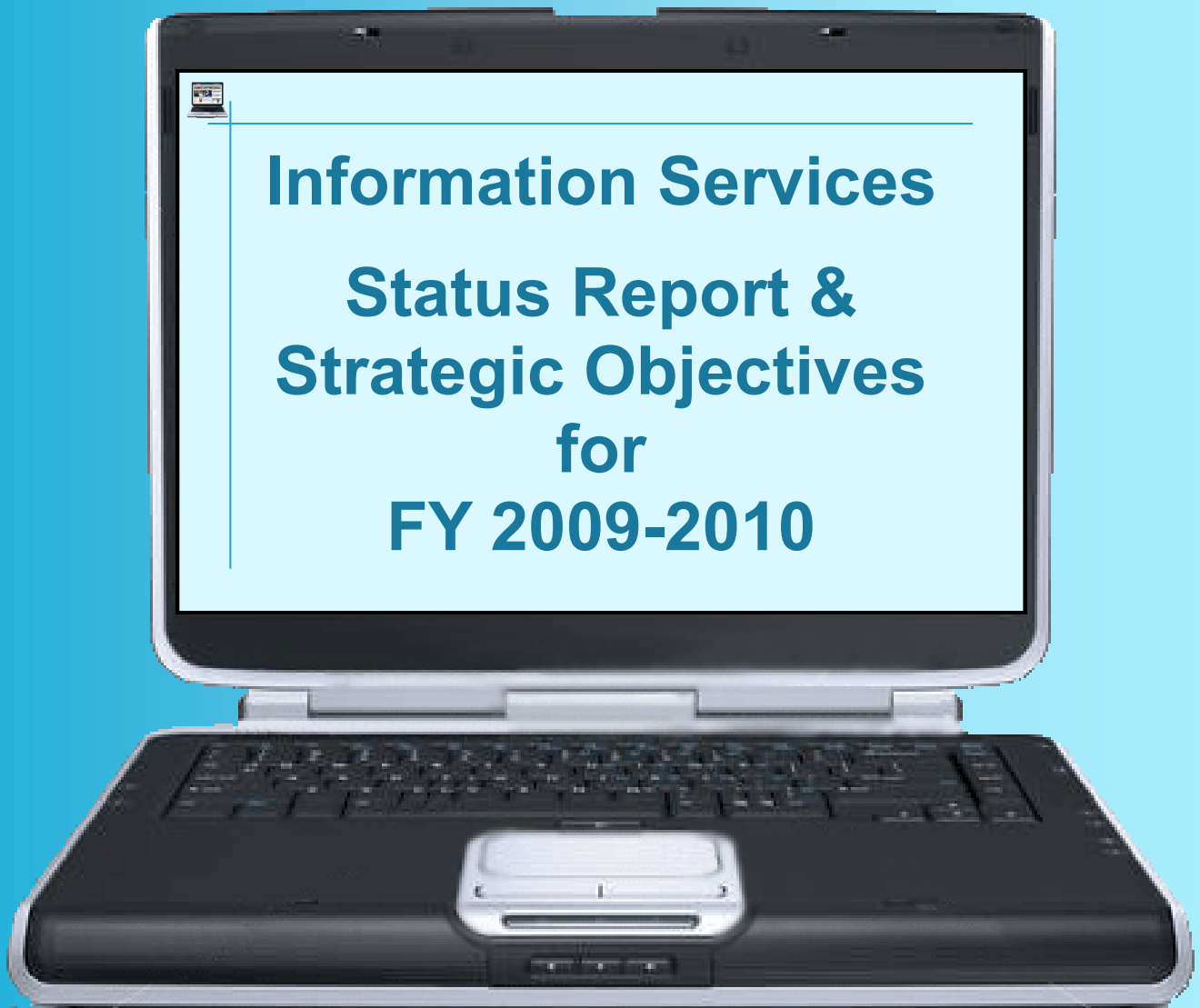# Information Services

Status Report
&
Strategic Objectives
FY 2009-2010

Information Services

Status Report & Strategic Objectives for FY 2009-2010

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Section 1

Executive Summary

Executive Summary

The primary goals of the Information Services departments are to enhance the strategic value of information and information technology tools for teaching and learning, to mange Sinclair's information and information technology resources effectively, to fully comprehend and manage the expectations of all students, faculty, and staff, to ensure fiscal discipline regarding the acquisition and utilization of information and information technology resources, and to satisfy the strategic objectives of Sinclair Community College.

This document consists of four (4) additional sections. Section 2 describes the various organizational units within Information Services including their associated areas of responsibility. They include:

- Library Services
- Systems Development & Maintenance
- Administrative Systems
- Web Systems
- Research, Analytics & Reporting
- Information Technology Services
- Technical Services
- Systems & Network Administration
- Help Desk & IT Labs
- Multimedia Services
- Network Operations Center

Section 3 provides a status report of the Major Accomplishments achieved in Information Services for FY 2008-2009, and Section 4 delineates the Major Projects (strategic objectives) planned for FY 2009-2010 as follows:

Major Accomplishments for FY 2008-2009

Library

- ☆ Data Quality & the Library
- ☆ CybraryN

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Systems Development & Maintenance

⭐ Prepare for transition to SQL database for ERP system
⭐ Requirements, RFP, and warranted implementation of Corporate software
⭐ Feasibility study and warranted implementation of document imaging
⭐ Add refinements to faculty payload process
⭐ Provide ERP support for conversion of financial aid year
⭐ Feasibility study and warranted implementation of HS transcript exchange
⭐ Continued implementation of Colleague enhancements
⭐ Feasibility study and warranted implementation of classroom podcasting
⭐ Continued implementation of web site enhancements
⭐ Feasibility study and warranted implementation of check in processes
⭐ Incorporate Colleague update capability into workflow tool
⭐ Implement selected Angel presentation software
⭐ Reassess Angel technical procedures
⭐ Feasibility study and warranted implementation of Archibus software
⭐ Feasibility study and warranted implementation of Tech-Prep database
⭐ Support for the University System of Ohio

Research, Analytics, & Reporting

⭐ Continued Maturation of the DAWN Environment
⭐ Accommodating Reporting Needs of the University System and other Federal/ State agencies
⭐ Analysis of Academic Programs from a Demand Perspective
⭐ Development of a Data Governance Board

Information Technology Services

⭐ Implement Voice over IP Phone System
⭐ Remote Application Access
⭐ Provide Expanded Access to the Internet
⭐ Pilot Classroom
⭐ VMware Infrastructure Implementation
⭐ Implement Disaster Recovery Facilities at Courseview Campus Center
⭐ Email archival and search capability
⭐ Project Lead the Way
⭐ Expand Wireless Network Access throughout Campus
⭐ Implement SAN within the Certification Lab
⭐ Create an Additional Computer Classroom in the Sinclair Center
⭐ Upgrade Bookstore Network
⭐ Improve the Usability of the Network for Non-College Owned Devices

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

- ★ System Insight Manager
- ★ Improved Remote Password Reset Procedures
- ★ Dental Hygiene Lab Multimedia Project
- ★ Upgrade Computer room air conditioning
- ★ Adobe Connect Usage and Support Procedures
- ★ Systems Vulnerability Assessment
- ★ Implement Queuing System
- ★ Provide Improved Data Archival Capability
- ★ Conversion of Videoconferencing to IP Only
- ★ College use and handling of Credit Card Information
- ★ Evaluate Network Monitoring Tools
- ★ Convert Tartan Card System to IP Communication
- ★ Room and Equipment Scheduling Software and Classroom Equipment Needs Assessments
- ★ Transition CIS lab support to ITS
- ★ Security Information Event Management
- ★ VOIP Network Preparation

Major Projects for FY 2009-2010

<u>Library</u>

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

<u>Systems Development & Maintenance</u>

- ★ 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 tool
- ★ Support Corporate & Workforce Development 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

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Research, Analytics, & Reporting

⭐ Growing Value in the DAWN environment
⭐ State/federal Reporting - monitoring and instilling required changes
⭐ Providing Major Project Support
⭐ Data Mining and Modeling

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

Section 5 presents a synopsis of Sustainability (green IT) with examples of Best Practices obtained via literary research and corresponding examples of how Sinclair is performing against those Best Practices.

Appendix A contains a glossary of terms used throughout Information Services operations.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Section 2

Introduction

Introduction

It takes an enormous effort on the part of the employees of Information Services to accomplish the goals and objectives set forth in this document, as well as meeting the day to day needs of the students, faculty, and staff of Sinclair. In the following pages are the individuals who are responsible for carrying out these activities, as well as the objectives of the individual departments and units.

Senior Vice President's Office

Figure 2-1.Senior Vice President Kenneth Moore and Executive Administrative Assistant Laurie Devol.

Dr. Kenneth Moore, Senior Vice President and Chief Information Officer for Sinclair Community College, is responsible for articulating and cultivating a clear and progressive vision for Information Technology Services, Systems Development & Maintenance, Research, Analytics & Reporting, Business Services, Public Safety, and the newly renovated Library, consistent with Sinclair's vision for learning excellence and core indicators of institutional effectiveness and the strategic plan that identifies critical performance areas and initiatives congruent with the development and growth of a learning college. The Senior Vice President is responsible for overseeing the strategic planning of these areas to guide them in the implementation of processes, procedures, and state-of-the-art technology required to fulfill Sinclair's learning-centered mission to support its students, faculty, staff, and administration.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Library

Figure 2-2. Library Director Doug Kaylor and Administrative Assistant Victoria Burchfield.

Figure 2-3. Library staff.

Sinclair's state-of-the-art Library provides an exciting mix of student friendly learning and social spaces, computers and information technology, and traditional library resources in a single facility with a unique academic ambience. It is a user-friendly environment that includes comfortable places to meet friends, quiet rooms for individual and group study, both formal and informal learning spaces, and even a cup of world famous coffee.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Library resources and services include computers, laptops, WIFI access, group study rooms, classrooms, Writing Center, Tutoring & Learning Center, individual study spaces, quiet reading room, traditional library collections, complete digital library and access to other digital information sources on the Internet, a Starbucks coffee bar and lounge area. Librarians assist students in obtaining information and using course reserves for papers, readings, and more while the I.T. computer lab staff provide friendly, expert help in using the Library's many computers and working with many different software programs.

Sinclair's Library staff also works with faculty to develop and continuously improve collections and access to digital publications, to meet curricular and accreditation needs, and to assure student access to the information resources needed to be successful learners. Students and faculty with Internet access at home or work can connect to library resources at any time, 24 hours a day, 7 days a week. In addition, because Sinclair belongs to the OhioLINK consortium, students can borrow books and videos from colleges and universities across Ohio, either online or by visiting other campuses and using the Sinclair Tartan Card as a library card. Thus, Sinclair's Library is both an outstanding facility for learning and student success as well as an extended digital library capable of supporting the college's many academic programs.

Systems Development & Maintenance

Figure 2-4. Systems Development & Maintenance Director Mike Burns and Administrative Assistant Terri Dillon.

The Systems Development & Maintenance Department is made up of the Administrative Systems and Web Systems units. Administrative Systems is responsible for maintaining the enterprise software that is used to support the student services and business offices of the college. Web Systems is responsible for

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

maintaining Sinclair's web sites, which include the Internet, Intranet, and Portal, as well as the Angel Online Learning Management System. In addition, Web Systems develops web-based, custom applications to support essential college processes such as the Curriculum Management Tool and the Student Success Plan.

Figure 2-5. Administrative Systems Manager William Dean and staff.

The Administrative Systems Unit manages software design, development, maintenance, and overall architecture of the institutional business systems to help   create the vision that defines the direction required to ensure administrative systems continue to meet the growing needs of the college.

Figure 2-6. Web Systems Manager Russ Little and staff.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The Web Systems Unit is responsible for the majority of Sinclair's online presence including managing design, development, maintenance and overall architecture of institutional Websites and web-based applications. But, Web Systems is not responsible for the content. Content is entered maintained by 200+ Sinclair employees in various departments across campus using a custom web-based content management tool designed by Web Systems. Web Systems also develops custom web-based applications to meet the needs of the college, including the award winning Student Success Plan and Curriculum Management Tool, as well as the afore mentioned content management tool.

Research, Analytics, & Reporting

Figure 2-7. Research, Analytics, & Reporting Director Joan Patten and Office Coordinator Candi Jones.

Research, Analytics, and Reporting (RAR) is responsible for maintaining Sinclair's data warehouse and its vast amount of statistical information. RAR is also responsible for analyzing this information and creating reports for various departments at Sinclair, State and Federal government agencies, and to be shared through the DAWN (Data Analysis, Warehousing, and iNtelligence) portal.

Research, Analytics and Reporting is formally divided into two units:

1) Research
2) Analytics and Reporting

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 2-8. Research Manager Laura Mercer and staff.

The Research Unit is: responsible for several facets of production including the completion of the Research Agenda (specific in-depth research projects approved by College leadership), the enrollment projection process, accreditation reporting (of the College, of departments, divisions and programs), the majority of state and federal reporting, and ad hoc data and research requests. This aspect of the department is also the primary support agent for the majority of grant-funded projects.

Figure 2-9. Analytics & Reporting Manager Karl Konsdorf and staff.

The Analytics and Reporting Unit is responsible for the development and upkeep of the data warehouse and the associated DAWN portal. This unit is responsible for developing widely-shared reports and customized reports for on-line, just-in-time

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

reporting, including benchmarking. Continued development of the warehouse includes the addition of multiple stand-alone databases and external databases to enrich the research capabilities for the College. This unit is also charged with providing end-user training for the analysis and reporting tools..

Several processes and projects are shared between Research and Analytics and Reporting. For example, instructional program review and the development of business intelligence information (often employing data mining efforts) are shared processes.

Information Technology Services

Figure 2-10. Information Technology Services Director Scott McCollum and staff.

Information Technology Services (ITS) is responsible for the development and production activities for all hardware, software, information security, and telecommunication services, as well as the support components which facilitate the effective distribution and operation of Information Technology functions. ITS is composed of the Help Desk & IT Labs, Multimedia Services, Information Security, Network Operations Center, Policies & Procedures, Systems & Network Administration, Technical Services, and Voice Telecommunications.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 2-11. Help Desk & IT Labs Manager Jeanna Reedy and staff.

The IT Help Desk Unit provides telephone support for students, faculty and staff and is the single primary point of contact for technology related issues. The IT Help Desk supports a large number of diverse support procedures which requires extensive knowledge in the areas of information technology hardware and applications software, as well as the ability to assist all levels of users in using these technology resources.

IT Labs provides in-person support for students with software applications and coordination and support of IT classrooms for faculty and staff to ensure technology resources are available.

Figure 2-12. Technical Services Manager Donna Blankenship and staff.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The Technical Services Unit is responsible for network operations systems and desktop computer support both on and off campus. Technical Services provides hardware and software support, upgrades of operating software, and installation of new PCs for all the on-campus labs, administrative offices, and off-campus distance learning labs. Technical Services maintains an equipment inventory database for monitoring the location and use of computers, monitors, and printers.

Figure 2-13. Systems & Network Administration Manager David Krasofsky and staff.

The Systems and Network Administration Unit is responsible for the technical administration and support of the college network infrastructure and other college-wide information systems, and coordinating all operating systems, local area network, wide area network, and remote network activities. The team is also responsible for supporting all IT functions at Miami Valley Research Park, Englewood Learning Center, Huber Heights Learning Center, and the Sinclair Community College Courseview Campus Center.

Figure 2-14. Network Operations Center Manager Bob Gutendorf and staff.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The Network Operations Center (NOC) Unit is responsible for monitoring, alerting, and acting upon incidents that may potentially impact infrastructure, application, and business process availability and performance, and monitoring and maintaining servers, network devices, and VOIP equipment at all of Sinclair's Campuses. The NOC is able to correlate and manage all components of Sinclair's IT infrastructure by utilizing HP Operations Manager, Network Node Manager, and Veritas Netbackup.

Figure 2-15. Multimedia Services Manager Suzanna Smith and staff.

The Multimedia Services Unit is responsible for providing instructional media support for internal and external customers of Sinclair Community College. Multimedia Services provides technical support for desktop and classroom videoconferencing, conference center and campus events and for other multimedia systems and classrooms for all Sinclair campuses.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

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**Section 3
Major
Accomplishments**
for
FY 2008-2009

Major Accomplishments for FY 2008-2009

A wide variety of projects were in process or started during FY 2008-2009. Several were cancelled due to the emergence of more effective technologies or alternative methods to achieve the same end result and a few will continue into FY 2009-2010. Many of those completed provide innovative processes for students, faculty, and staff. This section describes many of the more significant project accomplishments. Each project title has associated with it a color coded object to reflect the Sinclair Strategic Priority supported. These priorities are shown at the bottom of each page.

Library

Following are the major accomplishments for FY 2008-2009 for the Library:

☆ Data Quality & the Library
☆ CybraryN

☆ Data Quality & the Library

The Library catalog is a specialized database that identifies information resources owned and leased by Sinclair. It serves as a finding aid for students and faculty and an inventory control system for the college. Data from this system is made available to Sinclair students and faculty, the Greater Dayton community, the OhioLINK consortium of Ohio colleges and universities, and the broader library community that includes public and school libraries in Ohio and around the world. The Sinclair Library catalog is housed on a server on the college campus, and data records are shared with the OhioLINK system in Columbus. In addition, cataloging data and holdings information are both taken from and filed to another library system known as OCLC. OCLC is an international cataloging utility service used by over 60,000 libraries around the world with 100 million data records representing a billion items. It is an essential player in interlibrary lending and local database record creation and maintenance.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-1. Illustration of interface between Sinclair Community College, OhioLINK, and OCLC.

As the Sinclair Library conducted a comprehensive review of its book, media, and journal collections this year, adding new materials as appropriate and eliminating outdated and out-of-scope materials when necessary, one significant activity librarians performed was to reconcile the library catalog with the actual physical collections. This was a time consuming process involving physical handling of thousands of items and corresponding changes to three database systems.

Librarians and faculty consulted on what materials should be kept in the Library collection. Once that decision was made, materials to be withdrawn were removed from the shelves and boxed for surplus or recycling. The Sinclair catalog records were corrected to reflect each item withdrawn. Finally, this updated information was shared with OhioLINK and OCLC in order to complete the cycle and achieve quality records in all three systems.

Qualitative/Quantitative Return on Investment: Sinclair realizes significant benefits from being able to find and borrow books, videos, and journals from OhioLINK and other OCLC member libraries. From an academic perspective, the correct information is placed in the hands of the student or faculty member in a timely manner in order to facilitate learning. From the college perspective, resource sharing of expensive scholarly books saves money. Sinclair does not have to purchase, for example, the 6000 plus books borrowed from OhioLINK each year.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-2. Library catalog page illustrating title, locations, and availability status.

Cost savings/Cost avoidance: Accurate records save everyone time. The student and faculty member can find out what is immediately available and what they can retrieve from other libraries. Library staff do not waste time, based on inaccurate data, searching the shelves for materials that are not there. In addition, the Library earned $900 in credits from OCLC for updating ownership status in the database and for participating in Inter Library Loan resource sharing with non-OhioLINK libraries. This credit will apply to future catalog costs.

Target Completion Date: June 2009

Actual Completion date: The review of journals (magazines and newspapers) and legacy audiovisual materials review was completed in April 2009 and over 29,000 items were removed from the shelves and catalog records updated to reflect accurate holdings. The quality of catalog records for books is accurate, and it is anticipated that catalog data quality will be maintained as the faculty continues to review and weed books.

☆ CybraryN

The purpose of this project was to implement CybraryN, a PC waiting list management application in the Sinclair Library. CybraryN was purchased to improve services in the Library by providing fair and equitable distribution of computers to patrons. There are

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

three different entrances to the Library and it was difficult for patrons to see what computers were being used. A patron could wander around trying to find a computer, while another patron walked in and found an open station immediately.

The goal was to distribute the Library's computer resources equitably to all Library patrons with as little assistance from staff as possible, and to allow patrons to choose specific PC stations with different software such as ADA software or Nursing software. This necessitated a self service system that could allow patrons to use the computers on a first come first serve basis and separate the specialized computers in the Library. CybraryN met these criteria.
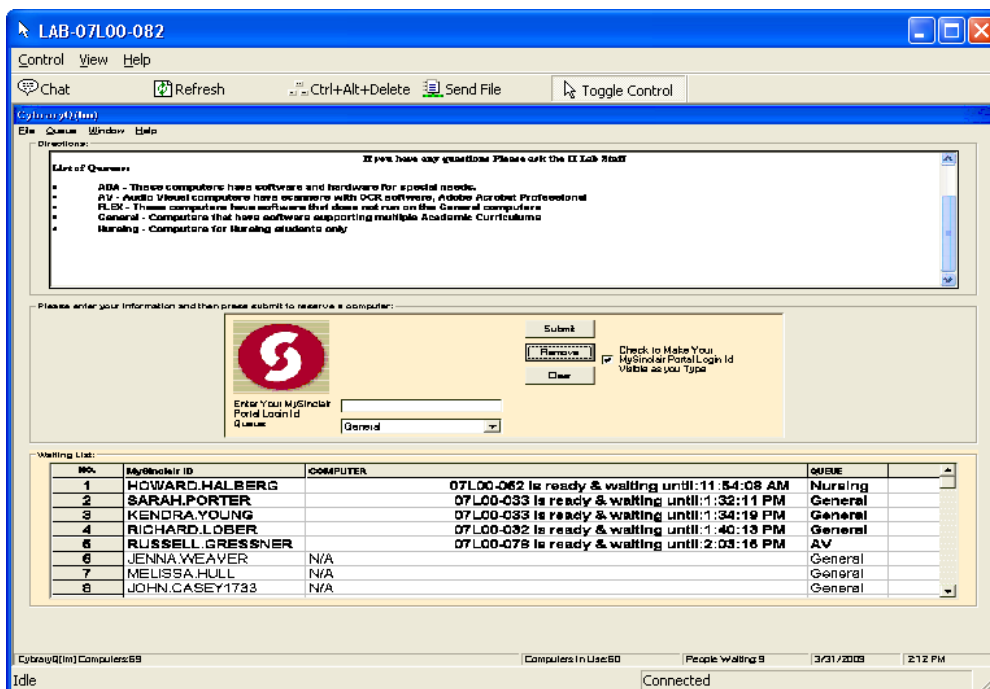
Figure 3-3. The CybraryN login screen.

Qualitative/Quantitative Return on Investment: Fair allocation of computers provides resources to students that need them.

Cost savings/Cost avoidance identified with the project: Less intervention from staff helping students find an open computer allows the staff to provide the support that they are hired for. This allows higher levels of service to be provided without adding staff.

Target Completion Date: September 2008

Actual Completion Date: August 2008

Systems Development & Maintenance

Following are the Major Accomplishments for FY 2008-2009 for Systems Development and Maintenance:

⭐ Prepare for transition to SQL database for ERP system
⭐ Requirements, RFP, and warranted implementation of Corporate software
⭐ Feasibility study and warranted implementation of document imaging
⭐ Add refinements to faculty payload process
⭐ Provide ERP support for conversion of financial aid year
⭐ Feasibility study and warranted implementation of HS transcript exchange
⭐ Continued implementation of Colleague enhancements
⭐ Feasibility study and warranted implementation of classroom podcasting
⭐ Continued implementation of web site enhancements
⭐ Feasibility study and warranted implementation of check in processes
⭐ Incorporate Colleague update capability into workflow tool
⭐ Implement selected Angel presentation software
⭐ Reassess Angel technical procedures
⭐ Feasibility study and warranted implementation of Archibus software
⭐ Feasibility study and warranted implementation of Tech-Prep database
⭐ Support for the University System of Ohio

⭐ Prepare for transition to SQL database for ERP system

This activity was a multi-part project that looked both at the conversion of the college's existing ERP system to a SQL database and examined the feasibility of converting the campus ERP system to one specifically designed to run on a SQL database. Both project components were motivated by a desire to provide Sinclair with a modern, robust, and easily integrated data structure that would link seamlessly with all of the college's programming and information technology support structures.

The first part of the project was accomplished by gathering database conversion information from the college's current ERP vendor and subjecting this information to a cost benefit analysis. This analysis led to the conclusion that there was little benefit in attempting to convert the existing ERP to a SQL database. The current ERP system is designed in such a way that the SQL database can only be added on top of the existing Unidata database management software; thus, the move to SQL is more of a cosmetic change rather than a structural enhancement that supports the inherent strengths of SQL. In addition, the conversion of the existing ERP to SQL necessitated entering into an expensive conversion contract with the vendor. The minimal gains of this approach did not warrant the large financial outlays that the conversion would require.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-4. SQL server license.

