Automating The OneCard Office via Web Applications

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Abstract

UNCW continually integrates technology throughout the University and focuses on enriching services to students, faculty and staff. The OneCard has surpassed the limits of identification and become a vital component for the Universities business operations. It now provides and enhances services on campus, benefiting both the cardholders and operations. In times when cost reduction has become imperative, the opportunity for amplified technology is fundamental in areas such as the OneCard Office.

By implementing proven "best practice" applications, costs could be cut down and processes improved.

Typical office procedures, in the OneCard Office as well as point-of-sale and patron client offices, are very capable of having web interfaces, automating manual processes. By creating an electronic forms and signature application, along with an online reporting application for card system clients, the now popular OneCard Office at UNCW has gone "paperless" and is virtually automated.

Introduction

The University of North Carolina at Wilmington (UNCW) is a comprehensive public institution with more than 1,600 faculty and staff and nearly 11,500 students located in southeastern North Carolina. With 71 undergraduate degree programs and 26 graduate programs, UNCW has a variety of academic programs designed to meet the diverse needs, abilities and interests of all students. The university also offers one doctoral program in marine biology through the Center for Marine Science, one of the newest and most technologically advanced coastal ocean science research facilities on the eastern seaboard. The Business Affairs Division of UNCW is the support arm of the university and supports the university mission by providing excellent facilities, financial and business services to a variety of constituents--faculty, staff, students, alumni, parents and visitors. Business Applications analyzes operations, develops and implements web applications, and provides server and application support to all departments in the Business Affairs Division, including Auxiliary Services. Specifically, the UNSea OneCard Office, a subdivision of Auxiliary Services, provides services to over 20,000 active cardholders and processes over $10M in transactions per year.

Initiative

A vital component of the UNCW mission statement is to integrate technology throughout the University. The Business Applications Office continually focuses on enriching the business operations and services to students, faculty and staff. A thorough assessment of the Auxiliary Services OneCard Office lead to the initiatives of reducing overhead costs created from storage, plummeting production cost of office forms and paperwork, and managing both student time and staff manpower during carding events associated with the orientation process.

The OneCard office was using a variety of forms, which needed to be completed in the office. The forms utilized included multiple card applications and cardholder account adjustment forms. Business Applications' recommendation of an electronic forms and signature web application would reduce storage, simplify retrieval, improve process time, and decrease errors of manual entry.

Point of sale and patron reports generated from the card system, used by campus departments, and internal/external vendors, were distributed via campus mail or e-mail. Reports could not be generated on-demand, only scheduled for daily activity reporting, meeting minimal requirements for reconciliation purposes. Complaints of undeliverable e-mails, production of "on-demand" reports being time consuming, and lack of report detail, led to the proposal of a web reporting application. The application could be used by any card system client, but limiting their reporting capabilities based upon permissible card system locations defined by department head or authorized requestor.

Design

The methodology used to develop the initiated applications was to use maximum existing resources, minimizing additional costs, producing the optimal solution.

The electronic forms application design began by acquiring all forms used in the OneCard office requiring cardholder signature. All forms were then reviewed and re-engineered with cooperation between the OneCard staff and the Business Applications developer. Electronic signature pads and software to support the pads were thoroughly researched. The decision was made to use the epad with Solaris Approve IT software, because the software was compatible with word, excel and PDF and included the software license in the price of $239.95 per epad. Initially, only one epad was ordered to test both the efficacy of the software and the use of electronic forms in Word. Microsoft Word was used due to our existing knowledge base of opening word within a browser. During the testing phase of the epad, it was determined that enabling a customer to input their campus id number would be the best practice. This was achieved by using self-service numeric keypads for new customers and magnetic stripe readers for existing cardholders. The electronic signature application for the forms was designed to work with either input device.

The forms were then designed allowing all of the cardholder information to be verified against either the student or employee database and directly inserted into the forms. All forms are then saved as a bound document, based on the type of form and campus id for prompt retrieval purposes, on a server share in the Business Applications Office. Forms are archived onto cd and maintained for time frames required by state policy. Total costs for the project was just over a thousand dollars (4 epads @ $240 per epad, 4 numeric

keypads @ $20 per keypad , 4 magnetic stripe readers @ $30 per reader). Existing resources used include a web server, data server, and additional disk space for form storage.

