SIERRA COLLEGE

TECHNOLOGY MASTER PLAN

A REPORT AND RECOMMENDATIONS

TO THE GOVERNING BOARD

Approved June 10, 2014

SIERRA COLLEGE STRATEGIC COUNCIL REVIEW

April 11, 2014

Commendation – Implementation of technology resources in support of instruction, student services, and operations, and integration of technology planning with institutional planning.

Accreditation team commendation Fall 2013

"Technology touches everything. Adequate staff and equipment to support IIT functions, including support for Banner, is essential for success in everything the District does".

Program Review Executive Report July 2009.

"Support and Demonstrate the Sustainable use of all resources"

Sierra College Core Value

Purpose Statement

The purposes of the Technology Master Plan are two-fold. First, develop a process/template that Sierra College can utilize in the future for developing technology goals and initiatives to meet strategic needs in support of the Educational master Plan. Second, take the high priority initiatives developed in this process and identify (or clarify) the technology and resources needed to successfully implement these initiatives.

The hunger for technology is growing and before we expand or change we need to answer a couple of key questions as we progress through this plan: What is the purpose of technology in supporting our mission? Why do we need it?

The result is the ability for the campus community to clearly understand the significant impact that key initiatives will have on technology resources and what technology requirements exist in order for these initiatives to be implemented successfully. This understanding will be critical in the strategic decision making process for the district.

This plan was developed to be strategic in nature (as opposed to operational) and therefore, many of the initiatives involve performing a feasibility study or further research, identification, and formation of a more detailed initiative.

Planning Assumptions

Without question 24x7x365 access and availability are the expectation and remains a daunting challenge.

All initiatives contained in this plan were developed to support the Strategic Goals of Sierra College, and work in support of the Educational Master Plan and in conjunction with the other Master Plans for the district.

The development and implementation of the Technology Master Plan is one of the district's key strategic plans and plays a critical role in the success of the district's mission. Due to the current economic climate resources will be severely constrained while demand for technology innovation and support will increase within the district.

The value of technology planning is achieved through the information gained by participation in the process as much as it is conveyed through the final report.

As the detailed design and planning phases are implemented through the various Master Plans, the Information and Instructional Technology division is continuously working to integrate information technology into the district strategic plans.

A significant number of demands for technology-related support will compete for limited funding. Consequently, the use of resources allocated to technology will be driven by needs, which are identified in this plan as the first step of a selection method involving the collaborative selection process of Sierra College and the Information and Instructional Technology Division.

Throughout the process of creating the Technology Master Plan staff in all of the major divisions – Instruction, Student Services, and Business Services, Human Resources – have expressed a keen interest in increasing the use of technology in their departments.

There is little doubt that students and instructors will continue to demand ever increasing levels of technology support and services. Students expect to engage technology systems that are interactive, real-time, authentic, intuitive, and always available. Their expectations of technology can be summarized by three phrases: on-time, real-time, and all the time.

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Approved June 10, 2014
(Pending)

SIERRA COLLEGE STRATEGIC COUNCIL REVIEW

April 11, 2014

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FOREWORD

This plan represents the hard work of many Sierra College employees and students over a period of several months. All employee groups and students had an opportunity to contribute to the creation of this plan.

Sierra can be rightfully proud of its technology heritage. As noted in the plan, many aspects of the technology environment at Sierra need updating, but this in no way detracts from the exemplary efforts of Sierra faculty, staff, and administration who utilize technology to improve instructional delivery in the classroom, provide streamlined services and support to our students, and to our employees who support our college.

I wish to especially acknowledge the efforts of the Information and Instructional Technology staff, which has provided and continues to provide the college community with creative, effective, and relevant solutions to its technology needs.

Gary Moser
Chief Technology Officer

See below for structure and technology membership committees.

Strategic Council

William Duncan	Superintendent\President	Chair (non-voting)
Laura Doty	Director Facilities Construction	SCMA
Sonja Lolland	Dean - BAAPE	Management Senate
Sue Michaels	Manager, Marketing & Public Relations	Management Senate President
Stephanie Ortiz	Executive Dean – NCC	Executive Appointee
Debra Sutphen	Vice President Instruction	Executive Appointee
Anne Fleischmann	Associate Dean Liberal Arts	Alternative
Tammy Kenber	Manger, Human Resources	Alternative
Alistair Turner	Program Manager Outreach	Alternative
Paul Cooper	Faculty	Academic Senate/SCFA
Jane Haproff	Faculty	Academic Senate President
Don Harris	Faculty	Academic Senate
Jane Hemmerling	Faculty	Academic Senate
Stan Spencer	Faculty	SCFA
Denise Bushnell	Faculty	Alternative
Aimee Myers	Faculty	Alternative
Ruth Echavarria	Classified	Classified Senate/FUSE
Ryan Goodpastor	Classified	Classified Senate
Kristie Purdy	Classified	FUSE
Thad Selmants	Classified	Classified Senate President
John Willoughby	Classified	Classified Senate
Elaine Atnip	Classified	Alternative
Greg Brown	Classified	Alternative
Annette Richards	Classified	Alternative
Marisa Magallanes	Student	Student Senate President
Jacob Penney	Student	Student Senate
Andrew Rohrer	Student	Student Senate
Ashley Strausser	Student	Student Senate
Jeannette Bischoff	Confidential	Recorder

District Operational Steering Technology

Gary Moser	Chief Technology Officer	Chairperson
Pat Efseaff	Dean Student Services	Dean's Council
Rebecca Bocchicchio	Interim Dean Liberal Arts	Dean's Council
Cameron Abbott	Manager, Human Resources	Management Member
Linda Williams	Program Manager, Financial Aid	Management Member
Linda Fisher	Manager, Finance	Management Member
Gail Modder	Manager, Admissions & Records	Management Member
Debbie Phipps	Administrative Assistant – IIT	Recorder

Banner Team Leads

Gary Moser	Chief Technology Officer	Management Member
Scott Snyder	Manager, Systems & Programming	Management Member
Tom Benton	Manager, Network Operations	Management Member
Cameron Abbott	Director, Human Resources	Management Member
Linda Williams	Program Manager, Financial Aid	Management Member
Linda Fisher	Manager, Finance	Management Member
Bev Yoha	Manager, Finance	Management Member
Gail Modder	Manager, Admissions & Records	Management Member
Sue Michaels	Manager, Marketing & Public Relations	Management Member

Terri Maddux	Counselor & DegreeWorks Manager	Faculty
Ninette Dollesin	Project Supervisor, EP&S	Classified
Kourtney Crandell	Finance Information System Specialist	Classified
Dianne Dakis	Account Payroll	Classified
Lynn Twang	Info Systems Analyst	Classified
Angela Casey	Info Systems Specialist HR	Classified
Debbie Phipps	Administrative Assistant –IIT	Recorder

Educational Technology Advisory Council:

Gary Moser	Chairperson – Chief Technology Officer	CTO
Brian Haley	Dean – Learning Resources	Dean's Council
Michael Kane	Associate Dean – Sciences & Math	Dean's Council
Tom Benton	Network Operations Manager	IIT
Phil Yorde	Technical Support Services Manager	IIT
Annette Nylander	Instructor	Faculty
Jill Rafael	Instructor	Faculty
Donna Smith	Instructor	Faculty
Suzanne Davenport	Distance Learning	Faculty
Tom Read	Instructor	Faculty
Elaine Sturgell	Instructional Assistant	Classified
Thad Selmants	Assistive Technology Specialist	Classified
Cody Watson	Instructional Assistant	Classified
Bill Hemphill	Technical Support Specialist	Classified
Debbie Phipps	Administrative Assistant –IIT	Recorder

Representative Group

Deans Council

Debra Sutphen	VP of Instruction	Exec. Member
Mandy Davies	VP of Student Services	Exec. Member
Kim Bateman	Dean – Tahoe Truckee	Dean's Council
Rebecca Bocchicchio	Dean – Liberal Arts	Dean's Council
Pat Efseaff	Dean of Student Services	Dean's Council
Sharon Adams	Dean of Student Services	Dean's Council
Anne Fleischmann	Associate Dean – Liberal Arts	Dean's Council
Brian Haley	Dean – Library & Learning Resource Center	Dean's Council
Roz Goldenberg	Interim Assoc. Dean of Athletics	Dean's Council
Erik Cooper	Dean – Planning, Research & Resource Development	Dean's Council
Sonja Lolland	Dean – BAAPE	Dean's Council
Darlene Jackson	Associate Dean – BAAPE	Dean's Council
Michael Kane	Associate Dean – Sciences and Math	Dean's Council
Stephanie Ortiz	Executive Dean – Nevada County Campus	Dean's Council
Heather Roberts	Dean – Sciences & Math	Dean's Council
Nancy Schwab	Associate Dean – Allied Health, Nursing	Dean's Council

Academic Senate

Jane Haproff	Faculty – President of Academic Senate
Brook Oliver	Faculty
Josh Breese	Faculty
Beth Ervin	Faculty
Brian Gosney	Faculty
Vernon Martin	Faculty
Robin Persiani	Faculty

Denise Bushnell	Faculty	
Brandie Murrish	Faculty	
Vera Nelson	Faculty	
Ivor Cooper	Faculty	
Andrea Neptune	Faculty	
Soni Verma	Faculty	
Susan Lucyga	Faculty	
Don Harris	Faculty	
Sig Pikul	Faculty	
Stan Spencer	Faculty	
Jane Hemmerling	Faculty	
Megan Seely	Faculty	
Randy Snook	Faculty	
Paul Cooper	PT Faculty	
Ed Gutowsky	PT Faculty	
Reyes Ortega	Faculty	
Barbara Erysian	Faculty	
Kent Fortin	Faculty	
Marisa Magallanes	Student Senate Representative	

Distance Learning and Instructional Technology

Suzanne Davenport	LRC Coordinator - Chair	Faculty
Cynthia Birdsong	Distance Learning	Classified
Daniel DeFoe	Faculty	Faculty
PJ Elson	Faculty	Faculty
Jeanne Guerin	Instructional Assistant – Writing Center	Classified
Brian Haley	Dean – Learning Resource	Dean's Council
Debbie Hill	Faculty	Faculty
Susan Johnson	Faculty	Faculty
Michelle Macfarlane	Faculty	Faculty
Vernon Martin	Faculty	Faculty
Lynn Medeiros	Faculty	Faculty
Soni Verma	Faculty	Faculty
Sonia Klenner	Faculty	Faculty
Tina Sixt	Faculty	Faculty
Barry Brown	Faculty	Faculty

Classified Senate

Thad Selmants	President – Classified Senate	Classified
Elaine Atnip	Vice President	Classified
Annette Richards	Secretary	Classified
John Baca	Senator	Classified
Cody Watson	Senator	Classified
Ryan Goodpastor	Senator	Classified
Mark Laws	Senator	Classified
Alysia Lopez	Senator	Classified
John Willoughby	Senator	Classified
Caroline Fernandes	Alternate	Classified

Associated Students

Marisa Magallanes	President/Trustee
Ursula Kajani	Vice President

Greg Harnage	Treasurer
Ashley Strausser	Chief of Staff
Brenda Chang	Program Director
Zobeida Mendez	Public Relations
Ernesto Aguilera	Student Senator
Vitaly Dukhnovskiy	Student Senator
Skye Ngo	Student Senator
Jacob Penney	Student Senator
Gabby Ramirez	Student Senator
Leslie Ramirez	Student Senator
Lehma Sawez	Student Senator
Tim Haenny	Faculty Advisor
Carol Hartzell	Administrative Assistant

Information and Instructional Technology Staff

Gary Moser	Chief Technology Officer
Julia Arreguy	Systems Analyst/Programmer, Senior
Satyendra Attota	Systems Analyst/Programmer, Senior
Ricardo Bajamundi	Systems Administrator
Robert Bateman	Database Systems Administrator
Tom Benton	Network Operations Manager
Kelly Bruce	Systems Analyst/Programmer, Senior
Eddie Caudill	Network Support Specialist
Craig Caughlin	Systems Administrator
Judy Chew	Network Support Specialist
Dade Clark	Systems Administrator
Robert Dean	Network Operations Manager
Greg Dorando	Network Operations Manager
Caroline Fernandes	Systems Analyst/Programmer, Senior
Mike Glashan	Network Support Specialist
John Healy	Technical Support Specialist
Bill Hemphill	Technical Support Specialist
Debbie Phipps	Administrative Assistant
David Poirier	Network Support Specialist
Charles Polisher	Systems Administrator
Shilpa Pothula	Systems Analyst/Programmer, Senior
David Prather	Network Support Specialist
Allen Race	Network Support Specialist
Daniel Rusk	Network Support Specialist
Tim Smith	Database Systems Administrator
Scott Snyder	Systems & Program Manager
Greg Van De Bogart	Systems Administrator
Trudie Wiggins	Help Desk Technician
Paul Wiley	Telecommunications Systems Specialist
John Willoughby	Systems Analyst/Programmer, Senior
Phil Yorde	Technical Support Services Manager

Technology Master Plan

This plan is divided into the Executive Summary, Previous TMP plan status, and Overview with several major sub sections including: Infrastructure, System and Data Security**,** System and Data Backups and Disaster Recovery, Support and Training, Banner/ERP, Document Management, Operational Considerations, Instructional Technology Considerations, Facilities, Hardware & Software Lifecycle, Budget, and Appendices.

The mission of Information and Instructional Technology (IIT) Division is to support, encourage and enhance the use of Information Technology for students, faculty, and staff by providing planning, leadership, solutions for technology, and administering the College's technical support services. The services that we provide district-wide include the ERP system, technical infrastructure, telecommunications, server and desktop support, computer labs, smart classrooms, design consulting, IT security, and leadership for technology.

Technology Planning Process

Sierra's Technology Master Plan addresses both administrative and instructional technology issues and is being written in support of the Educational Master Plan. Review of this plan will follow Sierra's governance structure and the necessary and desired multiple opportunities for faculty, staff, and student input afforded by our collaborative structure.

The Chief Technology Officer will facilitate this process and consolidate this report in preparation for submission to the Strategic Council, Executive Council, and eventually the Governing Board. Consequently, the process will be to meet and develop the plan utilizing the below primary focus groups:

Educational Technology Council (Ed Tech).
District Operational Technology Steering (DOTS)

Each focus group has broad campus representation with particular emphasis placed on each of their respective areas (administrative and instructional). The CTO and these groups in turn will work with the other represented groups below and submit information through them:

Associated Students
Academic Senate
Classified Senate
Management Senate
Distance Learning and Instructional Technology
Deans Council
Banner Team Leads

Once the focus groups give final recommendations for the Technology Master Plan it will be updated and will be presented to the Strategic Council for review in March 2014. The Strategic Council provides recommendations as needed and then the CTO will follow up at the April meeting for a final recommendation from Strategic Council if needed.

The Technology Master Plan will then be presented to the Strategic Council for final comment in April 2014. The Technology Master Plan will be reviewed by Executive Council for final recommendations prior to going to the Governing Board. The final version of the Technology Plan will be presented to the Governing Board in May 2014.

Significant milestones in completing the Technology Master Plan

Date: Event:

Fall 2013   Educational Technology Council and Banner Steering Committee formed as primary
               Focus Groups to recommend proposed Technology Master Plan (TMP) topics, overview,
               and timetable. IIT will provide recommendations and analysis to include technical
               recommendations due to expertise

Dec 2013   DOTS and Ed Tech committees formed as primary Focus Groups to recommend
               proposed Technology Master Plan (TMP) topics, overview, and timetable. Task force
               groups include the Deans Council, Academic Senate, Classified Senate, Management
               Senate, DLIT committee, and Associated Students.

Jan 2014   Information item provided to Governing Board

Jan 2014   District Operational Technology Steering (DOTS) Focus Group meets to discuss topics
               and plan

Jan 2014   Educational Technology Council (Ed Tech) Focus Group meets to discuss topics and
               plan.

Feb 2014   Representative Group recommendations are completed as needed and are presented to
               DOTS Focus Groups for approval

Feb 2014   Representative Group recommendations are completed as needed and are presented to
               Ed Tech Focus Group for approval

Mar 2014   Focus Group reports are shared with the Strategic Council

Mar 2014   First draft of Technology Master Plan presented to Strategic Council

Apr 2014   Edits completed as needed

Apr 2014   Final edits to Technology Master Plan presented to the Strategic Council for review of
               Technology Master Plan

Apr 2014   Strategic Council reviews plan and presents to Executive Council for first reading and
               discussion. Edits to Technology Master Plan completed as needed

May 2014   Technology Master Plan presented to Executive Council for second reading, discussion,
               and approval

June 2014   2014-2017 Technology Master Plan presented to Sierra Governing Board

Executive Summary

Sierra's technology systems have served the college well over many, many years. The college's faculty, classified personnel, managers, and the Information & Instructional Technology (IIT) Division staff have employed a myriad of innovative techniques and solutions that have provided a consistently high quality of technology services for students, faculty, and staff. They have made the best and fullest use of the technologies that have been available to them.