Even though there is little benefit to transitioning the current ERP to SQL, the analysis of this option did serve to support and reinforce ongoing efforts to replicate existing ERP data in Sinclair's data warehouse. Data warehousing efforts have been ongoing for several years, and these efforts have resulted in approximately 80% of the data in the college's ERP system now being replicated in a SQL-based data warehouse. Consequently, one outcome from this phase of the project has been to accelerate the pace of converting ERP data to the data warehouse.

The second phase of this project was accomplished by conducting a comprehensive analysis of the SQL-based ERP system available from Campus Management Corporation (CMC). CMC was selected for analysis because the ERP is known to make use of service-oriented-architecture (SOA) principles. These principles allow data to be made available as a service to multiple programs, and thus, the design supports both vendor-specific and third-party access to data. This feature is of particular importance to Sinclair as we continue to develop in-house applications that leverage information from multiple data sources.
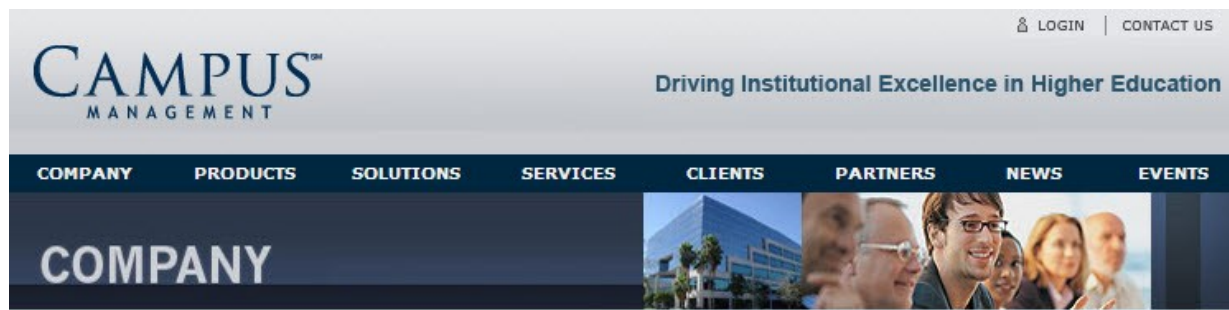
Figure 3-5. Campus Management home page.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Arrangements were made with CMC for Sinclair to have access to a test instance of their software located at a CMC hosted site. Sinclair paid for training and setup required to make this hosted software look and feel like Sinclair's actual data. CMC waived hosting fees in exchange for Sinclair providing CMC with a comprehensive analysis of how the software functioned within a non-for-profit, comprehensive community college setting.

Reaction to the CMC product by Sinclair staff was mixed. Those evaluating the technical components of the software were satisfied that the data structure would provide the type of access needed in the future to develop student-facing applications that were responsive to changes in student's expectations and communication preferences. Those evaluating the existing functionality of the ERP solution for general ledger, payroll, accounts receivable/payable, and purchasing did not see the software offering any especially unique advantages. Those evaluating the software from a student services/registration/advising perspective were extremely impressed with the manner in which the software leads students to follow their identified program path. This latter feature was seen as particularly valuable during Sinclair's potential conversion from quarters to semesters. If the quarters to semesters conversion occurs, all students will need academic planning tools that keep them on track to reach their program completion goals.

Training of staff will be required for the conversion to a SQL database, regardless of whether this conversion is accomplished with the existing or a new ERP system. As part of this project, a SQL training plan was developed and separate levels of SQL knowledge expertise were identified. This plan is available for implementation if a decision is made to transition to SQL.

Qualitative/Quantitative Return on Investment: The primary benefit of moving to a SQL database for the college's ERP system is the flexibility this move would provide for future linkage with third party or in-house-developed software. SQL is an industry standard, and is designed to serve multiple software development platforms.

Cost savings/Cost avoidance: One of the primary reasons for not making the move to SQL at this time is the additional costs that this move would generate. The ROI of a SQL move can only be realized if it is done in conjunction with a change in the College's ERP system. Such a change was not undertaken during FY2008-2009.

Target Completion Date: June 2009

Actual Completion Date: January 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

★ Requirements, RFP, and warranted implementation of Software system for Workforce Development & Corporate Services Division

This project called for the analysis of several software solutions to address varying needs of the college's Workforce Development and Corporate Services Division. Software is needed to improve the support for the corporate services activities of event management/scheduling, registration for continuing education events, and financial management/reporting.

A committee was established to evaluate event management/scheduling software. The committee was made up of members from corporate services; media support services, and information technology. During this plan year the committee evaluated two prominent event management/scheduling software systems. As of the writing of this report, the committee is interviewing users of these products, with the goal of making a recommendation for purchase as part of the FY 2009-2010 budget cycle.

The search for software to support continuing education registration started with an analysis of the features included in the CMC ERP solution referenced earlier in this report. This ERP software offered promise for those situations where participants in the continuing education activity had a previously established relationship with the college. However, when the training was being offered to individuals new to the college, the software's requirement for admission to a program was too much of an impediment to barrier-free access that is required in the corporate training environment. As of the writing of this report, the college is evaluating different software that does not require prior admission for event participants. If this evaluation demonstrates that the software can meet the needs of corporate services, funding will be sought for implementation during FY 2009-2010.

Figure 3-6. Talisma is one example of event management software evaluated.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The third component of this project, evaluating fiscal/reporting software, was accomplished concurrent with the two project components previously described. The evaluation of event management and continuing education software included an analysis of how the software tracked event costs and resources and how this tracking was aggregated either within the software itself or as an extract that is made available to standard accounting software such as Quickbooks and Excel. Actual implementation of this software component would be a sub-activity of implementing the event management and/or continuing education registration software during FY 2009-2010.

Qualitative/Quantitative Return on Investment: Sinclair's Workforce Development & Corporate Services Division has the goal of quadrupling its revenue in the next three to five years. A goal of $12,000,000 revenue has been set for the end of this period. An integrated and flexible software system is an essential component supporting the attainment of this goal.

Cost savings/Cost avoidance: Workforce Development & Corporate Services currently has a paper-based event management system, uses off-the-shelf small business accounting software, and employs a manual, multi-step process to enroll participants in continuing education offerings. In addition to an improved client-facing presentation of offerings and services, an integrated and flexible software system would eliminate the manual rework that is currently required to exchange information between corporate services' various business processes.

Target Completion Date: December 2008

Actual Completion Date: June 2009

☆ Feasibility study and warranted implementation of document imaging

This project builds upon an earlier project that had evaluated the process time savings that could be realized by implementing a campus-wide document imaging solution. This project extends the previous study by quantifying the savings that document imaging may have for specific processes within various areas of the College. In addition to process time savings, this analysis identified space and consumable resource savings that a document imaging solution might generate.

The enhanced study was completed by a consultant contracted through the Senior Vice President/CIO's office. The consultant worked with staff from various departments to quantify the time, consumables, and space devoted to selected paper-intensive processes. The consultant delivered a report estimating document imaging implementation costs and a projected return on investment. This report was given to the respective Senior Vice Presidents/Vice Presidents for review and disposition.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Note: It should be noted that document imaging is not an Information Technology function, but rather a college-wide process for storage and retrieval of institutional documents.

Qualitative/Quantitative Return on Investment: The findings of this study indicated that Sinclair could save approximately 7,000 hours per year of staff time that could be repurposed to address other important projects. Additionally, if implemented properly, document imaging would provide better service to students and facilitate inter-site coordination.

Cost savings/Cost avoidance: The savings to Sinclair each year in the four functions included in the study (Registrar, Financial Aid, Human Resources, and Purchasing) is estimated to be $140,000. However, the cost of hardware, software, implementation, and training is estimated to be $250,000-$300,000. Therefore, the breakeven point is in the 2-2 ½ year range.

Target Completion Date: June 2009

Actual Completion Date: December 2008
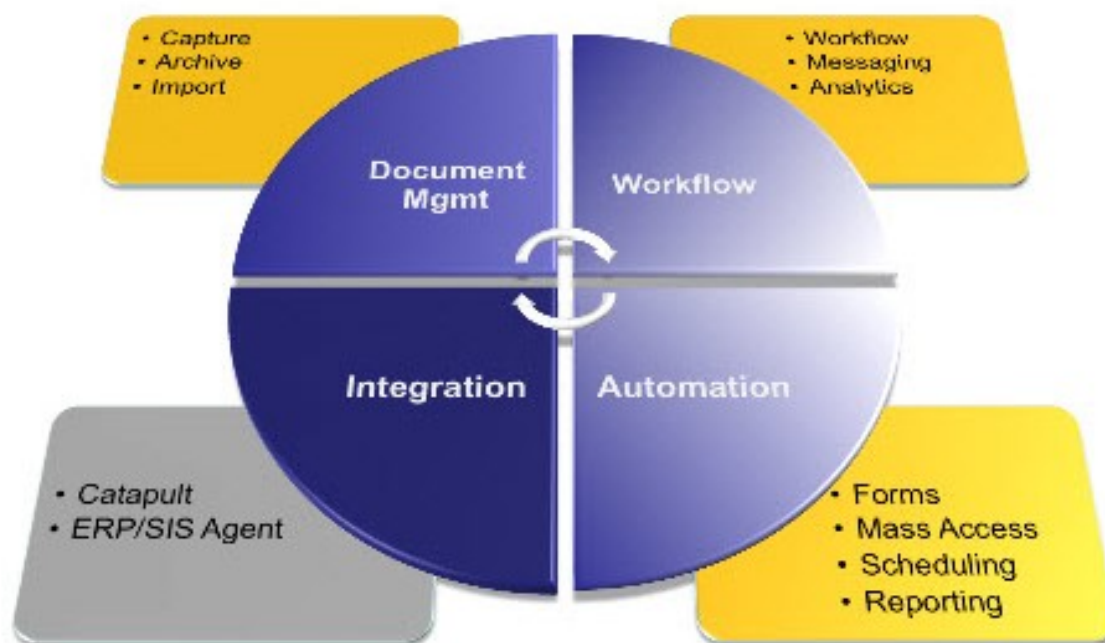
Figure 3-7. Diagram of steps in a document imaging process and the work performed for each step.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Add refinements to faculty payload process

During FY 2007-2008, software was developed to streamline and centralize the manner in which academic chairs recorded faculty payload information. The previous project allowed payload information to be captured in a central database that could be used to generate payroll transactions and workload analyses. The current project called for adding refinements to the software to improve data integrity and reporting utility.

The following refinements were added to the software during this fiscal year:

- The software's single data entry screen was divided into two screens, one for entry of full-time faculty information and the other for entry of part-time faculty data. This separation allowed screen features to be tailored to the unique data entry requirements of each group.

- Data integrity features were added to data entry screens to limit the free-form entry of some faculty assignment information.

- Fields were added to the entry screens to show the last date of update and the last person performing the update.

- A year-to-date, total-teaching-load field was added to each screen.

- A lookup feature was added to assure that general ledger account numbers are properly formatted.

Figure 3-8. Data entry screen for the Faculty Payload system.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Qualitative/Quantitative Return on Investment: Close to 80% of Sinclair's budget is allocated to personnel expense, the large majority of which is expended for instructional personnel. The faculty payload system allows for the centralized collection of information on how these resources are assigned and allocated across all of the College's academic units. The system has become the primary data collection point for tracking instructional personnel expenses at the course, department, and academic division levels.

Cost savings/Cost avoidance: The data integrity and data entry improvements made to the faculty payload system during FY 2008-2009 have resulted in greater accuracy of recorded data, which in turn has improved reporting precision. These improvements have removed the need for much of the data cleansing rework that was previously required.

Target Completion Date: September 2008

Actual Completion Date: February 2009

☆ <u>Provide ERP support for conversion of financial aid year</u>

Sinclair currently begins its federal financial aid year with the summer term. While advantageous for students who wish to begin their programs of study early, this schedule can be problematic for students who attend more than three quarters within one financial aid year. A summer-trailing financial aid year is more advantageous for this category of student.

Systems Development and Maintenance staff met with Financial Aid staff in the summer of 2008 to begin planning for the transition from a summer-leading to summer-trailing federal financial aid year. This initial planning focused on techniques that might be used to accommodate students who would have five quarters of financial need during the transition year. No specific recommendations were developed at that time.

Very soon after this initial planning session, Sinclair began active planning for converting from a quarter to a semester academic calendar. As a result, financial aid decided to postpone the conversion of the federal financial aid year so that the conversion could be accomplished concurrent with the quarters to semester transition. Consequently, this project has been put on hold until such time that the quarters to semesters process is started.

Qualitative/Quantitative Return on Investment: Not applicable.

Cost savings/Cost avoidance: Not applicable.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Target Completion Date: March 2009

Actual Completion Date: Not applicable, project has been put on hold.

☆ Feasibility study and warranted implementation of HS transcript exchange

The focus of this particular project has been modified since first envisioned. During consultation with the college registrar, she advised that it would be more advantageous if project resources could be used to provide support to various high-school linkage projects as opposed to providing an electronic means of uploading high-school transcripts. High-school transcripts are not required for admission to Sinclair, but identification of high-school linkage activity is essential to Sinclair's ability to provide quality service to students participating in these programs.

Figure 3-9 Area of class roster where high-school linkage information is listed.

Thus, project resources were redirected toward providing technology support for various high-school linkage activities. Specifically, support was provided for the seniors-to-sophomores and Advance College Entry (ACE) programs. Services were improved by modifying class rosters to show participation in these programs. These class roster designations allow faculty to be cognizant of any specialized attention that students participating in high-school linkage programs may require.

Qualitative/Quantitative Return on Investment: It is a well-documented research finding that increased personalized attention will result in higher levels of student persistence in reaching academic goals. The class roster enhancements implemented in this project enable faculty to customize instructional efforts to the unique needs of these populations of students. This specialized attention should result in higher levels of student persistence.

Cost savings/Cost avoidance: The programming that was written to place the student designations on the class roster was designed in such a way that the code can be reused for any future class roster designator that may be required. Consequently, there will be no software development costs for subsequent uses of this feature.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Target Completion Date: May 2009

Actual Completion Date: September 2008

☆ Continued implementation of Colleague enhancements

This was a multi-faceted project that focused on the continuous improvement of the college ERP system. The following list represents some of the major ERP enhancements that were implemented during this fiscal year:

- Since its inception during FY 2003-2004, the use of web-registration has steadily increased, and the use of telephone registration has steadily decreased. By fall 2008, telephone registration had fallen to 2% of total registration transactions, and the decision was made to discontinue support for this mode of registration. This decommissioning took place in November 2008 and resulted in the redirection of 48 ERP licenses from telephone registration support to web-registration support.
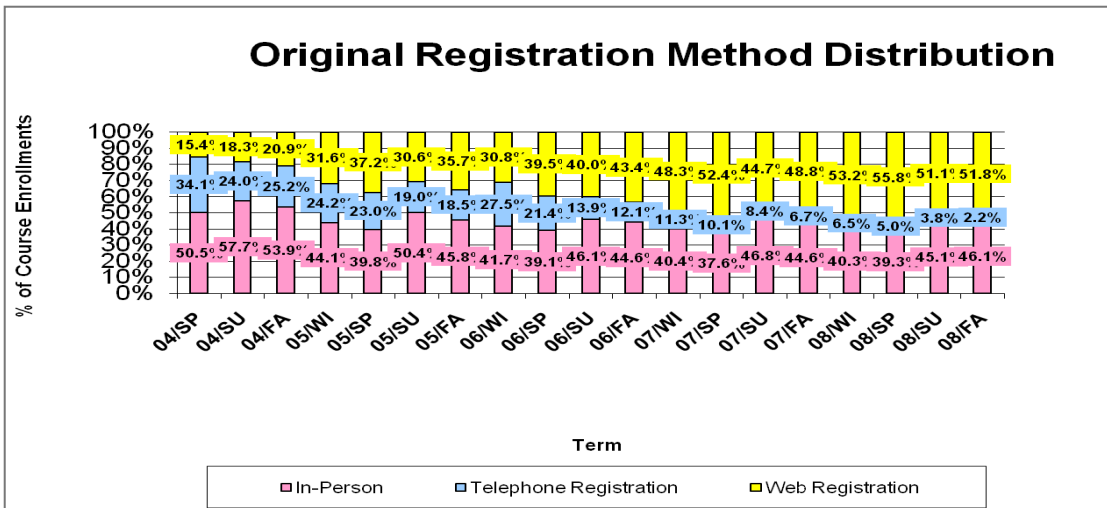
Figure 3-10. Distribution of registration methods.

- During the college's annual IT audit, conducted in summer 2008, the auditors recommended that the college implement a more frequent test of the media used during the daily backup of the ERP system. In response to this recommendation, a system was put in place to use backup media whenever there was a need to refresh data in the ERP's test and development environments. This refresh process had previously been accomplished by copying information directly from the production environment to these support

environments. With this change in procedure the auditor's recommendation has been addressed and the downtime for the production environment has been decreased because production no longer needs to be taken offline to accomplish the copy process.

- The college ERP software supporting the bursar's office has been modified to allow students to make partial payments against their account balances.

- The system that controls the college's Tartan-Card transactions has been upgraded, and the operating system has been changed from Unix to Windows, which will substantially reduce future maintenance and support costs.

- The system that connects the bookstore's point of sale system with the ERP system has been upgraded. This upgrade changed the communication protocol between the two systems to allow for multiple simultaneous connections between systems.

Qualitative/Quantitative Return on Investment: These enhancements have resulted in several qualitative and/or quantitative benefits. The partial payment option has allowed students to spread tuition and fee payments over a longer period of time thus reducing the initial barrier to entry imposed by a single payment system. The transfer of under-used telephone registration licenses to the heavily-used web registration process has significantly improved the responsiveness of web registration. The number of communication failures between the bookstore point-of-sale system and the ERP's financial aid system has been reduced by 40%.

Cost savings/Cost avoidance: The decommissioning of the telephone registration system resulted in $50,000 cost avoidance by removing this system from the college's equipment replacement schedule.

Target Completion Date: March 2009

Actual Completion Date: February 2009

☆ Feasibility study and warranted implementation of class room podcasting

Discussions have been held with distance learning staff to identify technical solutions that could be used to support classroom podcasting. The technical challenges have been evaluated, and it is clear that Sinclair has the technical structures in place to support podcast activity. Specific solutions provided by iTunes University and open source software have been examined. Web Systems is poised to support podcasting as faculty seek access to this instructional tool.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Qualitative/Quantitative Return on Investment: The primary benefit of pod-casting is the flexibility this delivery method provides to students. Course presentations become portable with this technology, and students can access course content on their own schedules using devices of their own choice.

Cost savings/Cost avoidance: There is no demonstrable cost savings from this project at this time since the pod-casting features have yet to be adopted within any specific course offering.

Target Completion Date: December 2008

Actual Completion Date: December 2008

☆ Continued implementation of web site enhancements

This project was driven primarily by needs identified by the Marketing group. During this plan year, most of these needs involved small modifications and refinements to the changes that came about from the complete rewrite of the www.sinclair.edu website accomplished during FY 2007-2008. Changes requested by Marketing focused primarily on modifications to access and design rights.
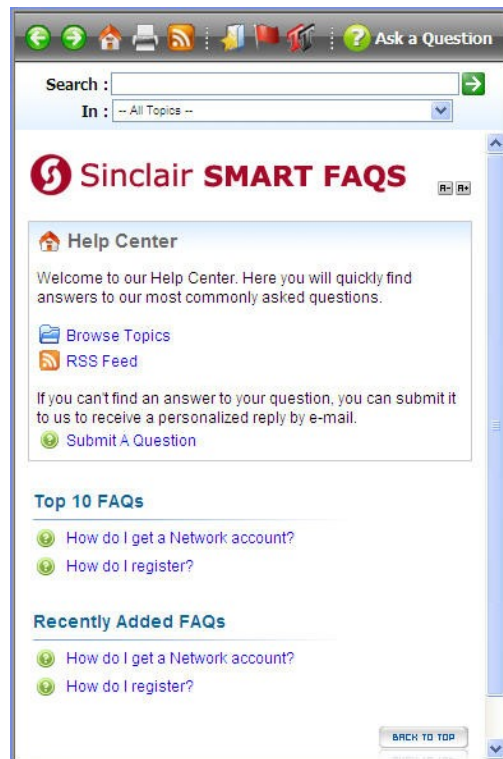
Figure 3-11. Sinclair's online knowledge base.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Chat and knowledge-base features were added during this fiscal year. The chat feature was implemented as a pilot and is being used by call center staff, following guidelines provided by Marketing. The knowledge-base feature is installed and the supporting database is being developed by representatives from the call center, the help-desk, distance learning, advising, and admissions. Once developed, website users will be able to access the knowledge-base system for frequently asked questions and for short tutorials/learning guides on how to accomplish business processes such as registering for classes and paying fees.

Qualitative/Quantitative Return on Investment: The purpose of chat and knowledge-base systems is to improve the quality of the constituent's interaction with Sinclair. Chat allows Sinclair to project a cost-effective, personal touch in response to each constituent's real-time questions. Knowledge-base allows constituents to employ a self-service approach for answers to frequently asked questions.

Cost savings/Cost avoidance: Every web-based inquiry that can be answered via a knowledge-base system is one less answer that needs to be handled by real-time staff. Over time, a robust knowledge-base system will slow the staff growth rates for services such as Sinclair's help desk and call center.

Target Completion Date: June 2009

Actual Completion Date: November 2008

☆ <u>Feasibility study and warranted development of a Test Management System</u>

Sinclair offers a testing center service for faculty and students. This service allows faculty to submit tests for the center to administer to faculty-identified students. In the mid 1990's the center contracted with a third-party vendor to develop software to monitor which faculty are submitting tests and which students have been identified to receive these tests. During the intervening years the software has not been updated nor supported. The company that developed the software has gone out of business. The software is now inadequate to respond to the explosive growth in distance learning and the need for offsite test administration which this growth requires.

This project involved developing software to replace and improve the current program. A new, web-based application was developed that allows faculty to submit their requests for testing center services using any web browser. The application is designed to let the testing center reject requests if not properly submitted. The application allows faculty to monitor which of their students have taken tests and at

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

what time and location. Most importantly, the system can be accessed and used at any site where assessment is required – high school academic resource centers, learning centers, and proctored exam sites located worldwide.

Figure 3-12. Screen shot of the newly developed Test Management System for Sinclair's Testing Center.

By the end of FY 2008-2009, the software will be in pilot use within the Sinclair testing center, and plans will be in place for full implementation of the software throughout campus and at offsite locations during fall term 2009.

Qualitative/Quantitative Return on Investment: The testing center's new check-in system has greatly expanded the flexibility of service that the center can provide. Because the system is web-based, faculty no longer need to be on-campus to submit tests to the center. Faculty can perform real-time look-ups to determine which students have completed tests, and the testing center can extend its services seamlessly to external sites such as the Courseview, Englewood, and Huber Heights learning centers.

Cost savings/Cost avoidance: In the mid 1990's, the testing center paid close to $60,000 to an outside vendor to create a check-in system. In today's dollars, this cost would be well in excess of $100,000. This outlay has been avoided by using internal resources to design and produce the new software.

Target Completion Date: October 2008

Actual Completion Date: June 2009

| Student Success | Work Force Development | Downtown Campus Development | Increased Regional Access | Expanded High School Linkages | Partnerships | Alternative Sources of Funding | Quality Workplace & Quality Workforce |

☆ Incorporate Colleague update capability into workflow tool

Initial plans called for data collected from workflow processes to be directly sent into the college's ERP database. The plans also anticipated that this direct data linkage would have the highest value if applied to the employee leave request workflow. However, after reviewing the complexity of the ERP system's data structure and the software code within the ERP that depended upon this complex structure, it was determined that an automatic, direct data linkage would incur too great a risk of corrupting ERP data. Consequently, this project was refocused to concentrate on the development of tools that improve the workflow-ERP data link without actually automatically loading data into the ERP system.

Two specific workflows were developed. The first workflow involved creating custom forms for the submission of capital budget requests. Once submitted, the workflow routed a request to the appropriate approving authority, and once the approval step(s) were completed, the forms were aggregated within the budget office in a format that expedited data entry into the ERP budget module.

