Strategic Technology Plan
2017 – 2020

Updated by TAG March 5th, 2020

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Introduction

With the amount of information technology that is rapidly changing, Rancho Santiago Community College District (RSCCD) recognizes the importance that this technology plays in the success of both students and employees. Information and communications technologies serve as the basis for influencing how people work, learn, communicate and do business, RSCCD is constantly evaluating and strategizing cost-effective ways to meet the technology expectations and demands of the students and workforce while being mindful of the budget.

The purpose of the Strategic Technology Plan (STP) is to serve as a benchmark for information and communication technologies currently being used throughout the district. This benchmark will be used to establish technology guidelines, standards, and policies that will help guide the DOC, SAC, SCC and the college's non-credit educational centers, Centennial Education Center (CEC) and Orange Education Center (OEC), in response to the future technological needs of their students, faculty, and staff. The plan should remain flexible as we attempt to accommodate both rapidly evolving technology and funding issues that we may face.

The STP also includes administrative procedures and recommendations that need to be followed in order for the colleges and district to maintain the student and employee expectations for technology. These procedures and recommendations outline the budgetary requirements necessary to maintain currency in technology and infrastructure. The plan includes future staffing needs that require consideration to support the colleges' growth in technology.

The STP is designed to support the colleges and their educational plans, maintain the accreditation standard III C and other standards, including Technology Resources defined by the Accrediting Commission for Community and Junior Colleges (ACCJC). In summary, the STP demonstrates how technology impacts our students, how technology is used in the classroom, how technology helps students achieve their educational goal, and how technology keeps RSCCD competitive.

Please refer to **appendix A** for a summary of achievements and highlights, which were recently accomplished. **Appendix B** provides a list of our Applications Support Projects, and **appendix C** provides a list of our Network and Communications Roadmap. These are the critical projects that our valuable ITS resources will be focused on over the upcoming years.

Executive Summary

The Rancho Santiago Community College District (RSCCD) Strategic Technology Plan (STP) is a collaboration of the District Operations Center (DOC), Santa Ana College (SAC) and Santiago Canyon College (SCC). The current plan was written by members of the Technology Advisory Group (TAG) and staff within the Information Technology Services (ITS) department through meetings and collaborative research. Various members of both the ITS department and the TAG committee participated in the development of this plan, providing valuable input in their area of expertise and all TAG members were presented with the various iterations of drafts as this document took shape. Also, an effort was made to align the STP with the colleges' educational mission to optimize technology for student learning and promote successful student outcomes. The STP shall remain a "living document" that is reviewed and updated regularly and used as an assessment guide for current and future technology needs at the colleges, centers, and within the district.

Critical Recommendations

There is no funded computer replacement plan. The recommendation to replace standard desktop computers every 5 years has been established; however, there has not been any specific ongoing funding set aside for this purpose. Therefore, it will be the responsibility of the colleges to consider funding the computer replacements. We recommend that SACTAC and SCCTEC prioritize all technology related purchases, and the centers, grants, and off-site locations should be taken into consideration during this process. If there are any opportunities for ITS to fund replacements by utilizing the current ITS budget, then this will be made a priority, since it is our best interest to use our technology support staff members in the most efficient manner possible.

The primary cost of ITS resources is personnel. The annual maintenance agreement renewals are our second largest expense. The cost of our software renewals and maintenance agreements continues to increase over time. The list of our renewals has been shared at TAG beginning in 2015 as an effort to provide transparency. The rough cost of our **annual maintenance renewals is** $2,122,777 for 2016. A 10% ongoing increase to support our annual contracts is requested.

We recommend a goal to establish a best practice **technician staffing ratio that is as close to 200 computers per technician** as possible. And, we understand this might take several years to accomplish. The current technical support staffing levels at both SAC and SCC are low considering the quantity of requests being received. ITS can barely sustain the current levels of technology that the college has already attained. However, there is a continuous request for additional software, hardware, and support. We are attempting to supplement these requests with part-time short term employees, but that is less than ideal. Construction at SAC is widespread as is remodeling at SCC. This causes disruption and the need to relocate technology as departments are required to move.

We also recommend upgrading the current desktop operating systems be **upgraded to Microsoft Windows 10 and the Microsoft Office 2016 Suite** as quickly as feasible if the hardware supports. In the past we have remained on older versions of software beyond their supported lifecycle. Doing this puts us at a competitive disadvantage with other institutions and creates a disservice to our students. Additionally, old software poses additional security risks and demands more technician hours to keep operational.

Security and disaster recovery are two strategic areas that need additional focused ITS time to properly manage. These areas in the past have been put at the bottom of the priority list and have been neglected. This needs to change in 2017; however, other projects will need to be rescheduled accordingly to free up our internal resources. California Attorney General, Kamala Harris, documented the requirement for organizations to establish proper security controls to protect personal identifiable information. The following report is applicable to RSCCD, from the California Data Breach Report issued in February of 2016. Please refer to **appendix D** for a list of the security controls that we will be working to implement.

The TAG committee identified a goal within RSCCD in the unavailability of delivered end-user **technology training and support**. TAG has focused on the two major shortfalls within the district: Academic Training & Support and Operational Training & Support. Microsoft E-Learning and Lynda.com are available to all employees. Training for Learning Management Support (LMS), Colleague, Microsoft, Instructional Design Center, and overall staff support is critical and highly recommended.

The TAG committee also strongly recommends that all student, employee, and publically facing websites and information be accessible to persons with disabilities and therefore meets all relevant **accessibility regulations**.

It is critical for readers of this report to refer to both of the SACTAC Strategic Technology Plan and the SCCTEC Technology Master Plan for details related to college level planning and requests. **This RSCCD Strategic Technology Plan 2017-2020, which was approved at TAG on November 3, 2016, will be updated to align with both the SACTAC Strategic Technology Plan and the SCCTEC Technology Master Plan once those plans are finalized.**

Strategic Planning Elements

A. Technology Advisory Group (TAG)

RSCCD established a district Technology Advisory Group (TAG) in 2007, which meets once a month to discuss ideas, evaluate solutions, and make recommendations related to the information and communication technologies used within the district.

Members of TAG include administrators, faculty and classified staff from both colleges and the district offices who are immersed in the implementation of technology or oversee technology functions as a part of their regular job. TAG recommended to increase its membership by adding one student representative from both SAC and SCC and that recommendation was approved by District Council on August 10, 2015. The current committee members include:

Santa Ana College	Santiago Canyon College	District
George Sweeney, Faculty*	Scott James, Faculty	Lee Krichmar, AVC*
Cherylee Kushida, Faculty	Mike Taylor, Faculty	Alfonso Oropeza
John Steffens, Admin	Sergio Rodriguez, Admin	Archana Bhandari
Tammy Cottrell, Classified	Ancie Dulalas, Classified	Dean Hopkins
Jim Kennedy, CEC	Daniel Oase, OEC	Jesse Gonzalez
SAC, Student Rep.	SCC, Student Rep.	Pat Weekes
Joe Pacino (alternate)	(alternate)	

* Co-Chair (faculty co-chair rotates between SAC and SCC)

B. TAG Committee Responsibilities:

- Develop and evaluate RSCCD and college technology plans
- Assess the effective use of technology resources
- Develop and evaluate hardware and software standards
- Review and evaluate hardware replacement cycle
- Develop recommendations regarding equipment, staffing, and training needs related to the use of technology

TAG Vision

To advance the operational efficiency and optimize student success and learning through technology.

TAG Mission

To support district and college associated committees, groups and departments by coordinating technology requests, supporting the development of technology policies and procedures, and promoting student learning through technology.

TAG Goal

On October 6th, 2016, the TAG committee agreed to set a goal for the ITS department technical support staff of 200 computers to 1 technician. This 200:1 ratio was established to help provide the service level that would best meet the needs of the campuses and centers. Within the Centralized Services section for ITS Budget and Technology Staffing, we discussed the budget and staffing concerns for RSCCD.

C. Information Technology Services (ITS) Structure

RSCCD maintains a centralized and collaborative Information Technology Services (ITS) department led by the Assistant Vice Chancellor of ITS. One of the primary goals of ITS, is to provide students and employees with quality technology services and systems that foster learning, productivity, and collaboration.

The majority of ITS systems and services are centrally run from the DOC, but the department provides technical services and staffing to SAC, SCC and all of the educational centers and most of the training sites within the district. ITS is responsible for operating and maintaining the physical infrastructure that includes computers, servers, and equipment to support the voice and data network. ITS also oversees the core business and communication systems that include email, telephone, student information, financial, and human resources, reporting and related software. Finally, ITS oversees the core functions of our public and private facing websites.

The department is divided into four areas, which include Application Systems, Network Administration and Academic Support departments at SAC and SCC. Below is a list of services and responsibilities provided district-wide by the individual ITS departments:

1. **Academic Support**
    - Develop effective system in deploying, maintaining and monitoring classroom equipment and software
    - Provide site-licensed operating system and business application software
    - Install instructional software and equipment for students and faculty
    - Deploy software and equipment for non-instructional needs to faculty staff, and management
    - Provide technical expertise of hardware/software specifications to colleges that meet district standards and instructional requirements
    - Develop system and maintain instructional inventory of hardware and software
    - Provide technical assistance to faculty, staff, and students on an as-needed basis
    - Procure and maintain college computers and printers
    - Collaborate between colleges to standardize technology support procedures
    - Collaborate with Media Systems department to support classrooms

2. **Application Systems**
    - Provide technical support for network and campus technicians as necessary to resolve problems
    - Monitor the performance of systems, services, and processes to maintain system stability
    - Develop, document, and implement standards and procedures related to application administration
    - Act as technical liaison between campuses and district departments for evaluating technological solutions based on strategic initiatives and needs
    - Provide project implementation and post-implementation support for applications and enhancements to existing systems
    - Manage Enterprise Resource Planning (ERP) System modules, upgrades and requirements
    - Evaluate and integrate third party vendor functionality into ERP
    - Provide State and Federal reporting systems and services
    - Maintain multiple data sources for reporting and analytical needs including the Institutional Research data warehouse

3. **Web Development**
    - Manage and integrate Enterprise Web Content Management System (ECM)
    - Coordinate Web Content Management System upgrades

- Support the needs for web application development on public and employee-only websites
- Coordinate institutional district websites branding and functionality implementation
- Deliver interactive web design prototype services for Intranet and public websites
- Provide ECM support for enterprise wide web solutions
- Conduct Web Content Management System training sessions for web publishers
- Provide web content layout and functionality planning services
- Participate in the drive to make the institutional websites compliant with ADA
- Maintain supporting services for all District Economic Development websites

4. Network Administration

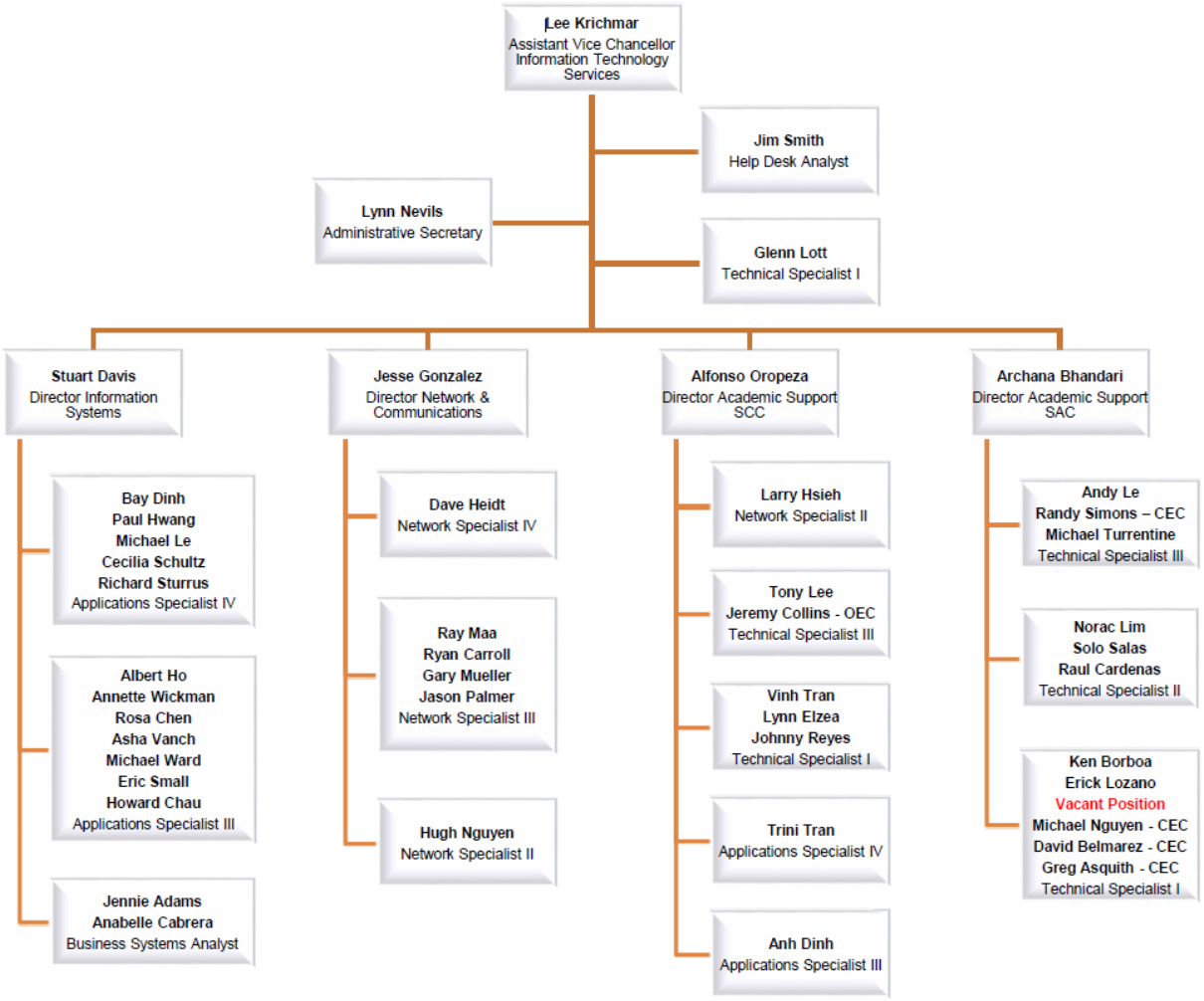
- Host and maintain application servers
- Host and maintain enterprise storage systems
- Design, implement and maintain network and infrastructure equipment
- Develop strategies to manage network growth and internet bandwidth usage
- Develop mechanisms that provide a safe and reliable network (*e.g.* firewalls, antivirus, intrusion systems)
- Perform backups of enterprise data
- Maintain telecommunication system
- Maintain physical cable plant
- Support video surveillance
- Maintain wireless network

The ITS department is led by the Assistant Vice Chancellor of ITS and is divided into four areas:

1. Application Systems
2. Network Administration
3. Academic Support at SAC
4. Academic Support at SCC plus Web Development

Below is a photo of the ITS leadership (pictured left to right: Jesse Gonzalez, Stuart Davis, Lee Krichmar, Alfonso Oropeza, and Archana Bhandari)

Below is the ITS organization Chart for the entire ITS department, which is available on the ITS webpage:



D. Guiding Principles for Technology

If RSCCD is to be successful in implementing its vision of technology and accomplishing its strategic goals, it is important for TAG to create a list of guiding principles that will define and direct the criteria for decision making in regards to purchasing and utilizing information technology.

Below is a list of TAG's guiding principles:

- We must adhere to state and federal laws pertaining to technology
- Our colleges strive to provide leadership in technology for the communities they serve
- Students and the community deserve the best technology that is available
- Technology can enhance RSCCD's ability to provide multiple modes of access and a consistent delivery of all services
- Continuous assessment of technology services is vital for ongoing improvement
- Critical district-wide services/data must be standards-based, reliable and secure
- Ease-of-use must be a factor in selecting and implementing new technology
- Intra-district communication is a mission-critical element
- Technology planning must be a major factor in local and district-wide funding decisions

- Funding for the development and upgrading of infrastructure must be considered in the budgeting process
- ITS provides a district-wide coordinating function
- The integrity of data must be assured and safeguarded
- Staffing should increase in proportion to the implementation and application needs of technology

E. Assumptions

A primary reason that TAG has developed the STP is to insure that RSCCD looks to the future and develops progressive learning and working environments for its students and employees in order to foster positive student learning outcomes through the use of technology. Below is a list of planning assumptions developed based upon the input provided by members of TAG. The assumptions include the current internal and external environmental factors that affect the development and implementation of the STP.

Student Assumptions:

- Students need access to resources and services at any time from any location
- Student expectations and skills vary widely but are generally increasing
- All electronic instructional materials and services meet or exceed Americans with Disabilities Act accessibility guidelines
- Technology supports successful instruction
- Technology is similar to and at relative parity with other local colleges

Employee Assumptions:

- Faculty members expect current technology to support and enhance instruction
- Technology requires more specialized staffing
- Technology requires continuous employee training
- Technology redefines work culture and environment
- Staff development and communication is dependent on technology

Support Assumptions:

- District-wide technology cooperation will become increasingly critical
- The demand for general technology support and adaptive technology support will continue to increase
- Assess technology to assure the Americans with Disabilities (ADA) Act Standards are being met.
- Continually evaluate technology to improve and streamline business processes
- Meet the growing demand for emerging technologies
- Employ the most highly qualified technical support staff possible

Resource Assumptions:

- The need for technology will always be greater than the resources provided
- Due to the extreme budget crisis, the funds allocated for technology enhancements may be reduced
- Federal stimulus money may be available for infrastructure updates and expansion
- In order to make the most effective use of resources, a coordinated plan (like the STP) is needed for the design, deployment and use of technology

General Assumptions:

- Online resources should be developed with responsive designs so that smart phones and tablets provide a positive user interface and experience
- We will consider placing server related items into the cloud as we perform analysis on procuring new technologies
- VPAT's will be reviewed and tracked by the Purchasing department for new procurements of hardware and software
- Demand for electronic access and communication will continue to increase
- Technology-related costs will continue to increase
- A balance between a secure and service-oriented environment will be provided
- Security risks and exposures have become more important for data integrity
- Continuous updates in infrastructure, hardware and software must be provided
- Reliance on the internet to accomplish essential functions continue to increase
- Our electronic communication includes email, internet, Intranet, smart phones, tablets, PDAs, telephone conferencing, videoconferencing, wireless, and remote access
- New and easy-to-use technology will be implemented for all employees

F. ITS Department Mission and Core Values

ITS Mission Statement:

Information Technology Services provides leadership and planning for the effective and strategic use of educational technologies in alignment with academic and administrative missions for Rancho Santiago Community College District.

In support of this mission, we will:

- Partner with stakeholders to understand the information technology needs of faculty, staff, and students
- Provide secure, reliable, and integrated technology solutions
- Demonstrate technical and operational excellence through a commitment to professionalism, solution assessment, and continuous improvement in both existing and emerging technologies

Core Values:

Our Core Values drive and guide the ITS department as we serve RSCCD. As members of ITS, we are committed to:

- Collaboration: We are dedicated to a constructive, team-oriented environment, gathering varied perspectives, sharing knowledge, and building effective partnerships with key stakeholders
- Continuous Improvement: We strive for operational excellence through the ongoing development and evaluation of resources, processes and solutions across the entire organization
- Innovation: We encourage creative and critical thinking in the development of technology services and solutions
- People: We listen to, respect, and care for faculty, staff, students, and one another, both professionally and personally
- Service: We strive to provide excellent service by being consistent, agile, reliable, and accessible to all
- Transparency: We leverage open communications and thoughtful business processes to be accountable in our interactions and our work

G. Assessment of Technology

Incorporating an assessment process into the STP fosters a more collaborative environment between the district and the colleges, creating an atmosphere where new technology and ideas can be presented and discussed. The results of technology sharing will continually help TAG develop a centralized process for managing innovation, implementing new ideas in technology, and evaluating its current technology standards.

A key component of the plan is imbedding a mechanism to evaluate and assess its purpose. On a regular basis, information is gathered through our research department, surveys, focus groups, managerial reviews, professional observations, program reviews, faculty/department advisory groups, and planning portfolios to help TAG evaluate and prioritize the technology needs of the district and colleges in order to allocate resources appropriately, better serving students and employees. TAG should rely HEAVILY on input from SAC TAC and SCC TAC.

The Purchasing department will request and track the VPAT (Voluntary Product Accessibility Template) documents necessary for reviewing if a product we intend to procure has been assessed for universal access according to Section 508 standards. Our goal is to make our technology related products as accessible as possible to all individuals.

H. Resource Planning and Obsolescence

The development of technology standards and a centralized planning process allows TAG to be mindful of its budgets for future technology. With the regular assessment of technology incorporated into the STP, TAG plans and develops yearly timelines to coordinate the replacement and reallocation of computers, software, and hardware that have become obsolete. TAG should rely HEAVILY on input from SAC TAC and SCC TAC in order to determine the campus priority for computer replacements if funds from the central ITS budget are available for this purpose.

I. RSCCD 2016-2019 Strategic Plan

Below is the RSCCD Strategic Plan Goals and Objectives for our upcoming years. It is critical to our overall success that ITS encompasses these into our ITS Strategic Plan to ensure we are properly aligned overall.

Rancho Santiago Community College District
2016-2019 Strategic Plan

Goals & Objectives	Responsible Individual(s)/Party
RSCCD will assess the educational needs of the communities served by RSCCD and will adjust instructional programs, offerings, and support services and will allocate resources as needed to optimize the alignment of students' needs with services and fiscal resources.	
• Continue to determine the needs of the community	Planning & Organizational Effectiveness Committee
• Develop sustainable, alternative revenue streams to student educational needs	Fiscal Resources Committee, Asst. VC, Educational Services, Foundation Directors
• Continue to monitor student educational preparation	Planning & Organizational Effectiveness Committee, Director of Research
RSCCD will assess the educational needs of the communities served by RSCCD and then pursue partnerships with educational institutions, public agencies, non-profit organizations, and business/industry/labor to collaboratively meet those needs.	
• Strengthen outreach and recruitment; develop new and sustain current relationships with key partners and stakeholders	Chancellor, Presidents
• Support regional development by becoming the primary local source of skilled employees for high demand occupations	Chancellor, Presidents
RSCCD will annually improve the rates of course completion and completion of requirements for transfer, degrees, certificates, and diplomas.	
• Consistently and accurately measure educational goal completion for university transfer, degrees, certificates and diplomas	Vice Presidents of Academic Affairs, Director of Research
• Support integrated approaches to student success and achievement	Planning & Organizational Effectiveness Committee
• Identify economic barriers to student achievement	Planning & Organizational Effectiveness Committee, Director of Research

Goals & Objectives	Responsible Individual(s)
RSCCD will support innovations and initiatives that result in quantifiable improvement in student access, preparedness, and success.	
• Maintain and enhance the RSCCD's technological infrastructure	Technology Advisory Group
• Support faculty development in the areas of innovative pedagogies and curriculum design	Chancellor, Presidents, Planning and Organizational Effectiveness Committee
• Examine course success rates by population served and promote strategies that foster student equity.	Vice Presidents of Academic Affairs, Director of Research
RSCCD will use a cycle of integrated planning that will demonstrate the effective use of resources.	
• Support and encourage focused green practices	Physical Resources Committee
• Utilize current processes to inform program, facilities, human resource and technology allocation	Vice Chancellors
• Evaluate the cycle of integrated planning	Planning & Organizational Effectiveness Committee

The primary focus for the above Objectives for the ITS department will be:

1. Increase support for Distance Education and Open Educational Resources (OER)
2. Maintain and enhance the RSCCD's technological infrastructure

Strategic Planning Framework

In the Spring of 2019, a group of representatives from TAG, SACTAC and SCCTEC pursued an initiative to establish a districtwide technology planning framework in order to better align the College and Districtwide Strategic Technology plans and streamline the planning process. The group assessed proven technology planning frameworks used at other California Community Multi-College Districts. The group settled on a planning framework used by San Jose Evergreen Community College District, which has been adopted by Yuba Community College District and the Chief Information Systems Officers Association (CISOA). This planning framework considers internal and external environment conditions, accreditation standards and the goals established by the District's Comprehensive Master Plan and the College's Educational Master Plans. The end result is a hierarchical planning structure that includes three planning layers: **Strategic Themes**, **Goals** and **Initiatives** and an operational execution layer: **Projects**.

1. Strategic Themes

Strategic Themes is the highest strategic layer in the planning framework. Strategic Themes are intended to be brief, high level, broad, long lasting, all-encompassing and a reflection of the external and internal environments. Strategic Themes are derived from an assessment of the current technology trends in the higher education space and the California Community College System, the District's Comprehensive Master Plan and the College's Educational Master Plans. Developing Strategic Themes is the first step in the planning process.

2. Goals

Goals are derived from the Strategic Themes. Goals are lower level, more specific and aligned with Technology Accreditation Standards. Goals take more of the internal institution environment districtwide into account when developed.

3. Initiatives

Initiatives are derived from the Goals. Initiatives are low level, specific and based on a more detailed analysis of institutional technology needs. Initiatives can occur at a districtwide or college specific level. Initiatives represent the bridge from planning to execution. Participatory groups are to involve operational workgroups in the development of initiatives. Operational workgroups are to align project requests with initiatives and prioritize based on their support to the planning framework.

4. Projects

Projects are the lowest common denominator. The Project layer is not part of the planning process, rather, it's its result. Projects are derived from initiatives; they are the lowest level

items, very specific and cannot be broken up any further. Projects can occur at a districtwide or college specific level. Projects are generated in several ways, including but not limited to, by institutional stakeholder requests, external mandates or statewide initiatives to name a few. District operational workgroups are in charge of ensuring that project requests are properly aligned with the initiatives in the Strategic Technology Plan, that they are prioritized based on their positive institutional impact and that they are timely executed in support of the Strategic Technology Plan.