The mission of Information & Instructional Technology is to support, encourage and enhance the use of Information Technology (IT) for faculty, staff and students by providing planning, leadership, solutions for technology, and administering the College's technology support services.

Sierra's Technology Master Plan has three primary goals:

1) Complete and full disclosure of the college's existing technology environment.
2) Clear and accurate descriptions of recommended solutions to meet any deficiencies that may be present.
3) Prioritize and implement solutions based on district need and resources availability.

The services that we provide district-wide include the Banner ERP system and associated 3rd party application interfaces and customizations, the MySierra portal, email, technical infrastructure, wireless, telecommunications, SSSP, mobile devices, server and desktop support, computer labs, smart classrooms, design consulting, IT security, and leadership for technology.

There is little doubt that students and instructors will continue to demand ever increasing levels of technology support and services, including a rapidly growing phenomenon known as BYOD (bring your own device) within Sierra College. This is brought upon us through the consumerization of technology, where it has become so affordable and pervasive for anyone to have an Internet capable device and expect to be connected to the Internet from anywhere ay anytime.

The growing demand for technology and related support services is reflected in Accreditation Standard III (C). Seven of the eleven standards in the report reference technology. The standard and sub-sections that pertain directly to technology are noted below:

Standard III C, Technological Resources:
Technology resources are used to support student learning programs and services and to improve institutional effectiveness. Technology planning is integrated with institutional planning.
III.C.1 – The institution assures that any technology support it provides is designed to meet the needs of learning, teaching, college-wide communications, research, and operational systems.
III.C.1.a – Technology services, professional support, facilities, hardware, and software are designed to enhance the operation and effectiveness of the institution.
III.C.1.b – The institution provides quality training in the effective application of its information technology to students and personnel.
III.C.1.c – The institution systematically plans, acquires, maintains, and upgrades or replaces technology infrastructure and equipment to meet institutional needs.
III.C.1.d – The distribution and utilization of technology resources support the development, maintenance, and enhancement of its programs and services.
III.C.2 – Technology planning is integrated with institutional planning. The institution systematically assesses the effective use of technology resources and uses the results of evaluation as the basis for improvement.

This plan makes a number of recommendations, the most salient of which are discussed and prioritized in the Executive Summary section. By far, the most pressing technology issues facing the college involves IIT staffing to support growth of the ERP systems, Document imaging, systems upgrades, Disaster Recovery, on-line instruction, security, and the growing demand from use of mobile devices on the District's wireless network etc. In addition the recent economic crisis has exacerbated the situation due to our systems not being upgraded and new technology enhancements not implemented.

Following this executive summary of our highest priorities a report of the previous plan is discussed. Then major technology issues are addressed in detail in the plan overview section followed by the appendices which include a cost analysis of options and additional recommendations.

The Technology Master Plan is a living document that will be reviewed and updated periodically through the work of the Educational Technology Council and District Operational Technology Steering.

<u>Information & Instructional Technology Staff Recommendations</u>

The staffing level for the districts IIT Division is currently below previous levels and not effectively able to meet the current needs of supporting the growth in systems, applications, and future requirements that have occurred and are being identified in this plan. Growth continues and staffing levels are lower than three years ago due to the economic crisis. This is especially true as the district and our students have an uptime expectation of 24x7 for all our systems and are staffed for a traditional 8x5-work week.

In addition the recent economic downturn has exacerbated staffing shortfalls due to vacancies not being replaced and amplifying these issues specifically related to continuous growth and obsolete systems.

The lack of appropriate staffing levels has resulted in long delays in upgrading, implementing and maintaining various software applications, systems, and hardware. By eliminating delays the college would immediately and directly help students, faculty, and staff. We currently average a 600 work order backlog. This has also reduced the responsiveness and quantity of technical support that the IIT Division staff is able to provide to the user community. The lack of appropriate staffing levels has resulted in increased stress levels, the accumulation of employee compensatory time and overtime, and has fostered a sense of being overwhelmed.

Enterprise applications typically require more than one IIT department to maintain these systems. For example, Banner not only requires Analyst\Programmers to support this application, but System Administrators to manage and maintain the host systems, While this integrated approach is very efficient it is man-power intensive for the IIT division when issues occur. Staffing shortfalls have also created long delays in implementing features we have already purchased and pending modifications and enhancements continuously being requested, some are identified in this plan.

The IIT Division supports numerous systems and associated applications in the district in an effort to keep up with frequent change. The challenges include time for testing, research and development, implementing new features and solutions, and innovation to meet our current and future district needs.

The district is continually asking technology to provide solutions and while this is the right approach resources are needed to meet this increasing demand. To <u>simply meet our existing base support requirements identified vacancies need to be filled</u>. Growth and change need to be supported

This plan recommends the following additions:

- 2 Systems Administrators (one replacement)
- 2 Systems Analyst/Programmer, Senior (one replacement)
- 1 Telecommunications Systems Specialist (replacement)
- 1 Helpdesk Specialist (replacement)
- 1 Network Support Specialist
- 1 Systems Coordinator
- 1 Technical Support Specialist – AV
- 1 Security\Training Specialist
- A salary compensation survey and classification study is a need for all IIT staff and management positions.

Budget: Annually
Cost: $80,000 per position

1. <u>Student Success and Support Program (SSSP)</u>

The new Student Success and Support Plan is a district project to provide planning tools to students, faculty and staff allowing success planning for a student's educational goals. DegreeWorks and MIS updates are a key technology upgrade that will support the goals of this project. More complete and reliable data will be available for making day-to-day management and strategic planning decisions in support of student educational planning.

The staffing requested in this plan will be needed to expedite this requirement and include a System Analyst Programmer, Systems Coordinator, Helpdesk Specialist, and Systems Administrators skills and abilities. This will help ensure the new systems and requirements are maintained and working efficiently. If not addressed the time to implement future parts and maintain in an optimal state are in jeopardy.

This system upgrade is required as part of an extensive process that involved many people. To meet these mandates our technology must be upgraded to support the projected requirements. This would include applications upgrades for DegreeWorks, increasing our storage space, providing proper test and development environments, updating MIS data elements, and integration of our Banner ERP systems

This new system will provide many opportunities to get needed efficiencies and information to any user that needs it. This will also be a discussion about other technologies that could support this effort such as early alert systems and increased student technology support. This project will be an immediate focus of effort for the IIT division over the next three years.

There are many new features and enhancements being released in Banner and this plan recommends the following:

- Upgrade DegreeWorks
- Upgrade hardware to include servers and storage systems
- Increase reporting and strategic information delivery
- Develop systems integration solutions to support the SSSP project
- Workflow implementation evaluation
- Address staffing levels to meet current and future needs
- MIS data configurations updates and mandated changes
- Implement Open CCCApply
- Prepare for Banner XE upgrade utilization of new technologies
- Create and refine procedures
- Address student technology support requirements

Budget: One-time: $75,000
Annual Cost: $45,000

2. <u>Disaster Recovery/Business Continuity Planning</u>

The college has recently upgraded key parts of a technology disaster recovery/business continuity solution however this is a constant evolutionary process for keeping the plan current with system enhancements and business continuity requirements.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator, Helpdesk Specialist, and Telecommunications Systems Specialist skills and abilities. This will help ensure that the systems and requirements are tested, maintained and working efficiently when required. If not addressed the time to enact, recover, and maintain in an optimal state are in jeopardy.

Over the past three years IIT has positioned itself to have much more flexibility when it comes to recovering systems by way of server virtualization and storage networking. By moving to a virtual server infrastructure we can quickly restore entire servers with applications and data sets on other virtual server infrastructures located in other District buildings, or at partner school locations, or even in the cloud. We have implemented an alternate server room location for a "hot-site" in LRC and are planning for NCC

providing this capability for our critical systems in a limited way. We have a good start to the planning process by identifying all IT services, categorizing the IT services and prioritizing the recoverability of those services with Ed Tech, and establish target recovery times that are deemed as acceptable for business continuity. Although this is a great start, the plan needs to be extended to involving all aspects of business continuity including functional users, emergency response teams, executive and management teams, communications protocols, and testing. Additionally the plan requires procedures to assure plan maintenance.

We have a responsibility to address this issue with a business continuity solution to bring the district back online in a timely way should a disaster occur. The question that we must answer is how long can we afford to be without access to our key systems?

This plan recommends the following:

- Ensure adequate time windows are available for systems maintenance
- Implement alternate server room location for "hot-site" at NCC if feasible.
- Provide on-going training and testing opportunities to ensure reliability
- Engage all required business constituents to expand the scope of the current IT Disaster Recovery steps to a full business continuity plan
- Expand 10GB to additional campus buildings
- Redundant Internet to NCC for business continuity plan – includes the need for a redundant WAN virtual circuit between NCC and LRC
- Explore Cloud and other solutions

Budget: One-time: $95,000
Annual Cost: $25,000

3. <u>Security Program</u>

The Security program is in need of revitalization and improvement. The Security Advisory Group has lapsed due to staffing levels and work load. User awareness and education programs are needed to help protect the district systems. Two major efforts are underway that will require commitments to District resources to assure the District's security posture improved to meet basic audit requirements:

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrators and Security\Training Specialist skills and abilities. This will help ensure that the systems and requirements are working toward a security solution, tested, and maintained. If not addressed the time to enact, recover, and maintain a secure systems environment in this district are in jeopardy

1. Sierra College instruction is initiating a program that will help the District achieve the Center of Academic Excellence in Information Assurance/Cyber Defense (CAE IA/CD) certification. The benefits associated with this designation include:

- National and State reorganization - There are currently 24 community colleges holding this designation and there are no California community colleges that have achieved this designation.
- Standardization of Curricula – CAE2Y represents a standard of IA curriculum accepted in the academic and professional communities.
- Articulation - CAE2Y communicates to four-year institutions the quality and nature of a community college's IA curriculum, thus facilitating articulation agreements.
- Student Recruitment – CAE2Y is an attractant for students in the external and internal community.

In addition to the Academic benefits listed above, the administrative and IT operations within the District will have to comply with the CAE2Y guidelines in order to maintain the program certification resulting in a substantially better security posture for protecting student and staff confidential information and other general security breaches that can impact IT systems operability.

2. The California Community College (CCC) Technology Center has recently hired a position to lead the efforts of security standards and awareness training for IT security throughout the CCC system. This leadership will help guide the Sierra College Security Advisory Group with obtainable standards, tools, and educational programs to enhance the effectiveness of the Security Advisory Group throughout the District,

Historically IT security became a much bigger problem with private networks connected to the public Internet. Firewalls were developed to provide a barrier at the perimeter of the public/private networks, but over time the perimeter has expanded from being a doorway between two networks to having threats all around the private network in the form of thumb drives and mobile devices, wireless networks, remote access from untrusted networks, and the Internet.

This plan recommends the following:

- External audits of all facets of our IIT environments
- The CAE2Y programs are prioritized and implemented so the District can enhance its security posture against cyber criminals and computer viruses.
- Implement the district security committee.
- The immediate replacement of our internal data center firewalls.
- Coordinate with the CCC Security Officer for recommendations

One-time Cost: $130,000
Annual Cost: $25,000

4. Network Infrastructure Upgrades

The college needs to plan for the upgrade and life cycle replacement of our network infrastructure to include switches, routers, firewalls, storage systems, UPS's, servers, and data center equipment (HVAC ,etc.). The cost to upgrade existing systems is very expensive and we will continue exploring cost-saving options. In the interim there is an urgent need to upgrade these systems to ensure compatibility, capacity, reliability, and maintainability at cost effective levels and provide systems availability.

The college does not have a funded replacement cycle for its network infrastructure.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator, Network Support Specialist, and Telecommunications Systems Specialist skills and abilities. This will help ensure that the systems are tested, upgraded, maintained and work efficiently. If not addressed the systems reliability and stability for current and newer systems and technologies are at risk.

The integration of modern technology greatly enhances access to district services and applications. The last major upgrade for most of these systems was in 2008\2009. Students, faculty, and staff expect to have efficient and reliable access at any time. Maintaining a formal refresh cycle for end of life systems would increase efficiency and lead to reduced support costs, especially in terms of man-power needed to support older systems.

We have seen extensive growth and demand on our network and services. The systems needed to support this are critical and must be maintained to support the mission of the district.

This plan recommends the following:

- Upgrade system components and software to current standards.
- Increase storage as services and systems expand
- Establish annual refresh budget to ensure replacement for network systems
- Ensure systems are upgraded to support current and future technologies
- Provide training to ensure stable and efficient use of our network
- Provide adequate maintenance windows to support systems
- Switches\Routers\Firewall\UPS\HVAC upgrades

- Address staffing levels to support district growth

Budget: 3 year total
Cost: $530,000

5. <u>Document Imaging Management</u>

<u>Enterprise Document Storage</u>

The current document imaging system that we have is Hershey and allows some departments to scan documents, and index them as needed (Student ID, Last Name, First Name, etc.) by linking to a field on the input document so that the data can be retrieved by the departments as needed. The system needs to allow restricted access so that someone entering the data wouldn't be able to access the database and input with erroneous information.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator, Systems Analyst/Programmer, Network Support Specialist, and Systems Coordinator skills and abilities. This will help ensure that the systems are implemented, tested, upgraded, maintained and working efficiently. If not addressed the Document Imaging solution, Storage systems, and Banner systems reliability and stability are at risk.

The system should be able to pull information from the Banner database or from a database updated daily from the Banner database once the ERP system is integrated. This system is also being requested by other departments and is pending due to the selection process and then implementation and possible integration with our ERP system. The man-power that is used for paper management is extensive and creates significant efficiency issues.

Any office that is paper intensive would benefit from using a document imaging\management system. It is recommended that the college explore expanding the document imaging\management system and integrate this system with Banner to the greatest extent possible. Other options will need to be evaluated to address our document management needs.

<u>Recommendations</u>

- Explore options for moving documents to a modern technology solution
- Provide training to support the new system
- Develop a project plan and implement a solution
- Replace our current Hershey system
- Integrate new system with our Banner ERP system, active directory, and possibly SharePoint

One-time Cost: $400,000
Annual Cost: $50,000

6. <u>Desktop Computers – Replacement\Virtualization\VDI review</u>

The college has recently begun exploring virtualizing desktop computers. The cost to upgrade existing systems is very expensive and we will continue exploring virtualization as a cost-saving option. In the interim there is an urgent need to upgrade these systems to ensure compatibility, reliability, and maintainability at cost effective levels.

The college does not have a replacement cycle for its instructional Desktop computers.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator and Network Support Specialist skills and abilities. This will help ensure that desktop systems are tested, upgraded, maintained and working efficiently. If not addressed the systems reliability and stability for our classrooms, computer labs, etc. are at risk.

The integration of modern technology into a classroom setting greatly enhances an instructor's ability to use digital media in instructional delivery. Students in current and future generations expect to have classrooms and labs that utilize current technology and instructors increasingly use innovative technology in their instructional delivery. Students expect to find modern computers with Internet access in classrooms. This would also lead to reduced support costs, especially in terms of man-power needed to support older systems.

Industry recommendations include a three year replacement cycle for computers to allow for reliability, technology changes, and reduced support costs. Realizing that the entire community college system doesn't have these resources the recommendation is a five year replacement cycle.

The District has ~2800 computers deployed in instructional and administrative environments. The average computer age in the District as of October 2013 is 5.2 years.   This age is somewhat skewed by the large number of computers purchased as part of the Furniture, Fixtures and Equipment (FF&E) of the V-building (442), Truckee Campus (135) and NCC expansion (159). The deployed systems are up to twelve years old. To the extent that the college employs older technology, it will become increasingly difficult to compete for students who have the expectation that the college will have modern technology available to them.

In April 2014, Microsoft will stop supporting its Windows XP operating system which is loaded on ~30% of District Windows-based computers. By this date, XP systems will need to be upgraded to Windows 7, necessitating the replacement of ~140 systems. This move from Windows XP to Windows 7 will require user training as well as training for other applications such as office 2010 and Office 2013.

This plan recommends the following:

- Upgrade obsolete computers to current standards minimally every 5 years.
- Have an annual refresh budget established to ensure computers can support current applications
- Explore and evaluate other solutions such a VDI, etc.
- Ensure systems are configured with the current standard district software, i.e. Office 2010, etc.
- Address staffing levels to meet current and future needs

The implication of replacing one-fifth on the District's ~2800 computers is that ~560 computers would be replaced annually, adding a new workload to the department which would only be partially offset by the removal of older and potentially more trouble-prone computers.

Budget: Annually (560 computers annually)
Cost: $577,630

7. __Smart Classrooms__

The college's Smart Classrooms for the most part are support-intensive, outdated, and in need of modernization to address newer applications, capabilities, reliability, and solutions.

