

OACIS – Online Academic Course Information System

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Abstract

This paper presents information on a student built online academic course information system (OACIS) for Dakota State University (DSU) that will allow students to view grades and take exams for their courses from within a portal. Faculty who choose to use the system will be able to automate their test administration, quizzes, and assignments. It will even allow a student to simply upload their assignments rather than e-mail them.

Keywords: Internet courses, student developed systems, course management, web development

1. Introduction

Educational institutions are constantly searching for new and better ways to integrate technology into the classroom. One common way this has been done at many institutions is to allow online grade checking, assignment posting, and electronic homework submission. While it has shown that integrating technology into the classroom is beneficial to learning, doing so can also cause added strain on both faculty and students. Faculty has the extra workload of preparing electronic delivery of their course material, preparing course web pages, and setting up the electronic grade checking. Depending on the current skill set of the faculty member, the difficulty involved can vary greatly. This also leads to a great deal of inconsistency for the students. Students have to remember separate web pages for each class, separate username/passwords to view grades, and deal with different delivery methods of course material. The OACIS project aims to cure many of these ills. It provides a web portal that can be used for all classes in which a student is enrolled, as well as a rich set of features to make it easy to use, and also a consistent interface for all users. It also makes converting a regular course to an online course painless for the faculty member. This paper is intended as an

introduction to OACIS. It describes its history, approach, functionality, and future path.

2. History

OACIS began development in the early spring of 2001. It began as an idea by one of the student developers as a way to resolve many problems with current systems at DSU. Originally, it was intended solely as a means for distance education delivery. But as the project and functionality grew, it evolved to encompass any class and make the transition between distance delivery and traditional classes as seamless as possible. Once some faculty interest was expressed in a system like OACIS, the original student was put in contact with two other students by a faculty member, and the OACIS team was formed. The OACIS team consists of three students and one faculty supervisor. Technical design and development has been done entirely by the students, while the faculty has assisted in procuring resources, endorsing the product, and as a main point of contact with the user base. The student developers have conducted all of the technical aspects of the project. After two years of design and development, OACIS was ready for BETA testing by Dakota State University in the summer semester of 2002. From here it is intended

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to become the standard course system for DSU and grow it to meet the needs of other universities and K-12 schools.

3. OACIS Approach

The OACIS project has followed a very loose developmental approach. The system can be compared to a mold of clay which very easily can be shaped and molded. Once the desired shape is achieved, the clay can be hardened into a firm useful device. To attain this effect we used a method of prototyping before rolling the prototype into a final version. Prototyping is a method of designing and building a sample of the final product. It combines a large portion of development and design into one step. An example would be to take a plan which allocates time as 40% design, 40% development, and 20% test. The majority of design and development are then merged to create a schedule more like 15% design, 50% prototyping, 15% development, and 20% test. This method was found to be very desirable for multiple reasons:

- 1) A web application is easily broken down into pieces, so each piece becomes a piece of clay which will eventually be part of the whole. A web application can be broken into pages, which can in turn be broken down into presentation and application. The latter may be broken into any number of pieces depending on the architecture of the system. (OACIS is not fixed; it uses an n-tier architecture)
- 2) Web pages can be easily modified so that changes are easily discussed.
- 3) Communication is greatly enhanced because there is something tangible to discuss. A certain aspect of the website can be shown and evaluated rather than everyone picturing something different in his/her own mind. The users have a much clearer picture of what the final product will be, and developers can more accurately determine status and progress of the project.
- 4) It is often very difficult to conceptualize a large application solely on discussion alone; hence issues can often arise where something makes sense on paper during design but proves to be very difficult to code. Many of these issues are often identified during design as the prototype is being created, rather than during a development cycle once design has been finalized.
- 5) It adapts very well to educational environments where the labor pool may not contain experts in the chosen technology. Students can begin work on the less complex pieces and acquire the needed skills as they progress.

This method has proven highly effective thus far. Through the first 3 months of use in live courses,

OACIS encountered only four defects, all of which were identified and repaired in its first week of operation.

