Information Services Status Report & Strategic Objectives FY 2010-2011











Information Services Status Report & Strategic Objectives FY 2010-2011

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Executive Summary

Executive Summary

Each year the Information Services Departments: Information Technology Services (ITS), Research, Analytics, & Systems Development (RASD), and the Library (LIB) identify strategic objectives (Major Projects) for the next fiscal year. Last year (FY 2009-2010) the 48 Strategic Objectives/Projects shown in Table 1-1, with their respective Target and Actual Completion Dates, were identified.

Strategic Objectives	Target Completion Date	Actual Completion Date
RASD		
Support Quarters-to-Semesters Conversion	June 2010	June 2010
Feasibility Study and Warranted Implementation of Mobile Device Services	June 2010	June 2010
Enhance Angel Learning Management System	December 2009	April 2010
Expand Implementation of Forms-Management Software	March 2010	June 2010
Enhance Web-based Schedule Planning Tool	December 2009	February 2010
Support Corporate Services Software Implementation	December 2009	June 2010
Promote Commercialization of CMT Product	June 2010	June 2010
Support Implementation of Math Prerequisite Changes	June 2010	April 2010
Improve Library Circulation System Quarterly Updates	January 2010	November 2009
Support Implementation of Continuing Education Content Delivery System	January 2010	November 2009
Grow Value in the DAWN Environment	June 2010	June 2010
Enhance State/Federal Reporting	June 2010	June 2010
Provide Research, Analytics, and Reporting Support for Major Initiatives	June 2010	June 2010
Improve Decision Making Using Data Mining and Modeling	June 2010	June 2010
ITS		
Preble County Learning Center	September 2009	September 2009
Recommend Changes to PC Permissions	June 2010	June 2010
Storage Area Network R&R	June 2010	In Process
Modify Room 14115 to Improve Service	December 2009	December 2009
VMware Lab Manager	June 2010	June 2010
Implement Server Disk Defragmentation	December 2009	May 2010
Sinclair Conference Center Multimedia Upgrades	June 2010	June 2010
Network Server R&R	June 2010	June 2010
Disaster Recovery Procedure Updates	April 2010	October 2009
Print, Copy, and Fax Management	April 2010	January 2010

Table 1-1. Strategic Objectives/Projects for FY 2009-2010.

Strategic Objectives	Target Completion Date	Actual Completion Date
ITS - Continued		
Standardization of Classroom Multimedia	Revised September 2010	
Application Virtualization	October 2009	September 2009
Network Infrastructure R&R	June 2010	June 2010
Protection of Personal Information	April 2010	April 2010
Implement ShoreTel Call Manager Software	February 2010	In Process
Dayton Campus Data Center Renovations	September 2009	January 2010
Disaster Recovery Site Renovations	December 2008	July 2009
Server Configuration Management	November 2009	January 2010
Improved Wireless Access	June 2010	June 2010
On-line Radiology Program Security Accreditation	June 2010	June 2010
Angel Infrastructure Improvements	June 2010	June 2010
Citrix Implementation	December 2009	December 2009
Server Virtualization	June 2010	May 2010
ShoreTel VPN Phones	March 2010	March 2010
ShoreTel at MVRP	August 2009	August 2009
AT&T Voice and Data Contract	July 2009	September 2009
Project Lead the Way	June 2010	May 2010
Help Desk Knowledgebase	December 2009	September 2009
Pharos Signup	September 2009	September 2009
Cable TV System Repairs	June 2010	April 2010
Multimedia Equipment Inventory	December 2009	December 2009
LIB		
Library Support for Distance Learning	June 2010	June 2010
Information Collaboratory—Teamwork Studio	June 2010	Postponed
Improved PC Reservation System for the Library	October 2009	September 2009

Table 1-1. Strategic Objectives/Projects for FY 2009-10 continued.

Please note that due to the changing economic climate and the increasing complexity of the Information Services environment, several projects, which were not identified last year, have also been initiated and/or completed.

The 34 Strategic Objectives/Projects identified for FY 2010-2011 are listed in Table 1-2, with their respective Target Completion Dates.

Strategic Objectives	Target Completion Date
RASD	
Support Quarters-to-Semesters Conversion	June 2011
Rollout and Enhance My Academic Plan (MAP)	June 2011
Support Four Square Planning Process (performance scorecard)	May 2011
Enhance Colleague Performance	November 2010
Enhance Planning for Disaster Recovery	March 2011
Use Predictive Modeling to Support Decision Making	June 2011
Support Bookstore Processes	June 2011
Implementation of Selected Mobile Applications	June 2011
Continue Data Quality Validation and Collection (DQVC) Initiative	June 2011
Conduct Feasibility Study and Warranted Implementation of Automated Support for Tech Prep Office	November 2010
Feasibility Study and Warranted Implementation of Payment Gateway	December 2010
Support Processes of Marketing Department	June 2011
Support Processes of Student and Academic Support Services department	January 2011
Conduct Feasibility Study for Replacement of Sinclair's Content Management System	January 2011
Implement First Phase of New Schedule Development System	June 2011
ITS	
Multimedia Standardization Phase II	April 2011
Security Information and Event Management (SIEM) Implementation	June 2011
Disaster Recovery System Identification	December 2010
Copier Management	June 2011
Equitrac Expansion	September 2010
Virtual Desktop Infrastructure	December 2010
Storage Area Network Upgrade	June 2011
Network Access Control Improvements	December 2010
Data Center Network Upgrades	June 2011
Disaster Recovery Resiliency	December 2010
Backup Software Replacement	June 2011
and the second control of the second control	

Figure 1-2. Strategic Objectives/Projects identified for FY 2010-2011.

Strategic Objectives	Target Completion Date
ITS Continued	
Data De-duplication	June 2011
Guardian Replacement	June 2011
Cable Television System Replacement	June 2011
Digital Asset Management System Replacement	June 2011
Investigate Centralization of Plato Data	March 2011
LIB	
Reinventing the Sinclair Digital Library	June 2011
Library IT Teamwork Studio: Phase 1	December 2010

Figure 1-2. Strategic Objectives/Projects identified for FY 2010-2011 continued.

Detailed descriptions of these projects are provided in Sections 3 and 4.

Section 5 presents a look at past and present technology predictions. In other words, which predictions have come true, and what are the predicted (future) technological transformations.

Introduction

Information Services complexity at Sinclair Community College continues to grow at a compounding rate due primarily to:

- expanding enrollment;
- students relying on technology-influenced processes such as distance learning for flexibility;
- more and more emphasis on Information Services to help resolve space and scheduling issues;
- faculty's need for continual training to stay abreast of the constantly changing technology landscape; and
- student expectations regarding incorporation of Information Services into their classes.

In fact, Sinclair Community College has the same needs and priorities as other higher education institutions (large and small). The Information Age organization must align itself with the accelerating pace of change, or it will be left in the dust. This pace has been rapid, especially in the last ten years, with the incorporation of the Internet and the World Wide Web (WWW) into our daily mode of operation. The rate of Internet diffusion since the creation of the WWW surpasses all other communication technologies. There are tens of millions of Americans online every day performing a wide variety of activities. The Internet has become an integral part of everyday life. According to the latest Pew Internet research, 80% of American adults use the Internet, represented by an equal number of men and women. The Internet is used for an increasing variety of activities. Also, there is a sharp increase in access to the Internet among less educated and lower income Americans.

Sinclair must keep adapting to new realities – Sinclair must keep changing – and Information Services is a key catalyst for change. But these changes must be structured and consistent. A major thrust must be to ensure the proper alignment of Information Services projects with the strategic initiatives defined by the Board of Trustees and the executive management team. Furthermore, these projects must be implemented in concert with the priorities established by the President's Cabinet. Additionally, all Information Services are predicated on the Mission and Vision delineated below.

Mission

To continuously improve the delivery of affordable, quality, lifelong learning opportunities by providing and leveraging an effective set of Information Services tools which enhance student learning and facilitate student success.

Vision

Sinclair's Information Services will provide a comprehensive platform of high technology tools that are easy to understand and use, and facilitate processes so that any student, faculty, or staff can perform all of his/her academic and administrative functions in a highly productive and efficient manner, and where students can actively explore and personalize their educational experiences.

Sinclair Community College relies extensively on Information Services resources to fulfill its mission of "helping individuals turn dreams into achievable goals through accessible, high quality, affordable learning opportunities." The challenges faced by the Information Services departments to promote and enhance more effective learning include:

- maintaining a secure and private Information Services environment;
- providing optimum availability of Information Services resources; and
- providing state-of-the-art Information Services tools to facilitate faculty, student, and staff, communication, collaboration, and access to information.

Determination of which Information Services to pursue to strengthen learning is extremely difficult with changes occurring so rapidly. The Information Services departments must work closely with all academic and administrative divisions to strengthen and broaden learning opportunities throughout the college.

Information Services have become such an integral part of our operational landscape, the success of many other initiatives are highly dependent on technological development and maintenance. There are many challenges in the Information Services departments today from funding to infrastructure security to identity management to staying current with governmental and regulatory changes. However, first and foremost, the projects must support the strategic initiatives of the institution.

Perennial basic objectives for Information Services include:

- Achieve innovation and growth while managing costs. Sinclair cannot stop innovating, and Sinclair cannot stop growing; therefore, Information Services must be strong financial stewards of the institutional funds.
- Enhance the strategic value of Information Services. The strategic contributions
 of Information Services must be identified, measured, and articulated effectively to
 all constituents.
- Manage Information Services resources efficiently and effectively. The Information Services must be managed with fiscal discipline, accountability, a responsive customer service mind-set, and a commitment to flawless operations.
- **Develop the next generation of Information Services leaders**. Sinclair must mentor the Information Services staff to become true leaders, to build productive relationships with faculty and staff and with external partners.
- Manage user expectations. Unknown, unclear, and unrealistic expectations of Information Services on the part of any constituents are precursors of failure. Information Services departments must understand and manage expectations to guarantee success.

The Information Services departments and their respective areas of responsibility are:

Information Technology Services (ITS)

Responsible for the development and production activities for all hardware, software, information security, and telecommunication service and support components, which facilitate the effective distribution and operation of Information Services functions. ITS is composed of Systems & Network Administration, Help Desk & IT Labs, Information Processing & Technical Services, Information Security, Multimedia Services, Policies & Procedures, and Voice Telecommunications.

Research, Analytics & Systems Development (RASD)

This consolidated department has a twofold area of responsibility. It is the official source of all institutional data related to enrollment matters. In that capacity, the department handles the majority of external reports required by regulatory bodies as well as approved information requests from a wide variety of other organizations. RAR provides information for curricula and program review processes; conducts numerous surveys; and manages an annual Research Agenda comprised of over 100 widely varying projects. The department is also responsible for directing the creative design, development, and execution for all business and web systems, which support the academic and administrative processes of the institution.

Library

Responsible for administering and developing an effective program of library services and learning support activities in concert with the mission, goals, and objectives of the college. This includes management, leadership and fiscal responsibilities for the staff, the resources, and the facilities.

This document contains a Status Report on the Strategic Objectives/Major Projects defined in FY 2009-2010, identification and brief descriptions of the Strategic Objectives/Major Projects planned for FY 2010-2011, a discussion on past and future technological predictions, and a Glossary of technical terms used herein to facilitate better understanding.

Major Accomplishments for FY 2009-2010

Major Accomplishments for FY 2009-2010

A variety of projects, large and small, were in process or initiated during FY 2009-2010. The overriding objective is to provide innovative processes for students, faculty, and staff. This section describes most of the more significant project accomplishments. Note that each project title has associated with it a color-coded object to reflect the Strategic Values established by the Sinclair Board of Trustees, as depicted in Figure 3-1.



Figure 3-1. Sinclair Board of Trustees Strategic Values

Research, Analytics, & Systems Development

Following are the Major Accomplishments for FY 2009-2010 for Research, Analytics & Systems Development:

- Support Quarters-to-Semesters Conversion
- Feasibility Study and Warranted Implementation of Mobile Device Services
- Enhance Angel Learning Management System
- Expand Implementation of Forms Management Software
- Enhance Web-Based Schedule Planning Application
- Support Corporate Services Software Implementation
- Promote Commercialization of CMT Product
- Support Implementation of Math Prerequisite Changes
- Improve Library Circulation System Quarterly Updates
- Support Implementation of Continuing Education Content Delivery System
- Grow Value in the DAWN Environment
- Enhance State/Federal Reporting

Access and Affordability Alignment to the Community Quality and Innovation in Student Learning and Support

- Provide Research, Analytics and Reporting Support for Major Initiatives
- Improve Decision Making Using Data Mining and Modeling

Support Quarters-to-Semesters Conversion

Administrative Systems made significant progress during FY 2009-2010 in supporting the quarters-to-semesters conversion. Major accomplishments included:

- The hardware and Colleague software environments have been configured to support the transition. A test and development system now exists for use in planning and configuring the setup and programming changes being made to accommodate semesters.
- Code has been tested and put in place to modify academic history records to reflect semester credit values. Code generously made available by Cedarville University was used to accomplish this task. Approximately seven million history records were modified using this code, and are now available for testing the transcript and academic history features of the Colleague semester software.

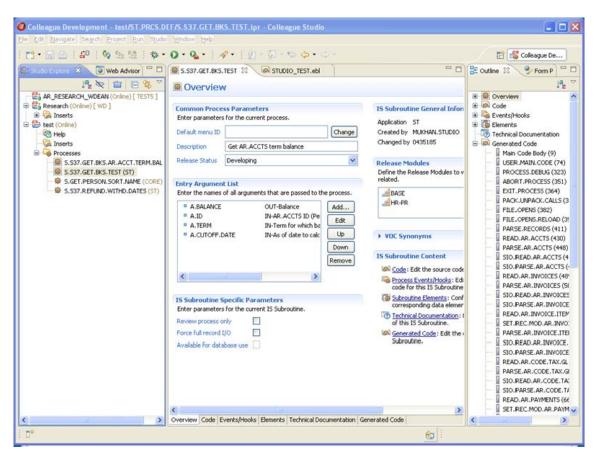


Figure 3-2. Colleague Studio Development Software.

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- The Colleague semester conversion system has been upgraded to the most current version of its underlying database software.
- Approximately twenty percent of the more than 1,100 Colleague custom routines have been evaluated and either changed to reflect semester values or have been determined to be obsolete and have been retired from use.
- All programmers/analysts within Administrative Systems have completed training on Colleague Studio development software (shown in Figure 3-2). The vendor of Sinclair's Colleague software has mandated the use of this development tool, and this mandate will be enforced during the quarters-to-semesters time period. Completion of the training at this time positions Administrative Systems to provide uninterrupted quarters-tosemesters support.

Web Systems has also been active in providing support to the quarters-to-semesters process. Perhaps their greatest contribution has been in the development of the "My Academic Plan" (MAP) application. This contribution and application will be presented in another area of this report – Enhance Web-Based Schedule Planning Application.

In addition to MAP, Web Systems supported quarters-to-semesters by making modifications to the Curriculum Management Tool (CMT). CMT is a centralized workflow process that has been in use at Sinclair for several years. It allows curricula to be developed within a common framework, and it enforces development rules that are designed to lead to quality curricular outcomes. In the quarters-to-semesters environment, some of these development rules needed to be temporarily suspended in order to accommodate the unique situation when massive amounts of curricular data are imported into CMT at one time. For example, under normal operation, CMT would not allow a course to be entered into the curriculum unless required prerequisites and co-requisites were already in the system. With quarters-to-semesters, however, it is not always possible to enforce this rule when hundreds of courses are being bulk-loaded into the system at one time. Consequently, CMT had to be modified to respond to this situation. This is just one of several situations where CMT changes were required.

Qualitative/Quantitative Return on Investment: In its University System of Ohio plan, the State of Ohio has actively embraced the semester calendar as the preferred choice for all of Ohio's publically supported higher-education institutions. Sinclair's primary transfer-out institutions have announced that they will be switching to the semester calendar. If Sinclair is to provide maximum flexibility and transferability for its students, this academic calendar transition is required.

Cost savings/Cost avoidance: Administrative Systems and Web Systems provide support for operational and custom developed systems. This support need will be ongoing regardless of Sinclair's academic calendar. Therefore, there is no specific direct cost savings within these units that will attributable to the quarters-to-semesters conversion. In fact, the quarters-to-semesters process has resulted in the identification of several opportunities for custom program development (e.g., MAP) that will improve the student's academic experience and will place additional requirements upon the staff within these units.

Access and Affordability Alignment to the Community Quality and Innovation in Student Learning and Support

Target Completion Date: June 2010

Actual Completion Date: June 2010

Current Status: The quarters-to-semesters conversion is a continuous process that spans multiple years. Completion of the full conversion is targeted for fall 2010; thus, this project will be included in future reports.

Feasibility Study and Warranted Implementation of Mobile Device Services

A formal survey of Sinclair students was conducted with more than a thousand responses and found that 95% of students have a mobile device, 65% can use some form of the Mobile Web, and 35% have Smart or Touch phones. The same survey revealed students wanted a mobile course schedule as the number one priority, with academic information and a phone directory being tied for a distant second.

A mobile strategy guide was created analyzing Short Message Service, Mobile Web and Device Specific Mobile Applications in terms of Sinclair capabilities, students' devices, and desired student services. The strategy guide advised that Sinclair focus on Mobile Web as the best way to reach the most students and leverage the existing capabilities and programming to deliver the desired student services.

Mobile devices were acquired. These devices (shown in Figure 3-3) are being carried and used by Web Systems and RASD staff to increase awareness and familiarity with mobile device uses and development methods.



Figure 3-3. Models of several different mobile devices.

Several mobile web applications were built to demonstrate the potential of the technology and deliver the student desired mobile services as determined by the survey data. These are ready for a Fall 2010 pilot.

Access and Affordability Alignment to the Community

Quality and Innovation in Student Learning and Support

Schedule Planner

- Search courses by keyword, department, location and course format
- Displays required books with ISBN's and pricing for both new and used options
- Uses the same data services as the main web schedule and requires no additional maintenance to keep up-to-date

My Current Schedule

- Password protected application that retrieves a student's current schedule
- Lists course times, locations, and links to course descriptions and book information
- Features the ability to email the schedule to your student account

My Current Booklist

- Password protected application that retrieves a student's current book list
- Displays required books with ISBN's and pricing for both new and used options

Program Viewer

- Allows the lookup of Sinclair programs of study by academic division and keyword
- Pulls data directly from CMT so all data is accurate and no additional maintenance is required

Employee Directory

 Keyword-based employee directory that lists title, location, phone number and email address

Additionally the following services were also built and are ready for a fall pilot:

- College News & Events
- Whiteboard Ticker & Alerts
- Help Desk Ticket Entry

These applications are ready for beta testing with students, and additional mobile web applications are likewise nearing a beta level.

Qualitative/Quantitative Return on Investment: Students expect the college to provide services via mobile devices. Many commercial products are device specific applications that reach a smaller percentage of students and also have considerable price tags. The survey data and extensive research on mobile devices influenced the creation of the mobile strategy guide, which will be invaluable as Sinclair moves forward in the mobile space. Overall the project was a resounding success and the college has gained the experience and skills needed to confidently approach and deliver mobile device solutions for student services.

Cost savings/Cost avoidance: In terms of direct savings this project will allow Sinclair to leverage the existing programming and data service development of its traditional web applications, preventing the need for costly re-writes or expensive products.

Access and Affordability Alignment to the Community Quality and Innovation in Student Learning and Support

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Enhance Angel Learning Management System

The description of this project in the 2009-2010 Information Services Status Report & Strategic Objectives included a bulleted list of eight items that would be accomplished. All of these items were accomplished, but they were accomplished under circumstances that were entirely unanticipated. The seventh of these bulleted items stated that "in December 2009, the most recent version of the Angel software will be moved from a test to a full production environment." This was accomplished, but immediately after the move to production, the Angel LMS experienced such severe performance degradation that the system was on the verge of being completely non-functional. This system meltdown caused the other bulleted items to be implemented immediately in an attempt to address the degraded system performance. Implemented items included:

- Server virtualization software was used to create multiple instances of the web servers supporting Angel. Additionally, following guidance from Angel's Hosting Services manager, each individual server, whether physical or virtual, was configured to have three instances of Angel per server. Going into the fiscal year, Angel was supported by four physical servers each running one instance. Coming out of the year, Angel is now supported by four physical servers, eight virtual servers, and each server has three instances of Angel installed a total of 36 instances.
- While the Angel setup configuration has not been changed to prevent access to features
 that are resource intensive, such as course copying from a previous term to the current
 term, the Distance Learning department has developed a communication plan for faculty
 to remind them to conduct these resource intensive activities in off-hours. This plan has
 reduced some of the demand on the Angel system during the high volume first week of
 the quarter.
- In late summer 2009, the database server supporting all Angel instances was replaced.
 Previous analysis had indicated that this server would need to be increased in capacity to accommodate anticipated growth.
- The Angel front page has been reconfigured to remove the links on the page that connect to a student's course schedule and email. Neither of these features is embedded within the Angel software, but by only providing access through Angel, this placed an inflated load on the system.
- Vendor supplied performance monitoring software has been used to develop a visual representation of Angel performance (as shown in Figure 3-4). All 36 web servers are monitored for current connections, queued requests, and CPU usage.

Access and Affordability

- A single-sign-on enhancement has been purchased that will allow students to change their passwords without needing to contact the Help Desk. This software is scheduled to be installed in July 2010.
- Predictive analytics have been used to determine that the file server supporting Angel
 has reached its maximum capacity. This information has been used to justify
 replacement and enhancement of this server during summer 2010.

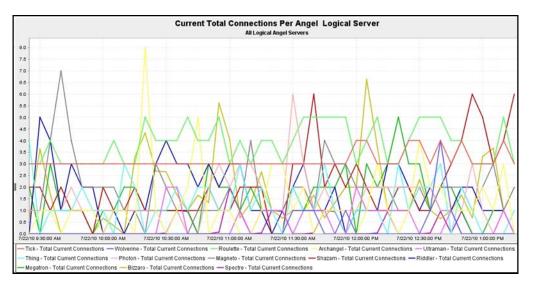


Figure 3-4. Performance Monitoring for Angel.

In addition to this planned activity, the Angel Learning Management System was enhanced by the hiring of a Web Enterprise Applications Engineer (a position re-purposed from another area within the department). This individual is responsible for assuring high-quality customer experiences for all services provided by the Web Services department. Since Angel is the major service provided, this position will take on the responsibility of continuously monitoring Angel performance and developing and implementing plans for service improvement.

Qualitative/Quantitative Return on Investment: Sinclair has set a strategic goal of increasing distance learning enrollments by 50% over the next two to three years. A strong argument can be made that a responsive and reliable learning management system is the most essential resource that will support attainment of this goal.

Cost savings/Cost avoidance: A stable, reliable learning management system has reached the point of being a standard cost of doing business for higher education. In addition to the yearly 20% plus growth in distance learning, all on-campus, face-to-face courses now have an LMS presence. Students expect such features within their courses, and if not provided, they will search elsewhere.

Target Completion Date: December 2009

Due to the aforementioned performance degradation and the excessive number of software errors encountered, it was impossible to meet the Target Completion Date.

Access and Affordability Alignment to the Community Quality and Innovation in Student Learning and Support

Actual Completion Date: April 2010

Expand Implementation of Forms Management Software

The online leave request process has gone through its pilot implementation stage and has been scheduled for campus-wide deployment starting in August 2010, with a mandatory adoption for all employees set for November 1, 2010.

During FY 2009-2010, the online leave request process was rolled out in a pilot mode to approximately 200 full and part-time employees. During this pilot stage several minor changes to the software were identified. For example, a feature was added that allowed employees to grant view access to individuals other than supervisors. Also, a feature was added that allows display of current leave balances. Once these changes were made, Human Resources certified that the system worked as expected and set the timetable for campus-wide implementation.

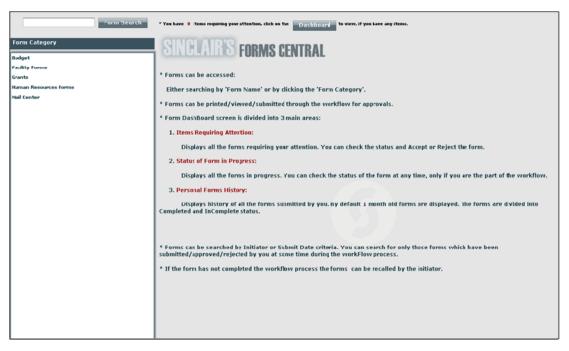


Figure 3-5. Sinclair Forms Central Home Page.

The key request form is another process that has been moved to the online forms management system during FY 2009-2010. This form is administered by Sinclair's Facilities department and is the record keeping process used to identify key distribution for all employees. This process was pilot tested during May to June, 2010 and went into production on July 1, 2010.

Qualitative/Quantitative Return on Investment: The workflow management application saves approximately ten minutes of effort in processing a leave request when compared to the manual, paper-based process.

Access and Affordability Alignment to the Community Quality and Innovation in Student Learning and Support

Cost savings/Cost avoidance: Assuming six leave requests per year for 800 full-time employees, this equates to a savings in staff time of 800 hours of effort. At twenty dollars per hour of staff time, this is an annual savings of \$16,000. This same type of savings can potentially be realized for many other paper forms.

Target Completion Date: March 2010

Actual Completion Date: June 2010

■ Enhance Web-based Schedule Planning Application

The Web-Based Schedule Planning Application underwent many transformations this year as outlined in the FY 2009-2010 Information Services Status Report & Strategic Objectives and exceeded the plan in many ways. A feature was added to connect the application to the Web Advisor shopping cart to eliminate duplicate data entry for students. Additional features were added to display the ISBN's and new and used pricing for text books to achieve compliance with the Higher Education Opportunity Act (HEOA) for disclosing true costs to attend college. There is a new dynamic calendar function to see the times and days of courses on a calendar as students select them. New administrative tools were introduced to make the application easier to manage for Registration and Student Records staff. The changes to the new version of the application are ready for a fall pilot.

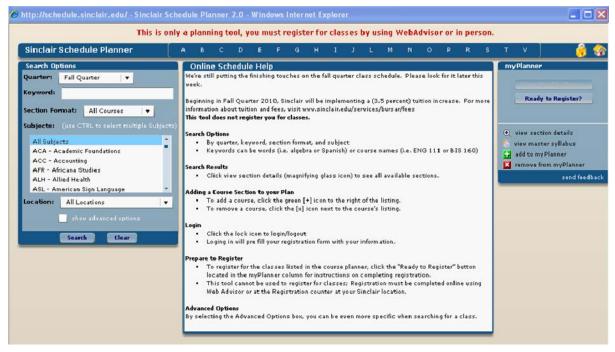


Figure 3-6. Sinclair Schedule Planner.