The staffing requested in this plan will be needed to support this requirement and include a Technical Support Specialist and Systems Administrator skills and abilities. This will help ensure that the classroom systems are tested, upgraded, maintained and working efficiently. If not addressed the classroom systems reliability and stability for current systems and newer features are at risk.

Modern Smart Classrooms allow instructors to take full advantage of new technologies to enhance instructional delivery in the classroom. A Smart Classroom is generally defined as a classroom with the capacity to accommodate the use of numerous current and possible future forms of audio-visual and computer equipment in an integrated manner. Five year replacement cycle is recommended.

At Sierra College there are 5 distinct generations of Smart Classrooms. This needs to be a standardized environment throughout the district to provide cost savings and ease of use by faculty. This will increase the quality of technical support, decrease downtime, reduce costs, and minimize the technology learning

curve. The complexity and confusion created by using a wide variety of configurations creates problems for instruction, especially for faculty that use multiple rooms.

District-wide 166 out of 217 classrooms are Smart Classrooms. 5% (9) of these Smart Classrooms are up to date (6th generation). 140 (~84%) are 5th generation. Roughly 6% (11) are 4th generation, ~1 % (1) are 3rd generation and 2% (4) of the District's Smart Classrooms are 2nd generation, . Many of the 5th generation Smart Classrooms were purchased as part of the V-building, Tahoe/Truckee and NCC construction projects and the oldest of the current generation smart Classrooms are over 6.5 years old. The District does not have a comprehensive technology refresh plan for Smart Classrooms.

The college also uses a wide variety of non-computer technology, including overhead projects, DVD players, VCRs, TVs, and even some slide projectors. Support of all of Smart Classroom\AV systems is provided by two Technical Support Specialists and one AV Technician. This level of support is inadequate.

This plan recommends the following:

- Upgrade obsolete smart classrooms to current standard.
- Have an annual refresh budget established to ensure smart classrooms use current technology.
- Provide the necessary interfaces to allow instructors to hook up any needed digital device – available in the 6th generation smart classrooms.
- Continue to increase the number of Smart Classrooms to the extent needed <u>and</u> supportable.
- Standardize the types and brands of data projectors, overhead projects, and other peripheral technology devices used across the district.
- Review smart classroom standard's annually to address changes and recommendations.
- Address staffing levels to meet current and future needs.
- Purchase and implement a computer lab scheduling software package district wide to address efficient usage of these specialized rooms.

Budget: Annually (33 per year)
Cost: $340,000

8. <u>Wireless network upgrade\expansion</u>

An enterprise class wireless solution was implemented for Sierra College and is effectively managed district wide. This includes radio resource management, access point maintenance and rogue detection, latest security protocol WPA2, and management through a centralized wireless network.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrators skills and abilities. This will help ensure that the systems are upgraded, tested, maintained and working efficiently. If not addressed the wireless networks reliability, capacity, and stability are at risk.

We have experienced extensive growth over the past few years due primarily to the "bring your own device" (BYOD) phenomenon and streaming applications growth of the end users. The need for expanded coverage in many buildings and common areas has created upgrade requirements for the Rocklin and NCC campuses. The primary buildings affected are the V-building, LRC, and campus center (J building), but as the demand for network access outside and around the buildings grows, and more instructional applications can be delivered to BYOD devices, the District's wireless network will have to scale to this.

The advantages of these converged services include Voice (audio), video, data, physical security, location services and environmental/telemetry applications that may be needed. This enterprise wireless solution provides the ideal infrastructure to support a mix of applications uniformly, across a district environment.

Guest usage has also grown dramatically and an automated solution is needed to help alleviate the workload on staff. The infrastructure is in need of an upgrade due to this increased user demand and provide for future technology changes such as the new 802.11ac, WIMAX, or other wireless standard. This plan recommends development of a wireless system roadmap to handle the current and projected growth to include the following:

- Upgrade system components and software to meet current demand and standards.
- Have an annual refresh budget established to ensure the wireless system can support current and future applications
- Provide an automated solution for guest access at all locations
- Ensure systems are upgrade to support the current standards
- Provide training and self-service support options to ensure stable and efficient use of our wireless network
- Expand to additional areas based on district needs

Budget: One-time: $167,245
Annual Cost: $25,000

9. Banner\System Hardware and Upgrades

The Banner ERP system provides users with direct access to appropriate information and the ability to make online self-service applications available to students, faculty and staff. College operations has also benefited from the availability of a single integrated information system. More complete and reliable data has been made available for making day-to-day management and strategic planning decisions.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator, Systems Analyst/Programmer, and Systems Coordinator skills and abilities. This will help ensure that the systems are tested, upgraded, maintained and working efficiently. If not addressed the Banner systems reliability and stability for current and newer features are at risk.

This system has provided many opportunities to get needed efficiencies and information to any user that needs it. With these opportunities there is also increased ongoing demand for technology services to use these features to their fullest. Our functional areas have now worked with this system and are requiring the features be put to use to assist and enhance their capabilities to do their jobs. We are currently using minimal capabilities of these systems and need to move to the next level to have it work for us. Implementing key features and enhancements is essential to our district.

There are many new features and enhancements being released in Banner and this plan recommends the following:

- Workflow
- Re-examine Data Warehouse migration
- Address staffing levels to meet current and future needs
- Reduction of Banner customizations (bolt-ons) where possible
- Prepare for Banner XE project which will require utilization of new technologies
- Banner integration with imaging system
- Banner Transfer articulation in conjunction with DegreeWorks changes
- Upgrade SAN performance and capacity

Budget: Annually
Cost: $50,000

10. Luminis upgrade\Student email Planning

The Luminis platform is better known to the district as mySierra which is our student portal and student email system. Luminis is a very complex and time intensive portal platform to maintain. The next version of Luminis will separate out the student email system which is an obsolete email system. We will need to research and implement another solution to meet the needs of students. This will include a detailed evaluation and possible change in portals and at the very least include a new student email option.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator and Systems Analyst/Programmer skills and abilities. This will help ensure that the systems

are evaluated for the best option, tested, upgraded, maintained and working efficiently. If not addressed the MySierra portal systems reliability and stability for current and newer features are at risk. This also would include impact to the student email and options that will need to be addressed.

This plan recommends the following:

- Explore other portal solutions that integrate with the Banner system.
- Explore other email solutions to replace the current student email system.
- Provide the resources to support the new environments.
- Refresh the existing portal technology

Budget: $130,000
Annually: $20,000

11. District Cabling Infrastructure

The District's network infrastructure varies greatly in terms of age and capability.   On the Rocklin Campus, many of the buildings date to the early 1960s and were built without provision for network infrastructure.

The staffing requested in this plan will be needed to support this requirement and include a Systems Administrator, Telecommunications Systems Specialist, and Network Support Specialist skills and abilities. This will help ensure that the cable plant is designed, tested, upgraded, maintained and working efficiently. If not addressed the all technology related systems connectivity is in jeopardy.

Building Cabling.

These buildings were initially networked in the early 1990s to the then-current Category 5 cabling standard and without dedicated wiring closets. Later buildings on the Rocklin campus, NCC, and Truckee campuses have more current infrastructure.

Inter-Building Fiber-Optic Cabling.

The conduit plant that the inter-building fiber-optics runs through on the Rocklin Campus was installed for the video broadband in 1986 and was installed in a common trench with the heat loop.   This conduit plant was utilized to connect all the building on the Rocklin Campus to Weaver Hall (where the data center was located) in the early 1990s. The fiber utilized effectively limits bandwidth to 1Gbps per fiber pair. In 2009, single mode fiber was installed between key buildings providing 10Gbps throughput and providing high-speed redundant network connectivity between key buildings on the Rocklin Campus.

The buildings at NCC are also interconnected via fiber-optic cabling.   The conduit plant and fiber were installed in 1996. The fiber utilized was multimode fiber which effectively limits bandwidth to 1Gbps per fiber pair.

A comprehensive network switch upgrade took place in 2008 in preparation for the deployment of the District's new VOIP phone system.   Over 200 new switches were installed, providing either 100Mbps or 1Gbps connectivity to all network devices District-wide.

Several buildings are in need of modernization with the focus being on the IDF's (Wiring closets). This includes equipping them with UPS's and the remainder being rewired. The District will need to address all IDF's for HVAC issues as these were not originally designed to accommodate this technology in this climate. All wiring closets at Roseville Gateway, NCC and Truckee locations have been equipped with UPS's. This phase is urgent due to the need to support current data capacity and future requirements. New locations can change these requirements and cost estimates.

This plan recommends the following:

- Continue UPS, HVAC, etc. installation/replacement plan and budget for MDF, BDF's, and IDFs.
- Trace out, document, and label the college's low voltage and conduit plant throughout the district.
- Continue to replace\upgrade needed existing low voltage fiber and copper wiring.
- Continue to relocate and rewire wiring closets to bring them up to current standards.

Budget: One-time - Total Infrastructure estimated upgrades $2,900,000
Cost: Current Phase II $100,000

12. IIT Training and Support: Immediate Needs

The type of training delivered to IIT staff varies depending on their job responsibility. Training has been very limited, primarily due to lack of funding and time. Some training has been delivered through traditional classroom models, occurred informally, and also on-the-job. Training for all IIT staff will be essential to meet the changing needs in the next three years and beyond.

Students, faculty, and staff are currently asking for the newest products and services to meet the demanding needs of the institution. Training is an essential piece of any technology related plan and is core to our districts success.

Training will address not only new systems support as they are implemented\requested but most importantly to address technology changes as a normal part of the business and systems support needs of today. Technology changes very quickly and ensuring we are prepared for the future is critical.

Products used should be thoroughly tested prior to deployment across the district. Information is shared in-house as the staff becomes familiar with the software however this process doesn't meet the timely needs of the district as the learning curve is much longer.

This presents many challenges in supporting the district systems in various critical areas such as the data center, systems, smart classrooms, computer labs, and desktop systems. We are not as efficient as we need to be to address today's needs, especially as change occurs we need to be able to efficiently adapt.

There are currently several major systems that will need maintenance and support. These include the new operating systems, the data center, network services, office suite, and security planning.

Due to the ever-changing technology landscape formal training is essential to meet the needs of current requirements. All staff, regardless of their position, should be trained to the greatest extent possible just to meet current demand for new technology.

This plan recommends the following:

- Send staff to the annual Ellucian Live and to the California Community College Banner Group (3CBG) meetings, both of which are essentially training sessions.
- Send staff to appropriate technical training.
- Create and maintain a regular annual training budget for all IIT areas.
- Implement a test lab for training on systems support and development (Virtualization benefit).
- Utilize cross training opportunities and on-the-job training (OJT) options for staff, especially with the remote centers.
- Explore training via Computer Based Training (CBT) courses, books, etc when appropriate.
- Training for IIT management to maintain awareness of technology advancements and trends for strategic planning for Sierra College.

Budget: Annually
Cost: $105,000

Budget

This report is divided into sections that address differing aspects of technology at Sierra College. Capital budget expenditures are reflected in the budget section and in several appendices where discussed in detail. Recommended budget expenditures reflect the college's needs for fiscal years 2014 through 2017.

The budget items that are presented in this plan are provided with estimated costs which are pending further review and analysis of the systems, scope, and situation at Sierra College. The items may not be all inclusive at this time pending feedback from the strategic planning process that will outline detailed criteria.

Costs and quantities have been gathered and included as this plan has evolved through the process outlined in the overview, milestones, and review. Technology costs change quickly and may require further analysis for any estimates outlined in this plan.

The priority order for the capital budget recommendations will be established by the existing method and process. The primary focus groups contributing to eth prioritization process are the Educational Technology Council and the District Operational Technology Steering committee.

The following chart summarizes the specific capital budgets associated with the recommendations in this plan and the recommended priority for consideration.

Overview Executive Summary for FY 2014-2017						
			Priority Ranking			
Item	One-time Costs	Annual Cost	IIT	Ed Tech	DOTS	
IIT Staffing		80,000.00				Per position
Projects:						
Student Success & Support Program	75,000	45,000	1	1	1	Mandated - have student Ed planning and reporting to chancellers office
Diaster Recovery\Business Continuity	125,000	25,000	2	2	4	Security and Risk - alternate location for systems recovery
Security Program	139,000	25,000	3	3	2	Security - firewall & spam systems replacement, and annual audits
Network Infrastructure upgrade		176,364	4	4	5	District wide - swiches, phones, etc.
Document Imaging Solution	400,000	50,000	5	5	3	Document retention-access: A&R, Fin Aid, HR, Finanace for paper reduction
Desktop Replacements -VDI\VM review		577,630	6	6	9	Growth impact, 2800 district systems, explore VDI cost savings\efficiency
Smart Classrooms		340,000	7	7	6	Growth impact, 166 systems to refresh, upgrade for instructional use
Wireless network upgrade - expansion	167,245	25,000	8	8	7	Upgrade to new technology - BYOD impact, guest access, new system load
Banner\System upgrades		50,000	9	9	8	Support, features and enhancements, etc. technology regulation change
Luminis-Student email planning	130,000	20,000	10	10	10	Portal (mySierra) - end of life current version, student email migration
District Cabling upgrade	2,900,000		11	11	12	Building wiring, fiber, copper replacement, IDF's etc.
IIT Training requirements		105,000	12	12	11	Technology education for changes and support efficiencies

Technology Master Plan 2011-2014 Review

The plan for integrating technology into Sierra Community College District is based on the district's educational vision and is part of our overall Educational Master plan. As one component of the districts Educational Master plan the Technology Master Plan is annually reviewed and updated on a 3 year cycle.

Participation in the process of planning for technology in education is by working with the college community and asking appropriate questions, such as: How will the technology be used? How will technology affect the role of instruction and business in a cost effective manner? How can technology benefit all students?

Scope

This section provides an overview of the previous Technology Master Plan for the district. Technology has continued to grow and evolve in use at Sierra College and is constantly being asked to provide solutions and features to the instructional and business communities of this district. Technology use and support needs have grown dramatically in just 3 years to include the following major components:

1. Network infrastructure
2. Desktop systems
3. Smart Classrooms and instructional support
4. Wireless network
5. Helpdesk support
6. Support Expectations of 24x7
7. Student account management
8. Systems upgrades and new functionality

This also must include the continuous change in technology to include new equipment and software versions, training requirements, and customer support requirements. It is recognized by program review as the first overarching theme of the combined programs report.

Staffing

IIT has been very productive over the past three years while at the same time going through major transitions in each of the 3 departments. The growth, demand, and expectations of technology have been significant and increasing. The spring 2013 customer survey shows continuous improvements in IIT customer service while recognizing staffing shortfalls. The economic issue has created staffing shortfalls as IIT staffing levels have actually decreased during these past three years.

Successes

Faculty, staff, and students have supported the school's initiatives in the use of technology and understand this as a critical need.

Collaboration activities with our customers are enhancing our communications and proactive planning to meet needs. Frequent meetings with committees and working groups to discuss plans and address operational issues allow us to proactively support our customers. Utilizing Ed Tech to facilitate communications regarding planning, goals, and strategies to support instruction, student services, and faculty enhances our ability to gather information from the campus community. We changed BSC to DOTS to include operational technology in a broader way.

- Banner Infrastructure upgrade - Virtualization
- Upgraded Banner ERP database (Oracle 10g to 11g)
- Implemented Canvas – new online learning management system(LMS)
- Implemented electronic transcripts for students
- Upgraded DegreeWorks for new functionality
- Changed vendors for disbursement of student fin aid and refunds and costs savings
- Implemented ESL online assessment
- Implemented DegreeWorks
- Implement Student Success Initiatives from Chancellor's Office
- CCCApply implementation for student admissions applications
- Implemented Scholarship application software for students
- Electronic waitlists implemented for students
- Implemented WSUS (Centralized Microsoft Patch Management)
- Implemented Pay-to-Print
- Deployed Office 2010
- Selected and deployed Trend Micro Officescan
- Deployed Faronics Powersave
- Implemented Redundant Internet connection in alternate location
- Deployed Trend AV on all Windows Servers
- Upgraded UPS power backup in data centers
- Upgrade Exchange to 2010
- Replaced Backberry mobile device support with Exchange Active Sync
- Upgrade Voyager to 7.2 on Red Hat Linux and decommissioned the Sun Sparc Server
- Upgrade the District perimeter firewall to allow blocking illegal content downloads
- Develop bulk email standards and systems to avoid email blacklisting
- Upgraded the District server backup services with deduplication capability
- Completed initial DR testing for network, Internet, phones, and Banner/mySierra
- Created an automated account provisioning QA program to improve provisioning
- Implemented a new WEB server infrastructure for www.sierracollege.edu
- Implementation SharePoint departmental collaboration (inside.sierracollege.edu)
- Installed SAN shelf at NCC for added storage capabilities

Delays
There have been significant delays in providing enhanced features and improvements to many systems. The economic crisis has had a substantial impact on the district as resources have been greatly reduced to include lower staffing levels and reduced budget to maintain current systems. The impact cannot be overstated.