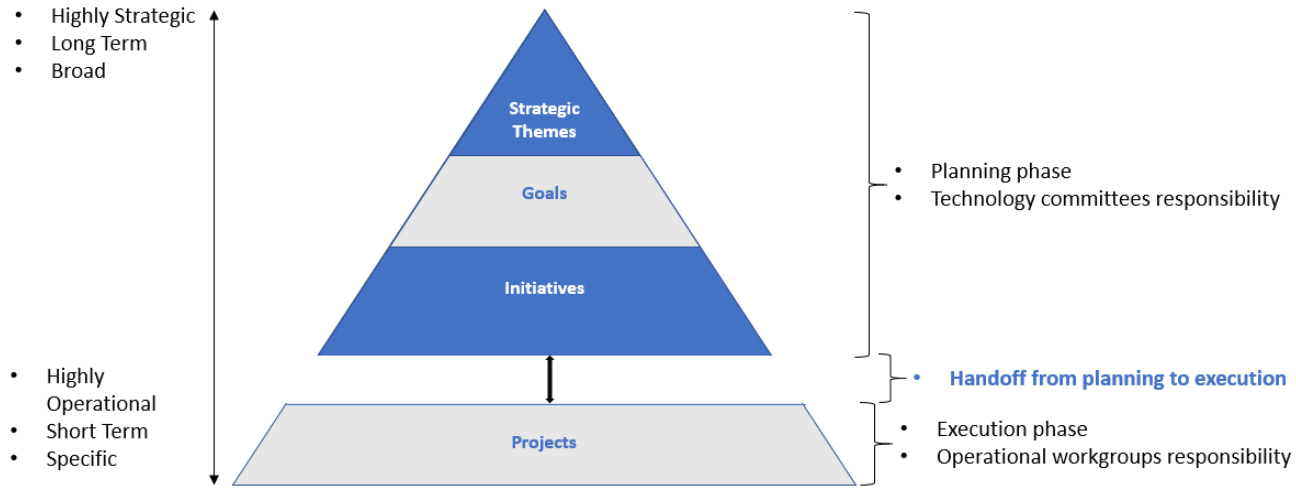


Figure 1 Hierarchy of Planning Framework

Using the Strategic Planning Framework to Support the Delivery of Technology Districtwide

The Strategic Planning Framework guides operations to ensure technology is delivered in support of institutional strategy. In addition, the Framework creates a feedback loop between technology committees, who are in charge of planning, and operational groups, who are in charge of executing. This occurs by establishing an informational process in which outcomes are communicated between these two groups. Communication is critical to determine the success of the Framework. Planning groups need to be aware of what is being executed and operational groups need to know what is being planned. This level of communication allows fine tuning to occur, which supports continuous improvement.

Figure 2 Technology Planning and Execution Cycle

Using the Strategic Planning Framework to Develop Strategic Technology Plans.

The Strategic Planning Framework ensures that there is thorough alignment in all Technology Plans districtwide. The same Strategic Themes and Goals are applicable to the Master, SAC and SCC Technology plans. Districtwide initiatives are captured in the Master Strategic Technology Plan developed by TAG, while College specific initiatives are included in the College Technology plans developed by SACTAC and SCCTEC.

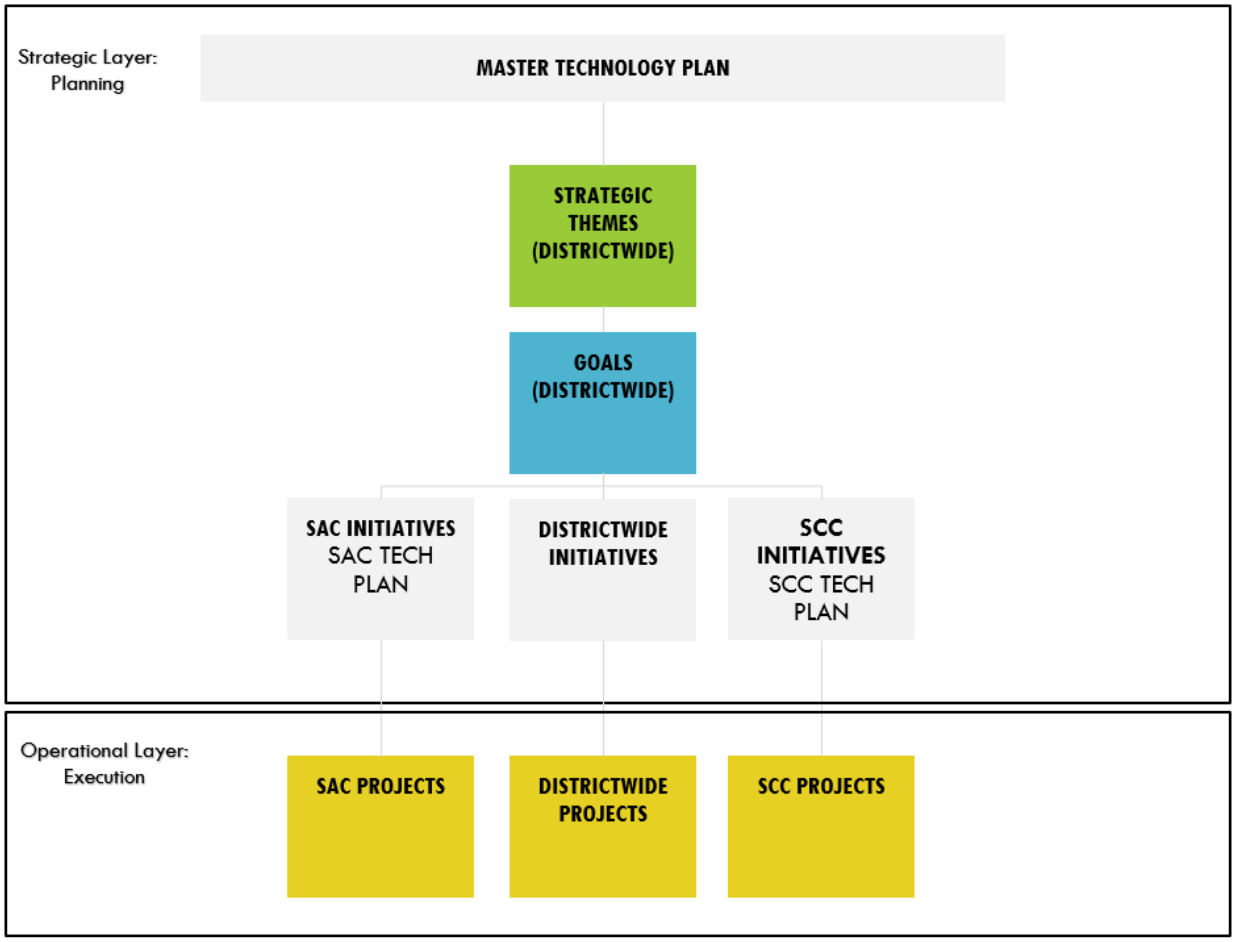


Figure 3 Strategic Technology Plan Structure

Strategic Elements Duration and Review:
Strategic Themes, being broader and longer term are designed to last longer than every other element. The timeframes shorten further down the hierarchy tree:

Strategic Element	Duration	Review Responsibility	Review Period
Strategic Themes	3 Years	Technology committees	Every 3 years
Goals	2 Years	Technology committees	Every 2 years
Initiatives	1 Year	Technology committees	Every year
Projects	As needed to complete	Operational Workgroups	Every 30 days

Planning Process

In order to start the planning process that would lead to the development of Strategic Themes, an environmental analysis was conducted. The purpose of the analysis is to consider both internal and external factors and identify patterns that can be grouped into broad strategies to guide the technology plan.

External environment analysis

Several trends affecting the higher education industry and the California Community College system were considered:

EDUCAUSE

EDUCAUSE, a nonprofit association and one of the largest communities serving higher education IT professionals, releases an annual report that highlights the top 10 IT issues affecting higher education, as determined by a panel of experts comprised of IT and non-IT leaders, Chief Information Officers, and faculty members, and then voted on by EDUCAUSE members in an annual survey. The top 10 IT Issues for 2019 were the following:

1. Information Security Strategy: Developing a risk-based security strategy that effectively detects, responds to, and prevents security threats and challenges

2. Student Success: Serving as a trusted partner with other campus units to drive and achieve student success initiatives

3. Privacy: Safeguarding institutional constituents' privacy rights and maintaining accountability for protecting all types of restricted data

4. Student-Centered Institution: Understanding and advancing technology's role in optimizing the student experience (from applicants to alumni)

5. Digital Integrations: Ensuring system interoperability, scalability, and extensibility, as well as data integrity, security, standards, and governance, across multiple applications and platforms

6. Data-Enabled Institution: Taking a service-based approach to data and analytics to reskill, retool, and reshape a culture to be adept at data-enabled decision-making

7. Sustainable Funding: Developing funding models that can maintain quality and accommodate both new needs and the growing use of IT services in an era of increasing budget constraints

8. Data Management and Governance: Implementing effective institutional data-governance practices and organizational structures

9. Integrative CIO: Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in supporting institutional missions

10. Higher Education Affordability: Aligning IT organizations' priorities and resources with institutional priorities and resources to achieve a sustainable future

Gartner

Gartner a global research and advisory firm providing information, advice, and tools for leaders in technology and other industries, produced the following Top 10 2019 Strategic Technologies for Higher Education:

1. Next-Generation Security and Risk Management
2. Artificial Intelligence Conversational Interface
3. Predictive Analytics
4. Nudge Tech
5. Digital Credentialing Technologies
6. Hybrid Integration Platforms
7. Career Software
8. Student Cross-Life-Cycle CRM
9. Smart Campus
10. Wireless Presentation Technologies

ACCJC Accreditation Standards

The Accrediting Commission for Community and Junior Colleges has developed the following set of accreditation standards for technology:

Standard III: Resources
C. Technology Resources

1. Technology services, professional support, facilities, hardware, and software are appropriate and adequate to support the institution's management and operational functions, academic programs, teaching and learning, and support services.
2. The institution continuously plans for, updates and replaces technology to ensure its technological infrastructure, quality and capacity are adequate to support its mission, operations, programs, and services.
3. The institution assures that technology resources at all locations where it offers courses, programs, and services are implemented and maintained to assure reliable access, safety, and security.
4. The institution provides appropriate instruction and support for faculty, staff, students, and administrators, in the effective use of technology and technology systems related to its programs, services, and institutional operations.
5. The institution has policies and procedures that guide the appropriate use of technology in the teaching and learning processes.

California Community College's State Chancellor's Office

At the California Community College System level, the **Vision for Success** developed by the State Chancellor's Office is a key environmental driver for technology strategy. The core element of the vision is "*making sure students from all backgrounds succeed in reaching their goals and improving their families and communities.*"

The Vision for Success has very specific goals to be accomplished by 2022:

1. Over five years, increase by at least 20 percent the number of California Community College students annually who acquire associate degrees, credentials, certificates, or specific skill sets that prepare them for an in-demand job.

2. Over five years, increase by 35 percent the number of California Community College students transferring annually to a UC or CSU

3. Over five years, decrease the average number of units accumulated by California Community College students earning associate degrees, from approximately 87 total units (the most recent system-wide average) to 79 total units

4. Over five years, increase the percent of exiting CTE students who report being employed in their field of study, from the most recent statewide average of 60 percent to an improved rate of 76 percent

5. Reduce equity gaps across all of the above measures through faster improvements among traditionally underrepresented student groups, with the goal of cutting achievement gaps by 40 percent within 5 years and fully closing those achievement gaps within 10 years.

6. Over five years, reduce regional achievement gaps across all of the above measures through faster improvements among colleges located in regions with the lowest educational attainment of adults, with the ultimate goal of fully closing regional achievement gaps within 10 years.

The California State Chancellor's Office Framework to accomplish the goals of the Vision for Success is another key component to guide technology strategy: **Guided Pathways.** Guided Pathways is a multi-year state program designed to provide all California Community Colleges with the opportunity to implement this new framework for the purpose of significantly improving student outcomes.

Figure 4 The Four Pillars of Guided Pathways

Internal environment analysis

The internal analysis considered RSCCD's Comprehensive Master Plan, SAC's Educational Master Plan and SCC's Educational Master Plan.

RSCCD's Goals

RSCCD has developed the following five goals within its Comprehensive Master Plan:

1. RSCCD will assess the educational needs of the communities served by RSCCD and will adjust instructional programs, offerings, and support services and will allocate resources as needed to optimize the alignment of students' needs with services and fiscal resources.

2. RSCCD will assess the educational needs of the communities served by RSCCD and then pursue partnerships with educational institutions, public agencies, non-profit organizations, and business/industry/labor to collaboratively meet those needs.

3. RSCCD will annually improve the rates of course completion and completion of requirements for transfer, degrees, certificates, and diplomas.

4. RSCCD will support innovations and initiatives that result in quantifiable improvement in student access, preparedness and success.

5. RSCCD will use a cycle of integrated planning that will demonstrate the effective use of resources.

SAC's Strategic Plan Areas
SAC's Educational Master Plan focuses on four main strategic areas, each one made up of multiple goals and objectives:

1. Student Achievement
2. Budget & Infrastructure (technology, fiscal, facilities)
3. Community Awareness and Engagement
4. Innovation

SCC's Goals and Action Items
SCC's Educational Master Plan focuses on nine main goals, with several action items related to them:

1. Support a college culture of academic excellence and personalized education
2. Support student success and equity by enhancing the integration of student services, instructional areas, and institutional initiatives
3. Focus on student completion of pathways
4. Improve communication within the college community
5. Support faculty and staff development
6. Optimize access to physical, technological, human, and fiscal resources through data-informed, integrated planning and resource allocation processes
7. Maintain and enhance the college's technological infrastructure and facilities
8. Strengthen and refine the processes that integrate planning and resource allocation
9. Enhance and expand the college's community presence

Putting it all together: Developing Strategic Themes for Technology

The environmental analysis clustered items around five common themes: A core theme and four supporting strategic themes.

Student Experience: This is the main strategic theme. All other themes play a supporting role to improving Student Experience. It is no surprise that student success is a common goal across higher education institutions at large as well as the driver to the goals of the College and District strategic and educational master plans. Statewide initiatives including the vision for success and guided pathways were designed to help students succeed. Advancing technology to optimize student experience is critical to achieve student success.

1. **Standardization:** Standardizing processes and technology creates efficiencies across the institution, which result in improved student experience. The guided pathways framework relies heavily on the standardization and alignment of institutional processes between the

different areas of student contact. As processes are streamlined through standardization, higher education institutions are faced with the need to implement tools to track student success and measure the efficacy of their framework. Implementing Customer Relationship Management (CRM) systems, products previously tailored to for-profit organizations wanting to standardize and improve customer experience, is now a common initiative in the educational space. The District's master plan and the Colleges' educational master plans goals focus on the effective use of resources and enhancing the integration of student services, instructional areas, and institutional initiatives, among other things. Accomplishing these objectives wouldn't be possible without the efficiencies gained through standardization.

2. **Data Driven Decision Making:** Data is a strategic asset to any institution. Educational institutions collect a significant amount of data from their students, faculty and staff. Having access to this data in the right place at the right time with the proper technology to support it provides a competitive advantage. Advanced technologies such as predictive analytics can guide decision making to get students to stay on the right path or discontinue programs that aren't generating revenue. The vision for success has very specific goals that are quantifiable and measurable through data analysis. Institutions that master data driven decision making are more likely to be successful at achieving student success.

3. **Security:** Higher education institutions are a large target for security attacks. The vast amount of protected data collected by colleges and universities coupled with the open nature of academic settings requires a fine balance between data privacy, regulation compliance and accessibility. College educational master plans include the enhancement of technological infrastructure as part of their objectives. Ensuring that data and infrastructure is secure is critical to the success of the District and its Colleges.

4. **Support:** Technology has and will continue to play a critical supporting role to help achieve institutional goals. From classroom technology to sustainability, to creating a smart campus to artificial intelligence, technology is the one element that permeates all and facilitates the educational objectives of higher education institutions.

	External environment				
	EDUCAUSE top 10 Issues, 2019	**Gartner Top 10 2019 Strategic Technologies for Higher Education**	**ACCJC Accreditation Standards**	**CCCCO Vision for Success Goals**	**CCCCO Four Pillars of Guided Pathways**
Student Experience	• Student success • Student-Centered Institution	• Artificial Intelligence Conversational Interface • Career Software • Student Cross-Life-Cycle CRM • Smart Campus • Wireless Presentation Technologies	• C1 • C2 • C4	• 1 to 6 (All)	• Create the path • Enter the path • Stay on the path • Ensure learning is happening
Standardization	• Digital Integrations • Sustainable Funding	• Hybrid Integration Platforms • Student Cross-Life-Cycle CRM	• C1 • C2 • C4 • C5	• 5 • 6	• Create the path • Enter the path • Stay on the path • Ensure learning is happening
Data Driven Decision Making	• Data-Enabled Institution • Data Management and Governance	• Predictive Analytics • Artificial Intelligence Conversational Interface • Student Cross-Life-Cycle CRM • Smart Campus	• C1 • C2 • C4	• 1 to 6 (All)	• Enter the path • Stay on the path • Ensure learning is happening
Security	• Information Security Strategy • Privacy	• Next-Generation Security and Risk Management	• C3	• 1 to 6 (All)	• Create the path • Enter the path • Stay on the path • Ensure learning is happening

Support	• Digital Integrations • Sustainable Funding • Integrative CIO • Higher Education Affordability	• Artificial Intelligence Conversational Interface • Career Software • Student Cross-Life-Cycle CRM • Smart Campus • Wireless Presentation Technologies • Hybrid Integration Platforms	• C1 • C3 • C4	• 1 to 6 (All)	• Create the path • Enter the path • Stay on the path • Ensure learning is happening

	Internal environment		
	RSCCD's Comprehensive Master Plan Goals	**SAC's Educational Master Plan Strategic Areas and Goals**	**SCC's Educational Master Plan Goals and Action Items**
Student Experience	• 1. RSCCD will assess the educational needs of the communities served by RSCCD and will adjust instructional programs, offerings, and support services and will allocate resources as needed to optimize the alignment of students' needs with services and fiscal resources. • 2. RSCCD will assess the educational needs of the communities served by RSCCD and then pursue partnerships with educational institutions, public agencies, non-profit organizations, and business/industry/labor to collaboratively meet those needs. • 3. RSCCD will annually improve the rates of course completion and completion of requirements for transfer, degrees, certificates, and diplomas.	• 1. Student Achievement • 4. Innovation	• 1. Support a college culture of academic excellence and personalized education • 2. Support student success and equity by enhancing the integration of student services, instructional areas, and institutional initiatives • 3. Focus on student completion of pathways • 7. Maintain and enhance the college's technological infrastructure and facilities

Standardization	• 4. RSCCD will support innovations and initiatives that result in quantifiable improvement in student access, preparedness and success. • 5. RSCCD will use a cycle of integrated planning that will demonstrate the effective use of resources.	• 2. Budget & Infrastructure (technology, fiscal, facilities) • 4. Innovation	• 2. Support student success and equity by enhancing the integration of student services, instructional areas, and institutional initiatives • 6. Optimize access to physical, technological, human, and fiscal resources through data-informed, integrated planning and resource allocation processes • 8. Strengthen and refine the processes that integrate planning and resource allocation
Data Driven Decision Making	• 4. RSCCD will support innovations and initiatives that result in quantifiable improvement in student access, preparedness and success. • 5. RSCCD will use a cycle of integrated planning that will demonstrate the effective use of resources.	• 2. Budget & Infrastructure (technology, fiscal, facilities) • 4. Innovation	• 3. Focus on student completion of pathways • 4. Improve communication within the college community • 5. Support faculty and staff development • 6. Optimize access to physical, technological, human, and fiscal resources through data-informed, integrated planning and resource allocation processes • 8. Strengthen and refine the processes that integrate planning and resource allocation

Security	• 1. RSCCD will assess the educational needs of the communities served by RSCCD and will adjust instructional programs, offerings, and support services and will allocate resources as needed to optimize the alignment of students' needs with services and fiscal resources. • 2. RSCCD will assess the educational needs of the communities served by RSCCD and then pursue partnerships with educational institutions, public agencies, non-profit organizations, and business/industry/labor to collaboratively meet those needs	• 2. Budget & Infrastructure (technology, fiscal, facilities)	• 6. Optimize access to physical, technological, human, and fiscal resources through data-informed, integrated planning and resource allocation processes • 7. Maintain and enhance the college's technological infrastructure and facilities
Support	• 1. RSCCD will assess the educational needs of the communities served by RSCCD and will adjust instructional programs, offerings, and support services and will allocate resources as needed to optimize the alignment of students' needs with services and fiscal resources. • 2. RSCCD will assess the educational needs of the communities served by RSCCD and then pursue partnerships with educational institutions, public agencies, non-profit organizations, and business/industry/labor	• 2. Budget & Infrastructure (technology, fiscal, facilities) • 3. Community Awareness and Engagement • 4. Innovation	• 2. Support student success and equity by enhancing the integration of student services, instructional areas, and institutional initiatives • 3. Focus on student completion of pathways • 5. Support faculty and staff development • 6. Optimize access to physical, technological, human, and fiscal resources through data-informed, integrated planning and resource allocation processes • 7. Maintain and enhance the college's technological infrastructure and facilities

	to collaboratively meet those needs		• 9. Enhance and expand the college's community presence

Strategic Themes 2019-2022

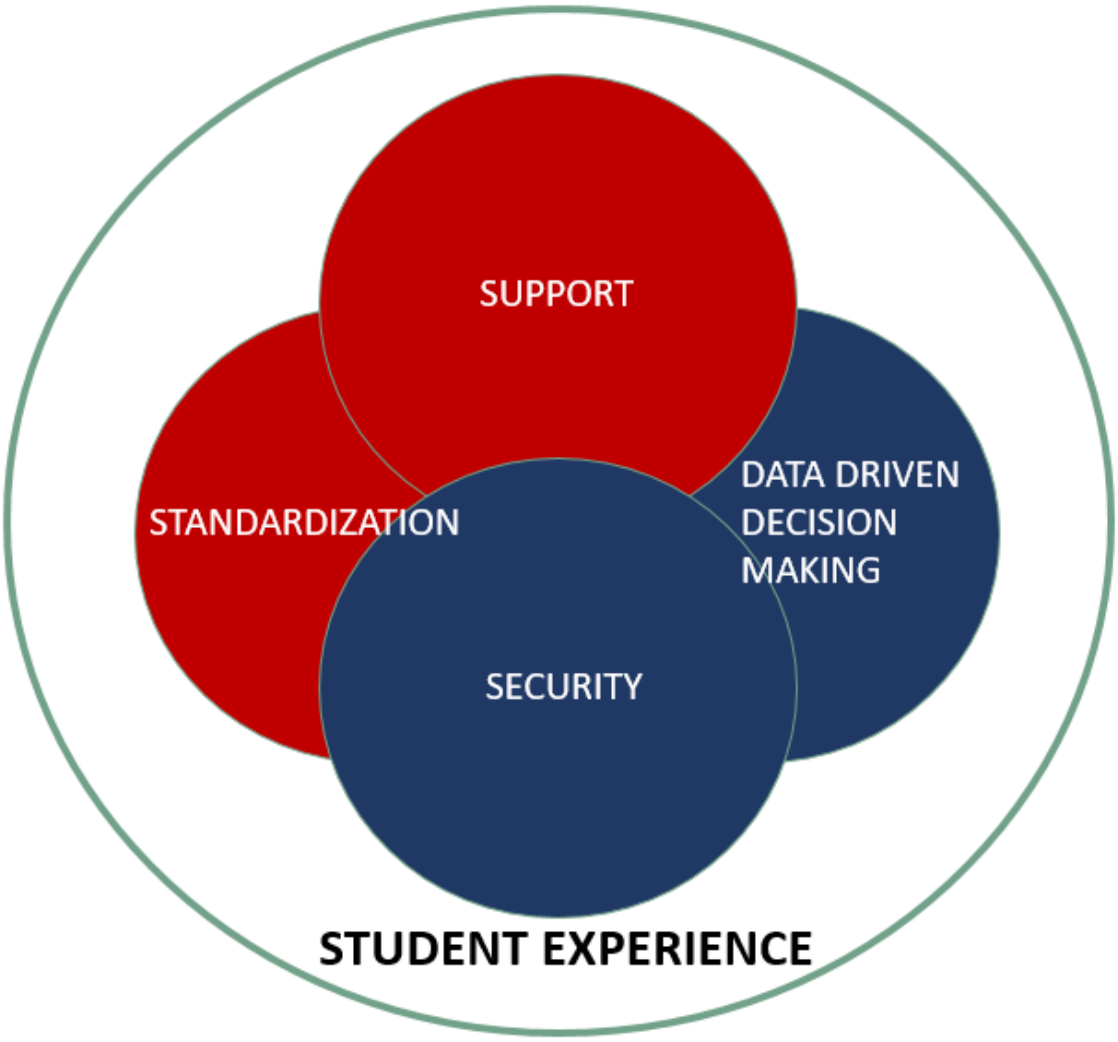


Figure 5 Strategic Themes 2019-2022

Goals 2019-2021

1. Student Experience

a. Provide technology infrastructure capacity and technology services to support on-campus and online student support services. (III.C.1, III.C.2)

b. Provide scalable technologies, services and staff to fully support online education. (III.C.1)

c. Provide technology services to align student experience with the pillars of guided pathways. (III.C.1, III.C.4)

d. Enhance internal and external web resources and mobile applications to improve ease of use for students, programs, services and operations. (III.C.4)

2. Standardization

a. Establish an ongoing plan to ensure all technology equipment is replaced on a regular basis to support operations, programs, services and district and college missions. (III.C.2)

b. Ensure that all classrooms, labs and study spaces have standardized audio-visual equipment, networking, hardware and software to support collaborations, simulations, presentations, teaching and learning. (III.C.1)

c. Develop and update policies and procedures that guide the use of technology and support teaching and learning processes. (III.C.5)

d. Continuously improve and establish standardized business processes involving technology to enhance institutional operations. (III.C.4)

e. Institutionalize technology planning framework and standardize project management including portfolio management, project intake and project prioritization. (III.C.1)

3. Data Driven Decision Making

a. Plan regular updates of technology to ensure the quality and capacity to support operations, programs, services and the mission. (III.C.2)

b. Institutionalize data management and data governance for data-informed decision making. (III.C.4)

c. Streamline, encourage and support the use of Business Intelligence reports and reporting tools for the effective use of technology systems. (III.C.1)

4. Security

a. Continuously improve network infrastructure security processes at all locations where courses, programs, and services are implemented and maintained to assure reliable access, safety, and security. (III.C.3)

b. Develop and maintain information security plans, policies, procedures, practices and projects to assure reliable access, safety, risk management and security compliance at all locations. (III.C.3)

c. Deploy Single Sign-On (SSO) solution for all standardized applications and technology resources to assure reliable access, safety and security at all locations. (III.C.3)

d. Perform ongoing information security training to faculty, staff, students, administrators and external stakeholders. (III.C.3.)