The Schedule Planner (as shown in Figure 3-6) was integrated with the beta application for My Academic Plan (MAP) which allows prescriptive degree plans to be created and stored for each

Access and Alignment to the Affordability Quality and Innovation in Student Learning and Support Organization

student. The integrations and modifications to the Schedule Planner guide a logged-in student to select the courses on the advisor-created MAP and warn them if they do not make those selections.

The creation of the MAP application and integration represents a major accomplishment towards the stated goals of keeping students on track with their academic plans to reach their goals. These changes surpassed the original planned feasibility study for studying integration ideas with prescriptive degree planning tools. It had been planned to use mock data in XML files or SQL to test the feasibility of the integration. The MAP was created to build the test data and serves as the beta application for the new prescriptive degree planning effort. The application has been heavily demonstrated and is being refined to meet the needs of the advisors to create student MAPs. The integration with MAP is approaching a high degree of sophistication and is ready for pilot use.

Qualitative/Quantitative Return on Investment: Educational research is consistent in the finding that goal expression and identification is a significant factor associated with persistence to a degree. This project is an attempt to directly apply these research findings to a student's registration activity. As the project is rolled into production, it is anticipated that a significant, positive increase in retention and degree completion will result.

Cost savings/Cost avoidance: It is not possible to place a precise quantitative value on this project. However, since a portion of state support of higher education is based upon successful program completion, and this project is specifically designed to increase degree persistence, expectations are that this project will result in a positive return to the college.

Target Completion Date: December 2009

Due to the expanding scope of this application, the original Target Completion Date had to be shifted.

Actual Completion Date: February 2010

■ Support Corporate Services Software Implementation

Sinclair's Corporate Services department has reached a level of activity where their current enterprise software is not appropriately scaled to support the operation. The department's software needs fall into three categories: financial tracking and reporting software, event registration software, and event planning and scheduling software. During the preceding fiscal year, support was provided in the selection of software solutions for two of these three needs.

The department made the decision to select Cvent software to support their event registration needs. This is a commercial product that is web-based. It allows users to develop a web presence that advertises event offerings. The software handles registration and payment for the event and provides the client with up-to-the-minute reports on event activity.

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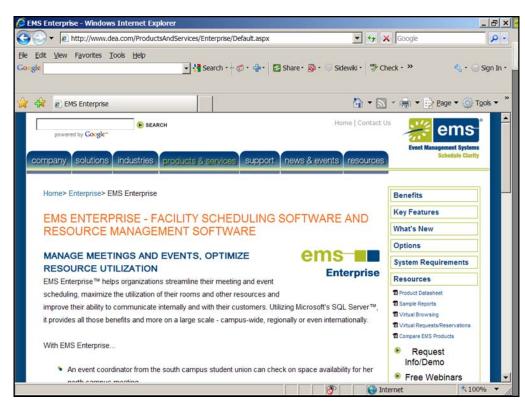


Figure 3-7. Corporate Services new event planning software-EMS Enterprise.

The department also made the decision to select EMS Enterprise software (shown in Figure 3-7) to support their event planning and scheduling activities. This software is locally hosted. It allows office staff immediate and accurate access to a comprehensive picture of all scheduled events, and the software provides extensive reporting capabilities for ancillary services such as multi-media and food service.

At the present time, Corporate Services has decided to hold off on a change in their financial reporting software.

Qualitative/Quantitative Return on Investment: The Corporate Services department has set the goal of quadrupling its annual revenue within the next four years. By the end of this period, Corporate Services expects to be a \$12,000,000 per year operation. Scalable, reliable, and targeted software support is essential in allowing Corporate Services to reach this goal.

Cost savings/Cost avoidance: The annual operating costs for the Cvent software are based upon a charge of \$7.00 per registration. Units of registration are prepaid and can be scaled to the precise level of need. As Corporate Services grows, the registration costs can be grown at the exact same rate. The EMS software implementation cost was approximately \$25,000, and there is an ongoing annual maintenance of about \$1,500.

Target Completion Date: December 2009

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Actual Completion Date: June 2010

■ Promote Commercialization of CMT Product

This project has undergone a significant change in direction throughout the course of the fiscal year. The enthusiasm for CMT commercialization was based upon the high expectations held for Sinclair's first venture into the sale of one of its internally-developed software products. During FY 2009-2010, those expectations experienced a significant setback, and this setback has influenced the pace of CMT commercialization. Specifically, it has become obvious that successful commercial sales need to be supported by a financially sound vendor with sufficient resources to weather the challenges of launching a new product.

Notwithstanding the experience of the launch of the first product, the CMT product (shown in Figure 3-8) did have one successful sale during FY 2009-2010. A large community college purchased the product and has actively incorporated the product into its curriculum development process.

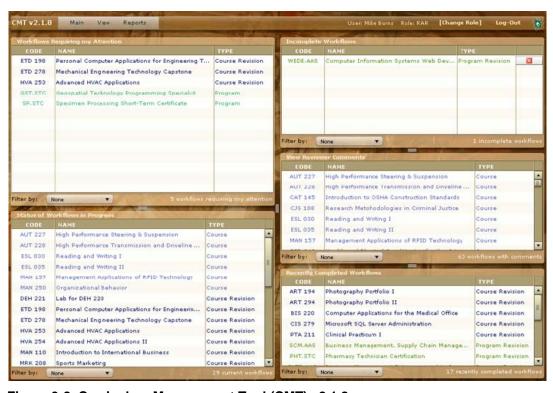


Figure 3-8. Curriculum Management Tool (CMT) v2.1.8.

Qualitative/Quantitative Return on Investment: The first instance of Sinclair entering into a licensing agreement with a third-party vendor for software sales was expected to result in a minimum return to Sinclair of approximately \$100,000 per year. This level of return has not been realized and has been a major factor in the decision to move slowly toward commercialization of the CMT product.

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Cost savings/Cost avoidance: It is not possible to put a specific cost savings/cost avoidance amount on this project. Various business plans have been developed for this commercialization activity, but all are premised on the need for initial investment capital. Until such time as specifics are known about the availability of such capital, an ROI cannot be calculated.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Support Implementation of Math Prerequisite Changes

This project called for the design of a registration rule and a subroutine to be used within the Colleague ERP system to bring about enforcement of the Math registration requirements. The developed subroutine accepts a student's ID and course section information entered at the time of registration and determines if the student has completed all the math prerequisites within a designated time period. The project was designed to support the goal of having students concentrate their math experience in order to increase the probability of successful math course completion. Administrative Systems staff, in cooperation with the Registration and Student Records office, successfully created a Colleague process to enforce the prerequisite time limit for selected math courses. The process has been demonstrated to key staff from the Advising, Registration and Math departments. The process has been moved into the production environment and will be in operation for registration transactions for the winter 2011 quarter.

Qualitative/Quantitative Return on Investment: Math proficiency is one of the major skills students must master if they are to be successful in pursuing an academic degree. Implementation of this math rule is designed to increase students' proficiency levels so they will ultimately master the math skills needed for academic success.

Cost savings/Cost avoidance: It is not possible to place a precise quantitative value on the implementation of this rule. Since a portion of state support of higher education is based upon successful program completion, it is expected any activity designed to promote program completion success will result in a positive return to the college.

Target Completion Date: June 2010

Actual Completion Date: April 2010

■Improve Library Circulation System Quarterly Updates

The library's circulation and authentication system depends upon information within Sinclair's ERP system to identify individuals who are eligible to make use of library services and

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materials. The accuracy and timeliness of this information interchange has become increasingly problematic as enrollments have increased and the demand for library electronic resources has skyrocketed. Prior to implementation of this project, information extracts into the library system took place only at the beginning of the quarter. Furthermore, the programming code used to support this exchange was out-of-date and very difficult to support since the developers of the code were no longer associated with Sinclair.

This project called for modifying the exchange process to make use of the reporting and exporting strengths of the data warehouse and to improve the accuracy and frequency of information provided to the library circulation system. With this improved exchange, library staff were freed from the troubleshooting chores associated with database changes, and significant improvements in service levels were provided to students. Of particular import is the fact that the new process allowed for daily updates of the library system throughout the quarter. As students dropped and/or added classes, the library system reflected these changes within the twenty-four hour refresh cycle of the data warehouse.

Qualitative/Quantitative Return on Investment: Every time a problem comes up in the data exchange between the ERP and library system, students are prevented from acquiring library resources critical to their academic success. If the access to material is extended for a long enough period of time, it is quite likely individual students will fall behind in their course work and will withdraw from courses without successful completion.

Cost savings/Cost avoidance: It is not possible to place a precise quantitative value on improving this data import process. Since a portion of state support of higher education is based upon successful program completion and productive access to program materials is critical to program success, it can is expected any activity designed to promote access to materials will result in a positive return to the college.

Target Completion Date: January 2010

Actual Completion Date: November 2009

■ Support Implementation of Continuing Education Content Delivery System

The Workforce Development and Corporate Services (WD&CS) division has the responsibility to create a library of offerings that can serve the certification, job improvement, and professional needs of service area clients. One objective is to deliver these offerings in a convenient, adaptable and cost-effective manner. This project involved assisting WD&CS in identifying, evaluating, selecting, and implementing learning management software that supports their course delivery goals. The goals of this project were accomplished by assisting WD&CS in the evaluation of two learning management systems. WD&CS needed to develop

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modular learning units as a deliverable for a grant received to train Air Force Procurement Specialists. One open-source and one commercial product were evaluated, and ultimately the decision was made to use the open-source product.

Qualitative/Quantitative Return on Investment: Since WD&CS used course content supplied by the Department of Defense, the ROI for using the open-source product was compelling. The open-source product would accommodate the DOD content without need for extensive course design rework. Open-source could be hosted at several commercial vendor sites; thus, there was no need for a local hardware investment. And lastly, the open-source system required no renegotiation of the license for the system used by the college's credit courses.

Cost savings/Cost avoidance: For the limited use WD&CS makes of learning management software, the selection of an open-source option resulted in approximately a \$25,000 cost avoidance for the division. This situation might change if WD&CS offerings were to expand beyond their current level.

Target Completion Date: January 2010

Actual Completion Date: November 2009

■ Grow Value in the DAWN Environment

One item which illustrates the value of the DAWN portal can be found in the fact that the Research, Analytics, and Reporting (RAR) department has created and deployed payload reporting for the institution. Department chairs are now able to use the DAWN portal to run reports showing payload variance by individuals within their departments. They can extract information showing when payload standards have been overridden -- for faculty, sections, and terms. In addition, chairs can quickly identify when faculty are approaching the 66 hour upper limit for teaching assignments within an academic year. Payload data can be represented in graphic format and can show comparisons across multiple years. Reports that previously had taken weeks to develop can now be produced within minutes. See example in Figure 3-9.

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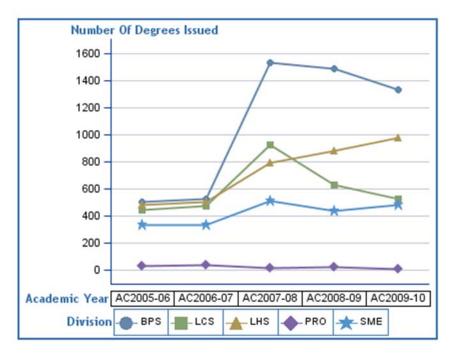


Figure 3.9. An example of the information found on DAWN portal.

Another example of DAWN value can be found in changes made to beginning-of-term processes run in the Bursar's office. Each quarter the Bursar's office needs to identify all students with an outstanding balance on their account. This involves processing in excess of 25,000 students with each student having hundreds of invoice items associated with his/her account. Using the ERP system, this processing can take in excess of 16 hours to run. When run through DAWN using the data warehouse, the process can be completed in a matter of a few minutes.

Because of performance improvements as identified above, the year-over-year usage of the DAWN portal during FY 2009-2010 has increased by 148%. The number of reports generated from DAWN has increased correspondingly.

Qualitative/Quantitative Return on Investment: The DAWN portal provides users with new perspectives by which to view operational data. These enhanced views provide the opportunity to see patterns and relationships that would normally be hidden to managers. These views lead to new opportunities to implement managerial enhancements and to lower costs.

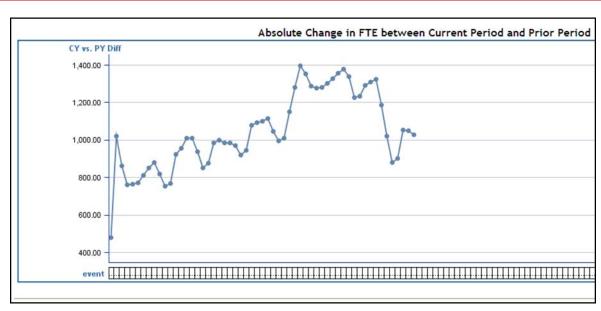


Figure 3-10. An example of graph data available in DAWN.

Cost savings/Cost avoidance: Sinclair budgets in excess of 50 million a year for personnel to provide teaching services. If the improved faculty payload reporting provided by DAWN results in but a one-tenth of one percent improvement in the efficiency of the allocation of these resources, that represents a \$50,000 annual savings for the college.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Enhance State/Federal Reporting

Two significant improvements have been put in place within the Research, Analytics, and Reporting (RAR) area relating to state and federal reporting. First, responsibilities and duties within the state HEI reporting processes have been changed to allow for broader knowledge of the processes and to provide reasonable staff redundancy for task completion. HEI file preparations continue to be transitioned from specialized to routine processes. Second, in cooperation with Registration and other Information Services departments, RAR has implemented the federally mandated changes for reporting of race and ethnicity. These changes necessitated a rework of both the paper and online admissions form and a transition of race and ethnic information from a single to a multi-valued storage configuration.

Qualitative/Quantitative Return on Investment: It is not possible to place a precise quantitative value on improvements made to the state and federal reporting processes. However, state reporting is known to be the foundation upon which all state funding models are based. Improvements in how HEI data are prepared and increases in the number of individuals who are trained in these preparation techniques will provide assurance that Sinclair will continue to report accurate and timely HEI information.

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Cost savings/Cost avoidance: There is no direct cost savings/cost avoidance associated

with this activity.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Provide Research, Analytics, and Reporting Support for Major Initiatives

Research, Analytics, and Reporting (RAR) played a major role in the re-accreditation process (AQIP) during the site visit in winter 2010. RAR was singled out for praise on its ability to provide disaggregated data and reports for student populations. One opportunity for improvement identified was the need for RAR to reference additional benchmarking data when producing reports. In order to respond to this opportunity, RAR has identified budget resources and has entered into collaboration with the National Community College Benchmarking study. Sinclair comparison data has been supplied to the group and further analysis using results from the study are planned as part of the FY 2010-2011 projects.



Figure 3-11. Four Square planning

RAR has been actively engaged in supporting the Four Square planning initiative identified by the Board of Trustees. RAR has provided assistance in aligning current research and reporting activity with the Four Square categories (shown in Figure 3-11) and has assisted the president's office in analyzing the results of campus-wide efforts to refine the plan categories.

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Qualitative/Quantitative Return on Investment: Without accreditation, Sinclair's credit course offerings lose the major portion of their value to students. The extent to which this project supports the accreditation process directly adds value to Sinclair's bottom line.

Cost savings/Cost avoidance: One of the very few criticisms coming from the accreditation visitors was the observation that Sinclair did not make sufficient use of benchmarking data when evaluating college outcomes. Membership in the National Community College Benchmarking study should provide Sinclair with quantitative values that can be used to set realistic performance metrics. Assuming that these metrics will squeeze additional efficiencies out of operations, it is expected that specific cost savings will result.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■Improve Decision Making Using Data Mining and Modeling

The application of data mining and statistical modeling techniques within the post-secondary educational environment has grown considerably over the last five years. Since the deployment of SAS statistical modeling software, Sinclair has taken part in this growth and has placed itself in a strategic position where institutional level decisions based on, and informed by, such techniques will be increasingly common.

During FY 2009-2010, Research, Analytics, and Systems Development (RASD) worked on a number of mining and modeling projects to assist college stakeholders in making data-based decisions. Specifically, RASD worked closely with the Financial Aid office to provide predictive capabilities in the area of student loan default. While the numbers of students who have historically defaulted were too low to permit accurate prediction for this year, it is anticipated that the model will provide management insights within the next year or two as the number of defaults grow.

Prior to the inception of a new "wait listing" process by Registration and Student Records (RSR), RASD successfully created a statistical model capable of determining who would withdraw from courses and when they would withdraw during the normal registration window. This model was particularly powerful in its ability to inform human resource decisions and decisions concerning the addition/cancellation of course sections.

Beginning in fall 2008, RASD began work with RSR to identify deregistered students who were most likely not to persist to the 14th day of classes. This information was used by RSR to intervene prior to the term's start. This work proved successful and helped the College generate hundreds of additional FTE's. Minor improvements to this modeling project are underway, and redeployment is scheduled for fall 2010 with the expectation of increased accuracy.

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Basket Analysis, a common marketing technique, was retooled by RASD to guide the creation of Learning Communities as well as provide the foundation for more advanced analyses of student course sequencing and success/failure within these specific sequences. This foundational work led to the creation of a Poisson Regression model slated for deployment during 2010-2011 capable of predicting the number and type of courses a student will struggle with during their academic program.

RASD continues to work with Student Services, specifically the ILP program, on a host of statistical models (e.g., Logistic Regression and Cluster Analysis) to identify students who are most at risk. RASD has also used mixed modeling techniques to provide FTE and enrollment predictions for the Budget office and has developed predictive capabilities for Accounting and Management courses in an effort to reach students most likely to fail. Overall, RASD will continue to broaden the models and techniques currently in use as well as develop new ones for the ever changing college environment.

Qualitative/Quantitative Return on Investment: In an era of reduced state support for higher education, it is not possible to identify actual funding increases that are associated with the increased FTE's realized through predictive modeling efforts. However, it is clear that increased FTE's are Sinclair's fundamental measure of growth and that growth is used by state funding agencies as the benchmark for mission attainment.

Cost savings/Cost avoidance: Almost all of the predictive modeling efforts are focused on the goal of retaining students who are already associated with Sinclair, either as an engaged student or as someone who has completed the registration process. In both cases, the cost of retaining the connection with actual individuals is significantly lower than the cost of trying to entice unknown individuals to apply.

Target Completion Date: June 2010

Actual Completion Date: June 2010

Information Technology Services

Following are the Major Accomplishments for FY 2009-2010 for Information Technology Services:

- Preble County Learning Center
- Recommend Changes to PC Permissions
- Storage Area Network R&R
- Modify Room 14115 to Improve Service
- VMware Lab Manager
- Implement Server Disk Defragmentation
- Sinclair Conference Center Multimedia Upgrades
- Network Server R&R
- Disaster Recovery Procedure Updates
- Printer, Copier, and Fax Management
- Standardization of Classroom Multimedia
- Application Virtualization
- Network Infrastructure R&R
- Protection of Personal Information
- Implement ShoreTel Call Manager Software
- Dayton Campus Data Center Renovations
- Disaster Recovery Site Renovations
- Server Configuration Management
- Improved Wireless Access
- On-line Radiology Program Security Accreditation
- Angel Infrastructure Improvements
- Citrix Implementation
- Server Virtualization
- ShoreTel VPN Phones
- ShoreTel at MVRP
- AT&T Voice and Data Contract
- Project Lead the Way
- Help Desk Knowledgebase
- Pharos Signup
- Cable TV System Repairs
- Multimedia Equipment Inventory

■ Preble County Learning Center

The new Preble County Learning Center in Eaton, Ohio opened for classes in September 2009. To prepare for the opening of the facility, ITS worked with college personnel to understand their needs and design an appropriate infrastructure for the site. Most of the needs of this site were similar to the needs of the Englewood and Huber Heights Learning Centers and the Courseview Campus Center, which have been built over the last few years. While the facility

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has a smaller number of classrooms, the amount and kinds of technology used is very similar. There is only one computer classroom, but all classrooms are equipped with multimedia podiums. The Learning Center is connected to the college-wide network which connects the Dayton campus and all other remote sites and uses the same VoIP phone system that allows 4-digit dialing to all Sinclair sites.



Figure 3-12. The Preble County Learning Center.

Qualitative/Quantitative return on Investment: Information Technology Services made use of technologies that have been proven and standardized at other campus locations. The learning center is connected to the college-wide network which provides the same access to learning center students as they would experience at any Sinclair campus.

Cost Savings/Cost Avoidance identified with the project: Connectivity to the Dayton campus is accomplished using a VPN connection over the Internet rather than other methods that would require costly leased telecommunication lines. ITS uses a remote technical support model which allows a high level of support while keeping costs low.

Target Completion Date: September 2009

Actual Completion Date: September 2009

■ Recommend Changes to PC Permissions

This project involved evaluating issues surrounding end-user privileges on personal computers, and developing recommendations and strategy for ensuring end-users have the most appropriate permissions needed to perform their duties. A fundamental principle of information security is the concept of "least privilege". In simple terms, this concept can be summarized as: *Users*

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should have the access they need, <u>and only the access they need</u>, to perform their jobs. When users are running as local administrator, they have access above what they typically need to do their jobs. For example, administrative privileges are required to **install** many applications, but are generally not required to **run** the applications (reference Figure 3-13). The typical user does not need to install applications, he/she needs to use the applications already installed. If a user does need to install an application, temporary access can be granted by use of privilege escalation tools or other methods.

The risk of users operating with administrative privileges on an Internet connected computer is particularly magnified because the attackers know and rely on it. A user with administrative rights can *intentionally* run/install <u>any</u> application/code on the machine—but most users are not aware that any application/code they run/install also inherits this ability. In all versions of the Windows Image through Windows XP, end users have routinely been granted (by installation default) 'local administrator' permissions on the PC.

Migrating end users from the current default "administrators" group to the standard "users" group has been a recommended 'effective practice' for many years. However, the design of the Windows operating system has typically made implementation of this recommendation difficult as it required significant central IT management and negatively affected the user's ability to efficiently manage system resources. Most successful implementations of privilege management required third-party software such as offered by BeyondTrust or CyberArk. This software is expensive and involves significant support and also added to administrative/support overhead.

Standard Users	Administrators
Establish a Local Area Network connection	Install and uninstall applications
Establish and configure a wireless connection	Install a driver for a device (E.G. a digital camera driver)
Modify Display Settings	Install Windows updates
Users cannot defragment the hard drive, but a service does this on their behalf	Configure Parental Controls
Play CD/DVD media (configurable with Group Policy)	Install an ActiveX control
Burn CD/DVD media (configurable with Group Policy)	Open the Windows Firewall Control Panel
Change the desktop background for the current user	Change a user's account type
Open the Date and Time Control Panel and change the time zone	Modify UAC settings in the Security Policy Editor snap-in (secpol.msc)
Use Remote Desktop to connect to another computer	Configure Remote Desktop access
Change user's own account password	Add or remove a user account
Configure battery power options	Copy or move files into the Program Files or Windows directory
Configure Accessibility options	Schedule Automated Tasks
Restore user's backed-up files	Restore system backed-up files
Set-up computer synchronization with a mobile device (smart phone, laptop, or PDA)	Configure Automatic Updates
Connect and configure a Bluetooth device	Browse to another user's directory

Figure 3-13. Permissions capabilities of Standard Users vs. Administrators in Windows.

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With the implementation of "User Access Control" (UAC) in Windows Vista, Microsoft included a built-in functionality that permits users to run as 'standard user', but also includes a virtually seamless permissions elevation path from standard user to administrator when warranted. UAC was updated and improved with the release of Windows 7. Because UAC enables users to easily run as standard users, we now have the ability to increase the security of the systems environment, including system files, audit logs, and system-wide settings. UAC also helps reduce the administrative and support overhead involved in repeated elevated privilege tasks on individual computers (as illustrated in Figure 3-14).

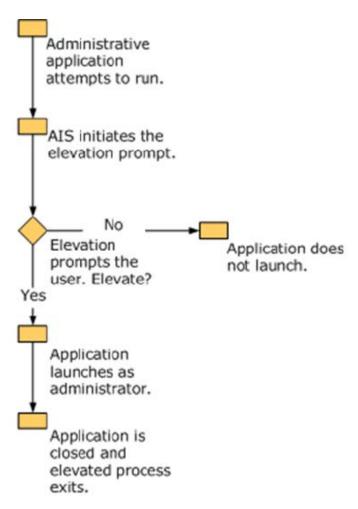


Figure 3-14. Flowchart of the UAC Permissions Elevation Process.

As a result of this project, the recommendation is to migrate the 'default' user role from administrator to standard user in conjunction with the upgrade/rollout to Windows 7 as the default operating system. As users are identified who have a genuine need to perform local administrator functions, their role can be elevated (permanently or temporarily) to administrator, and the UAC function will help mitigate the risk of the elevation. The pilot group for Windows 7 is being identified and issues with the standard user permissions will be identified and documented through the pilot.

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Qualitative/Quantitative return on Investment: Ensuring effective user permissions is a technical control that will augment existing controls to mitigate the risk of unintentional data loss or system breach due to malicious code. According to a reputable source, of the 154 bugs published and patched by Microsoft in 2008, critical or not, 69% would have been blocked or their impact reduced by configuring users to run without administrative rights. In addition to offering additional protection from vulnerabilities, proper user permissions also helps mitigate the risk and expense associated with spyware and other malware infestations.

Cost Savings/Cost Avoidance identified with the project: This project is difficult to quantify. Cost avoidance is the primary result of implementing these recommendations. Implementing effective security as a preventive measure is less costly—in dollars and public image—than the loss of production and recovery costs associated with a breach.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Storage Area Network R&R

Information Technology Services (ITS) maintains a plan for the annual renewal & replacement (R&R) of information technology infrastructure components. This plan is used to project expenditures of these components over a five year period to provide the college's leadership with information to aid in budget planning. Each year, during the annual planning and budgeting cycle, the R&R plan is updated with any new information that would change expected expenditures for the coming year as well as the next four years.

Each item that is identified on the R&R plan has a useful life. This useful life along with the total cost of the equipment, determines the funds that must be set aside each year to replace the equipment when it has reached its end of life. Sinclair's Storage Area Network (SAN) has an estimated useful life of five years. A SAN is a dedicated network for data storage devices (i.e., disk drives, tape drives, etc.). It is separate from the Local Area Network (LAN) that connects the workstations and servers. This separation allows high-speed access to data and applications by the servers without impacting LAN traffic.