Budget
The goal is to maintain our budget and operate within these limited resources. The challenge is we are experiencing continuing cost increase in several areas. Many of these relate to obsolete systems placing increased demand on parts replacement and staff support. New technology and features that are in demand by the district have also been limited due to resource constraints. Increased costs for licensing and maintenance contracts have also been experienced.

Summary

There have been a great many successes over the past three years. There also have been many challenges to address and progress is continuing to move forward. We are continuing to explore ways to reduce budget and implement solutions that provide long term reductions in costs and staff work load. This has been a slow process due to further reductions in IIT staffing and continued technology growth within the district.

There is new technology being requested consistently by faculty, business operations, etc. and we will need to continue to find ways to support our customers within the resources available. Setting realistic expectations will be needed to assist our planning in response to requests.

The newest technology impact has been the explosive growth of mobile devices and the support for these devices. This includes traffic impact on our network as well as support of these items for faculty, staff, and students.

Our major challenge in the next couple of years is planning what we can't do because of our resource constraints. More importantly is helping our customers with resolving their workload concerns so they can do more with less.

Summary of the 2011-14 Technology Master Plan Items Pending

Item	Status	Comments
Workflow	Delayed	Due to resources
UPS installation\replacement plan and budget for MDF, BDF's, and IDFs.	In Progress	Pending Resources
Trace out, document, and label the college's fiber and copper runs and conduit plant throughout the district.	In Progress	Pending Resources
Replace\upgrade most existing low voltage fiber and copper wiring	In Progress	Pending Resources
Relocate and rewire wiring closets to bring them up to standards.	In Progress	Pending Resources - spaces (telecommunications rooms)
Include infrastructure to address Disaster Recovery\Business Continuity Planning at alternate locations both on campus and at remote centers.	In Progress	
Educate the user community about the importance of the use of basic security practices such as passwords and not sharing them with other users.	In Progress	Security Committee establishing a security program that includes awareness
Continue efforts to move towards a single sign-on and password solution, knowing that there may be exceptions to this.	Partial	Delayed - Start up Spring 2014
Utilize some form of remote control help desk solution to help users with their passwords and configurations (as well as help them with many other issues).	In Progress	Training and tools
Implement a firewall appliance with network intrusion detection capabilities.	Partial	Palo Alto "Threat Management"
Design and implement a DR\BCP testing plan to occur on an annual basis.	Partial	First test done with minimal systems
Design and implement an Intrusion Detection\Prevention System	Partial	Palo Alto "Threat Management"
Create an Information Security Plan and Program	In Progress	IIT Security Committee
Implement a central help desk and create a hierarchy of support for a variety of technologies and systems (Discussed in a later section).	Partial	Helpdesk implemented and centralized - Staffing a concern
Create a helpdesk web page with up-to-date status reports of on-going procedures for support and helpdesk processes.	Partial	Initial setup completed with a future intranet growth
Technology purchases must include funding to provide total cost of ownership for the life of the system.	Partial	Pending Resources

Overview 2014 - 2017

Infrastructure

WAN, LAN, Wireless, and Telephone System

There's an environment of increasing demand for support and services from the Instructional, Student Services, and Business Departments, and the increasing expectation from the college's student body that the infrastructure be able to support access to needed systems on a 24x7x365 basis. We have experienced extensive growth on our wireless network over the past few years due primarily to the "bring your own device" (BYOD) phenomenon and streaming applications growth of the end users. The need for expanded coverage in many buildings and common areas has created upgrade requirements for the Rocklin and NCC campuses. As the demand for network access outside and around the buildings grows, and more instructional applications can be delivered to BYOD devices, the District's wireless network will have to scale accordingly.

It is recommended that the college continue to support an infrastructure modernization process that provides expansion scalability, and agility to meet changing technology. Such a solution provides: new equipment refresh cycles that will accommodate the increased demands that our students and faculty will place on the network; increased network and data security and reliability; a system that is robust and flexible and staff can easily manage; the capacity to deliver video over the network; the ability to support wireless networking throughout the campus; and the ability to provide telephony over the network.

This solution also recommends our IDF's be upgraded to include HVAC, wiring, and labeling all fiber and copper runs in the district to ensure all technology wiring closets are up to standard. Our newer campuses at NCC and Truckee are current and need to be maintained.

Wide Area Network (WAN)

The WAN provides the inter-connections for data network services between the college campuses. It also provides Internet access, and consists of one 1GB and one newly upgraded 1GB failover circuit for the main campus. The WAN capacity supports, a 50MB line to the NCC campus and a 20 MB line to RG and the Truckee Center. Our equipment is at midlife and supports the current needs of these centers. Future considerations need to address WAN redundancy to the remote campuses as it pertains to the DR/BCP for the college and evolving technology requirements.

The Sierra College data network should be assessed for supporting the IP video technology and its impact on the college's network with regard to capacity and standards, and to support video distribution and distance learning initiatives that will leverage the WAN, LAN, and Internet. Although the recent network improvements have helped to support total capacity and prioritization of network traffic, the district needs to assess the viability of a video content distribution system. Such a system would include servers/controllers for storage and distribution of content that help to avoid saturation in specific network segments and assure full-motion video qualify for quality education content vaulting, streaming, and management.

Our connection to the internet is through CENIC which is a managed ISP in support of educational institutions primarily in California in coordination with the Chancellors Office. Our

connection to NCC is though AT&T and our connection to the Truckee center is supported with a connection through the Nevada County network and has provided us a cost effective option to support this remote center.

<u>Local-Area-Network (LAN)</u>

Each campus LAN facilitates electronic communication between buildings on its campus; it is the "network". Sierra's LAN carries both administrative and instructional traffic.

The LAN is comprised of physical fiber and copper wiring, electronic components, servers, and physical spaces (usually wiring closets). The LAN has a Main Distribution Facility, or MDF. MDFs function as distribution points to Intermediate Distribution Facilities, or IDFs. IDFs typically feed one building or floor of a multi-floor building. The IDFs consist of electronic components and physical copper cabling runs to the network jacks that are in the offices, classrooms, and labs.

The continued growth of the district over the years, coupled with the many changes in networking technology, has resulted in a vast disparity between network distribution closets built at various times. There is a need for a consistent configuration and standard equipment in these rooms. Some rooms have power, lighting, and environmental issues. Some rooms share space with janitor sinks and leaking water heaters, and do not have the ability to expand.

On the Rocklin Campus, many of the buildings date to the early 1960s and were built without provision for network infrastructure.   These buildings were initially networked in the early 1990s to the then-current Category 5 cabling standard and without dedicated wiring closets.   The first District building to incorporate dedicated wiring closets was the LRC (1996) followed by the remodeled Winstead building (1998) and the V-building (2007).   Other buildings have been rewired as time and budget permits including Weaver Hall (2008), the M building in 2010 and the B, C and D-buildings in early 2011, all with dedicated wiring spaces in the form of 19" rack cabinets, acoustically-dampened where needed. The remainder of the buildings need to be rewired to current (category 6a) cabling standards with dedicated wiring spaces, including the LRC and Winstead Hall.   The upgrade\replacement of much of this is an absolute priority since all systems use this to communicate; including to the internet, Banner, Distance Education, telephone, Canvas, etc.

The original Nevada County Campus buildings were all built with dedicated wiring closets and were wired to the Category 5 standard. The portions of these buildings (N1, N2, N5, N6, N8, N11, N15) will need to be rewired.   The buildings built during the expansion and renovation of NCC were wired (in some cases only partially) to the category 6a cabling standards.

Roseville Gateway was wired in 2000 to the category 5e standard with dedicated wiring closets. As the lease expires in 2015, no cabling infrastructure expenditures are recommended.

The Truckee campus was built with dedicated wiring closets and wired to the category 6 standard.

<u>Inter-Building Fiber-Optic Cabling</u>

The conduit plant that the inter-building fiber-optics runs through on the Rocklin Campus was installed for the video broadband in 1986 and was installed in a common trench with the heat loop.   This conduit plant typically consists of 2x2" and 2x3" conduits.   This conduit plant was utilized to connect all the building on the Rocklin Campus to Weaver Hall (where the data center was located) in the early 1990s.   The fiber utilized was 62.5/125µ multimode fiber which effectively limits bandwidth to 1Gbps per fiber pair.   In 2009, 8.3/125µ single mode fiber was installed between the following building pairs:

- A-building and Winstead
- A-building and the LRC
- A-building and V-building
- LRC and Winstead
- LRC and V-building
- Winstead and Weaver

These new single-mode fiber links are capable of 10Gbps throughput and provide high-speed redundant network connectivity between key buildings on the Rocklin Campus.

The buildings at NCC are also interconnected via fiber-optic cabling.   The conduit plant and fiber were installed in 1996.   The conduit plant consists of 4x4" conduits to each building.   The fiber utilized was 62.5/125μ multimode fiber which effectively limits bandwidth to 1Gbps per fiber pair.

A comprehensive network switch upgrade took place in 2008 in preparation for the deployment of the District's new VOIP phone system.   Over 200 new switches were installed, providing either 100Mbps or 1Gbps connectivity to all network devices District-wide as well as power-over-ethernet (POE) capability for the VOIP telephones and wireless access points (APs).

As buildings are rewired and dedicated wiring spaces established uninterruptable power supplies (UPSs) are installed in order to provide emergency power in case of a power outage.   To date the following buildings have been completed: A-building, M-building, V-building, LRC, Weaver Hall, Winstead Hall, Z-building

The other buildings will be equipped with UPSs as they are rewired. All wiring closets at the Roseville Gateway, NCC and Truckee locations have been equipped with UPSs.

The college does have 2 new firewall appliances that protect the entrance into the district network and one in front of our Data Center.

Telephone System – explore alternate options for phone system

The telephone system was upgraded to a VOIP solution during the last plan and meets our needs with several features installed to include site survivability, voice recognition paging capabilities, and phones in each class room. There are several items remaining that need to be implemented to address newer technology that could be of use to the college.

The district will also explore other alternatives to using the current environment to include cloud and cellular technologies. This is due in part to the aging infrastructure and high cost of telecommunications systems in general.

Research and Development

The change in technology is frequent and continuous that places an enormous burden on existing systems and resources to meet the needs of students, faculty, and staff. We must continue to allow time to explore and research new technology and options that can create efficiencies and capabilities for Sierra College.

Recommendations:

Regarding infrastructure, this plan recommends the following:

- Explore alternatives to the current telephone model, to include looked at hosted VOIP and Cellular options
- Identify and build adequate IDF locations in remaining buildings on the Rocklin Campus.

- Continue UPS installation/replacement plan and budget for MDF, BDF's, and IDFs.
- Trace out, document, and label the college's low voltage and conduit plant throughout the district.
- Continue to replace\upgrade needed existing low voltage fiber and copper wiring.
- Continue to relocate and rewire wiring closets to bring them up to standards.
- Include infrastructure to address Disaster Recovery/Business Continuity Planning at alternate locations both on campus and at NCC.
- Conduct a security audit of the college's network.
- Implement an infrastructure refresh plan.
- Update district infrastructure to handle new and additional technology requirements and services.
- Explore and implement unified communications options and solutions.

System and Data Security

Although much progress has been made with regards to Information Security in the past 3 years, we have identified several areas that need continued focus.

The Security Advisory Group was formed to define and support a Security Program for Sierra College, and to make policy recommendations to the Educational Technology Committee and the District Information Security Officer role carried by the District's Chief Technology Officer. A program plan was developed, internal audits and security posture assessments were performed, but continued efforts need to be resourced to address security gaps and end-user awareness campaigns.

Network Security Upgrades – The internal district Firewall is obsolete with regard to its security capabilities and needs to be replaced. This firewall protects specific sensitive data "zones" such as Banner, Exchange email, and should also include other services such as VoIP Telephony services. Our network also has no Intrusion Prevention Systems (IPS) in place on servers other than basic anti-virus and anti-malware. IPS systems are essential components of enterprise network security in today's Internet community and should be no surprise considering all the publicized attacks on retail stores such as Target, or other schools such as Arizona State. The District needs to identify and implement an IPS that will improve its security posture against malicious and criminal activity.

Physical Security - The District's Data Centers and wiring closets are secured by key or FOB controls and restricted to appropriate personnel. Data Center FOB access lists are reviewed at least annually to assure only appropriate staff have access. In some cases wiring closets have environmental issues and is being addressed through the Campus Infrastructure planning and budgeting process.

Data Breaches - Information and Data Security is a top concern for Security and Security Awareness. The Security Advisory Group must make a concerted effort to focus on data classification and policy around the data classes defined, to include mobile devices, thumb drives, CD's/DVD's, remote access, hard copy reports and shredding. Incident procedures should be written and adopted to specify necessary actions should a data breach occur.

Spam

The college has been using a product called Barracuda. The volume of SPAM that the District receives has been increasing over time and started increasing dramatically in recent years. At this time our Barracuda appliance is reporting receiving over 56,000 emails per day of which 89% on average are detected as spam and blocked. Daily attention by the System Administrators is required to keep the Barracuda appliance operating efficiently, and malicious spam attacks impact our email system and require hours of remediation several times monthly on average.

Recommendations

- Continue to develop and implement our security program through the IIT Security Advisory Group.
- Create a training plan to educate the user community about the importance of the use of user security best practices, etc.
- Engage a firm to conduct a security audit of the college's network regularly.
- Implement desktop configuration management to address security best practices.
- Address the lack of Security-specific policies and procedures around Security Incident handling and data protection.

System and Data Backups and Disaster Recovery

Backups are being performed for over 200 servers in the district's primary data center. This includes our Banner ERP systems as well as our VM (virtual server) environment. The backup process has data retention of 6 months after which the backups are no longer kept. There are exceptions as derived from the data stewards for certain applications and data files, or for non-critical data (test systems, etc).

General Backup process:

Nightly –
      Incremental backup to disk, critical data redundant off-site.
      Incremental backup on any file changes to disk, critical data redundant off-site.

Weekly –
      Full backup on Friday to disk.
      Full backup on Sunday off-site.

Windows Servers backup process:

Full backups of the Windows servers occur weekly and monthly with nightly incremental backups to disk. Backup retention periods are set for one full month of weekly backups, and six months of monthly backups. All disk backups are replicated off-site at NCC or backed up redundantly to tape and stored with an off-site vaulting service provider.

Banner backup process:

RMAN is used as a backup tool for Banner Production data and is copied to disk in an alternate building approximately every 10 minutes. Full backups of the production servers occur nightly to tape with a 6 month retention period. Transaction logs and database control files are archived to disk in an alternate location every 10 minutes to allow for recovery times of 10 minute intervals. The tapes are sent off-site weekly to an off-site vaulting service provider.

Disaster Recovery

The college has recently upgraded key parts of a technology disaster recovery/business continuity solution however this is a constant evolutionary process for keeping current.

IIT has positioned itself to have much more flexibility when it comes to recovering systems by way of server virtualization and storage networking. Our virtual server infrastructure can quickly restore entire servers with applications and data sets on other virtual server infrastructures located anywhere. We have implemented an alternate server room location for a "hot-site" in LRC and are planning for NCC providing this capability for our critical systems in a limited way.

We have a responsibility to address this issue with a business continuity solution to bring the district back online in a timely way should a disaster occur. The question that we must answer is how long can we afford to be without access to our key systems?

