensive distance education program. WSU serves more than 21,000 students, including approximately 3,000 graduate students. The university consists of 10 colleges and a graduate school. For more than a century, WSU has offered strong and varied academic programs. The liberal arts and sciences occupy an important place in the curriculum, along with business, education, architecture, pharmacy, nursing and the traditional land-grant programs in agriculture and home economics, engineering and veterinary medicine. WSU was ranked again this year in the top ten wired public universities by Yahoo Internet Life magazine. This ranking is partially based on the excellent backbone network in place on our main campus and the educational network throughout the state. This technology was critical to the success of the university-wide implementation of an imaging and workflow system.

The Business Problem

Before the imaging and workflow project began, WSU's admission processing was based on paper application materials kept in each student's file folder and data kept in the mainframe student information system. Multiple staff members in Admissions and other offices needed to see the documents in the folders to do their work, and these pieces of paper could only be shared by making copies or passing the folder from desk to desk. Admissions Office file cabinets were burgeoning with folders and taking up valuable floor space. Loose documents and file folders were piled high on staff members' desks. Frantic emails were sent many times a day to the entire office to try to locate "missing" files, transcripts or applications. Admissions Office staff answering questions from students and parents on the telephone and at the front desk effectively removed a student's file from the processing flow when they retrieved it for information. Staff members from other offices, such as Athletics and the Student Advising and Learning Center, prowled from desk to desk in search of files for students they were trying to process. Copies of every transcript and transfer credit report were routinely made and sent to academic advisors via the campus mail system. We desperately needed a way out of the paper pandemonium!

WSU's desire to enhance enrollment was also a major consideration in the initiation of the project. By becoming more efficient and reducing the time necessary to process applications, WSU hoped to increase its success in national and regional competition for high quality students. Enrollment statistics show that the quicker applications are processed and students are offered admission, the more likely they are to enroll. University enrollment enhancement initiatives were expected to increase the number of applications submitted into the process, and the existing model simply did not have the capacity to handle them efficiently.

These business needs pointed to a paperless, shared admissions process to improve efficiency, expand capacity and enhance customer service. The solution explored and then implemented was a university-wide electronic document management system with automated

workflow. The Admissions Office was selected for the initial implementation of the new system, including document archive and retrieval functionality and automated workflow processing, with plans to extend it to meet similar needs of other university offices over time.

System Selection and Implementation

In the spring of 1998, WSU undertook the search for a solution to its document management needs. After an ambitious product and vendor evaluation effort, a selection was made that fall. The eMedia product (now renamed Acorde) from Optika Imaging Systems was selected, together with a third-party integrator, Integra Information Technologies.

Process analysis and design began immediately. Modeling of the manual file management system in the Admissions Office revealed a confusing mix of procedures within the office and at the branch campuses. Because of the tight schedule for system implementation in the admission application and enrollment business cycle, there was no time for reengineering, and the existing business rules and processes were programmed into the electronic workflow. Servers and a scanner were ordered, workstations and network connections were upgraded, software was installed, and staff members were trained. Optika's newly released imaging and workflow software along with Integra's custom scanning and indexing modules were implemented in the Admissions Office in January 1999, just after the start of the Fall 1999 processing cycle. This aggressive timeline, change in processing methods, and implementation of the new system precipitated many adjustments in the Admissions Office and transformed the processing of admission applications.

Results of the Transformation

Application forms, checks, transcripts, and other paper documents that arrive in the mail are sorted and scanned into the system daily. As soon as a set of documents has been scanned and image quality is approved, a staff member uses customized software that interfaces with WSU's student information system to assign indexes to each scanned document. These indexes include the applicant's student number, name, campus, and other identifying information so that the document image can be easily retrieved. Images submitted to the system are immediately available for offices across the university to view or annotate. This has provided an enormous customer service benefit. A staff member taking a call from a student or parent is able to use a query tool to see a list of documents received for the student in question without having to search for a file folder that might be anywhere in the office.

Electronic workflow has renovated the way applications are processed. In the old paradigm, an application form was held until the application fee was paid and all required supporting documents were received and manually added to the file folder. With the new system, a workflow package, or virtual file folder, is created upon receipt and scanning of an application. When the application is scanned, the index data from the student information system is also used to populate the workflow database. Workflow rules then automatically route the package to a holding queue until all necessary transcripts, etc. have arrived. Document type is captured during the scanning step, and any type other than "application"

triggers review of the package. When an application package is complete, workflow rules route it to the appropriate electronic queue for review and action. A staff member selects a package from the system by using a predefined profile, or filter, based on package characteristics such as status, campus, or queue. He/she "locks" the selected package into his/her electronic in-box before starting to work on it, guaranteeing that only one person is working on a package at a time, although multiple people can be working from the same queue. After his/her work on the package is complete, then a click of a button sends it back to the workflow process where it is evaluated by the automated rules and sent on to the next queue.

This automated workflow has had a huge impact on the Admissions Office. Staff members no longer need to pass file folders from desk to desk. Packages can be located by anyone using the software; journal entries and comments can be reviewed; package history reveals exactly what processing steps have been completed. Other offices involved in the admissions process, such as the Student Advising and Learning Center, are included in the workflow and no longer need to come to the Admissions Office to retrieve files.