In FY 2004-2005, ITS upgraded to the current SAN per the R&R schedule to provide increased storage space as well as better fault tolerance and performance. At that time, a "forklift" upgrade was performed to replace the SAN. After the upgrade, it became apparent that the SAN environment is becoming too large and critical to perform that type of upgrade again. In addition, a SAN Expansion Project in FY 2006-2007 added an additional 6.2 TB of storage to the SAN, which ITS estimates increases its estimated useful life by a couple of years.

ITS met with HP to discuss future needs and their product offerings to help determine the type and size of SAN to purchase. A final configuration was agreed upon and a HP EVA 6400 disk array (shown in Figure 3-15), as well as additional SAN switches and tape drives, were

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purchased in the summer of 2009. This new disk array provides Sinclair with an additional 41 TB of usable storage space. This storage space was desperately needed since the existing storage array only had only 800 GB of storage space that was unallocated.

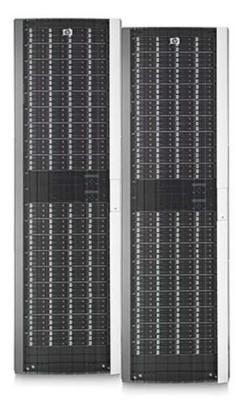


Figure 3-15. The HP EVA 6400 Disk Array.

The new disk array and tape drives were installed in August 2009 and integrated into the existing Storage Area Network. Over time, the files for the virtual infrastructure, SQL cluster, and Angel file server were migrated from the old disk array to the new disk array. This provides increased disk drive performance for these critical systems. Disk space from this new disk array has also been used for new physical servers that were added to the SAN. In total, 13.1 TB of disk storage has been added on the new disk array.

To complete this project, the new SAN switches still must be installed. The plan calls for that to occur before September 1, 2010, but it may get pushed back until Christmas break. This part of the project has been delayed due to the amount of downtime that will be incurred during the switch replacement process.

Qualitative/Quantitative return on Investment: The addition of a second storage array increased the SAN storage capacity by approximately 300% and provided better performance for critical applications. In fact, moving these applications to the new storage array resolved some of the issues experienced with Angel during Fall Quarter 2009.

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Cost Savings/Cost Avoidance identified with the project: This project came in \$5,323 below budget.

Target Completion Date: June 2010

Actual Completion Date/Current Status: The project is complete with the exception of installing the fiber channel switches. This will be completed by no later than December 2010

■ Modify Room 14115 to Improve Service

The purpose of this project was to increase the number of computer stations in room 14115 and create a better flow of traffic between 14109 and 14115.

Prior to Fall Quarter 2009, room 3241 was the BIS/CIS open lab and it was staffed with students that were hired and managed by the BIS department. Room 14115 was a training room and used as an overflow for the 14109 open lab when nothing was scheduled. In February 2010, the BIS/CIS open computer lab moved from room 3241 into room 14115. This allowed a reduction in staffing by using CIL lab staff to support the CIS computers which were setup in 14115 and the BIS software was already available in 14109

With the closing of the BIS\CIS open lab there was an increase of traffic in the 14109/14115 open lab. On average, at peak times, there were 5-6 students waiting for 10-15 minutes for a computer. To address the increased demand ITS increased the number of computer stations by 10 in 14109 and installed Pharos to assist in directing students to an open computer.

Qualitative/Quantitative return on Investment: The addition of computers and Pharos has increased the availability of stations and reduced the time staff spends on helping students find a station

Cost savings/Cost avoidance identified with the project: Less time needed from staff helping students find an open computer.

Target Completion Date: December 2009

Actual Completion Date: December 2009

■VMware Lab Manager

VMware Lab Manager is a software environment for the installation, configuration and management of virtual servers. It is purpose-built for the management of dynamic, non-production systems and allows granular access control to the virtual servers. It includes a self-service portal where users can create, replicate and decommission their own virtual servers using templates stored in an image library. However, system administrators still remain

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in control of access rights, storage and deployment policies. It also provides the flexibility to create complex networks virtually without effecting production environments.

The purpose for this project was to research VMware Lab Manager to see whether it demonstrated any benefit for Sinclair. In addition to the research component, the scope of this project was also to install/configure this software in the cert lab for testing by other departments. However, while the research portion of this project has been completed, the installation and testing did not occur. VMware does not have evaluation software for Lab Manager. We would have had to purchase this product to evaluate it and, while it did have features that we felt would be beneficial for Sinclair, there was no budget to purchase this software. This software is expensive, even at the discount provided through OARnet, and it did not seem prudent to purchase at this time, especially since we were just evaluating the software.

During the research however, and as part of Sinclair's new relationship with Citrix, it was discovered that Citrix has a Lab Manager product as well. This product appears to be comparable to, and in some ways, better than VMware Lab Manager. An additional benefit of using Citrix is that, as part of Sinclair's XenDesktop Platinum License which was purchased for another project, Sinclair is already licensed for Citrix Lab Manager, so no additional costs are necessary. However, a Citrix XenServer environment is needed in order to use Citrix Lab Manager. ITS plans to implement XenServer in FY 2010-2011, and the installation/configuration of Citrix Lab Manager (shown in Figure 3-16) has also been defined as a project for FY 2010-2011.

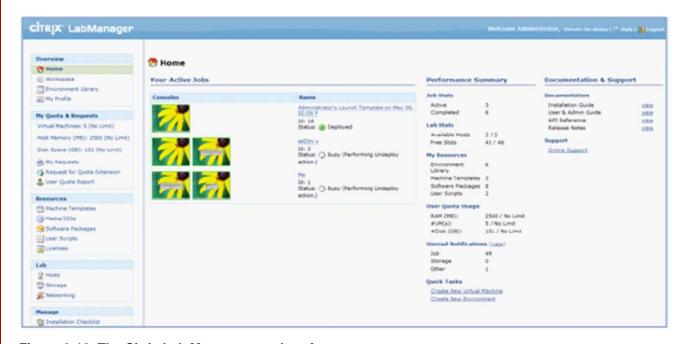


Figure 3-16. The Citrix Lab Manager user Interface.

Qualitative/Quantitative return on Investment: Since this project is investigational in scope, there was no budget allocated.

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Cost Savings/Cost Avoidance identified with the project: Not applicable.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■Implement Server Disk Defragmentation

ITS continually investigates ways to increase a server's life expectancy as well as improve performance. Today's servers must cope with escalating user demands to process larger and larger amounts of data with minimal slowdowns. Disk fragmentation occurs when a file is broken up into pieces to fit onto a disk. Because files are constantly being written, deleted and resized, fragmentation is a natural occurrence. When a file is split into multiple segments that are stored in different locations on the disk, it takes longer to read and write, decreasing server performance. Diskeeper has been implemented across Sinclair's server fleet resulting in improved read and write performance of approximately 10% on both local and SAN attached hard drives. Figure 3-17 illustrates file server disk fragmentation prior to utilizing Diskeeper, and Figure 3-18 illustrates file server disk fragmentation following implementation of Diskeeper.

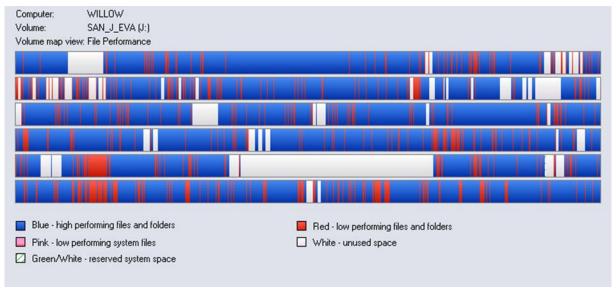


Figure 3-17. File Server Disk Fragmentation Pre Diskeeper.

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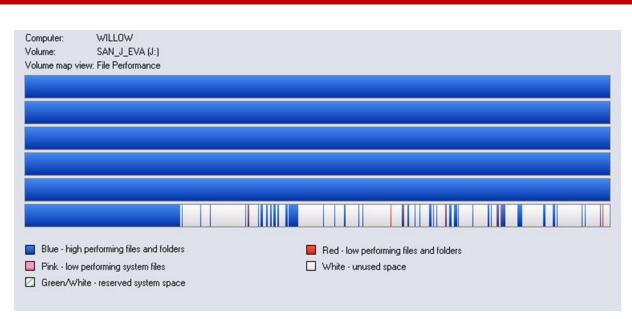


Figure 3-18. File Server Disk Fragmentation Post Diskeeper.

Qualitative/Quantitative return on Investment: Proactively defragmenting server hard drives helps to preserve performance and extend a server's life expectancy. Quantitatively, there are cost savings from less hardware, lower maintenance costs, and reduced energy and cooling costs. Qualitatively, increased productivity is realized due to less time spent on waiting for responses from servers.

Cost Savings/Cost Avoidance identified with the project: Downtime for server maintenance can squander productivity for both students and employees. Diskeeper automates the defragmentation process, improving performance and availability. There was no need to hire an outside consultant to help with configuration as ITS employees were able to deploy and configure Diskeeper during normal business hours.

Target Completion Date: December 2009

Actual Completion Date: May 2010

■ Sinclair Conference Center Multimedia Upgrades

The Sinclair Conference Center was originally built in 1989 to provide an affordable place where Dayton area businesses could hold meetings and conferences. Originally the facility was designed to be a meeting and dining facility and was equipped with whiteboards, flip charts, and plenty of area where dining tables and buffet lines could be placed. Twenty years later technical provisions such as projectors, microphones, and computers have replaced whiteboards and flip-charts as standard required equipment for meetings and events.

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Figure 3-19. Sinclair Conference Center Venues.

In FY 2009-2010, 19 of the 30 conference center meeting spaces were equipped with installed projectors, projection screens, computers, VHS/DVD players, multimedia control systems and program audio speakers. This project upgraded the audio system in the Great Hall, one of the flagship spaces at the Sinclair Conference Center, as well as added audio upgrades for both the Smith Theater and the Earley Auditorium.

Qualitative/Quantitative return on Investment: These upgrades have increased the capacity of the audio systems so that speaking voices and multimedia audio may be clearly heard and understood.

Cost Savings/Cost Avoidance identified with the project: Costs avoided include the refunds of client revenue when the previous sound systems underperformed.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Network Server R&R

Information Technology Services (ITS) maintains a plan for the annual renewal & replacement (R&R) of information technology infrastructure components. This plan is used to project expenditures of these components over a five year period to provide the college's leadership with information to aid in budget planning. Each year, during the annual planning and budgeting

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cycle, the R&R plan is updated with any new information that would change expected expenditures for the coming year as well as the next four years.

Each item that is identified on the R&R plan has a useful life. This useful life, along with the total cost of the equipment, determines the funds that must be set aside each year to replace the equipment when it has reached its end of life. Network servers have an estimated useful life of four years. In FY 2009-2010, ITS decommissioned 20 physical servers. Of these, nine servers were not replaced and the services they provided were either not needed or moved to another server. Six of these servers were migrated to become virtual servers and new hardware was purchased to replace five physical servers.

The budget estimated for Network Server R&R was increased by \$186,000 over what was projected for FY 2009-2010 due to the projected need to upgrade the Angel database servers. Based on current and historical server performance metrics, Angel usage and student enrollment trends, the department of Research, Analytics and Reporting projected that we would reach Angel database performance capacity Winter Quarter 2010. Due to this, a new Angel database server was purchased, installed and configured by the start of Fall Quarter 2009. This server was added into the Polyserve SQL cluster to provide redundancy in case of hardware failure.

Qualitative/Quantitative return on Investment: The ability to detach the services provided by a server from the physical hardware, made possible through virtualization, provides greater redundancy, hence increased uptime for these services. In addition, the higher performance metrics of the new SQL server for Angel allowed us to exceed the increased performance requirements brought about by increased student enrollment.

Cost Savings/Cost Avoidance identified with the project: Of the twenty physical servers decommissioned, we only had to replace five physical servers. This provided a savings of approximately \$120,000 that was used to purchase servers for additional, unplanned projects and provide more resources within existing virtual server clusters.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Disaster Recovery Procedure Updates

Sinclair's contract with SunGard Disaster Recovery Services expired in December 2008. ITS has re-evaluated its recovery strategies resulting in newly developed procedures and guidelines focusing on hardware maximization through virtualization. Utilizing the in-house disaster recovery facility at Courseview in conjunction with the newly developed procedures and guidelines ensure Sinclair's preparedness in the event of a disaster, as illustrated in Figure 3-20.

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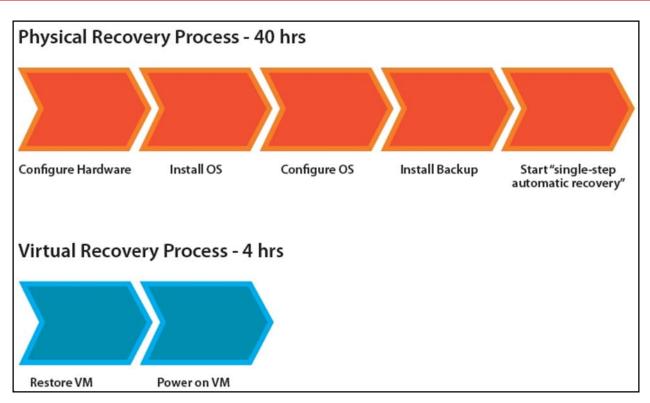


Figure 3-20. Virtualization significantly accelerates the recovery process.

Qualitative/Quantitative return on Investment: Quantitatively, there are cost savings from less hardware, lower maintenance costs, and no annual Sungard contract. Having the ability to test multiple DR scenarios with unlimited frequency, helping to ensure Sinclair's DR preparedness, is priceless.

Cost Savings/Cost Avoidance identified with the project: Developing and maintaining effective disaster recovery procedures and guidelines is less costly than the permanent loss of student and employee data.

Target Completion Date: April 2010

Actual Completion Date: October 2010

■ Printer, Copier, and Fax Management

Sinclair currently has approximately 430 printers that are connected to the campus network, which can be utilized by the college's 4500 administrative and academic lab computers. In addition to these printers which can be shared because of being connected to the network, there are over 800 printers that are directly connected to office PCs. With the cost of printing continuing to rise, there are significant opportunities for the college to reduce spending by implementing changes in the way that the college prints.

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In the Spring of 2009, Information Technology Services began collecting data related to the usage of printers and also conducting interviews with users of these printers. An analysis of the data was conducted and shared with a cross-functional team who proposed a set of recommendations for reducing overall printing costs. The first of the recommendations to be implemented was the purchase of the Equitrac print management software.

Equitrac was first installed at all remote sites that were not running the GoPrint print management software. Then GoPrint was replaced on the Dayton campus for the beginning of Spring Quarter. Also in the Spring of 2010, President's Cabinet approved the recommendation to make Equitrac a requirement for all student printing. This implementation is currently progressing.

Campus Copiers

Another component of the print management strategy is that ITS has assumed responsibility for all of the campus' satellite copiers which had previously been managed by Business Services. As these devices are becoming much more than copiers, it is clear that these other capabilities need to be leveraged, such as network printing, scanning to email, etc., to get the most out of Sinclair's investment.

To start with, 8 of the convenience copiers have been replaced with devices that can be connected to the network. One of these is being tested for integration with Equitrac to allow tracking of use and departmental chargeback. After procedures for these functions have been developed ITS will have an option to provide departments with a cheaper and more convenient alternative to local printers.

Qualitative/Quantitative return on Investment: Recommendations from this project are saving costs by reducing the amount of printer consumables and replacement costs for printers.

Cost Savings/Cost Avoidance identified with the project: The estimated cost savings from implementing pay for print in all campus labs and classrooms is over \$56,000 per year.

Target Completion Date: April 2010

Actual Completion Date: The recommendations of the Print Management team were completed in January 2010. The implementation of recommendations will continue for several years.

■ Standardization of Classroom Multimedia

In FY 2009-2010 a project was created to analyze space management and multimedia presentation equipment needs for Sinclair's Dayton Campus and to provide a recommendation, including associated costs, for installing standard multimedia presentation systems throughout the campus.

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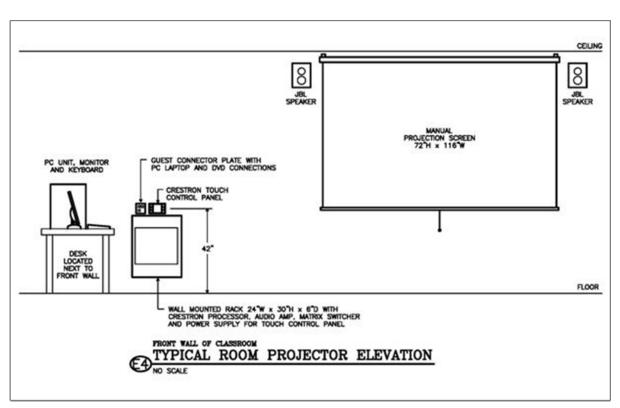


Figure 3-21. The configuration of a multimedia classroom's minimum standard.

This analysis determined a minimum set of equipment for every classroom and lab space on campus along with related costs. Also presented was a set of 115 classroom and lab spaces on the Dayton Campus that are equipped with non-standard, aging equipment or are currently not equipped with any multimedia capabilities.

Using this information, capital support was requested and approved to fund a portion of this project to standardize multimedia capabilities (shown in Figure 3-21) in the classroom and lab settings across the Dayton Campus. Funding to equip 27 rooms has been set aside, and the project was designed and bid in FY 2009-2010. During the Summer of FY 2010-2011 the equipment will be installed and programmed.

Qualitative/Quantitative return on Investment: As a result of this project, Sinclair's faculty will be better able to standardize classroom content using more effective multimedia resources as teaching tools.

Cost Savings/Cost Avoidance identified with the project: Standardization of the multimedia presentation equipment across all of the Dayton academic spaces creates an opportunity to use space more effectively. Effective use of space translates into time savings for instructors who can, after this project is complete, count on the same presentation equipment being in any classroom in which they are scheduled to teach.

Target Completion Date: Original = June 2010, Revised = September 2010

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■ Application Virtualization

ITS maintains the Windows "Images" in over 300 campus computer classrooms, which contain over 700 different applications in approximately 70 combinations. In the past the installation of any new application into an image required the creation of an installation script, which had to be installed on the computers that the software was made available on. The amount of time required installing the applications in an image and the testing required due to the possibility of conflicts between the applications caused response time for changes to images to be longer than desired.

In an attempt to improve response time for image changes and to promote the flexibility of computer classroom use, ITS has begun using an "application virtualization" program from Microsoft called App-V (formerly SoftGrid – see FY 2008-2009 IT Master Plan). Using App-V, application installation modules are created once and re-used without testing for conflicts because each application runs within its own virtualized environment. This also permits completely new combinations of applications to be created dynamically.

Because of the way that App-V (shown in Figure 3-22) allows applications to be assigned to users and dynamically installed when they are used, the possibility of using applications in any space on campus becomes possible. This has great benefits over the way that full application installs are done within physical spaces.

In the Fall of 2009, students began logging in with their own IDs on campus computers, and the applications that are used within the specific classes, that they are registered for, began being dynamically delivered to that computer. About 80% of all applications provided to students are now available via this dynamic delivery. In addition to allowing students to login anywhere on campus and receive these applications, we have begun providing these same applications remotely via the Internet using virtual applications delivered inside of a virtual desktop. The HIM department is currently using this system to provide remote access to software that previously was only available in a campus classroom.

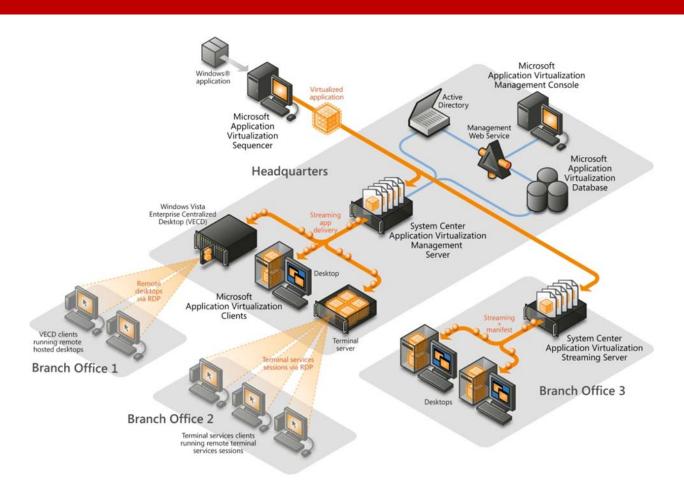


Figure 3-22. The Microsoft App-V infrastructure.

Qualitative/Quantitative return on Investment: The "just in time" assignment and installation of applications helps ITS to meet the ever-changing needs of the college as computers and software applications continue to be more integral to teaching and learning.

Cost Savings/Cost Avoidance identified with the project: ITS had evaluated App-V several years ago when it was owned by Softricity. While we were excited about the possibilities that it offered, the cost of nearly \$250,000 with 20% annual maintenance was too high to be realistically considered. When Microsoft purchased the company to fill a gap in their software deployment capabilities, they offered the software at an annual subscription cost of \$4,200.

Target Completion Date: October 2009

Actual Completion Date: The initial rollout of virtualized applications was completed prior to September 2009. Additional applications are being virtualized on an on-going basis.

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■ Network Infrastructure R&R

Information Technology Services (ITS) maintains a plan for the annual renewal & replacement (R&R) of information technology infrastructure components. This plan is used to project expenditures of these components over a five year period to provide the college's leadership with information to aid in budget planning. Each year, during the annual planning and budgeting cycle, the R&R plan is updated with any new information that would change expected expenditures for the coming year as well as the next four years.

Each item that is identified on the R&R plan has a useful life. This useful life along with the total cost of the equipment, determines the funds that must be set aside each year to replace the equipment when it has reached its end of life. Network Infrastructure equipment has an estimated useful life of five years. In FY 2009-2010, ITS had planned to replace the edge switches in Buildings 5, 11-3, 1, 3, 6, 10, 13-2, 14 and 20.

After a cost benefit analysis, which compared the costs to replace that equipment with performance/utilization data gathered from a variety of internally developed tools, it was determined that the best use of the budgeted funds was to replace the switches/routers in the data center instead. However, this was not simply a one-to-one replacement of existing equipment. We used this opportunity to re-design the switching/routing infrastructure in the data center. New S-Series products (shown in Figure 3-23) released by Enterasys in Q3 2010, which enabled this new infrastructure design, also influenced the decision to upgrade the data center devices.



Figure 3-23. Enterasys S-Series Family.

ITS met with Enterasys and traveled to Boston to visit UMass Medical School and Enterasys's corporate headquarters to see how they had implemented an infrastructure design similar to that which we were considering. After meeting with them and further discussions both internally and with Enterasys, the final design was determined and the equipment was ordered and delivered to Sinclair. Some of the equipment has been installed, configured, and servers have been migrated to that equipment. However, due to the complexity of moving from our

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current state to this new design, another project was defined in FY 2010-2011 to complete the installation/configuration of this equipment and move all related servers and other infrastructure devices.

Qualitative/Quantitative return on Investment: Using data gathered from both purchased and in-house developed tools, we were able to make informed decisions as to where the budget dollars would have the most impact. In addition, maintaining critical equipment within the college's network infrastructure is necessary to prevent failure due to aging or obsolete components. Also, the cost of implementing upgrades in a reactive way rather than as part of a planned renewal process can be much more costly.

Cost Savings/Cost Avoidance identified with the project: By combining the equipment from this project with the equipment from the Network Access Control project, we were able to save an additional 6%, or \$28,600, compared to the Midwestern Higher Education Compact (MHEC) pricing.

Target Completion Date: June 2010

Actual Completion Date: June 2010

■ Protection of Personal Information

Sinclair is committed to protecting the personal information of all College stakeholders: conducting a full assessment of where, when, and how personal information is collected, used, stored, and disposed of, is a basic requirement of proving this commitment. According to Ohio Law (Ohio Revised Code in Chapters 1347.12 and 1349.19), personal information is defined as a person's first name (or initial) and surname, in combination with any of the following:

- Social Security Number;
- Driver's license number or state identification card number;
- Financial account, debit, or credit number; or
- Other information that creates a 'material risk of the commission of the offense of identity fraud or other fraud to the individual'.

Sinclair currently has administrative controls—data classification, policy, procedures, etc.—in place to address many of the issues surrounding personal information. However, technical solutions to assist with controlling access to, and protecting, loss of personal information exist, and the technology and effectiveness of these solutions is maturing.

This project involved evaluating and conducting a feasibility study of acquiring and implementing a technical solution to assist in protecting personal information, with a particular emphasis on security of Social Security Numbers and Credit/Payment Card Account numbers. Solutions were evaluated that address locating, identifying, and securing electronically managed personal information at rest (i.e., in storage) and also in motion (i.e., being transmitted).

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A number of technical solutions were identified for evaluation, including:

- The DLP module/component of the PaloAlto Firewall;
- Commercial "Identity Finder" software; and
- Open source "Spider" (cornell.edu), SENF (utexas.edu), and "Find_SSNs" (vt.edu).

While all of the open source solutions were effective to some degree, they all required extensive configuration and technical administration to initiate a scan, and each performed to varying degrees depending on the data location (stored on a PC, network storage, Web). All three also produced an unacceptable number of false-positives. These solutions might be acceptable with enough 'tweaking' and support overhead to detect most 'data at rest', but they do not offer solutions for 'data in transit', and they simply identify potentially sensitive data, they do not offer remediation.

The firewall DLP solution also requires extensive configuration and administration, and also produces an unacceptable number of false-positives. With extensive tweaking, it might be effective at detecting data in transit, but it does not address data at rest. Unless the number of false positives could be greatly reduced, the remediation features would likely result in unacceptable user impact.

The Identity Finder solution (shown in Figure 3-24) outperformed all other evaluated solutions. It is easy to use, flexible, and false positives were minimal. Detection of data at rest in the 'pro' version was stellar. The enterprise version offers a solution for data in transit, and also offers remediation capability.



Figure 3-24. Identity Finder Search Wizard Options.

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Identity Finder Enterprise is the recommended solution. However, the company's current licensing model does not economically scale to our implementation plans. The sales department states that a new model is due to be offered in Summer 2010; therefore it will be re-evaluated when released.

Qualitative/Quantitative return on Investment: Personal information (such as credit card numbers and Social Security Numbers) is the primary target of criminals engaged in identity theft and other fraud. Colleges and Universities are prime targets for a number of reasons: the primary ones being the sheer volume of personal information stored in systems and the open to the public nature of campuses. Ensuring the College protects all personal information to the best of current ability is an inherent obligation when collecting and using it.