The second workflow focused on the College's leave request process. Workflows were developed that allowed employees to create and submit leave requests using an online process. These requests were routed to the designated approving office, and once approved and forwarded to human resources, reports were generated in a format that expedited data entry into the ERP payroll module.

Qualitative/Quantitative Return on Investment: The primary benefit of using the workflow tool for processing leave requests is the paperwork reduction that will result. The Human Resources office processes thousands of leave request papers each year. Each of these papers has been carried through at least two other offices prior to reaching HR. All of this paper is eliminated when the work flow tool is used, and HR is relieved of the need to organize and process thousands of documents. Instead, the information previously scattered through individual documents is now aggregated in a concise report designed to expedite quick data entry into the College's ERP system.

Cost savings/Cost avoidance: When a similar workflow was put in place a few years ago to process requests for duplicating services, there was a documented 600 hour reduction in staff time needed to process requests. The leave request workflow would impact a much larger number of users and can conservatively be estimated to result in a five to six fold increase in the savings realized from implementing the duplicating workflow.

Target Completion Date: December 2008

Actual Completion Date: June 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Implement selected Angel presentation software

A committee from the instructional and information technology areas evaluated several video presentation formats that could potentially be used with the College's learning management system, Angel. After extensive study and comparison of features, the committee settled upon the Adobe Connect desktop conferencing solution.

After settling upon a specific product, the committee then put together an implementation plan that would culminate in making this presentation software available to all Angel users. Dedicated internet bandwidth was purchased using funds available from a National Science Foundation grant. In winter and spring terms 2009, a pilot group of faculty and staff used the software, and plans are in place to have a full rollout of the software to all Angel users in fall term 2009.
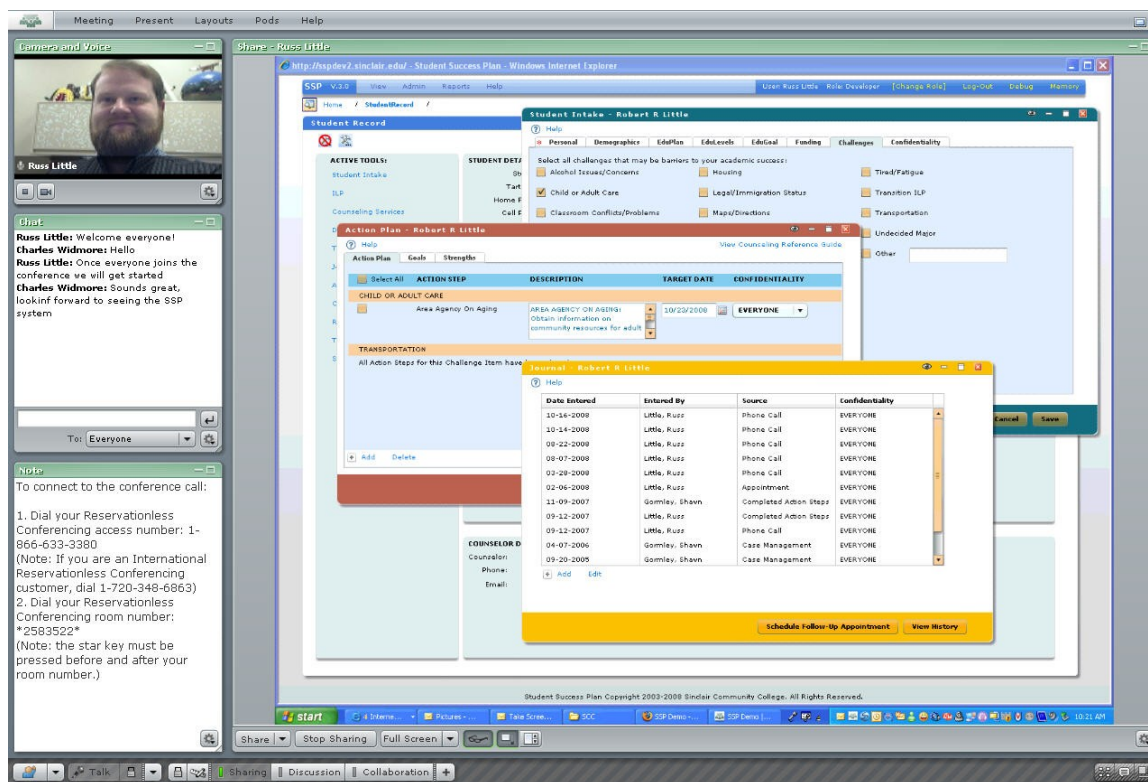
Figure 3-13. A Sinclair staff member using the Adobe Connect software to give a demonstration to clients located across country.

Qualitative/Quantitative Return on Investment: The most important qualitative benefit of incorporating presentation software within the Angel LMS is that it allows the benefits of face-to-face instruction to be extended to distance learning students. Using Adobe Connect, students in geographically dispersed locations can set up real-time, multi-member groups who can engage in collaborative learning.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Cost savings/Cost avoidance: The decision to use Adobe Connect as the Angel presentation software avoided at least a $100,000 expenditure. Every alternative product that was evaluated had a minimum license cost of $100,000. Since Sinclair had purchased a site license for Adobe Connect several years ago at a cost of $25,000, the College was exempt from Adobe's new licensing model which would have been in excess of $250,000.

Target Completion Date: April 2009

Actual Completion Date: June 2009

☆ <u>Reassess Angel technical procedures</u>

Angel is the name of the learning management system (LMS) used by Sinclair faculty and students. In fall 2008, there were over 3000 course sections per term loaded into the Angel LMS. The LMS was used by faculty both as a means of enhancing classroom instruction and as the instructional delivery method for distance learning courses.

This project focused on improving behind-the-scenes support mechanisms to assure that faculty and staff had reliable access to this critical instructional tool. Most project efforts have focused upon the development of metrics and models that can be used to troubleshoot real-time system performance and to forecast future points at which system capacity will be exceeded.

As a result of developed metrics and models, several pro-active support actions have been taken. The Angel usage model indicates that at projected growth rates, usage will exceed capacity for the current Angel database server during winter term 2010. Consequently, replacement of this server has been included as part of the FY2009-2010 budget planning. Additionally, metrics of early-term usage indicate that demand on the Angel LMS peaks at the beginning of a term and falls back to a steady state during the remainder of the term. In response to this usage pattern, two virtual web servers have been configured which can be dynamically engaged during peak usage period.

A next step in this project will be to develop a diagnostic dashboard that can be used to assess Angel performance in real-time. Approximately 60 potential diagnostic data points have been identified, and work is currently underway to assess which elements should be included in a monitoring dashboard. Once in place, this dashboard will be a primary tool used by both technicians and help-desk personnel as they respond to real-time system performance issues.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Qualitative/Quantitative Return on Investment: One of Sinclair's top strategic initiatives for the coming years is to grow distance education enrollment by 100%. The Angel LMS is the foundation upon which distance education offerings are built; thus, it is essential that systems and processes be in place to assure that Angel hardware is adequately sized and Angel software is functioning efficiently.

Cost savings/Cost avoidance: The peak Angel usage pattern coincides precisely with that period in the quarter when students can make course withdrawal decisions without incurring any penalty. Consequently, it is very important that problems with access to online course material not contribute to a student's decision to withdraw.

Target Completion Date: October 2008

Actual Completion Date: June 2009

☆ Feasibility study and warranted implementation of Archibus software

This project was cancelled by the Facilities Department.

Qualitative/Quantitative Return on Investment: Not applicable

Cost savings/Cost avoidance: Not applicable

Target Completion Date: June 2009

Actual Completion Date: Not applicable—project cancelled.

☆ Feasibility study and warranted implementation of Tech Prep database

Sinclair's Tech Prep office faces the challenge of coordinating student participation records generated from the high-schools with college-level records maintained for the same population of students. This project called for the development of technology tools that would assist in the coordination of these records.

After consultation with the Tech Prep office and analysis of the workflow associated with processing student records, a system was designed to allow specific Tech Prep information to be collected as part of the online application process that each Tech Prep student is required to complete. This specific information was incorporated into

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

the automated record creation process that results from the completion of a Sinclair online application. Once the Tech Prep information was recorded within the Sinclair ERP, reports were generated to assist high-schools in maintaining ongoing Tech Prep records.

Qualitative/Quantitative Return on Investment: For the past two years, there have been close to 2000 high-school students per year participating in tech prep programs at Sinclair. In the absence of an integrated system to link high-school and Sinclair databases, each of these students needed to be processed manually into both systems. The modifications made to the Sinclair online application have significantly reduced these data entry efforts.

Cost savings/Cost avoidance: It is estimated this project has resulted in a 400 hour reduction in the number of data entry hours that previously were expended in manually maintaining Tech Prep records in Sinclair's ERP system.

Target Completion Date: December 2008

Actual Completion Date: June 2009

★ Support for the University System of Ohio

A hallmark of the plan for the University System of Ohio is to develop collaborative and cooperative relationships between public higher-education institutions in Ohio. The following list represents activities within Systems Development and Maintenance that have taken place over the last year in support of these cooperative efforts:

- Enhancements have been made to the logging activity for Sinclair's component of the statewide curriculum access system (CAS). These logging enhancements allow rapid troubleshooting for any user access issues.
- Ten additional Ohio institutions were added to Sinclair's electronic transcript exchange system.
- Staff from Systems Development & Maintenance presented a session on Sinclair's Curriculum Management Tool at the Ohio Libraries and Learning conference. After the presentation, OBOR staff expressed interest in evaluating the product for statewide adoption.
- Staff from Sinclair served on the planning committee for the development of a request for proposal (RFP) for a statewide customer relationship management (CRM) system.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Qualitative/Quantitative Return on Investment: The governor of Ohio and the chancellor of the Ohio Board of Regents have identified the development of the University System of Ohio as one of their top priorities. Activities undertaken as part of this project serve to demonstrate Sinclair's participation in advancing this priority.

Cost savings/Cost avoidance: There is no direct cost savings/cost avoidance associated with this project.

Target Completion Date: June 2009

Actual Completion Date: June 2009

Research, Analytics and Reporting

Following are the major accomplishments for FY 2008-2009 for Research, Analytics and Reporting (RAR):

⭐ Continued Maturation of the DAWN Environment
⭐ Accommodating Reporting Needs of the University System and other Federal/State agencies
⭐ Analysis of Academic Programs from a Demand Perspective
⭐ Development of a Data Governance Board

⭐ Continued Maturation of the DAWN Environment

As DAWN and the data warehouse environment continue to mature, Research, Analytics and Reporting (RAR) determined concentration should be on the following aspects in FY 2008-2009:

- the installation of the latest version of the SAS software;
- the development of dashboards to facilitate the management of enrollment, marketing efforts, and course registration;
- the increased development of information maps, cubes and datasets available for knowledgeable end-users for reporting and analysis; and
- the integration of new internal and external data sources into the data warehouse.

Much has been accomplished associated with these goals. RAR worked closely with the software provider, SAS, to upgrade the software to the latest version. This

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

permitted the capability to develop dashboards, several of which have been successfully defined and developed, including a full Enrollment Management dashboard.

Figure 3-14. Enrollment Dashboard.

RAR has also made notable progress in moving all Colleague tables into the data warehouse with the objective being that at some point there would be no need to access reports through Colleague, the institution's Administrative system.   At this time all reports historically generated by Registration and Student Records can now be done exclusively through the data warehouse, with no further reliance on Colleague reporting. Tables associated with Human Resource reporting was the second target for development, and Human Resource Staff are currently in training on how to accomplish all reporting requirements via the data warehouse. Other tables will continue to be moved until such time as they are all accessible through the data warehouse.

Substantial progress has also been achieved related to the migration of several departmental stand-alone databases and new data sources to the data warehousing platform. Examples include Blackboard (Onecard), Raisers Edge Foundation database regarding Alumni, and the Mathlab database. This allows richer analysis of data, and eliminates in many instances a duplication of data collection and manpower effort.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

In addition, several new information products have been added to the DAWN information portal. A few examples include reports relevant to:

- Financial Aid and Scholarship usage;
- Dayton Campus enrollment and demographic reports;
- Faculty Payload Reporting;
- Strategic Enrollment Management reporting; and
- the Enrollment Management dashboard.

Qualitative/Quantitative Return on Investment: Increased richness of the data now permits more dynamic and aggressive use of information from multiple sources, facilitating an environment well positioned for increased data mining opportunities and follow-up action. The ability to react just-in-time to targets has been notably increased with the development of the Enrollment Management dashboard.

Cost Savings/Cost Avoidance: It is estimated that substantial savings in time and effort across the institution have been saved as a result of the merging of stand-alone databases and reports generated. In one department alone, nearly 40 hours of work a month (previously required to produce reports) have been released to other projects as a result of this work.

The development of dashboards has also provided opportunities to reduce institutional costs, as they provide a fuller understanding of performance against targets, allowing the end-user to make adjustments faster than they would have been able to prior to the establishment of the dashboards.
.
Target Completion Date: June 2009

Actual Completion Date: June 2009

★ <u>Accommodating Reporting Needs of the University System and other Federal/State agencies</u>

Over the past year, there has been substantial demand from the state for institutions to develop targets associated with approximately twenty overarching goals the state has developed aligned with higher education. RAR worked closely with a cross-functional committee and was an instrumental player in the production of historic, baseline and predictive data associated with these measures. Ultimately, RAR worked with this committee to finalize the targets. The final product included targets through FY 2013-14.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Tremendous growth this year has been occurring both in federal and in state reporting requirements. RAR has spent substantial effort in re-writing state-required files to meet these new needs. Additionally, federal reporting guidelines have radically changed in nature and in the number of reporting requirements to accommodate required accountability. Changes to the Colleague system have been necessary for the College to accommodate many of these reporting needs. Over 45 pages of anticipated changes in future federal reporting requirements are in review.

Figure 3-15. University System of Ohio.

Qualitative/Quantitative Return on Investment: For University System measures of accountability, the groundwork that has been laid in developing the benchmarks is invaluable in the development of enrollment management targets for the College.

The use of the data warehouse in the preparation of state file submissions has substantially decreased the amount of time necessary for preparation and submission of these files.

In addition, the use of the data warehouse in preparing HEI file submissions permitted an improvement in process where corrections to subsidy levels, that were previously made manually, are now done automatically prior to submitting the HEI files. The project analyst responsible for these file submissions estimates that it probably saves about a days' worth of time that was previously spent making the subsidy code corrections prior to submission of the files.

Cost Savings/Cost Avoidance: There is no direct cost savings or avoidance associated with this item. However, the use of the data warehouse in the preparation of state (HEI) file submissions has allowed process change which saves approximately eight hours a term of manual labor.

Target Completion Date: June 2009

Actual Completion Date: University System measures of accountability benchmarks were completed by January 2009. The programming necessary to utilize the data warehouse in HEI file submissions was complete by March 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Analysis of Academic Programs from a Demand Perspective

Initially anticipated to work systemically with instruction in this venture, the project did not come to its intended fruition this year, due in large part to competing issues within instruction. However, RAR has employed the use of environmental scanning, labor market data analysis, competitive analysis, and curricular review to inform some subsets of instructional curriculum, in order to help determine which programs should be developed, enhanced, or retired, and how Sinclair can better meet workforce needs.

Figure 3-16. Ohio Skills Bank.

RAR has worked closely with the Sinclair's liaison with the Ohio Skills Bank (OSB) initiative, providing data on area workforce supply and demand. OSB's focus is on aligning workforce supply and demand, and is related to the analysis of academic programs from a demand perspective. RAR has assisted with providing data for asset mapping in four areas: healthcare, aerospace research and development, instructional technology, and advanced manufacturing.

Lastly, course offerings for the newly developing Preble County Learning Center have been determined, in part, based on the projected occupational needs of the county.

Qualitative/Quantitative Return on Investment: As the state puts an increasingly high emphasis on aligning workforce supply and demand, it becomes imperative that Sinclair examine the programs offered to ensure that graduates are being produced in the fields most in demand in the area.

Cost Savings/Cost Avoidance: Not applicable.

Targeted Completion Date: June 2009

Actual Completion Date: June 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

⭐ Development of a Data Governance Board

As the institution matures in its use of data, and as more end users develop their own reports, it becomes critical that those engaged in these activities understand what the data represents and when it is appropriate to use for their analyses. The department of Research, Analytics and Reporting agreed to form a cross-functional team of end users to develop common definitions, and determine the feasibility of using a Wiki Engine to develop and maintain the metadata repository.

Figure 3-17. Formation of a Data Governance Board.

To date, RAR has evaluated several software packages to host the data definition information. The plan is to utilize wiki technology (something similar to Wikipedia) to allow end users to manage data definitions in their areas of expertise. Once a Wiki application has been selected, it will be integrated with the DAWN information portal.

RAR has reviewed several wiki technology products including MS Sharepoint, Tiki-Wiki, and Docu-Wiki (all of which are free-ware) Additionally, membership of the governance board has been identified. RAR will initially take a leadership role is generating and managing the content in the Wiki platform, with long range plans to migrate content management to the subject matter experts.

Cost Savings/Cost Avoidance Anticipated for the Project: Increasing appropriate use of data and minimizing the frustration on the part of the external user is invaluable to the institution as it attempts to serve numerous constituents through this essential standardization and communication channel.

Target Completion date: March 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Actual Completion Date: In progress, with a new estimated time of completion of August 2009.

Information Technology Services

Following are the major accomplishments for FY 2008-2009 for Information Technology Services (ITS):

⭐ Implement Voice over IP Phone System
⭐ Remote Application Access
⭐ Provide Expanded Access to the Internet
⭐ Pilot Classroom
⭐ VMware Infrastructure Implementation
⭐ Implement Disaster Recovery Facilities at Courseview Campus Center
⭐ Email archival and search capability
⭐ Project Lead the Way
⭐ Expand Wireless Network Access throughout Campus
⭐ Implement SAN within the Certification Lab
⭐ Create an Additional Computer Classroom in the Sinclair Center
⭐ Upgrade Bookstore Network
⭐ Improve the Usability of the Network for Non-College Owned Devices
⭐ System Insight Manager
⭐ Improved Remote Password Reset Procedures
⭐ Dental Hygiene Lab Multimedia Project
⭐ Upgrade Computer room air conditioning
⭐ Adobe Connect Usage and Support Procedures
⭐ Systems Vulnerability Assessment
⭐ Implement Queuing System
⭐ Provide Improved Data Archival Capability
⭐ Conversion of Videoconferencing to IP Only
⭐ College use and handling of Credit Card Information
⭐ Evaluate Network Monitoring Tools
⭐ Convert Tartan Card System to IP Communication
⭐ Room and Equipment Scheduling Software and Classroom Equipment Needs Assessments
⭐ Transition CIS lab support to ITS
⭐ Security Information Event Management
⭐ VOIP Network Preparation

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Implement Voice over IP Phone System

The final phase of the project to convert the college's telephone system to a new Voice over IP (VoIP) system was completed over the winter break of 2008. Over the past two years, the overall project included the installation of systems at the Englewood Learning Center, Huber Heights Learning Center, and the Courseview Campus Center with the final phase involving the complete replacement of the phone system at the Dayton campus. With this completion, the old Fujistu telephone system was totally replaced with the ShoreTel system and the cutover involved the conversion of over 1700 phone lines across campus and 150 external telephone network connections.

Figure 3-18. Examples of ShoreTel phones.

The highlights of the ShoreTel system include a distributed network architecture deployed over the Sinclair data network using the latest communication technology of Voice over IP. The system also features a fully integrated voice mail system with advanced auto attendant functionality. All staff and administration users now have display phones with caller ID, and some users have installed the advanced software called Call Manager, which can control the phone from the PC and provide unified communications capability as well. This capability is highlighted by the Find Me Follow Me feature which allows callers to find users at other locations when the caller reaches the user's voice mail. The ACD (automatic call distribution) functionality of the system is being used in the Call Center and the IT Help Desk employing advanced routing features which will enhance the operations of those two groups.

The system also features highly reliable and intelligent voice switches called ShoreGear switches which distribute the call control on the ShoreTel system to each and every other ShoreGear switch configured in the system to eliminate a single point of failure. In the unlikely event a voice switch fails or becomes isolated by a network fault, the other switches on the network continue to operate without being affected.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-19. ShoreGear intelligent voice switches.

This project was successful due in large part to pilot trials and research that were done over the past several years which identified issues that needed to be resolved and upgrades that needed to be done both on the data and voice networks. The hard work, dedication, and involvement of the entire IT staff included the telecom administrator, system engineers, network engineers, PC techs, Help Desk personnel and other IT staff who assisted as well. The cooperative working relationship with the vendor, Accent Information Systems, also played a pivotal role in the success of this project.

Qualitative/Quantitative Return on Investment: As a result of this conversion, Sinclair has positioned itself with a communications platform that is scalable and expandable for the future telecom needs of the campus and its remote locations.

Cost savings/Cost avoidance identified with the project: The Fujitsu phone system was due to be replaced after over 15 years of service. If the system were to fail it would have cost the college much more in lost productivity. With the ShoreTel system, many changes including physical phone moves can now be done by SCC techs saving outside contractor expense.

Target Completion Date: January 2009

Actual Completion Date: February 2009

★ Remote Application Access

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 Microsoft's application virtualization product called App-V (formerly SoftGrid), the chosen solution had to leverage this investment.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The remote application access solution chosen uses 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. To leverage Sinclair's App-V investment, Microsoft Server 2003 R2 with Terminal Services and App-V for Terminal Services was installed and configured on two servers. Terminal services would provide the remote desktop environment and App-V for Terminal Services would allow the virtual applications to be run inside the remote desktop. The IAG appliance serves as the entry point, or portal, through which users access their remote desktop/ applications as well as other services.

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. These applications were chosen due to the need to have them available remotely and because the number of users of these applications was fairly small, ~25 - 35 users for each. Groups within Active Directory were used to grant access to these applications and an automated process was developed where faculty and students were assigned to the appropriate group based on the courses. For example, faculty assigned to teach classes, or students registered for classes, in the HIM department, were automatically added to the appropriate groups that would allow them access to the SoftMed application, both on-campus and off-campus. This automated program is scalable and will be used to assign App-V applications to all faculty and students beginning Fall 2009.

ITS contracted with SCE Consultants to configure the IAG appliance. Besides remote access to applications through Microsoft Terminal Services, IAG was configured to provide remote file access for faculty/staff and Virtual Private Network (VPN) capabilities with remediation. In the past, access to the Sinclair network through VPN access was limited because the authentication mechanisms were based on user name only. Therefore, a valid user could potentially use their home PC and connect to the Sinclair network, circumventing our security policies. With VPN through IAG, access to the VPN can be limited to Sinclair owned devices. Furthermore, those Sinclair owned devices can be verified to have the latest anti-virus definitions and Microsoft patches.

After all the pieces of the remote access solution were developed, the domain name remote.sinclair.edu was created and the pilot started. The EMAS Pro application went live December 2008 and HIM taught SoftMed classes remotely Winter quarter 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-20. Microsoft IAG portal showing all currently available applications. Application availability will differ depending on user rights.

Qualitative/Quantitative Return on Investment: The ability to securely provide applications remotely will benefit faculty, staff and students. There are numerous qualitative benefits to providing access to applications which were originally only available on Sinclair's campus, to users wherever they happen to be, using whatever operating system they prefer to use.

Cost savings/Cost avoidance identified with the project: The cost of the IAG appliance was $8,393; however, this appliance is a potential replacement for the current Citrix solutions.

Target Completion Date: June 2009

Actual Completion Date: February 2009

☆ Provide Expanded Access to the Internet

The college's use of Internet bandwidth continues to grow as more and more resources are made available via the network. Adding bandwidth is not as easy as just increasing the amount of bandwidth of the Internet connection. There are devices that exist within the network that have limitations which could prevent the full use of added bandwidth if they are not also upgraded.

Adding to the importance of this project is the ability to increase the size of the Internet connection rather quickly, as budget would allow. Beginning in the summer of 2007, Information Technology Services (ITS) began looking at ways to cost effectively increase Internet bandwidth. In June 2008, the Internet connection to OARnet, which was a DS3 connection with a maximum capacity of 45 Mbps, was increased to a Gigaman fiber circuit, capable of 1Gbps bandwidth. Although only using 15 Mbps of the DS3, and contracted for the same 15 Mbps with the Gigiman circuit, this usage has increased to 30 Mbps this year. This type of circuit also provides the ability to increase the bandwidth very quickly when necessary.