The initial reporting application design began by having preliminary meetings with all clients using the card system. The purpose of the meetings was not only to get buy in from the users, but to empower them so they would have input on what new reporting methods could be most beneficial to their individual operations. All clients expressed a desire to have the current information used from location sales reports and plan usage reports combined into one detailed report. Many clients were also interested in obtaining more detail on customer patrons. A few of the clients wanted to be able to analyze the data, requiring the ability to specify date, time, and report type on demand for data from both current and previous years.

The current card system used at UNCW is Blackboard's Transaction System – Unix Edition. The product was not an ODBC compliant database; however, an extract utility was available for data mining purposes. The disk space on the Blackboard system is expensive; thus, it was policy to archive transaction data greater than two years to minimize costs. The Business Applications server administrator worked with the developer to determine the best way to build a data warehouse for the extracted data. UNCW has a Microsoft campus license, so it was inexpensive to purchase server and SQL server software. Since usage levels were expected to be moderate and data throughput not paramount, the administrator determined we could purchase less expensive IDE disk hardware for storage. The administrator then purchased an inexpensive server for this task.

Once the warehouse was setup, the next key factor was to get the data into the warehouse maintaining its' integrity. This was probably the most difficult and time-consuming task. Unix scripts were used to extract the data and ftp it into a share where it is picked up by a scheduled sql job and imported into the database on a nightly basis. Email notifications are sent out to the administrator when an import job fails.

Finally, the web design for the application could be started. A logical naming convention had to be developed for locations in the system. It was determined to use a 3-letter reader + 2-digit building code + 3-letter department code + name for all locations defined in the Blackboard system. This logic would enable the application to determine the types of reports that can be produced based on the reader type and what users could run reports for a specific location code defined in a privilege table. Due to the substantial size of the data, the most efficient sql queries needed to be written for the data. A user-friendly interface was used with a simple drop-down menu for location and time selection, and a "clickable" calendar for date selection. Upon submission, users could view, print, or save as an MS Excel document of the detailed reports for sales, patrons or products at their convenience on a daily basis.

Total costs of implementing the application were approximately three thousand dollars. The expenses were associated with set-up of the data warehouse (server, server software, and operating system). An existing web server was used for the interface.

Implementation

Implementation of the e-signature application was done at the start of fall orientation. Although this is a high peak time due to increased enrollment and in-office carding events, the new process would make the orientation much more rapid. This would also be the appropriate time for implementing new forms and applications. The considerable cooperation from the card office staff during the design and testing phases were beneficial. It gave them certainty that there would not be any tribulations with the application. Reception from students of the new process was very good and overall went extremely smooth. The epads have been proven durable and have been in place well over a year without any problems.

Initial implementation for the reporting application was done with three selected clients over a three-month period. The three clients were selected based on point-of-sale client with most usage, patron client with most usage, and client with combined largest usage of patron and point-of-sale. A three-month period was used so that there would be thorough time to test. It was also important to begin implementation during a slow operational time during the semester so clients would have dedicated time to learn and test the application. A three-month period was also important so that it would cross into both the end and beginning of a new semester. At this point, the users were comfortable with the new application, yet could test it during the highest transaction times. After the testing period, all clients were scheduled for training on the new reporting system over a two-week period. Upon completion of training, dual reporting methods were used for an additional two weeks until clients were comfortable with the new method. Both the

paper and email reports were discontinued and all client feedback was overwhelming positive.

Benefits

All of the applications implemented have had substantial benefits. The web reporting provides user-specified, presentation quality formatted reports with drill-down capability. The new reports enable greater detail with integrated data from a wide range of systems (OneCard system, student information, human resources) facilitating trend analysis. The web reporting also increased user accessibility, decentralizing controls and eliminating wasted resources such as paper and e-mail space. Users now have the ability to view, print, or download easily created reports on demand.

The online forms using e-signature is largely reducing overhead from form storage and is less time consuming for the cardholder. Increased security of the cardholder id and information has been established by eliminating verbal and written communication of information in the office. The card office has also benefited from the cost reduction of supplies for printing forms and now has a more professional look.

Retrospect

The e-signature application has been a great success. Due to the limitations of Internet explorer not being able to pass a stored file name to word, the application requires use of Netscape. Netscape works fine; however, it would have been good to have had more time to explore a way for the application to be IE compatible so users would not be required to have multiple browsers loaded on their desktop computers.

The capabilities of the reporting application have been extremely well received by our clients as well as many respectable institutes within the Blackboard community. It is not very often that import job failure occurs; however, our current error checking and resolution process is manual when it does fail. The ability to automate resolution is strongly desired. Plans to automate resolution are in the near future, but in retrospect would have been tied into the initial project.