Cost Savings/Cost Avoidance identified with the project: The evaluation process cost was essentially employee time and effort. The firewall solution is a module of our current firewall, open-source solutions are freely downloadable, and IdentityFinder provided free evaluation copies of their solution. If/when implemented, Cost avoidance is the most likely result. Implementing effective security as a preventive measure is less costly—in dollars and public image—than the loss of production and recovery costs associated with a breach.

Target Completion Date: April 2010

Actual Completion Date: April 2010

■ Implement ShoreTel Call Manager Software

Call Manager software is a ShoreTel client application that can manage a user's calls, voice mail, and personal system settings through the use of a graphical user interface on the user's PC. The system has different call manager types such as personal call manager, workgroup agent call manager, and workgroup supervisor call manager. The workgroup call manager software has been deployed to users who are using the workgroup feature in Academic Advising, Bookstore, and Career Planning with great success and ease of acceptance by the users. The personal call manager is the type that most users will be utilizing on campus. This software supports basic voice call handling and other call handling functions such as voice call control, telephony presence, history viewer, directory viewer, speed dial, Outlook call handling, Outlook voice mail integration, and other programmable buttons.

In the past year, the use of the Shoretel Call Manager software (shown in Figure 3-25) has been increased to a larger pilot group, and a high degree of acceptance has been generated. However, in reviewing the deployment of the software to the rest of the campus, it was determined that a standard access method should be used which entailed using the Sinclair Windows login. In order to achieve this method, the integration with Active Directory would be required. ITS upgraded the phone system to the latest release in order to get this integration in January 2010. However, further testing and other integration steps had to be implemented as well. Consequently, the project has been extended to complete the additional integration steps.

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It is anticipated that the software will be offered to users on an opt-in basis only. User training will be provided via on-line videos, online documentation, and open user training sessions. The implementation team that was assembled will still review the software implementation and training that has been developed for the typical Sinclair user.

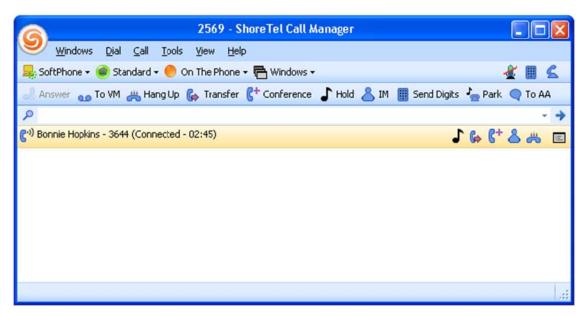


Figure 3-25. The ShoreTel Call Manager displayed on a Windows PC.

Qualitative/Quantitative Return on Investment: The further expansion of the capabilities of the phone system will make users more efficient in the day-to-day operations and allow users to make better use of their time on a daily basis. Expanding the uses of the phone system is very efficient and did not incur any additional costs.

Cost savings/Cost avoidance identified with the project: There are no additional direct cost outlays for this project because the software was acquired with the original phone system purchase.

Target Completion Date: February 2010

Current status: The original target date of February 2010 was not met due to the necessity to add Active Directory integration. Test servers have been installed to allow verification of the system's interoperability with Active Directory. The project is expected to be complete by the end of November 2010.

■ Dayton Campus Data Center renovations

In 2008, ITS contracted with IBM to perform a data center assessment at both the Dayton campus and the disaster recovery data center at the Courseview campus. As a result of that assessment, ITS and Facilities Management contracted with Helmig Lienesch and Associates

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to design, engineer and subcontract the installation of the following systems in the Dayton data center:

- A new 30 ton AC unit was installed, replacing an inadequate 15 ton unit, to give the room complete cooling redundancy.
- An automated electrical switch panel was installed to automatically power on and off the AC units in case of hardware failure or power loss.
- All overhead water and sewage lines were removed and/or routed around the server room.
- AC units were moved to two separate electrical panels. If one AC unit malfunctions it can no longer interfere with the operation of the other unit.
- AC units are configured in "Econo-Cool" mode which utilizes Building 13's chilled water system for more than 60% of its cooling.
- Installation of ductwork to distribute cool air evenly throughout the room, eliminating "hot spots."



Figure 3-26. Server Room Pre Renovations with ceiling tiles in place.



Figure 3-27. Server Room with vents for improved airflow and without ceiling tiles.

Qualitative/Quantitative return on Investment: All of the items included in this project were completed to prevent equipment damage and loss of data. Investing time and money into the protection of the server room now could prevent a multimillion dollar loss of equipment and data in the future.

Cost Savings/Cost Avoidance identified with the project: The two 30 ton AC units run in "Econo-cool" mode which utilizes the building's chilled water system. The AC units only use domestic water as needed, reducing the amount of water used drastically.

Target Completion Date: September 2009

Actual Completion Date: January 2010

Disaster Recovery Site Renovations

Information Technology Services has maintained a contract with SunGard, a provider of disaster recovery services, for several years. This contract provided temporary replacement hardware for any systems that are covered under the contract in the event of a disaster. Also, the contract allowed for annual testing of the ability to recover those systems. This type of service is very expensive, but has been used for many years due to the risk of a disaster rendering the college unable to continue to do business.

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During the planning for the Courseview Campus Center, Information Technology Services (ITS) performed an analysis of the cost of building and equipping a disaster recovery facility at the new site. It was determined that the college would achieve payback of the investment to build the facility in the fourth year of operation. In addition to saving money, the new facility will allow added benefits as well. For instance, systems that are meant to provide for disaster recovery may be continuously mirrored images of production systems. Another benefit of using the Courseview site is the ability to use a disaster recovery system as a test system, rather than having to purchase another system.

Due to the importance of the Courseview data center as a Disaster Recovery site, additional redundancy was budgeted for, and built into critical electrical and environmental systems. In 2008, ITS contracted with IBM to perform a data center assessment at both the Dayton and Courseview campuses. As a result of that assessment, ITS and Facilities Management contracted with Helmig Lienesch and Associates to design, engineer and subcontract the installation of the following systems for the Courseview data center:

- A second Power Distribution Unit, a second UPS and a generator dedicated to the data center to provide redundant power;
- A second, redundant air conditioning unit and AC4 panel to automate the failover;
- A fire panel to alert the Dayton Campus of fire and temperature alarms;
- Replacement of the "wet" fire suppression system with a dry, Sapphire system; and
- Enhanced security though the addition of a tartan card reader at the entrance door.

Qualitative/Quantitative return on Investment: By having our own DR site, changes to DR systems and/or services have been more efficient and more easily controlled. In the past with SunGard, a new contract had to be initiated for every change, usually resulting in higher fees being paid to SunGard.

Cost Savings/Cost Avoidance identified with the project: ITS budgeted \$275,000 for this phase of the project, of which \$172,778 was used, for a cost savings of \$102,222.

Target Completion Date: December 2008

Actual Completion Date: July 2009

Server Configuration Management

Information Technology Services worked closely with Web Systems and Database Administration to design and develop a flexible, normalized database to help track and manage IT assets and service availability. The system also includes a web-based graphical interface to allow maintenance of the data.

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The new and improved Server Configuration Management (SCM) database (shown in Figure 3-28) allows ITS to maintain better control over its infrastructure by providing detailed hardware, software, and service availability information. This helps ITS ensure servers and services comply with desired configuration states, improving systems availability, security, and performance.

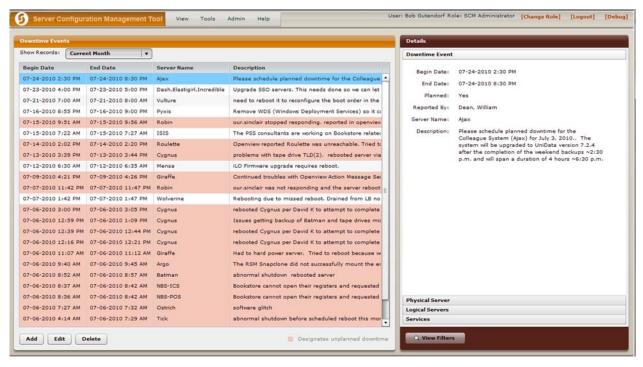


Figure 3-28. SCM Database and User Interface.

Qualitative/Quantitative return on Investment: The software and database was developed in house and did not require any additional software or maintenance costs. Qualitatively fewer personnel resources are used on server inventory and service management as all the data is stored and maintained in a centralized location thus affording substantial long-term savings in personnel costs.

Cost Savings/Cost Avoidance identified with the project: Developing and maintaining a server configuration management database is less costly than a security breach or loss of data due to a server or service mis-configuration.

Target Completion Date: November 2009

Actual Completion Date: January 2010

Alignment to the

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■Improved Wireless Access

Improved wireless access for Sinclair students was made available via the "airweb" wireless network. This is "Web Only" access similar to the type of access when connected to the Internet off-campus. Students are required to login with their Sinclair network username and password to access the Airweb wireless network.

Students now have the same wireless access level and access points as employees using personal devices do on the Sinclair network. The airweb network is a secure wireless network that is available in more locations than the Harborlink public access wireless network.

Airweb access was accessible to students during Fall Quarter 2010 but was not advertised as being available until June 2, 2010 so that ITS staff could use this time period as a pilot test to make sure the Airweb network could handle the load of additional users.

Instructions and additional information about connecting to the Airweb wireless network is available at the following link:

http://www.sinclair.edu/about/offices/its/pub/flyers/stdwrls/airweb.htm

A list of access areas on campus for the Airweb wireless network is found at the following link:

http://www.sinclair.edu/about/offices/its/pub/flyers/stdwrls/fstdsacpts.html

Qualitative/Quantitative return on Investment: Wireless access has become an expectation of students. The quality of the airweb network is significantly higher than the Harborlink network.

Cost Savings/Cost Avoidance identified with the project: There were no costs associated with this project as existing wireless equipment was used in the implementation.

Target Completion Date: June 2010

Actual Completion Date: June 2010

On-line Radiology Program Security Accreditation

The Department of Veterans Affairs (VA) has approximately 2500 radiologic technologists and radiologic technologist (therapeutic) staff. The American Registry of Radiologic Technology (ARRT) requires that to maintain certification, all RTR and RTT must obtain 24 hours of continuous education (CE) annually. To meet this need, Sinclair's Workforce Development &

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Corporate Services Division has, for a number of years, contracted with the VA to provide distance-learning courses that are accredited as CE credits by the ARRT.

Recent changes to the VA contracting procedures have imposed stringent Information Security-related requirements on all VA information systems. Specifically:

"The contractor shall ensure adequate LAN/Internet, data, information, and system security in accordance with VA standard operating procedures and standard contract language, conditions laws, and regulations. The contractor's firewall and web server shall meet or exceed the government minimum requirements for security. Per VA Handbook 6500, contractor access to the VA Intranet using non-VA owned Other Equipment (OE) will be provided via approved VA Virtual Private Network (VPN) access protocols, currently Remote Enterprise Security Compliance Update Environment (RESCUE), which will offer access to a limited set of VA applications and services."

The security requirements of VA Handbook 6500 are extensive, and attempting to implement them for delivery of the distance learning courses offered would likely exceed the monetary value of the contract, and the nature of the material in the courses does not require the level of security mandated. After thorough review of the VA handbook and associated supporting NIST documentation, Sinclair's CISO drafted a justification/RFP response for classifying the ARRT program as a 'minor application' per the IAW NIST guidelines, and the stringent security requirements were waived.

Qualitative/Quantitative return on Investment: Attempting to 'bolt-on' security to the existing course delivery system would have exceeded the value of the contract. Responding to the RFP without addressing the mandatory security concerns would likely have resulted in loss of contract.

Cost Savings/Cost Avoidance identified with the project: Successfully defining the course delivery system as a 'minor application' avoided the need to build a security module in excess of the contract value.

Target Completion Date: June 2010

Actual Completion Date: June 2010

Angel Infrastructure Improvements

Based on current and historical server performance metrics, Angel usage and student enrollment trends, the department of Research, Analytics and Reporting projected that we would reach Angel database performance capacity during Winter Quarter 2010. However, the increase in enrollment projected for Fall Quarter 2009 indicated that this database server should be replaced even sooner. In the Summer of 2009, a much larger database server was purchased and installed, well ahead of the regular 4 year R&R schedule. This server has a four times greater processor and memory capacity than the database server it replaced.

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Several new web front-end servers were also added to the Angel infrastructure. During the Summer of 2009, three new virtual servers were added as part of the Single Sign-On (SSO) upgrade that was performed prior to the start of Fall Quarter. Four virtual Angel front-end web servers were also added. These additions increased the number of SSO servers by 50% and increased the number of Angel front-end servers by 100% for the start of Fall Quarter.

In December, the upgrade from Angel v7.2 to v7.4 necessitated additional Angel front-end servers. During Winter Quarter 2010, six virtual Angel front-end servers were added, and one was retired, bringing the total number of front-end servers from 8 to 13. However, users were still experiencing various issues with Angel during Winter Quarter. Angel Hosting was consulted and recommended increasing the efficiency of each physical and virtual server by creating separate Angel instances on each of the Angel front-end servers. With the help of Web Systems, the number of Angel instances on each server was increased from one to three. This increased the total number of Angel front-end instances available for faculty, staff and students from 13 to 37. One server was left with one instance to serve as a control while continuing to work with Angel Hosting and Angel Tech Support to help resolve problems.

During Winter Quarter, the network switch that the Angel servers, as well as other web servers, are connected to was replaced. In addition, the Angel file server was moved to this switch so network traffic from the Angel web servers would not have to traverse a router to access this file server, thereby improving response times. Replacement of the switch was planned; however, the Angel issues during Winter Quarter accelerated its replacement schedule.

Though our discussions with Angel Hosting, they recommended an application called IIS Trace be installed on the Angel front-end servers to provide an additional tool that could be used to help determine the cause of the issues that were being reported. They also suggested some critical performance metrics that should be monitored to help foresee potential problems. This information was used to program HP OpenView to alert on potential issues and also to resolve problems when these metrics went above target thresholds. In fact, using OpenView and IIS Trace, several "bugs" were detected in the Angel software causing Blackboard, the company that owns Angel, to develop patches that were eventually distributed to all of their customers.

Qualitative/Quantitative return on Investment: The capacity and infrastructure improvements made to the Angel system throughout FY 2009-2010 have resulted in a more reliable, scalable and robust system. In addition, the monitoring tools that were put into place should help in troubleshooting problems quicker while providing data that will help determine when additional resources should be procured.

Cost Savings/Cost Avoidance identified with the project: The addition of the virtual server infrastructure enabled ITS to provision nine additional Angel front-end servers using resources already available, resulting a savings of approximately \$72,000.

Target Completion Date: June 2010

Actual Completion Date: June 2010

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■Citrix Implementation

In FY 2008-2009, Information Technology Services (ITS) had a project called "Off-Campus Access to On-Campus Lab Applications" where technologies to provide remote application access were researched and evaluated. Since Sinclair already had a large resource investment in a Microsoft's application virtualization product called App-V (formerly SoftGrid), the chosen solution had to leverage this investment.

The remote application access solution chosen at that time used App-V to deliver the applications as well as Microsoft Terminal Services and Microsoft's Intelligent Application Gateway (IAG) software running on an appliance from Celestix. Two virtual applications were used for the initial pilot; EMAS Pro, which is used by staff, and SoftMed, which is used by students in the HIM program. The HIM department went live with the system Winter Quarter 2009 and used the system through Fall Quarter 2009.

During the Winter and Spring Quarters of 2009, it became apparent that this system was not as compatible with disparate home systems as we would have liked. Namely, it did not support Macintosh computers nor did it support 64 bit versions of the Windows operating systems. The latter was the biggest concern since an increasing number of commercial PC's were being sold with 64 bit versions of the operating system. Due to this, and the announcement of a new virtual desktop technology from Citrix, Hogan Consulting Group was contracted to conduct a proof of concept (POC) evaluation of the Citrix Virtual Desktop solution in the summer of 2009. The POC was successful and this solution was piloted with a subset of the HIM distance learning students during Fall Quarter 2009. The Citrix XenDesktop solution (shown in Figure 3-29) went live Winter Quarter 2010.

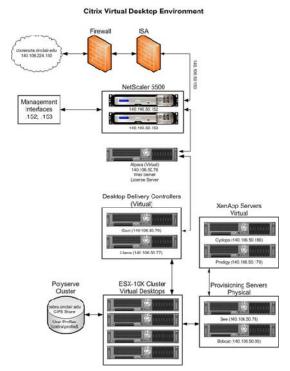


Figure 3-29. Citrix Virtual Desktop Environment.

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This solution is much more compatible with the various types of systems that students could use. It supports both 32 and 64 bit versions of the Windows operating system as well as Macintosh and Linux operating systems. You can even use an iPhone to access the system, although the small screen size on the iPhone makes usage difficult. The iPad, which runs the iPhone operating system, works much better due to its larger screen size. Faculty, staff and students log into ctxremote.sinclair.edu and are presented with an icon (shown in Figure 3-30) to launch a virtual desktop that resides on servers in the data center. Once logged into this virtual desktop, App-V automatically delivers the applications the users are authorized to receive. This provided the user the same desktop experience as actually sitting in a classroom, except that the student may be sitting at home or another remote location.

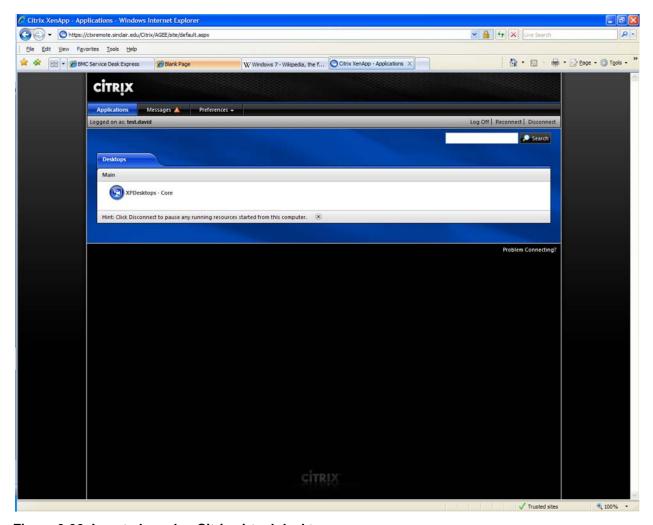


Figure 3-30. Icon to launch a Citrix virtual desktop.

Qualitative/Quantitative return on Investment: This virtual desktop technology dramatically expands the options available for distance learning classes. Distance learning classes can now be held without regard to what applications the class would require. By using a virtual desktop provided by Citrix, and virtual applications provided by App-V, faculty, staff and students can access the same managed desktop environment from home as they can from the classroom.

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Cost Savings/Cost Avoidance identified with the project: By using our existing virtual infrastructure, ITS did not have to purchase three servers for this project, or the servers to host the virtual desktops, saving over \$24,000 dollars.

Target Completion Date: December 2009

Actual Completion Date: December 2009

■ Server Virtualization

In FY 2007-2008, Information Technology Services (ITS) had a project to implement a VMware based virtual server infrastructure. At the completion of this project, ITS had installed/configured five physical servers in a virtual cluster that would be later used to host virtual servers. In FY 2008-2009, additional physical servers were added to this original cluster to provide more computing resources and a second, web cluster, was installed to host web servers, primarily Angel web servers. At the end of FY 2008-2009, there were seven physical servers in the initial NOC-Dayton-Cluster and three physical servers in the NOC-Dayton-Web-Cluster. In FY 2009-2010, one additional physical server was added to the NOC-Dayton-Cluster and two physical servers were added to the NOC-Dayton-Web-Cluster, bringing the total to eight and five, respectively. These physical servers host a total of 72 virtual servers and 20 virtual desktops.

The two servers that were added to the web cluster were newer generations of servers, which had different processors. Therefore, the three original servers, as well as the two new servers, had to be reconfigured to provide Enhanced VMotion Compatibility (EVC) processor support. After this was completed, all five physical servers were able to participate as part of the web cluster.

In May 2009, VMware released a new version of its virtualization software called vSphere 4. Later that year, we became aware that VMware was ending support on version ESX 3.5, which we were running in our virtual infrastructure. The planning process to upgrade Sinclair's virtual infrastructure to vSphere 4 began in January 2010. The plan called for a three phase upgrade process, all scheduled to be completed in May 2010. All physical servers and virtual servers were upgraded to vSphere 4 on schedule.

Qualitative/Quantitative return on Investment: Sinclair's investment in a virtual server infrastructure improves availability of servers, decreases the resources necessary to provision a server, and creates opportunities to save costs related to power and air conditioning usage. The upgrade of the VMware software allows Sinclair to continue to receive support and software updates making the system more reliable and secure.

Cost Savings/Cost Avoidance identified with the project: Fifteen virtual servers were created in FY 2009-2010. If a virtual infrastructure had not been in place, adding 15 physical servers would have cost Sinclair approximately \$120,000.

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Target Completion Date: June 2010

Actual Completion Date: May 2010

■ ShoreTel VPN Phones

The college's need to provide connectivity to the campus phone system from remote locations was identified for both operational flexibility as well as disaster recovery capabilities. The solution that was installed is the Shoretel VPN phone with the VPN LAN Concentrator. The ShoreTel VPN Concentrator securely connects remote IP phones to the rest of the system, enabling Sinclair staff to implement a very secure and flexible remote work policy. Remote users simply connect a ShoreTel VPN phone to a broadband router, and with minimal configuration establish a secure tunnel to the ShoreTel VPN Concentrator. Once connected, their phone acts as thought it was located in the office.

The first use of the new VPN phone was implemented so that Help Desk staff could work from home during a campus closing such as during a weather emergency, Help Desk personnel at home can easily connect to the phone system and begin to take calls from Sinclair staff, students, and faculty. This application was used several times this past winter during weather emergencies, and it worked well.

This application could also work for other remote situations in the event of a disaster, partial closure of the campus, or to support off-shift work arrangements.

Qualitative/Quantitative return on Investment: The ability to provide phone service to perform college functions without requiring employees to be on campus provides flexibility to address a number of business issues.

Cost savings/Cost avoidance anticipated for the project: This allows personnel to work from home, stay safe during harsh weather, and still ensure business calls to be answered by live personnel. It promotes better utilization of the staff's time in the event of weather difficulties, and it will reduce unnecessary overtime during this condition.

Target Completion Date: March 2010

Actual Completion Date: March 2010

■ShoreTel at MVRP

After completion of the new phone system on the Dayton campus in December 2008, it was determined that a replacement of the system at the Miami Valley Research Park was needed as well. After determining that there was a strong business need to have direct dialing to the

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extensions, it was determined that the connectivity to the Dayton campus (shown in Figure 3-31) would have to be increased as well. With the installation of another ShoreTel system connected to the Dayton Campus, the new system could have the direct dialing capability as does the Dayton Campus, and be connected for easier administration of the phone system as well as intra-campus calling features.



Figure 3-31. The ShoreTel ShoreGear 90V switch used at MVRP.

With the new system, MVRP has become another part of the larger campus system, including HHLC, ELC, CVCC, and PCLC. All common system features are transparent giving users the ability to easily transfer calls and conference calls between all locations. At the same time, the connectivity to the Dayton campus was increased to include two T-1's for voice and data connectivity.

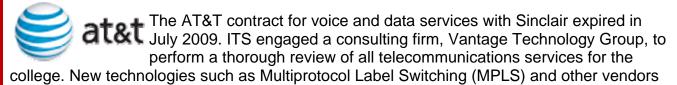
Qualitative/Quantitative return on Investment: With the completion of this installation all Sinclair staff has access to the same phone system and have the ability to make 4-digit calls between sites.

Cost savings/Cost avoidance anticipated for the project: The number of external phone lines was reduced, and one additional T-1 was added for a net monthly increase of \$40. This change gave MVRP much needed bandwidth as compared to the previous phone lines, which were not utilized effectively.

Target Completion Date: August 2009

Actual Completion Date: August 2009

■AT&T Voice and Data Contract



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were reviewed as options for Sinclair. After much discussion and examination of the services, it was determined that Sinclair should stay with the present services but have a logical path to upgrade the network to MPLS in the future as it becomes more economical.

Qualitative/Quantitative return on Investment: The College maintained the same level of services, but renegotiation secured a new 3-year contract.

Cost savings/Cost avoidance anticipated for the project: The new contract resulted in an annual savings of over \$10,000.

Target Completion Date: July 2009

Actual Completion Date: September 2009

■ Project Lead the Way

The purpose of this project was to improve on processes currently in place to support Project Lead the Way (PLTW). PLTW is a national program that uses Sinclair's engineering faculty to train high school faculty from Ohio and from other states on how to use engineering applications. PLTW has two 2-week sessions each summer. Each session has between 6 – 8 different classes that teach multiple engineering applications to over 100 faculty.

The previous processes required the participating high school faculty to bring in their own laptops on the first day of training. These laptops had to meet certain criteria for applications to install and for access to the Sinclair network. The laptops would be given to the technicians to install software, but many times the software could not be installed due to a number of issues. ITS changed the process to make use of the desktop computers in Sinclair's classrooms rather than using laptops provided by the participants. The participants now have access to the necessary software beginning on the first day of their session. They also install the software on their laptops so that they are familiar with the process, but it doesn't hold up their training. ITS has staff available to help with checking the configuration of the laptops to ensure the specifications to install the software are met and to assist with any install issues. To enhance the productivity for the faculty even more, PLTW made software available to faculty for download prior to coming to the Sinclair campus.

Qualitative/Quantitative return on Investment: The quality of the training is greatly enhanced due to the stability and standardization that college-owned computers provide.

Cost Savings/Cost Avoidance identified with the project: The cost savings is attributed to the reduced amount of time that ITS staff are required to install software and troubleshoot issues with participants' laptops. The first day of the session there are between 5 and 8 technicians dedicated to installing software on the laptops. ITS has reduced the number of hours that the technicians are needed to install software on the first day from 8 hours to 5 hours.

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Target Completion Date: June 2010

Actual Completion Date: May 2010

Help Desk Knowledgebase

The purpose of this project was to implement a Knowledgebase for Sinclair Community College providing faculty, staff, students and potential students the instrument for retrieval of knowledge online.

ITS worked with Marketing, Web Systems, Registration, Call Center, and other college staff to pick a knowledge base product, create initial content, and publish the content online. The team decided on a product called Absolute.

The Absolute Knowledge Base (KB) is searchable by keyword and includes many important topics of interest for current users and for potential students. In addition, it includes an FAQ feature (shown in Figure 3-32) in which users can search for answers to questions, and if they do not find the answer they are looking for, they can submit the question to the KB. The question is answered by the appropriate college staff member, and the answer can be added to the KB. The KB can also be browsed by topic and can be accessed through an RSS feed.