The following is a graphic depiction of our current backup strategy:
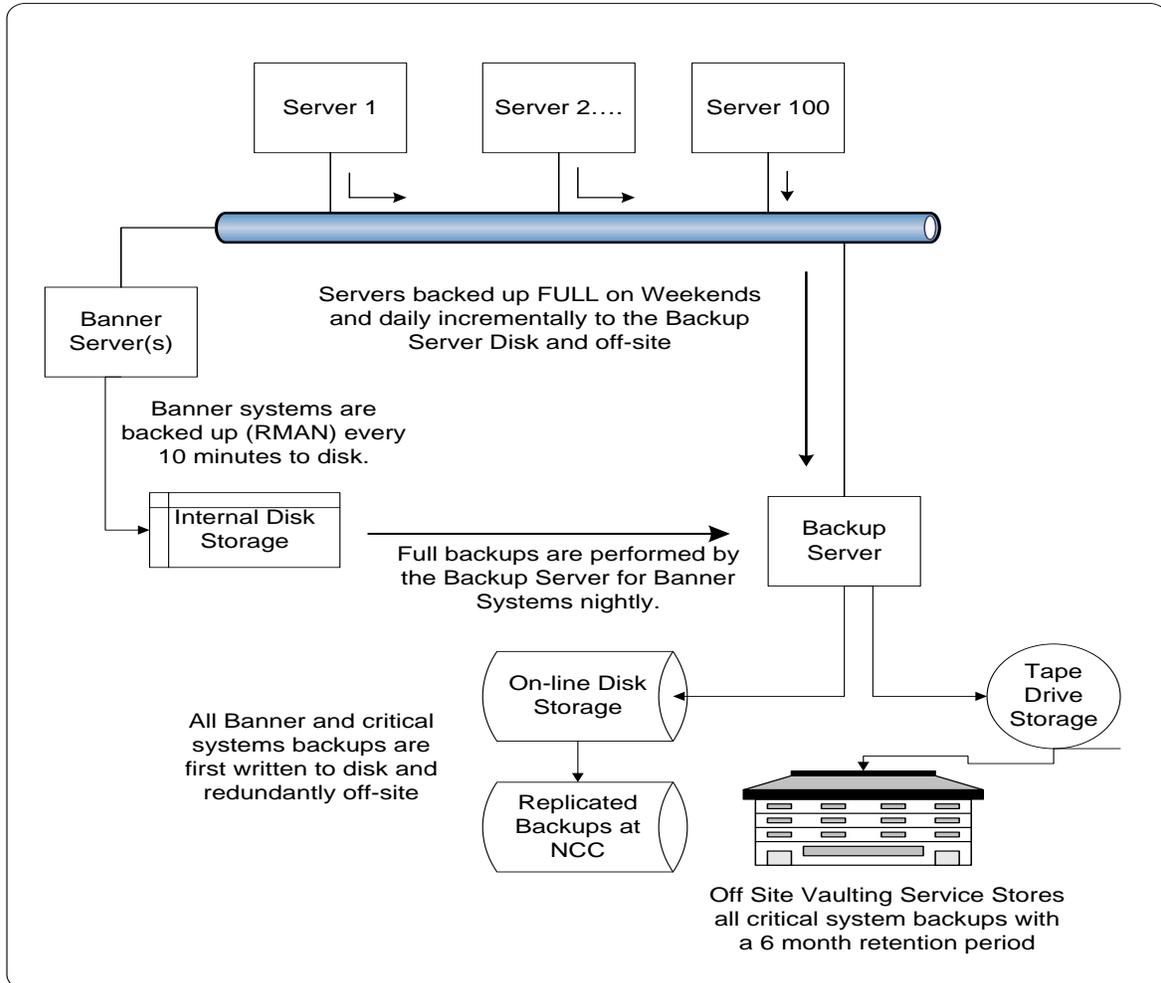
* Setup of backup services at NCC is in progress but not yet implemented.

Support and Training

Helpdesk Plan

In the chaotic world of IT, all roads eventually lead to the help desk. This primary technology focal point for the district is the first response center for problems, and help desk efficiency is often the pivotal ingredient in IT customer satisfaction. End-user perceptions typically live and die based on how quickly, efficiently, and thoroughly the help desk performs.

We have a formal centralized helpdesk to address some key concerns to include a, remote control support for customers, user accessible incident tracking and status system, self-service student password reset tool, and limited off hour support for priority issues. There is a vacancy as we have one helpdesk person for the entire district and currently average a 600 work order backlog. .

"A help desk is effective if it delivers high customer satisfaction at a low cost," says David Coyle, a Gartner research director covering IT operational management. "Best practices state that 54% to 75% of all IT service requests should be managed by the first-level technician at the first point of contact by the end user—known as the first call resolution rate. Calls managed by the first-level support analyst typically should cost an average of $20 per call. So if customer satisfaction is low or if a help desk isn't able to close approximately 54% to 75% of calls at a cost of about $20 per call, then there are opportunities to upgrade the help desk."

<u>**Recommendations**</u>

- Increase staff to address support for the district staff and students.
- Training for Helpdesk staff to enhance first call resolution.
- Provide resources to support first call resolution.
- Fill the vacant Help Desk Specialist position.
- Provide additional training for supported applications.
- Plan for evening and Saturday support realizing this is a resource issue.
- Publish FAQs (provided by Divisions) on a central help page.

User Technology Training

In general, the training opportunities do not meet the college's basic needs. Since a well-trained user community minimizes the need for additional support, it is important to deliver effective training that meets the user's needs in current and future technology.

The lack of a training program for new applications, programs, etc. dramatically reduces the effectiveness of staff and create long delays in keeping technology current in our district. This includes Banner, Office applications, upgrade changes, etc.

<u>**Recommendations**</u>

- Provide resources to implement a training staff, possibly another helpdesk specialist with 50% helpdesk and 50% training.
- Develop a plan to address new user technology training needs.
- Use group training and self-paced methods whenever feasible.
- Use the train-the-trainer model whenever possible.
- Explore a variety of training options and modalities, webinar's, books, CBT's, etc.

Technology training goes hand in hand with technology support, since the better trained the users are, the less ongoing support they will need.

We should look at a wide variety of training options to include: scheduled, drop-in, and online. For the most cost-effective use of Sierra's training and support resources, however, group training and self-paced training methods should be promoted and expanded.

Technology training is by necessity a distributed affair. It is reasonable to expect a department to provide their own staff training for specialized hardware or software used only or largely by that individual department. By the same token, training on the college's shared or standard hardware or software should continue to originate from a centralized source.

Sometimes the scale of the training needed overwhelms the centralized department, as when the campus rolls out the Banner ERP system or a new network operating system.

Student Technology Support

There is ongoing concern of email interruptions due primarily to occasional mass quantities of email being sent in short periods of time. This has resulted in our being "blacklisted" occasionally by several ISP's. This issue had been addressed with a new mass email application for marketing

With a new version of Luminis coming out in the near future the email module will be separated out from the Luminis platform. We will need to evaluate our options to determine the direction we will take in the future.

The college maintains a student email system with over 130,000 accounts with very limited resources. This also has an impact on overall support requirements for the district as users have expectations of 24x7 availability.

We have implemented a wireless network that students have access to throughout the district. It is integrated with our student authentication domain for a single sign on solution with the portal.

Student support is via automated password reset tools and FAQ's in each of these environments. They also have the option to forward their email to a personal account.

We have also implemented a student pay for printing solution that will need support for students and their printing needs.

Recommendations

- Implement a student support center for technology assistance
- Continue to update automated technology and FAQ's as needed.
- Evaluate our student email solution based on pending changes in our current product.
- Develop a replacement student password reset process that offers greater functionality and security.

Banner/ERP Management

Overview

Sierra College utilizes Banner Administrative Software. This also included an upgrade from Banner 7 to Banner 8, interfaces, 3rd party applications, ODS, DegreeWorks, etc. In 2013 SunGard HE, the developers of Banner software, was acquired by a venture capital group and the company name has changed Ellucian. This may present some challenges as the venture capital group also owns Datatel, which was a competitor of Banner, and support and future direction of the Banner software may be in question.

System personnel and organization -

For a system of this magnitude, the oversight and governance structure is vital. The outcome has far-reaching consequences and will affect every aspect of the institution. In this regard, it is important that this system be viewed as an "institutional" effort and not an "IIT effort."

The Banner® system will continue to have a major impact on College operations and the delivery of student services. The integrated system will serve as a "single system of record" for decision support, managing operations, and delivering services. Departmental processes have changed as the College moved from a functional orientation organized by domains of responsibility toward a process orientation defined by desired outcomes. As a result, the College must be prepared to anticipate and guide the necessary changes in organizational structure, responsibilities, reporting relationships, and communication channels.

This system provides a continuous opportunity for the College to improve its processes. Individuals will need to adopt new ways of performing functions in conjunction with the changes of the Banner® system. The full extent of the impact will need to be accounted for within the context of district planning and in conjunction with future strategic planning at an institutional level.

Planning Process & Leadership

Executive Council

The role of the Executive Council is to:

- Approve overall strategic direction
- Address system resource concerns and planning.
- Respond to policy and philosophy questions.

District Operations Technology Steering (DOTS)

The role of the Steering Committee is to provide senior level leadership for the overall operational systems and is responsible for instituting the procedures, practices and organizational changes necessary to successfully operate the fully integrated Banner® and other enterprise systems.

Team Leads

The Team Leads will manage and are responsible for their Banner® application module(s and associated data and selected ancillary software in their overall functional areas. These leads will be equally responsible for ensuring the success of their particular changes.

Specifically, the Functional Team Leaders will:

- Plan and discuss operational systems issues to meet district needs
- Make recommendations to IIT to support those operational issues
- Identify and understand, in-depth, the business objectives to be attained as well as the preferred manner to achieve objectives.
- Develop an in-depth knowledge of the software product and of current and preferred operating methodologies.
- Present issues to DOTS when additional support or direction is required.
- Set standards and manage quality of their modules as data stewards.
- Coordinate effectively with other Team Leaders and Cross Functional Teams.
- Adhere and manage to the agreed upon management methods.
- Help develop training and user procedure materials and conduct training as required.

Business Process Improvement

Specific tasks include, but are not limited to:

- Analyze and document selected current business processes.
- Work with College faculty and staff to identify opportunities for improving processes that can be made more efficient.
- Document recommendations for achieving business process improvements.
- Assist the project teams with developing effective change management strategies required to support the implementation of specific process improvements.

- Assist the project teams with identifying and understanding the greatest business value available in Ellucian Banner modules.
- Identify where existing functionality can be used to avoid customizations.
- Recommend business process changes required to take advantage of baseline product functionality.
- Provide expert advice on business process best practice.

Reporting Strategy

Sierra College has adopted Argos as the standard reporting tool for the District. The developers of Argos, Evisions, Inc. have partnered with Ellucian (Banner) which make this a good choice. Reports are created by designated "report writers" and "data block designers" as defined by Argos permissions. If there is a need to have a report created by IIT personnel a Systems and Programming Service Request needs to be completed as well as an Argos Data block Report Request and submitted to the Helpdesk. The Helpdesk will assign to the appropriate department for prioritization and assignment. The requests forms are located in Inside.Sierra, Forms Library link, IIT Forms section..

Communications

Clear and consistent communication will be critical to successfully maintaining the Banner® system solution. All those serving on the various teams should consider it a primary responsibility to share information with colleagues in their areas. Frequent, informal updates on progress will be extremely helpful in keeping everyone informed.

The DOTS will meet regularly to review the status of the system, etc. This committee will be kept informed by the CTO and will maintain communication with the Functional Teams.

System Modifications and Tailoring

There is a subtle but important distinction between configuring and customizing. Configuration does not involve making changes to the underlying software programs. Adding data fields, screen modifications, and report formatting are a few examples of ways to tailor the system without making custom changes to the underlying software.

Customization involves the modification of the underlying software programs being used by the system in order to somehow change it for some intended purpose. All departments are encouraged to work within the existing system parameters to meet their needs. The resource cost of these customizations it extensive as we have seen as upgrades have occurred. We should also work to remove the changes that are currently in place and avoid the ongoing cost.

All customization of the system must be coordinated and approved by the CTO and DOTS prior to the tailoring being performed by either third party consultants or internal programmer/analysts. The CTO will have final approval authority.

Recommendations

Continue as planned with the following goals:

- Improved information services for students, faculty, and staff through an integrated software system providing sharing of common data.
- Streamline business processes to provide improved efficiency through the reduction of manual and paper based systems and the implementation of automated systems that monitor, track, and trigger processes

- Improved collection of data, information, and transaction processing – reporting capabilities to proceed to the next level of information analysis
- Responsiveness to Board, management, state, federal, research and local reporting requirements
- Security and integrity of data important to confidentiality and providing for accurate data necessary for good decision making in the future
- Evaluate modules not owned by the college, to see if any of these modules should be implemented.
- Stay current with the latest releases of software
- Ensure hardware refresh cycles are observed.

Operational Considerations

System Maintenance and Downtime

Automation has reduced the frequency of user downtime for most system maintenance. Downtime associated with planned maintenance, however, will continue to increase due to proliferation of key systems in our Data Center such as Banner. There is a need for non-emergency maintenance and upgrades on a regular basis for all production systems and some ERP test systems and this has been addressed with an agreed upon and posted maintenance schedule. This remains a significant challenge due to competing priorities.

A standing time acknowledging the outage windows for the district have been established and posted when upgrades or maintenance is required. Given an environment of more organized project flow and college-wide established technology priorities, a web based monthly calendar was created to alleviate some issues. Currently this schedule is posted in our intranet site under IIT however there is a constant challenge to get time which risks systems stability and security.

Policies and Procedures

Sierra's Computer and Network Use Policy (CNU) was written in 2001 and approved by the Governing Board as defined in the CNU board policy (BP 3720). Sierra College has Administrative Procedures (AP 3720 and 3721) providing further information on technology procedures. This BP\AP were reviewed and approved in 2012

There are many cases where procedures and guidelines are not published that would include providing clear guidance and most importantly outline expectations with regard to security. Specifically, standards and procedures for perimeter network security, Wi-Fi, Social Networking, mobile devices and encryption, data classification and information privacy, and computer security incident management need to be documented and ratified.

Many of the requirements of the policy and procedures are based on legal requirements that are relatively new. These laws are at both the federal and state levels. Further reference to some of the more pertinent laws can be found in appendix.

Additional standards with regard to shared storage and file management, email use and email retention, and new system provisioning, etc. need to be documented and communicated to the college to assure proper expectations are set with regard to IIT and customer roles and responsibilities.

There are some well-defined support processes and procedures in place to provide information on how Sierra College IIT operates. Several new procedures are being developed to provide information on service metrics, acceptable use, and business operations. These new procedures

will help the district understand the workload and support requirements that are the responsibility of IIT as it relates to technology support.

New processes and procedures need to be clearly defined to outline support requirements, set expectations, and compete for resources, especially as the district continues to demand more technology support and solutions. Many faculty and staff feel that the campus should increase resources to improve the services, access, and response times for computer/network support and repair.

The CNU is based on several laws, policies, procedures, and best practices. The modifications being made to the CNU are reflected in the Information Technology and Electronics Communications Procedure and reviewed as part of the Banner implementation process. See in Appendix.

<u>Recommendations</u>

- Update procedures as required (AP 3720 and 3721).
- Communicate the CNU and other procedures to employees via the college's committees, website, e-mail, and other appropriate modes.
- Require all employees to acknowledge the college's CNU at login and as part of the new hire process.
- Require anyone logging into a district system to acknowledge acceptance of district technology policies and procedures.
- Update technical support processes and procedures, and communicate these to the campus community to set expectations, some recommended are in appendix.
- Regular systems maintenance times need to be provided by the district

IT Work Order\Project Management and Prioritization

Work orders are submitted through the helpdesk or via our web based submission form. The work order system then notifies the person that it has been entered into the system. At this point it may not be actually worked on until assigned to a technician. Status can be checked by the person submitting the work order via our web based self -service tool.

Project requests have historically been submitted to the IIT Division in a variety of informal ways, depending on the type and complexity of the request. The IIT Division, the Educational Technology Council, District Operational Steering Committee, Vice Presidents, etc.

To whom and how requests have been submitted varies depending upon the functional area involved, for example whether or not it is a request for programming versus an infrastructure support project. Other factors have included the size of the project and resources needed to do it. Requests for major projects are typically submitted through a manager or Vice-President.

Project Prioritization

To enhance the project management and prioritization structure for incoming requests, it is recommended that for major divisions submit projects into the DOTS process through their respective divisions and in consultation with the IIT Division. This is due to a typically large resource requirement needed or district impact.

The IIT Division will continue to schedule projects into the overall schedules for all technology services. This will allow effective and efficient utilization of staff and systems resources. This will also enhance institutional planning and effective use of resources via formalized processes.

- Submit work orders and formal project requests through our web-based self-service tool.
- Any formal projects of any size that would require the customization of major systems such as the Banner ERP core system requires the approval of the CTO for Sierra College.
- IIT should be consulted in any case where new information technology is considered or implemented prior to implementation.
- Evaluate possible replacements for the District's Track-It! Help desk software.

Data Warehousing

The current data warehouse is setup on SQL servers and supported by a consultant on a part time basis. The hardware is in need of upgrade and discussions on migrating this to our Oracle data base system to allow the college IIT division to support a common platform is also needed. The research office is currently the data steward of this environment and will be essential to the planning process.

Recommendations

- Modernize or migration of the SQL data warehouse to our Oracle DBMS for life cycle support.
- Coordinate with Research & Planning to provide planning and reports needed.

Current User Technology Usage, Hardware, and Standards

Sierra employees use a wide variety of technology. In general most employees are familiar with the technology that they use. The District has ~2800 computers deployed in instructional and administrative environments. The average computer age in the District as of October 2013 is 5.2 years. This age is somewhat skewed by the large number of computers purchased as part of the Furniture, Fixtures and Equipment (FF&E) of the V-building (442), Truckee Campus (135) and NCC expansion (159). The deployed systems are up to twelve years old. To the extent that the college employs older technology it will become increasingly difficult to compete for students who have the expectation that the college will have modern technology available to them. Roughly ten percent of the computers owned by the District are Apple Macintoshes.

