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‘THE ECU STUDENT DESKTOP’
WEB-ENABLING EAST CAROLINA UNIVERSITY’S STUDENT SYSTEMS

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About East Carolina University:

East Carolina University has come a long way since its founding in 1907. The university has evolved from a small state-supported teacher training school into, first, a liberal arts college (1947), a state university (1967) and constituent institution of the University of North Carolina (1972), and finally a Doctoral II university (1998). Today East Carolina’s enrollment of nearly 18,000 makes it the third largest university in North Carolina.

East Carolina has a history of exceptional teacher education and has earned a national reputation in health science education, with a particular focus on primary care and responsive regional service. The university boasts nationally accredited programs in business, social work, and technology and academic programs of high distinction in music, art, and theatre. It has a long record of outreach and service to the people of the region and is the educational and cultural center for the local community.

ECU is located in Greenville, North Carolina. The east campus is adjacent to downtown between East 5th St. and East 10th Street; the School of Medicine campus is adjacent to Pitt County Memorial Hospital in west Greenville. The small city, home to approximately 56,300 people, is located 80 miles east of Raleigh and is accessible by four-lane highways and nearby airports. Greenville is within easy driving distance of coastal and beach resorts and the Outer Banks, as well as Richmond, Virginia, and Washington, D.C.

Paper Abstract:

The ECU Student Desktop is a dynamic web-based environment that allows students convenient access to information including grades, course history, course availability, housing information, and weather as well as register for classes, update personal information, and contact students from their hometown or region. As of late Fall 1999, most currently registered students have accessed the site. The ECU Student Desktop has also surpassed 125,000 total visits by students and visitors from all over the world. Great effort has been made to present a totally dynamic, online environment with attention given to detail. The user interface is simple and fun as it changes according to the season and serenades students’ on their birthday. It is our goal to become the best web-based student information system in the UNC system and be the benchmark in which all web-based student information systems are measured.
‘East Carolina University Student Desktop’
Web-Enabling East Carolina University’s Student Systems

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Getting Started

The project initially began with the intent of providing a web-based method for students to register for courses and check grades. Initial research involved locating relevant student data, exploring the feasibility of leveraging pre-existing business logic, and deciding what tools would afford the greatest functionality. Then, what started as a small undertaking, quickly grew into a much larger and more sophisticated system.

Most student data is stored in a single database located on an on-site mainframe computer. This database contains information from the past twenty years. Fortunately, strategic initial planning had produced a simple database structure that was sophisticated and robustness enough to allow for a solid foundation on which to build our web-based system.

Existing business logic was in the form of in-house, custom written COBOL programs. It was our goal from the beginning to reproduce as little pre-written business logic as possible. This goal was especially important when considering the complexity of pre-existing programs such as course registration. Since these pre-existing software programs were written in COBOL for use in a mainframe environment, it became apparent we must include a method to directly access these programs in our development process.

It became apparent we had other pre-existing programs that could be made available via our dynamic, web interface as well as additional student data that should be made available for which programs had not yet been written. With this in mind, two software products were selected.

To provide access to our existing COBOL programs, we chose Opal by Computer Associates. Opal provides an environment for creation of a web interface that directly accesses existing traditional mainframe programs. Implementing Opal allowed deployment of web-based student applications that used pre-existing business logic and had already been tested and refined.

To provide access to mainframe data, we chose Cold Fusion by Allaire Corporation. Cold Fusion is a product that adds programming functionality to web pages allowing access to databases via ODBC and a scripting language for the creation of a rich, robust dynamic environment. Cold Fusion does this by adding a set of ‘tags’ similar to HTML that accommodate most common programming functions and facilitate database access. Development began after the software products were selected and deployed.

Though both software products provided feature-rich, robust environments for application development, it became apparent that our applications could be developed and deployed more rapidly than expected. The first version of The Student Desktop was developed and deployed in less than three months. Since that time, the Student Desktop (located at www.student.ecu.edu) has grown to incorporate many features and functionality.
Security

An important consideration when releasing information of this magnitude via a ‘world accessible’ medium such as the Internet, is security. If sensitive data or the methods of retrieving this sensitive data were not protected, disastrous results could occur. To facilitate a high degree of security, a PIN system, much like the type financial institutions use, was developed. To receive an East Carolina University PIN, one must be a currently enrolled student with an assigned campus email address. If these criteria are met, the student requesting a PIN must access a web site and submit the required information. A PIN is then generated and sent to their assigned campus email address. The student must then access their campus email account that also requires password authentication.