5. Support

a. Develop and foster Information Technology service excellence, performance feedback and assessment. (III.C.4)

b. Provide training and support for faculty, staff, students, and administrators in the effective use of technology and technology systems related to academic programs, student services and operations. (III.C.4)

c. Improve the effectiveness and efficiency of technology, services and support provided to students, faculty, staff and administrators. (III.C.1)

d. Ensure that technology resources at all locations are implemented and maintained to assure compliance with the American with Disabilities Act (ADA) and all applicable accessibility laws and regulations. (III.C.3)

Districtwide Initiatives 2019-2020

Initiative ID #	ITS District Wide Initiatives 2019-2020	Districtwide Goal #
19-20*01	Implement an improved enrollment management solution	19-21*3C
19-20*02	Multiple Measures Implementation	19-21*5C
19-20*03	Online Education Initiative (OEI) Implementation	19-21*1B
19-20*04	Improve overall data quality for reporting needs	19-21*3B
19-20*05	Optimize student onboarding process	19-21*1C
19-20*06	Implement student case management solution with early alert and predictive analytics	19-21*1C
19-20*07	Abide by technology replacement cycle for hardware	19-21*2A
19-20*08	Refresh or replace end of life software	19-21*4A
19-20*09	Establish Colleague patch cycle standards	19-21*2D
19-20*10	Standardize Electronic Content Management (ECM) solutions	19-21*2D
19-20*11	Implement Ellucian Ethos Integration Manager (EIM)	19-21*5C
19-20*12	Implement a standard reporting solution with ad-hoc capability	19-21*3A
19-20*13	Self Service Implementation	19-21*1A
19-20*14	Implement CCCCO Integrated Library System (ILS) ExLibras/Alma	19-21*5C
19-20*15	Implement a single sign on (SSO) authentication solution for staff and students	19-21*4C
19-20*16	Assess functional and technical gaps with SharePoint	19-21*5C
19-20*17	Deploy Microsoft's SCCM centralized solution for computer management and support	19-21*5C
19-20*18	Assess future use of AirWatch as centralized solution for mobile device management	19-21*5C
19-20*19	Deploy a centralized ITSM solution for ticketing, inventory tracking and project management.	19-21*5A

19-20*20	Assess guided pathways scheduling optimization options	19-21*1C
19-20*21	Utilize professional services for Database Administrator support for district wide applications	19-21*5C
19-20*22	Assess solutions for browser security measures to proctor online testing	19-21*1A
19-20*23	Implement security solutions to comply with Gramm-Leach-Bliley Act (GLBA) and General Data Protection Regulation (GDPR)	19-21*4A
19-20*24	Implement solutions and processes to support Business Continuity (BC) and Disaster Recovery (DR)	19-21*4B
19-20*25	Develop Standard Operating Procedures (SOPs) that define and streamline functions and services across ITS teams	19-21*2D
19-20*26	Support technology solutions that support facility construction projects, improve efficiencies and automate manual processes	19-21*5C
19-20*27	Improve district website mobile experiences and platform stability	19-21*1D
19-20*28	Standardize classroom mediation deployments	19-21*2B
19-20*29	Provide business process documentation for districtwide technology solutions	19-21*2C
19-20*30	Document technology planning standards and ITS project prioritization procedures	19-21*2E
19-20*31	Schedule ongoing cybersecurity awareness training sessions.	19-21*4D
19-20*32	Develop training materials and schedule training sessions for districtwide technology solutions	19-21*5B
19-20*33	Improve Siteimprove accessibility scores for district websites	19-21*5D

19-20*34	Foster base system utilization and improve stability while reducing customizations within Ellucian Colleague	19-21*5C

Technology Standards

Creating technology standards allows the district to consolidate and streamline business processes, leverage its buying power, and provide better support and training. The district recognizes the importance of allowing flexibility to create collaborative environments among its faculty and staff to explore new technologies that could benefit departments, programs, colleges or the district as a whole. Therefore, desktop standards will be created, as an example, but a specific department might need a non-standard computer to meet a specific need, which should be accommodated.

A. Network Infrastructure

One of the biggest challenges an educational institution faces is managing and maintaining its IT network infrastructure. The challenge also holds true for RSCCD, where demands, both internal and external, continue to increase as more administrative functions and business processes are automated or web-based. A secure, reliable, 24/7 connection to the district network and internet is a vital necessity. It is also important for the network infrastructure to be designed in a way that allows for scalability and growth. The district is mindful of its resources and continues to look for ways to maintain its network resources in a responsible manner, and adopts proven technology rather than base its infrastructure on the latest fad.

RSCCD's network infrastructure is based on Brocade & Cisco equipment that manages the network traffic between the DOC, colleges, and educational centers over a fiber backbone. An industry-accepted network management tool monitors RSCCD's equipment health, including traffic collisions, hardware outages, and application failures.

RSCCD's connection to the World Wide Web (WWW) is provided by the Corporation for Educational Network Initiatives in California (CENIC), which provides network connectivity to educational campuses statewide.

RSCCD uses a "Single Log On" strategy, using its existing Active Directory (AD) system for authentication for employee only services, such as for email. Services for students, like Blackboard and WebAdvisor, use the Lightweight Directory Access Protocol (LDAP) system.

The district provides wireless connectivity for faculty, staff, students, and guests at all locations based on Aruba technology. The wireless network currently provides a secure connection to faculty, staff, students and other guests in most areas. Accessibility to a secure wireless connection will continue to expand into additional areas as needs arise.

Centralized services provided by the Network team within ITS include:

Network Core: The core network infrastructure at SAC and SCC is being upgraded to 40 Gigabit (Gb) backbone capability from the current 10 Gigabit (Gb) speeds. The data center resources at each respective location will be connected at this capacity. Continued virtualization of server infrastructure and video surveillance bandwidth requirements are the primary factors driving this need.

Legacy Cisco network switches in the buildings serving up end user connectivity are being upgraded to new Brocade switches. These switches can support 1 Gigabit (Gb) endpoint connectivity and power network connected devices such as desk phones, conference phones, and security cameras. Where more than 48 ports are required, multiple Brocade switches are stacked together as a single logical unit in stacks of up to 8 switches each (384 usable network ports). We are standardizing on this single model of user endpoint switches to facilitate easier replacement and service.

The two main campuses' (SAC & SCC) IP schema is being restructured for a more granular network presentation in each building and each floor in each building. This creates a more robust and resilient network. For example; SCC has been assigned a /11 IP Range (maximum 2,097,150 IP addresses). These large ranges are then carved up per building. For example; SCC A building has been assigned two /20 IP Ranges carved off the /11 IP Range for SCC. Each IP Range can support a maximum 4094 IP addresses. (One range is for Staff and Faculty connected systems and the other is for Student related networks (i.e. labs, classrooms). These building ranges are then further carved up per floor. The first floor of the Administration building for Staff/Faculty resources has been assigned a /24 IP range (maximum 254 addresses). If more than 254 addresses are required for a floor, then another range of 254 addresses will be assigned. Network segmentation such as this creates a very efficient communication model allowing for small broadcast domains and containment of network issues to very small areas. As of August 2016, this project is 100% complete at SCC and 90% complete for SAC.

***Email*:** The email infrastructure is based on Microsoft Exchange 2013. This system currently supports full-time faculty, staff and part-time instructors. All active students at SAC and SCC were provided with .edu student email accounts and access to Office 365 in 2015. Gateway servers are also maintained to ward off spam and reduce virus exposures. An assessment is scheduled to occur in 2017 to determine whether the organization would benefit from moving faculty and staff email up to Exchange 365

***Remote Access*:** The District provides remote access through dedicated remote access appliances which provide a secure tunnel from the end-user to the district. With remote access, an employee gains secure access to email and private directories.
New alternatives for remote access are being explored during the latter half of the 2016-2017 Fiscal Year that can help reduce or eliminate dependence on VPN and shift toward a browser based remote connectivity solution. This would increase our offering to support multiple OS platforms and devices and reduce security exposures associated with running VPN clients on non–District issued hardware.

***Virtualization*:** The District has adopted a "virtualization first" approach for all new server systems, and has committed to reducing physical servers to a minimal level. Virtualization reduces cooling needs and saves power and space, while providing flexibility to meet users' demands. The District has also completed a desktop virtualization pilot to evaluating the role of virtual desktop technology, which did not prove beneficial due to the large quantity of older software that is utilized throughout our district. However, a further assessment is to be made in the near term on a more suitable application for desktop virtualization, as this technology continues to mature.

ITS is scheduled to pilot Virtualization of Network gear during the first half of the 2016-2017 Fiscal Year. This could provide tremendous capabilities, as it will allow Virtual Machines to be moved back and forth between SAC and SCC, as required, for maintenance or emergency purposes, thereby increasing our fault tolerance. Furthermore, it will give us the flexibility to microsegment our network to improve security posture.

***Centralized Storage and Backups*:** The District's centralized storage solution is comprised of both storage area network (SAN) and network attached storage (NAS) solutions. As the systems grow, ITS evaluates which systems fit best on either the SAN or NAS in order to centralize storage and backup.

ITS utilizes Dell as its primary centralized storage, which is split between the two data centers at SAC and SCC. In 2016 ITS upgraded both SAN's with new controllers and added additional capacity for each SAN, which gives us a total capacity of 175 terabytes. The platform has performed extremely well. Dell continues to add additional features to keep the SAN at the forefront within this product category. We expect that Dell will continue to SAN product support. ITS does not see any need to replace this within the next few years, after which, we would recommend a complete refresh to what is current in the industry and fits RSCCD's future storage needs. The SAN replacement will require a significant budget and because a large quantity of Colleague servers will be migrated to the cloud. Our on premise storage needs will change significantly over the 2016-2017 Fiscal Year.

Additionally, we have a small HP SAN with a capacity of 35 terabytes used for ITS Programming and Networking groups, which can be expanded as more storage is required. HP has recently upgraded this product line, which should remain current for the foreseeable future.

ITS currently uses an EMC solution to support the districts backup requirements. We are in our third revision of this software and second revision of the hardware. The backup product has been stable with EMC keeping up with changing trends within the backup community. We are nearing the end of the maintenance life cycle that we originally purchased with the equipment. With the cost associated with renewing this maintenance, it is recommended that we either purchase new EMC equipment or look at replacing both the backup software and storage. In addition, we will assess adjusting retention times and cloud storage locations to provide increased restore timeframes and mitigate data loss from localized risks.

***Antivirus/Spyware*:** The antivirus and firewall product Symantec End Point is leveled at centrally managed environments to protect servers and workstations. ITS uses an antivirus server that monitors client workstations for threats and notifies the network team of viruses to be eliminated. If a serious threat arises, ITS has the ability to take immediate action to shut down individual work stations to prevent further infection.

An assessment will be conducted in 2017 on how to leverage the next generation non-signature based end point protection products currently out in the market, as the protection offered by classic Antivirus solutions are limited to what they can do against the more sophisticated threats that are currently trending.

***Telecommunications*:** The district continues to use a Voice over Internet Protocol (VOIP) system from CISCO, which was implemented back in the summer of 2009. Cisco Unified Communications Manager (CUCM) is an enterprise-class IP telephone call processing system that provides traditional telephony features, as well as advanced capabilities, such as mobility, presence, preference, and rich conferencing services.

Planned expenses to support the core services include replacing hardware and software on a regular basis, the assessment and implementation of new technologies and providing for planned growth (e.g. increased centralized storage).

New technology allows consolidation of traditional PRI and T1circuits onto SIP trunks, which have the potential of reducing costs and offering additional features. ITS is due to make an assessment on the deployment of a SIP based phone system which can combine a cloud hosted or hybrid on premise/cloud solution. Any changes to overhaul the existing phone system need to be carefully considered to ensure potential costs savings and additional functionality offset deployment costs. The number of phone handsets in the district is a critical factor that can drive cost up, if they had to be all upgraded at once. It would be crucial to evaluate a product that can support the existing handsets and allow for a gradual phase in implementation of newer devices with more rich features.

ITS will also evaluate the implementation of advanced features including unified messaging to integrate with Skype for business, Outlook, and other primary applications, as well as assessing soft phone and other features not currently leveraged by the existing phone system.

Voice mail has been largely integrated with Exchange and Outlook. ITS will evaluate addressing simple phone trees through Exchange technology and more complex ones through Cisco's UCCX, which replaced the former Cisco Unity platform. There are still a number of phone trees residing on Cisco Unity, which are due to be moved to the new UCCX platform. Unfortunately, UCCX has added a layer of complexity to execute moves, adds, and changes, which has proven to be a challenge. ITS will continue to rely on third party consulting for advanced call trees and will assess whether a simpler solution would better fit our needs.

The phone system's supporting electronics are on the following replacement cycle:

Equipment Type	**Replacement Cycle**
Core/Backbone	8 years
IDF	5 years
Switches	Replaced when no longer able to repair
Wireless	5 years (hardware), 3 years (software)
SAN/NAS	6 years plus growth
Physical layer—Project based	15 years minimum
Call Manager	5 years (hardware), 3 years (software)
Virtual Servers	4 years

B. Edge Devices

A big challenge faced by educational institutions is managing the “edge” equipment such as computers, printers, and recently, tablets and smart phones. It is a common assumption that computers at work should function as they do in an employee or student’s home. However, the home environment does not require the same sophisticated security authentication and hacking prevention of the RSCCD network. Also, in a home environment, individuals have the freedom and flexibility to experiment with personal hardware and software without significant risk to other linked users on the network. For example, ITS prevents individuals from downloading software on their PC because of the potential threat for virus infections or security breaches.

Standards in this area do assist in providing the optimal support for a large majority of business and teaching functions. Replacement of these edge devices is increasingly important in order to keep up with the expectations of faculty and staff, as well as the increased needs of business processes. **While the deployment and software support is provided by ITS, funding the equipment replacement is the responsibility of the college.**

Edge devices supported by our two locations based Academic Computing Support departments include:

Computers: Generally a computer user falls into one of two types: typical or high-end. The standard desktop computer is determined by TAG with guidance from the ITS department and satisfies the needs of a typical user. High-end users generally require more processing power and/or memory to handle either graphic or computational requirements. Curriculum developed for a graphic artist or engineering would also require high-end computers.

Establishing life cycles for technology helps the district to determine what equipment is obsolete or nearing the end of its service life, thus requiring its replacement, and enables the college to predict costs and use funds more efficiently. It is recommended that typical computers are replaced every five years and high-end computers are replaced every four years.

Tablets: For the last few years, there has been a significant increase in requests by academic and administrative users for tablets connecting to our wireless network. Apple iPads are predominantly being used by administrators. However, the use of Windows 10 tablets is increasing at a steady pace. The latest Microsoft Surface Pro has been evaluated and we have received many requests and positive feedback for this device.

Printers: The useful life of printers has decreased for several reasons. The initial purchase price has decreased as many of them consist of more plastic material than in the past. With the cost of repair service increasing as well as replacement parts, fewer printers are being serviced and more are being replaced.

Equipment Type	Replacement Cycle
Typical Computer	5 years
High-end Computer	4 years
Printers	5 years
Tablets/Notebooks	Discretion of the department – 3 to 5 years

ITS can't sustain supporting equipment beyond the recommended time period. It becomes very costly to attempt to keep old notebooks and tablets working effectively. If there is no associated warranty on the equipment, then the ITS department will assess the cost benefit of the repair and will advise the department as necessary.

C. Media Systems (A/V) Mediation

Media Systems provides support of Audio Visual (AV) equipment. This includes checkout of equipment, such as digital cameras, laptops, portable projectors and other related AV equipment. Upon request, they may deliver and/or setup up equipment for classrooms instruction and special events. They provide requirements for classroom mediation and work with vendors to install equipment.

Media Services and Academic Support work together to assess the classroom needs before purchases of media equipment. During installation, they continue to work together, to ensure all components operate correctly.

The following items are considered and discussed when mediating a district facility or classroom:

- Functionality
- Future capability
- Current equipment
- Room layout
- Lighting
- Sound
- Electrical outlets—ceiling and wall or floor
- Network access, including wireless
- Latest technology wide-format is now the standard default ratio of 16:9 display
- Digital switching allowing the equipment performance to be managed, and maintained from a server with access from any computer on campus
- Apple TV device for wirelessly projecting from iPad

While the majority of the SAC and SCC classrooms are mediated, the district is continually working towards completing the classroom mediation at all locations. Mediation has become an important element in the faculty's teaching practices, and the colleges have recognized the importance of classroom mediation. Therefore, media needs will be identified and subsequent installation required, consisting of a network jack, a projector placement and an instructor station, in all future classroom building construction. ADA compliant furniture with hydraulic lifts has been established.

Equipment Type	**Replacement Cycle**
Projectors	6 Years

D. Software

Our strategic approach for software is to keep up with the current information technology industry standards and provide our students with the knowledge and hands-on experience with popular applications that make them marketable. It is important for our employees to embrace the currently supported applications over older versions. Most employee computers run on the Windows operating system and feature the Microsoft Office Suite, which includes Excel, Word, PowerPoint and Outlook, for daily computing needs since it is the most widely used set of programs in business and industry and considered the de-facto standard. Outlook is used for district email, professional contact information, and managing one's calendar and task list. Every user's Outlook is configured to connect with the back end server (Exchange) that stores users' data. The server is backed up routinely, and staff can access their data from anywhere using the district's remote access (remote.rsccd.edu).

The two academic support staffs in conjunction with the network staff have agreed on a core set of software in order to minimize any configuration collisions. The core software is funded by ITS, and as updates are released, the academic support staff, with input from the colleges and coordination with the network staff, develop a plan to install the latest versions. Essentially, the updating process consists of three factors: First, if the curriculum demands the newest version, then academic labs and their associated faculty will receive the updated software. Second, the

newest software versions will be the standard on all new computers. Finally, faculty and staff needs will be evaluated to determine if their computers need the updated software.

A summary of the "core" set of software programs as defined by the colleges' Academic Support Directors and the Networking Director are:

- Operating System: 64-bit and/or 32-bit
- Microsoft Office Suite
- Browsers: Microsoft Internet Explorer, Microsoft Edge, Mozilla Firefox, and Google Chrome
- Plug-ins: Java, Adobe Reader, Flash Player, Microsoft Silverlight, and Windows Media Player
- System Utilities

Here is the existing TAG Software Standards website: https://rsccd.edu/Departments/Business-Operations/Pages/Software-Standards.aspx

Each college academic departments purchase necessary licenses for specialized software outside the core standard software. Academic Support will install the software on the computers.

Although the Windows operating system is installed on the majority of computers district-wide, ITS also supports Macintosh computers used for specific work or academic environments, such as desktop publishing and/or professional video production. It is appropriate for students interested in these professional fields to learn the Macintosh operating system and its applications in order to prepare for successful careers.

E. Hardware

TAG is the forum where hardware standards are being established for the district. In 2015 the TAG committee invited in three of the top commercial PC and laptop vendors for comparison purposes. Dell, Lenovo, and HP presented at the TAG meeting and brought the most common hardware components for our consideration and review. We evaluated multiple devices and also compared the pricing. HP emerged as the leader with the least cost. We were able to extend our hardware warranty on the HP from 3 to 5 years, increase the memory from 4 to 8GB, and standardize on a 23" monitor for a small price differential. TAG agendas and meeting minutes are all documented on the TAG website: http://www.rsccd.edu/Departments/Business-Operations/Pages/Technology-Advisory-Group.aspx.

The current hardware standards are posted on the TAG website: http://www.rsccd.edu/Departments/Business-Operations/Pages/TAG_standard_desktop_staff.aspx.

F. Surveillance Video

ITS currently supports OnSSI Ocularis Ultimate Edition software for our surveillance video systems. We have **784** cameras recording to **18** recorders with 850 terabytes of total storage, across **9** sites. There are multiple core management/SQL servers and 13 failover servers.

ITS has been experiencing problems with Dell PowerVault storage at SAC (353 cameras) and SCC (249 cameras). ITS is planning to move off of centralized storage and switch to individual

server/storage combo with about 80 terabytes per server. However, we are also considering a robust centralized and scalable solution from EMC. We currently have multiple individual servers, but plan to procure more this coming year due to our continued growth. We will slowly switch SAC over to the standalone servers first before transitioning SCC off PowerVault. As we replace servers/storage, we will use these older units as failover servers until PowerVault is out of warranty and is fully retired. We will retire all physical Intransa systems that were deployed over three years ago, which are currently used as failovers. Also, in the coming year we plan to complete our conversion of the remaining 44 analog cameras to full 1080p HD cameras within the next year. Depending on price points and the overall solution, we may use the centralized solution at SCC in small scale. Performance of both centralized and decentralized models will determine the overall path to take for the district.

Within the next 3 to 5 years, we will be bringing up new SAC Science Center and Johnson Center. We anticipate around **100** new cameras, based on our current plans, which will be in or around these two new buildings.

ITS is also looking to compare storage utilization levels between Axis and Sony cameras in the first half of the 2016-2017 Fiscal Year. Axis cameras are supposed to provide significant storage savings with the way they record video over our existing Sony standard. There is a small set of Axis cameras being utilized at the district and they all have performed well.

The cameras have continued to provide assistance to law enforcement personnel in several instances of theft, car accidents, and other crimes. Safety and Security is responsible for the ongoing monitoring and administration of the video surveillance system and will continue to evaluate additional camera requirements to meet the security needs of students, faculty, and staff.

G. Wireless Access

Currently there are over **800** Aruba access points that are both internal and external deployed throughout the district. Every site is providing wireless connectivity to guests, students, faculty, and staff, with up to **6000** unique device connections per day. ITS upgraded the wireless infrastructure with new Aruba controllers in 2016. A significant improvement with the new controllers significantly improved the user experience when people move around from one access point to another. ITS is committed to providing high quality wireless access to our customers and also to provide a vast coverage area at our various locations. In an effort for continuous improvement, ITS will be adding additional coverage including at SCC and including upgrades of older wireless access points at key locations both at SAC and SCC.

Since wireless access has become a basic utility, we perform a reassessment of coverage on an ongoing basis. Additionally, we are incorporating wireless into the design of all new buildings being planned, built, or remodeled. We will continue to upgrade and improve the end user experience as newer technology becomes available.

Technology Initiatives

The technology initiatives below will impact most of our critical stakeholders such as students, faculty, and staff members. We selected these categories because they are either new or critical to our district.

A. Cloud Computing

Cloud computing is a combination of hardware and/or software services that are supplied from a provider and is accessed via the Internet. Cloud computing is comprised of one or more of the following:

- Software as a service
- Infrastructure as a service
- Platform as a service

Some of the benefits of the cloud are:

- Improved security and monitoring (24x7)
- Reduce RSCCD Existing Risk (No DBA, No Security Admin, limited D/R & monitoring)
- Provide up-to-date expertise and experience
- Allow existing developers to focus on strategic priorities
- Reduce total cost of ownership
- Improved Return on Investment
- Speed to delivery
- Grow our environments as needed

RSCCD entered into a new agreement in 2016 to transfer approximately 30 servers into the Ellucian Hosted Services within AWS (Amazon Web Services). These servers are a combination of virtual and physical servers that are used for Colleague, WebAdvisor, and ImageNow. Here are the details: on September 14, 2015, the Board approved an agreement with Ellucian Systems for Application Management Services (AMS) with the future option to enter into Application Hosted services (AHS) or the cloud. After a six-month trial it was confirmed that the AMS arrangement has proven to be beneficial for maintaining the district's critical applications of Colleague, Web Advisor, and Image Now. We recommended moving forward into the AHS agreement in order to expand the services into the areas of information security, disaster recovery, server and network administration, and infrastructure hardware. The infrastructure hardware is critical and timely because we would otherwise incur significant hardware replacement expenses. A discussion detailing the impact of moving Ellucian to the cloud was presented at the following venues: 1) at Chancellor's Cabinet in December 2015; 2) at both SAC and SCC Management Team meetings in January 2016, and 3) at the Technology Advisory Group (TAG) on March 2, 2016.

The Application Hosted Services (AHS) agreement allows Ellucian Colleague, Web Advisor, and Image Now to reside securely in the cloud (within Amazon Web Services locations), and will be hosted directly by Ellucian. The district will benefit from Ellucian's years of experience and expertise with a fully hosted and managed solution. Ellucian cloud services provides secure facilities, with scalable infrastructure and hardware capacity, specifically to provide the ideal environment for these applications. This project will be funded out of the ITS budget. This cost will be partially offset with savings from the retirement of one ITS Director position, which will not be replaced, and our server and other hardware replacement expenses.

B. Universal Access - Section 508

The Purchasing department will request and track the VPAT (Voluntary Product Accessibility Template) documents necessary for reviewing a product we intend to procure has been

assessed for universal access according to Section 508 standards. Our goal is to make our technology related products as accessible as possible to all individuals.

We utilize a software tool called Siteimprove to identify and report accessibility related issues on webpages. We've identified the RSCCD-related websites, which all share a similar quantity of accessibility issues. ITS is focused on reducing the quantity of problems at the SAC website as a first priority.