Microsoft Office is used most often for word processing, spreadsheet, and database needs and is the district standard office software. The most frequently used Internet browsers are standardized on Internet Explorer and Firefox.

Software, including OS standards, are based upon what is compatible, efficient, secure, as well as affordable. Currently, the college standard is Microsoft Windows 7 Enterprise SP1 for the OS on PCs, and Microsoft Office 2010. At this time we are 1 Office version behind the current release, Office 2013. Being one version behind is having little if any impact on users.

In April 2014 Microsoft will stop supporting its Windows XP operating system which is loaded on ~30% of District Windows-based computers. By this date, XP systems will need to be upgraded to Windows 7, necessitating the replacement of some systems. This move from Windows XP to Windows 7 has largely taken place and is expected to be substantially completed by the April 2014 Windows XP end-of-support date, given the resources to replace the District's ~140 oldest, non-Windows 7 compliant systems. One notable exception at this time is the ESL program which, although having Windows & compliant systems is unable to be upgraded due to the majority of the software required not being Windows 7 compatible.

Resource limitations are inhibiting upgrade and migrations to the current software and hardware needed and is adversely affecting instructional and business efficiency in some cases.

Hardware and network standards are set by the IIT Division in consultation primarily through the Educational Technology council. Minimum standards for hardware and software are established and revised as needed.

Standardizing on as few various hardware and software platforms as possible across the district will greatly improve reliability and flexibility for faculty and staff. This will allow employee's, primarily faculty, to move between locations as efficiently as possible and reduce training needs. This will also allow us to utilize volume discounts, reduce training needs to specific platforms, and enhance the user's technology experience.

The Manager of Technology Support Services sets the PC/Mac hardware standards and approves operating software standards suggested by the IIT Division with input from the Educational Technology Council. The college has evolving "standards" for older equipment that get re-evaluated unofficially as needed.

The standards for new equipment change based on what is available from the manufacturer coupled with what seems to be the most cost-effective technology at the time. The major change recently has been a new standard of Multi Core Processors. This also has a ripple effect for the types of software that are needed by the district creating a vast gap between several variations of system configurations being added to our current resource challenges.
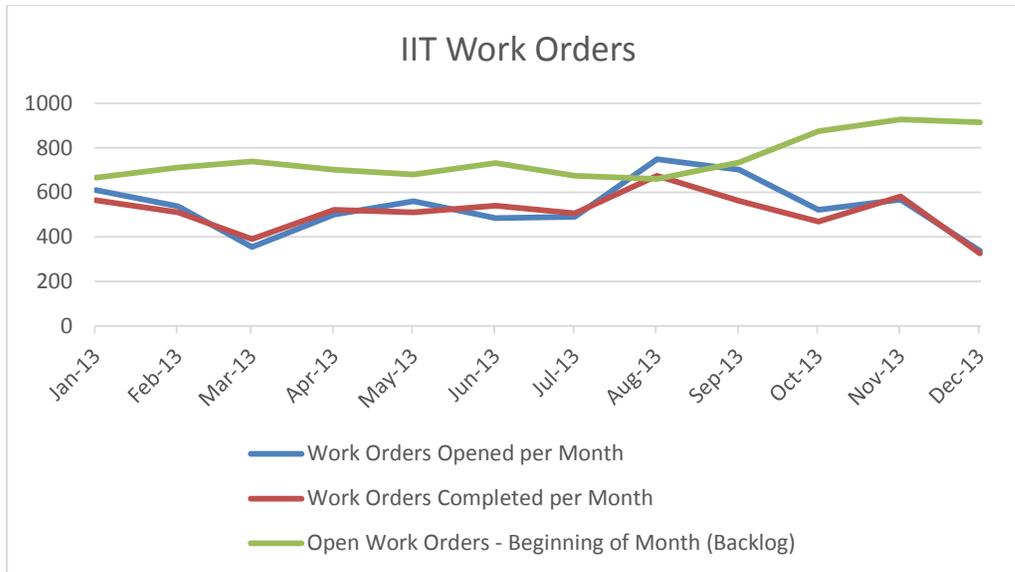
Recommendations

- Require that a three-year warranty be purchased with every new computer.
- Standardize on as few varieties of hardware and software as possible.
- Implement a standard baseline configuration for all computer systems across the district to increase reliability of systems and efficient support by limited numbers of staff.
- Develop processes to include DSP&S review of existing\remodeled\new computer labs to ensure an adequate accessibility standard using common universal design principles.
- Explore a plan for efficient refurbishing and recycling of technology.
- Freeze purchases for systems that create an increase in total quantities for cost control.

Maintenance, Repairs, and Total Cost of Ownership

PC and printer repair is done in-house by the college's technicians as much as possible, unless covered under warranty. Minimal Mac repairs are also performed in-house depending on the needed service. The determination as to whether to fix or replace hardware is based on need, cost, etc. The IIT Division keeps a small number of "loaner" and attrition replacement PCs and Macs on hand to be able to respond to equipment failures.

The IIT Division has a small number of Network Support Specialists in relation to the number of systems supported and this has created long delays in work orders being completed. The average time it takes the NSSs to close a work order is 18.60 working days (January 1, 2013 to December 31, 2013 reporting period). The average time for the Technical Support Specialists to close a work order during the same reporting period is 5.59 working days and for Technical Support Services as a whole for the same reporting period is 17.91 working days. Currently, more work orders are being opened than closed per month on average.   The open work order backlog as of January 1, 2014 was ~925 work orders.

IIT Work Orders

- Work Orders Opened per Month
- Work Orders Completed per Month
- Open Work Orders - Beginning of Month (Backlog)

Peripheral equipment growth has also been dramatic and strained our resources to support these technologies. This is especially true of printers in the district.

Maintenance expectations continue to be a concern as computer system numbers continue to see sustained growth in the district. This also places increasing demand for daily and after hours support creating strain on budgets and delays in support

One of the primary concerns is many systems are purchased without regard to total cost of ownership. This places an immense burden on the college's budget and IIT Division manpower.

Occasionally IIT staff are asked to support privately owned computers, smart phones, etc. This is not authorized for a variety of reasons to include limited resources, liability, etc.

While the IIT Division has a small repair budget, in most cases, a replacement would be charged to the appropriate department/division based on their decision to fix versus replace with a new purchase. The standard practice is if the repair cost exceeds 50% of the replacement value it is recommended that new equipment be purchased. Long term warranties will help defray this cost.

A formal testing lab needs to be implemented in the IIT Division to properly test prior to release of software\hardware into the production environment. This process will help ensure that new hardware, software, updates, patches, security configurations, etc. work prior to release. This will help minimize changes that can adversely affect our employees and students educational and technology experience.

There is continued progress on providing an integrated PC/Mac centralized network managed tools that provide automatic real-time asset management. There are tools for integrated solutions for management of client devices; including desktops, notebooks, and handheld computers, throughout their lifecycle. This is from initial configuration and deployment through software packaging, delivery, patch management, and backup and recovery; increases protection from human, network, and system-level threats and vulnerabilities.

The IIT Division's goal is for no user to be without a computer for more than a day.

- Require that a three-year warranty be purchased with every new computer.
- Implement test labs for formal testing and implementation of new hardware and software.
- Ensure total cost of ownership is addressed for new technology <u>prior</u> to purchase.
- Technology purchases must include funding for total cost of ownership for the life of the system.
- Increase the IIT Division repair budget with on-going funding.
- Increase the IIT Division training budget with on-going funding.
- Adequate staffing to decrease response times for maintenance.
- Support only district owned systems.
- Continue the use of incorporating new technology for automated desktop support.
- Evaluate leasing options for computer systems.
- Evaluate Virtual Desktop technology

Standardization of Hardware and Software

The district currently uses various hardware, operating system, and application software versions throughout the District. This includes smart classrooms and computer labs that have a direct impact on students. This is also true of Smart Classroom technology where at least five different generations of design and multiple hardware and software configurations exist.

The result of this is increased costs in supporting and training that decrease productivity and affect the District's budget. From the perspective of the student this can be a very confusing issue when they need to learn about a course in addition to learning different software when they change classes or computer labs. From the user perspective moving between systems or offices can require orientation and training time as well. This is especially true of faculty as they move from class to class.

From the support perspective this also increases training time as technicians need to learn the differences of several different configurations and software. Training costs are also increased by having to learn these different systems so they can be supported. We also have to maintain several different hardware platforms and don't get the largest possible volume discounts when we buy for different models and versions.

Desktop standardization is taking place in the with regard to staff and faculty computers through the development and use of a Windows 7 Enterprise 64-bit "office systems" deployment image. Student use/lab computers software loads are built based on "lab owner" input as submitted to Technical Support Services through the use of "Lab Software Control Sheets" prior to the beginning of each semester. Smart classroom systems have also been largely standardized in terms of installed software with additional software installed as per instructional requirements.

Currently Sierra College does not have a centralized system for tracking software licenses. This can result in potential licensing violations and possible fines. A lack of centralized management may result in multiple divisions duplicating purchases and missing out on volume discounts.

Server standardization is taking place through leveraging virtual server technology. By standardizing on virtual technology the District extends the longer life cycles for hardware refresh needs, lowering costs for purchasing server hardware and disk storage. It also provides much needed operational efficiencies and reduction of downtime for system maintenance.

The advantages to a standardized environment are increased stability, reliability, and supportability of systems as well as minimizing training issues for students and employees. This would also include significant cost savings from purchasing discounts if bulk purchases were the norm. IIT's perspective is standardization reduces maintenance time, training, and trouble calls.

Recommendation

- Standardize on a baseline configuration for all computer systems for hardware and software.
- Standardize on virtual technology for servers.
- Build a test\training computer network to be used in part for testing prior to release in production environment.
- Purchase at predetermined times to optimize volume discounts.
- Require deviations in configurations or systems to go through a formal discussion process to address impact to all parties involved prior to purchase\configuration.
- Require new software\hardware to go through an evaluation process prior to purchase to determine impact to costs, support, training, compatibility, duplications, etc.
- Assess and review our current license tracking process and establish standardized licensing procedures with centralized management.

Cloud Computing\Consortium Options

Technology changes at a very fast pace and as new technology options become available evaluations need to occur to determine efficiencies and cost savings opportunities. We currently have our LMS Canvas hosted by the vendor and other systems need to be reviewed for this same solution such as email.

Consortium options are being explored for technology much like other business processes. A current evaluation is being explored for our Banner system. This is being initially discussed with eight other districts in the system lead by Sierra College. There are significant challenges to this however the benefits in efficiencies and long term cost savings are an important consideration.

Recommendations

- Continue to support a hosted LMS environment which is currently Canvas
- Explore email as an optional cloud solution – initially focusing on student email
- Continue to explore the 4CIS ERP consortium with other districts
- Explore hosting options at Sierra College

Software upgrades: Operating Systems, Office Suite, etc.

Change in technology is an on-going occurrence and one that we must plan for on a consistent basis. There are currently several pending upgrades that will affect most of our District's systems. We are currently in the process of upgrading Windows XP systems to Windows 7 Enterprise SP1 even though Windows 8.1 has been released.   At this time, other than as a result of instructional necessity, we do not plan on upgrading systems from Windows 7 to Windows 8.1. Apple continues to release new versions of its OSX operating system on an roughly yearly basis, discontinuing support for older hardware with each new version, effectively limiting which systems can be upgraded. We must also plan to upgrade to the latest version of Microsoft Office although this is typical across the district for many of our software applications. Note that as a general rule, newer versions of software have increased hardware requirements and not all District systems will be able to be upgraded.

We will need to continue to plan for this software upgrades as at some point in the future the current versions will no longer be supported by the vendor. A case in point for this is Microsoft Office 2003 going end-of-support in April 2014. This also represents an issue with instruction not having the current software used in the market place and preparing our students with proper training.

To achieve optimal results and contain support and training costs all users should be migrated to commons version of software. This will allow for effective cross training, volume discounts, and efficient use of support personnel.

A key challenge is training our staff on the new versions as they are quite different than what is used currently. The district has no training program for new district wide software and is a key concern is moving to the next version that must be addressed.

Recommendation

- Build a test\training lab to be used for testing and training.
- Continue to upgrade software as new versions are released based on analysis and impact to IIT and the district

Staff Technology Training for Future Needs

An ongoing Training program is needed within the Information & Instructional Technology Division to ensure that staff members stay abreast of current technological trends, new hardware and software developments, and issues pertinent to their job responsibilities.

There are approximately 32 technical support staff within IIT who are responsible for supporting and maintaining numerous aspects of district technology at various levels of expertise. They, therefore, require different kinds and levels of on-going training. While it will be ideal for all staff to be able to obtain annual professional training for the systems supported, due to financial limitations it is not believed this is feasible. An implementation plan should address training for various staff members per year on a priority needs schedule. IIT staff will remain current in critical areas of their job responsibilities, and provide a better service to the campus community.

Training of this nature serves to increase staff morale and provide for a more productive workforce. The staff will then utilize train-the-trainer formats, OJT, etc. to share knowledge and experiences.

Further, this budget would provide other professional growth opportunities in such areas as customer relations, written and verbal communications, and software analysis. IIT staff will also take advantage of no or low-cost vendor workshops in the area as well as attend appropriate courses.

Essential benefits are improved response and support to faculty, staff, and student demands, integration with future technologies, and teaching requirements met in preparation for new technologies and strategies.

Recommendation

- Develop a plan to increase the training opportunities for IIT staff by using various training techniques to support the main campus, NCC, RG, and Truckee.
- Build a test\training lab to be used in part for training.
- Provide cross training opportunities for technical staff; train the trainer, etc.
- Allocate funding to be used for technical professional development.
- Utilize courses at Sierra College to enhance skills that meet demands of this division.

Video Teleconference (VTC)

Video conferencing uses telecommunications of audio and video to bring people at different sites together for a meeting. This can be as simple as a conversation between two people in private

offices (point-to-point). Besides the audio and visual transmission of people, video conferencing can be used to share documents, computer-displayed information, and whiteboards.

Sierra College currently has five VTC units with three located on the Rocklin campus, one located at NCC, and one located in Truckee. This connection has provided many benefits to the college by saving time and travel costs by allowing the people working at NCC to communicate real time with the main campus.

Many additional benefits could be gained by having this same capability expanded to include additional units at various locations throughout the main campus and at NCC. Other remote centers could benefit from this technology, especially the Truckee campus which is located 79 miles from Rocklin. This would allow for expanded distance educational opportunities.

There is a need for one-on-one or one-to-many communications using VTC. Other colleges are using it for faculty communications to students and even teaching to students in other countries. This could also be used for counseling sessions, orientation meetings, training, etc. This could be easily adapted using a program being sponsored by the Chancellors office called CCC Confer. This is currently our call conferencing program as well. The advantage is it is available at no cost to the district.

<u>Current Locations</u>

- Rocklin Campus L-193, LRC-313 and U-11
- NCC Admin Conference Room
- Truckee

<u>Recommendations</u>

- Increase the number of VTC capable rooms on the main campus and at NCC.
- Use CCC Confer to enhance student communications for learning and services.

Assistive Technology

<u>Summary</u>

The ADA requires that access to communications for individuals with disabilities be as effective as that for their non-disabled peers.

Section 508 of the 1973 Rehabilitation Act requires that electronic and print media be made accessible to people with disabilities in all entities receiving federal funding. This was codified in Section 11135 of California's Education Code to make this requirement explicit.

A task force should be created to review existing plans for providing this level of access. Specifically, the task force should be charged with addressing student access in computer labs, establishing assistive software and hardware standards, and recommendations for future direction.

The result of this task force's work is a goal to encompass all Assistive Computer Technology (ACT) initiatives for Sierra College District. This initiative contains the recommendations for on-going Educational Technology committee support for providing ACT-based accommodations to students with disabilities, hardware and software standards for Assistive Computer Technologies, computer-to- student ratios, and installation, maintenance, and improvement issues.

Recommendations

- Develop process to include ACT/LR Division in a review of existing computer labs, and when remodeling or constructing new labs, to ensure an appropriate accessibility standard using commonly employed principles.
- Implement a separate, stable budget line for maintaining and improving ACT and accessibility.
- Ensure upgrades for hardware and software are coordinated and accomplished at the same time to eliminate compatibility and training issues.
- Implement a process to provide a timely solution to assistive technology requests.
- Implement a process to ensure that online courses are ADA compliant and Section 508 conformant.

IIT Division Staffing

By any measure, Sierra's IIT Division is understaffed to meet the needs of the district. The lack of appropriate staffing levels has resulted in long delays in implementing and updating hardware and software systems that could directly and immediately improve a student's experience while here at the college. This issue also directly effects faculty and staff rendering them less productive due to delays in implementations and updates of these systems. Opportunities for implementing new features, etc. are greatly reduced by extreme delays.