This project provided a plan to increase the capabilities of all necessary equipment to allow for the college's Internet bandwidth to be increased. The first step was in identifying all of the devices that are used to provide Internet connectivity (Figure 3-21). Starting from the outside and working in, the devices identified were:

- Cisco router for Gigiman circuit to OARnet.
- Cisco router for Internet connection to Donet.
- Cisco Border Gateway Protocol (BGP) router to route traffic between the OARnet and Donet Internet connections.
- Nokia/Checkpoint firewalls
- Palo Alto Application firewall
- Packeteer Packetshaper for managing bandwidth usage.

Of these, the Cisco router to Donet, the Cisco BGP router, and the Packeteer Packetshaper were found to not scale well beyond 45 Mbps of Internet bandwidth.

In October 2008, the Internet connection to Donet was upgraded to a 100 Mbps fiber circuit. This required replacement of the router with a new Cisco router, which Donet supplied. This eliminated that device as a limitation to Internet bandwidth expansion. In March 2009, the Cisco BGP router was upgraded to remove this device as a limitation. Evaluation of the ROI of the Packeteer Packetshaper device is still in process.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-21. Devices involved with providing Internet access.

Qualitative/Quantitative Return on Investment: Due to the fiber connections and contractual arrangements with the Internet Service Providers (ISP's), increases in bandwidth can now be provisioned quickly, and at a reduced cost. Sinclair is now in a better position to utilize increased Internet bandwidth when necessary.

Cost Savings/Cost avoidance identified with the project: The Cisco routers servicing the Internet connections to both OARnet and Donet were replaced by the ISP at no cost to Sinclair. The Cisco BGP router cost $11,660 and was covered under the college's IT R&R plan.

Target Completion Date: June 2009

Actual Completion Date or Current status: June 2009

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☆ Pilot Classroom

The purpose of this project was to create a pilot classroom for demonstrating improvements in technology furniture. With this furniture, faculty no longer need a computer lab and a lecture room for a single class.

ITS identified the Communications (COM) classroom in building 14 for the Pilot Classroom. In the COM classroom laptops were used instead of desktop computers because the faculty believed the desktop computers would interfere with the learning objectives when students did not need them. Laptops were used so students could close them to remove the barrier the monitors caused.

Convertible tables are now used to change a computer station, quickly and easily, to a clear work surface. These tables (shown in figures 3-22 and 3-23)removed the barrier the regular computer stations caused and reduced the added cost associated with the use of laptops.

Figure 3-22. Monitors positioned "up" for computer class .

Figure 3-23. Monitors hidden away for traditional class.

Qualitative/Quantitative Return on Investment: This new furniture allows a single room to be used as a computer classroom and for classes that do not require computers. Having this type of furniture as an option for campus labs provides the opportunity to use spaces for multiple purposes, reducing the need to build additional classrooms or purchase more expensive computer equipment.

Cost savings/Cost avoidance identified with the project: There is a cost savings of $7,360 every 4 years due to the difference in the cost of desktop computers versus laptops. It is also more expensive to support laptops; therefore; a reduced cost of providing support to these rooms is realized.

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Target Completion Date: January 2009

Actual Completion Date: December 2008

☆ <u>VMware Infrastructure Implementation</u>

Continuing with the VMware infrastructure implementation project completed in FY 2007-2008, this project was originally scoped to add three physical servers to the VMware virtual cluster. In actuality, there were four additional servers added to this virtual   cluster, bringing the total of physical servers in this cluster to seven. To give Information Technology Services (ITS) the ability to virtualize web servers, a separate cluster was configured from three physical servers.
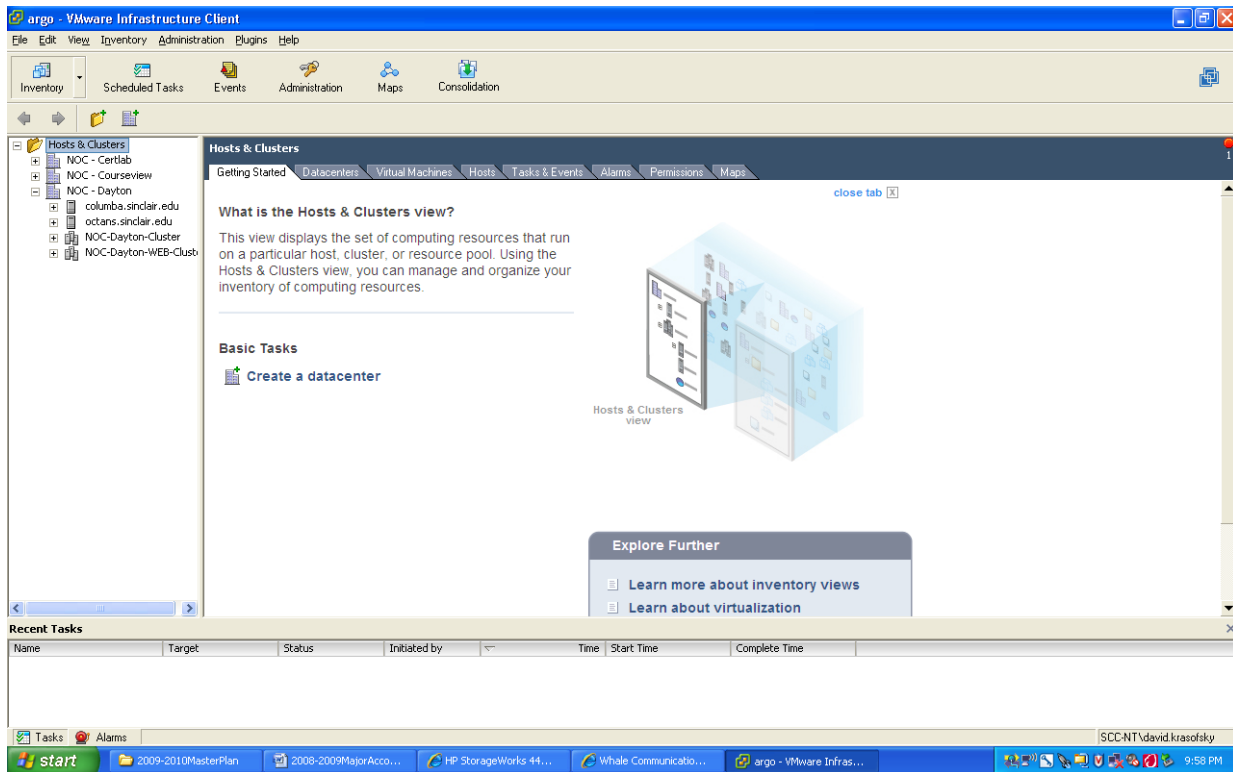
Figure 3-24. VMware Infrastructure Client showing two virtual clusters, NOC-Dayton-cluster and NOC-Dayton-WEB-Cluster.

Another virtual disaster recovery cluster was created that spans both the Courseview Campus Center and the Dayton campus. This cluster is comprised of two physical servers at each location which will house the virtualized Windows virtual servers for disaster recovery. An additional physical server was installed at Courseview for SAN,

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

server and backup management. A HP StorageWorks Enterprise Virtual Array (EVA) 4400 was purchased and installed to create a Storage Area Network (SAN) at the Courseview site as well as a tape library, and a HP Integrity UNIX server.

The tape library will be primarily used to restore data from backup tapes to the Courseview SAN in the event of a disaster. The UNIX server will be used to recover Colleague if a disaster occurs, but will also be used as a Colleague test server on a daily basis by Systems Development and Maintenance.

Should a disaster occur, either tape backups or file copies will be used to transfer programs and data to the SAN located at Courseview. This process duplicates the services that were once purchased through SunGard. However, additional work is still being performed on this project to automate the replication of data to the Courseview SAN. Automatic file replication from the Dayton campus to the Courseview campus will drastically reduce the amount of downtime should a disaster occur.

Qualitative/Quantitative Return on Investment: Moving to a virtual server environment improves availability of servers and creates opportunities to save costs related to power and air conditioning usage.

Cost Savings/Cost identified with the project: Through virtualization of servers replaced through R&R in FY 2008-2009, ITS estimates a savings of $38,000.

Target Completion Date: June 2009

Actual Completion Date or Current Status: June 2009

★ Implement Disaster Recovery Facilities at Courseview Campus Center

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.

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

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

to saving money, the new facility will allow added benefits. 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, 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;
- 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 a Sinclair DR site, changes to DR systems and/or services will be more efficient since the DR process is totally under Sinclair's control. In the past with SunGard, a new contract had to be initiated for every change, which usually resulted 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: April 2009

☆ Email archival and search capability

Email is extensively used for creation, communication, and transmission of documents and other official records throughout the College. Various legal requirements, such as public records law and e-discovery rules, apply to preservation, retention, and production of email records. In addition to these legal issues, the growth of email use and data storage is challenging from a technical and administration perspective. As

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

part of the routine business continuity and disaster recovery processes, ITS routinely backs-up email to magnetic tape. However, finding and retrieving an individual email message or group of messages from tape is extremely difficult and labor intensive.

Quest Recovery Manager has been installed to alleviate many of the issues listed above. The software provides ITS with a centralized email recovery capability, allowing item-level recovery, regular expression searches, and e-discovery compliance.
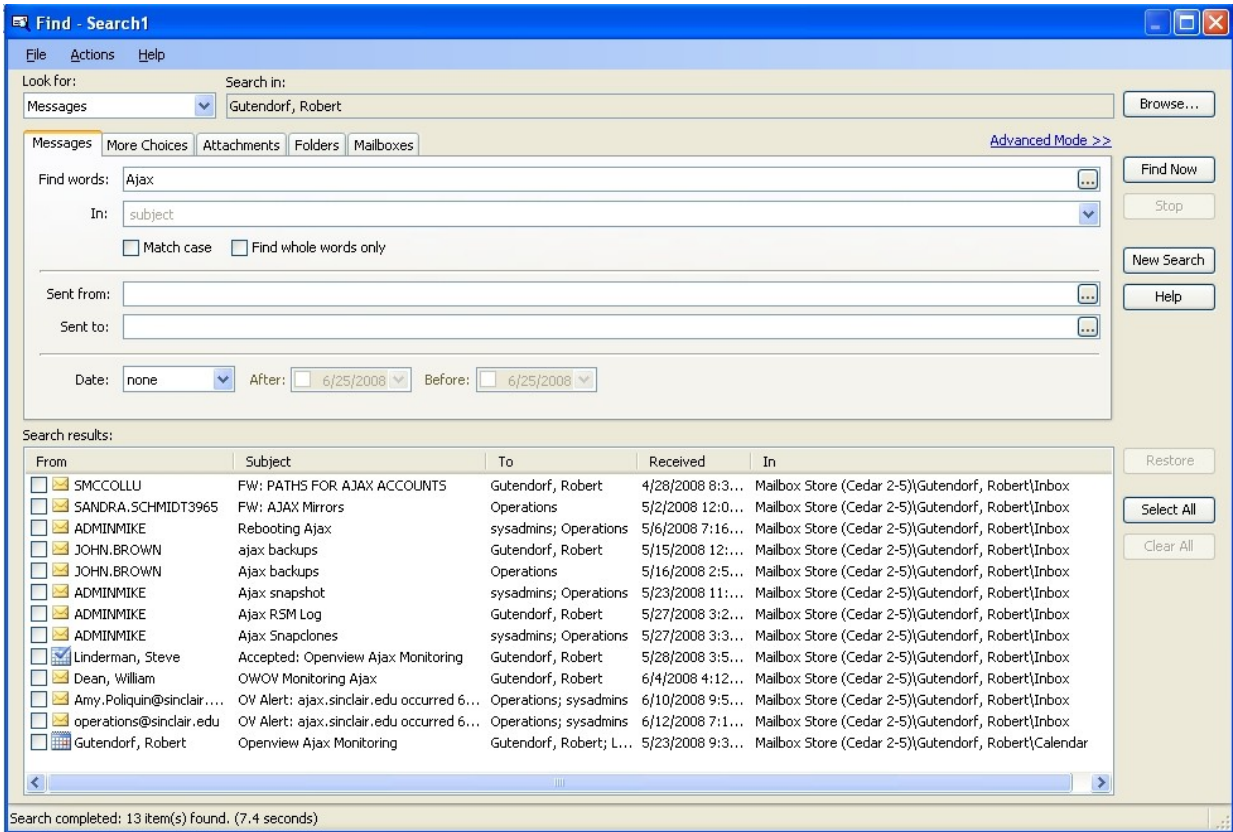
Figure 3-25. The Quest Recovery Manager for Exchange search screen.

Qualitative/Quantitative Return on Investment: This project was completed in order to reduce the cost of e-discovery by simplifying the email restore process as well as providing end users with item-level recovery without the cost of an Exchange recovery server. Quantitatively, there are cost savings from less hardware being used, lower maintenance costs, and reduced energy and cooling costs. Qualitatively there will be faster restore turnaround times and fewer personnel resources required to perform those restores. The ROI of being able to comply with e-discovery requests, reducing the likelihood of fines or sanctions associated with non-compliance, is immeasurable.

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Cost savings/Cost avoidance identified with the project: The cost for this project was $16,000. This was paid to Digital Controls and included consulting fees to assist Network Operations Center personnel with installing the software. The cost of performing these same recovery functions using other methods would be significantly more due to the need for maintaining recovery servers.

Target Completion Date: January 2009

Actual Completion Date: February 2009

★ Project Lead the Way

The purpose of this project, which was not identified as a Major Project in the FY 2008-2009 Information Services Status Report & Strategic Objectives, was to improve on processes to support Project Lead the Way (PLTW). PLTW is a grant-funded initiative that uses Sinclair's Engineering faculty to teach high school faculty how to use engineering applications for teaching in their home schools. PLTW has two 2-week sessions each summer and each session has between 6 – 8 different classes that teach the multiple engineering applications to over 100 faculty. The previous process was for all faculty to bring in their laptop the first day of training. These laptops had to meet certain criteria for applications to be installed and for faculty to access the Sinclair network. Many times ITS could not get all of the software installed on these laptops.

For summer 2009 ITS has created incentives for faculty to send their laptops in early. In addition, ITS will have laptops with the engineering applications pre-loaded to loan faculty if problems exist.

Qualitative/Quantitative Return on Investment: PLTW is an annual program that is scheduled every summer. Improving the processes for supporting this program creates a better learning environment for the high school faculty that are involved.

Cost savings/Cost avoidance identified with the project: In previous PLTW sessions ITS has had to provide as many as 8 Technicians for the remediation of problems with laptops and installation of software. These new procedures allow the number of dedicated Technicians to be reduced significantly.

Target Completion Date: June 2009

Actual Completion Date: March 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Expand Wireless Network Access throughout Campus

Wireless networking is becoming a very important technology for organizations. There are many innovative capabilities that wireless connectivity can enable. Beyond this, more and more computing devices are being delivered with built-in wireless capability. Information Technology Services has created a strategy for providing role-based access to the wireless network, and access to the network via wireless connectivity is available in every campus building.

While wireless networking has not progressed to the point where it is suitable for the replacement of wired networking, it provides great productivity benefits. Allowing individuals to be connected to network resources while away from their office provides a great return on the investment in the necessary infrastructure. This project will identify areas where access to the campus wireless network is not available, prioritize where wireless expansion will provide the greatest benefit, and implement the capability where it is justified.

Figure 3-26. Enterasys' wireless infrastructure components.

Qualitative/Quantitative Return on Investment: ITS has chosen Enterasys Networks' technology for the expansion of the wireless network on campus. Enterasys' wireless portfolio was expanded when the company combined with Siemens Enterprise Networking in a joint venture. This partnership provides significant opportunities for ITS to leverage the capabilities of the Enterasys wired infrastructure via the wireless network. This project will also provide for the expansion of the wireless network by increasing the total access points to 150, increasing the total spaces that wireless is available on campus by almost 100 percent.

Cost savings/Cost avoidance identified with the project: The replacement of the existing wireless infrastructure will be accomplished at a much reduced cost due to a

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

highly competitive economy. The amount of expansion that will be accomplished is also much greater due to these reduced costs.

Target Completion Date: June 2009

Actual Completion Date: June 2009

☆ Implement SAN within the Certification Lab

In FY 2003, ITS received capital funds to build a certification lab that is used for building/testing new servers and software and services prior to placing in a production environment. This separate environment is necessary to ensure the security and reliability of production services. As testing needs grew, the need for a Storage Area Network (SAN) in the certification lab became apparent. When the production SAN was replaced in FY 2004, since the old SAN still had some useful life outside of a production environment it was used for the certification lab. This SAN is now 6 years old and in need of repairs that are too costly based on the age of the equipment. Therefore, a new SAN for the certification lab was purchased.

A HP StorageWorks EVA 4400 with 4 TB of storage was purchased and will be installed and configured in the Cert Lab. Once installed, servers will be connected to the SAN and the infrastructure documented

Qualitative/Quantitative Return on Investment: This project will allow ITS staff to test hardware, software and services outside of the production environment without impacting users.

Cost savings/Cost avoidance identified with the project: $33,000 was budgeted for this project. The EVA 4400 is the same architecture as the EVA 5000 production disk array and is exactly the same product used at the Courseview disaster recovery site, so ITS staff are already familiar with the operation and management of this technology. In fact, a savings of approximately $5,000 in installation/configuration costs will be realized since ITS staff can perform the necessary tasks.

Target Completion Date: December 31, 2008

Actual Completion Date: June 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

★ <u>Create an Additional Computer Classroom in the Sinclair Center</u>

Originally this project was created to meet demonstrated demand for an additional computer classroom located in the Sinclair Center. Furnished with up-to-date technology, this new computer classroom would have been designed to provide increased stability and supportability for the College, as well as an additional selling point for the Sinclair Center. However, this project was cancelled because the conference center was able to reclaim room 12-372 to provide this function. This also allowed funding to be reallocated to the technical upgrades deemed more important to the Sinclair Center.

Figure 3-27. Computer classroom in the Sinclair Center.

Qualitative/Quantitative Return on Investment: N/A

Cost savings/Cost avoidance identified with the project: Cancelling this project provided $63,000 in cost savings that was applied to the conference center's renovation.

Target Completion Date: June 2009

Current Status: Project cancelled.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Upgrade Bookstore Network

When the Nebraska Books Point of Sale (POS) system was first installed in the second quarter of 2005, ITS configured the network according to the specifications received from Nebraska Books. The initial network consisted of each POS terminal connected to the network at 10 Mbps speed with the fiber uplink to the computer room in Building 13 connected at 100 Mbps.

Subsequent upgrades to the POS software over the years brought about the need to upgrade the network to keep the performance of the system at acceptable levels. In FY 2007-2008, the edge switches were upgraded to provide 100 Mbps connectivity to each POS terminal and 1 Gbps connectivity through the fiber uplink to the computer room, resulting in a 10x increase in bandwidth for the system. The remainder of the project was carried over into FY 2008-2009.
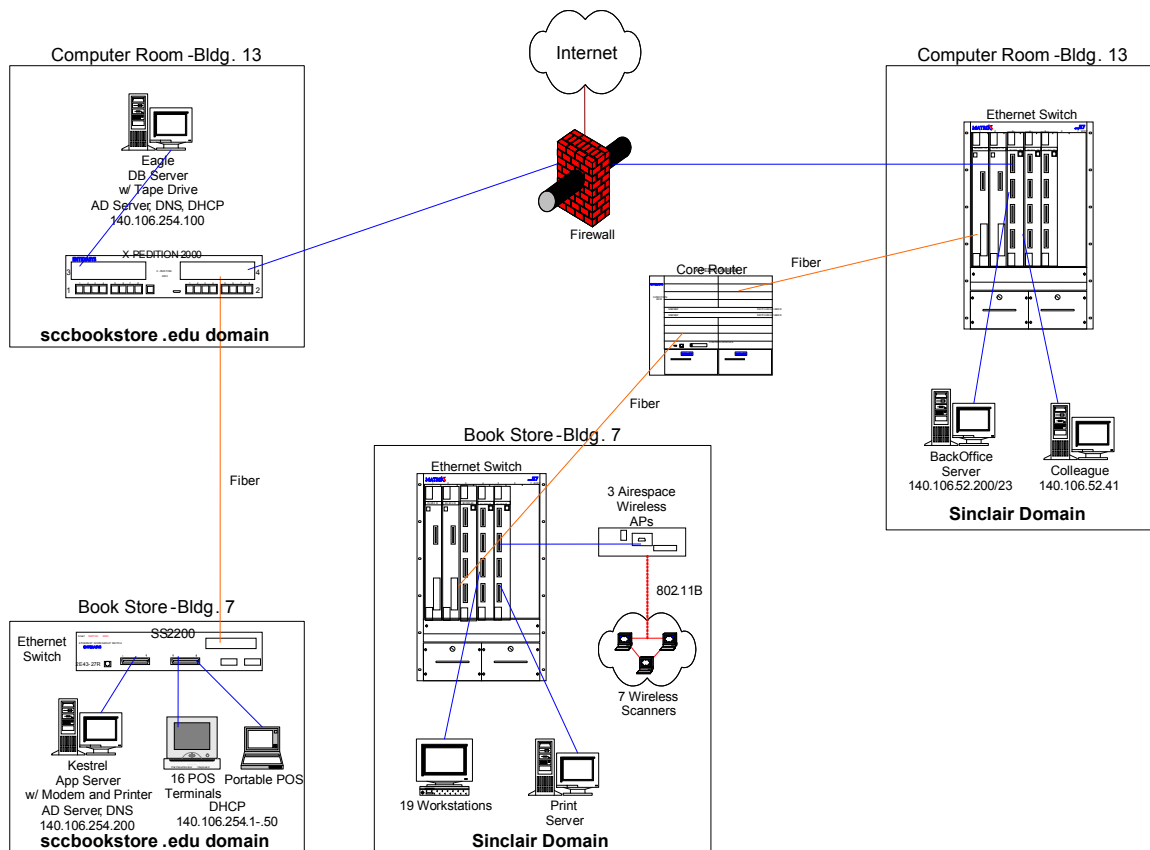
Figure 3-28. Diagram of Bookstore Network.

Qualitative/Quantitative Return on Investment: Network bandwidth was increased 10 fold over what was originally installed. This increase should result in faster transaction times and less wait time for the students.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Cost savings/Cost avoidance identified with the project: Lost business due to bad image as a result of poorly performing systems can be very expensive.

Target Completion Date: June 2008

Actual Completion Date: September 2008

☆ Improve the Usability of the Network for Non-College Owned Devices

The ability for college faculty and staff to use personally-owned network devices to connect to the campus network is provided by the Information Technology Service's Secure LAN Strategy. These devices do not receive the same level of access as college-owned devices, but are allowed to get the type of access that most people are used to experiencing in wireless "hot spots".

The current system that is used to authenticate employees who want to connect their own device is difficult to use and better technologies have become available since this system was originally installed. ITS met with representatives from Cisco, Bradford Networks, and Enterasys to learn about their product offerings. ITS is in the process of evaluating the Enterasys Network Access Control product due to its integration with the existing infrastructure and common management platform.

Figure 3-29. Enterasys NAC solution equipment.

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The Enterasys NAC solution performs multi-user, multi-method authentication, vulnerability assessment and client remediation. This means that, depending on the device and/or user, the application can deny or allow full, or partial access to the Sinclair network automatically, using the same management interface used for managing the wired infrastructure.

The Enterasys NAC solution will provide granular visibility and control over individual users and applications, which is not available with the existing Cisco CCA product. Furthermore, by using Enterasys NAC policies, additional capabilities are available to permit, deny, prioritize, rate-limit, tag, re-direct and audit network traffic based on user identity, time/location and device type.

Qualitative/Quantitative Return on Investment: $30,000 was budgeted for this project. If the Enterasys product is selected, qualitative costs would be reduced due to its seamless integration with the existing infrastructure and the common management platform.

Cost Savings/Cost avoidance identified with the project: Making use of the existing infrastructure that was put in place as part of the Secure LAN project will make this project cost less than if those capabilities needed to be created or modified as part of this project.

Target Completion Date: June 2009

Actual Completion Date: June 2009

☆ System Insight Manager

In November 2008, Network Operations began installing and configuring HPSIM (HP System Insight Manager) to improve hardware monitoring capabilities. When completely implemented, all HP branded equipment will forward hardware status information into the HPSIM console.