The KB is found at the following link: http://faqs.sinclair.edu/

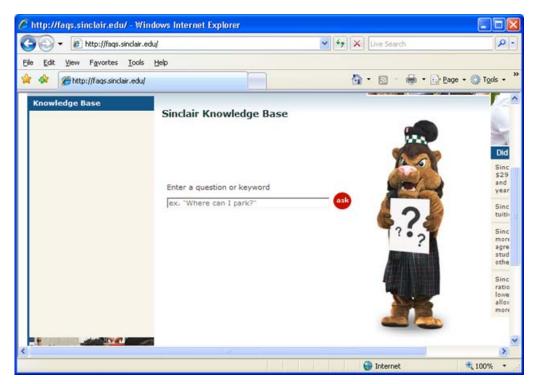


Figure 3-32. The Knowledge Base question entry screen.

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Qualitative/Quantitative return on Investment: Improved service and reduced costs are realized through the implementation of this technology.

Cost Savings/Cost Avoidance identified with the project: The use of an on-line Knowledge Base reduces costs by allowing current users and potential students' retrieval of knowledge via self-service rather than requiring the use of college personnel time.

Target Completion Date: December 2009

Actual Completion Date: September 2009

■Pharos Signup

The goal of this project was to implement a system that provides for the fair and equitable distribution of computer resources with as little assistance from staff as possible. The Pharos Signup application (shown in Figure 3-33) is a PC waiting list management system that assigns PCs in the order that reservations are made and limits the time that a machine can be used. Pharos was purchased to improve services that were being provided by the previous Library waiting list application, CybraryN. Pharos was implemented in the Sinclair Library, and later in the Teleport in Building 13 and the CIL open lab in Building 14.

Pharos eliminates manual sign-up sheets and waiting at the front desk for available PCs. Pharos is a self service system that allows customers to use the computers on a first come first serve basis. Pharos also allows ITS to identify and separate the specialized computer stations into queues for general availability, ADA stations, or other special purposes.

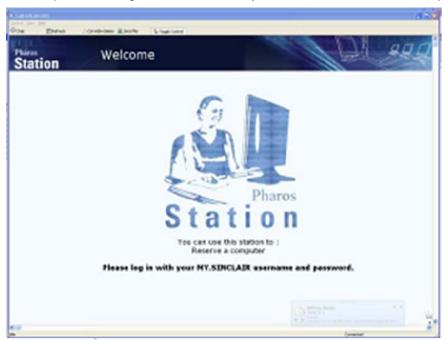


Figure 3-33. The Pharos reservation screen awaiting a student's login.

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Qualitative/Quantitative return on Investment: Less intervention from staff is required to help students find an open computer. The replacement of the CybraryN product has provided a much more stable environment.

Cost Savings/Cost Avoidance identified with the project: The Pharos software has allowed the reduction of 20 part-time staff hours per week.

Target Completion Date: September 2009

Actual Completion Date: September 2009

■Cable TV System Repairs

In keeping with Sinclair's strategic initiative to maintain and develop the downtown campus, picture quality and other cable television distribution system maintenance issues have been under investigation and repair for the past several years.

The first steps towards a solution were taken during the FY 2008-2009 Fiber optic cable project. This project properly fused the fiber in the distribution closets increasing signal strength throughout campus. In FY 2009-2010 an assessment of the signal-generating and distribution equipment was performed by an external contractor. The result of this assessment was a recommendation to immediately replace many failed or failing components within the cable television head-end. The replacement recommendations totaled over \$50,000 worth of new equipment.

Before acting on the external recommendations, ITS performed an evaluation of the equipment specified in the report and determined repairs could be made in-house to save the component replacement costs. In-house repairs to the equipment were achieved at no additional cost, which greatly improved the signal quality throughout campus and also the stability of the system as a whole.

Qualitative/Quantitative return on Investment: Repairing specified equipment in-house provided a low-cost option to keep the equipment functional and services running while determining next steps for the aging, legacy technology.

Cost Savings/Cost Avoidance identified with the project: Cost savings was nearly \$50,000 since all repairs were performed in-house and no new components were purchased to achieve the goal of maintaining a working system.

Target Completion Date: June 2010

Actual Completion Date: April 2010

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■ Multimedia Equipment Inventory

Prior to centralizing Multimedia Services in FY 2006-2007, most multimedia presentation equipment was department-purchased, owned, and maintained. For this reason, much of the information about multimedia equipment on campus was not maintained in a central location. Because of the lack of central knowledge of the equipment, no plan for maintenance or replacement had been created.

This project was created to identify and create a plan to maintain all multimedia presentation equipment at all Sinclair sites.

During FY 2009-2010, physical inventories were taken at all Sinclair sites. During these inventories, detailed information was gathered about all Sinclair multimedia presentation equipment. A database was created and used to track and analyze the information gathered. And as a final step, a replacement and renewal schedule was created for the \$6,000,000 worth of Multimedia Presentation equipment identified during this project.

Qualitative/Quantitative return on Investment: Central knowledge of the multimedia presentation equipment on campus allows ITS to standardize the equipment, making it more user-friendly, and also allows for planned maintenance and replacement of the equipment prior to the time when it fails and causes classroom downtime.

Cost Savings/Cost Avoidance identified with the project: Standardizing multimedia equipment reduces costs associated with repair, maintenance, and lamp replacement and increases the effectiveness of the technicians working on the equipment.

Target Completion Date: December 2009

Actual Completion Date: December 2009

Library

Following are the Major Accomplishments for FY 2009-2010 for the Library:

- Library Support for Distance Learning
- Information Collaboratory—Teamwork Studio
- Improved PC Reservation System for the Library

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■ Library Support for Distance Learning

The Library offers Sinclair students and faculty over 150 database products, which identify scholarly and scientific literature and media that support the curriculum and complement textbooks and related course materials. Many of these products (a few of which are shown in Figure 3-34) include full-text, digitized content that can be read, viewed, or listened to from any computer with access to the Internet. The Library presents these research databases and digital content through the college web site and, in cooperation with the faculty, through the Angel Course Management System.



Figure 3-34. Library electronic resources.

To make effective use of these resources, students must be able to select the appropriate resource and then use it correctly. This is particularly challenging in today's world where Google, Yahoo, Facebook, and similar Internet companies offer easy access to so much information. How do students know when to use one resource rather than another? When is Google good enough, and when does a library research database offer significantly better information? Making good choices is an outcome of information literacy, a general education competency at Sinclair. The Library's role in information literacy is to make information available, and then help students put the lessons they learn from their classes into practice by choosing and using information effectively.

On a daily basis, Library staff provide instruction to classes and reference assistance to on-campus individuals to help them make these choices and succeed with information. However, as the college offers more distance learning classes, the Library must develop new methods to deliver effective reference and instructional support to these students who may never set foot on the campus.

This project's goal was to help improve the visibility of Library databases to distance learning students, a marketing function, and then provide assistance in using resources effectively, a library instruction function that supports information literacy. Every distance learning student must have access to real help: online guides, tutorials, webcasts, interactive chat, blogs, and telephone support. Some level of support must be available 24x7 to every Sinclair student.

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Qualitative/Quantitative Return on Investment: Sinclair realizes its best return on its Library resource investment when its databases and digital content are used routinely and effectively. Data on page and session counts, searches, and downloads can be studied for cost analysis.

Target Completion Date: June 2010

Basic help files should be available for library research databases for Fall Quarter 2009. The Library web site should be revised to incorporate basic help for distance learning support for Fall 2010 and undergo a quarterly revision for Winter and Spring 2010 to improve integration. Help files, tutorials, and the like should be available to Sinclair faculty for their Angel shells for Winter and Spring 2010.

Actual Completion Date: June 2010

Completed on schedule: updated 24x7 chat reference support, Facebook-based announcements, Angel course management support, faculty training sessions in the integration of library resources in Angel were all provided on time and on schedule. The Library also added a professional Librarian to the staff during the year with experience and skills in working with digital resources and services. This librarian will be the Library's liaison with the distance learning division for the coming years. The revision of the Library web site will be carried over to next year.

■Information Collaboratory - Teamwork Studio

The Information Collaboratory or Library-IT Teamwork Studio (depicted in Figure 3-35) will be a flexible technology rich space within the Library that is designed to support students working in groups or small classes seeking a temporary flexible computer space. When not needed for group learning activities, the Collaboratory can be used by individuals, effectively adding up to 20 additional computers to the Library commons, which is often at full capacity. By creating a flexible space that can be used for classes, small groups, or individuals, the college realizes maximum us of the space and return on investment.

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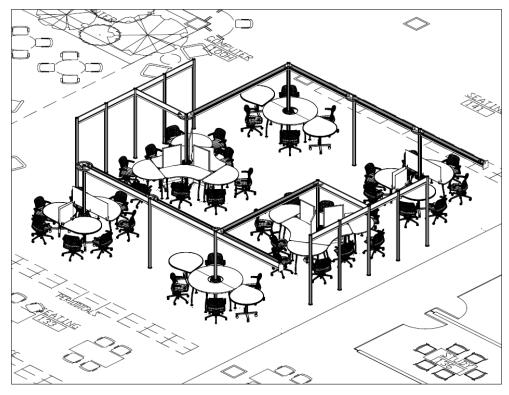


Figure 3-35. Architect's rendering of possible Collaborative Space.

The Collaboratory design will use post and beam construction to carry power and data to computers and media equipment, becoming, in effect, a virtual room within the larger Library space. The proposed design can seat up to 40 people at 20 computer stations. Groups can form and arrange furniture for their projects and even have access to projection equipment that supports presentation and communication skills. It fits with the Library's architectural program of offering students unique zones and destinations. Its furniture and flexible layout will carry the feel of a high-tech commercial space, offering a unique place on campus for student directed group activities that require access to computers and Internet resources.

Estimated Cost of Project: \$135,000 for furniture, computers, classroom media hardware, network and data cabling.

Cost Savings/Cost Avoidance Anticipated for the Project: This project takes Library space that has been devoted to book and magazine shelves – essentially a storage function – and turns it into a high tech learning space that will be used by many more students on a daily basis. It integrates well with the other computers in the Library, which will allow existing IT staff to provide lab support without having to add staff to support a new, separate area.

Target Completion Date: June 2010

Actual Completion Date: Due to constraints on the Capital Budget, this project was postponed until FY 2010-2011.

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■Improved PC Reservation System for the Library

On any given day, the Library may have hundreds of students use computers to work on projects, write papers, conduct research, connect to their course web sites, or search the Internet. Often demand for computers exceeds supply, especially during the day, from 9:00 am to 6:00 pm. In the past, this high demand has led to student frustration, competition for computers, and occasional behavioral problems. To address this issue, the Library in collaboration with the ITS Department implemented a reservation system using a product called Cybrary. The goal of the project was to provide Sinclair Library students and visitors with fair and timely access to computers and give staff the tools to manage computer access.



Figure 3-36. Students sign in to use a computer.

The College's experience with Cybrary has been mixed. As a proof of concept, Cybrary demonstrated that a reservation system improved the student experience. However, Cybrary has not integrated as promised with the large and complex campus network infrastructure found at Sinclair. As a result, staff have spent significant time troubleshooting performance, installing and uninstalling clients, and assisting students when there are problems.

The goal of this project was to identify and implement an improved reservation system for the Library; one that can integrate smoothly with the campus network, function reliably, require less staff intervention, and still give students the positive benefits of access to computers in a fair and timely manner.

Estimated Cost of Project: Based on initial reviews of various other products on the market, the cost of a comprehensive software package costs approximately \$5,000 to \$10,000 depending upon the number of licenses purchased for individual computers. Staff time to implement the new system would represent an additional cost and be dependent on the system selected.

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Cost Savings / Cost Avoidance Anticipated for the Project: The current system has proven to be very staff intensive to maintain and support. ITS personnel have spent hours troubleshooting problems and clearing stalled processes. Certain updates and changes require staff to touch every computer (142) currently on the system to turn on or turn off the client software or install updates. Products on the market today offer reliable service on large, complex networks and allow many routine functions to be performed remotely by a single tech.

Qualitative / Quantitative Return on Investment: The new Library system recorded 179,000 sessions between September 2009 and June 30, 2010. Accurate data about the number, duration, dates, and distribution of these sessions allowed for the efficient assignment of support staff. In addition, support staff were able to more effectively use their time because the new sign in system did not require a staff intervention at each client station whenever an image change was needed. Also, it became possible to make more effective use of Room 7L03 as a training room and an extension of the Teleport because the supervisor could reserve the room from a remote console rather than having to have staff turn client software on and off at each computer. Thus, this new PC reservation system improved staff productivity significantly.

Target Completion Date: September 2009

Actual Completion Date: September 2009

Major Projects for FY 2010-2011

Major Projects for FY 2010-2011

A variety of innovative projects are planned for FY 2010-2011 in concert with the Strategic Values establish by the Sinclair Board of Trustees. The projects are grouped by three departments within Information Services and presented in a priority sequences requested by the President's Cabinet. Please note that the plan is to complete all defined projects during FY 2010-2011 barring any unforeseen circumstances. Also note that priorities may need to be adjusted based on the availability of required personnel and/or the identification of critical unplanned projects.

Research, Analytics & Systems Development

Following are the Major Projects for FY 2010-2011 for Research, Analytics & Systems Development:

- Support Quarters-to-Semesters Conversion
- Rollout and Enhance My Academic Plan (MAP)
- Support Four Square Planning Process (Performance Scorecard)
- Enhance Colleague Performance
- Enhance Planning for Disaster Recovery
- Use Predictive Modeling to Support Decision Making
- Support Bookstore Processes
- Implementation of Selected Mobile Applications
- Continue Data Quality Validation and Collection (DQVC) Initiative
- Conduct Feasibility Study and Warranted Implementation of Automated Support for Tech Prep Office
- Feasibility Study and Warranted Implementation of Payment Gateway
- Support Processes of Marketing Department
- Support Processes of Student and Academic Support Services Department
- Conduct Feasibility Study for Replacement of Sinclair's Content Management System
- Implement First Phase of New Schedule Development System

■ Support Quarters-to-Semesters Conversion

Administrative Service's support of Sinclair's movement from quarters-to-semesters is one of the highest priority projects for FY 2010-2011. There is a significant change effort required in the Colleague Student System. These changes encompass the Financial Aid, Bursar's, Registration & Student Records, Information Technology Services and Research, Analytics and Systems Development staff and resources. Much of the change in these areas involves setup and configuration of a semester-based year for both Financial Aid and Registration and Student Records. Specific activities include input of courses/programs developed by the

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curriculum staff, Colleague custom program changes to support the semester system, hardware considerations, and input from vendor consultants as necessary. Some of the specific activities of this effort are described below:

- Prior to FY 2010-2011, Administrative Systems evaluated Sinclair-developed programming code that needed to be changed to support the quarters-to-semesters transition. Approximately 1,200 items were identified as needing changes. During the preceding year, these 1,200 items were closely evaluated, and 400 items were identified as being either obsolete or unused. These items have been retired. During FY 2010-2011, Administrative Systems will continue this close evaluation with the goal of transitioning a significant number of the remaining 800 items to a semester configuration.
- The quarters-to-semesters change of curriculum is at the core of a successful transition. Not only are faculty faced with the monumental task of redistributing course content into differing delivery units, but the relationships concerning prerequisites, co-requisites and course sequencing must be recalculated for every changed course. These recalculations need to be tested and, as errors are discovered, changes must be made. Unfortunately, the College ERP system is not designed to accommodate rapid and extensive changes without investing in a very labor-intensive process. Consequently, this project component calls for developing a system that will allow for rapid de-construction and rebuild of Colleague's course structure without engaging in extensive manual intervention. The project will use features of the Colleague new-client import process, ELF, to emulate the creation of a course structure when a client first converts to Colleague software. Using the ELF tool, the semester course structure will be built, destroyed, and rebuilt within a test environment until all of the course relationships are correct.
- In previous years, Web Systems supported quarters-to-semesters by making modifications to the Curriculum Management Tool (CMT). CMT is a centralized workflow process that has been in use at Sinclair for several years. It allows curricula to be developed within a common framework, and it enforces development rules that are designed to lead to quality curricular outcomes. In the quarters-to-semesters environment, some of these development rules needed to be temporarily suspended in order to accommodate the unique situation when massive amounts of curricular data are imported into CMT at one time. For example, under normal operation, CMT would not allow a course to be entered into the curriculum unless required prerequisites and co-requisites were already in the system. With quarters-to-semesters, however, it is not always possible to enforce this rule when hundreds of courses are being bulk-loaded into the system at one time. Web Systems will continue to make changes to CMT to accommodate the unique situation of building the completely new curricular structure required by semesters.

The status of this project and its various sub-projects is provided at the website shown in Figure 4-1.

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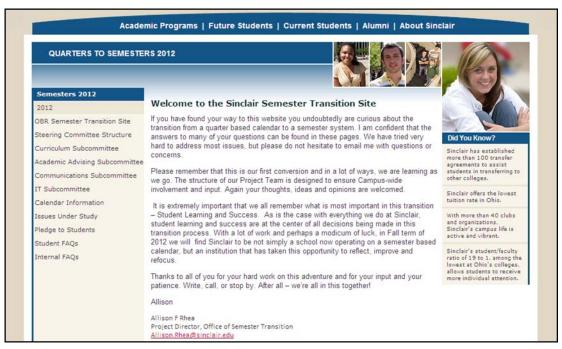


Figure 4-1.: Website supporting the quarters-to-semesters transition.

Estimated Cost of Project: At least 75% of staff time within Administrative Systems will be allocated for efforts related to the transition to semesters. In addition, CMT development staff will spend at least 25% of time supporting this effort. Total personnel costs supporting the transition will exceed \$500,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The transition is a mandated change led by the Chancellor of OBOR. All public institutions within Ohio are making this change. If Sinclair is to serve its students with articulated courses to other Ohio institutions, this change must be made.

Target Completion Date: June 2011

Current Status: This project is a continuation of efforts that have been underway for several years. The transition to semesters is scheduled for fall 2012, so this project will continue to be represented in the strategic objectives through that time period.

Rollout and Enhance My Academic Plan (MAP)

Research consistently supports the notion that when presented with too many course options, students do an inadequate job of staying on target for degree completion. Likewise, even when students have the intention to stay on plan, they will quite often make incorrect course selections when they self-advise. In either case, students find themselves accumulating academic credit, but taken together, these credits do not result in a completed degree. Not surprisingly, students in this situation are at greater risk of dropping out, and even if they

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persist, they find themselves with greater levels of college debt and fewer credits articulating with programs at baccalaureate institutions.

This project calls for moving into production a set of software applications that will allow academic advisors to extend their advice to students who fall into the above categories. Specifically, the project will result in software that links the degree planning activity with the course selection activity and ultimately with the course registration activity. With this system in place, it is expected students will have less opportunity to stray from their academic plans, and consequently will be more successful in reaching their degree completion goals.

During the prior year, Web Systems made significant progress in piecing together several software components for the purpose of developing a prescriptive degree completion application. The application is made up of three components. When combined, the software is referred to as My Academic Plan (MAP), as shown in Figure 4-2. The first component consists of a degree planning application that advisors use to structure a student's complete academic program, both for the current quarter, and for all future quarters. Since degree seeking students are required to meet with an advisor upon declaration of degree intention, it is expected that the plan can be initially developed even for those students likely to self-advise as they move through their programs.

The second component of the MAP focuses upon each student's course selection activity. In this component, the existing course selection application is linked to the degree plan to provide a system where students are guided through course selection in sync with the degree courses needed to stay on track. The software alerts both the advisor and the student when the student makes an off-plan selection. This alert allows advisors to proactively intervene before the student is well down the road of an incorrect selection. It should be noted that the application will not prevent students from making off-plan selections; it will just make sure they, and the academic advisor, are aware such a selection has been made.

In addition to the prescriptive features listed above, the second component also includes added value that expedites the student's completion of the registration activity. The first of these features exchanges course selections made in the course planner with the shopping cart feature in the Colleague ERP. The second feature links required book information available in the bookstore's point-of-sale system with the course information in the course selection application. This latter feature allows students to finalize their book purchases immediately upon selection of their courses.

The third and final component of the MAP software links the course selection step to the registration step. This tight linkage reduces the likelihood that a student will self-select courses at the registration stage. MAP will transfer course selection information directly into the ERP's shopping cart feature and will provide an automatic link upon exit from course selection directly into the Colleague ERP registration module. Once within the registration module, the shopping cart feature is easily accessible and represents the least complicated method for students to finalize course registration. Because of this ease-of-use characteristic, it is expected that the majority of students will select this registration option and thus, will stay on the degree completion plan presented in the course selection step.

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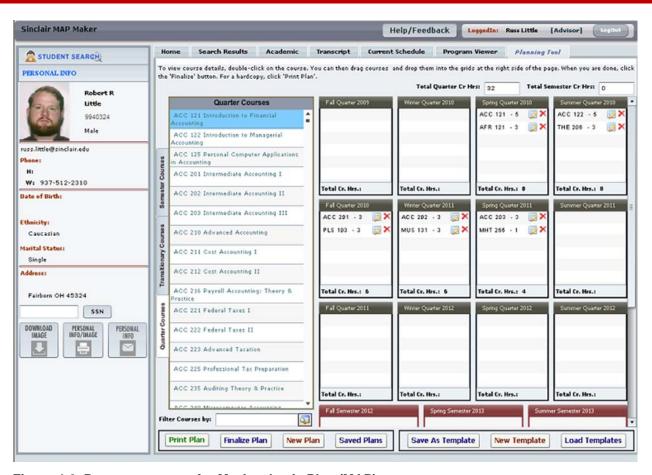


Figure 4-2. Prototype screen for My Academic Plan (MAP).

Estimated Cost of Project: It is expected that the rollout and enhancements to the MAP software will require approximately one full-time-equated developer's time. With fringe benefits included, the cost of the development time should be approximately \$80,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Degree/credential completion is at the forefront of almost every current metric used to evaluate community college success. In the University System of Ohio's master plan for higher education, degree/certificate completion is one of the basic twenty core measures to judge institutional effectiveness. The MAP software is squarely targeted at the goal of increasing each student's degree completion; therefore, it is directly linked to Sinclair's overall success as measured by OBOR.

Target Completion Date: June 2011

■ Support Four Square Planning Process (Performance Scorecard)

During FY 2009-2010, Research, Analytic, and Reporting (RAR) undertook evaluating its operation with the intent to better align its services and activities with the needs of college units. The general finding from this effort showed an increased need for RAR to engage in efforts that

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supported the strategic initiatives of the college. One specific area for this shift was in the research and information support for the Board of Trustees' four square planning initiative. This initiative is an attempt to consolidate and aggregate multiple information sources currently reported as discreet units into four general information streams that the Board can use to quickly and accurately assess the college's overall effectiveness.

Another area ripe for redirection was the degree of focus that RAR placed upon measuring input and process variables to the detriment of measuring output variables. In simple terms, RAR had become very good at describing the characteristics of those who used college services and was equally proficient at describing how those services were implemented (e.g., number of users, time on task, etc.). Where RAR was not reaching the mark was in the area of measuring whether or not college services had an impact on a student's future success.

This project is intended to continue current efforts designed to redirect RAR's focus. A special supplemental appropriation is included in the FY 2010-2011 operating budget to allow for collection and analysis of outcomes data. This new effort, combined with a comprehensive revamping of current data collection practices, will place RAR in a much improved position to support Sinclair's strategic initiatives. It is expected that the project will result in the creation of a performance scorecard (similar to the one shown in Figure 4-3) that gives a visual performance representation for the Board's four strategic planning categories.



Figure 4-3. An example of a performance scorecard currently in use by Sinclair's Registrar.

Estimated Cost of Project: Realignment of RAR's data collection and analysis processes will require substantial effort from three full time staff, in the range of 70% of their time. In addition, the special appropriation for this effort was \$50,000. Together, the project cost will be approximately \$220,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Measurement of students' goal attainment is one of the most difficult assessment challenges facing community colleges. Most nationally known metrics (such as IPEDS first-time, degree-seeking cohort) have been shown to be a poor substitute for the diverse range of hopes and aspirations motivating community college enrollment. Yet, measurement of goal attainment is central to evaluating institutional success. This project is designed to improve Sinclair's ability to measure attainment and will thereby enhance the college's ability to manage a critical component of its core mission.

Target Completion Date: May 2011

■ Enhance Colleague Performance

The Colleague ERP system, which is used to process all of the College's business transactions, will require substantial changes in order to accommodate the planned college and vendor modifications. Some of the specific activities for this project are described below:

- Conversion to semesters will require that the Colleague financial aid system be modified to accept a five-quarter-long financial aid year for the year in which the quarters-to-semesters transition is made. The financial aid office wished to change from a summer-term-leading year to a summer-term-trailing year. This change will align maximum financial aid awards with the academic terms in which students are most likely to incur maximum expenses. This change, however, is not insignificant and will require extensive analysis of, and changes to, programs and processes.
- Semester conversion will also necessitate a comprehensive archiving of students' accounts receivable (AR) records. As designed, the Colleague system creates at least one AR transaction for every course registration/cancellation action by the student. The Colleague system is designed to hold all AR records generated for a student, regardless of the number of years that a student is associated with the college. Over time, the number of records per student can become quite large, and system performance for that student degrades. This activity is designed to consolidate AR records in order to improve system response time during the heavy processing load generated when both semester and quarter systems are running in the production environment.
- The Colleague vendor has announced that they are changing the design of the interface used to access the Colleague system. The vendor will be discontinuing a client-based interface (as shown in Figure 4-4) and will be requiring that all access be made via the web. Unfortunately, this required change is taking place simultaneously with the quarters-to-semesters change. Consequently, the web-based interface will need to be evaluated to assure that this change does not adversely impact the quarters-to-semesters project.

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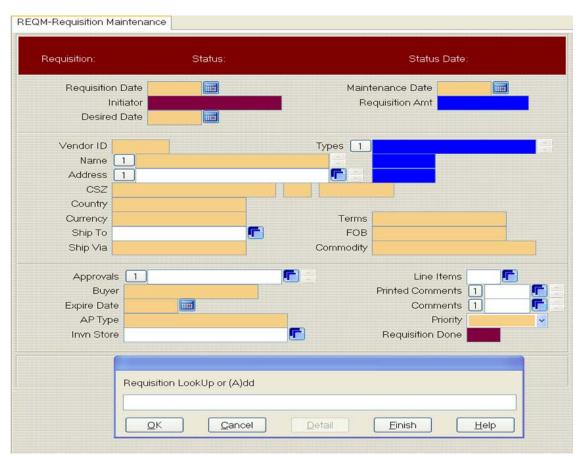


Figure 4-4. An example of the interface used to access Colleague.