Understaffing has reduced the timeliness and quantity of technical support that the IIT Division staff are able to provide to the user community. For the existing IIT staff, the lack of appropriate staffing levels has resulted in increased stress levels, the accumulation of employee comp time and overtime, and has fostered a sense of being overwhelmed.

While the successes speak to the creativity, innovation, and motivation of Sierra's IIT Division staff to fashion workable solutions to existing problems, a limited number of employee resources will present critical challenges. This will be exacerbated as demand for technology solutions continues to grow.

The ability to address changing technology and growth in the district will limit what can be done to support the need to address ever increasing technology requests. As solutions to district staffing and resource shortages continue to be delayed changing instructional and business requirements will suffer.

Sierra has never stood for mediocrity. If Sierra simply aspires to address most of our current critical requirements we would need to employ additional staff in the IIT Division. This is simply to address the growth in equipment that has occurred throughout the district.

In addition to staffing levels, salary compensation for IIT division personnel needs to be addressed as it has been very difficult to attract, hire and retain qualified IT personnel. This has been the situation for quite some time. A salary compensation survey and classification study is needed on a regular basis. The personnel in IIT support all mission critical systems for the Sierra College district often being required to work weekends and off hours.

Instructional Technology Considerations

Student Printing

Student pay-to-print was implemented in 2012/2013. Pay-to-print was proposed with a limited number of staffed print release stations. This plan was not followed during implementation as a result of feedback from the instructional Deans resulting in student-use printers remaining deployed in labs and classrooms.

Distance Education and Web Enhanced Instruction

Distance learning is defined as instruction that is delivered to students who are not physically in the classroom but are connected to it through a form of technology. Sierra offers distance learning courses in the online, hybrid, and live television modalities. All three modalities offer students the ability to access their courses from anyplace at any time. An active Distance Learning and Instructional Technology (DLIT) Committee has worked closely with the Distance Learning department to ensure that a successful program is in place to serve our distant students effectively.

The online program currently serves more than eleven percent of District students. As evidenced by how quickly they fill once registration begins, the demand for DL classes is growing. In addition to the online offerings, there has been an increase in the popularity of live TV courses. This can be attributed to the adjustments made to the delivery of the TV courses in an effort to make them more accessible to our students. In addition to viewing the live courses synchronously through cable television or by video streaming through EduStream, students can now access them asynchronously through iTunes U.

In December 2012 our license with Blackboard was due to expire and the DLIT Committee determined that it would be worthwhile to explore other course management systems. After many months of vendor presentations and evaluations, Canvas emerged as the clear choice to replace Blackboard. A five year contract without annual price increases took effect with Canvas in January 2013. There were several reasons for the selection of Canvas: the use of cloud-based technology, minimal downtime, ease of use, intuitiveness of the system, audio and video capabilities, the ability to use the speedgrader and other tools to enhance the online classroom, and the opportunity to bring instructor presence into the classroom.

In addition to fully online courses, Sierra also offers courses that are a blend of the on ground and online classroom, referred to as "hybrid." Recent enrollment trends demonstrate that students are gravitating towards this type of learning environment in ever increasing numbers. In addition to having required course material accessible online, the student in a hybrid class has the opportunity to meet in person with their instructor throughout the semester, typically one day a week.

Canvas is also widely used by faculty to "web-enhance" on ground classes. When an instructor web-enhances their classroom, students are able to access course material online regardless of whether or not they are in the online classroom. In addition to course content, faculty have the opportunity to post grades, assessments, discussion prompts, audio and video segments and feedback, and to give all students access to the technology tools used. One of the greatest benefits of web-enhancing a course is that it gives an instructor the ability to "flip the classroom". By flipping the classroom, the instructor is able to provide all of the required weekly course material for the students to review prior to the scheduled live class time. On the day of the on ground class the students come ready to actively participate in an engaged conversation centered on the course material.

Workshops on Canvas are offered to faculty on a regular basis, and are always well received. At Sierra College, the initial training for Canvas took place over four months as the Blackboard contract was ending. Hundreds of faculty took advantage of the many sessions of Canvas training that were offered to prepare them for the transition between platforms. Most left after a two hour session and were able to navigate and build their courses in Canvas in a short amount of time. For those instructors interested in teaching an online or hybrid course, a five-week Online Training session is also required. This training prepares the instructor to be successful as they begin to develop their online course. In addition to these workshops, the DLIT Committee developed the Sierra Online Summit, an intense four-day training available once a year. Faculty are given the opportunity to use some of the emerging technologies available to them in both the online and on ground classroom. Recently, new workshops have been developed on training

faculty how to make their online courses accessible to all students. The DLIT Committee and the Distance Learning department have made a concerted effort to ensure that all online and hybrid courses are ADA compliant by June 30, 2014.

In recent years the Distance Learning and Instructional Technology Committee (DLIT) made it a priority to increase the success and retention rates in both the online and TV courses. The efforts made by the committee have resulted in an eleven percent increase in success rates over the past ten years in the online courses and fourteen percent over the same time period for the TV courses. Retention rates for online for the same time period increased sixteen percent for online and nineteen percent for TV. It's interesting to note that the retention rate for on ground classes is now only two percent higher than that for TV.

Multiple factors contributed to the substantial success and retention rate increases: acquiring Canvas as the college's course management system; the Online Course Review Process that all new online courses must go through before being offered; revised SCFA Contract language requiring the evaluation of courses taught in each modality (online, hybrid, TV and on ground); updated Online Faculty Training; establishing Best Practices for online instruction; the integration of audio and video into the online classroom; the incorporation of Online Student Services including an online Tutoring and Writing Center; the preparation of our students who complete a course on How to be a Successful Online Student; and an increased usage of iTunes U and Edustream to deliver TV courses to students not living locally.

The Distance Learning and Instructional Technology Committee reports to the Academic Senate and is comprised primarily of faculty representing a broad range of academic disciplines as well as classified and management staff. The committee meets twice a month to discuss issues surrounding distance learning, implement policy and procedures, and provide overall guidance and direction for the program.

Recommendations

- Support the Distance Learning and Instructional Technology Committee as it continues to guide the direction of the distance learning program over the next three to five years.
- Provide the infrastructure necessary to accommodate the growth in distance education.
- Determine the number of active faculty users on the Canvas LMS.
- Ensure that Canvas is regularly maintained.

Facilities

This issue warrants discussion due to several concerns that have been discussed about the physical location of IIT on campus and the work environment itself. IIT like many other divisions is in need of updated and modernized facilities as well as a proper location for the entire division within the campus. While it is recognized that the "A" building is not an appropriate location for IIT it is absolutely critical that IIT staff are located in the same building work spaces.

The adjacencies are essential in our intergraded systems environment and separating departments would have a detrimental impact to operations and systems support. We have already experienced some of these issues with our AV department in a remote location.

The physical security of IIT needs to be improved to comply with industry best practices. This process will be completed after a review by the district security director and include his recommendations for this area based on discussions with the IIT division staff.

<u>**Recommendations**</u>

- Maintain the current priority for IIT staff to be co-located.
- Provide updated physical security in the IIT spaces
- Incorporate in the facilities master plan a design that will provide adequate work spaces for the entire IIT division, including a data center, conference room space, workbench, storage, etc.
- Prepare for Bond submission in conjunction with facilities.

<u>Hardware & Software Life Cycle</u>

Smart Classroom Detail

Smart Classrooms allow instructors to take full advantage of new technologies to enhance instructional delivery in the classroom. A Smart Classroom is generally defined as a classroom with the capacity to accommodate the use of numerous current and possible future forms of audio-visual and computer equipment in an integrated manner.

The college also uses a wide variety of non-computer technology, including overhead projectors, DVD players, VCRs, TVs, and even some slide projectors. Support of all of the non-computer A/V systems is provided by the same 2 Technical Support Specialist positions that install and support the Smart Classrooms. NCC has a position that has some capability for these requirements. This level of support is completely inadequate district wide to meet instructional needs.

<u>Smart Classrooms Categories</u>

A Smart Classroom display should be large enough and bright enough for everyone in the room to see. There should be sufficient inputs to that display to "hook up" all present and, as much as possible, future devices. Examples of current equipment would be DVDs, VHSs, computers, IPods, etc.

At Sierra College there are 6 distinct generations of Smart Classrooms. This needs to be a standardized environment throughout the district to provide cost savings and ease of use by faculty.

At Sierra, 1st generation Smart Classrooms were defined as classrooms with a computer, data projector, and screen. All the 1st generation smart classrooms have been upgraded.

2nd generation Smart Classrooms are defined as classrooms with a computer, data projector, screen, and small speakers. The technology employed in 2nd generation Smart Classrooms is not integrated, meaning the instructors have to physically switch between technology input sources.

3rd generation Smart Classrooms are defined as classrooms with a computer, data projector, screen, and possibly a VCR audio/video through the computer speakers. The technology employed in 3rd generation Smart Classrooms is not integrated, meaning the instructors have to physically switch between technology input sources.

4th generation Smart Classrooms are defined as classrooms with a computer, data projector, screen, and a VCR/DVD unit. The technology employed in 4th generation Smart Classrooms is not integrated, meaning the instructors have to physically switch between technology input sources.

5th generation Smart Classrooms are defined as classrooms with a computer, data projector, screen, and DVD/VCR unit that are integrated utilizing an analog switcher and controlled by a centralized control panel. The maximum resolution for these smart classrooms is limited by the switcher at 1024x768.

6th generation Smart Classrooms are defined as classrooms with a computer, data projector, screen, and DVD/VCR unit that are integrated utilizing a hybrid analog/digital switcher and controlled by a centralized control panel.   This generation of smart classroom utilizes a projector with a hybrid LED/laser light source in place of a traditional high-pressure lamp.   The hybrid analog/digital switcher allows for higher resolutions than 5th generation smart classrooms as well as digital (HDMI/DVI) and analog (VGA) inputs. 5th and 6th generation smart classrooms share a common control panel.

District-wide 166 out of 217 classrooms are Smart Classrooms. 5% (9) of these Smart Classrooms are up to date (6th generation). 140 (~84%) are 5th generation. Roughly 6% (11) are 4th generation, ~1 % (1) are 3rd generation and 2% (4) of the District's Smart Classrooms are 2nd generation, . Many of the 5th generation Smart Classrooms were purchased as part of the V-building, Tahoe/Truckee and NCC construction projects and the oldest of the current generation smart Classrooms are over 6.5 years old. The District does not have a comprehensive technology refresh plan for Smart Classrooms.

While the decision as to whether or not a classroom should be a Smart Classroom should be made on a case-by-case basis, in general, it is anticipated that the use of technology in the classroom will continue to increase, both in terms of its reach into additional academic disciplines, and the depth of its use in a particular discipline. .

The decision as to whether or not every classroom should have a computer in it would vary division to division; therefore an equitable funding for computers across the board may not be sensible. That being said, all departments would probably benefit in some way from increasing the number of and use of computers and other technology systems. This is especially true as new and younger faculty members are hired, as they have used technology all of their lives and may use technology more in the classrooms than existing faculty. Individual departmental program plans should be used to determine the need for technology.

Instructional departments should continue to consult with the IIT Division regarding computer purchases and standards. The smart classroom standard is reviewed regularly by the Educational Technology Council.

Standardization of data projectors and other peripheral technology devices across campus would allow for better and quicker service and support, as well as allow the college to leverage purchases. Standardization is an excellent way to increase the quality of technical support, decrease downtime, and minimize the learning curve needed for users if the technology present in a classroom varied room by room. It should be noted that projector model lifespans are short (~ one year), posing challenges to long-term standardization .

The differing equipment levels that are now used throughout the district have created issues for students and instructors as they move from room to room. These varying levels of technology complicate the instructional process as quality and usage are not the same from room to room. This also dramatically increases support costs in terms of the various types of equipment that users and technicians mush work with and repair. The cost of replacement parts, etc. is also higher and volume discounts and parts availability vary dramatically from platform to platform.

Recommendations

- All Smart Classroom projectors\displays should be large\bright enough for everyone in the room to see.
- Standardize on necessary interfaces allowing instructors to connect needed digital devices.
- Implement a Smart Classrooms five year refresh cycle.
- Base instructional technology purchases on standardized needs and plans as coordinated through the Educational Technology Council.
- Standardize the types and brands of data projectors, projects, and other peripheral technology devices used across campus to increase the quality of technical support, decrease downtime, and minimize the technology learning curve.

Implications:
- Smart classroom technology has a ~5 year lifespan.
- 139 5th generation smart classrooms have been installed since mid-2007.
- The first 8 6th generation smart classrooms were installed in mid-late 2013.

Smart Classroom Options

Sierra began the effort to modernize the technology present in its classrooms by turning them into "Smart Classrooms", or classrooms that provided state-of-the-art presentation equipment and computers that were fully integrated into one switcher and control panel that an instructor could use to present digital media to students. This process has continued as time and resources had allowed. At this point there are several generations of Smart Classrooms and a growing demand for additional and upgraded rooms continues. This presents significant support challenges.

The cost to continue this process is noted below:

Budget: Annually 5 year cycle (33 annually)
Cost: $330,000

It should be noted that implementing a smart classroom refresh plan would have a significant workload impact on the District's technology staff that support these requirements. It should also be noted that refreshing 33 smart classrooms per year would be problematic in terms of classroom scheduling and staff workload.

Replacement projector Bulbs are an expensive maintenance requirement. A single replacement bulb costs approximately $500 per projector and lasts roughly one to two years of normal use.

Advantages (all Service Levels): As discussed in this plan, the integration of modern technology and modern presentation systems into a classroom setting greatly enhances an instructor's ability to use digital media in instructional delivery. Students in current and future generations expect to have classrooms that utilize modern technology, and instructors increasingly use technology in their instructional delivery.

Disadvantages (all Service Levels): To the extent that the college employs older technology, or has classrooms with no technology in them, it will become increasingly difficult to compete for students who have the expectation that the college will have modern technology available to them.

Detailed information about this budget item may be found in Appendix D.

Servers and Storage Area Networks

<u>Servers</u>

We currently have over 120 servers supporting district operations. This includes the new ERP system (Banner). Over the past 3 years more than 80% of these servers have been virtualized and this approach is now an adopted standard.

Typically, server refresh cycles average 4-5 years as an industry average and IIT targets server refresh cycles every four years. Server replacement cycles are essential to providing a platform that can handle the newest software, especially as software is updated through routine maintenance and application updates require it. By standardizing on virtual server technology the refresh cycles are extended and many physical servers that have reached their useful life can be provisioned in the virtual server environment at a much lower cost. Currently the production virtual server infrastructure provides 10 physical blade server hosts with combined processing power of 640 CPU's and 1.2 terabytes of memory. This configuration more than supports the workloads that were provided in the past by 100 physical servers with 1600 under-utilized CPU's and approximately 800 GB RAM, allowing us to better leverage the investment made in server processing power.

In terms of network operating systems, the majority of servers run Windows Server 2008 Release 2. Several of servers run Redhat Linux AS4, AS5, and most recently AS6.. We plan to migrate Windows OS servers to a Windows 2012 server standard environment over the next 3-year plan cycle in the virtual server (VM) environment..

<u>Storage Area Network (SAN)</u>

The current server storage requirements are best addressed by the use of a SAN solution to support the growing needs of the district. A recent consultant performed an assessment of the current SAN and determined we have 81 terabytes (TB) of required capacity. Based on usage trends this number is growing at about 40% annually. To cost-effectively manage data growth and backup capabilities a SAN solution can provide a shared disk resource for multiple servers, consolidating the management of disk capacity and backup services. Advanced technologies such as SAN replication and snapshots can be used to reduce the labor hours associated with system backup and restoral services.

NCC has a SAN installed to help offset traffic between the main campus data center and the NCC campus.

It should be noted that this option is a key component of our disaster recovery and business continuity plan and virtualization solution, but can also be leveraged by other systems.

Recommendations

- Expand the use of the SAN for Banner ERP, DegreeWorks, new Document Imaging needs, and other services
- Increase the budget to support a server refresh and capacity expansion plan to ensure servers are able to address requirements.

Computer Labs

Computer labs are an important component of instruction at Sierra College. With this in mind the stability and reliability are essential to student success. All computer labs should be configured to a baseline standard configuration to ensure reliability, supportability, and security of these systems for student use. This will allow for shared use by various disciplines across the district and share out limited resources providing flexibility to instructional needs.

A centralized approach to upgrades and replacements can then be developed and implemented that will best meet the needs of the district and our students. The need to keep these systems current should be one of our highest priorities due to student usage of these systems for a positive educational experience.

Due to the need to ensure that computer systems are of high quality the computer refresh cycle should be set at no more than five years. Once these systems are removed we can determine if these systems can be refurbished and still deliver an acceptable level of performance and move then to other areas.