The next step in the implementation process is to get the hardware information from HPSIM to the Operations Manager console. Operations Manager is the overall systems management platform that ITS uses to monitor servers. Prior to the implementation of HPSIM, Operations Manager was mainly used to monitor the operating and application software. As of March 2009, 75% of Sinclair's server inventory is able to report hardware information successfully to Operations Manager. The other 25% are on schedule to be completed by June 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

An added benefit of the software has been the detailed hardware inventory reports. Network Operations can now check serial numbers and firmware versions without physically touching a server.

Figure 3-30. HP Systems Insight Manager Event Viewer.

Qualitative/Quantitative Return on Investment: Quantitatively, there is a reduction in the amount of software running on a NOC technician's PC. All server related messages will report to the Operations Manager console. Qualitatively there should be faster response times to hardware issues and a more accurate server inventory.

Cost savings/Cost avoidance identified with the project: There were no costs associated with this project. The HPSIM software is free and could be installed on a virtual server.

Target Completion Date: June 2009

Actual Completion Date: June 2009

☆ Improved Remote Password Reset Procedures

User account passwords are the primary keys used to provide authorized individuals access to, and protect the College from unauthorized access to, information systems. Effective password security dictates that passwords should not be written down; this results in people forgetting their passwords and being unable to access the information resources they need. When a user forgets his/her password, there must be a mechanism for resetting the password to regain access. A critical component of the reset process is authenticating the user—verifying the user is who he/she claims to be. The most secure method for authenticating the user before password reset is to require the user to physically appear and produce proof of identity documentation. However, this is neither user-friendly nor practical in a distributed systems environment, so a method of remote authentication is required.

The College has offered a Web-based self-service password reset tool, as well as telephone reset via the help desk. However, the authentication processes for both of these systems relied on identifying the individual using personal information in conjunction with either a Student ID or Social Security number. This information is fairly easy to obtain by some third parties, thus the potential risk of fraudulent password reset was unacceptably high. An additional driver for this project was legislation/regulation that limits use of Social Security numbers and Student ID numbers as authenticators.

Figure 3-31. The previous Web-based password reset tool.

The objective of this project was to identify and recommend more secure, user-managed processes. Based on a review of password solutions used in other Higher Education Institutions, and on reports from well-respected IT researchers, 5 solutions were evaluated: Anixis Password Reset, Avatier Password Station, CA Identity

Manager, Password Geneous Self-Reset-Plus, and Quest PasswordManager/InSync. All of these solutions used a 'shared secret' model, and any of them would likely meet Sinclair's needs at reasonable cost. However, in January 2009, it was determined that the current Single-Sign-On solution provider had incorporated a complete identity management solution, including password reset functionality, in their latest product version. As this solution is simply an upgrade to the existing solution, implementation and support infrastructure are in place, so this solution was recommended.

Qualitative/Quantitative Return on Investment: A major quantitative benefit of remote/self-service password management systems is reduction in help desk call volume. Approximately 20% of all Sinclair Help Desk requests are for password reset. Self-service password reset is estimated to reduce this percentage to 10% in the first year of implementation and gradually reduce to below 5% over time.

A qualitative benefit of self-service password reset is increased user satisfaction and productivity. Self-service provides the end-users help-desk-level service without the overhead of telephone 'hold' time waiting for an analyst. Another benefit to the solution chosen is the elimination of using Social Security Numbers as part of an authentication mechanism.

Cost savings/cost avoidance identified with the project: The primary cost of this project was employee time for solution evaluation. There is no cost to acquire the recommended Version3 solution as it is considered a product upgrade and is covered by the existing annual maintenance agreement. Gartner estimates costs of password reset calls range from $10-$35 per call. Based on Help Desk password reset volume of 7500 per year, and the low estimate of $10 per call, password reset costs Sinclair $75,000 per year. Even if only half of the current volume Help Desk password reset calls are eliminated by self-service, the College potentially saves $37,500 per year.

Target Completion Date: June 2009

Actual Completion Date: June 2009

☆ Dental Hygiene Lab Multimedia Project

As part of the technical equipment grant project approvals for FY 2008-2009, Dental Hygiene received funding to include multimedia capabilities in two new, high-tech labs located on the Downtown Dayton campus. In both spaces the multimedia systems were designed to remain as standard as possible while still enabling the latest technology in Dental Hygiene labs to be fully utilized. This standardization effort creates support efficiencies as well as achieving design, installation, repair and replacement cost reduction.

**Figure 3-32. Dental Hygiene Lab
multimedia system.**

Qualitative/Quantitative Return on Investment: Multimedia activities integrated into the classroom encourage students to work in groups, express their knowledge in multiple ways and solve problems. The advantages of integrating multimedia in the classroom provides a much richer student learning environment, which far outweighs the implementation costs.

Cost savings/Cost avoidance identified with the project: Standardizing integrated multimedia capabilities within Sinclair classrooms creates space and resource scheduling efficiencies, which save time and money associated with complicated resource scheduling.

Target Completion Date: October 2008

Actual Completion Date: October 2008

☆ Upgrade Computer room air conditioning

The current computer room backup air conditioner is a 15 ton unit which does not provide enough cooling for the computer room in the event that the primary unit would fail. Upgrading the backup unit to a 30 ton unit will provide sufficient air conditioning in the event of a failure of the primary unit, ensuring the room will always be kept at the required temperature for the computer equipment.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Qualitative/Quantitative return on Investment: The computer room will be able to operate at all times even if the main air conditioner unit has a failure. The new unit will continue to ensure the room is kept at the required level of cooling for the computer equipment.

Cost Savings/Cost avoidance identified with the project: The replacement unit for the Trane will be a newer model Leibert that is more energy efficient than the current 30 ton Leibert unit. The new unit can be used as the main air conditioner unit and reduce the electrical consumption for the computer room. This will be a cost savings for the college and also follow House Bill 251 requirements to reduce energy consumption.

Target Completion Date: June 2009

Actual Completion Date: June 2009

★ Adobe Connect Usage and Support Procedures

Adobe Connect has been selected as Sinclair's primary web conferencing tool. It was rolled out to faculty and staff in FY 2008-2009 and with the rollout developed a need for documented usage and support procedures.

To meet this need, the college formed a cross-functional team composed of both faculty and staff to research best practices for usage and support and to create a document containing this information.

Figure 3-33. Adobe Acrobat Connect web conferencing Tool.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The team worked to determine how accounts and meeting spaces should be created, what permissions faculty and staff should be granted by default and also upon request, and to develop training opportunities for Sinclair faculty and staff.

Also evaluated were technical and administrative support processes. The team determined that leveraging the existing technical support escalation process would be the most effective and helpful strategy for end users.

Qualitative/Quantitative Return on Investment: This project will help make the most effective use of the Adobe Connect software product at Sinclair.

Cost savings/Cost avoidance identified with the project: Internet bandwidth, licenses, and hardware are limited resources that will be used most effectively for Sinclair when governed by usage and support procedures.

Target Completion Date: March 2009

Actual Completion Date: March 2009

☆ Systems Vulnerability Assessment

The ever-increasing scope and span of Internet-based information security attacks, coupled with the increased use of targeted, low-profile attack vectors and zero-day exploits, mean today's Internet-connected network is under continuous attack. One of the most effective ways the College can assess the security of its systems is to test them for known vulnerabilities. Sinclair's vulnerability assessment plan has been divided into a cycle of three annual phases:

>   Phase 1: An external technical vulnerability evaluation
>   Phase 2: An internal technical vulnerability evaluation
>   Phase 3: A minimally technical, social engineering vulnerability evaluation

In FY 2008-2009, an external technical vulnerability evaluation/assessment was conducted by a contracted security assessment vendor. Over a period of one month, the entire Sinclair Community College address space was identified, then assessed by the contractor. The Internet facing network was scanned repeatedly with a variety of tools, a wireless penetration test was done in each building, and the Sinclair website was scanned using a specialized tool specifically for web application vulnerability testing. After all the data was collected, it was analyzed and compared to other scans. Where selected vulnerabilities were discovered, exploits were manually verified to attain the depth of the issue.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

At the conclusion of the assessment, the vendor provided a report detailing the process and all verified and unverified vulnerabilities. The vendor reported:

> "The architecture and configuration of devices at Sinclair Community College portray an *"ABOVE STANDARD"* level of security awareness."

NOTE: Definition of rating – "Above Standard Security controls and safeguards are providing more than adequate perimeter defense. One or two low level risks may be present."

Qualitative/Quantitative Return on Investment: Systems vulnerability testing is a 'best practice' method of finding weaknesses. Proactive self-discovery of vulnerabilities is considerably less costly than recovering from a breach resulting from an attacker successfully discovering and exploiting a vulnerability that results in compromise of personal information. Vulnerability assessment is also a required compliance component of standards such as the Payment Card Industry Data Security Standards (PCI DSS).

Cost savings/cost avoidance identified with the project: 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. Secondary cost avoidance issues are related to the PCI DSS standards. Organizations found to be non-compliant face significant fines and increased processing fees.

Target Completion Date: January 2009

Actual Completion Date: November 2008

☆ Implement Queuing System

This project was created to track and coordinate the implementation of the ACF Technologies Advanced Student Flow and Queuing Management System. Chosen by the Student Services and Marketing division for its value and robust capabilities, this system was specifically designed to assist Sinclair's Enrollment Services, Financial Aid department, and Counseling services in the management of historically long wait lines. Now, instead of waiting in line, students are assigned a queue number. When it is the student's turn, their queue number will display on a nearby 42" monitor. This system allows students to wait in comfort while grabbing a snack at the Main Street Café or studying in the waiting area.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships

Figure 3-34. Queuing Management System.

Qualitative/Quantitative Return on Investment: Customer-driven goals provide an environment likely to produce repeat customers. While this system does not directly save money or earn revenue, allowing students the freedom to snack at the Main Street Café, purchase snacks or drinks from a vending machine, or study in the comfort of a cushy chair rather than standing in line is likely to make their experience at Sinclair a more positive one. This positive experience is likely to lead to return visits and positive word of mouth communication about Sinclair.

Cost savings/Cost avoidance identified with the project: No cost savings or avoidances are directly associated with this project. However, allowing students the freedom to eat at the main street café or from the vending machines could produce additional revenue.

Target Completion Date: June 2009

Actual Completion Date: February 2009

☆ Provide Improved Data Archival Capability

ITS has been researching options available to store records in a media other than paper. In order to identify the type of media that would be an acceptable long-term solution, the services of Gartner Group, and an IT industry research firm were utilized. It was determined that UDO (ultra density optical) media is the best repository for records retention storage. UDO media is designed for a 50+ year life, withstands the rigors of continuous, long-term use, and is recommended in place of hardcopy, CDs or DVDs to store records.

The focus of this project is to ensure Sinclair has the ability to efficiently and appropriately comply with records retention requirements, conserve storage space, and be able to retrieve the needed information in a timely manner. Policies and

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

procedures will be developed, resource requirements identified and acquired, and personnel expertise will be developed to ensure the College can effectively respond to the increasing need for an efficient records retention storage process.

Qualitative/Quantitative Return on Investment: Proactively developing policies and procedures, and otherwise planning for, preservation, retention, and production of records retention storage with a media that requires little shelf space and has a long shelf life is implementing the first step in converting the college hard copy records retention storage to a state of the art methodology.

Cost savings/Cost avoidance identified with the project: Changing the current process to eliminate printing reams of paper quarterly to be stored indefinitely will reduce   paper costs and storage costs incurred by the College.

Target Completion Date: May 2009

Actual Completion Date: June 2009

★ Conversion of Videoconferencing to IP Only

Sinclair has been involved, via Distance Learning, in live, interactive course delivery for over two decades. In the mid 1980s, that meant live, interactive television via an ITFS system (microwave). In 1998 Sinclair began to offer videoconference-delivered courses using ISDN technology, and a few years later ATM videoconferencing technology was added to the mix. IP communication via the Internet is now the predominant technology used for videoconferencing.

Figure 3-35. Classroom equipped with videoconferencing capabilities.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

This project was initially created to develop a plan to leverage Sinclair's existing IP resources for Distance Learning course delivery in order to take advantage of this technology and all it has to offer. The hope was to implement the plan in FY 2009-2010. However, the creation of a plan led to a pilot test and then to an implementation of the plan. Currently all Distance Learning videoconference-delivered courses are being offered using existing bandwidth and equipment and IP technology. ATM and ISDN equipment and services have been discontinued.

Qualitative/Quantitative Return on Investment: The project carried no directly associated costs. However, since all videoconferences now use the same communication technology, the shift to IP creates resource redundancy as well as the opportunity for more focused technical support.

Cost savings/Cost avoidance identified with the project: By leveraging existing college bandwidth, this conversion resulted in a savings for the college of nearly $10,000/year ($825/month).

Target Completion Date: December 2008

Actual Completion Date: February 2009

☆ College use and handling of Credit Card Information

The incidence of Credit/Payment Card fraud related to electronic transactions, and particularly to Web-based transactions, is rapidly increasing and costs the payment card industry and consumers millions of dollars in lost revenue annually. There is an active underground economy specializing in profiting from the illicit sale/use of personal information that can be used to commit fraud (and identity theft). A recent study by Carnegie Mellon University researchers found that of all the personal information involved in this illicit trade, the majority of information involved credit card account information.

In response to this increase in fraud, the payment card industry has developed and mandated compliance with the "Payment Card Industry Data Security Standards" (PCI DSS). The PCI DSS includes requirements for security management, policies, procedures, network architecture, software design and other critical protective measures. According to the PCI Council: "This comprehensive standard is intended to help organizations proactively protect customer account data." All entities that accept payment cards must comply with these standards or risk penalties from increased processing fees, through significant fines, to the loss of ability to conduct card transactions.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-36. Distribution of sensitive data sold in the underground economy.

This project is an initial phase of assessing Sinclair's compliance status with PCI DSS. As a first step, all college areas/departments that use or accept payment card transactions were identified by the Chief Information Security Officer (CISO). The CISO then met with stakeholders from each area to review current processes and determine the specific compliance requirements for each area based on the PCI "Self Assessment Questionnaires". The results of these assessments were documented for action by the appropriate staff members.

Qualitative/Quantitative Return On Investment: Retaining the ability to accept payment card transactions is essential for the College, and will likely increase in criticality as students shift from an on-campus to a distance learning model. Complying with these industry standards can potentially reduce the cost of transaction fees, prevent incurring industry fines for non-compliance, and is a compulsory requirement for any institution that processes payment card transactions.

Cost savings/cost avoidance identified with the project: Cost avoidance is the most likely result, although the College may experience a decrease in individual transaction fees when compliance is validated.

Target Completion Date: June 2009

Actual Completion Date: May 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Evaluate Network Monitoring Tools

With the convergence of voice, video, and data on a single communications structure, it has become essential to have the capability to monitor, measure, and evaluate the data network. After evaluating several products, AdventNet Netflow Analyzer was purchased and installed in November 2008. Netflow enables Sinclair to proactively monitor the current operational baseline of the network, allowing ITS staff to assess the effect of networking changes and perform root cause analysis.
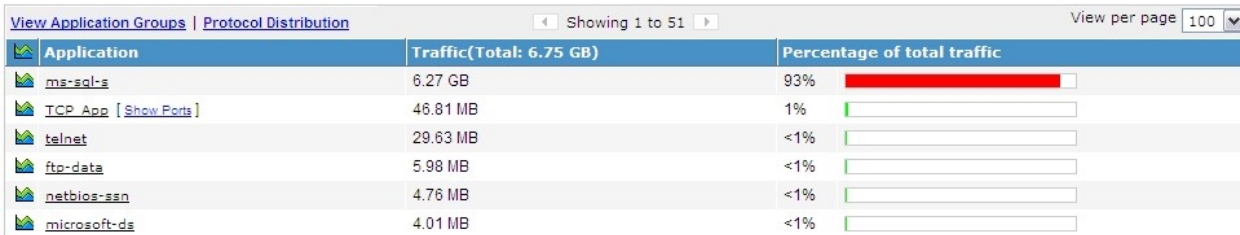
Figure 3-37. Netflow Top Application Report.
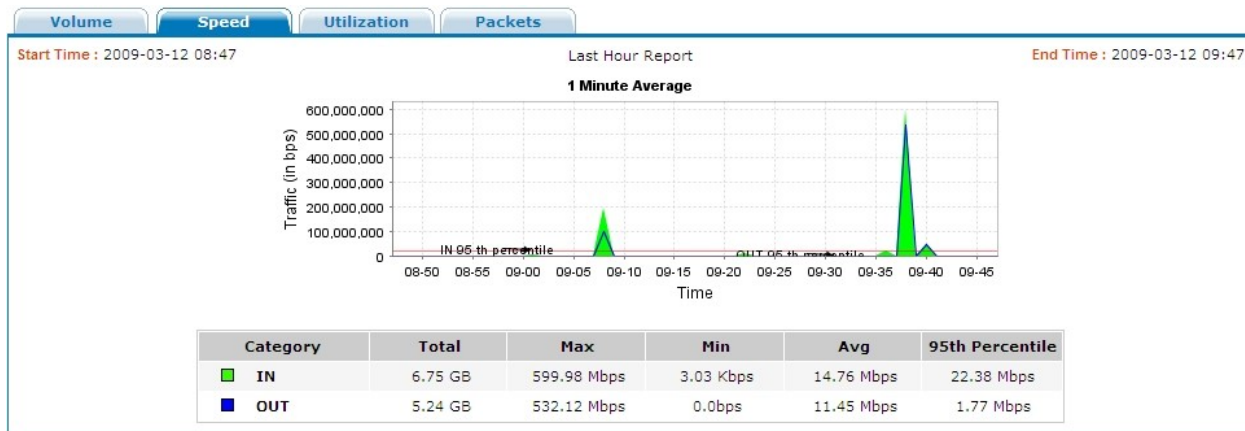
Figure 3-38. Netflow Traffic Report.

Qualitative/Quantitative Return on Investment: Netflow has already helped to improve Sinclair's data network service level by successfully resolving connectivity and slowness issues within the Library and the Shoretel VOIP Phone system. ITS expects the success to continue with reduced downtime and outages through the use of proactive monitoring and alerting.

Cost savings/Cost avoidance identified with the project: ITS spent a total of $34,544 on the project. This includes $14,994 for the Netflow software and $19,550 for the additional memory modules required by routers and switches to enable Netflow data collection.

Target Completion Date: November 2008

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Actual Completion Date: September 2008

☆ <u>Convert Tartan Card System to IP Communication</u>

The card readers that were installed with the original Tartan Card system were cabled "point to point" and connected to a Unix system that managed the transactions. The company that sells this system has changed the system to work with Microsoft Windows using TCP/IP communication. In order to convert to the new Windows-based system, all Tartan Card readers on pop and snack machines, and in the computer labs, Library and PAC needed to be able to run via the campus data network using IP converters installed in the network closets. The Tartan Card POS registers also were replaced with units that natively communicate via TCP/IP.

Qualitative/Quantitative return on Investment: Converting the tartan readers to communicate via IP will allow them to be monitored via the network like other IP devices. Extended hours of support can be provided by the technicians who are on campus for two shifts during the week and are also on campus on Saturday.

Cost Savings/Cost Avoidance identified with the project: Upgrading the Tartan Card system to IP based equipment ensures increased uptime for the network devices. They will be easier to monitor and notifications can be sent when a unit is down. Installing the IP converters in the network closets permits discontinuance of the old point to point wiring, which is outdated and more difficult to repair. Using ITS technicians for the installation of the IP converters in the network closets reduced costs that would have been incurred if done by an outside vendor.

Target Completion Date: December 2008

Actual Completion Date: December 2008

☆ <u>Room and Equipment Scheduling Software and Classroom Equipment Needs Assessments</u>

The goal of this project was to determine the advantages and feasibility of implementing a different, industry-leading space management package to replace Resource25. In addition, this project included a study of equipment needs for the Downtown Dayton Campus classrooms and conference rooms and provided a plan and cost analysis for implementation.

Space, equipment, and usage information were used to determine that 115 classrooms on the Downtown Dayton Campus require multimedia equipment in order to have

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

desired saturation of equipped academic spaces. Each space must be equipped minimally with a ceiling mounted projector, an instructor computer, and remote control and monitoring capabilities. This equipment and installation will cost approximately $9,950 per space for a total cost of $1,144,250 for the entire project. Options for phases to spread costs over a period of time include conversion of 53 non-standard spaces first, then 1/2 (31) of the non-equipped spaces, then finally the remaining 1/2 (31) spaces.
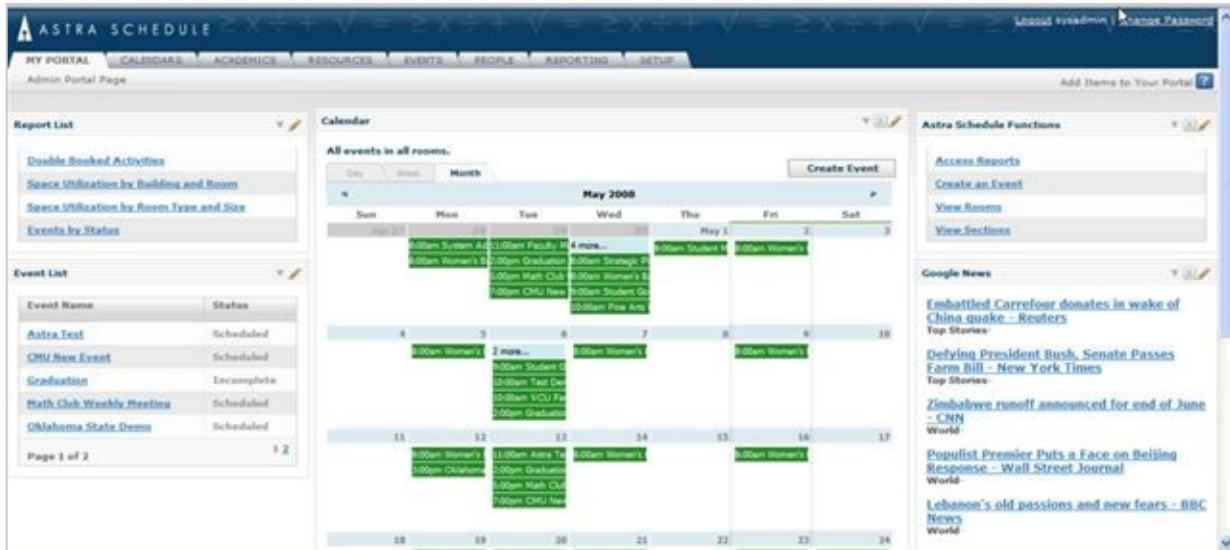
Figure 3-39. Room and equipment scheduling software.

Qualitative/Quantitative Return on Investment: This project is primarily a committee research and benchmarking project. Return on investment should occur when committee recommendations are implemented.

Cost savings/Cost avoidance identified with the project: This project is a feasibility study and will not include cost savings or avoidances in this Phase.

Target Completion Date: December 2008

Current Status: The classroom equipment portion of this project was complete as of February 2009. A review team composed of members from Research, Analytics and Reporting, Space Analysis, Registration, Information Technology, and the Sinclair Center has extensively reviewed Ad Astra, which has been reported to be an industry leader in the space management software arena, and has begun review of EMS, another industry leader. Next on the agenda is to complete the review of the software package EMS and to also review Resource 25 to see if it has new features not currently used. Review of the EMS and R25 software packages began in March of 2009 and should be completed by July of 2009. At this point the review team will submit a report of findings including recommended next steps for the college.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Transition CIS lab support to ITS

The Computer Information Systems Department (CIS) identified its desire to have its lab support managed by ITS. The CIS labs were being supported by a full and part time lab tech who reported to the CIS department. CIS needed more depth in their support and assistance to bring their labs up to date. ITS worked with CIS to bring all of the lab hardware up to date. New PCs with additional memory and second hard drives were installed and VMware was implemented in the lab images.

Utilizing the existing ITS infrastructure to provide support for the CIS labs and faculty has given CIS faculty help desk assistance 7 days a week, technical support on first and second shift during the week and first shift on Saturdays. The ITS infrastructure also provides server and network engineers for server upgrades and network connectivity.

Qualitative/Quantitative return on Investment: ITS has provided an infrastructure of support not previously utilized by the CIS faculty and labs. ITS now provides Help Desk support, Systems and Network, Imaging, Technical Support evenings and Saturdays and Lab Coordination to the CIS department.