• During the prior year, an online leave request process was incorporated into Sinclair's Forms Central software product. This process allows college employees to initiate, and supervisors to approve, leave requests online. This project is an enhancement to the online process and calls for an automatic load of approved leave requests into the Colleague ERP system. As currently envisioned, the enhanced product would give Human Resources (HR) a pre-commit report generated from the online request system indicating the current leave balances for requesting employees, with the requested leave amounts included. HR would have an online means to override the processing of a particular individual's request. Once HR has approved the pre-commit amounts, the transaction would be automatically imported into the Colleague system and officially recorded on the employee's leave record.

Estimated Cost of Project: Much of the staff time described in this activity is associated with the quarters-to-semesters project listed earlier in this plan and the costs for those activities have been represented there. The automatic import to Colleague is independent of the transition project and is projected to take about one person month of effort. That effort represents about a \$5,000 cost.

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Cost Savings/Cost Avoidance Anticipated for the Project: One person in the HR office currently spends the majority of her time maintaining employee leave records. This enhancement is expected to free up approximately 20% of her time which represents an annual savings of approximately \$12,000.

Target Completion Date: November 2010

■ Enhance Planning for Disaster Recovery

There is a need within Research, Analytics and Systems Development (RASD) to re-evaluate and to consolidate planning concerning disaster recovery for this unit. Several factors are contributing to this need. Within the last few years, the college has moved from a hardware disaster recovery plan, that was based upon services provided by a third-party vendor, to a plan that is based upon the college owning a second complement of hardware located at a remote site – the Courseview Campus Center. In addition, the rapid growth of the data warehouse and the corresponding dependence that several offices place upon information stored in the warehouse has significantly increased the need for planning a disaster response for loss of this data.

This project will consist of several parts. The first action will be to conduct a comprehensive review of RASD supported and supplied systems with respect to their inclusion in existing disaster recovery plans. A second action will be to identify the minimum levels of service required, and for what duration, for each critical service if a disaster were to occur. This analysis will give special attention to the dependencies that exist between services and the consequent complementary services that would need to function during a disaster period. And finally, the activity will include realistic testing of disaster preparedness by simulating a set of disaster scenarios.

Estimated Cost of Project: The activities will be spread among a large number of individuals, but when aggregated, total activity will amount to approximately six person months of effort. This equates to about \$30,000 in total personnel costs to complete this project.

Cost Savings/Cost Avoidance Anticipated for the Project: Successful disaster recovery planning can mean the difference between business continuity and business termination. In addition, realistic planning can only be accomplished when scaled to an anticipated level of disaster. If that level is significantly exceeded, business termination will occur regardless of the investment in disaster planning. This project will plan for restoration of minimum service levels required for short term recovery until a fully functional operational state can be reached, and it will be premised on the assumption that an experienced disaster will be localized to only one of the two existing hardware sites.

Target Completion Date: March 2011

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■Use Predictive Modeling to Support Decision Making

With the acquisition of SAS analytic software and the development of staff expertise in making full use of the software's comprehensive range of analytic tools, the Research, Analytics and Reporting (RAR) department is very well positioned to employ these tools to improve the college's bottom line. During FY 2010-2011, RAR will be applying the tools in areas such as the following:

- RAR will be working to integrate new wage and employment data into existing stores and models. Specifically, RAR will calculate the economic value of completing various degrees at Sinclair Community College with an emphasis on returns, costs, and benefits. Moreover, the ability to calculate returns on degree acquisition will allow Sinclair to map and monitor the employment/wage trends of its graduates.
- RAR will be able to refine its current capability of leveraging SAS to mine the text data from Twitter, Facebook, and other social media to better understand our marketing potential in these areas as well as respond to emerging student concerns/needs.
- Both Angel and One Card data represent potentially rich sources of behavioral information. Currently, RAR has not integrated this data into existing models related to student success/retention. Data such as student lab usage, time on campus, spending patterns, library resource utilization, and PAC usage should prove invaluable in developing predictive retention models. Regarding the latter, physical activity center usage has shown promise as a correlate of student success in the university environment. Similarly, knowledge of peak flow and usage of our parking garages can inform human resource decisions for garage staffing and course scheduling. Time on campus, lab usage, and use of other campus resources will likely supplement existing models of student course success. Regarding Angel, this data will permit insight into student work behaviors and patterns. The Angel data promises to provide a powerful means of predicting student course success and designing systems that notify stakeholders of potentially detrimental usage patterns/behaviors.
- Throughout FY 2010-2011, RAR anticipates having greater accuracy of prediction, both at the course and schedule level, through the use of various regression techniques (e.g., Poisson and Logistic). Schedule level predictions present not only a unique challenge, but an opportunity as well. Being able to predict the number and types of courses a student will have difficulties with would be invaluable to academic advisors. At the course level, Business and Public Services sees a 70% success rate in their MAN-105 course. This rate, while noteworthy, still represents a number of struggling students. The challenge now, and in the future, will be to accurately identify at-risk students before difficulties emerge. The advantages predictive modeling offers, in this situation, over an early alert system is the ability to hone in on at-risk students prior to the start of a class. This sort of early, "early alert", has shown considerable promise and accuracy in its application to developmental and accounting courses and will be available to the Business and Public Services Division during FY 2010-2011.

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- Over the next fiscal year, RAR may also be able to provide analytics and research support to the new AQIP project on improving Entering Student Success. This project will involve developing specific metrics surrounding the AQIP project and performing analysis (descriptive and predictive) of related data including the following: SENSE, CCSSE, persistence, and success rates.
- A supportive role may also be realized for the Gates Foundation CLIP grant where RAR
 assists the Wright State University Applied Research Center on Student Success in
 analyzing junior ACT practice test scores, postsecondary progress, and workforce entry
 data.

Estimated Cost of Project: It is expected that the lead researcher will devote approximately 25% of his/her efforts to developing and running predictive models. This translates to approximately \$22,000 in cost.

Cost Savings/Cost Avoidance Anticipated for the Project: Data-driven decision making is the wave of the future and will represent the competitive edge that an institution can employ to attract and retain students. By way of example, if Sinclair were to reduce instructional costs through the application of predictive analytics and this application caused a one-tenth of one-percent (0.001) reduction in instructional costs; this would translate into a \$50,000 annual savings for the college.

Target Completion Date: June 2011

■ Support Bookstore Processes

The Sinclair Bookstore is a major retail operation that is owned and operated by the college. It is unique in that its sales patterns are extremely cyclical with major levels of activity occurring immediately before, and immediately into, the first days of an academic term. During this short window of approximately 20 days straddling the beginning of a term, the Bookstore will serve upwards of 20,000 plus customers. Consequently, it is critical that supporting systems be sized for this intense level of operation and that they be stress-tested to assure optimal functionality during these rush periods.

This project is designed to address outstanding issues that have in the past prevented attainment of the performance objectives identified above. One persistent source of difficulty has been the performance reliability of the interface software connecting the bookstore's inventory/AR/Point-of-Sale system with the college's ERP system. During this year, Administrative Systems will develop an alternative design approach for possible replacement of the existing interface software.

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Figure 4-5. Course scheduling tool with book cost interaction.

Another improvement opportunity exists in the increasing volume of books sold via the web. This increase in volume presents the bookstore with a record keeping problem in that the existing record system requires several points of manual data input. When volume was low, this approach was sufficient. Under current load, the approach creates a service bottleneck. During this year, RASD staff will assist the bookstore staff in developing an automated record keeping system that will minimize the need for manual intervention.

Estimated Cost of Project: The improvement of online sales processes will require about two person months of effort. The interface prototype will take about four person months of effort. These six person months will equate to a cost of approximately \$40,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Poor service levels in the Bookstore is something that will impact a large number of students and the negative impact will be far-reaching. This poor performance can drive students to competing bookstore outlets, and consequently, can negatively impact the level of funding the Bookstore provides to the college's overall operation.

Target Completion Date: June 2011

■ Implementation of Selected Mobile Applications

During FY 2009-2010 a number of Mobile Web achievements were made, and this project will leverage those accomplishments by moving the research completed and the prototype applications created into production tools. During the past year a Mobile Strategy Guide was created to guide and influence future mobile projects at Sinclair. This guide used independent research, surveys, and analysis of Sinclair's resources to determine the best direction to implement mobile services. Several prototype Mobile Web applications were created to test

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and demonstrate the Mobile Web capabilities of the college and to gain knowledge and skills. Using the Mobile Strategy Guide and the prototype applications, the following Mobile Web tools will be delivered into production use.

Schedule Planner

- Searches courses by keyword, department, location and course format
- Displays required books with ISBN's and pricing for both new and used options
- Uses the same data services as the main web schedule and requires no additional maintenance to keep up-to-date

My Current Schedule (shown in Figure 4-6)

- Password-protected tool that retrieves a student's current schedule
- Lists course times, locations, and links to course descriptions and book information
- Features the ability to email the schedule to the student's account

My Current Booklist

- Password-protected tool that retrieves a student's current book list
- Displays required books with ISBN's and pricing for both new and used options

Program Viewer

- Allows the lookup of Sinclair programs of study by academic division and keyword
- Pulls data directly from CMT so all data is accurate and no additional maintenance is required

Employee Directory

Keyword-based employee directory that lists title, location, phone number and email address

The process of implementation will be to move the current prototype applications to a pilot and introduce the applications to students. Web Systems will gather feedback and usage data, and will further refine applications during an iterative process of piloting and revision before the applications are deployed as production services.





Figure 4-6. Prototype display of the course schedule mobile application.

Estimated Cost of Project: The project will cost \$10,000 for mobile devices plus annual service contracts for devices. Since this technology changes so rapidly, these devices will need to be placed on a rapid replacement cycle. It is expected that developers and designers will spend approximately 10% of their time programming for these devices. This equates to a staff cost of approximately \$20,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The Mobile Web applications selected to be moved to production level this year were identified by surveying students and gaining their feedback on the services and information they wanted from a mobile device. This project is a direct reflection of over 1,000 student survey responses and meets a growing demand for providing college information and services when and where students want these services. Potentially, the savings to the college is greater than the cost of the project in license fees alone, and also provides new methods and tools for students to interact and do business with the college.

Target Completion Date: June 2011

■ Continue Data Quality Validation and Collection (DQVC) Initiative

The Data Quality, Validation and Collection unit within RAR has a two-fold responsibility. The unit's first responsibility is to analyze work flow and data collection/correction processes that have exhibited inconsistency and/or inaccuracy in the past. The output from this analysis is a description of current practice along with recommendations on how workflows and practices

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can be modified to improve data quality and timeliness. The unit's second responsibility is to collect, aggregate, and report on data supplied by students concerning their opinions of their classroom experiences.

Even though the unit has only been organized for approximately six months, it has already made significant progress in both areas of responsibility. The unit has evaluated Sinclair processes for collecting and maintaining directory information, and the unit is ready to make recommendations to improve this long-standing data integrity problem area. Likewise, the unit has invested in improved scanning equipment and software to significantly improve the turnaround time for processing end-of-term student opinion surveys.

This project calls for the unit to continue to tackle data problem areas. Some activities envisioned for the upcoming FY include:

- The college's process for collecting and storing information on faculty credentials is dispersed and differs between academic units. This information is required for accreditation processes, both college-wide and by department. During the upcoming year, the DQVC unit will analyze these data processes and recommend improvements.
- There has been a long-standing request from the Budget office that current practices
 with respect to associating budgeted positions with actual individuals be examined for
 improvement opportunities. This is another area that the DQVC unit will evaluate in the
 coming year.
- New survey scanning software was purchased last year at the same time that new scanning equipment was acquired. This software affords the opportunity to revamp current survey construction practices with the result of greatly improving both the accuracy of returned information and the costs of preparing the survey instrument. The DQVC unit will undertake this revamping process during the year.
- One of the largest investments that Sinclair has made in customizing ERP code is in the
 area of sponsored billing processes in the Bursar's office. This customization has a
 large maintenance cost and has been the root cause of much of the poor performance
 associated with the ERP system. During the coming year, it is expected that the DQVC
 unit will be able to bring a fresh perspective to all sponsored billing practices with the
 goal of recommending equally functional or improved alternatives to the current
 sponsored billing practices.

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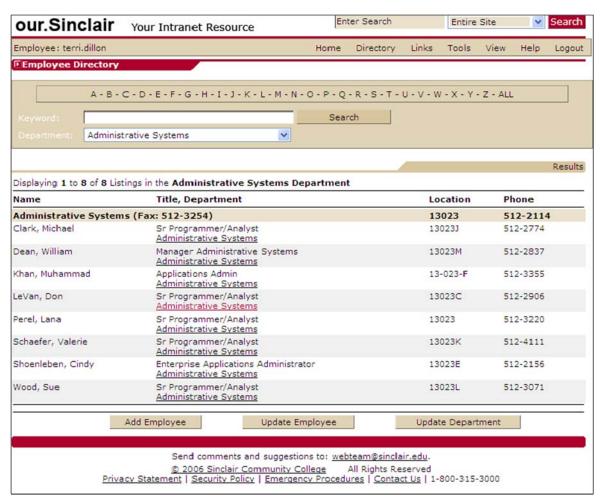


Figure 4-7. This screen shot is just one of several directory information screens evaluated by the DQVC unit.

Estimated Cost of Project: The unit is assigned three full-time positions. The unit's total annual operating expense is approximately \$175,000.

Cost Savings/Cost Avoidance Anticipated for the Project: It is anticipated that the unit will annually identify cost savings and/or process efficiencies that will at least offset, if not exceed, the unit's annual operating expense.

Target Completion Date: June 2011

■ Conduct Feasibility Study and Warranted Implementation of Automated Support for Tech Prep Office

The Access database used by the Tech Prep office was originally designed to serve two purposes. It was to be used to identify students eligible for tech prep scholarships, and it was to be the storehouse for data needed to report enrollments to OBOR's Higher Education

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Information system. It was anticipated that the database would need to hold approximately 900 records – only seniors who graduated from a tech prep program.

These original expectations for the database have been overwhelmed by additional record keeping needs added to the Tech Prep office. Records are now being kept for activities such as proficiency testing, articulated credit, web-based transmittal forms, placement test results, Colleague enrollment data, and scholarship eligibility. Furthermore, the database is now serving over 7,100 students.

This project calls for a systems analysis of the office record keeping processes and data storage needs with the goal of designing replacement systems that will streamline office operations and improve data integrity. Due to competing demands on IT resources, it may not be possible to include the actual implementation of these recommendations within this year's planned activities.

Estimated Cost of Project: It is expected that the analysis phase of this project will consume approximately three person months of analyst time. This time equates to a cost of approximately \$15,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The Sinclair Tech Prep office supports the entire Miami Valley Tech Prep Consortium. There were approximately 7,500 tech prep enrollments in consortium schools during the FY 2009-2010 academic year. While not all participants choose to attend Sinclair, this readily identified pool of potential students is an actively recruited population. It would be desirable that these students not develop a negative image of Sinclair as a result of record keeping difficulties within the Tech Prep office.

Target Completion Date: November 2010

■ Feasibility Study and Warranted Implementation of Payment Gateway

The Bursar's office has a need to accept payments from non-students. Since the Colleague ERP system does not provide for accepting payments unless the payee has a demographic record within the ERP system, the Bursar's office can only accept non-student payments at their central location on campus. This limitation is especially problematic for parents wanting to deposit funds on their son or daughter's account and for relatives of children enrolled in the college's daycare center who are wishing to pay for services.

This project calls for the study of alternatives that may be put in place that would allow for online payments outside of the current ERP process. Other offices, such as the Sinclair Foundation and the Blair Hall ticket office, have systems in place to accept payments. However, in both of these cases, there is no need to have the payments immediately reflected on an account against which charges for services can be made. Consequently, the challenge

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of this project will be to develop an interface system that will allow transactions on a non-ERP system to be immediately reflected within the ERP system.

Estimated Cost of Project: The feasibility portion of the project can be accomplished within about one person month. This would equate to a cost of approximately \$5,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The lack of payment flexibility is a customer service issue where the real monetary costs are difficult to measure. It is reasonable to expect parents will react negatively to barriers that prevent them from providing for their children.

Target Completion Date: December 2010

Support Processes of Marketing Department

Sinclair's Marketing department has requested support from Research, Analytics, and Systems Development in several areas of their operation. Any and all of these requests have the potential to improve Marketing operations and to increase accuracy of information communicated to Sinclair's constituencies. This item in the plan calls for RASD to analyze each of these requests for feasibility and cost of implementation and, where possible, to carry the projects into production. Specific analysis will be conducted to answer the following:

- What are the project specifications and implementation challenges of improving the current "Request for Information" process on Sinclair's website? Can this process be linked to a central database that will aggregate information received from several web locations? Can the multiple locations where the "Request for Information" service exists be modified to collect unique information and still feed into a centralized and commonly-shared database?
- How can Sinclair's news and calendar dissemination process be enhanced to assure that information is uniformly distributed to all appropriate outlets? What automated controls can be put in place to assure disseminated information is timely and is removed from distribution when it has passed its period of newsworthiness?
- How can the annual process of developing the academic calendar be improved? With
 the recent staff retirements, Marketing is ideally positioned to reassess this annual
 activity, and RASD can assist with this analysis through its thorough understanding of
 all campus-wide information systems.
- What are the technical challenges of creating high-school-specific portal pages for each of Sinclair's feeder high schools? What methods could be used to link these portals to specific applicants, and how could information of unique interest to these applicants be generated and maintained in an automated fashion?

Access and Affordability **Estimated Cost of Project**: The actions listed in this project involve project analysis and specification development. No actual product development time is anticipated during this year. When looking solely at the analysis/specifications phase, costs are estimated to be approximately two person months of effort, which equates to a monetary estimate of \$13,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Enrollment growth is driven by successful marketing. Revenue generation will be directly proportional to the extent to which the activities of this plan enhance the Marketing department's success.

Target Completion Date: June 2011

■ Support Processes of Student and Academic Support Services Department

Creation of the Student Success Plan (SSP) software has been one of the major services provided to Student and Academic Support Services (SAS) over the past several years. This application is core to much of what SAS does, and the focus of this project is to extend features of this product to further enhance its usefulness to the department. Specifically, this project will accomplish the following:

- A daily extract process will be developed to transfer snapshots of SSP data to the data warehouse, and an SSP reporting cube will be created within the DAWN information portal to provide users easy access to reports. These features will add a chronological reporting dimension to SSP data which does not currently exist.
- Pending the availability of grant funding to support this effort, the MyGPS component
 of the SSP software will be modified to incorporate additional student groups. MyGPS
 currently functions as a self-service version of SSP for students who enroll in Sinclair's
 how-to-succeed-in-college course, SCC 101 Student Success Experience. This
 project would create similar modifications to the software for the Displaced Workers
 student group.

Estimated Cost of Project: It is estimated that the MyGPS portion of this project will be funded by the existing DEI grant, and the work would be performed by an external contractor. Therefore this component should be cost neutral. The reporting cube portion of the project will consume about two person months of effort with an estimated monetary cost of \$13,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Research consistently and emphatically supports the fact that student engagement is a key factor in student success. The SSP software is designed to actively engage students in the identification and selection of resources that will lower barriers to their academic success. SSP has a direct and demonstrable impact on student retention.

Target Completion Date: January 2011

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■ Conduct Feasibility Study for Replacement of Sinclair's Content Management System

It has been approximately five years since Sinclair's Content Management System has been evaluated for the purpose of measuring appropriateness of features and currency of technology. This project involves performing such an analysis and producing recommendations for possible future changes to the college's content management system.

Estimated Cost of Project: The project will require evaluation efforts from several staff members. In aggregate, these efforts will equal approximately two person months of effort, for a total estimated cost of \$13,000. Implementation of a replacement CMS is not within the scope of this project. Those efforts, if warranted, would occur in future years.

Cost Savings/Cost Avoidance Anticipated for the Project: Effective content management systems allow website maintenance to be distributed to the non-technical owners of web content while still maintaining coding enforcement of campus-wide standards for style, placement, organization, etc. In the absence of such a system, Sinclair's public facing web presence would be chaotic and inconsistent.

Target Completion Date: January 2011

■ Implement First Phase of New Schedule Development System

Sinclair's enrollment, at all campus locations, has reached a level where, using current practices, there is little opportunity to add additional sections because the facilities have reached the limit of their capacity. There is a compelling need to modify scheduling practices in order to optimize section placement within the limits of the existing physical footprint and according to realistic projections of instructional need.

Ideally, analytic software is needed that can take multiple input variables, such as projected academic roadmaps of currently enrolled students and detailed analysis of prior enrollment demand, and create a predictive picture of future section needs. Such software would require multiple years to develop. This project includes those development steps that can realistically be accomplished within the current fiscal year.

Specifically, the tasks for this year include:

 Administrative Systems will develop a procedure that will allow Registration and Student Records (RSR) to use the Datatel Electronic Load File (ELF) process to transfer Excel files containing section records information directly into Colleague. This will remove a major data entry burden from the current process.

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- The Research Analytics and Reporting (RAR) unit will develop edit checking software that will evaluate Excel files submitted to RSR for adherence to scheduling guidelines such as acceptable time/day combinations, percentage of courses scheduled within given time periods, etc.
- Web Systems will undertake a collaborative process to develop the full complement of software specifications that will guide the future development of this application.
 Specifications will, by the end of the year, be at a point where they are sufficiently detailed to allow immediate movement to software coding.

Estimated Cost of Project: The three activities, taken together, will equate to a time commitment of approximately .5 FTE. The estimated dollar amount is \$45,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Conventional wisdom suggests that modifications to current scheduling practices, if rigorously enforced, could release sufficient space to expand section offerings by 30%. This equates to an additional 30,000 seat enrollments. Assuming average tuition revenue of \$180 per seat, there is the potential to increase revenue by \$5,400,000.

Target Completion Date: June 2011

Information Technology Services

Following are the major projects for FY 2010-2011 for Information Technology Services:

- Multimedia Standardization Phase II
- Security Information and Event Management (SIEM) Implementation
- Disaster Recovery System Identification
- Copier Management
- Equitrac Expansion
- Virtual Desktop Infrastructure
- Storage Area Network Upgrade
- Network Access Control Improvements
- Data Center Network Upgrades
- Disaster Recovery Resiliency
- Backup Software Replacement
- Windows 7 Implementation
- Data De-duplication
- Guardian Replacement
- Cable Television System Replacement
- Digital Asset Management System Replacement
- Investigate Centralization of Plato Data

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Multimedia Standardization Phase II

In FY 2008-2009 a project was created to analyze space management and multimedia presentation equipment needs for Sinclair's Dayton Campus and to provide a recommendation including associated costs for installing standard multimedia presentation systems throughout the campus, similar to the one shown in Figure 4-8.



Figure 4-8. Multimedia Classroom.

This analysis determined a minimum set of equipment for every logical classroom and lab space on campus with related costs. Also presented was a set of 115 classroom and lab spaces on the Dayton campus that could accommodate multimedia equipment and are currently equipped with non-standard, aging equipment or are not equipped with any multimedia capabilities.

Using this information, capital support has been requested that would fund this project to standardize multimedia capabilities in the classroom and lab settings across the Dayton Campus.

During FY 2009-2010, 27 classroom and lab spaces were standardized as Phase I of this project. During FY 2010-2011, funding has been approved that will accommodate approximately 17 new standardized classroom presentation systems.

Estimated Cost of Project: \$240,000

Cost savings/Cost avoidance anticipated for the project: Standardization of the multimedia presentation equipment across all of the Dayton academic spaces creates an opportunity to use space more effectively. Effective use of space translates into time savings for instructors who can, after this project is complete, count on the same presentation equipment being in any classroom in which they are scheduled to teach.

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Target Completion Date: April 2011

Current status: Helmig Consulting has been retained to design and bid this project.

■ Security Information and Event Management (SIEM) Implementation

The systems infrastructure required to support Sinclair's faculty, staff and students is very complex and made up of many disparate systems and interconnected networks. To assist in monitoring, maintaining, and troubleshooting these systems, most of the individual devices and components within the infrastructure are capable of generating detailed activity logs. These logs are particularly useful for determining exactly what was happening (or not happening) during a system malfunction or security issue. However, these logs are generally long and detailed, and manually 'parsing' for useful information is very difficult.

When an incident or issue involves multiple systems—as most do—the volume and complexity of manually analyzing logs is nearly impossible. Active log monitoring and management is also typically required by legislation, financial standards organizations, and other regulatory bodies. It is unrealistic and impractical to assign an individual to manually monitor systems logs 24/7 looking for events or issues that might compromise compliance.

Security Information and Event Management (SIEM) technology automates the log aggregation and correlation functions required to provide both real-time monitoring (to help detect/mitigate current issues) and historical reporting (for incident analysis/lessons learned) of logged events from networks, systems, and applications. Effective SIEM implementation improves security operations, threat management and incident response capabilities. While the emphasis on these systems is generally security and compliance related, they are also very useful for troubleshooting and analyzing general system problems.

This project involves implementation of an SIEM solution. After a 2-year project to determine requirements and effective solutions, the Nitrosecurity ESM appliance (shown in Figure 4-9) has been purchased and installed. Implementation will initially involve collection and correlation of critical server and other device logs. A second priority is developing event trigger rules and reports specifically tailored to compliance with the Payment Card Industry-Data Security Standard (PCI-DSS). The complete implementation will result in automated monitoring and security information/event management across Sinclair's IT infrastructure.



Figure 4-9. The Nitrosecurity ESM appliance.

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Estimated Cost of Project: The SIEM solution was purchased using FY 2009-2010 funds of approximately \$30,000. Primary costs in FY 2010-2011 will be employee time to configure and customize rules and event logs specific to the Sinclair infrastructure.

Cost savings/Cost avoidance anticipated for the project: Potential cost savings will result from automated log/event management vs. current workload on staff and possible reduced calls to third party vendors for troubleshooting devices. Cost avoidance of potential fines/penalties for non-compliance with regulatory log monitoring mandates is also anticipated.

Target Completion Date: June 2011.

Current status: Nitrosecurity ESM appliance has been selected, purchased, and installed. ITS is initiating log collection from Windows servers and testing netflow collection from 2 core switches.

■ Disaster Recovery System Identification

A disaster recovery plan is part of the college's business continuity plan and is necessary due to the reliance on information systems to perform everyday tasks. The risk of not being able to use the college's information systems over a prolonged period of time could make the college unable to provide services to students, to pay employees, and to meet many of the college's legal obligations. Events that could cause the college to not be able to use the information systems include the direct impact of natural disasters such as floods, tornadoes, snow and ice storms, etc. The number one reason why companies declare a disaster is due to lack of electricity from the utility company.