The ITS department has initiated the following activities in 2016 as an attempt to help reduce the identified accessibility problems:

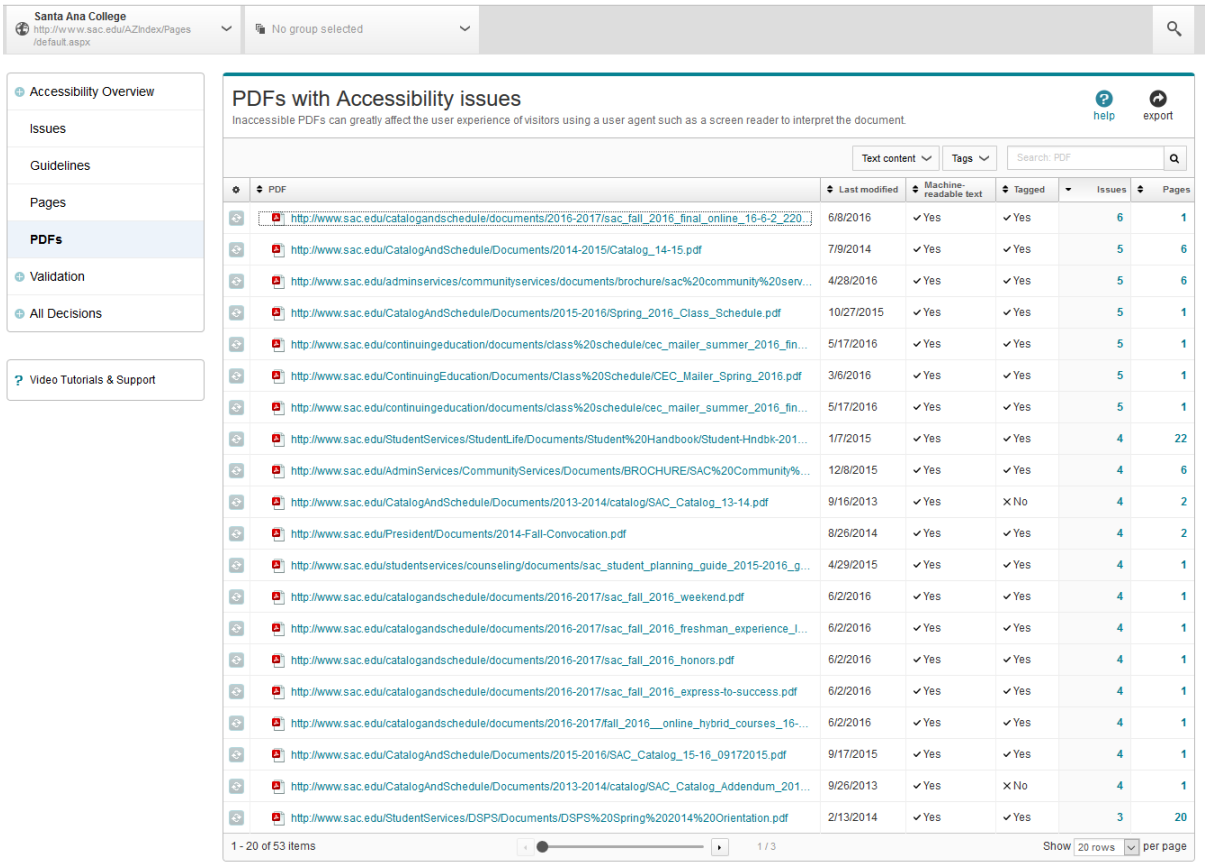
- In May of 2016, the Siteimprove software module for accessibility checking of websites was purchased. This was necessary because we were unable to determine the risk associated to non-compliant PDF documents and web general web accessibility guidelines, which are both critical. The module was installed but ITS experienced some initial problems that required troubleshooting.
- Two members of ITS web team began working both independently and with SectorPoint Inc. to establish an action plan with the appropriate strategies to fix our SAC website.
- We contacted the CCC High Tech Center to communicate our situation and action plan and to determine if there are other tools we might need to consider utilizing. Their input confirmed our action plan was viable.
- ITS can NOT fix all accessibility problems on our own. Since websites are dynamic in nature, we need to educate and have the participation of ALL web publishers. So, as a crucial measure, ITS created documentation to assist with training of our new Siteimprove accessibility module. This coordination is happening with coordination DSPS and Web Committee representatives from each college. Here is the beginning of the web-based training materials: http://www.rsccd.edu/WebAccessibilityManual/Pages/default.aspx.
- The SAC Project Manager has been named as the liaison for overseeing Section 508 compliance of the SAC website per the VP of Student Services. This will be an important measure to facilitate the training and ongoing monitoring. ITS believes it is critical to have participation on an ongoing basis from the SAC Web Committee.
- ITS provided the individual accessibility reports to the appropriate web publishers so that they can manage their webpages independently. Managers should be receiving the report with 'broken links and spelling errors', but we need to provide the additional Siteimprove accessibility report for the pertinent details.

Here is the detailed progress of the SAC website improvements that have been made thus far:

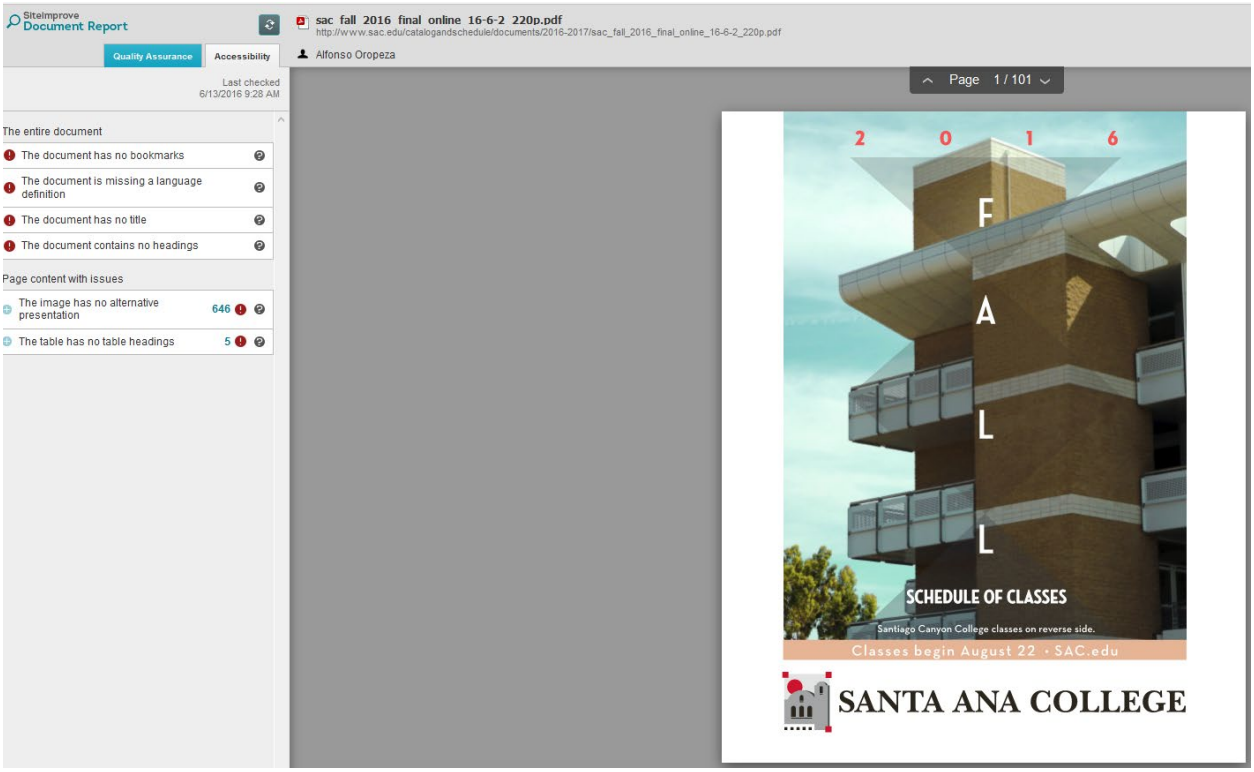
There were a total of 100 PDF files that had problems when we enabled the new PDF report. ITS fixed 59 of them and sent the remaining list to Public Affairs to have them fix the remaining problems since they had possession of the original files. The PDF files include our catalogs, class schedules, and other important college publications.

As of August 2016, the current number of remaining PDF files that have problems is 53. The SAC website is dynamic and therefore, even though we fixed the issues and the numbers of problems decreased significantly or even disappeared, some of them returned or increased due to users republishing without training. It is because our users updated the sites and inadvertently the mistakes were reintroduced. The fixes that ITS performed were on a variety of pages such as the master page, department page, page templates, or an input field or text field.

Below are the remaining PDF issues:

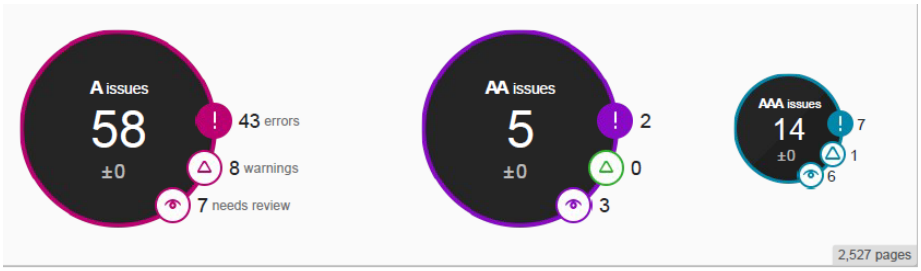


Below are what the PDF errors looks like in Siteimprove:

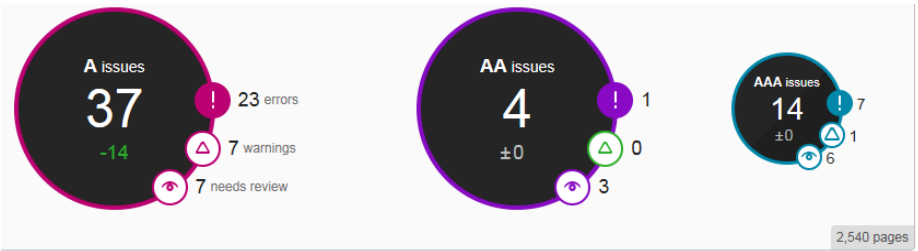


Below is the overall summary of the progress between April and June:

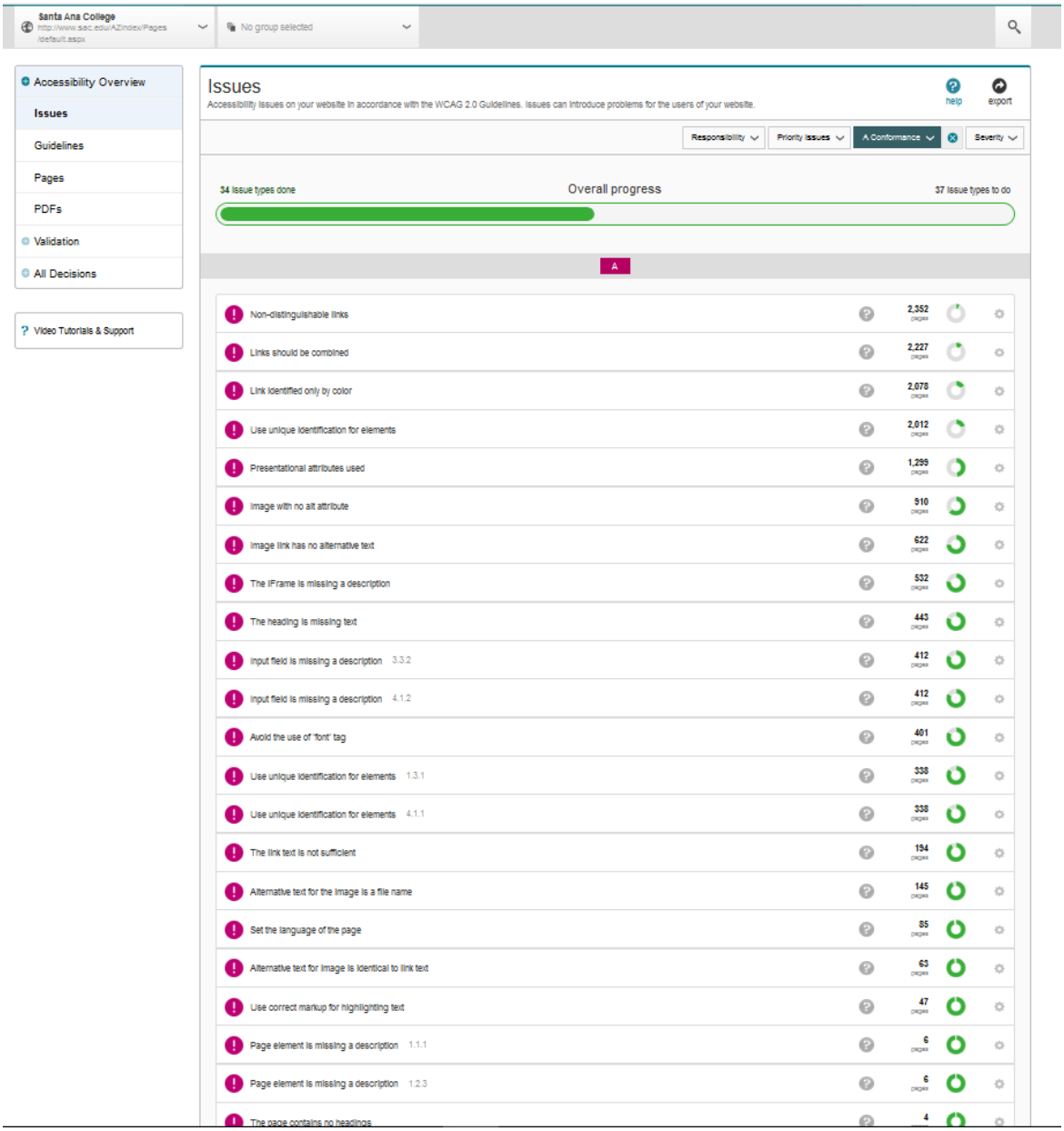
4-5-16 Summary



6-13-16 Summary



The summary report above does not look alarming, but it is. Details of the fixes and the numbers of pages affected are detailed below. There are thousands of pages reported with similar errors. ITS has focused on fixing issues within templates so that large quantities of pages can be fixed simultaneously.



ITS will continue working on the SAC website as our main priority. We will complete the online training documentation and work with the SAC Project Manager to provide the training. We need the concentrated effort of all web publishers to fix and to maintain our websites properly in order to achieve our ADA compliance goal.

An additional risk exists that cannot be quantified using Siteimprove. There are many Microsoft Word, Excel, and PowerPoint documents on our various websites. We don't have a tool to identify or report these issues, but during the training ITS is recommending that we train on how

to prevent accessibility issues when using Microsoft applications; currently DSPS already provides this training at SCC. DSPS staff from SAC will begin providing training in Fall 2016.

C. Security

The ITS department is required to take a defensive stance to protect our data and infrastructure from electronic attacks. The district is bound by regulatory compliance given the type of information that it handles, which includes FERPA, HIPAA and PCI data. Although qualified third parties currently handle significant portions of these protected information, it is still the district's responsibility to ensure that third parties handling our data provide evidence of compliance with industry regulations on an ongoing basis and that proper security and compliance mechanisms and controls are in place for any protected private information whether it resides on premises or in the cloud.

ITS is looking to formalize a strategic and ongoing Cybersecurity plan in the near term that improves the organization's overall security posture by focusing on people, processes and technology. ITS has contracted security advisory services, referred to as a Cybersecurity Partnership program, from a reputable Cybersecurity company in order to continuously monitor the maturity of our Cybersecurity plan, identify where we need to be and to get assistance meeting our security goals. The program is designed to guide RSCCD towards building and maintaining a consistent and reliable foundation to address the broad scope of cybersecurity considerations, including leadership decision making, assistance with the tracking of progress for various cyber and information security related (tactical) projects, and reviewing the district's program operations and management.

The Partnership Program is offered in conjunction with preferred rates for individual project engagements to be delivered sequentially based on a prioritized schedule of services.
Given the complex and volatile nature of cybersecurity, it is becoming increasingly common for higher education institutions to engage domain experts to provide ongoing advisory and security services. Partnering with cybersecurity professionals allows RSCCD to leverage a resource that focuses on, and is responsible for, remaining current with CA specific compliance requirements and cybersecurity best practices.

District's leadership involvement and governance will be required and are critical to the successful implementation of the cybersecurity program. The Partnership Program includes quarterly onsite visits where interviews with RSCCD resources will occur to determine current gap areas, and security controls to mitigate exposure. Participation from division areas handling protected information and compliance will be crucial to this process; this includes but it is not limited to, ITS, Risk Management, Human Resources, Admissions and Records, DSPS, Child Development Services, Health Centers, Stores and other areas accepting credit card data, etc. One of the most likely results of this engagement is the development of draft policies that will drive security controls and that will be sent for board review and approval.

California Attorney General, Kamala Harris, emphasizes the need for organizations to establish proper security controls to protect personal protected information. The following are key excerpts, applicable to RSCCD, from the California Data Breach Report issued in February of 2016 (The full report can be found at https://oag.ca.gov/breachreport2016):

"…if companies collect consumers' personal data, they have a duty to secure it. An organization cannot protect people's privacy without being able to secure their data from unauthorized access."

"California's information security statute requires businesses to use "reasonable security procedures and practices…to protect personal information from unauthorized, access, destruction, use, modification, or disclosure."

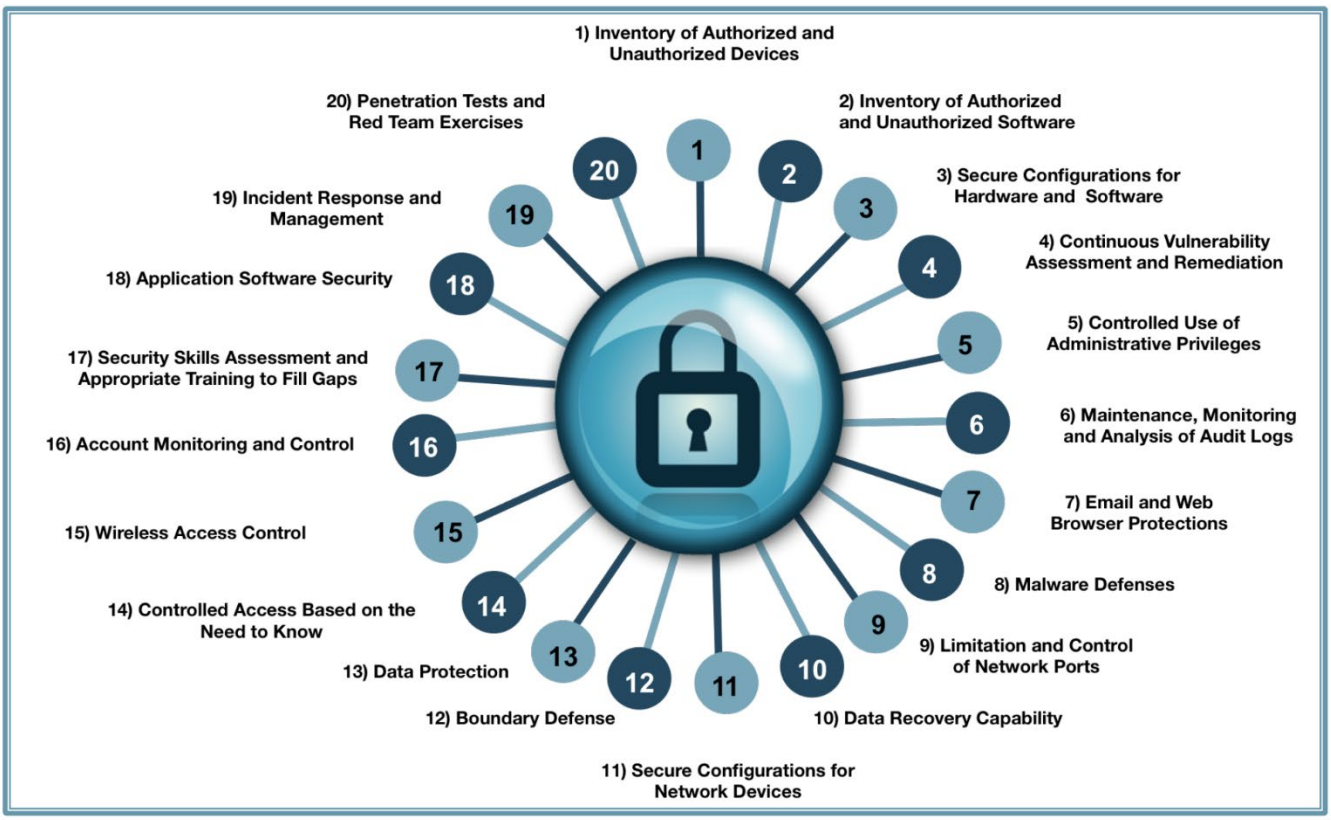
"The 20 controls in the Center for Internet Security's Critical Security Controls identify a minimum level of information security that all organizations that collect or maintain personal information should meet. The failure to implement all the Controls that apply to an organization's environment constitutes a lack of reasonable security

"The law requires any person or business that conducts business in California, and any state or local agency, that owns or licenses "computerized data" that includes personal information to notify any resident of California whose personal information was, or is reasonably believed to have been, acquired by an unauthorized person as the result of a breach of security."

"Any agency that is required to issue a security breach notification pursuant to this section to more than 500 California residents as a result of a single breach of the security system shall electronically submit a single sample copy of that security breach notification, excluding any personally identifiable information, to the Attorney General."

As stated above, it is in RSCCD's best interest to establish the 20 controls in the Center for Internet Security's Critical Security Controls as a minimum level of information security to be deemed as an institution providing reasonable security.

There are a total of twenty unique controls, out of which five primary controls are deemed essential to create a "Foundational Cyber Hygiene" – the basic things that must be done to create a strong foundation. Although some of the areas within the controls are already in place, they need to be formalized and driven by policies that will be sent for board review and approval. Below are the key elements within this framework (The full controls document can be found at https://www.cisecurity.org/critical-controls/Library.cfm). Please refer to **Appendix D** for a detail of the first five controls that ITS will be working to implement.



D. Mobile – Responsive web design

Smart phone access of web content is at an all-time high, and it is expected to continue to increase. And, this is the device that the majority of our students are using to access the Internet. Because of this trend, ITS is taking a strong stance on trying to provide a positive experience to our users for as many services that are online as possible. Per Wikipedia, responsive web design (RWD) is an approach to web design aimed at allowing desktop webpages to be viewed in response to the size of the device one is viewing with.

A site designed with RWD adapts the layout to the viewing environment by using fluid, proportion-based grids, flexible images, and CSS3 media queries, an extension of the @media rule, in the following ways:

- The fluid grid concept calls for page element sizing to be in relative units like percentages, rather than absolute units like pixels or points.
- Flexible images are also sized in relative units, so as to prevent them from displaying outside their containing element.
- Media queries allow the page to use different CSS style rules based on characteristics of the device the site is being displayed on, most commonly the width of the browser.

Responsive web design has become more important as the amount of mobile traffic now accounts for more than half of total internet traffic.

E. Disaster Recovery

The district recognizes the potential financial and operational losses associated with service interruptions maintained by the Information Technology Services (ITS) Division. ITS, in conjunction with district leadership, will assess the existing Disaster Recovery (DR) plan to ensure it properly addresses district needs for the recovery of systems that are considered critical for business continuity.

Technology related disasters include a myriad of situations rendering services unavailable: from an isolated server failure (the least impactful, but more likely events) to complete loss of an entire data center or the physical plant (the least likely, but most impactful events.) Isolated server or server component failures are typically addressed by regularly scheduled and tested backup procedures. More impactful events may require alternate solutions, planning, and testing that needs to be properly documented and coordinated.

The existing DR plan does not include procedures to recover from an incident rendering both Santa Ana College's NOC and Santiago Canyon College's NOC useless. ITS has been leveraging the use of cloud technologies, including the migration of Colleague services up to the cloud, to prevent the adverse effects of a localized disaster. ITS will continue to evaluate ways that can reduce physical and geographical exposure to disaster events for critical systems. Advances in network virtualization technology, such as VMWare NSX and virtual server replication provided by technologies like VMWare's Site Recovery Management or Veeam server replication allow for quicker recovery mechanism across sites or the cloud. These technologies are to be assessed in order to determine proper avenues to better protect district information systems in the future.

Proper DR planning decision making should be driven by district leadership to identify critical systems, determine reasonable Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO), along with appropriate resources and procedures to be leveraged during a disaster event. ITS objective will be to translate district requirements into technology solutions that can meet the objectives drawn by district leadership and that can be periodically tested to ensure they continue to meet DR needs.

F. Social Media

Social Media has become an instrumental communication tool that the district, colleges, and centers use to share information, engage with their audiences, manage reputation, and conduct research.

Currently each major district location uses a variety of social media channels and tools that were implemented and are managed by the district Public Affairs & Publications department in collaboration with the colleges and/or centers. Below is a list of district locations and the social media channels that are being used.

- RSCCD – Facebook, Twitter, YouTube
- SAC – Facebook, Instagram, Twitter, YouTube
- SAC School of Continuing Education – Facebook, Twitter
- SCC – Facebook, Instagram, Twitter, YouTube
- SCC School of Continuing Education – Facebook

Individual departments are encouraged to contact the Public Affairs & Publications department to establish social media accounts to ensure they are created correctly and proper permissions are set accordingly. Periodically staff members from the Public Affairs & Publications department

conduct social media workshops to introduce district and college employees to social media and share best practices. Public Affairs & Publications constantly monitors social media trends and evaluates emerging platforms for possible use by the district, colleges, and centers.

Because of the popularity and ever-evolving landscape of social media, the district, colleges, and centers are understaffed when it comes to generating content and providing quality customer service. Currently, the district employs one manager of publications & electronic media who collaborates with key departments, short-term employees and independent contractors to manage content on the district's social media channels. The lack of ongoing employees limits the consistency and effectiveness of social media when regular retraining of new part-time employees occurs.

Currently there are no district social media guidelines in place but steps are being taken to establish social media guidelines in 2017.

G. Facilities Projects

a. Energy Management

All sites will be connected to an energy management system (EMS). The energy management is primarily focused on HVAC monitoring, control and efficiency. Upon the completion of the Central Plant at Santa Ana College the new EMS will integrate monitoring and control for the 7 current and any future buildings that will connect to the Central Plant but will also integrate EMS for all other buildings that are serviced by individual HVAC systems. Some systems do have the ability to monitor lighting as well and the intent is to integrate some level of lighting monitoring and control. Separate systems are to be installed that will monitor and control irrigation. Irrigation systems are also "smart" systems. They utilized on-site weather stations to be predictive regarding irrigation cycles and durations.

b. Access Control

Access control is being addressed on three separate fronts that need to be coordinated: Key control; compliance with state and DSA lock down controls standards, and District Design Standards. Design standards were development in conjunction with multiple staff at each college campus. The Facilities department has been working with the Safety and Security department to have a district-wide assessment performed of all doors and door hardware to assess and make recommendations for compliance with California Assembly Bill 211 (2009-2010 Regular Session, Chapter 430) and Division of State Architect Bulletin BU 11-05, that allow doors to classrooms and any room with an occupancy of five or more persons to be locked from the inside.

c. Facilities Construction Standards for ITS

Construction standards were developed in close coordination with ITS input. Systems that serve as the basis of design were included in District Standards. Recent projects at SAC and SCC have implemented these standards for mediated classrooms, for Wi-Fi coverage and security cameras. Projects are routinely coordinated with ITS to ensure compliance with the most current standards and prevent interference that would diminish current system capacity or functionality.

d. Blue Safety Phones

Blue Light Safety Phones are being coordinated across multiple campuses utilizing the same standard. The project is still in planning and coordination but the basic scope is the replacement of the existing phone with a new standard. Some replacement and additional phone coverage locations will be provided in current and planned Capital improvements at SAC. Other replacement or additional coverage locations will be implemented as stand-alone project(s). These efforts are coordinated with ITS, the Safety and Security department and campus staff.