Cost Savings/Cost Avoidance identified with the project: ITS providing the CIS lab support is utilizing existing resources without increasing costs to the college.

Target Completion Date: October 2008

Actual Completion Date: October 2008

☆ Security Information Event Management

Over the past year ITS has investigated a number of Security Information Event Management (SIEM) products from a variety of different vendors. Thus far, the front runner is TriGeo's Security Information Management software. TriGeo delivers real-time log management, sophisticated event correlation and response, as well as audit compliance capabilities.

Before moving forward with a purchase, the product needs to be evaluated in a production environment. Additionally, evaluating the amount of time required to administer these systems is essential in order to make sure that the investment in personnel, as well as the investment of dollars, is worth the benefits that would be received. ITS is in the process of scheduling visits to other organizations that use the software to view the product in action.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 3-40. TriGeo SIM Rule Builder.

Qualitative/Quantitative Return on Investment: Providing the ability to automate the collection, consolidation, and remediation of log file data to help prevent data breaches could prove invaluable.

Cost Savings/Cost Avoidance identified with the project: The cost of a data breach that goes undetected can cost the college a large amount of money. The ability for personnel to monitor logs for anomalous behavior would be so expensive that it could never be done without a tool to aid in the process.

Target Completion Date: June 2009

Actual Completion Date or Current Status: ITS will make a decision on whether to purchase the product by June 2009. The implementation of the product will occur during the next fiscal year.

☆ <u>VOIP Network Preparation</u>

The implementation of VOIP across campus required certain preparations to the data network to be able to accommodate the new phone system. To aid in these preparations, data and phone jack information was gathered and input into a database. This information was used to determine how many new data jacks would need to be installed, to verify the phone count and locations on campus, and to identify the location of the network connections in the telecommunications closet. The VOIP inventory started in August 2008 and was completed by November 2008.

Unlike traditional phone systems, VOIP systems do not draw power from a centralized phone switch. Devices that inject Power Over Ethernet (POE) cable must be installed to power the phones. These POE units are distributed throughout the campus and need to be provided with emergency power in case the building's power fails. To provide this emergency power, additional uninterruptable power supply (UPS) units were installed in the network closets.

All of the closets were reviewed for current UPS coverage and the new VOIP requirements factored in to identify the quantity of UPS units to purchase. The power was installed and the UPS units ordered. The technicians installed the UPS units across campus in the network closets and also installed network interface cards in the UPS units to allow the network to monitor them.

Qualitative/Quantitative return on Investment: Without UPS units in the telecommunication closets, there would be a risk of not providing people with the ability to communicate during power outages.

Cost Savings/Cost Avoidance identified with the project: Information Technology Services technicians performed the inventory and ensured data jacks were available to be used by the new phones. Technicians also installed the POE devices and UPS units in the network closets, minimizing work that needed to be outsourced and allowing the project to remain on schedule.

Target Completion Date: December 2008

Actual Completion Date: December 2008

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Major Projects for FY 2009-2010

A variety of innovative projects are in process or are planned to start during FY 2009-2010. This section describes many of these major projects. Each project title has associated with it a color coded object to reflect the Sinclair Strategic Priority supported. These priorities are shown at the bottom of each page.

Library

Following are the major projects for FY 2009-2010 for the Library:

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

☆ 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 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 Learning Management System.

Figure 4-1. A few of the many resources available to students, faculty, and staff through the Library.

Students must be able to select the appropriate resource and use it effectively. 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

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

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 the students who may never set foot on the campus.

This project's goal is 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 should have access to real help: online guides, tutorials, webcasts, interactive chat, blogs, and telephone support. Some level of support should be available 24x7 to every Sinclair student.

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: Basic help files will be available for library research databases for Fall Quarter 2009. The Library web site will 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 will be available to Sinclair faculty for their Angel shells for Winter and Spring 2010.

☆ Information Collaboratory - Teamwork Studio

The Information Collaboratory or Library-IT 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 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 use of the space and return on investment.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 4-2. 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

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ <u>Improved PC Reservation System for the Library</u>

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 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 4-3. 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 well, as promised, with the large and complex campus network infrastructure at Sinclair. As a result, a significant amount of time has been spent troubleshooting performance, installing and uninstalling clients, and assisting students when there are problems.

The goal of this project is 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 software package will run approximately $5,000 to $10,000

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

depending upon the number of licenses purchased for individual computers. Cost of staff to implement the new system would represent an additional cost and be dependent on the system selected.

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 technician.

Target Completion Date: October 2009

Systems Development & Maintenance

Following are the Major Projects for FY 2009-2010 for Systems Development & Maintenance (SD&M):

⭐ 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 tool
⭐ Support Corporate & Workforce Development 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

⭐ Support Quarters-to-Semesters conversion

If Sinclair transitions from a quarter-based to a semester-based academic calendar, significant changes will be required in the Colleague ERP System. Changes will need to be made to the custom programming found in Financial Aid (FA), Bursar, and Registration & Student Records (RSR) programs. In addition, the software's baseline configuration will need to be changed to represent the new calendar.

The Financial Aid module within Colleague has been customized specifically to support both federal and state regulatory requirements. Hence, considerable effort will be required to ensure a smooth transition from a quarter- to a semester-based credit

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

system. There have been many changes over the years since the Financial Aid module was initially setup and configured, and all of these changes will need to be transitioned to the new calendar. In addition, the move to the semester calendar provides an excellent opportunity to implement the long-planned change in financial aid years from a summer-leading year to a summer-trailing year.

Additional setup and reconfiguration of the Colleague system will be required within Bursar Office software. Several policies and operational procedures will need to be redefined. The following is a partial list of the tasks, procedures, and programs needing attention within Colleague as a result of the semester calendar transition:

- Refund processes and rules;

- Deregistration process and schedule;

- Student payment plan setup;

- Bursar web page reconfiguration; and

- Student billing statement configuration.

Changes in Registration & Student Records (RSR) processes will be central to successful quarters-to-semesters transition.   The following represents a partial list of the software activities that will need to be accomplished:

- All registration and application rules and restrictions will need to be re-coded for semesters.

- Rules will need to be evaluated for obsolescence.

- All historical and current registration records will need to be converted to semester credit values.

- Recoding will need to be done for programs such as Fresh Start and Course Content Replacement.

- A semester-based course inventory will need to be created.

- A semester-based program inventory will need to be created.

- Process redesign and code consolidation opportunities will need to be identified and implemented.

The software coding undertaken during the quarters-to-semesters process must be done within a test environment that is separate from, and does not interact with, the day-to-day production environment. The FY 2008-2009 Information Services Status Report & Strategic Objectives called for the procurement of equipment to be placed at the Courseview Campus for disaster recovery purposes. This equipment is now in place, and the determination has been made that the equipment can be used to support the quarters-to-semesters coding process without adversely affecting the disaster recovery function.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 4-4. Announcement of OSU's move from quarters to semesters.

Estimated Cost of Project: The Systems Development and Maintenance staff has identified approximately 1,100 individual program units that will need to be re-coded and tested as a result of moving from quarters to semesters.

At a coding rate of one-person-day per program unit, 8,800 hours of staff time will be required to accomplish the quarters-to-semesters recoding and testing. Since the process will be spread over a two year time period, half of the hours will be used during FY 2009-2010. These hours equate to slightly more than two FTE at an estimated cost of $160,000 for the year.

Sinclair contracts for six hours per month of technical phone support from the ERP vendor. This time has historically been consumed to support normal business operations. During the transition the need to contract for additional phone support will significantly increase. An additional 75 hours of phone support has been anticipated for FY 2009-2010. At $250 per hour, this comes to a total cost of $18,750.

The complexity of changes in financial aid requires that vendor consulting resources be employed during the transition period. It is the recommendation of the Financial Aid office that approximately 60 days of vendor consulting be utilized in order to support the transition. At $1800 per day, this comes to a total cost of $108,000.

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Additionally, a contingency amount of $63,250 is recommended to accommodate unforeseen issues, bringing the total estimated cost to $350,000.

Cost Savings/Cost Avoidance Anticipated for the Project: 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.

Target 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 2012; thus, this project will be included in future reports.

☆ <u>Feasibility study and warranted implementation of mobile device services</u>

Mobile devices are the communication mode of choice for a large majority of Sinclair students. However, most of Sinclair's web services are designed for access via traditional web browsers such as Internet Explorer and Firefox. These access modes are not always seamlessly transportable to mobile device formats. Consequently, this project calls for equipping several web developers with various mobile devices so that the developers can acquire skill in designing for these formats.

The following mobile devices will be acquired:

- iPhone service from AT&T (Carrier Dependent Device);
- G1 Android device and service from T-Mobile (Carrier Dependent Device);
- BlackBerry Bold and service (or other similar modern model);
- Nokia N85 or similar modern Sybian Based Phone; and
- Palm OS Based Device and service.

Figure 4-5. Mobile communication devices.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Estimated Cost of Project: The project will cost $11,000 for the devices plus an annual service contract for each device. 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: Mobile devices are very prevalent and most students now carry some type of mobile phone. It is expected students will continue to want to do business on the mobile devices as the devices become more powerful and faster for data access. The devices allow students to interact with Sinclair services at any time, any place.

Target Completion date: June 2010

☆ Enhance Angel Learning Management System

The Angel Learning Management System is software that underpins all of Sinclair's distance learning and technology enhanced courses. In spring quarter, 2009, over 2000 course sections actively relied upon the Angel LMS to deliver course content. Under normal load, between 1500 and 2000 users access Angel content at any given time, and peak access can exceed 4000 simultaneous users.

During FY 2008-2009, the Angel LMS experienced performance declines at the beginning of fall, winter, and spring quarters. These performance problems were caused by different system components in each instance, but all problems were exacerbated by the inherent complexity of the Angel LMS and the difficulty this complexity creates in isolating the root cause of a performance problem.

This project involves the development and enhancement of system performance monitoring tools that will allow for rapid response to performance problems. Additionally, the project will focus on the development of scalable system configurations that will allow additional computing resources to be rapidly allocated to Angel processes.

The following actions are anticipated as components of this project:

- Server virtualization software will be used to create multiple instances of the web servers supporting Angel. The available instances will allow additional server resources to be instantaneously allocated to Angel as user demand dictates.
- The full complement of Angel services will be evaluated to determine if non-mission-critical services can be disabled at the beginning of quarters and remain disabled until the initial rush of use has passed.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

- Pending budget approval, an enhanced data base server will be allocated to support Angel transactions.
- Non-course-related features of Angel, such as access to student email and course schedules, will be taken off of Angel and moved to an alternative site in order to minimize access contention.
- Performance monitoring data from the Angel database, the Angel web servers, the Sinclair computer network, and other critical Angel support resources will be consolidated into one readily accessible performance dashboard that can be used to expedite troubleshooting efforts.
- The software that supports the ability for users to use a single account name and password for Angel related services will be brought up to the most recent release level.
- In December 2009, the most recent version of the Angel software will be moved from a test to a full production environment.
- The Angel end-of-capacity predictive model developed by the Research, Analytics and Reporting department will be recalculated using FY 2008-2009 enrollment data, and new dates will be established to predict when expected growth will exceed Angel resources.
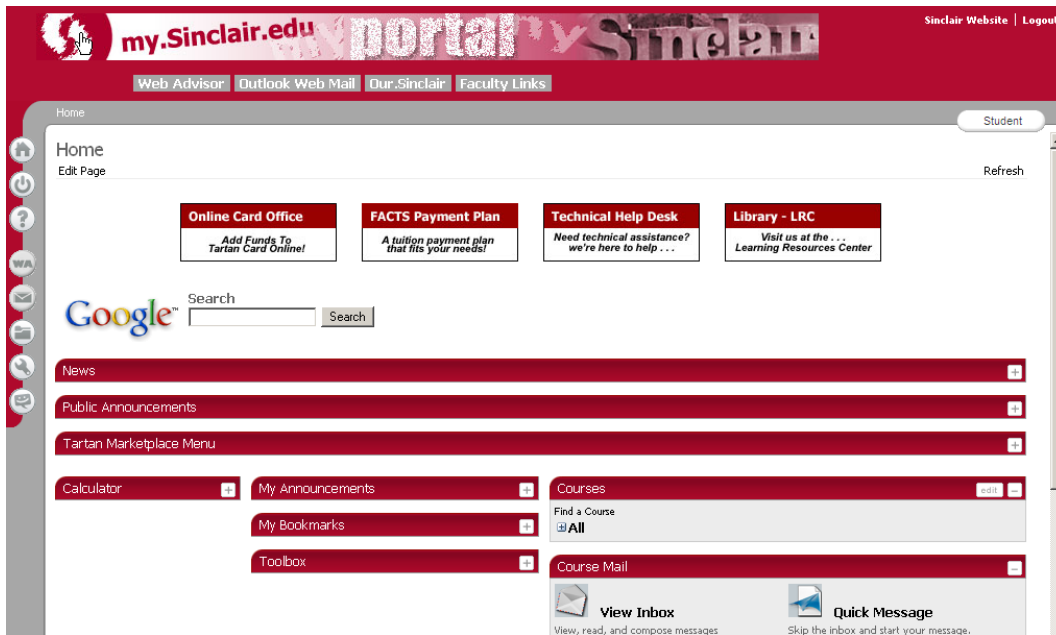
Figure 4-6. Angel portal home page.

Estimated Cost of Project: The new database server will cost approximately $130,000. The next version of the Angel software will result in an increase of approximately $13,000 in the Angel annual software license amount. The costs of the other components of this project are all staff-time related. It is estimated that these components will require approximately 2.0 FTE's at a projected costs of $140,000.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Cost Savings/Cost Avoidance Anticipated for the Project: Sinclair has set a strategic goal of increasing distance learning enrollments by 100% 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.

Target Completion date: December 2009

☆ Expand implementation of forms-management software

In June 2009, the Systems Development & Maintenance department implemented a pilot test using the forms-management software to electronically submit leave requests. At the same time, a custom report was developed for the Human Resources office that validated and consolidated the requests submitted via the pilot in order to expedite the entry of leave information into the Colleague ERP system.

This project moves beyond the pilot testing of the leave submission and extends the process campus wide. At the completion of the project, it is expected Sinclair will no longer be using a paper leave request process and the majority of the calculations needed to confirm leave availability will be automated.

An additional component of this project calls for extending the forms-management software to the budget transfer and tuition reimbursement processes. Upon project completion, all budget managers will initiate and approve budget transfers using electronic forms processing, and individuals requesting tuition reimbursement will process requests and supporting documentation using the document attachment feature of the software.
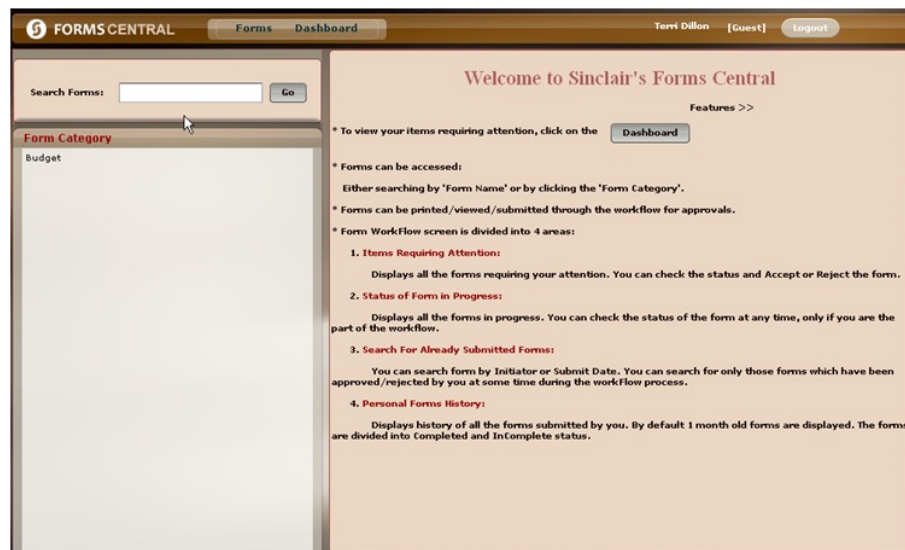
Figure 4–7. Sinclair's Forms-Management software.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Estimated Cost of Project: The forms-management software has been developed, and the template for the leave request form has been incorporated into the tool. The costs of the project are primarily the training and communication efforts needed to implement the project throughout campus. The rollout effort will require approximately .25 FTE at an estimated cost of $20,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The workflow management tool will save time compared to the manual, paper-based method when creating and processing a leave request. Assuming that six leave requests per employee, for 800 full-time employees, are created and processed each year, 800 hours of staff time would saved. At twenty dollars per hour, this would equate to an annual savings of $16,000.

Target Completion date: March 2010

☆ Enhance web-based schedule planning tool

During FY 2008-2009, Web Systems developed a schedule planning tool allowing students to build their course schedule interactively on the web. This tool has been enthusiastically received by students and has received extensive praise from registration staff. The user experience with this tool is significantly improved compared to that available in the college's Colleague ERP system.

Unfortunately, due to the complexity and inaccessibility of the computer programs underlying the registration component of the Colleague ERP system, it was not possible to link this planning tool directly to the registration processes within Colleague. Once a student completed the planning steps on the web, they needed to take a printout of their plan to the Colleague system and re-enter the information.

This project will undertake the task of eliminating the double data entry the current arrangement requires. By making use of a market basket feature, which is available within the Colleague system, this project will create the necessary behind-the-scenes data transfers automatically moving data from the schedule planning tool to the Colleague file holding market basket information. This automated movement will not eliminate the need for the student to access Colleague to complete registration, but it will assure that the courses selected within the web-based planning tool will be accurately and effortlessly replicated within Colleague and will stand ready for the registration transaction to be completed by the student.

This project also involves completing an analysis and feasibility study of adding a prescriptive enrollment component to the scheduling tool. As indicated in the quarters-to-semesters project, the Colleague e-advising features will be evaluated as a possible

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

enhancement to the degree audit information that students currently receive within Colleague. If this enhancement performs as hoped, students will have within Colleague a program completion plan that lays out the remaining courses required for their program. The feasibility study will determine if this remaining course list can be dynamically extracted from Colleague and presented in the schedule development tool as a guideline for what courses a student should select while using the tool.
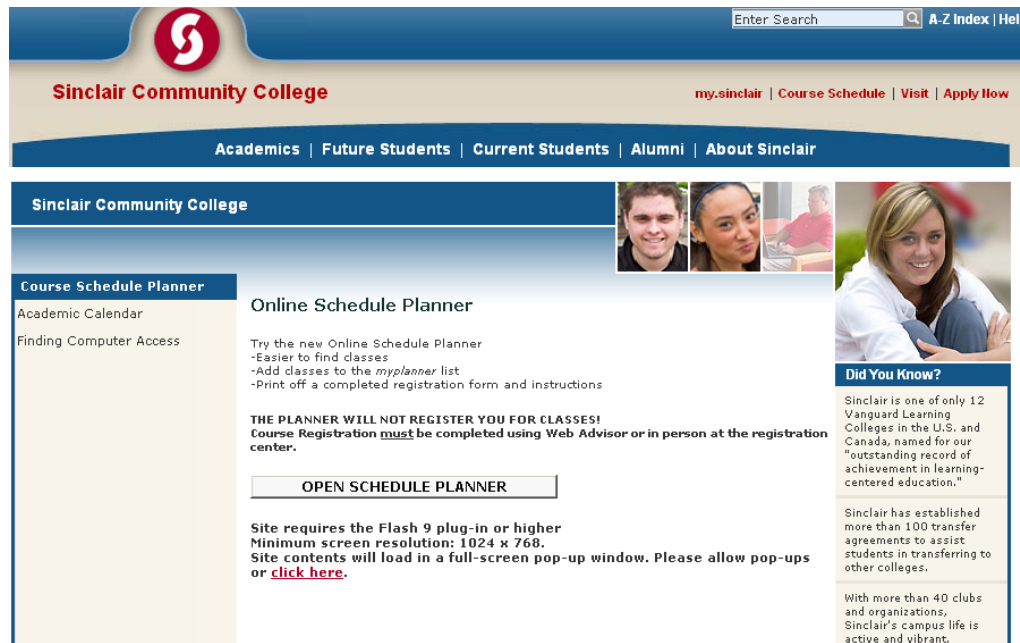
Figure 4-8. Entry page to Sinclair schedule planner.

Estimated Cost of Project: This project will require effort from both Administrative Systems and Web Systems to complete. In total, the project will require the equivalent of two FTE to complete at an estimated cost of $140,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The number of completed registration transactions should increase by creating a direct link between course selection and registration. In addition, errors caused by inaccurate translation of data from one system to another should be significantly reduced and possibly eliminated.

Target Completion date: December 2009

Current Status: The web-based component of the schedule planning process was completed during FY 2008-2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

★ Support Corporate & Workforce Development software implementation

Sinclair's Corporate & Workforce Development department has reached a level of activity where their current enterprise software is not appropriately scaled to support the division's operation. This project calls for identifying, evaluating, selecting and installing the division's next generation of software. The software to be selected falls into three general categories: financials, conference center reservations, and web registration for instructional offerings. The desired software features for each category are as follows:

- The Financials software will include components for accounts receivable management, sales management, invoicing, client/contact management, robust accounting, credit card processing, and financial reporting.

- The conference center reservations software will provide ease in researching, creating and detailing client event requirements: availability of rooms by date/ size, food, multimedia, set-up, security, parking, etc. The software will easily integrate with reporting software and email marketing software.

- The web registration for instructional offerings software at a minimum will support fully-automated, web-based registration, acknowledgement, and billing for events; full costing of events; contact management supporting mass emailing; and knowledge-based event management.

All components must be structured for multiple, simultaneous accesses via the web, and the software needs to be scalable for the planned growth of the division.

Estimated Cost of Project: Since the software and associated hardware have not been identified, development of a realistic cost estimate is impossible. Staff time needed to support installation and implementation would average one FTE individual at an estimated cost of $70,000. Additional staff will be required to support the ongoing operation of these software components; however, until the software selections are finalized, the types and number of staff cannot be determined.

Cost Savings/Cost Avoidance Anticipated for the Project: The Corporate and Workforce Development department has set the goal of quadrupling its annual revenue within the next four years. By the end of this period, Corporate and Workforce Development expects to be a $12,000,000 per year operation. Scalable, reliable, and targeted software support is essential in allowing Corporate to reach this goal.

Target Completion date: December 2009

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

★ Promote commercialization of CMT product

Web Systems has created a curriculum management tool (CMT) that has the potential to be licensed as a product for sale by a third-party software vendor. This project calls for Web Systems to incorporate into CMT the commercial characteristics necessary for transitioning the product from a single, Sinclair-centric implementation to an application which can be installed seamlessly in multiple higher education settings. During FY 2008-2009, CMT was sold for the first time to another community college. Installation of this sale will take place within FY 2009-2010, and this experience will serve as the impetus to accomplish the general commercialization of the tool.

Figure 4-9. Curriculum Management Tool.

During FY 2008-2009, Sinclair entered into a licensing agreement with a software vendor to serve as the sales and support representative for Sinclair's student success plan (SSP) product. A similar licensing agreement would be pursued for the curriculum management tool once it has been transitioned to a commercial product.

Estimated Cost of Project: The project is estimated to take approximately one-half FTE of a web developer's time at a total cost of about $35,000.

Cost Savings/Cost Avoidance Anticipated for the Project: The first instance of Sinclair entering into a licensing agreement with a third-party vendor for software sales resulted in a minimum return to Sinclair of $100,000 per year. It is expected the CMT licensing agreement would carry similar benefits.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Target Completion date: June 2010

☆ Support implementation of Math prerequisite changes

The Curriculum Committee has requested a Colleague feasibility study of the proposal by the Math department to change the prerequisite policy for students registering in Math classes. The Curriculum Committee, while supportive of policies that encourage student success, is cautious about the potential negative impact of a policy of this sort on the ability of students to register for all courses. As proposed, the policy will prevent students from registering in Math classes if they have not taken a placement test within two years and if they have not met the required MAT prerequisite(s) within the last two years.

It is proposed that Sinclair Community College develop a course eligibility rule that would qualify on the following logic:

1) Student must have completed all prerequisites for the Math course within the last two years.

2) Students must have taken a math placement test within the last two years.

Both conditions of the logic must be met in order for the student to register in their chosen Math class. Prerequisites will be obtained from the Colleague database. Failure in either condition 1) or 2) above will result in the student being unable to register for the MAT course.