Information Technology Services discontinued the college's contract with Sungard Recovery Services in December 2008. This contract would have provided temporary replacement hardware in the event of a disaster. As part of the college's program alignment process, it was determined that the same hardware could be purchased for placement at the planned Courseview Campus Center with a payback of less than 5 years.

A major shortcoming of the Sungard contract was that the high cost on a per-system basis led to a large number of systems not being included in the contract. Now that the Courseview disaster recovery facility is operational, the college has the ability to cover more systems without increasing the investment in hardware. There is also the possibility of using hardware that has been removed from production which might still have some useful life (in a diminished capacity).

This year Information Technology Services will work with the college's leadership to identify the most critical systems that need to be available in the event of a disaster and plan for any changes to that need to be made to Information Technology Services' disaster recovery plan.

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Estimated Cost of Project: There is no cost associated with this project. After this project is complete there could be costs for a follow-on project to purchase additional hardware to provide recovery of any systems that are not currently in the disaster recovery plan.

Cost savings/Cost avoidance anticipated for the project: While the cost of providing for disaster recovery of systems is not inexpensive, it is much cheaper than the costs that can be incurred due the loss of access to important systems and data.

Target Completion Date: December 2010

Current status: This project has not been started.

■Copier Management

The copier management project started with a transition from Business Services to Information Technology Services. This change was made to coordinate the print reduction project with the copier support and replacement. Information Technology Services will be adding new multi-function color copiers that can be networked and provide access for color printing capability. Additional copiers will be networked if they have the capability now, or as they are replaced in accordance with their useful life. The Equitrac Software will be used to track printing and streamline the charge back process.

This change will help Information Technology Services expand the use of campus copiers and reduce departmental and local printing. The college will save money by eliminating unnecessary printers such as inkjets or low-volume color LaserJets throughout the campus and directing much of the printing volume to cheaper high-volume devices. With Information Technology Services managing the copier and printer inventory and maintenance contracts, ITS will have the ability to recommend removal of printers based on need, to direct users to appropriate copiers for their color and black and white printing needs, and to reduce the expense of printer supplies and printers.

Estimated Cost of Project: \$30,000

Cost savings/Cost avoidance anticipated for the project: The cost of purchasing consumables and managing devices will be reduced through standardizing and improving processes. Money that would have been spent on replacing or upgrading printers can be better used by purchasing higher-volume, lower-cost shared devices.

Target Completion Date: June 2011

Current status: Eight copiers have been replaced with network, color devices and are currently being tested with Equitrac.

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Equitrac Expansion

The purpose of this project is to install Equitrac in the remaining classrooms and open labs on the Dayton campus. Equitrac (shown in Figure 4-10) is the name of the new 'pay-for-print' system. The phrase 'pay-for-print' simply refers to the function that Equitrac performs – requiring users to pay for their printouts in classrooms and labs. GoPrint was the previous 'pay-for-print' system. It is being replaced by the Equitrac system. Equitrac was chosen as the replacement 'pay-for-print' system because of its ease of use and improved integration into the college's network and lab and classroom spaces.

During Spring Quarter 2010, Equitrac was implemented in the classrooms and labs that had GoPrint. Starting Summer Quarter 2010, the Equitrac 'pay-for-print' system is being installed in all remaining college labs and classrooms.



Figure 4-10. Equitrac dialog prompting for the funds to be charged.

Estimated Cost of Project: \$30,000 was spent in FY 2009-2010 for the software.

Cost savings/Cost avoidance anticipated for the project: Equitrac will reduce cost primarily by decreasing the amount of waste. The use of GoPrint for the last several years demonstrated that about half of the printed pages are eliminated when students are required to pay for their print jobs. The cost to implement Equitrac at all Sinclair sites is approximately the same as the cost that would have been required to expand GoPrint to all sites, but it provides may additional features and is much more reliable.

Target Completion Date: September 2010

Current status: Equitrac has replaced GoPrint and is being implemented in the remaining academic spaces.

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■Virtual Desktop Infrastructure

At the start of Spring Quarter 2009, a remote access solution utilizing Citrix XenDesktop went into production. At the time of implementation, the virtual desktops were installed within Sinclair's existing VMware virtual infrastructure. This project will augment this virtual infrastructure with a Citrix XenServer infrastructure and migrate all XenDesktop components from the VMware environment to the XenServer environment.

There are several reasons for migrating the XenDesktop environment to a XenServer infrastructure. One is that XenServer is optimized for Citrix XenDesktop and XenApp products so there are performance benefits in using an underlying XenServer architecture. In addition, there are some Citrix products that only work on XenServer, and staying with VMware would limit our ability to use these new products. Another reason is that having a single vendor's products encompass the entire virtual desktop solution makes support calls more efficient and updates to the various products better integrated. In fact, we have experienced more issues since we upgraded VMware to vSphere 4 than we did when we were using ESX 3.5. By eliminating VMware from the equation, these types of issues should decrease.

This project will also provide a significant amount of additional server resources for hosting a larger number of virtual desktops. Eight new physical servers will be installed in a XenServer cluster and Citrix Essentials will be installed to monitor and manage the XenServer environment. Also, the existing Citrix XenDesktop servers, virtual desktops, licensing server, and XenApp servers will be migrated to the XenServer cluster.

Estimated Cost of Project: There are no anticipated costs associated with this project as the eight servers were purchased last FY and the XenServer software is included in the Citrix XenDesktop Platinum licenses already purchased.

Cost savings/Cost avoidance anticipated for the project: By using licenses already purchased, the XenDesktop environment can be scaled more cost effectively than purchasing additional VMware licenses.

Target Completion Date: December 2010

Current status: The server hardware has been purchased, awaiting delivery.

■ Storage Area Network Upgrade

As referenced in the Storage Area Network R&R project completed in FY 2009-2010, this project will replace the original disk array installed in FY 2004-2005 with a new array using funds moved forward from the FY 2009-2010 R&R budget.

This project will involve researching various vendors' storage products to determine the type and size of disk array to purchase. Interoperability with the current SAN environment will be a

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critical factor in the decision-making process. In addition, decisions made for this project are also influenced by decisions made in other projects defined for this year, namely the Data De-duplication, Backup Software Replacement, and the Disaster Recovery System Identification projects. After the decision is made on which product(s) to purchase, the project will involve installing, configuring, and migrating data to the new disk array.

In addition to the new SAN, this project will also involve the purchase and installation of a Network Attached Storage (NAS) system. A NAS is one or more devices connected to an IP network that provides file based data storage services (i.e., share access) to users on the network. This will provide higher performance and greater redundancy for the Angel File Server, departmental and academic shares, and user home directories. Of particular importance, replacing the Angel file server with the NAS will provide redundancy for this function and eliminate it as a single point of failure in the Angel system. The NAS project will have the following scope:

- Installation/configuration of the NAS components;
- Migration of data to the NAS storage system; and
- Migration of shares to the NAS storage system while preserving share level and file level security.

Estimated Cost of Project: \$600,000 is budgeted for this project. There was \$350,000 identified for replacing the system purchased in FY 2004-2005 and an additional \$250,000 added to the project to accommodate the need for increased storage space.

Cost savings/Cost avoidance anticipated for the project: Maintaining critical equipment within the college's server infrastructure is necessary to prevent failure due to aging or obsolete components. Also, the cost of implementing upgrades in a reactive way rather than as part of a planned renewal process can be much more costly.

Target Completion Date: June 2011

Current status: The NAS products have been selected and are expected to be delivered in August 2010. Planning to replace the Angel file server with the NAS before the start of Fall Quarter 2010.

■Network Access Control Improvements

In early 2005, ITS initiated a plan to implement a number of technologies on the campus network, which are commonly known as "Network Access Control" or NAC. This plan, which has become known as the Secure LAN Strategy, was initiated to build intelligence into network devices so they can limit the type of communication that they will forward. These limitations vary based on the type of user and the type of device that is attempting to connect to the network. This puts the control over the network's security into the hands of the College rather than at the mercy of the various devices that can be connected.

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Since the time that the Secure LAN Strategy was implemented a new technology has been released by Enterasys, the college's network infrastructure vendor, which can greatly improve the functions that are provided for campus users. The Enterasys NAC Appliance provides improved capabilities to identify network devices, to remediate issues, and to classify types of devices. The identification and authentication of non-college owned devices is currently performed using Cisco Clean Access (CCA). CCA is an aging platform that is not very user-friendly.

In addition to improving the experience of users with non-college owned devices, the NAC appliance will provide improved security for all campus users because, unlike CCA, every device on the network will be visible by the NAC appliance, rather than just devices that cannot authenticate. Also, improved functions will be available in the future as different types of devices are connected to the network

Estimated Cost of Project: \$90,000.

Cost savings/Cost avoidance anticipated for the project: The main cost savings associated with this project is related to personnel. College staff productivity will be increased through improved reliability of the authentication process. Also, ITS staff will spend less time troubleshooting authentication issues.

Target Completion Date: December 2010

Current status: The NAC appliances have been purchased and are being installed. Wired authentication will be completed in the Summer of 2010 and wireless authentication will be implemented in Fall 2010.

■ Data Center Network Upgrades

The devices that provide connectivity between the file servers located in the Dayton campus data center and the rest of the campus network are extremely important parts of the college's IT infrastructure. This year this equipment will be upgraded to provide much higher throughput capabilities and improved reliability. Another important part of this project is a change to the type of equipment – a more modular configuration.

In the past ITS used large, chassis-based switches that allow hundreds of device connections to be housed in a single device. With the increasing use of virtualization technologies, the number of servers that need to be connected into these devices is beginning to create cabling issues. The new design will place smaller switches in each of the server racks and only run fiber-optic cable from these switches to the routers that are located in the telecommunication racks where all switching was done in the past.

Estimated Cost of Project: \$150,000.

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Cost savings/Cost avoidance anticipated for the project: The renewal and replacement of network equipment avoids the costs that could occur from equipment failure. Placing switches in server racks will avoid the costs that might be required to redesign the Data Center to allow much greater numbers of cables to be run between server racks and telecomm racks.

Target Completion Date: June 2011

Current status: Most of the network equipment was purchased in FY 2009-2010 and some of the equipment is currently being installed. This project will be completed incrementally to reduce the amount of down-time that would be necessary to do the whole implementation at one time.

■ Disaster Recovery Resiliency

In the process of evaluating the recovery strategies and the utilization of the Courseview Campus Center as the in-house disaster recovery facility, a review of the network and WAN infrastructure is needed as well. Consequently, ITS will be reviewing the current WAN network connections between the Dayton campus, Courseview, and the current Internet providers (Donet and Oarnet). Utilizing designs of the current technology platforms available in the marketplace will allow ITS to establish a more resilient network in the event of an outage or a disaster that would affect the Internet providers at the Dayton campus.

The technology utilized will be a Multiprotocol Label Switching (MPLS) network which will provide a highly scalable, protocol agnostic network. One of the big benefits of this type of network is that permanent virtual circuits (PVCs) can be established between nodes or locations. This can eliminate the cost of dedicated circuits with the benefit of a virtually dedicated connection. The network will be scalable in terms of using ethernet connectivity over fiber backbones for maximum bandwidth capability for future growth.

Qualitative/Quantitative Return on Investment: The capability to continue business operations in the event of an outage or disaster is a beneficial economical return at any point in time versus a loss of business.

Cost savings/Cost avoidance: As more locations are added to this type of network, the cost for the new location will be much less than a dedicated connection with far more bandwidth capability.

Target Completion Date: December 2010

Current status: Currently reviewing vendor proposals for the service.

■ Backup Software Replacement

Information Technology Services has been utilizing the same backup methodology and technology for the past six years. With the college's continued growth comes the need for more storage, and in turn, more backups. With such a large amount of data to backup, the current backup technology has become inadequate. Recently, there have been exciting breakthroughs in backup technology specifically designed for large amounts of data, such as data deduplication and replication. With these technologies in mind, ITS will be looking for a reliable, secure, automated, scalable solution that can be centrally managed from Sinclair's Dayton campus.



Figure 4-11. Backup Software Replacement Goals.

Estimated Cost of Project: The project will cost approximately \$150,000. There are a variety of software and hardware solutions available. ITS will take this FY to decide on a solution and FY 2011- 2012 for implementation.

Cost savings/Cost avoidance anticipated for the project: De-duplication lowers storage costs since fewer disks are needed, and shortens backup/recovery times since there can be far less data to transfer. Replication will allow the college to recover quickly in a disaster situation as the Courseview campus could have up to the minute data replicated from the Dayton campus.

Target Completion Date: June 2011

Current status: Technologies are being investigated

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■Windows 7 Implementation

In late 2009, Microsoft released Windows 7 (shown in Figure 4-12), the long-awaited successor to their poorly received Windows Vista operating system. This operating system is a significant upgrade that has much greater hardware requirements than Windows XP, the version of Windows which the current campus workstation image uses, due to its enhanced user interface. Windows 7 is not only a significant change for the end user; it also operates much differently in the way it communicates with servers and other network devices.

During FY 2009-2010 ITS completed the development of a Windows 7 image and began pilot testing the new image on a small number of campus computers. During FY 2010-2011 ITS will expand the pilot test and begin the campus wide rollout for the replacement of the Windows XP based image. The implementation plan will need to take into consideration the impact on hardware replacement schedules, the interdependencies with existing applications, and how the new image will operate within the campus' security infrastructure.

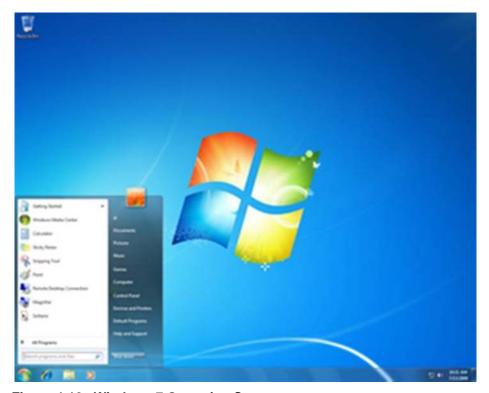


Figure 4-12. Windows 7 Operating System.

Estimated Cost of Project: Existing hardware and software plans will allow this project to move forward with no direct costs.

Cost savings/Cost avoidance anticipated for the project: Windows XP will no longer be supported by Microsoft in April 2014. Moving to Windows 7 prior to this will reduce the cost of supporting campus computers.

Target Completion Date: December 2010

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Current status: The Windows 7 image has been built and is being pilot tested. Plans are being developed to begin rolling out the image on new hardware in the Fall of 2010.

■ Data De-duplication

Data De-duplication is the process of eliminating duplicate or redundant data to improve storage utilization. De-duplication identifies identical sections of data and replaces them with references back to a single copy of the data (as shown in Figure 4-13). De-duplication is able to reduce the required storage capacity as only the unique data is stored.

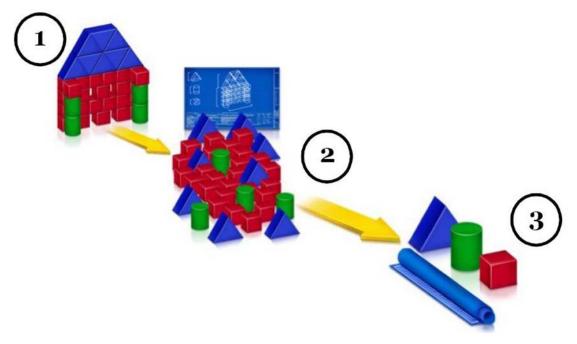


Figure 4-13. De-duplication eliminates redundant data and reduces storage needs.

Recent studies have shown that over 80% of data is duplicated across production servers in an enterprise environment. Data de-duplication offers the college an opportunity to dramatically reduce the amount of storage and bandwidth required for enterprise applications and backups. It saves only a single copy of duplicated content thus reducing backup time, bandwidth, and storage.

Estimated Cost of Project: This project could cost approximately \$150,000 if it is pursued. There are so many de-duplication vendors and technologies available, ITS will take this FY to decide on a vendor and FY 2011- 2012 for implementation.

Cost savings/Cost avoidance anticipated for the project: De-duplication lowers storage costs since fewer disks are needed, and shortens backup/recovery times since there can be far less data to transfer. With de-duplication, the college can store 10TB to 30TB of data on 1 TB of physical disk capacity reducing storage needs and the associated cost by almost 30%.

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Target Completion Date: June 2010

Current status: ITS is beginning to identify products and vendors to research.

■ Guardian Replacement

The purpose of this project is to research and test the UNIX interoperability components built into Windows Server 2008 with the goal of integrating the UNIX and Windows login process to achieve a single sign-on between these two systems. The Services for UNIX components built into Windows Server 2008 have the capability to integrate UNIX Network Information Service (NIS) security and Windows Active Directory services.

UNIX—based and Windows—based operating systems have historically used different directories and access control mechanisms. Because of these differences, users have separate user identities for each system. Subsequently, access to resources on UNIX from a Windows—based computer required a separate authentication process. The Services for UNIX components use Active Directory to store UNIX based NIS data and also support password synchronization between these two systems.

Estimated Cost of Project: Since this project is investigational in scope, there is no budget allocated. Moreover, the Services for UNIX components are included with Windows Server 2008 so there should be no additional costs if implemented.

Cost savings/Cost avoidance anticipated for the project: If implemented, Services for UNIX have the potential to save approximately \$10,000 annually by eliminating the maintenance costs associated with Guardian, Sinclair's current UNIX authentication product.

Target Completion Date: June 2011

Current status: Not Started

■ Cable Television System Replacement

The campus television system (shown in Figure 4-14) is used by Sinclair for more than just the distribution of broadcast entertainment. Satellite conferences and other video events can be viewed in virtually any classroom on campus using the campus television system. In addition, the CastNET campus messaging system and the Qflow system used by the Counselor's office, Financial Aid, and Enrollment Services are broadcast to monitors throughout campus using the campus television system.

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Figure 4-14. The campus cable TV system displays multiple types of video in Building 14.

Now in its sixth year of operation, the campus television system has begun to exhibit some undesired qualities. Among those are picture quality problems and, at times, channels becoming unavailable for viewing.

In keeping with Sinclair's strategic initiative to maintain and develop the downtown campus, these issues have been under investigation and repair for the past several years. The first steps towards a solution were taken during the FY 2008-2009 Fiber optic cable project, and during FY 2009-2010 repairs were made to keep the system stable.

The purpose of this year's project will be to replace the legacy cable television distribution system with a more efficient system that will leverage existing infrastructure and technology. Capital funding has been requested for this project for FY 2010-2011.

Estimated Cost of Project: \$250,000

Cost Savings/Cost Avoidance identified with the project: Continuing to maintain the existing, legacy cable television system is not cost effective. Updating now to a system designed to leverage technologies used throughout the campus reduces future maintenance and upkeep costs.

Target Completion Date: June 2011

Current status: Funding for this project has been requested in the FY 2010-2011 capital budget.

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■ Digital Asset Management System Replacement

In FY 2004-2005, Sinclair's ITS department in partnership with Distance Learning, implemented "digistore.sinclair.edu", a Digital Asset Management system. This system enabled faculty and staff to ingest, categorize, store, and catalog large documents, files and rich multimedia content and share them with students, faculty and staff as learning objects or stand alone media files. Now five years later the servers that run Digistore are at the end of their useful life and will be replaced in FY 2010-2011. This hardware replacement offers the opportunity to review the Digistore system's capabilities and to benchmark it against available products that may better meet the needs of Sinclair's students, faculty, and staff.

The purpose of this project is to review data gathered during a focus group of Sinclair staff and faculty who are using the current system to document its strengths, weaknesses and suggestions on how it could be improved. This data will be compared against product(s) offered by the current vendor as well as other content management systems in the market. An important criterion in the evaluation of products will be its integration with Sinclair's Learning Management System, Angel.

Estimated Cost of Project: There was no additional capital funds requested for this project besides those needed for the hardware replacement. Any additional funds would come from cost savings from other funded projects.

Cost savings/Cost avoidance anticipated for the project: No cost savings or avoidances are directly associated with this project. However, the choice of a less complex system could decrease support costs.

Target Completion Date: June 2011

Current status: Not Started

■Investigate Centralization of Plato Data

Sinclair Community College has been implementing Plato software (shown in Figure 4-15) in ARC (Academic Resource Centers) labs at high school locations since 2002. Plato is a learning software application that evaluates a student's abilities, determines which academic areas they are deficient in, and provides remediation for the deficient areas. Plato brings the student up to their proper grade level with the goal of preparing the student to enter College without needing to take developmental classes.

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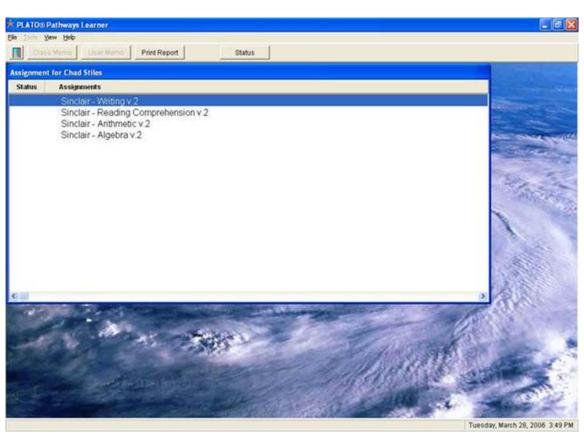


Figure 4-15. Plato Pathways application interface.

One of the shortcomings of the ARC concept is the fact that the data on students' performance is not maintained in a central location. This makes it impossible to use the data for analysis. This project will investigate methods of extracting data from the decentralized Plato systems for loading into the college's data warehouse. An option that will be included in the investigation is the centralization of the systems rather than continuing to operate in a decentralized fashion.

Estimated Cost of Project: There is no cost associated with this project. After this project is complete there could be costs for a follow-on project to purchase hardware or software to implement any changes.

Cost savings/Cost avoidance anticipated for the project: The project has the potential of saving the college money by eliminating servers and reducing the amount of support resources required to staff the ARCs.

Estimated Completion date: March 2011

Current status: This project has not yet begun.

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Library

Following are the major projects for FY 2010-2011 for the Library:

- Reinventing the Sinclair Digital Library
- Library IT Teamwork Studio: Phase 1

Reinventing the Sinclair Digital Library

The Sinclair Library web site (shown in Figure 4-16) is, in effect, a portal to the many digital databases, e-books, electronic journals, digital media, web links, library catalog, OhioLINK, and similar data products that comprise the authoritative scholarly and intellectual content of the modern library. As an extension of last year's distance learning project, the Library web site needs to be reviewed and re-invented to function as a coherent digital library for the campus, a portal not only for effective searching for specific information, but a vehicle for the discovery of information, across the intellectual spectrum represented by a comprehensive community college curriculum.



Figure 4-16. Existing Sinclair Library Website.

As part of this project, the Library needs to improve the integration of external web resources into the Library's offerings, possibly through a commercial product such as LibGuides (shown in Figure4-17), which claims to have over 95,000 web subject guides, written by 21,000 librarians, from 1,400 colleges and universities. Well over a hundred community colleges (e.g., Anne Arundel Community College and Cuyahoga Community College) use a LibGuide product.

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Often these web guides can be built on the shared expertise of librarians across the country and customized to fit Sinclair's needs. They can be organized by subject or by class. They can include references to web sites, web-based media, and additional tutorials.

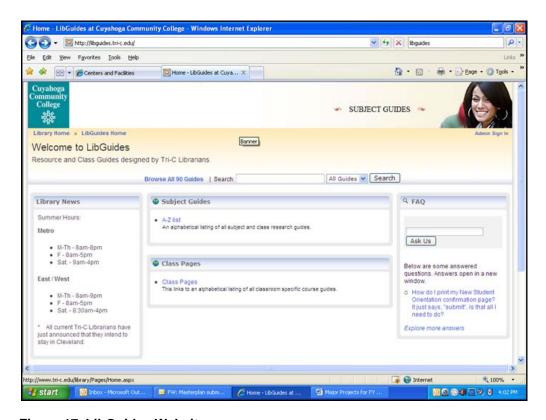


Figure 17. LibGuides Website.

Another potential source for authoritative web-based information is MERLOT, the Multimedia Educational Resource for Learning and Online Teaching (shown in Figure 4-18). This resource is often used by faculty to develop online and distance learning classes. Its resources may also be appropriate content sources for a revised Library web site.



Figure 4-18. MERLOT Website.

Additional areas that should be better integrated in a new web page include digital media: whether films, images or music. Last year, to support distance learning in the health sciences, the Library added digital media from Films on Demand (shown in Figure 4-19). The Library also expanded access to digital classical music files last year in response to increased demand for expanding music classes.



Figure 4-19. Films on Demand Website.

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Estimated Cost of the Project: If the Library selects an outside source for web content such as LibGuides, the subscription costs for such as service will likely cost \$3,000 to \$5,000 to set up the product. At that point, the librarians will still have to invest significant time to evaluate the guides and select those that fit Sinclair's curriculum. They will also all be heavily involved in the web site redesign, which makes this project a significant expenditure for the college.

It is anticipated that this project will take a year to complete, with a number of intermediate targets set to select resources, design pages, test the design, and implement revisions. In the meantime, the existing web site will be maintained and updated as necessary to provide effective and timely information for the academic programs.

Cost Savings/Cost Avoidance Anticipated for the Project: The Library, will realize significant economic gains if existing, free, web-based resources can be used in place of commercial products. Also, the Library can expect long term productivity gains in the ongoing maintenance involved in keeping a web site up-to-date.

Target Completion Date: June 2011.

■ Library IT Teamwork Studio: Phase 1

The Information Collaboratory or Library-IT Teamwork Studio (conceptually shown in Figure 4-20) project carries over from the prior year when capital budget limits caused the project to be postponed. Reintroduced for FY 2010-2011 as a phased project, the Teamwork Studio will be a flexible technology rich space within the Library that is designed to support students working in groups or small classes seeking a temporary flexible computer space. When not needed for group learning activities, the Teamwork Studio can be used by individuals, effectively adding up to 20 additional computers to the Library commons, which is often at full capacity. By creating a flexible space that can be used for classes, small groups, or individuals, the college realizes maximum utilization of the space and return on investment.

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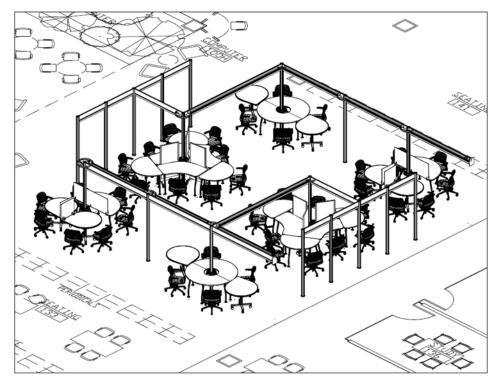


Figure 4-20. Architect's rendering of possible Collaborative Space.