In conjunction with a PIN, the entire web application resides on a ‘secure’ web server. The web server is configured to offer the same degree of security as that of most financial institutions. As an added security precaution, all the actually software ‘code’ is encrypted before being deployed. Encrypting the software code keeps any methods of retrieving sensitive information hidden.

The last tier of security is in the actual database software. Since our data currently resides in an IBM DB2 database, all database transactions are recorded and a database administrator sets security levels. The added security of DB2 makes it virtually impossible for unauthorized manipulation or retrieval of data. For example, the often-mentioned ability of a student to change course grades is virtually impossible.

Requirements

Since early in the development process, it has been our goal to provide a set of customized, dynamic, informational and procedural applications in a central location. Development and deployment began with a small number of standard applications such as course grades, course registration, course seat availability and a dynamic list of courses offered during a particular term and year. Since that time, with consideration of a large number of student suggestions, the applications available to a student have grown. The current version of the ECU Student Desktop offers a dynamic, customized environment for a student to view and manipulate much of his or her current university data.

By identifying individual students during the login process, the ECU Student Desktop possesses the ability to offer a completely customized set of applications. Options and applications available to one student may not be available to another. For example, an entire set of campus orientation applications would be available to freshman while being unseen and unavailable to seniors. The use of a customized system based on an individual’s profile, offers a system that displays options only relevant to the current user, thus eliminating options that have no relation to the user.

Before allowing access to the system, the user’s computer and Internet browser software is checked for compatibility with the system’s minimum requirements. The basic, minimum requirements of the ECU Student Desktop are:

- A current version of Microsoft Internet Explorer or Netscape Navigator. The minimum version of Internet browser required is version 4.0. If the user of the Student Desktop does not meet this requirement, entry is refused and a link is given for free download of current software.
- A screen resolution of at least 800 x 600 pixels. If the user of the Student Desktop does not have their system configured with a screen resolution of at least 800 x 600 pixels, the user is instructed to make the appropriate configuration changes.

By requiring a minimum set of system and software requirements, it is possible to incorporate most of the current, ‘cutting edge’, internet technologies.
Features

Once a user’s software and hardware has passed the minimum set of requirements and entered a correct PIN and student ID number, a main menu is displayed. To gain access to the main menu, the user must read and agree to the current Student Computer Use policy. The user must read and agree to this policy only once. Once the user agrees to the computer use policy, a main menu is displayed. Main menu features are as follows:

- **Parking Tickets** – This particular application allows the student to view the ticket number, ticket amount, and ticketed vehicle information related to any parking tickets that may have been received. The parking ticket application is only displayed if the student using the system has any outstanding parking tickets. If there are not any parking tickets present, the option is not displayed. The number of days the parking ticket has been pending is also displayed. Future enhancements to this application include the payment of outstanding parking tickets with a credit card.

- **Adviser Survey** – An adviser survey is currently administered once a year during the spring semester. The survey consists of five questions that will allow advisees to rate their current adviser with results reported to interested advisers. The adviser survey option is only displayed during a pre-designated time span and during that time span only if the student using the system has not taken the survey. Future Enhancements will allow the students to evaluate their adviser during the spring and fall semesters.

- **Student Application Toolbox** - The Student Application Toolbox is a collection of applications designed around dynamic, student data. For a list and description of applications, see the section below.

- **Vending Survey** - The campus vending survey option is only displayed during a pre-designated time span to on-campus students. During that time span, only on-campus student whom have not taken the survey will have the option on their menu. The survey asks basic questions regarding on-campus vending services. Results of this survey are sent to the Campus Vending Services offices once completed.

- **Hold Tag Information** – The hold tag information application is only displayed to students using the system whom have a hold tag. If selected, the application will display the type of tag and whom to contact for removal. Hold tags are placed on a student’s records if a fee has not been paid, has outstanding parking tickets, etc. The presence of a hold tag on a student’s record will not allow registration for courses. If a hold tag has been placed on a student’s records due to some sort of delinquent payment, future enhancements using electronic commerce would allow for payment and removal of the hold tag.

- **Homecoming Voting** – Homecoming voting is only displayed during a pre-designated time span and during that time span only if the student using the system has not voted for homecoming candidates. The application currently includes the names, pictures and information about each individual homecoming candidate. All information is entered by the ECU Homecoming Committee via and administrative web application designed for this purpose. The administrative application is password protected and also allows for viewing of current voting totals.

- **What’s New on the Desktop** – The What’s New option allows the student to view what’s new on the Student Desktop. This option allows ‘advertisement’ of new enhancements or features in which the student may not be aware.
• **Local Weather Forecast** – The local weather forecast option collects and displays data produced by a weather satellite receiving station with an emphasis on the Greenville/Washington area. During the hurricane season, storm-tracking maps are available for viewing. Future enhancements will include storm warning / watch data as well as local flooding data will be posted with an emphasis on the local area. ECU official announcements would also be posted in this area.