The use of profiles has had benefits other than allocating work among the staff. Because most admission processing for the branch campuses is done locally (transcript evaluation being the exception), manual procedures were difficult to standardize. Use of profiles allows the automated process and a single set of rules to drive procedures and events at all campuses. Also, when management decides to give priority to processing applications in a particular status, profiles enable quick set up of queries to find them, instead of researching and locating individual files.

Seven custom forms and a workflow database were developed to display and hold all data necessary to process a student's application. Each of the forms is designed to address the needs of staff members during a particular step of the processing. For example, one form holds information for answering status questions on the telephone, one contains transcript evaluation items, and one includes items pertinent to international students. Several of the forms contain free-form fields where comments can be entered, effectively replacing the yellow sticky notes that used to dot the file folders and documents. A recently added form consolidates all the comments and is especially useful for front desk and data entry employees. The system administrator easily creates and/or modifies the forms when new data elements or changes are required.

A custom module supplied by our system integrator produces all letters mailed to applicants, replacing the cumbersome mainframe merge and print process. When a button is clicked on one of the workflow forms, a Visual Basic program extracts the necessary data from the workflow database, temporarily stores it on the local workstation, and launches the word processor. The letter text is merged with the extracted data and reviewed by the operator. After any changes are made, the letter is printed for mailing to the student and an image of the letter is automatically indexed and stored as part of the applicant's virtual folder.

Another custom feature of the system is the ability to hold transcripts or other documents in a searchable "suspense" file until an application arrives for that student. No action is taken on these documents until a matching application arrives and they are attached to the student's virtual folder. This feature has virtually eliminated the problem of "lost" transcripts.

Benefits of Document Imaging

The most noticeable benefits of document imaging are the absence of piles of paper in the Admissions Office and shared electronic access to all application materials. Paper admission file folders are a thing of the past, and substantial savings has been realized because staff in the Admissions Office and at the branch campuses no longer spend time tracking down "lost" folders or documents.

Customer service staff members have immediate access to a student's virtual folder without interrupting processing. They are able to give informed and accurate answers to questions regarding a student's information or status. Other offices across campus, including Athletics, International Programs, and Multicultural Student Services, can also view and track a student's progress through the system. Advisors in academic departments can see or print transcripts and transfer credit reports themselves, eliminating the need to make and mail copies from the Admissions Office. Because the branch campuses are able to scan and index documents that they are received, they no longer need to fax, mail, or send application materials by courier to Pullman.

Other benefits include:

- All campuses and departments have access to all imaged documents, including all letters sent to students regarding status, missing documents, transfer credit, etc.
- Admissions application processing flow is triggered and monitored electronically, not by file folders passed from desk to desk, and office to office.
- Permanent "file folders" for students who enroll are now maintained and available electronically, not created and transported to the vault in the Registrar's Office.
- Staff members have the ability to make and view annotations of different types added to the images.
- Management information, including counts of particular kinds of documents in the process, etc., is readily available.

Benefits of Electronic Workflow

Since implementation of the imaging system, admission application processing is totally driven by the automated workflow designed and developed by Integra and WSU. The system currently contains more than 12,000 applications in various stages of processing. Along with the benefits listed above for document imaging, realized workflow benefits include:

- Electronic workflow has standardized procedures across the university, including the branch campuses and Extended Degree Program.
- Changes in business practices are easily programmed and implemented in the workflow rules.

- Transcript evaluation has been efficiently centralized in Pullman, with no delays for mailing or faxing transcripts.
- Processing workloads are effectively managed using workflow tools.
- Process reporting and tracking tools allow management to strategically allocate staff time and target specific groups of applications for priority processing.
- A complete history of actions taken on every student is kept automatically by the system.

Lessons Learned

As one of the first client-server application installations in the student services area at WSU, this was a complex project and required more coordination, consulting and monitoring than expected. Defining the relationship between the vendors and WSU and the responsibilities for work on the project was a challenge. Issues emerged involving communication, points of contact, and roles, both internal and external to WSU. Executive support, active user involvement, and an energetic champion proved critical for success and the need for them should not be underestimated

Because of the business cycle of the Admissions Office, an aggressive implementation schedule was undertaken despite the risks involved, and the system went directly into production mode with no parallel processing. All problems and bugs that surfaced immediately affected the ability of users in the Admissions Office to do their work. To mitigate this problem, a test system has been put into place for future implementations, enhancements, and upgrades.

Equipment requirements for the users were underestimated at the beginning of the project. Everyone in the office relies on the system to do their work and the need for large, high-resolution monitors and powerful processors at every workstation quickly became apparent. All workstations and monitors in the office have now been replaced or upgraded.

The timeline for the Admission Office business cycle was not sufficiently considered in the design of the storage strategy for images. Because an application may remain in the process for as long as nine months, removing the associated images from cached storage with quick retrieval time and forcing retrieval from optical disks with significantly longer response time resulted in huge frustration for the users. The solution has been to increase the size of available cached storage and to keep all images there for a complete application cycle. All documents needed for processing are now available almost instantaneously.