The Collaboratory design will use post and beam construction to carry power and data to computers and media equipment, becoming, in effect, a virtual room within the larger Library space. The proposed design can seat up to 40 people at 20 computer stations. Groups can form and arrange furniture for their projects and even have access to projection equipment that supports presentation and communication skills. It fits with the Library's architectural program of offering students unique zones and destinations. Its furniture and flexible layout will carry the feel of a high-tech commercial space, offering a unique place on campus for student-directed group activities that require access to computers and Internet resources.

Estimated Cost of Project: \$135,000 for furniture, computers, classroom media hardware, network and data cabling. Phase 1 cost: \$80,000.

Cost Savings/Cost Avoidance Anticipated for the Project: This project takes Library space that has been devoted to book and magazine shelves – essentially a storage function – and turns it into a high tech learning space that will be used by many more students on a daily basis. It integrates well with the other computers in the Library, which will allow existing IT staff to provide lab support without having to add staff to support a new, separate area.

Target Completion Date: December 2010

Access and Affordability Alignment to the Community

Quality and Innovation in Student Learning and Support

Technology Predictions

Technology Predictions

Whether it is called prognosticating, forecasting, or predicting future technologies, it is still more of an art than a science. There are many historical examples of knowledgeable, highly intelligent people who have made laughable predictions. Examples include:

- A Western Union executive, who in 1876 stated, "This telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us."
- H. M. Warner, Co-Founder and President of Warner Brothers, who in 1927 stated, "Who the hell wants to hear actors talk?"
- Thomas J. Watson, President of IBM, who in 1943 stated, "I think there is a world market for maybe five computers."
- The editor in charge of business books for Prentice Hall, who in 1957 stated, "I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year."
- Ken Olson, President, Chairman and Founder of Digital Equipment Corporation, who in 1977 stated, "There is no reason why anyone would want a computer in the home."

Every year the technology gurus attempt to predict the next destructive technology, one that will effect business transformation. Sometimes they get it right, but many times they are way off track or premature in their judgment. Depending on which technology magazine is read or which web sites are visited, the predictions vary significantly.

What is a destructive technology – one that can cause business transformation? Table 5-1 provides a glimpse of some historic destructive technologies. It is easy to see how they were truly transformative.

Old Technology	Disruptive Technology
Sailing Ships	Steamships
Telegraphs	Telephones
Horse and Buggies	Automobiles
Ice Houses	Refrigerators
Offset Printing	Computerized Printers/Copiers
Film Stock. Photo Processing	Digital Photography
Typewriters	Word Processing
Travel Agents, Catalogs, etc.	Internet/World Wide Web

Table 5-1. Historic Disruptive Technology.

As noted in the FY 2003-2004 Information Technology report, the Information Technology industry was on an accelerating pace of innovation and change, and all indicators pointed to the same for the foreseeable future. At that time, the four technologies that were expected to cause business transformation at Sinclair were:

- Business Intelligence;
- Wireless Networking;
- Electronic Portfolios; and
- Web Services

Looking at the impact of these technologies seven years later, it is evident that three of the four were right on, and the fourth, Electronic Portfolios, is starting to gain momentum.

Business Intelligence, in conjunction with Data Warehousing, Data Mining, and Predictive Analytics, has made substantial inroads in just about every industry, including higher education, and has helped to transform decision-making processes to rely heavily on data. In *Competing on Analytics: The New Science of Winning*, Thomas H. Davenport and Jeanne G. Harris argue that

The frontier for using data has shifted dramatically. Leading companies are doing more than just collecting and storing information in large quantities. They're now building their competitive strategies around data-driven insights that are, in turn, generating impressive business results. Their secret weapon? Analytics: sophisticated quantitative and statistical analysis and predictive modeling supported by data-savvy senior leaders and powerful information technology.

Wireless Networking has almost become state-of-the-art. With laptops, e-books, smart phones, iPads, etc., and the capabilities of transmitting voice, data, and video, wired networks may soon become a thing of the past. Therefore, this was another insightful prediction.

The technology known as Web Services has helped to transform the Internet/World Wide Web into an essential business medium. Web Services, which laid the foundation for Service Oriented Architecture (SOA), Cloud Computing, and Software as a Service (SaaS), give organizations the capability to do more business electronically, with more potential partners and customers, in more and different ways, and at reasonable cost. Examples of this transformative technology are bountiful with supply chain management, credit card processing, outsourced data centers, outsourced/shared applications, and the various flavors of social media. Thus, another astute prediction.

Electronic Portfolios, which are used primarily in educational settings, are a combination of educational plans, assessments of student learning, examples of educational experiences, etc. that may be shared with other education institutions or potential employers. In theory, this is a great concept, and it still has a chance to become transformative; however, it has not taken hold as predicted.

Once again, in the FY 2005-2006 Information Technology report, the idea of future technologies was explored, with the emphasis on those that are dependent on, or supportive of the Internet/World Wide Web. The technologies identified were:

- Visual Search Interfaces:
- Digital Audio Books, e-Books, and Digital Rights Management;
- Multi-factor Authentication;
- Unified Communications:
- Desktop Videoconferencing;
- Learning Objects; and
- Digital Dashboards.

Five years later, all of these technologies have been influential in the continuing growth and transformative power of the Internet/World Wide Web – some more than others. Nevertheless, it may take a few more years to see which technologies rise to the top, and which are replaced by newer, better ideas.

Once again, looking to the future, what prospective destructive technologies are waiting in the wings? Some old ones are re-surfacing and some new ones are taking root, as follows:

- Green IT
- Cloud Computing
- Mobile Devoices
- Unified Communications
- Data De-duplication
- Security

Green IT, managing Information Technology resources to realize reduced power consumption, is still being hyped as a transformative endeavor; however, it only makes sense when the organization is already investing in infrastructure changes.

Cloud Computing, predicted by many to be the next big revolution in electronic processing, has as many obstacles as it has benefits. Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (laaS) are all being pursued, but at a much slower pace than predicted. Due to the prospective lower cost and implementation speed, Cloud Computing will win a large share of the market, but the major obstacles, such as security, must be overcome for it to be a transformative process.

Mobile Devices are rapidly becoming the electronic processing device of choice, especially among the younger generations. These devices are already leading the way toward an anytime, anywhere communications life style – both business and personal. The only question: Is this a truly destructive technology or merely an add-on? Only time will tell.

Technology Predictions

Unified Communications keeps appearing on the list of predicted future technologies; nevertheless, progress has been extremely slow. Perhaps as mobile devices encapsulate more of the communications landscape, Unified Communications will start to experience accelerated acceptance. Notwithstanding, Unified Communications becoming a transformative business process is questionable.

Data De-duplication may not be an encompassing destructive technology, but it will definitely change many parts of the Information Technology environment. The elimination of redundant data will not only reduce storage requirements 70%-75% and back-up requirements correspondingly, but it will help to reduce Information Technology budgets substantially. Storage needs will continue to grow due to the adoption of Data Warehousing and Business Analytics, Unified Communications, and an increasing amount of digitized video.

Security issues will continue to be a major concern around the world. The question is not if, but when, the world suffers the next cataclysmic security threat. What type of transformation would this cause? A possible example: If a cyber-attack against the United States results in a massive loss of data or an enormous reduction in public services, the Federal Government could conceivably mandate compliance with new regulations overnight.

As stated at the beginning of this section, predicting destructive/transformative technological change is difficult, but change is inevitable – the question is not if change will occur, but rather when it will occur. As Machiavelli said many years ago, "There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."

Appendix A

Glossary

Acceptable Use Policy: also known as TOS (Terms of Service); a contract specifying what a subscriber can and cannot do while using an ISP's service. Policy contains things like liability disclaimers, lists of actions or behavior that will result in the termination of a customer's account, definition of terms such as "unlimited use," billing policies, SPAM clauses, etc.

Access: The technology choices available by which users can connect to the public data network at the level they demand or need (dial-up, cable, DSL, ISDN, wireless, etc.)

ACS: Automated Cartridge System is a storage and retrieval system, often used for library management.

Anti-virus Software: Programs to detect and remove computer viruses. The simplest kind scans executable files and boot blocks for a list of known viruses. Others are constantly active, attempting to detect the actions of general classes of viruses. Anti-virus software must be regularly updated to be effective against the latest viruses as they are released and discovered.

Authentication: The process of verifying that an electronic identifier is correctly mapped to the person using it. Authentication may take a variety of forms and typically relies on one or more of the following:

- Something you know, such as a password;
- Something you have, such as a smartcard with a public-key certificate;
- Some personal attribute, evidenced by a retinal scan, fingerprint, or photo.

B2B (business-to-business): The exchange of products, services, or information between two or more businesses using networked technologies.

B2C (business-to-consumer): The exchange of products, services, or information between businesses and consumers over the Internet.

Bandwidth: The amount of data that can be transmitted in a given amount of time over a particular connection.

Blog: Web-based content consisting primarily of periodic articles or essays listed with the latest entry and visitor comments at the top. Blogs topics can range from personal diaries to political issues, media programs and industry analysis. Blogs are also known as "weblogs" or "web logs."

bps: Measurement of transmission speed - bits per second.

Broadband: High speed data transmission over which a single medium can carry several channels at once. DSL and cable modem service are broadband services.

Business Intelligence (BI): A broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining.

Byte: A byte is a series of 8 bits - also called a character. Computer storage space is measured in bytes. A kilobyte (1 KB) represents 1024 bytes. A megabyte (1 MB) represents 1024 KB. A gigabyte (1 GB) represents 1024 MB. A terabyte (1 TB) represents 1024 GB.

Cable modem: A device that enables a personal computer to be connected to a local cable TV line and receive and send data.

Chat Room: An online forum where people can broadcast messages to people connected to the same forum in real-time. Sometimes, these forums support audio and video communications allowing people to chat in audio and watch each other.

CIO: Chief Information Officer

CISO: Chief Information Security Officer

CMT: Curriculum Management Tool – Software written by Sinclair's Web Systems unit. The software manages all phases of curricular additions and changes.

Colleague Application/Database: The application (developed by Datatel, Inc.) used by the College for Enterprise Resource Planning (ERP). It is a collection of software programs that tie all of the various diverse functions (student services, business operations, finance, HR, etc.) into a cohesive database.

Common Address Redundancy Protocol (CARP): Its primary purpose is to allow multiple hosts on the same network segment to share an IP address. CARP works by allowing a group of hosts on the same network segment to share an IP address. This group of hosts is referred to as a redundancy group. The redundancy group is assigned an IP address that is shared among the group members.

Course Management System (CMS): See Learning Management System.

Customer Relationship Management (CRM) software: CRM entails all aspects of interaction a company has with its customer, whether it be sales or service related using tools such as help-desk software, e-mail organizers and Web development apps to personalize online experience.

Data Base Management System (DBMS): A complex set of programs that control the organization, storage and retrieval of data for many users; extensively used in business environments. Data is organized in fields, records and files. A database management system must also control the security of the database.

Data Cleansing: The act of detecting and removing and/or correcting a database's dirty data (i.e., data that is incorrect, out-of-date, redundant, incomplete, or formatted incorrectly).

Data Warehouse: A database designed specifically to support decision-making (Business Intelligence). It is a data repository which may be populated from multiple sources, including multiple transaction-oriented databases.

Dial-up access (modem): Refers to connecting to the Internet via a modem and standard telephone line. Maximum speed is 56 Kbps.

Digital Subscriber Line (DSL): A technology which enables the ordinary copper component of telephone lines to carry data at rates much higher than ISDN. Maximum speed is 8 Mbps.

Distributed computing: An industry-standard software technology for setting up and managing computing and data exchange in a system of networked computers.

Domain name: The unique name that identifies an Internet site and its address.

Domain Name System (DNS): An internet service that translates domain names into IP addresses.

DriveLock: Software that is installed on laptops that prevents the hard drive being used without knowing the password to the drive. This software protects against loss of sensitive data in the event a laptop is stolen.

Dynamic Host Configuration Protocol (DHCP): A set of rules used by communications devices such as a computer, router or network adapter to allow the device to request and obtain an IP address from a server which has a list of addresses available for assignment.

Electronic Advising: A Colleague module designed to allow students to design and review a program completion plan which can be shared with and receive approval from an academic advisor.

Electronic Business (e-Business): The transformation of key business processes through the use of Internet technologies.

Electronic Commerce (e-Commerce): Commercial and noncommercial transactions facilitated through the use of networked technologies, such as over the Worldwide Web.

Electronic Data Interchange (EDI): The transfer of data between companies using computer networks, such as the Internet.

Electronic Mail Services/System (E-mail): Any messaging system that depends on computing facilities to create, send, forward, reply to, transmit, store, hold, copy, download, display, view, read, or print computer records for purposes of asynchronous communication across computer network systems between or among individuals or groups, that is either explicitly denoted as a system for electronic mail; or is implicitly used for such purposes, including services such as electronic bulletin boards, listserves, and newsgroups.

Electronic Mailbox: A file (or folder) designated to a particular user on a particular computer in which received electronic mail messages are stored ready for the user to read them. Using the example firstname.lastname@sinclair.edu, "firstname.lastname" is the name of the user's mailbox file on the mail server.

Email Address: The string used to specify the source or destination of an electronic mail message. A typical college e-mail address format is firstname.lastname@sinclair.edu.

Email Distribution List: A distribution list is a group of recipients, all gathered under one name, or address. A distribution list allows you to send a message to all of the recipients by entering just that one address. There are two common kinds of distribution lists: Personal Distribution Lists (stored on an individual's PC) and Public Distribution Lists (server-based). See their individual definitions.

Email Record/Email Message: Any or several electronic computer records or messages created, sent, forwarded, replied to, transmitted, stored, held, copied, downloaded, displayed, viewed, read, or printed by one or several email systems or services. This definition of email records applies equally to the contents of such records and to transactional information associated with such records, such as headers, summaries, addresses, and addressees.

Email Users: Individuals who create, send, forward, reply to, transmit, store, hold, copy, download, display, view, read, or print email (with the aid of College email services). A (College) Email User is an individual who makes use of (College) email services. Receipt of email prior to actual viewing is excluded from this definition of "use" to the extent that the recipient does not have advance knowledge of the contents of the email record.

Encrypted/Encryption: Procedures using algorithms to encode or convert plain text into cipher-text to prevent any but the intended recipient from reading that data. There are many types of data encryption; they are the basis of network security.

Enterprise Resource Plan (ERP): A system that supports the planning and management of all the resources in an enterprise - a multi-module software system that supports enterprise resource planning. An ERP system typically includes a relational database and applications for managing purchasing, inventory, personnel, customer service, shipping, financial planning, and other important aspects of the business.

File Transfer Protocol (FTP): Used to transfer data from one computer to another over the Internet, or through a network. FTP is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an intranet).

Frame Relay: Used for connecting local and wide area networks - can support data transfer at T-1 and T-3 speeds.

Gigabits per second (Gbps): A measurement of the rate of speed at which data is transferred (e.g., 1 Gbps equals 1 billion bits per second).

Graphical User Interface (GUI): A computer terminal interface, such as Windows, that is based on graphics instead of text.

Information Delivery Portal (IDP): Web-based interface that enables users to view and organize analytical content such as reports prepared by using SAS statistical software.

Information Map: A grouping of data warehouse elements that have been joined and linked in a conceptually related manner that is meaningful to end users.

Information Technology (IT): The broad subject concerned with all forms of technology used to manage and process information electronically.

Infrastructure: The communication networks that connect users to a networked environment such as the Internet.

Instant Messaging (IM): A software tool that allows real-time electronic messaging or chatting. Instant messaging services use "presence awareness" indicating whether people on one's list of contacts are currently online and available to chat. Examples of IM services are AOL Instant Messenger, Yahoo! Messenger and MSN Messenger.

Integrated Services Digital Network (ISDN): A service that allows for higher data transmission speeds over telephone lines and is capable of handling at least two services over one line simultaneously (i.e., voice and fax or voice and data). Maximum speed is 128 Kbps.

Internet Authentication Service (IAS): Microsoft's implementation of a Remote Authentication Dial-in User Service (RADIUS) server and proxy with Microsoft Windows Server 2003. As a RADIUS server, IAS performs centralized connection authentication, authorization, and accounting for many types of network access including wireless and wired connectivity. IAS stores its authentication data in Active Directory.

Internet Protocol (IP): Internet Protocol is a protocol used for communicating data across a packet-switched internetwork using the Internet Protocol Suite, also referred to as TCP/IP.

Internet Service Provider (ISP): A company or organization that provides users with connectivity to the Internet.

Kilobits per second (Kbps): The rate of speed at which data is transferred (e.g., 1 Kbps equals 1,000 bits per second).

Learning Management System (LMS): A software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums. The Advanced Distributed Learning group, sponsored by the United States Department of Defense, has created a set of specifications called Shareable Content Object Reference Model (SCORM) to encourage the standardization of learning management systems.

Letter or Mail Bomb: An email message containing malicious code intended to do nefarious things to the recipient's computer or network. Also, to send, or urge others to send, massive amounts of electronic mail to a single system or person, with intent to crash or spam the recipient's system. Letter or Mail bombing is a serious offense and is not tolerated.

Lightweight Directory Access Protocol (LDAP): An online directory service protocol defined by the Internet Engineering Task Force (IETF) which is a simplification of Directory Access Protocol (DAP). An LDAP directory entry is a collection of attributes with a unique identifier, called a distinguished name (DN). The directory system is in a hierarchical structure.

List Owner: Individual(s) who establish the scope and distribution of and perform the maintenance of email distribution lists.

Listserv: An electronic mailing list software application that was originally developed in the 1980's and also known as "discussion lists." A listserv subscriber uses the listserv to send messages to all the other subscribers, who may answer in a similar fashion.

Local Area Network (LAN): A network of interconnected workstations that share the resources of a single processor or server within a relatively small geographic area, such as an office.

Mail relay server: Often referred to as an e-mail server, a device and/or program that routes an e-mail to the correct destination. Mail relays are typically used within local networks to transmit e-mail among local users.

Malicious Code: Code is a common term used to describe a set of instructions to a computer, also called program or software. Malicious code in general can be defined as "software which interferes with the normal operation of a computer system." Another general definition might be "software which executes without the express consent of the user." Common types of malicious code include viruses, Trojans, and worms.

Megabits per second (Mbps): A measurement of the rate of speed at which data is transferred (e.g., 1 Mbps equals 1 million bits per second).

Megabyte (MB): A measurement of capacity (e.g., 1 MB equals 1 million bytes).

Microsoft Outlook: The Microsoft "groupware" information management and communication software used by the college for email communication, group planning and scheduling, and contact/task management.

Mobile e-Commerce (m-Commerce): Commercial and noncommercial transactions facilitated through the use of wireless networked devices.

Online Analytical Processing (OLAP): A method of database indexing that enhances quick access to data, especially in queries calling for large quantities of data or viewing the data from many different aspects.

Online Forum: A web application where people post messages on specific topics. Forums are also known as web forums, message boards, discussion boards and discussion groups. They were predated by newsgroups and bulletin boards in the 1980's and 1990's.

Peer-to-Peer (P2P) File-Sharing: Directly sharing content like audio, video, data, software or anything in digital format between any two computers connected to the network without the need for a central server. Examples of P2P networks are Kazaa, OpenNap, Grokster, Gnutella, eDonkey and Freenet.

Personal Distribution Lists: These lists are created by individuals for their own use. Personal distribution list files are stored in the individual's Personal Address Book. Personal Address Books usually reside on the individual's hard drive (or a drive of their choice). These lists are called "Personal" as they should be created for personal (one person) use. Sinclair users are permitted to create and share the lists to facilitate group communication.

Point Of Sale (POS): The time and place in which a transaction is made. Point of sale computer systems include cash registers, optical scanners, magnetic card readers, and special terminals. Reading product tags, updating inventory, and checking credit are some of the operations performed at the point of sale.

Portlet: A portlet is a Web-based component that will process requests and generate dynamic content. The end-user would essentially see a portlet as being a specialized content area within a Web page that occupies a small window in the portal page.

Privacy policy: A statement by an organization describing the ways in which it collects, stores, and uses personal information gathered from citizens and consumers.

Project DAWN: Data Analysis Warehousing and iNtelligence (DAWN) initiative that is deploying business intelligence services to the Sinclair decision makers

Public Distribution Lists: These are created by IT staff for use by all Sinclair users. The distribution list files are stored on the Exchange Mail server. These lists are called "Public" as they are designed to be available to all users. Use of these lists is for academic and administrative purposes only as misuse wastes system resources and can affect the entire College network.

Remote Authentication Dial-in User Service (RADIUS): Multi-user client-server security protocol used in computer networks to provide remote user authentication and accounting. The RADIUS software can read several kinds of password databases and use several kinds of authentication schemes.

Return on Investment (ROI): A quantitative analysis of investment in budgets and the resulting return on the investment.

Role-based Access: After official authentication, access to Information Technology resources is granted based on the individual's role at the institution. As an example, a faculty member would have access to a totally different set of resources than a student, and a Dean might have access to a greater set of resources than an individual faculty member.

SAN: Storage Area Network is a high-speed subnetwork of shared storage devices. A storage device is a machine that contains nothing but a disk or disks for storing data.

Secure Sockets Layer (SSL): A protocol developed by Netscape for transmitting private documents via the Internet. SSL works by using a private key to encrypt data that's transferred over the SSL connection. Both Netscape Navigator and Internet Explorer support SSL, and many Web sites use the protocol to obtain confidential user information, such as credit card numbers.

Sender Policy Framework (SPF): An extension Simple Mail Transfer Protocol that stops e-mail spammers from forging the "From" fields in an e-mail. SPF is one method that can be used to stop spam from being sent using unauthorized domain names.

Server: A computer that provides some service for other computers connected to it via a network. A mail server has a drive that hosts user electronic mailboxes and receives, stores, and sends email messages via the network.

Single Sign On (SSO): A software program that accepts a single authentication transaction and brokers this transaction to provide authenticated access to multiple web or computer based services.

Social Networks: Websites promoting a "circle of friends" or "virtual communities" where participants are connected based on various social familiarities such as familial bonds, hobbies or dating interests. Examples include eHarmony, Facebook, Friendster, Linkedin, Match.com, MySpace, Plaxo and Yahoo!Groups.

Spam or Spamming: Electronic junk mail or junk newsgroup postings. Spam is generally email advertising for some product sent to a mailing list or newsgroup. Spamming is sending or transmitting these junk messages. Receipt of Spam is virtually impossible to control; Spamming to or from college email systems is strictly prohibited.

SQL Server: A relational Database Management System (DBMS) supplied by Microsoft.

SSP: Student Success Plan – Software written by Sinclair's Web Systems unit designed to serve as a customer relationship management system for "at risk" students.

Staff Person Month: A metric of cost that equates to the average of all non-management or system maintenance staff within Systems Development & Maintenance multiplied by a 1.30 weight to account for fringe benefits and divided by the total number of staff month available to perform work.

Structured Query Language (SQL - pronounced SQL or Sequel): A language used to create, maintain, and query relational databases. It is an ISO and ANSI standard. SQL uses regular English words for many of its commands, which makes it easy to use. It is often embedded within other programming languages.

T-1: Point-to-point dedicated phone line connection. Maximum speed is 1.544 Mbps.

T-3: Point-to-point dedicated phone line connection. Maximum speed is 44.7 Mbps.

Telecommunications: Refers to all types of data transmission, from voice to video.

Terabits per second (Tbps): A measurement of the rate of speed at which data is transferred (e.g., 1 Tbps equals 1 trillion bits per second).

Terabyte (TB): A measurement of capacity (e.g., 1 TB equals 1 trillion bytes).

Twitter: Twitter is a free social networking and micro-blogging service that enables its users to send and read other users' updates known as *tweets*. Tweets are text-based posts of up to 140 characters in length which are displayed on the user's profile page and delivered to other users who have subscribed to them (known as *followers*). Senders can restrict delivery to those in their circle of friends or, by default, allow anybody to access them. Users can send and receive tweets via the Twitter website, Short Message Service (SMS) or external applications. The service is free to use over the Internet, but using SMS may incur phone service provider fees.

Unidata: The database management system used for Colleague.

United States Postal Service (USPS): Commonly referred to as snail mail.

Usage: The extent to which business, government and household users utilize the Internet access and infrastructure available to them.

User Interface (UI): The means by which a user interacts with a computer. The interface includes input devices such as a keyboard, mouse, stylus, or microphone; the computer screen and what appears on it; the way commands are given, etc. With a command-line interface, only text appears on the screen, and the user must type in commands; with a graphical user interface, windows, mice, menus, and icons are used to communicate with the computer.

User Login/Logon ID: The string that, in conjunction with the password, identifies a user to the network. A typical college user ID consists of the user's first and last name separated by a period. As in "firstname.lastname".

Virtual LAN (VLAN): Method of creating independent logical networks within a physical network. Several VLANs can co-exist within such a network. This aids in network administration by separating logical segments of a LAN (like company departments) that should not exchange data using a LAN.

Virtual Private Network (VPN): A private data network using the public telecommunication infrastructure with security procedures that maintain privacy.

Virus: A program or piece of code that generally executes without the user's knowledge and runs against their wishes. Most viruses are malicious in nature and can also replicate themselves. All computer viruses are man-made and vary in degree of danger. Even a simple virus that replicates itself without actually harming system files is dangerous because it quickly uses available memory and other resources. A more dangerous type of virus is one capable of transmitting across networks and mutating to bypass security systems.

Web Content Management System (WCMS): A system or set of tools used to manage the content of a Website. Typically, a WCMS consists of two elements: the content management application and the content delivery application. The content management application allows the content manager or author, who may not know Hypertext Markup Language (HTML), to manage the creation, modification, and removal of content from a Website (via an intermediate database) without needing the expertise of a Web Developer. The delivery element uses and compiles that information along with predefined templates to generate web pages. The features of a WCMS system vary, but most include a data repository, format management, revision control, indexing, search, and retrieval.

Wide Area Network (WAN): A geographically dispersed telecommunication network.

Wiki: A web application that allows one user to add content and any other user to edit the content. The popular software used to implement this type of web collaboration is known as "Wiki." A well-known implementation is Wikipedia, an online encyclopedia.

Wireless access: A communications system in which radio-frequency or infrared waves carry a signal through the air, rather than along a wire.

World Wide Web (WWW): The system of Internet servers and users that support documents formatted in the HTML language.