This project calls for the design of a registration rule and a subroutine to be utilized within the Colleague ERP to bring about enforcement of the Math registration requirements. The developed subroutine will accept the student id and course section and will determine if the student has completed all the prerequisites and taken the Math placement within two years from the day the subroutine is run.

Estimated Cost of Project: This project is estimated to take one-half of an Administrative Systems analyst's time over a three week period of time. This staff time will cost approximately $8,200.

Cost Savings/Cost Avoidance Anticipated for the Project: 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.

Target Completion date: June 2010

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Improve library circulation system quarterly updates

The Sinclair library uses a circulation database named Millennium ILS. This system is used to authorize an individual to make use of local and state-provided library materials. The Millennium ILS authorization database is updated each quarter to reflect changes in the current student and staff populations for the quarter.

The quarterly processes used to provide student and staff changes from the Colleague ERP system to the Millennium ILS system were written over a decade ago by an individual who is no longer associated with Sinclair. Consequently, whenever difficulties arise in the extraction process, it is necessary to reverse engineer the computer code supporting the process in order to effectively troubleshoot the problem.

Since the extraction process was initially written, Sinclair has engaged in the development of a data warehouse that is used for the vast majority of the college's reporting needs. This project envisions making use of the power of the data warehouse to replace the need to use the unsupported process code. Specifically, staff in Administrative Systems will reverse engineer the old code to determine the exclusions and exceptions that prevent an ERP record from being included in the Millennium ILS extract. These exclusions and exceptions will be passed on to the data warehouse staff so that they can recreate the Millennium ILS extraction process using the modern, SQL-based tools of the data warehouse.

Estimated Cost of Project: This project is estimated to take one-quarter of an Administrative Systems analyst's time over a three week period. This staff time will cost approximately $4,100.

Cost Savings/Cost Avoidance Anticipated for the Project: Every time a problem occurs in the data exchange between the ERP and Millennium ILS, 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.

Target Completion date: January 2010

★ Support implementation of continuing education content delivery system

The Corporate Services and Workforce Development division has set a goal to grow its continuing education offerings. The division wishes to create a library of offerings that can serve the certification, job improvement, and professional needs of service area clients.

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A critical component for successfully completing this goal is to select supporting software that can serve as the delivery vehicle for continuing education offerings. This project involves assisting Corporate Service in identifying, evaluating, selecting, and implementing such software.

The ideal software will be configured to support multiple sources of content. Corporate Services will pursue content that is locally developed or available from various local and/or national content providers. The software will need to be flexible enough to efficiently support any of these content sources.

Estimated Cost of Project: The cost of the project is yet to be determined. The actual cost will depend upon the specific software solution selected

Cost Savings/Cost Avoidance Anticipated for the Project: The Corporate Services and Workforce Development division has set an aggressive goal to quadruple their annual revenue during the next three years. Continuing education offerings are a significant component of this anticipated revenue growth and the supporting software is essential to success of continuing education offerings.

Target Completion date: October 2009

Research, Analytics, and Reporting

Following are the major projects for FY 2009-2010 for Research, Analytics and Reporting (RAR):

⭐ Growing Value in the DAWN environment
⭐ State/federal Reporting - monitoring and instilling required changes
⭐ Providing Major Project Support
- Quarter to Semester Conversion support
- Ohio Skills Bank and Academic Program support
- Re-accreditation support (AQIP)

⭐ Data Mining and Modeling
- Distance learning - predict the likelihood of sections meeting capacity

⭐ Growing Value in the DAWN Environment

Substantial growth and utilization of the DAWN environment has occurred over the last four years of implementation, and demand for continued refinements, new products, and new opportunities continues to build. Tools such as the web report studio are being used at an unprecedented rate, and the department continues to

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

exploit the data warehouse and portal to accommodate institutional change and the College's need for business intelligence.

This coming year will see, at minimum, dashboard creation within the instructional arena (chair, dean and provost views) and the business side of the house (e.g. facilities HB251 Energy Utilization dashboard). Numerous new reports will also be developed: examples include FTE/demographic reporting for the Preble County site, and an easy access through the portal for 'automatic updating' of charts and tables required for AQIP (national accreditation) reporting.
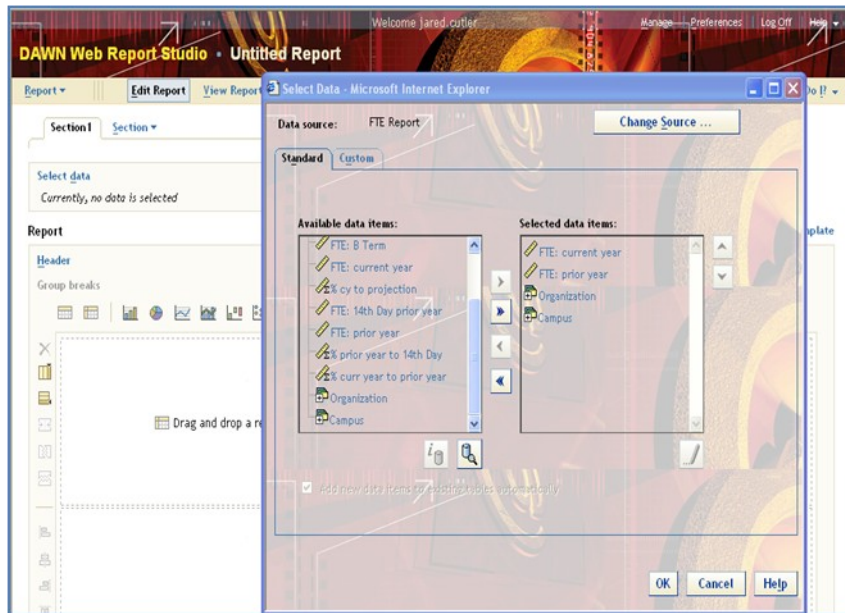
Figure 4-10. Dawn Web Report Studio.

Continued integration of other databases into the data warehousing platform will also be a high priority. Specifically, RAR will be incorporating the Capital Project databases currently used by the budget office, as well as the access database used by Grants to enrich the data capturing and reporting capabilities of both.

Lastly, the creation of a portal 'tracking' tool which would allow supervisors to monitor who within their departments are scheduled to be out of the office through leave, business trips, et al has been requested and will be honored.

Estimated Cost of Project: Approximately 2,000 hours of staff time for an estimated cost of $84,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Notable efficiencies and effectiveness for end users will ensue as a result of this effort, and an increased richness in the data will lend itself to better understanding and value. Dashboards will provide daily information against institutional targets, while migrating other databases

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

onto the warehouse platform will minimize duplication of effort and human error, while enriching the amount of information available to the end user through cube development and data mining. Ideally, this will also reduce the number of ad hoc requests currently received by the department.

Target Completion Date: June 2010

☆ State/federal Reporting - monitoring and instilling required changes

Over the past year, the College has learned of substantial changes in accountancy requirements being applied to higher education from both State and Federal mandates. Over 45 pages of required reporting changes from the federal government have recently been released, and will have major implications to data collected, as well as to collection, validation and data dissemination processes. Concurrently, changes at the State level, in relationship to changes in subsidization and performance reporting (including the University System's Accountability requirements) also require changes in reporting structure, data collected and internal processes.

RAR will be spending substantial time in assuring the institution is in compliance with these new regulations.
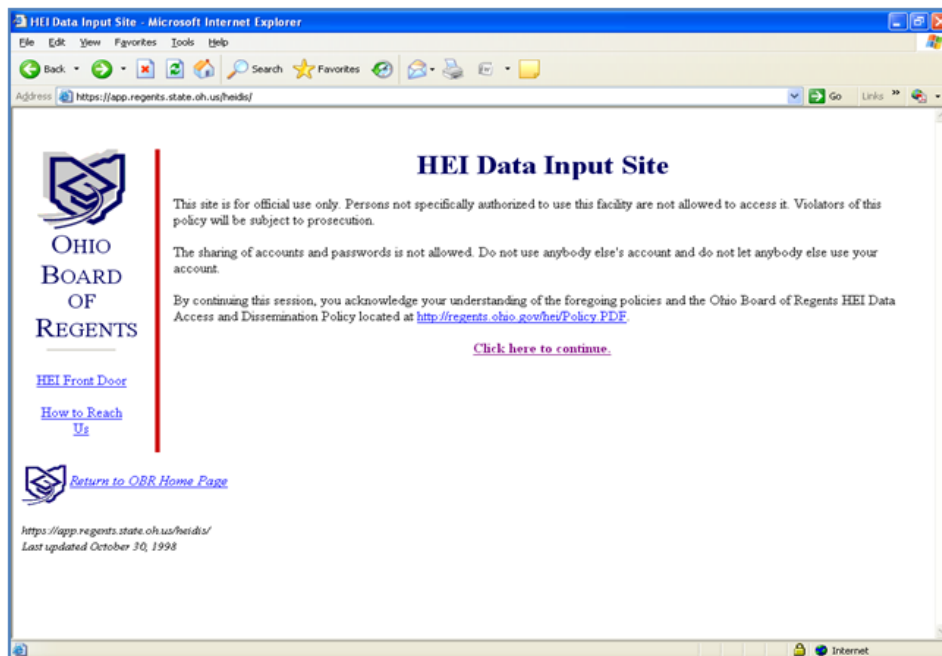
Figure 4-11. Ohio Board of Regents Higher Education Information (HEI) Site.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Estimated Cost of Project: Approximately 1,200 hours of staff time for an estimated cost of $54,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Compliance to state and federal reporting requirements positions the institution to receive state and federal financial aid and subsidization. Should this accountancy transparency not take place, it would or could endanger substantial funding for the institution, and availability of financial aid for students.

Target Completion Date: June 2010

☆ Providing Major Project Support

Several major projects for the institution will require RAR to be a substantial contributor in order to meet institutional or project needs. Some examples of major projects include:

- *Quarter to Semester Conversion Support*

A project scheduled over the next few years, the quarter to semester conversion will need substantial feedback and assistance from this department, as processes, transcription (e.g. translation of historic data), the development of newly-required data elements, and the impact on curriculum are considered. RAR is currently represented on two of the conversion subcommittees.

- *Ohio Skills Bank and Academic Program Support*

In its second year, the Ohio Skills Bank continues its work aligning labor market need with academic programs and other programs within the region. RAR's role has been, and likely will continue to be that of providing environmental scanning capability and labor market analysis.

Concurrently, RAR will continue to serve the instructional side of the College as it develops new programs and retires others. Program-level environmental scanning is a standard feature of the Program Review process, and labor market analysis of select programs have helped (and will continue to help) identify which courses/programs should be offered at specific sites.

- *Re-accreditation Support (AQIP)*

The current re-accreditation process for the institution requires on-going evaluation of the institution's current status and a record of continuous improvement activities

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

associated with the data findings. Periodic updating of the portfolio is required. In order to make this process easier and the data more meaningful and current, RAR will develop a portal page that will have each portfolio chart/graph automatically updated as appropriate. This will save numerous hours of trying to find the data for editing the portfolio, and will permit end-users to see trends associated with these metrics whenever needed.

Figure 4-12. Academic Quality Improvement Program (AQIP).

Estimated Cost of Project: Approximately 2,000 hours of staff time for an estimated cost of $84,000.

Cost Savings/Cost Avoidance Anticipated for the Project: Support from RAR on these projects minimizes the need for consulting (in particular related to Ohio Skills Bank, Program Development and AQIP). Additionally, information used to develop new programs or to sunset those that are no longer relevant saves the institution resources that might otherwise be utilized to maintain programs perceived to be of less value for the community. RAR's role within the quarter to semester conversion is critical in assuring the institution is minimizing error while maximizing efficiency and effectiveness.

Target Completion Date: June 2010

☆ Data Mining and Modeling

Data mining is a very powerful tool that has been employed by RAR most successfully this last year. Coupled with targeted outreach, the data mining findings have led to nearly $200,000 in recouped funding associated with 'rescued' enrollments.

This coming year, the department has been asked to predict the likelihood of distance learning sections meeting capacity. If successful, resources can be maximized, and the appropriate number of sections can be developed with increased confidence of their value in the mix.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 4-13. Trends in online enrollment.

Estimated Cost of Project: Approximately 350 hours of staff time for an estimated cost of $15,750.

Cost Savings/Cost Avoidance Anticipated for the Project: Finding a reliable predictive model on which distance learning sections will fill will minimize under-utilized human and technological resources. Increased efficiencies and effectiveness translates to better use of faculty, improved opportunities for students and a reduction of cost to the institution.

Target Completion Date: June 2010

Information Technology Services

Following are the Major Projects for FY 2009-2010 for Information Technology Services (ITS):

⭐ 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

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Preble County Learning Center

The new Preble County Learning Center in Eaton, Ohio will open 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 which have been built over the last few years. While the facility will have a smaller number of classrooms, the amount and kinds of technology that will be used is very similar. There will only be one computer classroom but all classrooms will be equipped with multimedia podiums. The Learning Center will also be connected back to the Dayton campus and will use the same VoIP phone system that will allow 4 digit dialing to other Sinclair sites.

Figure 4-14. Artist rendering of the Preble Learning Center

Estimated Cost of Project: $302,000.

Cost savings/Cost avoidance anticipated for the project: ITS will use a remote technical support model for the Preble Learning Center rather than providing a User Support Technician on-site and no additional technical support staff will be added to support the site.

Target Completion date: September 2009

Current Status: The design of the infrastructure is complete and the budget has been provided. Installation of equipment will begin in July 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Recommend Changes to PC Permissions

In all versions of Windows through Windows XP, end users by default were granted 'local administrator' permissions on the PC. The risk when users run with administrative privileges on an Internet connected computer is particularly magnified because the attackers know and rely on it. When users run with administrative rights, they can intentionally run/install any application/code on the machine—but any piece of code they run/install also has the ability to run/install any application code because the code is running at administrator level.

This project involves evaluating issues surrounding end-user privileges, then developing recommendations and a strategy for ensuring end-users have the most appropriate permissions needed to perform their duties. In most cases, this will likely require migrating end users from the current default "administrators" group to the standard "users" group on administrative imaged and other end-user machines. This will restrict the typical computer user—and any code the user accesses—from making system-wide changes to the machine. Individual users with a legitimate need for administrative privileges should be identified and provided access to and training on the use of tools such as the "run as" command. In instances where the "run as" command will not meet the users' needs, alternative solutions will be explored and offered.

Estimated Cost of Project: Unknown, but should be minimal as the tools, infrastructure, and skills are in place to implement.

Cost savings/cost avoidance anticipated for the project: Cost avoidance is the most likely result as 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

☆ 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.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

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 was becoming too large and critical to perform that type of upgrade again. In addition, a SAN Expansion Project in FY 2007-2008 added an additional 6.2 TB of storage to the SAN, which ITS estimates increases its estimated useful life by a couple of years.

For FY 2009-2010, ITS will not replace the existing SAN but augment this SAN with an additional SAN. As such, ITS decreased the SAN R&R allocation in the FY 2009-2010 budget from $750,000 to $400,000. ITS plans to roll the $350,000 difference forward to the FY 2011-2012 R&R Budget, at which time the original SAN will be replaced. The scope of this project is as follows:

- Determine the type and size of SAN to purchase;
- Ordering SAN;
- Installation/configuration of SA;
- Installation/configuration of tape drives;
- Determine what data to move from the existing SAN to the new SAN; and
- Moving data from existing SAN to new SAN.

This project will also involve some reorganization of the computer room to make room for the new equipment. The reorganization will be tracked in a separate project.

Estimated Cost of Project: $400,000 has been budgeted for this project.

Cost Savings/Cost Avoidance anticipated for the project: By expanding the SAN in FY 2007-2008, two additional years were added to its replacement cycle. This deferred $350,000 from FY 2009-2010 until FY 2011-2012.

Target Completion Date: June 2010

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

⭐ Modify Room 14115 to Improve Service

ITS is hoping to better serve students in the open lab in building 14 by making room 14115 more connected to 14109 and adding more computers. 14115 has been used as open lab space and a training classroom for the Colleague system whenever needed. Because of the infrequency of the room's use as a Colleague classroom, that function has been moved to the Short-Term Schedulable Lab in the Teleport. Also, in February 2009 the BIS/CIS open computer lab moved from room 3241 into room 14115 to increase the support of CIS students without increasing staff and to free up room 3241 to become a large computer classroom for BIS. Eight computers were setup in 14115 to support CIS student learning.

With the closing of the BIS\CIS open lab in room 3241 there has been an increase of traffic in the 14109/14115 open labs. On average, at peak times, there are 5-6 students waiting for 10-15 minutes for a computer. This project will increase the number of computer stations by between 5 and 8 computers and create a better flow of traffic between 14109 and 14115.

Estimated Cost of Project: $27,800

Cost savings/Cost avoidance anticipated for the project: Other alternatives for providing the same level of service would require additional staff resources and therefore be more costly to support.

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

This project will investigate the use of VMware Lab Manager in the Cert Lab. It will be installed/configured in the Cert Lab and piloted with Web Systems, and possibly other departments, to see if this is a viable solution for development and testing.

Estimated Cost of Project: Since this project is investigational in scope, there is no budget allocated for this project.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Cost Savings/Cost Avoidance anticipated for the project: ITS plans to use decommissioned servers in the cert lab, so no additional server hardware will have to be purchased for this project.

Target Completion Date: June 2010

☆ Implement Server Disk Defragmentation

ITS continually reviews ways to increase a server's life expectancy as well as improve server 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 spread out over several locations, it takes longer to read and write, decreasing server performance. Utilizing InvisiTasking technology Diskeeper performs real-time defragmentation to continually keep server disk volumes in tip-top shape, allowing servers to process data with little or no degradation.
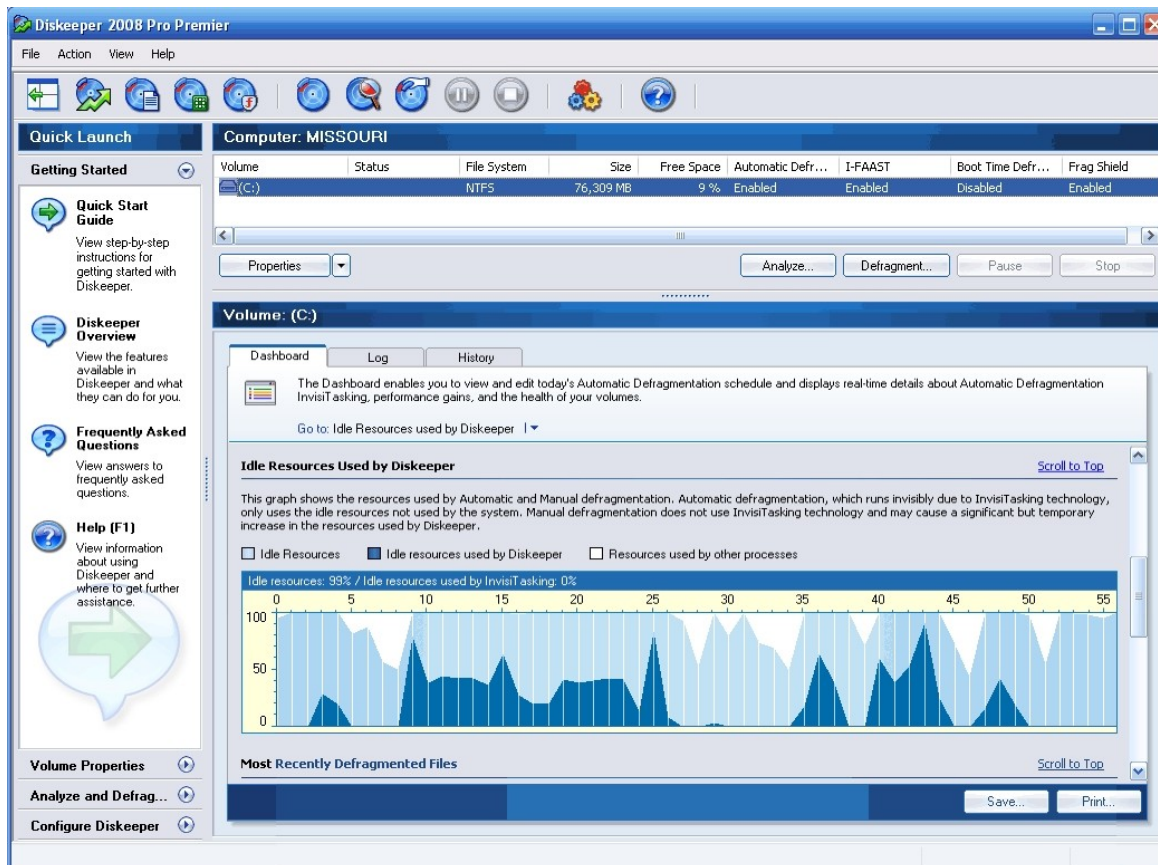
Figure 4-15. The Diskeeper Dashboard.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Estimated Cost of Project: The cost of the Diskeeper software for all Windows Servers that ITS maintains is $13,543. There may be some additional cost for vendor/ consultant services to assist with implementation. Employee time and resources to support the implementation, administer the system, and develop policies and procedures for use are also resource considerations.

Cost Savings/Cost Avoidance anticipated for the project: Server maintenance can drastically reduce server response time which wastes end user time in the form of lost productivity and also increases time of administrators to troubleshoot server availability. Diskeeper automates the defragmentation process, improving performance and availability.

Target Completion Date: December 2009

★ 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. In FY 2008-2009, 19 of the 30 conference center class- and meeting-spaces were equipped with installed projectors, projection screens, computers, VHS/DVD players, multimedia control systems and program audio speakers.
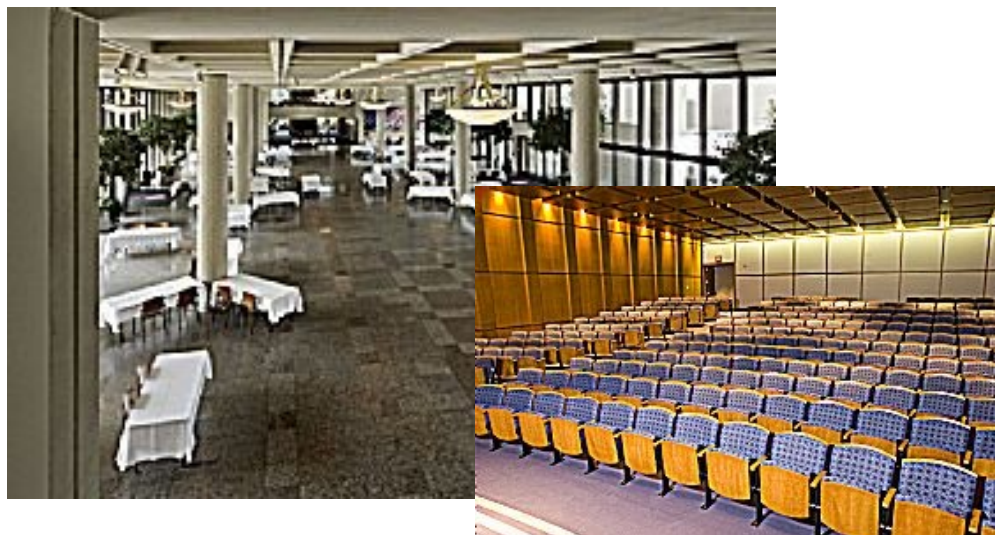
Figure 4-16. Sinclair Conference Center.

| Student Success | Work Force Development | Downtown Campus Development | Increased Regional Access | Expanded High School Linkages | Partnerships | Alternative Sources of Funding | Quality Workplace & Quality Workforce |

This project proposes to upgrade the multimedia capabilities in the Great Hall, one of the flagship spaces at the Sinclair Conference Center, as well as to add audio upgrades for both the Smith Theater and the Earley Auditorium.

The Great Hall upgrades will add installed but versatile projection capabilities to the North and South ends of the hall as well large flat panel monitors to increase viewing from every seating angle in the hall.

In the Smith Theater and the Earley Auditorium audio upgrades will increase the capacity of the audio systems so that speakers and multimedia may be clearly heard and understood.

Estimated Cost of Project: $350,000, which was submitted as a FY 2009-2010 Capital Budget request by the Workforce Development & Corporate Services Division.

Cost Savings/Cost avoidance anticipated for the project: Cost savings and cost avoidance is accomplished by enabling resource reallocation of the equipment and technical support staff currently used to create then tear down portable projection and extended viewing systems in the Great Hall.