• **Frequently Asked Questions** – The FAQ option allows a student to view a current list of questions and answers regarding the Student Desktop. The student also has the ability to send a question of his/her own. In the near future, the FAQ system will be re-written to encompass a broader scope of questions and answers. The future version of the FAQ will answer general campus questions as well as the ‘not so well known’ subjects (i.e. what’s the maximum number of exams I can take in one day). Some of the information could also be ‘custom tailored’ to the student’s current course and University information.

• **Useful Web Links** - The useful web links option is simply a list of useful web links. The student also has the ability to request a new link to be added to the list. The useful web links option will be modified to give a more custom list of web links for the student that is using the system. The student will also have the ability to add/delete any personal links.

The Student Applications Toolbox is a section of the ECU Student Desktop that contains dynamic applications that interact directly with the ECU Student Database. The current set of applications available are as follows:

• **Course Shopper** - The course shopper allows students to view ALL currently offered courses (on-campus, extension courses, internet courses, etc). The listing includes the course name, course number, course section, course location, course time, and the instructor. The number of available seats is also displayed. If at least one seat is open, the student may add it to his/her course ‘shopping cart’. Courses that reside in the shopping cart may be submitted for registration during the proper registration period. A student may also view all courses offered by a particular instructor. A student may also view current, official, University course descriptions and requirements. The course shopper will be modified to allow for a much more customized selection of courses. Future versions will allow the student to select times that he/she is not available and build the possible schedules around the selected times. Once the student has found a desired schedule, it will be added to the course shopping cart for submission to the registration option.

• **Course Registration** – The course registration option simply allows the student to register for courses he/she has placed in their course shopping cart. Course conflicts are checked before registration is allowed. The course registration currently interfaces with our previously written CICS transaction via a product by Computer Associates called Opal. The use of Opal requires the student to download and install a browser ‘plug-in’. Future Enhancements include the removal of the need for downloading and installation of a browser plug-in. Removal of this plug-in will be done with implementation of Jasmine TND. Jasmine TND is a Computer Associates product that will allow for web connectivity to our current systems without the use of the browser ‘plug-in’. Another major enhancement would include the payment of tuition and fees via credit card.

• **Student Locator** – The student locator application allows currently registered students to search for other currently registered students using a set of criteria. A student may search all students or a group of students based on the entry of a last name. Student may also search their current courses and receive contact information. This feature proves useful to a student whom may have missed a class meeting and needs information that might have been given during that time. Another option allows the student to search for students from their home state, hometown, and even home county. This option helps students locate and contact students whom have similar experiences thus enhancing the ‘college experience’. Future enhancements include the
implementation of a ‘ride board’ that will allow students to find ‘rides’ with other students to specific destinations (most notably, home).

- **ECU Majors and Degrees** – The majors and degrees application displays all the currently available undergraduate and graduate ECU majors and degrees. Specific degree requirements are also displayed. A student may also check if he/she is eligible to change to a selected major from their current major.

- **Vehicle Registration** – The vehicle registration application allows a student to register his/her vehicle and receive an ECU parking permit. Once a parking permit type is selected, the student may pay for the permit online or mail payment.

Interaction with the ECU student database allows for the construction of a dynamic set of customized student applications. The current list of dynamic, customized applications are as follows:

- **Course History and Grades** – The course history and grades option allows the student to view his/her complete course history and related grades. The student may view the entire history or by one semester at a time. During the introduction screen, a pie graph is displayed that gives a grade distribution. Future enhancements to the course history and grade option could be enhanced to recommend submission of a ‘grade replacement’ form for courses that meet the requirements for such a replacement. Other enhancements could include a comparison of grades received in a course with the average grade given (pending political approval).

- **My Textbooks** – The textbooks option gives a student a list of textbooks needed for their current course load during the current semester. The student may view the entire list of textbooks needed or view the textbook requirements for each course. Future enhancements to the textbook option could include an option for students to purchase books via credit card and have sent to their location or readied for pickup at the bookstore.

- **My Visual Schedule** – The visual schedule option gives the student a ‘visual’ representation of their current course schedule on a weekly calendar. In the past, many students used this method to construct and ‘scheduling calendar’. This application simply automates the previously manual process.

- **Current Exam Schedule** – The current exam schedule option displays a list of times, dates, and locations of the final exams for each of their courses. In the past, it was often confusing to determine the times, dates, and locations of final exams.