Approximately half of WSU's undergraduate admission applications are received via the Web. When the system was initially implemented, these were downloaded, printed, and then set aside for scanning and indexing. The system has since been enhanced to create images from Web applications in the same way that letters generated by the system are stored as images without printing and scanning. The images are indexed using a module that automatically matches to the student's record on the mainframe student information system or creates a new record. The transaction to create the workflow package is automatically

generated, and the application sent into the stream of processing without the need of any operator involvement.

Because the imaging and electronic workflow system was built on an NT platform and the student information system is mainframe-based, data entry on both the workflow forms and on the mainframe was required when the system went into production. A project to design and build data feeds between the two systems has eliminated this duplicate data entry. Now when a student is admitted, the credentials analyst needs only to change the status on the workflow form, and the student's status in the mainframe information system is synchronized automatically. When a student changes his/her address using WSU's Address and Telephone Maintenance service on the Web, the change is automatically imported into the workflow database so that any letters are produced with the most current address.

Future Plans

While we are extremely pleased with the imaging and automated workflow systems that have been implemented at WSU, we also have a growing list of ideas for enhancements and processing improvements.

After using the original implementation of workflow for two full application processing cycles, an effort is currently underway to examine the Admissions Office business practices and rules. The models developed and metrics extracted from the database will drive a long-awaited reengineering of the workflow and reallocation of personnel to gain processing efficiencies and further improve customer service for future application cycles. The plan is to combine previously fragmented, piecemeal tasks so staff can take responsibility for larger chunks of the process, with decisions made closer to the point of actual customer service. The flexible technology of the system makes it possible for valueless and redundant steps to be removed and provide automatic, systemic control for the process.

We are currently involved in a project to receive transcripts from the state community colleges via EDI (Electronic Data Interchange). When the project is complete, the EDI data for a transcript will be automatically converted to an image and stored in the system in the same manner as Web applications. The student's workflow package will be updated to show that the transcript has been received and is ready for evaluation. Automating this route of receiving transcripts and eliminating the need to scan and index them will result in substantial time-savings, especially at the end of a processing cycle when almost every transfer student submits a final transcript.

The Registrar's Office is planning to use the Admissions Office scanning and indexing tools to make the permanent records of 40,000 current and former students available for retrieval using the imaging system. The current procedure is for an Admissions Office staff member to manually retrieve a required file from the vault, walk it over to the scan station, wait while it's scanned and then return the paper file to the Registrar's Office. When the back scanning is complete, this time-consuming trip will no longer be necessary.

We plan to implement Web access to documents in the imaging system. The next version of the Optika software actively supports the Web as an interface to both image retrieval and workflow processing. Web access will remove the need to install client software on the casual user's workstation. This will make it easier to broaden the use of the imaging system in the academic departments throughout WSU and to academic advisors in any location.

Student email address is currently collected from the admission application and stored in the workflow database. When university policy and procedures have been worked out, an enhancement will be made to the electronic workflow process to trigger automatic email for specific actions, such as the receipt of a transcript. When a transcript arrives and becomes part of a student's application package, the student will be sent an email message. This automatic notification should greatly decrease the volume of telephone calls to the office asking if a transcript has been received.

WSU is also investigating the use of optical character recognition (OCR) to feed data into the imaging and workflow system. The biggest return would come from using it to read applications and transcripts submitted on paper, and since the trend seems to be moving rapidly toward the Web and EDI, this idea may be abandoned for the Admissions Office.

We would also like to apply imaging and electronic workflow to processing needs in the Graduate School. Graduate School staff members already use the system software to search the "suspense" holding file for transcripts and to view undergraduate admission files. Web access and annotation of images and electronic workflow on the web will be invaluable to graduate coordinators and committees who make admission decisions for applicants to the Graduate School. Program evaluation and graduation processes could also benefit from the use of imaging and workflow technology.

Conclusion

Imaging and automated workflow have enabled a major transformation of the admissions process at WSU. Even casual observers have noticed the change in the office, and the staff openly wonders how they survived without the system. As an example of their enthusiasm, and testimony that reluctant staff members can be transformed as well, the following quote was excerpted from an email sent to the university community by the transcript evaluator team:

> *"Greetings from the Office of Admissions Evaluators! To borrow a phrase from one of The Pointer Sisters' songs: "We're so excited!!"... We just have to share with everyone our good news! ...as most everyone is aware, we are working with an imaging system in our office. While being paperless was at first a challenge, we believe that it has dramatically changed our lives and allowed us to work more efficiently. ...for those with access to Optika (our imaging software), you*

can view and print your student's TCR (Transfer Credit Report) almost as soon as we produce it."

The imaging and automated workflow project instituted sweeping technological, administrative process, and organizational change, and has created a major shift in culture in the Admissions Office. With continued enhancements and exploitation of other features of the technology, we hope to maintain a high level of user satisfaction and realize even more processing improvements in the future, as WSU continues its commitment to deliver high-quality education and customer service to the next generation of students.

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