Target 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 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 will replace 20 Windows servers. Not all of these servers will be physical servers however. Server virtualization will be used whenever possible depending the services provided by that server. This project will have the following scope:

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

- Determining which servers can be deployed virtual and which servers will have to remain physical servers;
- Determining the specifications of these new servers;
- Ordering servers;
- Installation/configuration of new servers;
- Migrating services from the old servers to the new servers; and
- Installation/configuration of new Angel database server.

The budget estimated for Network Server R&R was increased by $186,000 over what was projected for FY 2009-2010 due to the need to upgrade the Angel database server. 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, the Angel database server will be upgraded ahead of the regular 4 year R&R schedule.

Estimated Cost of Project: $312,553 is budgeted for this project.

Cost Savings/Cost Avoidance anticipated for the project: It is expected that some percentage of the servers planned to be replaced will be replaced with virtual servers, resulting in a cost savings. In addition, the current Angel SQL server has not reached the end of its useful life and will be re-purposed for a different function.

Target Completion Date: June 2010

☆ Disaster Recovery Procedure Updates

Sinclair's contract with Sungard Disaster Recovery Services expired in December 2008. ITS has since implemented an in-house disaster recovery facility at Sinclair's Courseview campus. ITS will need to re-evaluate its recovery strategies in light of the new virtualized solution to identify any additional levels of protection that can be accommodated. New procedures and guidelines will also be developed and maintained to ensure Sinclair's preparedness in the event of a disaster.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 4-17. Virtualization significantly accelerates the recovery process.

Estimated Cost of Project: The project has minimal direct cost other than staff time and administrative resources.

Cost Savings/Cost Avoidance anticipated for 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

☆ Printer, Copier, and Fax Management

Sinclair currently has approximately 430 printers 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 400 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 printer resources are utilized.

The college has approximately 180 fax machines that are located throughout the campus in various offices. With the increased use of digitalization of images and delivery via email and other electronic technologies, the need for fax machines has decreased dramatically. The cost to maintain these fax machines and the associated phone lines can be reduced in many situations by making scanning more accessible.

With this project ITS will collect data related to printing, copying and fax usage and store it into a database for analysis. Using this data and through interviewing campus users, an understanding of the college's needs and behaviors. Recommendations will be made for ways that costs can be reduced through a reduction or reallocation of devices, implementation of tools, or changing of processes.

**Figure 4-18. HP multifunction printing devices provide
printing, scanning, copying, and fax capabilities.**

Expected Cost of Project: The cost is currently unknown but it is expected that the savings from reduced printing will cover all associated costs. Some funding could be needed in future budgets to replace individual printers, copiers and faxes with multifunction devices.

Cost savings/Cost avoidance anticipated for the project: Recommendations from this project will save costs by reducing the amount of printer consumables and the maintenance cost on phone lines and fax machines as well as eliminating printers from the college's renewal and replacement budget.

Target Completion date: April 2010

Current status: ITS is negotiating with prospective vendors who will help with the data collection and analysis phases of this project.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ <u>Standardization of Classroom Multimedia</u>

In FY 2008-2009 a project was created to analyze space management and multimedia presentation equipment needs for Sinclair's Downtown Dayton campus and to provide a recommendation including associated costs for installing standard multimedia presentation systems throughout the campus.

Figure 4-19. Multimedia classroom.

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

Using this information, a FY 2009-2010 Capital Budget request was submitted to fund this project to standardize multimedia capabilities in the classroom and lab settings across the Downtown Dayton campus.

Estimated Cost of Project: $1,144,250

Cost Savings/Cost avoidance anticipated for the project: Standardization of the multimedia presentation equipment across all of the Downtown Dayton academic spaces creates an opportunity to use space more effectively since every space has a standard set of equipment that can be used by multiple disciplines, courses, and course sections.

Target Completion Date: June 2010

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ Application Virtualization

ITS maintains the Windows "Images" in over 200 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 run on the computers that the software was made available on. The amount of time required to install the applications in an image and the testing required due to the possibility of conflicts between the applications has caused response time for changes to images to be inadequate.

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). Using App-V, application installation modules are created once and re-used without the current testing for conflicts because each application runs within its own virtualized environment. This will also permit completely new combinations of applications to be created dynamically.

Because of the way that App-V allows applications to be assigned to users and dynamically installed when they are used, 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. ITS is already using App-V to deploy applications to campus computers and re-building images that are used in academic classrooms and labs.

The goal, by Fall 2009, is to allow a student to login with their own ID and access the applications that are used within the specific classes that they are registered for. ITS has already converted about half of the 700 applications in the classroom images to App-V and has created procedures that automatically assign these App-V applications to student logins based on the classes that the student is registered for.

In addition to allowing students to login anywhere on campus and gain access to these applications, ITS has recently begun testing the capability of providing these same applications remotely via the Internet using an additional capability of App-V called "App-V for Terminal Services". In a pilot project, the HIM department is currently using this system to provide remote access to software that previously was only available in a campus classroom.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Figure 4-20. A representation of how an application is sequenced using App-V.

Estimated Cost of Project: ITS is utilizing internal resourcs to complete this project so there are no incremental costs.

Cost savings/Cost avoidance anticipated for the project: ITS had evaluated App-V several years ago when it was owned by Softricity. While 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 a annual subscription cost of $4200.

Target Completion date: October 2009

Current status: About half of the college's 700 academic lab software packages have been sequenced using Microsoft App-V. The remainder will be completed by Fall 2009.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

☆ 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 will replace the edge switches in buildings 5, 11-3, 1, 3, 6, 10, 13-2, 14 and 20.

Prior to replacing this equipment, ITS will evaluate whether to upgrade the links from the edge switches to the core routers from 1 Gigabits per second (Gbps) to 10 Gbps, which would provide a 10 fold increase in speed from the edge to the network core. This would complement the 10 Gbps inter-router links within the network core that were installed during FY 2006-2007.
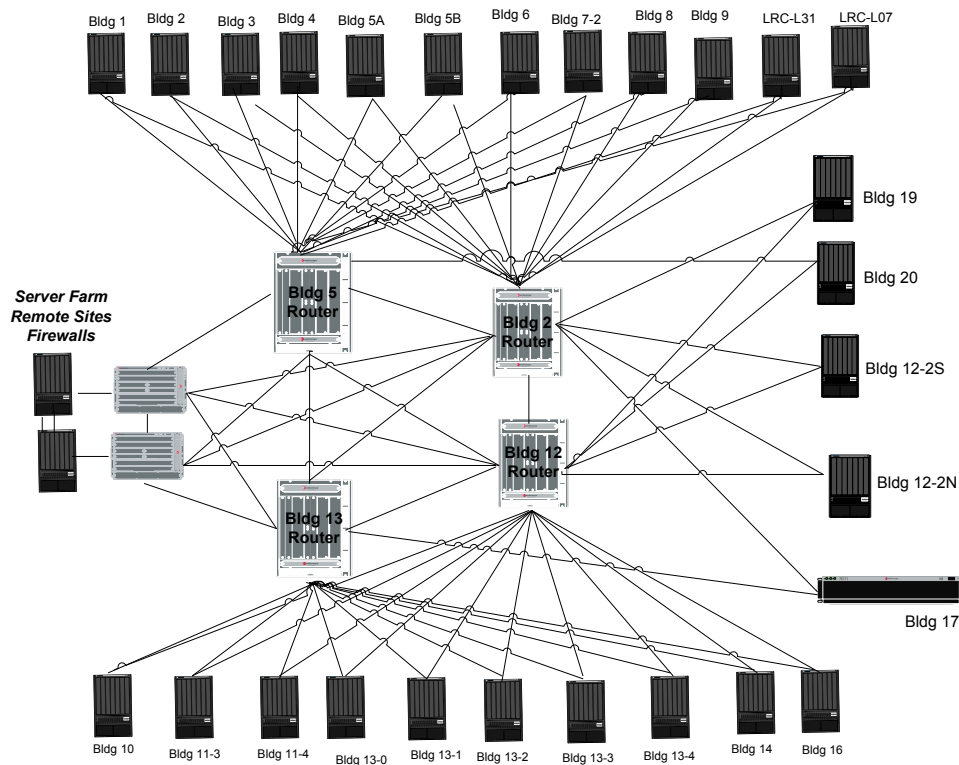
Figure 4-21. Relationship between edge switches and the network core.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

The scope of this project will be to determine equipment requirements in the defined buildings, ordering, installing and configuring the equipment.

Estimated Cost of Project: $300,000 has been budgeted for this project.

Cost Savings/Cost Avoidance anticipated for the project: 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.

Target Completion Date: June 2010

☆ Protection of Personal Information

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 its ability is an inherent obligation.

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. Sinclair currently has administrative controls 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 involves 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 will be 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).

Estimated Cost of Project: There will be no cost other than personnel time of existing resources as this project is an evaluation of solutions.

Cost savings/cost avoidance anticipated for the project: 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.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Target Completion Date: April 2010

☆ <u>Implement ShoreTel Call Manager Software</u>

During the process of planning for the new phone system from ShoreTel, it was obvious that the Call Manager software would afford added productivity gains for phone users. However, an easy method to implement it and deploy it across most users on campus was not available. Consequently, it was determined that in order to get better user acceptance and training, the deployment and training for this software would be planned after the new system conversion was completed in December 2008.
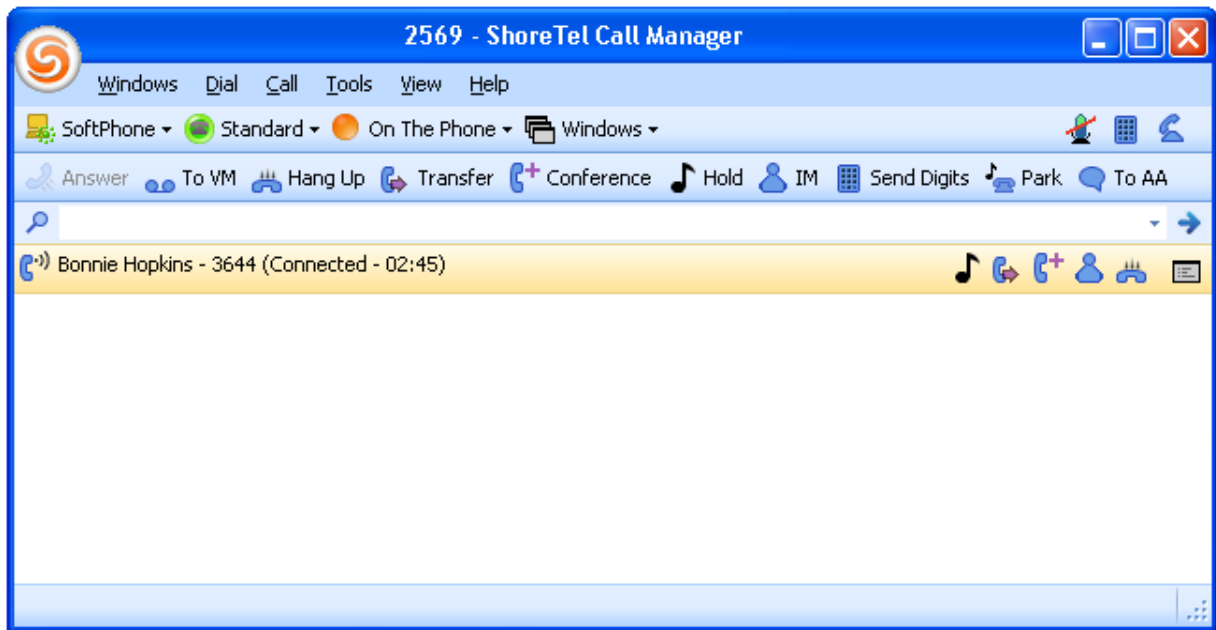
Figure 4-22. ShoreTel Call Manager application showing a call in progress.

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 5 different call manager types such as personal call manager, professional call manager, workgroup agent call manger, workgroup supervisor call manager, and operator 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 with the users. The personal call manager is the type that most users will be using 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 functions.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce
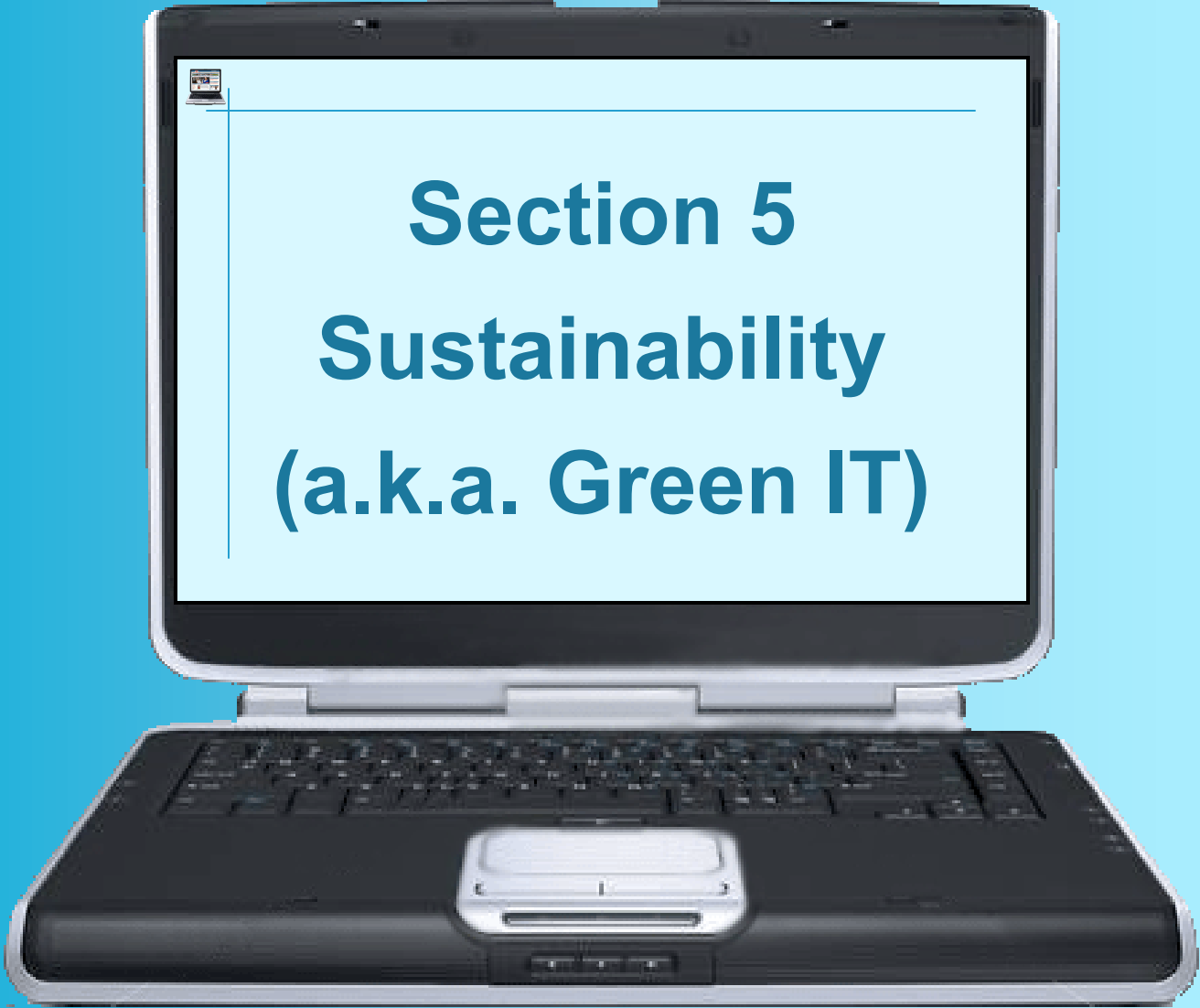
Based on the fact that, with the system conversion in December 2008, most users were already overwhelmed with new features and a new phone, it was decided to plan the methods of deployment, gain trial user experience, and develop helpful user training. The nature of the product and distinct difference from a typical phone operation dictated that a smooth conversion would only enhance user acceptance as well as ensure a smooth implementation. Therefore, a team was assembled to review all aspects of the software implementation and training to be developed for the typical Sinclair user.

Estimated Cost of Project: There are no additional direct cost outlays for this project because the software was acquired with the original phone system purchase.

Cost savings/Cost avoidance anticipated for the project: This project is planned to offer additional productivity gains for the users and reduce the need for larger phone types which will result in savings for future set purchases and ongoing maintenance costs.

Target Completion Date: February 2010

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Section 5

Sustainability

(a.k.a. Green IT)

Sustainability (a.k.a. Green IT)

In today's economy, every organization is under incredible pressure to cut costs. One method being adopted is the concept of Sustainability – often referred to as Green initiatives. In fact, Sustainability is propagating throughout all sectors of the economy (manufacturing, transportation, education, etc.). As an example: Anne Mulcahy, CEO of Xerox Corp. in a Wall Street Journal article by Alan Murray indicated that Xerox has tried to integrate Sustainability into its business plan.

The rapid growth of IT hardware, and thereby the data centers required to house the hardware, are leading to potential regulations/constraints due to the impacts on power grids, carbon emissions, and other environmental issues. Moreover, with the current economic situation, most institutions of higher education are forced to look for ways to reduce costs, and energy-saving initiatives and the reduction of carbon emissions can make a substantial contribution to overall savings. Likewise, as the technology environments and capabilities continue to expand, associated energy, economic, and regulatory constraints are expanding correspondingly.

In the April 2009 edition of Campus Technology magazine, Jane-Ellen Miller, SunGard Higher Education VP noted that a year or two ago no college or university presidents were talking about Sustainability. However, the climate is changing with demand emanating from all sectors – from students to governmental funding agencies. Options to involve the entire organization in Sustainability efforts continue to emerge. In fact, Green initiatives are pervasive on college campuses throughout North America.

Sustainability in the information technology (IT) context means creating technologies, IT infrastructure, and new business models that promote low emissions, reduce costs, and leave a lighter carbon footprint. Rising energy costs, escalating demand for computing resources, and the growing urgency of climate change are reshaping IT. The future is more about the environment than factors such as processing power or storage capacity.

Many of the leading experts in Green IT suggest that the impact of computer equipment on the environment should be an integral part of the purchasing process. For example, buying energy-efficient equipment from vendors that strive to reduce toxins and waste and to conserve materials should be a major consideration. Recycling obsolete equipment (that cannot be reused), printer cartridges, and paper is also an important component of the Green IT movement.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Sinclair Community College developed a Strategic Energy Plan (November 2008), which is a comprehensive framework and plan for addressing the requirements of Ohio House Bill 251, the Advanced Energy Law. The major imperatives are the efficient management and conservation of energy. It is definitely a challenge to transition to more energy-efficient systems; however, with rising energy prices and shrinking budgets, a comprehensive energy policy can improve performance via energy cost savings, diminished data center footprint, and lower capital costs for IT equipment.

Energy efficiency is no longer optional. It must be a fundamental ingredient of the strategic IT objectives. According to the Environmental Protection Agency (EPA), U.S. data centers consumed nearly 61 billion kilowatt-hours in 2006, which was double the consumption in 2000. Furthermore, the EPA stated that energy consumption could easily double again by 2011.

According to Gartner Research (June 2008), one hundred CEOs worldwide endorsed a statement which indicated the intent to pursue Green IT.

As noted by the 2008 EDUCAUSE Evolving Technologies Committee, the three areas that colleges should focus on are power and cooling, server consolidation and virtualization, and systems management.

- Power and cooling not only pertains to the institution's Data Center, but also to the hundreds or thousands of PCs installed across the campuses. Ensuring that the PCs are shut down at the end of day and powered on the next day, saves significant amounts of power and minimizes the heat displacement.

- Server consolidation and virtualization likewise contributes substantially to reduced energy utilization and heat disbursement.

- Systems Management refers to the use of operations software to ensure optimum utilization of IT equipment.

One of the top 10 strategic technologies for 2009 as identified by Gartner Research is virtualization, which can play a major role in Sustainability. Virtualization is the creation of a virtual (rather than actual) version of something, such as an operating system, a server, a storage device or network resources.

- Network virtualization is a method of combining the available resources in a network by splitting up the available bandwidth into channels, each of which is independent from the others, and each of which can be assigned (or reassigned) to a particular server or device in real time. The idea is that

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

virtualization disguises the true complexity of the network by separating it into manageable parts.

- Storage virtualization is the pooling of physical storage from multiple network storage devices into what appears to be a single storage device that is managed from a central console. Storage virtualization is commonly used in storage area networks (SANs).

- Server virtualization is the masking of server resources (including the number and identity of individual physical servers, processors, and operating systems) from server users. The intention is to spare the user from having to understand and manage complicated details of server resources while increasing resource sharing and utilization and maintaining the capacity to expand later.

From the Sustainability perspective, virtualization is currently focused on two areas: servers – one physical server housing multiple virtual servers, and storage – use of Storage Area Network (SAN) equipment to minimize the number of disk devices directly attached to servers. Both of these virtualization methods yield substantial decreases in the number and cost of physical devices and thereby savings in power consumption and cooling requirements.

In an article in EDTECH Magazine (March/April 2009), information provided by the Aberdeen Group stated that organizations that conduct virtualization projects are experiencing 18% savings in infrastructure costs and 15% savings in power and cooling costs.

In the April 2009 edition of Campus Technology magazine, SunGard provided the following list of best practices to help achieve IT Sustainability (Green IT):

- Use servers as heaters – especially during cold months.

- Conserve PC power – via power conservation software.

- Go LCD – use monitors with lower-energy LCD screens – cuts power consumption by as much as two-thirds.

- Eliminate desktop printers – not only saves energy, but greatly decreases the amount of printing – and wasted paper.

- Implement pay-to-print – primarily to reduce the amount of paper wasted by students.

- Cash in on copper cabling – recycling can yield a good cash return.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

- Replace older computers – typically yields a 20%-50% decrease in power consumption.

- Turn off PCs after business hours – manually and/or automatic via software.

- Proper disposal of old IT assets helps the environment and helps to avoid the legal issues when the equipment shows up in an illegal dump.

Sinclair's Sustainability (Green IT) initiatives include:

- Proper disposal of old IT equipment – via the GovDeals online auction program.

- Replacement of IT equipment on a routine life-cycle basis – use of newer power -saving technology. Sinclair's life-cycle replacement program for computer equipment moves the organization up the Green IT curve since the newer products are typically built with energy conservation as a basic premise.

- Sinclair Community College engaged an outside consultant to perform a comprehensive assessment of the Data Center's physical servers and devise a plan for how they may be consolidated and virtualized to achieve optimum performance with minimal energy utilization and heat disbursement. To-date Sinclair has formally decommissioned 22 physical servers. The services performed by these physical servers were either consolidated into another physical server or virtualized to one of 13 virtual servers. In addition, a total of 28 servers were configured as virtual servers rather than physical servers.

- Automatic (via software) power-off and power-on of PCs campus-wide.

- Replacement of CRT monitors with energy-efficient LCD monitors.

- Replacement of old PBX (telephone) system with Voice over Internet Protocol (VoIP) system.

- A major IT project started in FY 2007-2008, which will continue into FY 2009-2010, is the development of a system to facilitate electronic transmission and approval of College forms. This system will not only help to realize significant savings in paper and printer cartridges, but also reduce the amount of intra-campus mail and the equipment used to process and transport it.

- Sinclair has initiated a Print Management Assessment project in order to achieve a cost reduction in equipment and printer/copier/fax consumables. For example, by moving printers from desktops to central locations, forces

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

workers to get up and walk to retrieve printed material – which helps deter excess printing. Additionally, an effective Print Management program will result in a substantial savings in power consumption and consumables.

- A "pay-to-print" system was implemented in most classrooms and labs as a deterrent to paper waste. All faculty and students are allocated a reasonable amount for printing each term based on class schedules, and required to pay for any excess printing.

- A server and software application was implemented to automatically turn-off data projectors in all classrooms to minimize power consumption and maximize bulb life.

As noted, Sinclair Community College has already made significant progress in Sustainability (Green IT). By taking this proactive position, Sinclair has demonstrated fiscal responsibility and desire for eco-friendly learning environments.

Student Success	Work Force Development	Downtown Campus Development	Increased Regional Access	Expanded High School Linkages	Partnerships	Alternative Sources of Funding	Quality Workplace & Quality Workforce

Appendix A
Glossary

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 iNtelligenge (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.