H. Student Online Experience

The Rancho Santiago CCD needs to provide a robust online environment for its students in order to remain competitive with our neighboring colleges. ITS will remain focused on improving the online services to students as quickly as possible. In order to apply Colleague patches and updates, it is critical that we make little to no customizations to our ERP. Below are some of the initiatives that we are working on, which will greatly improve the online services:

a. Student Email and Microsoft Office365

Office 365 is a subscription plans, which we are entitled to utilize under our existing Microsoft Campus Agreement for no additional cost, which includes access to Microsoft Office applications plus other productivity services that are enabled over the Internet or within the cloud. RSCCD now has a district-wide implementation with **3,000** faculty members and **63,000** students licensed. Through this program, the students have access to the full Office suite for personally owned devices (PC, Mac and iOS), as well as web-based analogs and collaboration tools for each software package.

This suite offers faculty and students a constantly updated installation suite typical of an enterprise environment for personally owned devices. All of our 'active' students are now provided with Exchange email accounts within the cloud and collaboration tools for group learning situations. Looking forward, ITS will be adding functionality to allow more simple transitions for users switching between student and faculty roles, further automation, process improvement and capacity. Office 365 represents a change in direction for Microsoft and it is move towards SaaS (software as a service) licensing, and will become more integrated in many Microsoft products in the coming years. ITS is aligning its strategy with the move to the cloud in an effort to provide our students with access to the most up-to-date and dynamic online environment.

When students register, their account is created on our local domain and synchronized to Office 365 every 3 hours, with the goal of providing a new student with their Office 365 account the same day. This license application is a scripted, automated process, capable of moving students between active and alumni groups as well as processing name and role changes.

b. Ellucian Portal

Ellucian Portal is a higher education Portal that simplifies information exchange for our students, faculty, and staff by giving them a single point of entry. It eliminates the confusion of multiple

logins with a personalized, role-based, single sign-on access. This Portal will ultimately replace WebAdvisor and allows for personalized and customizable content so users get the information they want and the information we want them to see. It creates a seamless experience between applications such as Blackboard, Ellucian Colleague and more. Portal offers responsive design so viewers can use any device and have the same experience. It allows for targeted alerts, announcements, emails, and calendar notices. The campuses are still testing this application and will perform a soft rollout to selected groups in Fall 2016, with an expected full rollout in Spring 2017. WebAdvisor and Portal will be run in tandem for two semesters, with WebAdvisor being turned off for students beginning Fall 2017.

Below is a detailed description of our planned rollout of the Ellucian Portal in three structured phases:

1) **Fall 2016- Initial Roll Out:** The Portal teams have been pre-trained, the SAC IQ Bars are up and running in the Administration Building lobby and in the Library, where they have been serving students since summer 2016. The initial roll-out will be a soft launch as we start to highlight the Portal to students and make adjustments based on real-time feedback from them. Electronic forms for Counseling and Admissions and Records will be built out in the Portal during this time and staff training will continue.
2) **Winter 2017- Team Sites/Apps Roll Out**: We will be working over the next three months with colleagues from Ellucian to enable the team sites within our Portal to work with specific communication Apps that our student leaders have been very eager to have and use. This will include both piloting and training for interested user groups.
3) **Summer/Fall 2017- Embedded LMS Access:** The final official phase of Portal implementation will be the integration of our new LMS (Canvas), which will be incorporated into the Portal with single sign-on for seamless student access to academic materials and other critical items as part of the Portal experience.

Each of these phases at SAC is paired with professional development workshops that will take place within and beyond Flex Week and are also a part of the orientation process for new students. ITS will continue to refine and improve the overall functionality as each stage of implementation is achieved. The SAC and SCC project managers have been instrumental in the successful creation of this new student Portal.

Please refer to **Appendix E** for Ellucian Portal sample screen shots.

c. Technology and Instruction

Administrators, faculty, and departments need the ability to assess the effectiveness of various activities that are being undertaken for students' benefit. These activities are a myriad and include supplemental instruction, tutoring, course redesigns, and counseling services. Currently, there is very little way to coordinate students' involvement in these activities and their success. Individual student services that are offering programs to promote student success have very little recourse in finding out how effective a particular course of action was. Furthermore, faculty members are asked to assess their strategic learning outcomes (SLO's) for their courses. Both colleges have begun to use new systems for completion and assessment of SLO's. In order for these programs to be fully and effectively utilized, a comprehensive program for implementation and training needs to be developed with the use of the system.

The district and the State of California have placed a premium on assessment and accountability in order to determine the efficacy and cost-effectiveness of various programs

district-wide. Computer programs and training are necessary to allow faculty and staff to best utilize the data capabilities to the greatest effect. With the advent of the Colleague system, the district has acquired a powerful tool to assess the effectiveness of programs and to administer the various educational institutions in the district. Thus, there is an opportunity to leverage these systems to increasingly assess the effectiveness of courses, programs, and the colleges.

Santa Ana College Instructional Technology

There is currently some training available during the flex week but apart from that ITS is often asked to train users when they install new software or upgrade. While ITS has tried its best, ITS has not been able to cover this due to lack of personnel and training. Both staff and faculty need training. This has been recognized as a deficiency within SAC.

Instructional Technology Training

In Fall 2016, faculty at Santa Ana College elected to move from our current LMS, Blackboard to Canvas. The move to Canvas will require a significant workload to migrate classes and teachers to the new system. As a part of moving to Canvas, SACTAC has requested that all savings from the move go towards implementation of Canvas and improvement and expansion of the Distance Education program.

As a result of widespread improvement projects to our facilities and increasing demand, the campus is looking towards increasing our online class offerings. Increases in online class offerings require both increases in faculty involvement and improvement in curriculum design for online offerings. Currently, the majority of SAC's faculty are trained in in-person teaching methods, but require greater training and curriculum development to be effective in the online environment. We recommend that SAC hire an instructional designer and allocate significant funds towards online curriculum and professional development.

Support and training are not limited to the online teaching. There continues to be a need for support for software and hardware that is designed to improve instruction. The campus has placed significant investments into software, hardware and mediation. Faculty and staff need to be trained in how to use these technologies to improve instruction.

Hardware for instruction

SACTAC has the responsibility to promote appropriate technology in the classroom and online instruction. ITS is committed to support and promote the technologies researched and recommended by SACTAC.

It is the constant commitment from SAC that programs where technology and constantly shifting technology play a vital role in preparing students for the workforce request and receive technology that is consistent maintaining the program, faculty and students' recentness. Hence, it is SACTAC's first job to insure that SAC's faculty and staff have sufficient technology to retain our programs' competitive advantage.

Curriculum developed using these technologies are solely managed by the academic intellectual rights holders of the courses.

Online Instruction

SAC is committed to furthering online education and the use of LMS in all its courses, credit and non-credit. Faculty at both campuses require training, instruction and ongoing assistance with the LMS (Blackboard currently) and Distance Education best practices. The administration of course creation, enrollment, assessment and problem resolution in Blackboard can be extensive and requires continual staffing for immediate support of students/faculty. As a classroom that is "open" to students at any time, day or night, the support of faculty and students is a primary concern to both ITS, for hardware, network and Blackboard application support, and the colleges for support of student/faculty training, account access, and specific course support.

SAC is committed to using a good LMS. A good LMS would be one that:

- Enables faculty and courses to meet student educational needs and expectations
- Enables faculty to more effectively educate students
- Provides easy to use tools to faculty for teaching n learning
- Provides easy communications, collaboration and navigation
- Integrates well with the Student Management systems and other systems that may need to interact with it
- Enables the college to remain competitive

The current LMS is Blackboard. This may change to Canvas depending on evaluation results. The LMS task force performed the comparison of Canvas to Blackboard 9.x and Blackboard Ultra. The task force unanimously recommended that both campuses migrate to Canvas from Blackboard. This recommendation has been sent to the management to get approval.

Classroom Technology

Currently every classroom is mediated at SAC and has an instructor station with technical capabilities. Most have a computer with projection and audio and a document camera, projector with screen and ability to play DVDs.

Currently Utelogy technology is being piloted for mediating classrooms. A small number of classrooms were set up as a pilot project at both SAC and SCC colleges. Santa Ana College had three classrooms A-130, C-213, and R-202 converted to use the Utelogy technology along with the new Spectrum furniture, which is ADA compliant, and has an automatic lift so the table can be used from various heights.

Because SAC has mediated its classrooms piecemeal and has only recently has approached 100% mediation for the entire campus. Consequently, SAC needs to standardize its mediation equipment and bring all of the equipment on the campus to the mediation standard. Furthermore, all faculty must be trained in the best practices of the mediation standard.

Using Technology to Bridge the Digital Divide

The cost of textbooks and instructional materials have skyrocketed. Santa Ana College needs to take full advantage of the ability of technology to deliver instruction and instructional materials. Santa Ana College has committed significant categorical funds to develop OER courses. We recommend the continued use of technology to lower the cost of instructional materials for students and increase their deployment to more programs and course sections.
Furthermore, the campus commits to providing students with equitable access to technology to take full advantage of these materials. The campus' Digital Dons program has over 1000 laptops to loan students so that students who do not have computers in the home can complete their homework.

Technology and the Student Experience

As more money has become available for campus-wide improvements to SAC's technology infrastructure, SAC has increasingly committed to using technology to improve the student experience. SAC has five major student experience initiatives.

- Ellucian Student Portal
- Universal ID program
- Online Education Plans
- Degree and Certificate Audit
- Digital Dons

First, the student Portal is designed to improve communication with students and provide a one-stop location for students where they can register for classes, get their financial aid, find their email, access the LMS and get crucial information from the campus. The Portal is currently under construction and will be implemented in Spring 2017. The continual improvement of the Portal for the purpose of improving student experience is a priority for technology at SAC.

As part of the development of the student Portal, SAC has committed to the Universal ID program. All students will be given an ID, free of charge, for their use of student services. The universal ID program will allow SAC to track students in key student services and provide instructors with rosters that include student pictures as well as information about their students.

SAC must continue to provide students with appropriate and timely guidance as to scheduling classes and developing education plans to speed degree and certificate completion. The online education plans and degree and certificate audit represent significant steps forward in the use of technology to improve student experience. Online Education plans allow counselors to track student attainment of progress across multiple counselors and multiple years. Full implementation of Online Education Plans will be complete in 2017. SAC has used Degree and Certificate audit to identify students who are close to completing their degree and certificate goals or informing students who have completed courses towards a degree so that they can apply for the credential. SAC will continue to use degree and certificate audit as a best practice and use it as a way to give us information for future scheduling technology.

Technology is an undeniable aspect of the majority of our students' experiences. There is an increasing body of technology products and practices that can improve student outcomes and experience significantly. It is one of the commitments of SAC to continue to explore these opportunities and put them towards our students' best use.

Santiago Canyon College

Santiago Canyon College (SCC) is committed to using technology to increase student success by removing barriers that limit access to learning, and is committed to using innovative technology that promotes learning, increases motivation, connects us as a community, and creates time for motivating exercises that allow students to apply, analyze, evaluate and create.

Several interventions have been made to promote the foundation of instructional technology at SCC. Now that some of the foundational pieces are in place the focus will shift from planning to implementing our vision for instructional technology. In the coming semesters our focus will be on training. Several initiatives have been identified and preparations for implementing these initiatives are in place.

Teaching high quality online classes is important to SCC. Online teachers need quality technology and instructional design support. Additionally, the rules and regulations and effective practices for online teaching are continually evolving. A major change in online education is introduction of the California Community College Virtual Campus. This Virtual Campus will allow SCC instructors to teach online courses, which are made available to students at any community college in the state. Students taking these courses will be awarded credit at their home institution. Conversely, teachers from other community colleges in the State will be offering online courses directly to students at SCC for credit at SCC. This concept is a brand new concept for the California Community Colleges and will create several changes in online education in the years to come. Like SCC, the California Virtual Campus values high quality instruction. To meet this goal both SCC and the California Virtual Campus will be requiring any online teachers to earn an online teacher certificate before teaching their first online class. To meet the demand for training that the California Virtual Campus and online instructors have for training, SCC has begun to offer an aggressive in-house training program. First, SCC began to offer an in-house online instructor certificate course that began in 2014. This certificate program is based on the @One online certificate curriculum and has five classes to earn a certificate. The classes are: Introduction to Online Teaching and Learning, Designing Accessible Online Content, Introduction to Teaching with Blackboard, Designing Effective Online Assessments, and Building Online Community with Social Media. The second initiative that was implemented in the Fall of 2013 was to offer monthly instructional technology workshops that are offered on Friday mornings. These workshops will help to support our goal of promoting effective use of technology in the classroom for both online and face-to-face classes. The workshops are also designed to support our student service areas, helping them design ADA accessible content, and extending their reach with instructional technology and social media.

SCC requires our online instructors to take an online teaching workshop annually to maintain distance education currency. Our initiative for 2014 was to promote Instructor Initiated Regular and Effective Contact. This requirement was arguably the most important concept in online teaching. Without proper Instructor Initiated Regular and Effective Contact and student-to-student contact, the course would be considered a correspondence course, rather than an online course. Online instructors need to keep current with respect to online effective practices and rules and regulations for online classes. This topic is extremely important in maintaining the quality of our online classes, as well as supporting the Mission of Santiago Canyon College of maintaining an "…innovative learning community dedicated to intellectual and personal growth." The topics discussed for Instructor Initiated Regular and Effective Contact range from communication technologies, social media, email, assignment feedback, creating effective assessments, promoting student-to-student contact, authenticating your student, and more. Our regular instructional technology workshops have focused on ADA accessibility, screen capture, and video editing. In the future, the goal of these workshops will be to support student services by designing workshops that enable them to better extend their services to the online and traditional students. Additionally, the workshops will focus on using Web 2.0 technologies in the classroom and workplace. Additional technology workshops may be developed and offered to students on topics, such as collegiate instructional technology and Blackboard.

Santiago Canyon College has been supporting the classroom instructional model of Flipping the Classroom and promoting the use of Open Educational Resources (OER) for several years. We will continue to support these initiatives and have seen some exciting implementations of both in the classroom. Several of our instructors are flipping or adapting their Classrooms with positive results for both students and instructors. We are also continuing to promote OER and we hope to become a founding member of the Mindspring Project, which will promote OER on an institutional level.

In total, the direction of Santiago Canyon College will be to provide high quality training and professional development opportunities to our faculty, staff and students. This training will provide the foundation our faculty, staff, and students need to support our overall goal of promoting high quality online classes, innovative use of instructional technology, creative ways of deploying curriculum, and providing our students with high quality instructional materials at a low cost.

In regards to the changing technology and the gap in faculty knowledge of these new technologies, the colleges and ITS frequently receive requests to purchase or provide technology/software so that faculty can enhance instruction. Some of the requested technologies have stabilized, some are older technologies not worthy of support, and some are so new they need to be researched. TAG has the responsibility to address these issues to promote appropriate technology in the classroom and online instruction. ITS is committed to support and promote the technologies researched and recommended by TAG.

Under the direction of the colleges' Offices of Distance Education, ITS supports the Blackboard system. However, TAG and ITS recognize and respect that the curriculum developed using these technologies are solely managed by the colleges.

Santa Ana College and Santiago Canyon College are in agreement that faculty at both campuses require instructional and ongoing assistance with Blackboard and Distance Education best practices. The administration of course creation, enrollment, assessment, and problem resolution in Blackboard can be extensive and requires continual staffing for immediate support of students/faculty. As a classroom that is "open" to students at any time, day or night, the support of faculty and students is a primary concern to both ITS, for hardware, network, and Blackboard application support, and the colleges for support of student/faculty training, account access, and specific course support.

From the colleges' perspective, the ideal Distance Education Program would be one that allows the colleges to remain competitive among other educational institutions and allows them to meet student educational needs and expectations, knowing what currently works at the respective campus sites. To remain competitive and to more effectively educate students, e.g., improving student success and eliminating barriers to entry or academic completion, each college would require an Instructional Design Center of which Distance Education would be a component.

The adoption of the Utelogy technology for mediating classrooms began in fiscal year 2015-2016. A number of classrooms were set-up as a pilot project at both SAC and SCC colleges. Santa Ana College had three classrooms A-130, C-213, and R-202 converted to use the Utelogy technology along with the new Spectrum furniture, which is ADA compliant, and has an automatic lift so the table can be used from various heights. One room was similarly designed at SCC in room D-101 as part of this pilot process. Starting in the current fiscal year 2016-2017, and as part of the D building renovation at SCC, eleven rooms D-204, D-205, D-206, D-207, D-208, D-215, D-216, D-217, D-220, D-221, D-222, and one in the Science Center building SC-206 were fully furnished with Utelogy technology. All 12 SCC classrooms were ready for the opening of Fall 2016 semester. The plan is to continue at both colleges to acquire this type of technology to mediate the classrooms in the future because it provides a centralized management solution. The district now has a purchasing approved process to move forward with future replacement of media equipment in the classrooms regardless of the purchasing size.

The colleges have expressed the desire to have an Instructional Design Center that includes the following functions: Director of Instructional Technology, Instructional Designer, ITS Liaison,

Accessibility Expert (Americans with Disabilities Act), Media Expert, Web Designer, Trainer, helpdesk staff and programmer. The center would require a facility on each campus as a one-stop location providing for a faculty training room, audio/video recording rooms, and equipment checkout and storage area. This request was recently reiterated in 2016 when the LMS task force performed the comparison of Canvas to Blackboard 9.x and Blackboard Ultra. The task force unanimously recommended that both campuses migrate to Canvas from Blackboard. Survey's to both faculty and students were performed and a faculty pilot project was held over the summer of 2016. The savings from licensing costs could potentially be reallocated to fund this Instructional Design Center.

As an ultimate solution to assist faculty in providing best practices in the classroom, the Instructional Design Center would provide a one-stop location for all faculty whether their course be online, hybrid, or face-to-face. It has been the experience of the colleges that campus-based, drop-in training, and support best serves the faculty. Thus, an Instructional Design Center is recommended at each college. Technology is used throughout the curriculum of each college and it is necessary for faculty to have the training, assistance, and tools ready for utilization.

d. Student Internship

The Student Internship Program at SAC provides students work experience while they study. The college provides a few options:

Option 1: Internship (paid and unpaid)
Option 2: Current Employment

ITS SAC currently participates in option 1, unpaid internships. ITS provides students who qualify a chance to get some work experience under mentorship. The students go out with the ITS technicians on various calls and assist in a variety of tasks including installations and basic hardware and software support.

The internships at SAC counts towards Computer Science course credits and run through the CS104 course. The internship experiences are linked to the CS104 Work Experience Course objectives. This is the capstone course for these certificates.

In the past year, five interns have passed through ITS within this program. Several of them have been hired as short term or substitute paid employees within the ITS department after their successful participation within the internship program.

Centralized Services

A. ITS Budget

The primary cost of ITS resources is personnel. The annual maintenance agreement renewals are our second largest expense. The cost of our software renewals and maintenance agreements continues to increase over time. The list of our renewals has been shared at TAG in 2015 and 2016 in an effort to provide transparency. Here are the rough costs:

- **$1,833,244** for 2015
- **$2,122,777** for 2016

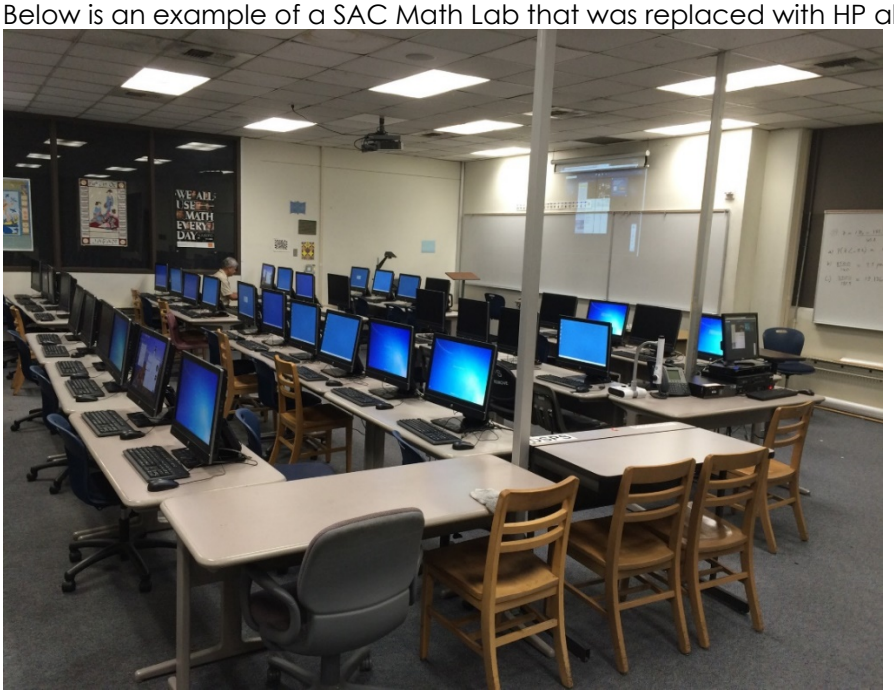
We have been required to add additional services and tools that relate to security to help keep our systems safe. Additionally, the migration to the cloud has increased our overall costs, and these additional costs have been offset by the reduction of an ITS Director position that was vacated due to a retirement.

ITS has been able to fund a small amount of computer replacements by using its internal budget. SAC and SCC TAC are used to help determine which labs and/or computers should be replaced at their respective campuses. ITS tries to keep the 70-30 split in mind during our expenses. For example, if there is $100,000 remaining in the ITS budget, then SAC would get $70,000 and SCC would get $30,000 respectively toward funding computer replacements. However, when it comes to infrastructure costs for some items such as network switch, UPS's, wireless access points, and camera's, it is more difficult to maintain this fair split.

There is no official replacement plan that is centrally funded. At this time the colleges are using the local SAC and SCC TAC committees and the planning and budget committee to determine the priority and locations for computer replacements. ITS can assist with providing inventory information so that the oldest computers are replaced first.

An updated and automated inventory list of the computers within the N (non-instructional) and I (instructional) sides is critical. Our eventual goal is to project the future computer replacements necessary at both campuses and the local campus allocates the necessary budget to fund the identified replacements equipment.

Below is an example of a SAC Math Lab that was replaced with HP all-in-one computers:



B. Technology Staffing

Technology resources are an essential core component for every constituent, whether they are faculty, staff, or students. Effective decision making is heavily reliant on a clear understanding of business practices, and technology is at the center of this process. Some key areas that rely heavily on information and technology are Admissions and Records, Financial Aid, and Counseling. Benefits can include shorter lines, accurate and timely financial information, and more complete educational records, just to name a few.

SAC Staffing Needs
Technology has now become mission critical. It is essential to examine the environmental factors that are contributing towards the use and need for reliable, up-to-date technology. Several mission critical systems rely on technology such as communications is dependent on technology The model the college is following is with centralized networking and applications support and on-site academic technology support.

ITS at SAC has the following structure:

- Academic Support Director -1
- Technology Specialist III positions -3
- Technology Specialist II positions -3
- Technology Specialist I positions -3
- CEC - Technology Specialist I positions -3

Total SAC I side Stations	1559
Total SAC N side Stations	798
CEC	424
DMC	74
Sheriff Academy	14
Delhi	25
Corbin Center	20
OC Jail	25
Sac B21 from Washington Elementary	10
Esqueda Elementary	11
SER	30
Santa Ana Senior Center	19
Grand Total SAC, CEC, and others	**3009**
Digital Dons	1200 + 3009 = **4209**

This current staffing level is low and with the amount of requests constantly flowing in, this barely sustains the current levels of technology that the college has attained. It is supplemented by part-time short term employees. Construction at SAC is widespread and causes all types of disruptions. The need for quick remedies and the for moving departments from one building to another adds a large quantity of tasks to the existing ITS workload.

SAC currently has over 3000 computers and 1200 HP tables for the Digital Don program. This does not include tablets, printers, scanners and other technology that SAC ITS maintains. ITS has a small team and the current ratio of technology to technician is very high at approximately 250 computers per technician. ITS's recommendation for a best practice ratio is closer to 200

computers per technician. There is currently a need for a minimum of two more technicians per SACTAC's Integrated Technology plan. One proposal is district and SAC management collaborate and bring ITS up to the level that can actually supply the service levels demanded. The role of ITS needs to be carefully defined and it needs to be appropriately staffed. Another aspect that has become apparent is the need for budget to keep the computers updated, upgraded and maintained in a timely manner. At present the computers are aimed to be upgraded every 5 years. There is no current standard for printers and peripherals. **One additional position will bring the ratio down to 231 and two additional positions will bring the ratio down to 214.**

A number you will see batted around as far as an "ideal" end user to IT service desk worker ratio is Gartner Research's 70:1. A 2008 survey by Robert Half Technology found actual reported ratios of 136:1, while the average "ideal" ratio reported was 82:1. Look through discussion threads online, however, and you'll see numbers are all over the map, from one lucky soul in a white collar environment with a 30:1 user to service desk worker ratio to another unfortunate service desk worker that is outnumbered with an 800:1 ratio. An informal average calculated from 17 reported users to service desk worker ratios on numerous IT discussion threads was 242 users to one service desk worker. Shockingly, though not surprising, the median was **200:1**.

The ITS management team understands the challenges with approving additional ITS staff. **ITS recommends the addition of a Network Specialist II position at SAC as being the MOST CRITICAL need at this time**. We have so many network and infrastructure issues going on at SAC due to the vast construction and changes that are going to be taking place over the next decade, that we feel this would be the best position at this time to help ITS better meet the needs of our SAC faculty and staff. We have reassigned a district Network Specialist II to SAC to fill this need - two days per week, however, this is clearly not enough. And, this puts additional strain on the district network team, which is responsible for supporting all locations.

As per SAC ITS a second TS1 position would be extremely useful as not only is SAC dealing with wide spread construction but the needs of off sites have grown as they have lost technical staffing while their technical support needs along with technology use and support needs at SAC have grown exponentially.

Currently needs are being met by part-time short term staff or the past few years. However due to the nature of that type of employment he staff cannot be reemployed and therefore ITS loses all its time put into training these positions and the staffing is lost soon after it becomes useful. With two more positions this issue will be less critical.