4. Technical Specifications

Development Languages:

Active Server Pages 3.0

JavaScript

Web Server:

Internet Information Services 5.0

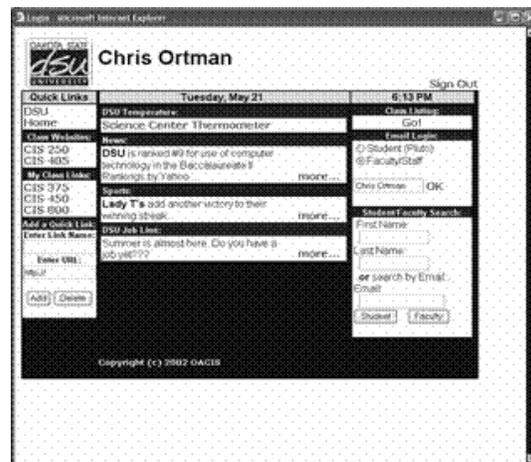
Database Server:

MSSQL 2000 / Microsoft Access 2000

5. System Functionality

OACIS supports students, faculty, and student-faculty (graduate students, or any student who is teaching and taking class at the same time). When users load the main OACIS page they are presented with a screen similar to figure 1. This main page includes links to current events

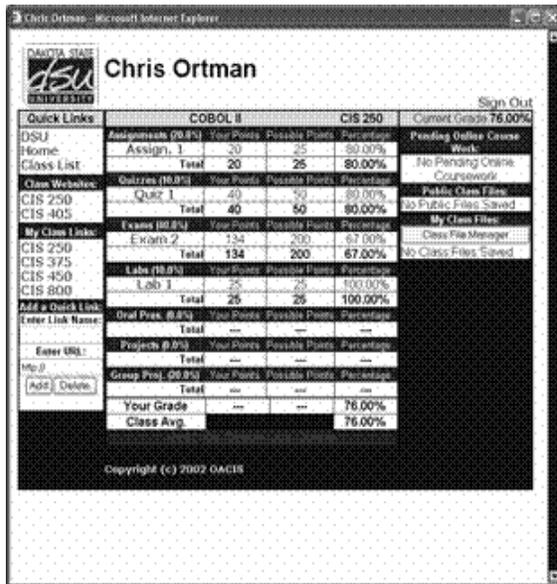
Figure 1



at the university, student/faculty email, directory information, and a user defined list of "quick links" to common places the user visits. From here a user can either go directly to one of his or her classes or view a list of all classes in which they are enrolled.

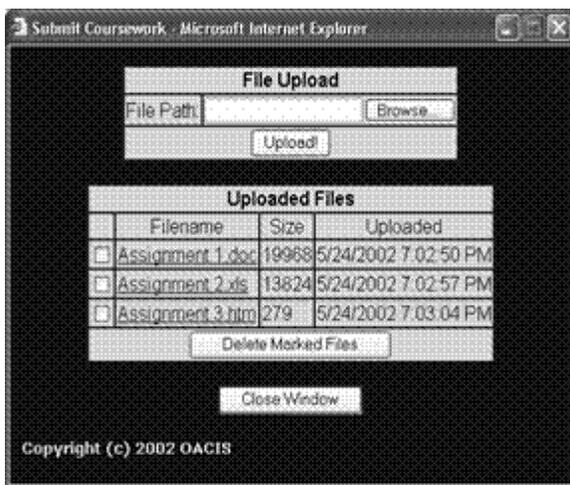
When a student views a class in which he/she is enrolled, he/she is presented with detailed information about each assignment, including when it is due, how many points it is worth, if it has been completed, and what his/her score is. Overall grades for the student are also displayed, as well as how the student is doing relative to the rest of the class. Clicking on a particular coursework name will display instructions for completing the coursework or the coursework itself, depending on which the instructor provides. Figure 2 illustrates a student's view of a class. Along with assignment information, it also includes an interface to let students manage assignments they have submitted.