- **Transfer Information and Evaluation** – The transfer information and evaluation option is only available to students whom have transfer credits. All attended institutions are displayed with the related locations, credit hours transferred, and GPA. If a DARS transfer evaluation is present, it is available for viewing.

- **Information Summary** – The information summary option gives a condensed summary of current information for the student using the system. Information displayed includes: address, advisor name, advisor contact information, advisor email address, current GPA, current credit hours, transfer credit hours, current classification, class rank, departmental rank, current major, current department, SAT scores, existing GRE and GMAT scores, and current course schedule. Future enhancements include the expansion of adviser information and contact is planned. This sort of expansion will facilitate more student/adviser communication and planning.

- **Change of Local/Permanent Address** – The change of address option allows the student to change his/her permanent and local mailing addresses. The city and state is automatically selected
based on an initially entered ZIP code. Once the student has edited the address and phone number information, he/she is asked to confirm validity. Once confirmed, the new address information is submitted to the database. As an added security measure, the updated permanent mailing address is verified to not allow entry of a campus mailing address.

- **Personal GPA Calculator** – The personal GPA calculator is a simple application that will allow a student to apply a ‘what if’ scenario to their current course schedule. Fictional grades are placed with each course with the GPA then being calculated. Future enhancements include expansion of the ‘what if’ scenario to allow the student to view the affect of grades on their overall GPA and make predictions on future performance.

- **Campus Housing Information** – The campus housing information option is only available to those students whom live on campus. This option allows the student to view current room/dorm assignments, room/dorm features, and roommate contact information. Future enhancements include an online campus housing application as well as many more residence hall related applications.

**Future Enhancements**

While the above features offer current students a secure, central location to retrieve most of their current University information, it is necessary to continue enhancing existing applications as well as developing new, innovative applications. While we currently have many ideas for consideration, our major projects are as follows:

- **The Virtual Adviser** – The Virtual Adviser application will answer many of a student’s academic questions based on that particular student’s current information. The application will also facilitate communication between the student and assigned adviser.

- **Degree Audit** – The degree audit will allow the student to perform a true degree audit. The audit would give the student a dynamic view of exactly where he/she stands in the process or receiving a desired degree. This application would also facilitate ‘what if’ scenarios such as change of major or double majors. With such an application, it will be possible for a student to plan his/her entire academic career during their freshman year.

- **Interactive Campus Map** – An interactive campus map will allow students to ‘find’ any building located on campus through a intuitive graphical interface. Another part of this application will locate all the buildings in which the student currently has a course.

- **Financial Aid Live** – The Financial Aid Live application will allow a student to apply for financial aid as well as view his/her standing in the often-confusing process of applying for and receiving financial aid. Once the student has applied for financial aid, it will be possible to view the status of his/her application. The main goal of this application is to simplify an often-confusing process.

- **Admission Applications** – Many of the current admission applications will be moved to a dynamic, interactive environment. By moving the admission applications to this type of environment, it will be possible to store and retrieve applications as well as electronic payment of application fees via credit card. Student’s will also be capable of checking the current status of a submitted application.

- **Discussion Boards** – Threaded student discussion boards will be implemented to allow students to communicate thoughts and ideas for a variety of subjects (courses, majors, campus life, etc.).
- **Scheduling Calendar** – A dynamic calendar will allow students to schedule meetings or events with other students, instructors, or even advisors. Campus events (i.e. courses, exams, etc.) will be automatically added to the student’s personal calendar.

- **Career Planning** – Through current job market information, the career planning application will assist the student in making educated decisions regarding their education that will enhance future career goals and opportunities.

- **Wireless Desktop** – The purpose of implementing a ‘wireless’ version of the Student Desktop would be to allow access to student applications such as checking grades and registering for courses via a wireless device (i.e. Palm Pilot VII). With implementation of a ‘wireless desktop’, it is possible for a student to check course grades or register for courses while on a camping vacation, miles from any computer terminal.

While the ECU Student Desktop is a custom written application designed around East Carolina University’s existing database, the concept of developing custom written software with a product such as Cold Fusion can be universally implemented. Some commercial products are currently available that claim to do what the Student Desktop has accomplished. Most, if not all, of these commercially available solutions require exporting of data to accommodate a pre-defined format. The advantage of developing a custom solution allows development of a system that not only takes advantage of the power of your pre-existing systems, but also, if properly written, requires very minimal administrative support. Implementation and enhancement of current features as well as the additional of new, ‘cutting edge’ features will move East Carolina University closer to the goal of establishing the ECU Student Desktop as the benchmark in which all web-based, student systems will be measured.