There needs to be further development of a 5-year technology plan that addresses the needs of replacement and develops yearly timelines to coordinate the replacement and reallocation of computers, software, and hardware that have become obsolete. Funds from the central ITS budget are available for this purpose and the campus SACTAC sets priority for computer replacements.

SCC Staffing Needs

ITS at SCC has the following structure:

- Academic Support Director -1
- Technology Specialist III positions -1
- Technology Specialist I positions -2
- Network Specialist II positions -1
- OEC - Technology Specialist III positions -1
- OEC - Technology Specialist I positions -1

Total SCC I side Stations	1223
Total OEC I side Stations	839
Total SCC and OEC I side Stations	2062
Total SCC N Side Stations	499
Grant Total SCC and OEC N and I side Stations	**2561**

SCC currently has over 2500 computers. This does not include tablets, printers, scanners and other technology that ITS maintains. ITS has a small team and the current ratio of technology to technician is very high at approximately 426 computers per technician. ITS's recommendation for a best practice ration is closer to 200 computers per technician.

C. Computer Replacement Plan

The district standard plan calls for computers, both academic and administrative, to be refreshed on a five-year cycle. Printers and classroom projectors are also to be refreshed every five years. Replacement computers are funded by the colleges or district department. Our current budget model at the district office is to funnel all remaining funds back to the campuses at the close of the fiscal year. Therefore, it will be the responsibility of the colleges to consider funding a computer replacement plan. ITS recommends that SACTAC and SCCTEC prioritize all technology related purchases, and the centers, grants, and off-site locations should be taken into consideration during this process. If there are any opportunities for ITS to fund replacements by utilizing the current ITS budget, then this will be made a priority, since it is our best interest to use our Technology Support staff members in the most efficient manner possible. After a computer reaches its useful life, then the ongoing support costs will escalate significantly. Spending expensive staff time trying to get old PC's to function properly is not a sustainable activity.

D. Communication

ITS is committed to providing quality and timely communication internally across our divisions and to our customers. Some of the communication initiatives that ITS has taken upon include the following:

- Regular biweekly meetings and ongoing conversations between division directors to ensure there is a common understanding on existing initiatives and projects and guarantee alignment of strategy for the department
- General email notifications for planned maintenance work that involves outages or any other type of impact to system access
- General email notifications when unexpected downtime or reduced system access events occur. Frequent updates on ETA for a resolution and also follow-up messages when a resolution transpires
- Email alerts when spam, phishing attempts or other detrimental activity is detected in the network to ensure people know what to avoid, and what to do when faced with these types of events

ITS will continue to assess gaps in our communication strategies. Some of the initiatives that we intend to take upon to improve communication procedures include:

- Developing Standard Operating Procedures (SOPs) that guide the processes to be followed when updating ticket notes, escalating trouble issues across ITS divisions and notifying of downtime, among others. Assessing the use of self-help documents and

onboarding orientation to make sure all our stakeholders are aware of the different technologies available to them and how to get access to them
- Looking into ongoing training on existing technology capabilities, security awareness, and other topics of importance
- Assessing alternate effective methods of communication beyond email

Our ITS Network team has taken a proactive approach to communicate with our users regarding spam and phishing because we continue to receive fake (phishing) emails. Although we have safety measures in place, this is unfortunately a common and ongoing issue. It only takes one message to create problems. As such, our best method of defense is the action that we take when suspicious emails arrive:

- Do not respond to any emails that ask you to provide your user name and password, even if you know the sender
- Ignore messages that warn you about your account being deactivated unless you sign in to confirm your information
- The ITS department and the ITS helpdesk will never ask for your password, nor send emails informing you that your account will be deactivated
- Review the attached PDF for additional guidance on how to spot phishing email messages

Below is a sample phishing email that recently went through our system. Please notify the ITS Helpdesk ASAP at 714-564-HELP (4357) or x44357 if you have responded and provided your user account information:

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SAMPLE PHISHING EMAIL:

Dear Staff(s).

New security updates need to be performed on our servers, due to the rate of phishing. Please Click Faulty\Staff<xxxx://helpdeskcom.webeden.co.uk/> and sign in to the IT Help server for maintenance and update of your mailbox.

If your mailbox is not updated soon, Your account will be inactive and cannot send or receive messages.

On behalf of the IT department, this IT Alert Notification was brought to you by the Help Desk. This is a group email account and its been monitored 24/7, therefore, please do not ignore this notification, because its very compulsory.

Sincerely,
IT Department

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Also, the following attachment was sent with to all of our end-users as part of educating:

How to Spot a Phish

Finding the phish 101 with Professor Troy

Lesson 1: Watch out for emotions

Greed

Phishing emails often dangle a financial reward of some kind if you click a link or enter your login information. If an email offers you something that seems too good to be true, it probably is.

Urgency

If an email provides a strict deadline for performing an action – be suspicious. Phishing emails will try to fluster recipients by creating a sense of urgency.

Curiosity

People are naturally curious, and phishers take advantage of this by sending emails that promise to show us something exciting or forbidden.

Fear

Scaring recipients is a common tactic in phishing emails. Emails that threaten you with negative consequences or punishment should be treated with suspicion.

Lesson 2: Examine these items closely

Email Signatures

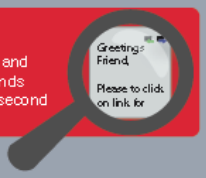
A signature block that is overly generic or doesn't follow company protocols could indicate that something is wrong.

Sender Address

If the address doesn't match the sender name, be suspicious of the entire email.

Email Tone

We know how our co-workers and friends talk, so if an email sounds strange, it's probably worth a second look.



Lesson 3: Beware of these elements

Attachments

When an attachment comes from someone you don't know or if you weren't expecting the file, make sure it's legitimate before opening it.

From: Joe Smith
To: Troy Foster
Subject: WebMail Migration

Attachment -- Webmail_Migration.pdf

Troy,

This is to inform you that we are in the processing of migrate our email infrastructure to the Windows 2003 platform, which includes an e e-mail.

Log-in Pages

Spear phishers will often forge login pages to look exactly like the real thing in order to steal your credentials.

Attached is a document outlining the benefits of th migration we request you to enter your Windows password before 8 PM on Tuesday. Failure to do so will result in being locked out of your email account!

Please click here to update your password.

Thank You,
John Smith

Links

Roll your mouse pointer over the link and see if what pops up matches what's in the email. If they don't match, don't click.

If you see something, say something!

Report suspected phishing emails to the information security team.

PHISHME

E. Helpdesk

The ITS helpdesk is the central hub for receiving customer requests for service and is located at the District Office. Our helpdesk is responsible for all incoming requests on hardware, software, network, and phone for support for staff and faculty for all campus locations. With the release of email for students and Microsoft Office365, the helpdesk is trying to support the added volume for students with login issues. SAC has recently released the IQ Bar and SCC is in discussions regarding student support. Because the ITS helpdesk is currently staffed with only one classified employee, it is impossible for ITS to provide ongoing student support.

The ITS helpdesk is the first line of support for faculty and staff as we try to assist in trouble shooting either over the phone, via email, or by remoting into the user's computer to assist with resolving the issue. The helpdesk ticketing system is Solar Winds software and tickets are sent to the technicians at the various locations after the initial diagnosis is made on the end-user's issue.

Faculty and staff can contact the ITS helpdesk by email, online, or by phone:

- Email: helpdesk@rsccd.edu < this is the quickest method*
- Online: Help Request & FAQ
- Call: 714-564-HELP (4357) or 44357

* When a user emails helpdesk@rsccd.edu, a ticket is automatically generated, so please limit your requests to one topic per email so each topic can be assigned to the appropriate person. Within the email you can add attachments or screenshots, which will be added to your ticket automatically.

End users should verify that they provide as much relevant information in their email or voicemail as possible so we can expedite the request. Please do not sent private information such as social security number, birthdate or home address information via email. Helpdesk@rsccd.edu will be sending you emails for each step of the ticket process:

- **New**: You will receive an email when your new ticket is created.
- **Assigned to Tech**: Once assigned to the appropriate person, you will receive an email.
    - Any questions regarding your ticket will be done via email and saved as notes inside of the ticket. Simply hit "Reply" to the email to add your notes to the same ticket.
- **Resolved**: When the work has been completed you will be sent an email, which has a Yes/No option.
    - If your issue is truly resolved then click Yes, which closes the ticket.
    - Clicking No will reopen the ticket and assign it back to the technician.
- **Pending**: If ITS is waiting on information (hardware or software to complete your request) your ticket will be updated to a Pending status while we wait.
- **Closed**: Upon closure of the ticket you will receive one final email with a link to our ITS survey.

ITS is investigating the possibility of implementing Information Technology Infrastructure Library (ITIL) industry best practice processes into the helpdesk workflow to improve server levels, get better analysis on trending issues, and to properly track authorization requests. ITIL is a framework

that contains a comprehensive set of practices to execute and improve IT Service Management. Some of the processes that ITS intends to implement overtime include:

- Incident Management
- Problem Management
- Request Fulfillment
- Change control

F. Data Warehouse

ITS supports three main data repositories or warehouses of data. The most robust system being the Online Report Repository, which can be found here: https://reports.rsccd.org. This repository supports **218 reports**, data extracts, and processes used in gathering or reporting data elements for RSCCD. Our second repository is the original Legacy Report Repository. It houses a few remaining reports that will be rebuilt and transitioned over to the Online Report repository by the end of 2016. Our final data warehouse is used primarily by the Institutional Research along with campus research staff. It houses over **200 data elements** used in a wide variety of internal as well as external reports, sent on behalf of RSCCD. This data warehouse continues to grow and develop as the required data needs of the campuses change.

ITS is focused on providing the best source of data for all reporting requirements and has begun a transition to a more reliable data repository for all reporting via Ellucian Hosted Services. This new infrastructure will allow ITS to transition data on demand to a secondary database thus all but eliminating the stress on the Colleague database from outside processes. This change once completed should allow for better data and improved stability within the Ellucian Colleague systems.

G. CA State MIS Reporting

The state of California mandates MIS (Management Information Systems) reporting for all colleges within our system. This is a significant and critical task that ITS is required to perform on an ongoing basis. In an effort to improve both data accuracy and submission times, ITS has dedicated a large portion of our Business Systems Analyst position to complete this task.

The California Community Colleges MIS reports encompass four term reports and five annual reports. ITS works in close coordination with multiple colleges and district departments to submit this data. The data is extracted and formatted from Colleague and translated for departmental review. Once all review and updates are complete, the data is submitted to the state Chancellor's office. A working calendar has been created for the departments so they are aware of all submission dates. Below is a sample of our calendar:

MIS TERM DATA SUBMISSION DATES

TERM	CC Dates		CE Dates		MIS Dates		Data Due To ITS	Data Due to State
	Start Date	End Date	Start Date	End Date	Start Date	End Date		
Spring 2016 (163)	2/8/2016	6/5/2016	1/11/2016	6/4/2016	2/1/2016	6/5/2016	6/20/2016	7/5/2016
Summer 2016 (165)	6/13/2016	8/7/2016	6/6/2016	8/6/2016	6/6/2016	8/7/2016	8/22/2016	9/7/2016
Fall 2016 (167)	8/22/2016	12/11/2016	8/29/2016	12/17/2016	8/8/2016	12/18/2017	1/16/2017	2/1/2017
Intersession 2017 (171)	1/9/2017	2/5/2017			12/19/2017	2/5/2017	2/20/2017	3/5/2017
Spring 2017 (173)	2/13/2017	6/11/2017	1/9/2017	5/27/2017	2/6/2017	6/11/2017	6/26/2017	7/11/2017
Summer 2017 (175)	6/19/2017	8/13/2017	TBD	TBD	6/12/2017	8/13/2017	8/28/2017	9/13/2017

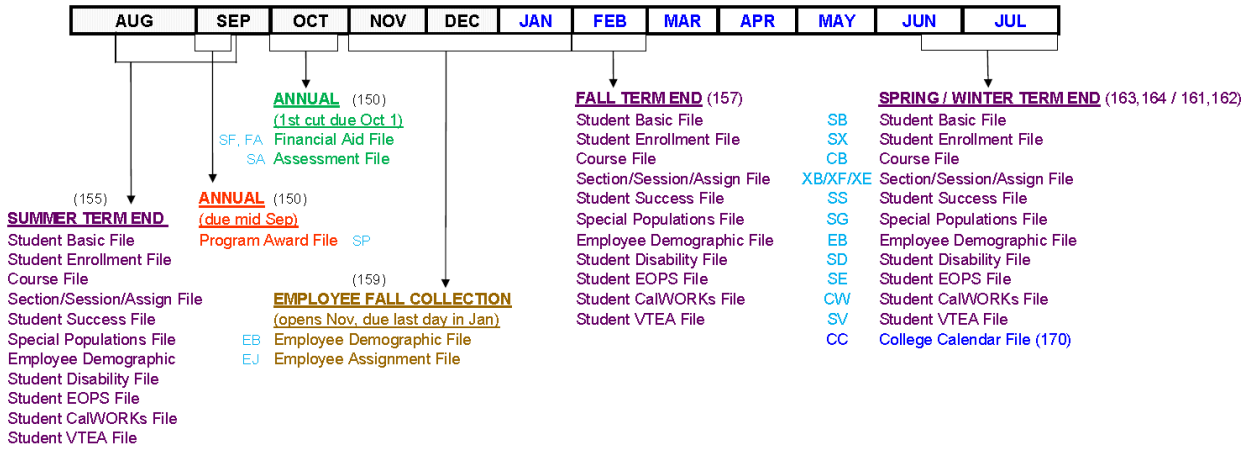
Departmental meetings are held to review the data intake process and coordinate ways to maximize the reporting of services offered. We have created several audit reports in the online report repository that allows the departments to run periodic checks on the MIS data and make corrections prior to submission deadlines. We constantly review each report process and determine if we need to move outside the delivered process, and build our own custom extracts in an effort to optimize contents and timelines. Moving forward, we have plans to build more audit reports with a goal to have a specific audit report for each MIS file type that can be shared with our end users. Additionally, in 2016 we were able to fill the second Business Systems Analyst position in ITS. This will allow us to have cross training and assistance with this critical component as we are required to adhere to these strict reporting deadlines. It is clearly in the best interest of RSCCD to have accurate data submitted because many other critical reports are generated by using this key MIS data for comparison purposes, such as the Student Success Scorecard.

ITS continues to attend all state update meetings, training opportunities, and keeps in constant contact with other colleges in regards to upcoming MIS updates and changes. Our ultimate goal is to maintain consistent, accurate, and timely delivery of the data to the state with the best interest of each department and the RSCCD district as a whole.

ITS is using a two-step approach for MIS submissions. The first part is a detailed audit report that tracks every syntactical, referential and quality check on data for each file that the State does on their side. It then flags errors and explains how to correct them. Snapshots are stored inside of a dashboard so that administrators can see the work that is being completed as well as remaining errors. The second part is a complete list of those files that will clear state validation checks and those records will be the only records submitted to the state. ITS is acknowledging that this new focus has brought RSCCD more in line with the expected MIS deadlines which are 30 days after the term ends. Below is the submission calendar from the Chancellor's office, which we are required to follow:

CALIFORNIA COMMUNITY COLLEGES
MANAGEMENT INFORMATION SYSTEM

MIS DATA SUBMISSION TIMELINE 2015-16



- **All term-end files are due within one month after the end of each term, with the following exceptions:**
  Winter Quarter data is due at the same time as Spring Quarter data.
  Districts with a Fall due date in January are not required to submit until the first Monday in February.

- **THE LAST DAY TO RESUBMIT:**
  Summer, Fall, Winter, Spring term-end files for allocation purposes is the first Monday in August (by 5:00 PM).
  Financial Aid data for VTEA allocation purposes is the second Friday in February (by 5:00 PM).

H. Federated ID

On April 11, 2016, the Board approved an agreement with Ellucian Systems for Application Hosted Services (AHS). This project moves our critical applications of Colleague, Web Advisor, and Image Now to the hosted environment within the cloud. We later recommended an additional supplemental module, called Ellucian Identity Services (EIS). A discussion detailing the impact and benefits of adding EIS was presented at the Technology Advisory Group (TAG) on April 14, 2016.

The Ellucian Identity Services (EIS) agreement and module will allow the ITS department integrate and provide for single sign-on (SSO) solutions to various 3rd party applications. Currently, the ITS department does not have a tool to allow us to build easier authentication (for students, faculty, and staff) between the various applications that we currently use, or may use in the future.

I. ERP System - COLLEAGUE

According to the California Community Colleges Technology III plan, "Enterprise Resource Planning (ERP) systems integrate, or attempt to integrate, all data and processes of an organization into a unified system. A typical ERP system will use multiple components of computer software and hardware to achieve the integration." This has proven true at RSCCD in that we have several software and hardware systems that make up our ERP digital footprint.

One difficulty in supporting the core business processes is balancing the requests with resources in a transparent manner. Therefore, in 2012, ITS began meeting with the college vice presidents and impacted department leaders to discuss projects that are resource intensive, provide information related to these projects, develop customizations to meet all colleges requests, and to better prioritize the projects.

Colleague—Fully integrated solutions for Admissions and Records, Curriculum and Scheduling, Financial Aid, Fiscal Services, and Human Resources. These solutions leverage the same comprehensive data to maximize departmental efficiencies by improving workflows, business processes, productivity, and efficiency across the entire district. Colleague is comprised of several modules and servers, providing "near" 24/7 access via the WebAdvisor and Ellucian Portal products.

Blackboard—Designed to meet the needs of both students and faculty to work inside and outside the classroom in ways that make sense to learning. The Blackboard solution is used for our online curriculum, hybrid sections, and as supplemental to the traditional "brick-and-mortar" classes. The district has chosen to have Blackboard host this solution. Information is ported from Colleague to the Blackboard system.

OCDE—Orange County Department of Education (OCDE) houses our payroll system which includes entering position and related pay for employees, tracking leave accrual and usage, and tracking timesheet hours.

CurricuNet—Designed to automate the entire process of submitting course and program proposals to the State Chancellor's Office via the web, providing a streamlined process for a cumbersome process. Once course descriptions are approved by the State, they are then entered into Colleague. CurricuNet retains course change history while Colleague holds the current descriptions.

OpenCCC Apply—Our online application solution was product developed by the State Chancellor's Office and used by most of the California Community Colleges. ITS created the Colleague integration solution to import the data into Colleague.

ImageNow—Document imaging, document management, and workflow for the forms and or documents that our colleges process in Human Resources, Payroll, Financial Aid, and eventually Admissions & Records, replacing the current LaserFiche system.

Astra Schedule—An interactive scheduling system that assists coordination of academic, event, and resource scheduling functions.

Attendance Tracking—A tracking system to track the time students spend in open-entry/open-exit labs, tutoring centers, fitness centers, and Math labs, English labs, and computer labs.

These solutions contain the mission critical data for the entire district, therefore, it is imperative that both the software and hardware are up-to-date, tested, and patched, and that the hardware is budgeted to rely on growth and upgrades.

With the implementation of Colleague, a committee of individuals from key departments was formed to test patches to these systems. With the software so tightly integrated, if a patch was not tested, the error will have a rippling effect, traveling through all the systems. Patches are loaded into a test environment on a monthly basis. This team tests patches and gives the

approval to move patches into the production environment. This process is scheduled to occur monthly so the district does not fall behind on patches.

When there are patches to the operating system that these solutions are installed on, they are first certified by the vendor. For example, if Oracle or HP updates their software, Colleague will first certify that their software has been tested on the new platform, then ITS will ask the committee to perform its tests. Once the committee is satisfied and has given ITS approval, the new operating system patches are moved into the production environment.

J. Web Presence

The institutional websites for the district are composed of three sites completely dedicated to prospective, current, and former students/employees, as well as the community at large. One institutional website is internal and provides online services for employees only. All of these four sites are hosted and maintained on district servers.

Website guidelines need to be established to help control to ensure quality and accessibility standards are met for locally hosted and outsourced websites. Examples of the details that the guidelines should contain include domain names, hosting agreements, Section 508 compliance, captioning, etc. Domain names should be requested and purchased by ITS so that renewals are centralized and can be managed.

The overall goal is to keep as many websites within our SharePoint environment.

a. External Institutional Sites

Each of the colleges owns and maintains individual websites that facilitate many of the services available to the students, faculty, and the community. Santa Ana College maintains its web presence in www.sac.edu and Santiago Canyon College at www.sccollege.edu. Each of the colleges established a web committee that serves as a steering group to oversee the website functionality, content, and look and feel, as well a web content management(WCM) engine upgrades. Each web committee made up of all college constituencies provides recommendations and decisions from regularly scheduled meetings to the rest of the colleges shared governance structure. The web committee for each college serves also as the main liaison between web content publishers and ITS department. Most of the district office services are publicized in the www.rsccd.edu site. Unlike the colleges, the district website functionality, look and feel, and content is overseen by cabinet members, managers, and a representative group of departmental web publishers. This group comes together into scheduled meetings when is time to make major website changes to collaborate with Public Affairs/Governmental Relations and ITS departments.

Each of the institutional websites reflect their individuality, and approach to appeal and serve the needs of constituents for their own service areas. In addition, the main purpose of the websites is to facilitate college information and services online such as:

- College application
- Class registration
- Operation Hours
- Academic Programs information
- Financial Aid information
- Employment information

Now that all sites are running on SharePoint 2013 web content management engine, the next challenge to overcome for the three public websites is to exploit integrating publishing tools, apply branding deployment functionality, and extend accessibility to mobile devices. Facilitating website access to the growing number trend of mobile users is an important goal to remain competitive in the student outreach and retention arena.

b. Intranets

The district has an institutional website dedicated to communicate with employees addressing district operations and services that lend themselves for a safe and secure online environment. The Intranet provides report viewing, form sharing, online counseling tool, training materials, etc. The employee Intranet website address is https://intranet.rsccd.edu. The site is accessible to employees only via a secure authentication method similar to the industry standard used to process online monetary transactions.

The next challenge is to provide employees the ability to maintain their own individual work site within the Intranet environment. The site will allow them to store and selectively share documents/information relevant to their assigned duties with other co-workers or departments. Similarly, there is the challenge to persuade individual departments, divisions, committees, and task force groups to take advantage of the benefits of using collaboration sites. These collaborative sites foster cooperative work via an online environment, whether developing a report, planning a meeting schedule, or follow up on meeting action items. The flexibility of making available work in progress documents to a small group, as well as finalized reports to the entire employee population are additional benefit examples.

The next biggest challenge of all is the planning, design, and implementation of a student/employee web Portal. A web Portal will be the capstone to complementing block-building steps towards a single sign-on. The tailoring of the main system of records and its satellite systems had been to work hand in hand with our employee directory services infrastructure. The single sign-on process will centralize a single access point for students or employees to applicable online services without having to redundantly login to various systems. The implementation of the student/employee web Portal is the culminating step to building the single sign-on process.

c. Niche Sites

The district also hosts niche websites for several economic development and education programs affiliated with the district. These websites are typically .com or .org sites supported with various levels of district resources. At this time, there are no formalized style guides for these sites, but the district expects a certain level of professionalism. RSCCD has no formal governance over these websites, but works with department or program administrators when issues arise. Support of these websites is based on availability of staff. These sites include:

Corporate Training Institute (www.cti4success.org)
Santa Ana College TV/Video (sactv.sac.edu)

K. Planned Initiatives

ITS is working to ensure the main server rooms at the campuses are protected by Transient Voltage Surge Suppressors (TVSS). These devices have the ability to protect electronic equipment against ground surges and other power conditions that UPS equipment cannot protect against. Adding a TVSS in our main data centers will provide an additional layer of

protection for IT gear and UPS devices, which can get damaged from unexpected power conditions.

An assessment is scheduled to occur to evaluate options to get alerting from AC and UPS units in the main data centers and critical locations where we are not currently receiving notifications of issues. The goal will be to have the most critical alerts go out to not just ITS staff, but also to vendors in charge of supporting the equipment.

ITS is looking into establishing ongoing Power Generator transfer to UPS testing district-wide. Current testing methods test Generators and UPS units individually through separate vendors. ITS recommends to have one single vendor manage and coordinate concurrent testing for both Generator and UPS equipment, given the criticality of accomplishing successful UPS power transfers from utility to Generator power. Without successful transfers, data centers cannot sustain extended power losses, which increases exposure to unexpected downtime.

ITS is in the middle of a project to add at least **80 rack mountable** UPS units to IDF areas at necessary locations where backup battery power was either unavailable, in need of replacement, or not present. This will ensure that campus areas can sustain through temporary power outages and most power surges. ITS understands it is critical for our IP Phone system to retain power, so that it's available during outages. All IDFs at all campus locations will be assessed on an ongoing basis, as battery life is limited to 3-5 years, which requires vigilant attention to ensure continued protection.

ITS is looking into adding temperature probes at IDFs district-wide, to ensure that proper monitoring and alerting is received when environmental conditions pose a threat to IT gear. Some of the most critical areas where temperature is already monitored will be assessed for additional monitoring to include humidity, power conditions, water detection on the floor, etc.

An assessment on the existing fire suppression mechanisms at the main data centers at SAC and SCC is also due to occur to ensure existing systems continue to meet the needs for both rooms.

L. Technology Training

The TAG committee identified a critical deficiency within RSCCD in the availability of technology training and support. TAG has focused on the two major shortfalls within the district: Academic Training & Support and Operational Training & Support.

There are two online training resources that are currently available for employees: 1) Microsoft E-Learning and 2) Lynda.com.

Microsoft provides a large quantity of training under our current campus agreement. The details to login to training are on the ITS website: https://rsccd.edu/Departments/Information-Technology-Services/Documents/MSTraining.docx.

The Professional Learning Network (PLN) announced in 2016 the availability of training provided by Lynda.com for California Community College employees on the PLN website. Once logged into the PLN, employees will be able to access Lynda.com resources. Here is the website: https://prolearningnetwork.cccco.edu/learn/.

Training & Support is vital to the professional growth of faculty and provides a vehicle for faculty to become proficient with technology to enrich the students' classroom and virtual classroom experiences. TAG also embraces the idea of a "learning community" where more technologically savvy faculty can mentor those that are struggling with the new educational tools, in addition to providing an online forum for faculty to post questions and receive suggestions and answers from their peers. Operational training and support is vital to the operational functionality and efficiency of the entire district.

RSCCD has minimal formal training available for faculty and/or staff. The onus is on the employee to learn to use the technology with very few resources available. Therefore, based on these findings, TAG recommends that training and support be made a priority.