Figure 2



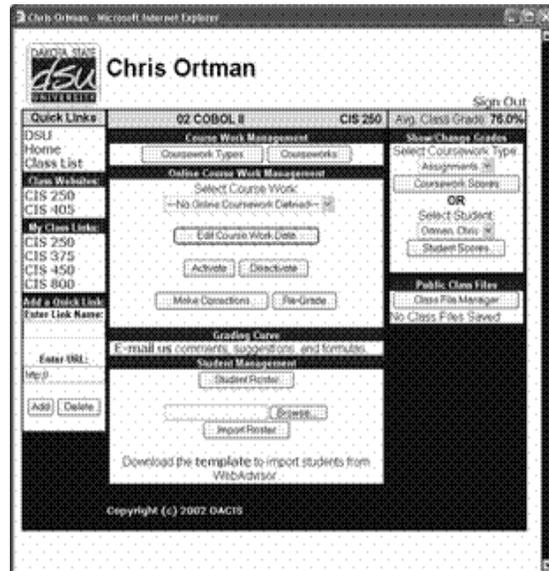
Rather than requiring students to email assignments to teachers, OACIS allows students to save electronic assignments to a directory that is accessible by that student and the faculty member instructing the course. The interface supports uploading, downloading, and deleting of files as shown in figure 3. The faculty portion of OACIS allows faculty to add students to the system and place them in a class either through the import feature or by manually entering the names. It also allows faculty to define the types of assignments (hereon referred to as courseworks) they will have, and set up grading weights and curves.

Figure 3



Courseworks can also be created to be online or as

standard take home. For online courseworks, multiple choice and true-false questions are graded automatically when the student submits their answers. Fill-in-the-blank and short essay style questions are manually graded by instructors, should they choose to include them. If a coursework is not to be completed online, a URL hyperlink may be provided where instructions for completion of the coursework are found. The instructor may also design courseworks in other formats and make them available for students by simply uploading to the public folder for that class. The main faculty screen can be seen in figure 4. This page also contains links to grading forms where students' grades can be viewed and entered. As it may be convenient to enter these scores pertaining to a particular coursework or student, separate forms are presented for each. For example, if grading by student, only the selected student's scores will be displayed in grids for each type of coursework. Conversely, grading by coursework will display scores for all courseworks of only the selected type, such as assignments or quizzes.



6. Problems Encountered

One of the problems encountered at the onset of the project was that none of the project team had any prior experience with ASP. This problem was remedied by the approach taken on the project. During prototyping the less complex pieces were built first and the skills and experience needed for more complex pieces were acquired on the fly. The majority of the other problems have dealt more with acceptance and resources than technical difficulties. The system was originally intended to use MSSQL Server as its database resource; however, as students, the project team was never able to gain sufficient privileges to accomplish these tasks. So

the system was built using Microsoft Access, but some rework will be needed to migrate back to MSSQL Server.

It is also very difficult to secure university support on a product in its early stages. As students, we were given very little credibility with some of the support staff. We would not have been able to overcome these problems without faculty support. Eventually a meeting of several faculty members, the administrators of Dakota State University's computer system, and the OACIS team was held to discuss the impact and consequences of implementing a student developed system in a live class. Upon discussion and deliberation, the use of OACIS was approved as an option for faculty members. Since then, the project has continued to progress.

7. Future

It is possible that OACIS could impact universities in ways other than enriching the learning experience. The way OACIS was built could serve as a baseline for a university internship program or advanced courses that provide great opportunities to students and provide a service to the university. Projects such as OACIS that are built and used on the university campus would make interesting case studies for use in traditional classes. By examining systems used everyday by the students they may be able to gain a clearer understanding of the details of the system development life cycle.

OACIS is intended to one day become a full time establishment, and will be marketed as a service, not a product. What this means is that OACIS will reside on a central server maintained by the OACIS developers. Universities or even individual professors will pay to use this website. Unlike some commercial systems users will not have to worry about purchasing expensive hardware and software, nor will they have to worry about maintaining the systems. All that a potential user needs is an internet enabled device of some kind. It also means that users will not have to worry about purchasing software only to find an upgrade is released the next day. As the OACIS system grows and improves the users will have the added features available to them the instant they are in place. Universities will not need to hire any new technical staff or purchase expensive training. Since the system is centrally maintained the only training needed is how to use the website interface, which in most cases thus far, has taken only a few minutes.

8. Conclusion

OACIS is a versatile product that could serve many purposes. It has provided three students a means to expand on and gain new knowledge they may have otherwise not encountered. It is a product that can enrich the student experience and ease the workload of faculty. It may serve as a baseline for developing university internships or implementing student developed projects,

and hopefully it will also become a cornerstone on which a solid company is built.

ADDITIONAL IMAGES

Figure 4



Figure 2



Figure 3



Figure 1