Instructional departments should continue to consult with the IIT Division regarding computer configuration, purchases, and standards. These requests for summer and winter break work and requested configurations should be submitted two months prior to the beginning of the semester due to workload and staffing levels. This would allow IIT to ensure the configuration meets instructional needs including user testing of new configurations.

Sierra College should establish a PC/Mac replacement cycle to ensure that students are using the latest technology possible and will enhance the student's learning experience.

Standardization of computers and other peripheral technology devices across campus would allow for better and quicker service and support, as well as allow the college to leverage purchases. Standardization is an excellent way to increase the quality of technical support, decrease downtime, and minimize the learning curve needed since the technology presented in a classroom varies room by room.

Standards for curricular, reference, and productivity software should be established with consultation with the IIT Division and instruction. The coordination of this will ensure that software and hardware are compatible, legal, and supportable by this district.

A centralized systems refresh plan for the district should be implemented to ensure students have the newest equipment. This would also allow for purchasing discounts, support efficiencies, and most importantly a minimal learning curve for students. This process would allow for cost saving by the district as volume discounts could be realized for hardware and software purchases.

Support of computer labs will continue to be a challenge as these continue to grow and resources and man-power have not increased to meet current demand let alone future growth.

Recommendations

- Maintain a common set of standards regarding the look and feel as well as organization of the college's computer labs.
- Explore configuration and submission strategies and potential solutions in great depth to ensure faculty needs are addressed.
- Continue to investigate various imaging and updating technologies as part of the normal upgrade cycle process.
- Adopt the proposed Computer and Network Use revision to address *Accessibility Policy's* to ensure Sierra's computers are in compliance with Section 508 of the Rehabilitation Act, the Americans with Disabilities Act, etc.
- Implement a centralized systems refresh plan to address aging systems in the district.
- Software installed will be done over the summer and with a (two month recommended) notification to submit requests for planning by IIT due to workload and staff size limitations. Plan will need to be implemented.
- Purchase and implement a computer lab scheduling software package district wide to address efficient usage of these specialized rooms.

Computers Refresh Cycle

The District has ~2800 computers deployed in instructional and administrative environments. The average computer age in the District as of October 2013 is 5.2 years. This age is somewhat skewed by the large number of computers purchased as part of the Furniture, Fixtures and Equipment (FF&E) of the V-building (442), Truckee Campus (135) and NCC expansion (159). The deployed systems are up to twelve years old. To the extent that the college employs older technology, it will become increasingly difficult to compete for students who have the expectation that the college will have modern technology available to them.

Currently there is no stable funding for computer or peripheral lifecycle replacement. Instead, any funding for replacements is available only on a year-to-year basis and competes against other district needs. Funding has not occurred in the last 3 years in any substantial way except for some funds for new purchases for the LRC Open Lab, DES lab and Math systems.. This makes it very difficult for staff efficiencies and productivity as well as technical support staff to properly maintain and support aging computers and peripherals.

IIT's current computer "refresh" program includes "trickling down" computers where possible to replace older ones that do not need as much processing power as some of the newer or more technology-oriented labs need. This process is time consuming and in some cases only provides a marginal increase in capability/performance while masking the need for new systems.

Due to how frequently software and hardware changes the current level of performance, reliability, and compatibility is essential to our student's success. This has created instructional and business problems and limitations due to these discrepancies.

Funding from outside sources was used years ago to cover the cost of replacing our computer labs on a 3 year cycle. This funding due to budget cuts has been eliminated over the last few years and there is no return in sight in the foreseeable future.

Providing IIT with a stable and dedicated budget for a computer systems refresh program will address a critical need. A combination of a specific line item budget amount and other annual funding (categorical, grants, technical $$, etc.) should will be identified where possible.

Centralize the process of systems replacement and refresh at the district level. This would include all funding sources so volume discounts and support efficiencies could be attained and resources could be directed where needed most.

With inevitable district growth and an ever increasing demand for new computers, peripherals, and new technology, appropriate funds must be allocated to the IIT systems refresh process. Newer software becomes problematic when loading on an older system creating user frustration and extensive support requirements.

With computers and systems being upgraded on a regular basis newer technology will be able to be integrated into our programs. Faculty will be able to better plan to utilize new instructional technologies in the computer labs and smart classrooms. Support costs will decrease and instructional interruptions will be minimized.

Recommendation

- Annual budget allocation of funds in IIT budget to replace 20% of systems annually.
- Implement a five year PC\MAC replacement cycle and refresh older systems to extend life of system when possible.
- Design and implement a test plan for using virtualization desktop solutions.
- Control growth and implement only with TCO included in purchasing equation.

- Centralize funding and disbursement at the district level in IIT to address the replacement and refresh\refurbish process to the most needed areas.
- Establish the process of replacing oldest systems first regardless of funding source.
- Include a funding source to replace peripherals on a regular basis.
- Explore a leasing option to ensure system refresh does occur at proper intervals.

Computer Desktop Cost Options - PCs/Macs

The college does not have a replacement cycle for its instructional PCs and Macs. The replacement of a Mac platform is significantly higher than the cost of a PC based platform. The cost to implement replacement cycles is noted below:

Budget: Annually 5 year cycle (560 annually)
Cost: $577,630 annually

Advantages A refresh plan will allow the district to reduce support costs and utilize current software to enhance productivity. This would also lead to reduced support costs, especially in terms of man-power needed to support older systems.

Disadvantages: Technology changes so quickly that it may simply be impossible to utilize new software on PCs or Macs that are five years old and older. As noted earlier, to the extent that the college employs older technology, it will become increasingly difficult to compete for students who have the expectation that the college will have modern technology available to them.

Industry recommendations are a three year refresh cycle for computers to allow for reliability, technology changes, and reduced support costs. Realizing that the entire community college system doesn't have these resources the recommendation is a four year replacement cycle.

Detailed information about this budget item may be found in Appendix E.

Budget

Technology resources should be planned for and purchased after a need is established based on our mission. This plan due to scope and the numerous needs identified will have resource needs and will be challenging from that perspective.

Our focus is to design our goals with the best plan in mind for the district to achieve our mission and learning objectives. Please keep in mind that due to resource limitations please ask: "What is the purpose and why do we need it?" so resources can be justified in support of our mission.

This report is divided into sections that address differing aspects of the technology implementation at Sierra College. Capital budget expenditures are reflected in the following sections.

The projected budgets needs for key resources are presented "cafeteria style." Some sections of the plan that have capital budget expenditures and are presented with multiple levels of service and based on quality.

It should be noted that the proposed budget items are a point in time cost analysis and does not mean that it would also have the highest cost, as may be seen in the appendices listed below.

With any technology we also need to account for total cost of ownership and what impact this has to our on-going costs. This includes addressing considerations regarding growth, licensing, and most importantly impact based on staffing levels.

Appendices

Appendix A					
3 Year Primary Capital Budget Expenditures Identified in the 2014-2017 Sierra Technology Master Plan					
Executive Section	**2014-15**	**2015-16**	**2016-17**	**Total Cost**	**On-going costs**
Student Success & Support Program	$75,000	$45,000	$45,000	$165,000	
Diaster Recovery\Business Continuity	$120,000	$25,000	$25,000	$170,000	Yes
Security Program	$139,162	$25,000	$25,000	$189,162	Yes
Network Infrastructure upgrade	$176,364	$176,364	$176,364	$529,092	Yes
Document Imaging Solution	$400,000	$50,000	$50,000	$500,000	
Desktop Replacements -VDI\VM review	$577,630	$577,630	$577,630	$1,732,890	Yes
Smart Classrooms	$340,000	$340,000	$340,000	$1,020,000	Yes
Wireless network upgrade - expansion	$167,245	$25,000	$25,000	$217,245	
Banner\System Hardware and upgrades	$50,000	$50,000	$50,000	$150,000	Yes
Luminis-Student email planning	$130,000	$22,000	$22,000	$174,000	
District Cabeling upgrade			$2,900,000	$2,900,000	
IIT Training requirements	$105,000	$105,000	$105,000	$315,000	Yes
Overview section - key projects					
Conduct a security audit of the college's network	$25,000.00	$25,000.00	$25,000.00	$75,000.00	Yes
Identity and Access Management Security	$50,000.00	$50,000.00	$15,000.00	$115,000.00	
UPS Replacement	$10,000.00	$10,000.00	$10,000.00	$30,000.00	Yes
Totals	**$2,365,401**	**$1,525,994**	**$4,390,994**	**$8,282,389**	

Appendix B
Sierra District Cabling Infrastructure Options (3 year plan)

	Annual	One-time
Low Voltage Upgrade	$230,000	
Core Fiber upgrades	$239,000	
Purchase Switches modules	$50,000	
Purchase IDF UPS's	$30,000	
IDF HVAC Upgrades (62 * $4000)		$248,000
Purchase IDF UPS's		$100,000
Document - Label Network		$100,000
Rewire wiring closets (IDF) to bring them to standard	$250,000	
WAN Links for remote sites	$20,000	
Total Annual (phased)	$819,000	
Total 3 year	$2,457,000	$448,000
Total:	$2,905,000	

Appendix C
Sierra Technology Infrastructure — 3-Year Refresh Plan

Description	Past Due	2014	2015	2016	Total
Network - Telecomm	$ 4,472.36	$ 5,450.00	$ 409,830.00	$ 38,150.00	$ 457,902.36
	$ 51,000.00	$ 6,000.00	$ 12,600.00	$ 2,400.00	$ 72,000.00
					$ 529,902.36
Server and Storage only (estimate)					
Asset Count (servers/SAN core) to Refresh	21	6	17	10	54
Refresh Funds Needed	$ 123,463.00	$ 42,000.00	$ 179,229.00	$ 57,960.00	$ 402,652
	$ 134,217	Annual avg - 7 year life cycle			

Appendix D
Sierra Smart Classroom Options (5 year Cycle)

Background information:

Number of instructional spaces on the campus:					217
Number of instructional smart classrooms in the District:					167
Number of new instructional spaces coming online:					

	Main	NCC	RG	TT	Smart
Version 6	9	0	0	0	9
Version 5	97	28	4	13	142
Versions 1-4	15	0	1	0	16
				Total	167

Average cost to install a Smart Classroom with current design	$13,000	(new install)
Replacement Bulb annual costs (per projector)	$350	
Total Annual Replacement Bulb costs	$55,300	

33 smart classrooms per year	$334,000

Appendix E
Sierra PC\Mac Replacement Options (5 year cycle)

Background information:

	Qty Main	Qty NCC	Qty RG	Qty TT	Total	Cost Per Unit	Total
Number of PC in Labs	1021	200	138	76	1435	$933	$1,338,568
PC Workstations	754	149	48	30	981	$933	$915,077
Number of Mac in Labs	195	60	0	27	282	$1,627	$458,794
Mac Workstations	89	15	4	0	108	$1,627	$175,708
Replacement Total					2806		$2,888,148

Service Level 2

Replace 20% of PCs\Mac's every year				
(represents refreshing technology every 5 years)		PC	Mac	
Total number of units		2,416	390	
20% of these:		483	78	
PC Cost per unit:		$933		
Mac Cost per Unit			$1,627	
Total:		$450,729	$126,901	$577,630

Appendix F
Sierra Printing Support Options (7 year cycle)

Student lab printers by location

	Qty Main	Qty NCC	Qty RG	Qty TT	Total	Cost Per Unit	Total
Number of Printers by Location	42	17	6	4	69	$1,750	$120,750

Replace 14.2% of Student-use printers per year (7-year cycle)

Total number of units	69	
14.2% of these:	10	
Approx. printer cost per unit:	$1,750	
Annual Total:	$17,147	

Staff/Faculty use printers by location

	Qty Main	Qty NCC	Qty RG	Qty TT	Total	Cost Per Unit	Total
Number of Printers by Location	140	28	14	7	189	$1,750	$330,750

Replace 14.2% of District printers per year (7-year cycle)

Total number of units	189	
14.2% of these:	27	
Approx. printer cost per unit:	$1,750	
Annual Total:	$46,966.50	
Total:	$64,113.00	

Appendix G
Sierra Wireless Network

Below are costs of a refresh of the Wireless Network Infrastructure.

Device	Project	Model	Qty	Year Deployed	Cost
Access Point	Wireless Network Upgrade	Aruba 125	217	2009	$130,200
Access Point	Wireless Network Upgrade	Aruba 124	18	2009	$10,800
Controller	Wireless Network Upgrade	Aruba 3600	2	2009	$15,500
Controller	Wireless Network Upgrade	Aruba 3400 (NCC "40APs")	1	2009	$6,470
Controller	Wireless Network Upgrade	Aruba 800 (Roseville "16APS"	1	2009	$3,150
Controller	Wireless Network Upgrade	Aruba 800 (Truckee "4APS")	1	2009	$1,125
					$167,245

The following improvements are needed to upgrade wireless capacity for supporting BYOD and Guest Access.

Item	One-Time Cost	Annual
Controller and License	$24,328.80	$4,890.00
Clear Pass Guest BYOD Mmngmt	$32,950.00	$6,200.00
Upgrade AP's	$16,800.86	$0.00
Campus network upgrades	$16,000.00	$0.00
	$90,079.66	$11,090.00

Appendix H

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99) is a Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.

FERPA gives parents certain rights with respect to their children's education records. These rights transfer to the student when he or she reaches the age of 18 or attends a school beyond the high school level. Students to whom the rights have transferred are "eligible students."

- Parents or eligible students have the right to inspect and review the student's education records maintained by the school. Schools are not required to provide copies of records unless, for reasons such as great distance, it is impossible for parents or eligible students to review the records. Schools may charge a fee for copies.

- Parents or eligible students have the right to request that a school correct records which they believe to be inaccurate or misleading. If the school decides not to amend the record, the parent or eligible student then has the right to a formal hearing. After the hearing, if the school still decides not to amend the record, the parent or eligible student has the right to place a statement with the record setting forth his or her view about the contested information.

- Generally, schools must have written permission from the parent or eligible student in order to release any information from a student's education record. However, FERPA allows schools to disclose those records, without consent, to the following parties or under the following conditions (34 CFR § 99.31):
    - School officials with legitimate educational interest;
    - Other schools to which a student is transferring;
    - Specified officials for audit or evaluation purposes;
    - Appropriate parties in connection with financial aid to a student;
    - Organizations conducting certain studies for or on behalf of the school;
    - Accrediting organizations;
    - To comply with a judicial order or lawfully issued subpoena;
    - Appropriate officials in cases of health and safety emergencies; and
    - State and local authorities, within a juvenile justice system, pursuant to specific State law.

Schools may disclose, without consent, "directory" information such as a student's name, address, telephone number, date and place of birth, honors and awards, and dates of attendance. However, schools must tell parents and eligible students about directory information and allow parents and eligible students a reasonable amount of time to request that the school not disclose directory information about them. Schools must notify parents and eligible students annually of their rights under FERPA. The actual means of notification (special letter, inclusion in a PTA bulletin, student handbook, or newspaper article) is left to the discretion of each school.

Protecting the Privacy of Student Education Records at Sierra College

The Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99) is a Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.

FERPA gives colleges the right to disclose information from a student's education record to school officials with legitimate educational interest.

- Members of the teaching faculty of Sierra College are school officials with legitimate educational interest in portions of the education records of students enrolled in their classes.

- Counselors and/or academic advisors at Sierra College are school officials with legitimate educational interest in the education records of students whom they counsel and advise.

- Academic administrators and support staff at Sierra College are school officials who may have legitimate educational interest in portions of the education records of students depending on their scope of responsibilities and work assignments.

- It is the responsibility of every school official at Sierra College with access to student records to carefully protect the privacy of those records. In particular, they may not share information from student records with third parties who are not themselves school officials with legitimate education interest in those records.

- Sierra College and its school officials must take every precaution to safeguard student records from theft, loss, or unauthorized access or dissemination by any means, including electronic media.

- Sierra College has the obligation to ensure that all of its school officials with access to the education records of students are made aware of their obligations to protect the privacy of these records.

Appendix I Policies\Procedures\Guidelines - Examples

Ref	**Title**
BP 3720	Computer and Network Use
AP 3720	Computer and Network Use
AP 3721	Electronic Information Security and Backup Procedures
AP 3300	Public Records
AP 3310	Records Retention and Destruction
IIT	Server Standards
TBD	Copyrights
TBD	Student Record Documentation
TBD	Unauthorized Use of Commercial and Copyrighted Software
TBD	Use of Laptops, PDAs, and Cellphones
TBD	Assistive Technologies
TBD	Use of Email
TBD	Purchasing Policy
TBD	Standard Software Load for Computers
TBD	Desktop Configuration management
TDB	IT Project Management
TDB	Server Standards
TBD	IIT Security Manual
TBD	IIT Network Security Standards
TBD	IT Project Management