To capitalize on technology, previously the TAG committee recommended the addition of a trainer. The centralization of the helpdesk to a full service "Service Desk" has provided end users with a single point of contact, a standardization of service with more efficient and timely resolutions. Centralization has allowed the district to provide extended service hours while reducing the operating cost of the helpdesk. A service desk environment would allow for self-help, documentation and training for support products and processes throughout the district. By using a tiered approach, the proper technician can be assigned without general disruption of other services. The Service Desk would provide tiered support and escalation options as needed to provide the end user with high quality, consistent service and timely problem resolution, while promoting a uniform and structured staff response.

The trainer would provide faculty and staff training on district-wide technology such as Email, Remote, Intranet, Outlook, Colleague, web page updating, accessibility, and the online report Repository. Working in conjunction with the Service Desk to identify training deficiencies within the district and employee education opportunities, the trainer would develop curriculum to help district employees learn the intricacies of the technology and how to use the technology to its fullest capability. By providing a District Technology Trainer, employees would have the opportunity for individualized learning experiences and solutions, as well as standardized instruction in the technology that is utilized in the daily operations of the district. By maximizing the use of the available technology, employees can better and more efficiently serve the student population that they support, making their daily tasks easier to accomplish. The migration to Canvas is an additional consideration for justification of a centralized trainer.

M. Server Room Environment

Technology servers should be located in an appropriate data center when feasible because it offers the optimal mix of physical security and environmental control. Site locations should be safe from exposure to fire, flood, explosions, and other similar hazards. And, server rooms should be located in areas where noise will not disturb classrooms, offices, etc.

a. Perimeter Security

All server rooms should have solid walls extending from the floor to ceiling. In areas where raised floors or a drop ceiling are in place, walls should extend below the raised floor and above the drop ceiling to prevent an individual from entering the room by climbing under the raised floor or over the wall by accessing the maintenance space. Locked racks may also be used to provide a secure perimeter layer.

b. Physical Access

Physical access to the server room must be limited to only those individuals who have legitimate responsibilities justifying such access. Use of card readers and electronic locks to permit access is recommended over traditional keys; if keys are used, they need to be controlled. Procedures must be in place to ensure access is removed when an individual no longer has such need and access lists of authorized individuals should be reviewed. Procedures must also be in place to address lost or stolen keys or access cards.

- Video cameras are recommended to monitor and record individuals entering or working in the space.
- When warranted by business needs, a log may be kept, recording the time of entry, time of exit, and purpose of physical access by visitors and/or authorized personnel.
- Visitors should be escorted by authorized personnel at all times.

c. Structural Concerns

- The server room must be located in an area that can bear the weight of all systems, including foreseeable planned growth.
- When feasible, door frame size should be sufficient to allow for easy introduction and removal of equipment. For new construction, doors should be 42 inches wide and 9 feet tall. If hinges are exterior to the room, doors should use locking hinge pins. Both SAC and SCC data center doors are sufficient.
- The ceiling of the room should be at least 9 feet high.
- The server room should not have exterior windows.
- The arrangement of equipment should provide for adequate clearance around computing racks; 4 feet at the front and 3 feet at the rear is recommended.
- For new construction, an anti-static floor surface is recommended. Raised floors with a minimum clearance of 24 inches are recommended for new construction of large server rooms.

d. Power Needs

- The server room should have sufficient dedicated circuits for all equipment, plus one or more additional circuits, as needed for flexibility in the event a circuit fails.
- All systems must be properly grounded.
- Critical systems should be connected to uninterruptable power supplies (UPS) and/or generator power, depending on the business requirements for server uptime.
- Uninterruptable power supplies (UPS) and/or generator power should be tested at least annually and maintained according to manufacturer specifications. ITS recommends using the same vendor to provide maintenance to the generator and UPS since it is critical that communication between those two devices works properly.
- Based on UPS monitoring thresholds, automatic shutdown features should be configured when feasible to gracefully shutdown and protect systems prior to power loss.
- Large rooms should have a clearly-labeled emergency power-off switch.
- Procedures should be posted in the room explaining how to respond in the event of a power failure.

- Server rooms should have emergency lighting to provide for life safety in the event of a power outage.

e. Temperature Control

- The server room must have sufficient temperature control to maintain temperatures within the operational limits defined for the hardware located in the room.
- The server room should have dedicated, redundant air conditioning sufficient to maintain temperatures between 65 and 70 degrees Fahrenheit. Fully enclosed racks with built-in cooling may also be considered.
- Environmental monitoring should be configured to alert administrators in the event of a cooling failure.
- For large rooms, cooling systems and equipment should be installed in a hot aisle / cold aisle configuration to maximize efficiency.
- Procedures should be posted in the room explaining how to respond in the event of a cooling failure.

f. Fire and/or Flood

- The server room must have some form of fire detection and suppression, adequately maintained and routinely tested.
- Server rooms must be reasonably free of fire hazards such as boxes, papers, etc.
- Each server room may have an easily visible and accessible clean-agent fire extinguisher. A standard fire extinguisher is not recommended for use around electronic equipment.
- If the server room is located near potential leak hazards (AC condensers, overhead water lines, sprinklers, kitchens, break rooms, restrooms, etc.) sufficient steps should be taken to protect systems, such as racks with solid tops, systems elevated off the floor, etc. Moisture sensors should be used in areas where leaks are most likely or would be most problematic.

g. Other Considerations

- Cabling must be maintained in an orderly fashion to reduce the possibility of an accidental outage.
- Server rooms should not have conspicuous signage that could attract unnecessary attention or attack.
- Items should be clearly labeled to avoid confusion or mistakes.
- All ITS related equipment needs to be recycled through our internal surplus process, under the direction of the Purchasing department. ITS is responsible for having the hard drives pulled and either wiped clean or sent to a vendor for destruction and/or recycling.

Appendix A—Summary of Achievements and Highlights

The following is a summary of the technical achievements from 2014-2016 and highlights for 2017-2018. This summary includes the major technological accomplishments and technology projects that are planned or in progress in the areas of instructional technology and district-wide technology.

Achievements

Instructional Technology:

- Implemented student email for SAC and SCC (including CEC and OEC)
- Implemented Microsoft Office 365 for students
- Purchased district-wide license for Tech Smith Relay
- Digital Don student tablet – HP x2 210
- Upgraded many student computers OS to Windows 10 (from Windows 7)
- Utelogy software for some mediated classrooms at SAC and SCC
    - Set A/V standards including height adjustable 'accessible' furniture
- Deployed all-in-one PC's for saving space in student labs and library at SCC
- Participate in the Adobe ETLA site license program
- Soft roll out of Ellucian Student Portal
- Implemented campus Health Centers replacement software, Point 'n' Click
- Implemented ClockWork for the DSPS office at SAC
- Implemented eTranscript send and receive capabilities for SAC and SCC

TAG / District Office:

- Established BP and AR for Section 508
- Rolled out release 1 of BBPay Collaborator (Generate Funding and Reissue Funding modules)
- Implemented electronic financial aid disbursements, Blackboard Pay
- Began checking VPAT's with the Purchasing department for verification of accessible procurements
- Upgraded and expanded our video surveillance system
- Upgraded and expanded our wireless network
- Implemented Microsoft Office 365 for faculty and staff
- Implemented Microsoft Training for faculty and staff
- Implemented Skype for Business
- Implemented DFS technology on File Servers to increase availability and resiliency on network shared drives
- Completed re-IP project at SCC for better logical management of network connected devices
- Upgraded core network router at SAC to faster Brocade model
- Implementation of online WebHelpDesk interface for ITS and end-users with FAQ's
- Continued improving Single Sign-on
- Upgraded sac.edu, sccollege.edu, rsccd.edu, and the employee Intranet to SharePoint 2013 and created a failover environment

- Implemented Electronic Status Change Forms
- Implemented Credentials Online Parking Permits
- Converted to TouchNet Online payment processing from ACI Worldwide
- Upgraded Ecommerce software to comply with PCI regulations
- Upgraded magnetic card readers with chip readers
- Improved large scale audit reports for MIS and 320/321 reporting
- Converted most reports to new online report repository (from legacy report repository)

Initiatives for the next two years

Instructional Technology:

- Work with colleges on replacement plan for instructional equipment
- Convert from Blackboard LMS to Canvas
- Continue improving the Ellucian Student Portal
- Student Success Act Compliance Enhancements: Degree Audit & Student Educational Planning
- Implement Clockwork for DSPS at SCC
- ITS Large Scale Data Warehouse creation for analytical reporting and trending
- Develop ITS continuous service improvement committee or sub-committee to discover pain points district-wide and identify ways to address them or improve upon them
- Transition campuses from SARs Grid to SARs Anywhere

TAG / District Office:

- Implement ADFS technology for Identity Management services integration with Colleague and other applications
- Establish ongoing cybersecurity plan for the institution
- Draft IT policies related to security, acceptable use and other areas not currently covered to be approved by the board
- Develop internal Standard Operating Procedures for standardization of services within ITS Divisions
- Implement internet connectivity failover capabilities out of SCC to protect internet access district-wide
- Implement Exchange Email Hybrid environment to address gaps with existing student and staff email workflows
- Rebuild Enrollment Management Tool to be budget based
- Implement Electronic Timesheet Processing

Appendix B—Applications Support Projects

Below is a highlight of the projects that Applications Support will undertake in the coming years as approved by College Academic and Student Services Vice Presidents:

CI-Track Replacement (Attendance Tracking): In Pilot Phase
- Pilot occurring now at both SAC and SCC
- Cutover from CI-Track completely, no later than Summer 2017

SCC DSPS Software (ClockWork):
- This will reduce multiple system support for both campuses and allow for a single data system
- SAC is already live with ClockWork

Ellucian Portal
- Employee Portal now live
- SAC & SCC to have a soft rollout, Fall 2016
- Spring 2017, Team Sites to be added along with App Store functionality if possible
- Fall 2017, ILP Connection for Canvas LMS connected

Blackboard Pay Collaborator: Fall 2017
- Release 2: Transmits, Return Tracking, Outbound integration, Reporting

Migration of Applications to .Net: Fall 2017
- Budget Modeling, OCDE Check Register, GL External Interface

Position Control / Slot Management: Fall 2016
- Working with Darren Rose of Rose & Tuck to handle this customization
- This will allow Fiscal to manage and monitor positions or slots based on funding allocations
- HR has gone live with ImageNow Status Change Forms helping this process

Faculty Evaluation Site: Spring 2017 Pilot
- Working on a complete overhaul to the faculty evaluation system
- Removal of generate and maintain faculty steps for secretaries, as it is unnecessary
- Removal of division based divides as well, to allow for faculty to be shared
- Phase 2: Looking into options for Peer, Counselor, Librarian, and Division Dean evaluations, possible ORM usage, similar to student evaluations

Community Services Site Replacement: Fall 2016
- Working with SectorPoint Inc. to provide Community Services with a replacement to their 11+ year old website
- Coordinating efforts with Community Services staff

ImageNow Timesheets Pilot: Fall 2016
- Working with Payroll to establish requirements for four categories
    - Student Workers

    - Short Term Classified
    - Ongoing Hourly
    - Classified Substitutes
- Will replace the need for Excel spreadsheets and special paper sizes
- Will function similar to absence cards in WebAdvisor now with electronic approval

ImageNow Forms:
- Working to replace four PDF forms with ImageNow eForms
    - Budget Change Form
    - Transfer of Expenditures
    - Conference Request Form
    - Mileage Reimbursement

Closure of Legacy Report Site: Fall 2016
- Transitioning the last remaining reports off the Legacy Report site so that there is only one reporting location for staff to utilize
- Remaining reports are mainly Fiscal and HR focused

OCDE Extract Payroll Changes: Waiting for OCDE Interface Revamp, Spring 2017
- Coordinating with Payroll to provide OCDE extracts from Colleague
- Currently a manual process to re-enter all payroll data from timesheets and Colleague
- Looking to streamline this into Colleague screens and extracts that can be securely sent up to OCDE for processing

CE LHE Conversion:
- ITS coordinating with CE VP's and HR to transition all part-time faculty on timesheets to an LHE based system
- Will heavily reduce workload on payroll staff for manual timecard entry
- Moves to exception based reporting for CE staff

Ellucian Mobile Release: Spring 2017
- Release of independent SAC and SCC mobile sites to work in conjunction Ellucian Colleague, WebAdvisor and Portal

Enrollment Management Tool 2.0: Fall 2017
- Rebuild of the EMT to account for budget, per Vice President and President direction
- Additional data elements added to enhance efficiency and reporting needs
- Removal of spreadsheet calculations, will be performed via tables to improve speed
- Addition of targets and Exhibit C data

Ellucian Self Service:
Enhancements to current WebAdvisor and Portal functionality. Replace existing links with more dynamic and intuitive screens
- Financial Aid Module: Spring 2017
- Accounts Receivable: Spring 2017
- Graduation: Spring 2017
- Student Educational Planning: Spring 2017
- Fiscal Services: Fall 2017

Human Resources HR Privacy Flag Restructuring: Fall 2016
- Addition of two additional HR privacy codes FA and BS
- FA = Faculty, BA = Blended Staff/Student

- Staff with an active academic program with be reset to BS, those with no active program will revert back to HR
- Staff on campus will lose HR privacy access to secure the private data of staff, but gain both BS and FA in return, resulting in no loss of job functionality

LaserFiche 10 Upgrade: Spring 2017
- Currently running LaserFiche 8 at each site
- Improved functionality and security with newer version
- Web client replaces the need for an installed .exe client on each computer

SARs Anywhere Upgrade: Summer 2017
- Campuses are currently using an older version of SARs Grid, which is very outdated and no longer serviceable
- SARs Anywhere has increased functionality and provides a Web UI client for staff
- Improves communication and accessing information needed for Student Success data submissions

Ellucian Colleague Security: Ongoing
- Review and rebuild of all existing security classes within Colleague to be role based
- Once completed ITS will build a security request form to match new security layout
- Allows for better controls and verification of access than currently in place

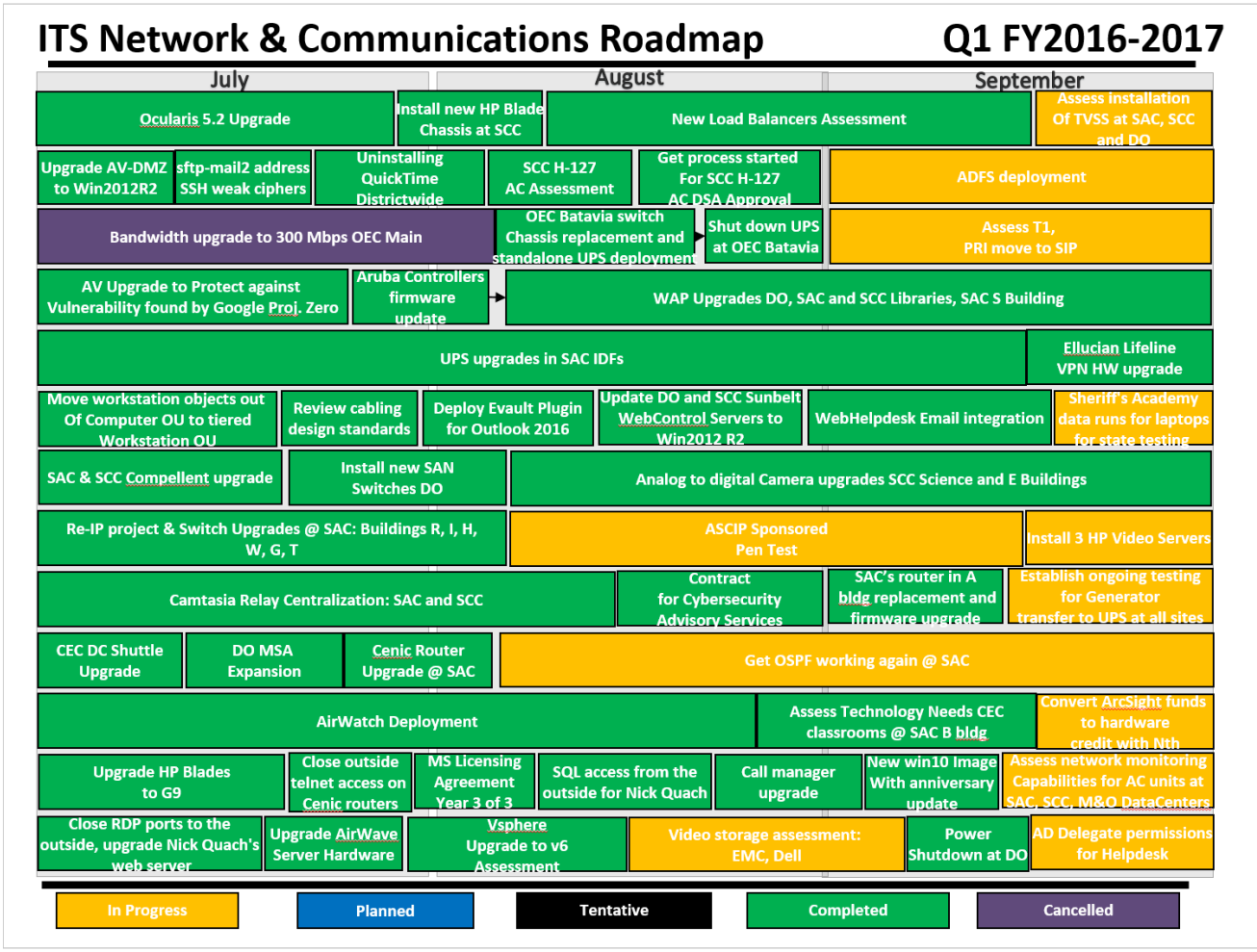
Colleague WebUI 5.0: Summer 2017
- Replacement of current WebUI that requires Silverlight add-on
- Works with all browsers instead of just Internet Explorer
- Adds improved functionality and new look matches self-service application

Ellucian Identity Services: Summer 2017
- Centralized authentication for multiple systems
- Existing Colleague applications as well as Blackboard will begin utilizing this service immediately, other systems to follow
- Provides a much easier interface for single sign-on for students and staff

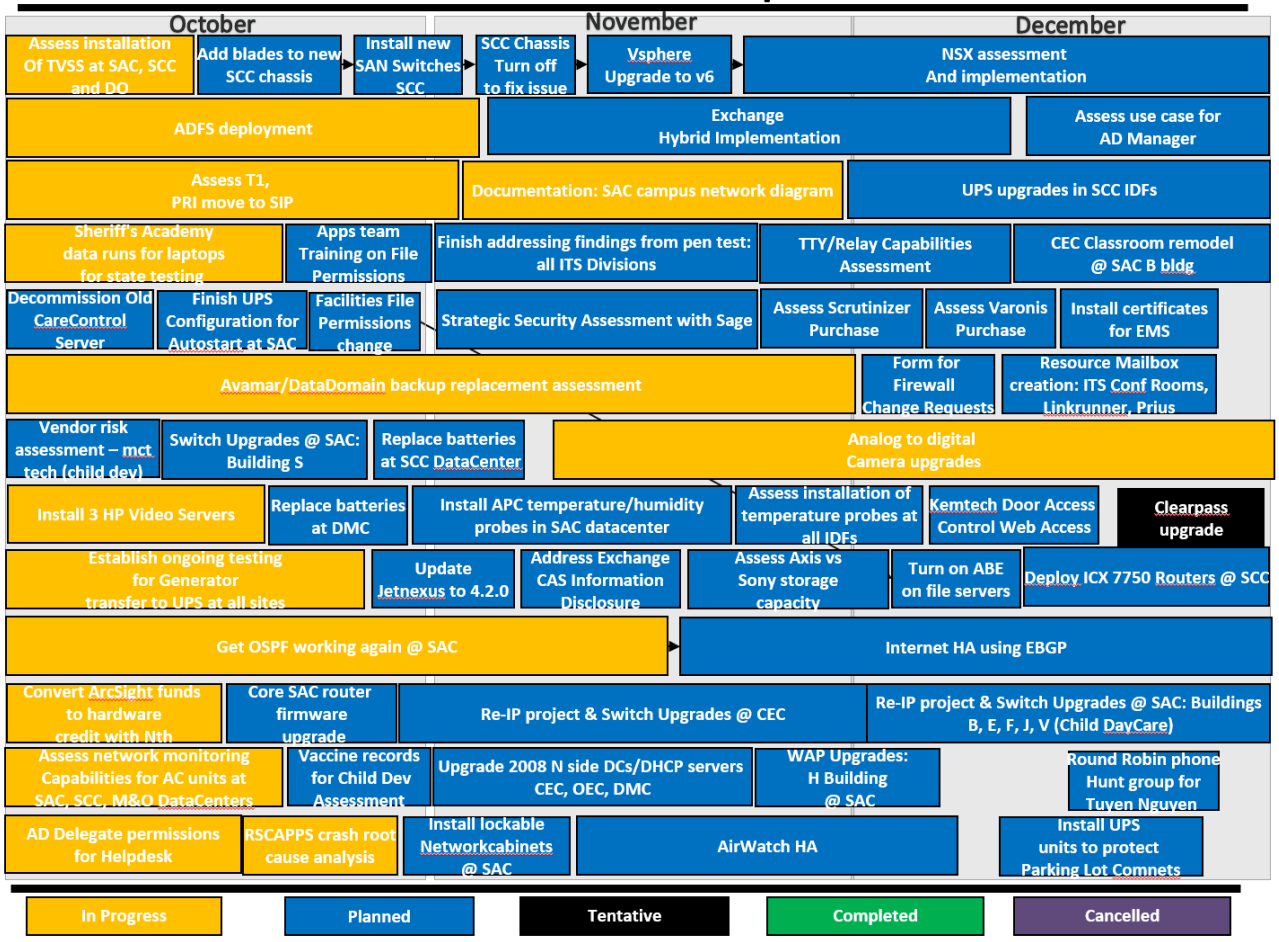
Common Assessment/Multiple Measures: Fall 2017
- State Chancellor's Office to provide an interface which will provide multiple measure assessment for all new students
- These measures include placement testing, high school transcripts and course completion as well as GPA
- ITS will provide a way to download and import this information into Colleague, similar to OpenCCCApply

Appendix C—Network and Communications Roadmap

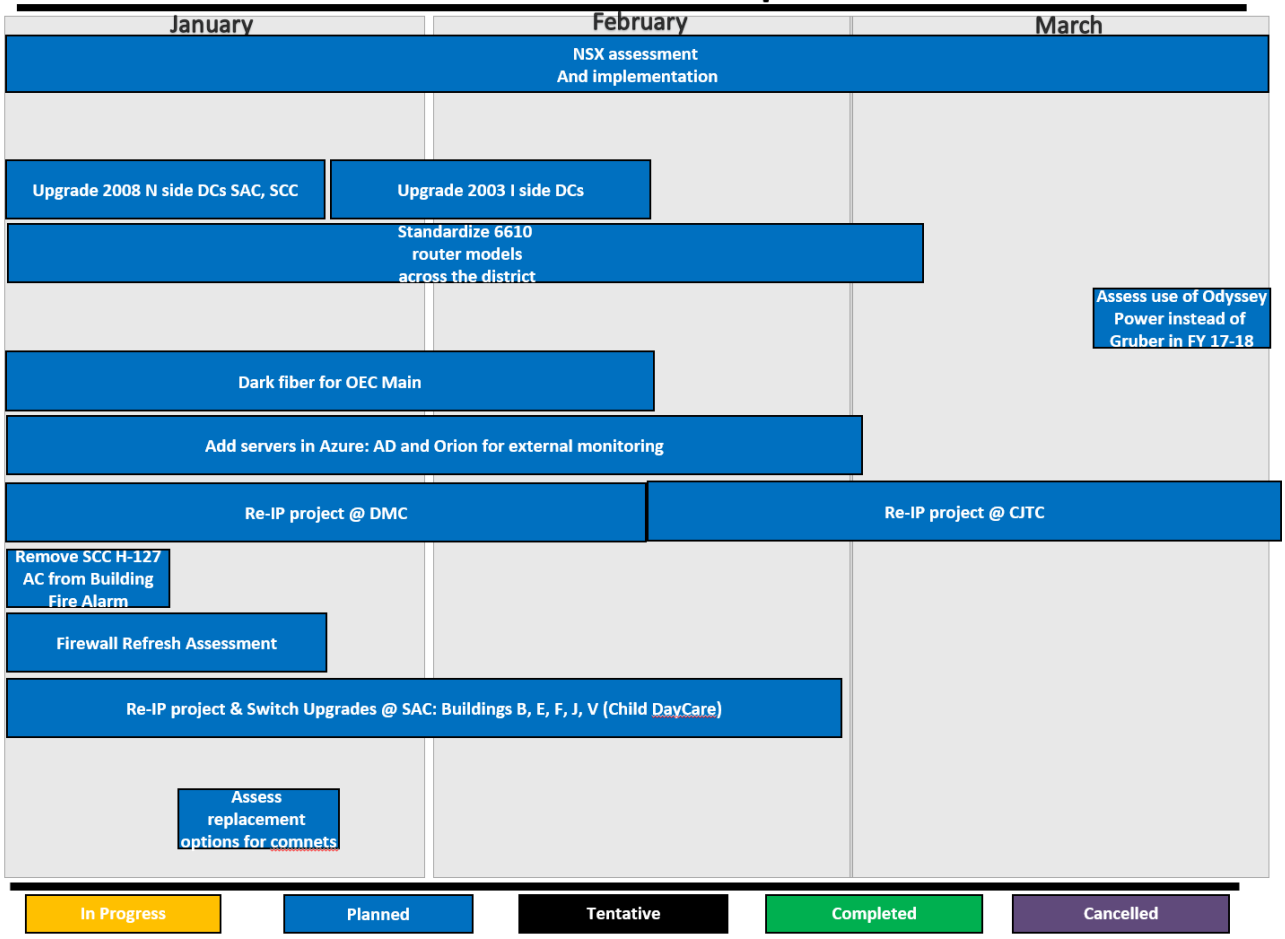
The following is the project roadmap for the Network and Communications team for the Fiscal Year 2016-2017. This document includes several of the major initiatives mentioned throughout this technology plan. The roadmap is regularly updated; the version shown here is current as of October 4, 2016:



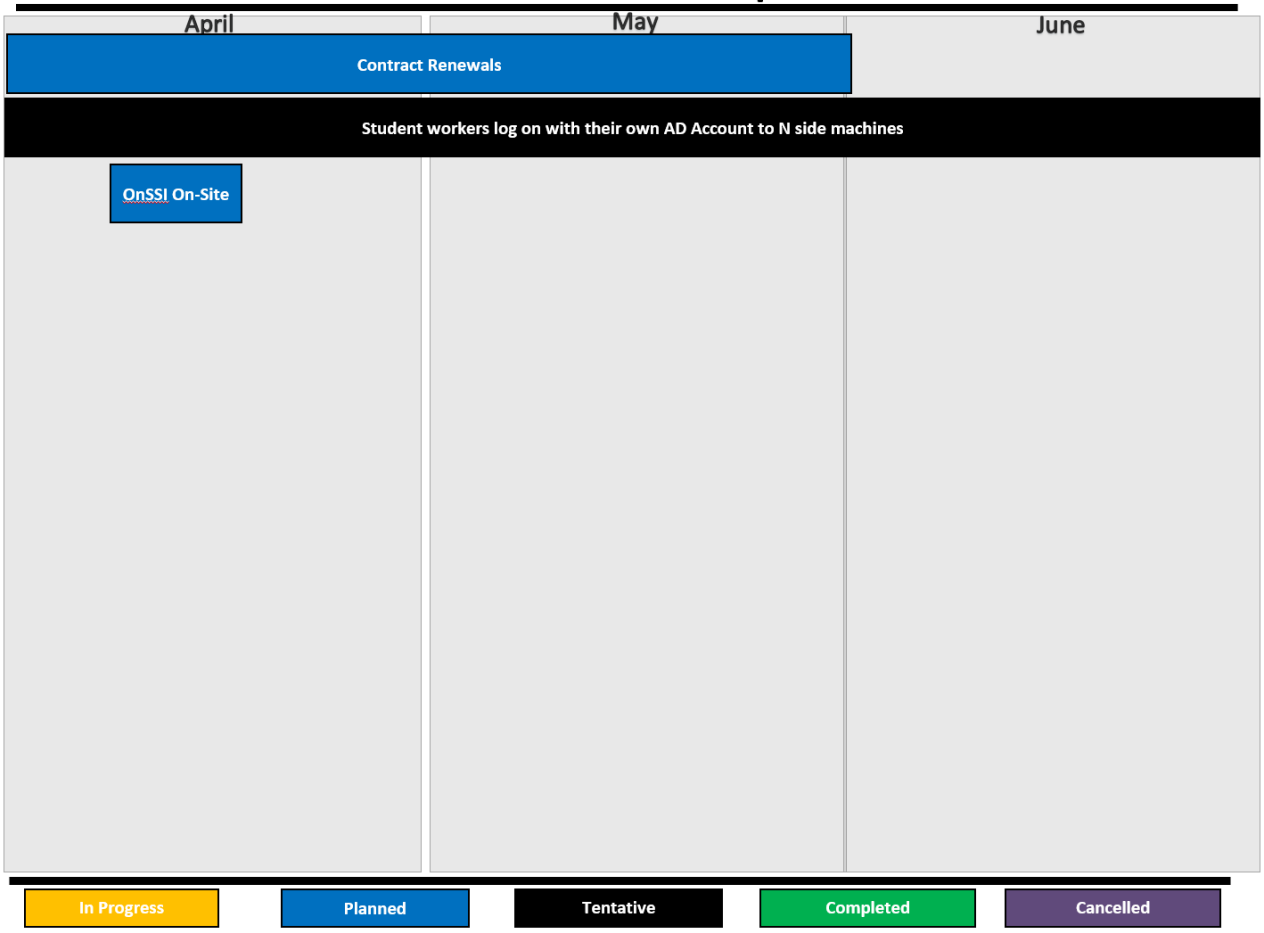
ITS Network & Communications Roadmap Q2 FY2016-2017



ITS Network & Communications Roadmap Q3 FY2016-2017



ITS Network & Communications Roadmap Q4 FY2016-2017



Appendix D—Security Controls

California Attorney General, Kamala Harris, emphasizes the need for organizations to establish proper security controls to protect personal protected information. Below are the first five controls in version 6.1, which we will be working to implement.

The Center for Internet Security Critical Security Controls Version 6.1		
Family	**Control**	**Control Description**
Critical Security Control #1: Inventory of Authorized and Unauthorized Devices		
System	**1.1**	Deploy an automated asset inventory discovery tool and use it to build a preliminary inventory of systems connected to an organization's public and private network(s). Both active tools that scan through IPv4 or IPv6 network address ranges and passive tools that identify hosts based on analyzing their traffic should be employed.
System	**1.2**	If the organization is dynamically assigning addresses using DHCP, then deploy dynamic host configuration protocol (DHCP) server logging, and use this information to improve the asset inventory and help detect unknown systems.
System	**1.3**	Ensure that all equipment acquisitions automatically update the inventory system as new, approved devices are connected to the network.
System	**1.4**	Maintain an asset inventory of all systems connected to the network and the network devices themselves, recording at least the network addresses, machine name(s), purpose of each system, an asset owner responsible for each device, and the department associated with each device. The inventory should include every system that has an Internet protocol (IP) address on the network, including but not limited to desktops, laptops, servers, network equipment (routers, switches, firewalls, etc.), printers, storage area networks, Voice Over-IP telephones, multi-homed addresses, virtual addresses, etc. The asset inventory created must also include data on whether the device is a portable and/or personal device. Devices such as mobile phones, tablets, laptops, and other portable electronic devices that store or process data must be identified, regardless of whether they are attached to the organization's network.
System	**1.5**	Deploy network level authentication via 802.1x to limit and control which devices can be connected to the network. The 802.1x must be tied into the inventory data to determine authorized versus unauthorized systems.
System	**1.6**	Use client certificates to validate and authenticate systems prior to connecting to the private network.
Critical Security Control #2: Inventory of Authorized and Unauthorized Software		
System	**2.1**	Devise a list of authorized software and version that is required in the enterprise for each type of system, including servers, workstations, and laptops of various kinds and uses. This list should be monitored by file integrity checking tools to validate that the authorized software has not been modified.

System	**2.2**	Deploy application whitelisting technology that allows systems to run software only if it is included on the whitelist and prevents execution of all other software on the system. The whitelist may be very extensive (as is available from commercial whitelist vendors), so that users are not inconvenienced when using common software. Or, for some special-purpose systems (which require only a small number of programs to achieve their needed business functionality), the whitelist may be quite narrow.
System	**2.3**	Deploy software inventory tools throughout the organization covering each of the operating system types in use, including servers, workstations, and laptops. The software inventory system should track the version of the underlying operating system as well as the applications installed on it. The software inventory systems must be tied into the hardware asset inventory so all devices and associated software are tracked from a single location.
System	**2.4**	Virtual machines and/or air-gapped systems should be used to isolate and run applications that are required for business operations but based on higher risk should not be installed within a networked environment.

Critical Security Control #3: Secure Configurations for Hardware and Software

System	**3.1**	Establish standard secure configurations of your operating systems and software applications. Standardized images should represent hardened versions of the underlying operating system and the applications installed on the system. These images should be validated and refreshed on a regular basis to update their security configuration in light of recent vulnerabilities and attack vectors.
System	**3.2**	Follow strict configuration management, building a secure image that is used to build all new systems that are deployed in the enterprise. Any existing system that becomes compromised should be re-imaged with the secure build. Regular updates or exceptions to this image should be integrated into the organization's change management processes. Images should be created for workstations, servers, and other system types used by the organization.
System	**3.3**	Store the master images on securely configured servers, validated with integrity checking tools capable of continuous inspection, and change management to ensure that only authorized changes to the images are possible. Alternatively, these master images can be stored in offline machines, air-gapped from the production network, with images copied via secure media to move them between the image storage servers and the production network.
System	**3.4**	Perform all remote administration of servers, workstation, network devices, and similar equipment over secure channels. Protocols such as telnet, VNC, RDP, or others that do not actively support strong encryption should only be used if they are performed over a secondary encryption channel, such as SSL, TLS or IPSEC.
System	**3.5**	Use file integrity checking tools to ensure that critical system files (including sensitive system and application executables, libraries, and configurations) have not been altered. The reporting system should: have the ability to account for routine and expected changes; highlight and alert on unusual or unexpected alterations; show the history of configuration changes over time and identify who made the change (including the original logged-in account in the event of a user ID switch, such as with the su or sudo command). These integrity checks should identify suspicious system alterations such as: owner and permissions changes to files or directories; the use of alternate data streams which could be used to hide

		malicious activities; and the introduction of extra files into key system areas (which could indicate malicious payloads left by attackers or additional files inappropriately added during batch distribution processes).
System	**3.6**	Implement and test an automated configuration monitoring system that verifies all remotely testable secure configuration elements, and alerts when unauthorized changes occur. This includes detecting new listening ports, new administrative users, changes to group and local policy objects (where applicable), and new services running on a system. Whenever possible use tools compliant with the Security Content Automation Protocol (SCAP) in order to streamline reporting and integration.
System	**3.7**	Deploy system configuration management tools, such as Active Directory Group Policy Objects for Microsoft Windows systems or Puppet for UNIX systems that will automatically enforce and redeploy configuration settings to systems at regularly scheduled intervals. They should be capable of triggering redeployment of configuration settings on a scheduled, manual, or event-driven basis.

Critical Security Control #4: Continuous Vulnerability Assessment and Remediation

System	**4.1**	Run automated vulnerability scanning tools against all systems on the network on a weekly or more frequent basis and deliver prioritized lists of the most critical vulnerabilities to each responsible system administrator along with risk scores that compare the effectiveness of system administrators and departments in reducing risk. Use a SCAP-validated vulnerability scanner that looks for both code-based vulnerabilities (such as those described by Common Vulnerabilities and Exposures entries) and configuration-based vulnerabilities (as enumerated by the Common Configuration Enumeration Project).
System	**4.2**	Correlate event logs with information from vulnerability scans to fulfill two goals. First, personnel should verify that the activity of the regular vulnerability scanning tools is itself logged. Second, personnel should be able to correlate attack detection events with prior vulnerability scanning results to determine whether the given exploit was used against a target known to be vulnerable.
System	**4.3**	Perform vulnerability scanning in authenticated mode either with agents running locally on each end system to analyze the security configuration or with remote scanners that are given administrative rights on the system being tested. Use a dedicated account for authenticated vulnerability scans, which should not be used for any other administrative activities and should be tied to specific machines at specific IP addresses. Ensure that only authorized employees have access to the vulnerability management user interface and that roles are applied to each user.
System	**4.4**	Subscribe to vulnerability intelligence services in order to stay aware of emerging exposures, and use the information gained from this subscription to update the organization's vulnerability scanning activities on at least a monthly basis. Alternatively, ensure that the vulnerability scanning tools you use are regularly updated with all relevant important security vulnerabilities.

System	**4.5**	Deploy automated patch management tools and software update tools for operating system and software/applications on all systems for which such tools are available and safe. Patches should be applied to all systems, even systems that are properly air gapped.
System	**4.6**	Monitor logs associated with any scanning activity and associated administrator accounts to ensure that this activity is limited to the timeframes of legitimate scans.
System	**4.7**	Compare the results from back-to-back vulnerability scans to verify that vulnerabilities were addressed either by patching, implementing a compensating control, or documenting and accepting a reasonable business risk. Such acceptance of business risks for existing vulnerabilities should be periodically reviewed to determine if newer compensating controls or subsequent patches can address vulnerabilities that were previously accepted, or if conditions have changed, increasing the risk.
System	**4.8**	Establish a process to risk-rate vulnerabilities based on the exploitability and potential impact of the vulnerability, and segmented by appropriate groups of assets (example, DMZ servers, internal network servers, desktops, laptops). Apply patches for the riskiest vulnerabilities first. A phased rollout can be used to minimize the impact to the organization. Establish expected patching timelines based on the risk rating level.

Critical Security Control #5: Controlled Use of Administrative Privileges

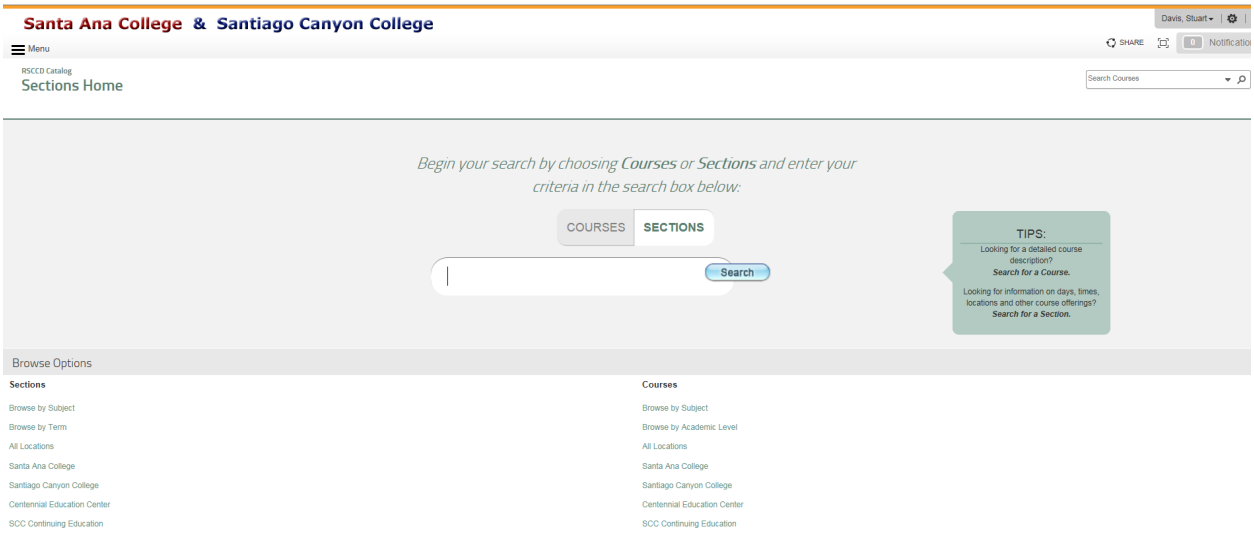
System	**5.1**	Minimize administrative privileges and only use administrative accounts when they are required. Implement focused auditing on the use of administrative privileged functions and monitor for anomalous behavior.
System	**5.2**	Use automated tools to inventory all administrative accounts and validate that each person with administrative privileges on desktops, laptops, and servers is authorized by a senior executive.
System	**5.3**	Before deploying any new devices in a networked environment, change all default passwords for applications, operating systems, routers, firewalls, wireless access points, and other systems to have values consistent with administration-level accounts.
System	**5.4**	Configure systems to issue a log entry and alert when an account is added to or removed from a domain administrators' group, or when a new local administrator account is added on a system.
System	**5.5**	Configure systems to issue a log entry and alert on any unsuccessful login to an administrative account.
System	**5.6**	Use multifactor authentication for all administrative access, including domain administrative access. Multi-factor authentication can include a variety of techniques, to include the use of smart cards,-certificates, One Time Password (OTP) tokens, biometrics, or other similar authentication methods.
System	**5.7**	Where multi-factor authentication is not supported, user accounts shall be required to use long passwords on the system (longer than 14 characters).
System	**5.8**	Administrators should be required to access a system using a fully logged and non-administrative account. Then, once logged on to the machine without administrative privileges, the administrator should transition to administrative privileges using tools such as Sudo on Linux/UNIX, RunAs on Windows, and other similar facilities for other types of systems.

System	**5.9**	Administrators shall use a dedicated machine for all administrative tasks or tasks requiring elevated access. This machine shall be isolated from the organization's primary network and not be allowed Internet access. This machine shall not be used for reading e-mail, composing documents, or surfing the Internet.

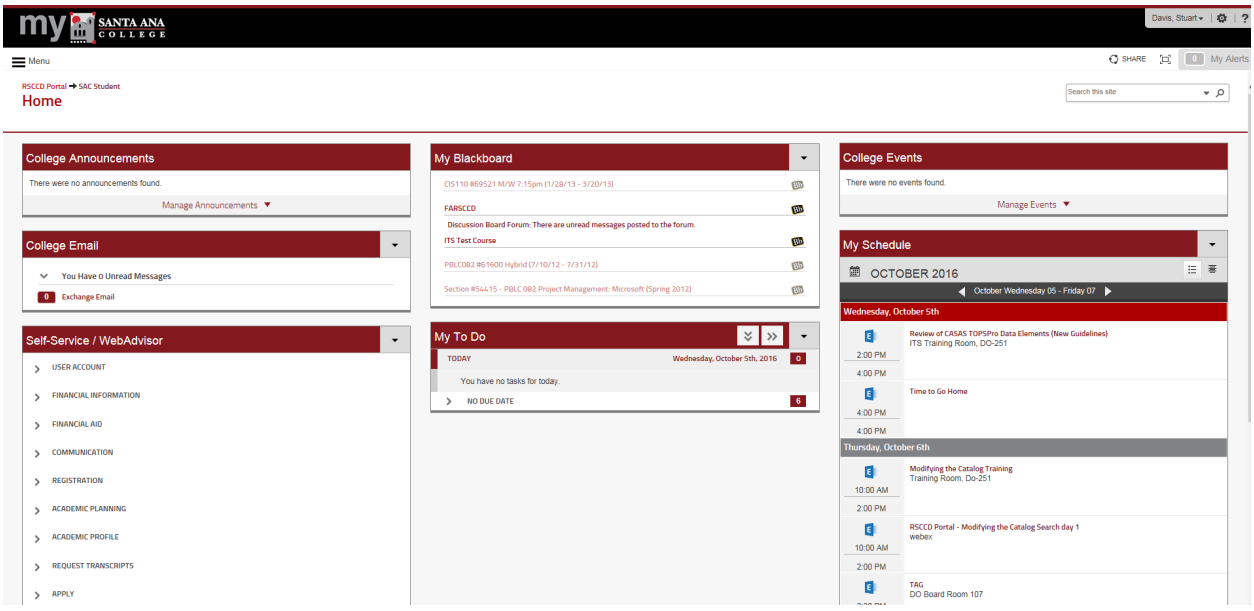
Appendix E—Ellucian Portal Examples

Below are sample screens shots of our new Ellucian Portal, which was implemented in 2016:

Course & Section Search



SAC Portal Landing Page



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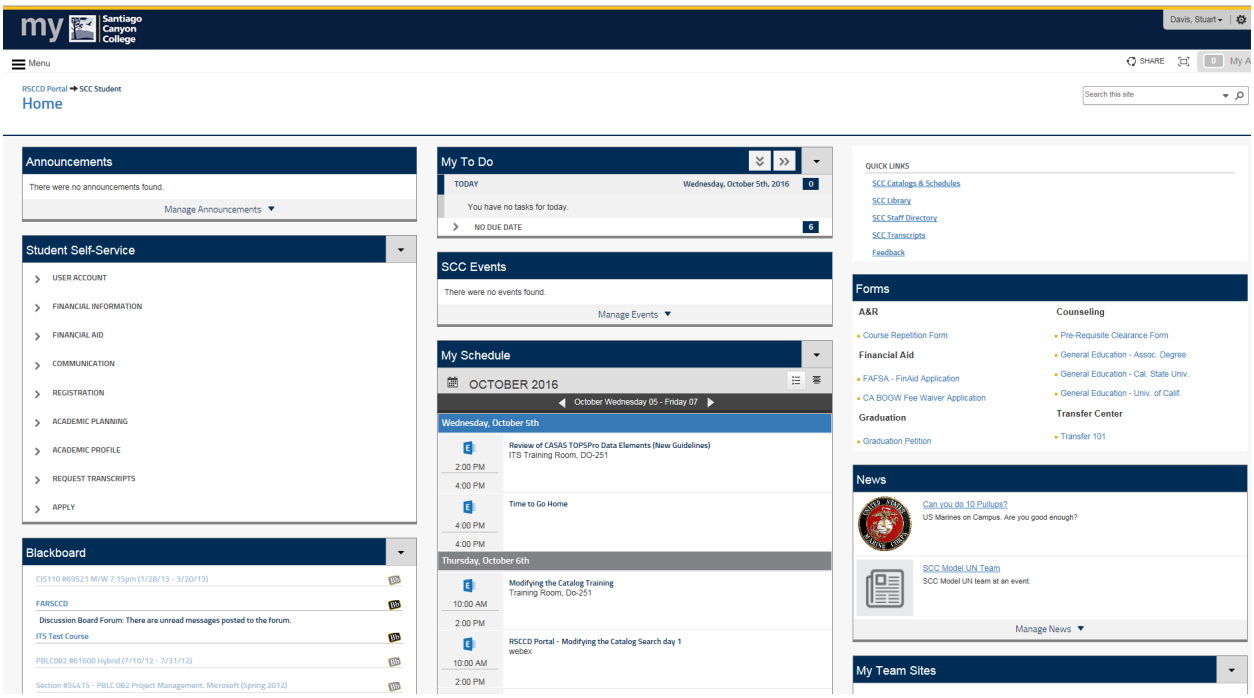
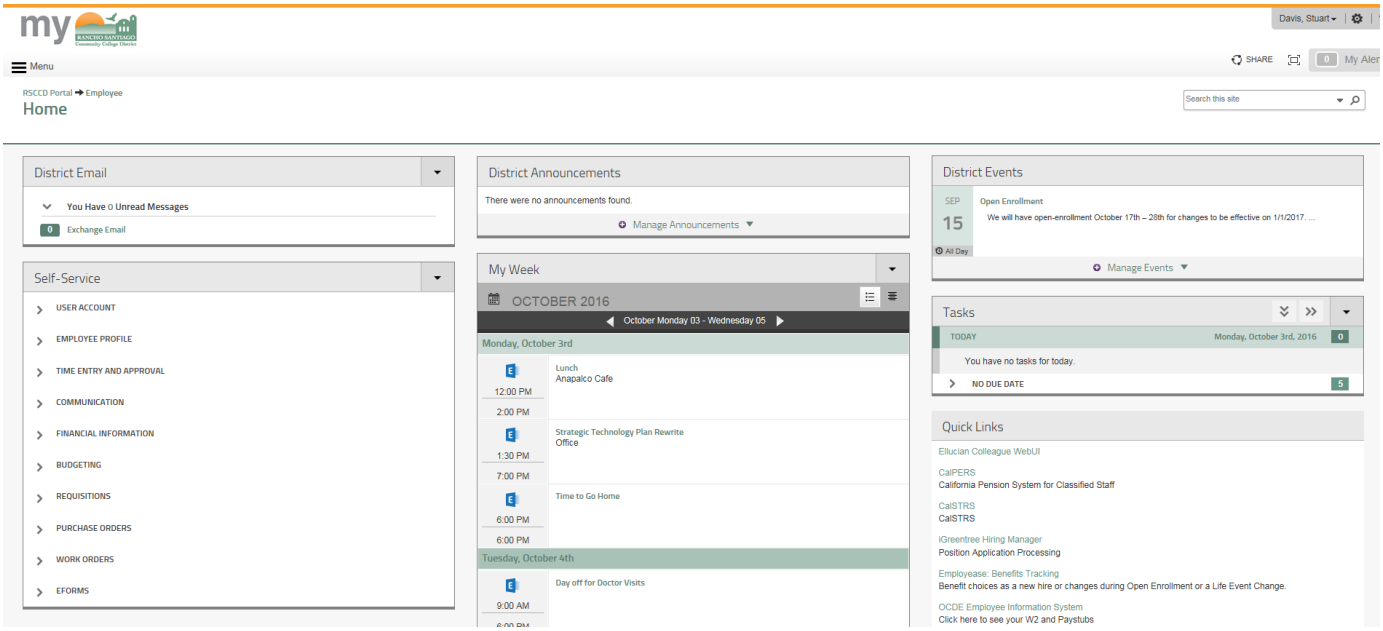
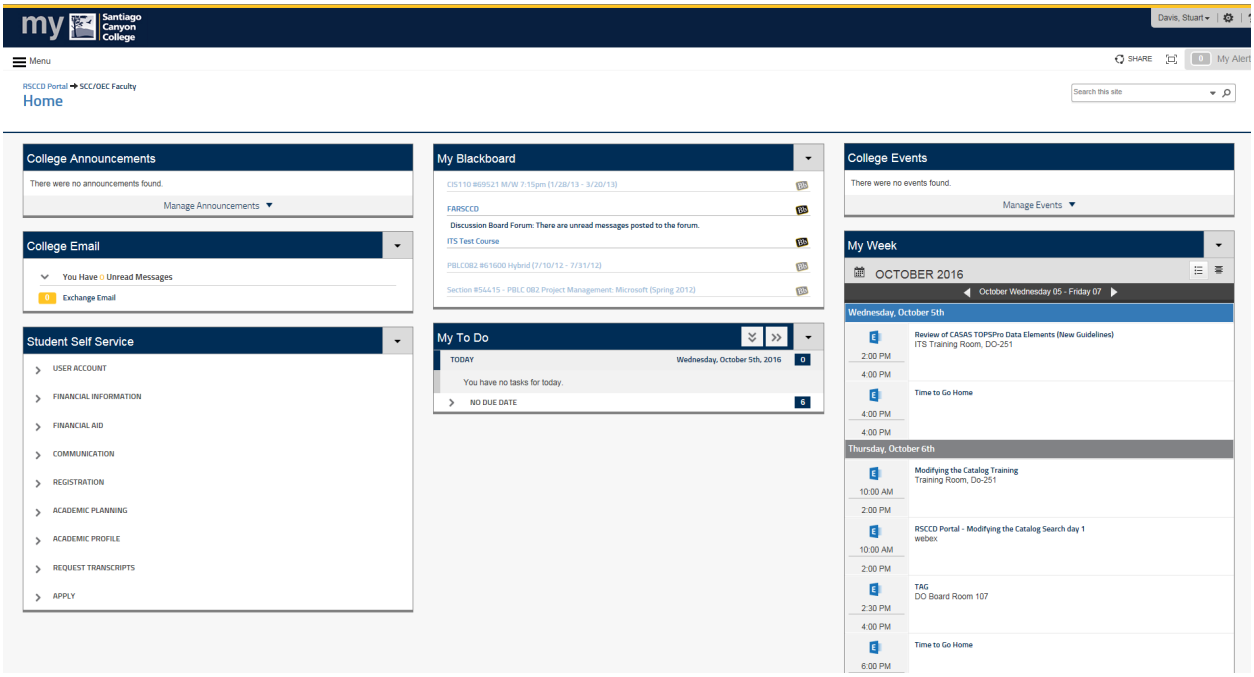


District Employee Landing Page



SCC/OEC Faculty Landing Page



SAC/CEC Faculty Landing Page