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FY21-22

# Operational Plan

## *Technology Services*

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*March 19, 2021*



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## Introduction

This document presents the Technology Services Department’s Operational Plan for fiscal year 2021-2022. The first chapter is an Executive Summary that provides an overview of the work accomplished in the previous year, the areas of focus in the upcoming year, and a brief description of what is anticipated in coming years. The summary also discusses what will be included in the FY21-22 budget request.

The summary is followed by three chapters that enumerate the accomplishments, detail the current needs, and lay out the road map for processes and technologies in the following service groupings:

- **Logistical Services:** these do not directly involve technology but are necessary to support the implementation and maintenance of technology.
- **Client Services:** these are delivered directly to faculty, staff, and/or students at the College.
- **Enterprise Application Services:** these pertain to software applications that support the College’s business processes rather than individual users.
- **Infrastructure Services:** these services provide the underlying technological infrastructure needed to support the other services.

Each of these chapters contain separate sections for technological or procedural categories. These sections, in turn, contain sub-sections for specific technologies or processes. Most sub-sections are then divided into three parts:

1. **Accomplishments:** describes what has been accomplished by the department over last 12-18 months, particularly as it pertains to what was laid out in the previous Operational Plan.
2. **Current Needs:** enumerates items that need to be addressed in both the remainder of the current fiscal year (FY20-21) as well as the following fiscal year (FY21-22).
3. **Roadmap:** discusses what needs to be addressed for the following three years.

Production of Annual Strategic Plan						
2018	2019	2020	2021	2022	2023	2024
FY19-20	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25	
Accomplishments		Current Needs		Roadmap		

Normally, the Operational Plan will be completed by the end of the calendar year. This initial Operational Plan, however, was delayed due to the department’s response to COVID-19 pandemic in 2020-21.



## Executive Summary

This chapter provides a high-level overview of the accomplishments, current needs, and road map in each of the department's four lines of service. More detailed information for each line of service is found in the chapters that follow.

The department's original intent was to document all existing information systems and then use that documentation to develop this FY21-22 Operational Plan. The COVID-19 pandemic, however, created a large, unexpected work load that prevented complete documentation before the development of this plan. Consequently, for many of the services, the current need is to performed such documentation. The road map will then be developed after such documentation is complete.

## Logistical Services

The department is focused on formally defining standard business processes based on industry best practices that govern how the department operates.

The primary emphasis is on implementing a service management approach to meeting the technology needs of the College. To this end, we have defined four lines of service and enumerated all of the services within each line. We have also structured our department around these lines of service. We have begun to create a "Technology Services Portfolio" document that lists all the services provided by the department and sets forth either a Service Level Agreement (SLA) or Operating Level Agreement (OLA) for each. In support of this effort, the department is currently documenting all of the information systems for which it is responsible. It is expected that completing this documentation as well as the "Technology Services Portfolio" document will take 2-3 years. In the coming year, priority will be given to the services that are provided to the largest number of users. Once the "Technology Services Portfolio" document is complete, the department will establish periodic service reviews with customers in order to evaluate the department's efforts to provide the defined level of service as well as to discuss possible changes to the services to better meet the College's needs.

Another area of emphasis is project management. The department has begun creating a standard project management methodology, including the creation of project document templates. It is expected that it will take 1-2 years to complete this methodology. The department has procured Monday.com as a tool to track all initiatives and projects in the College's Technology Portfolio. In time, this program will be used to perform enterprise resource management.

The department is also looking to mature the College's technology governance, primarily through the Technology Advisory Committee (TAC). The committee created a "TAC Charter" that formally defines its purpose, roles and responsibilities, meeting frequency, and membership. It also formally defined a 'Technology Portfolio' that consists of all technology initiatives and projects that the College is working on and a process for the TAC to review and make recommendations on any proposed additions to the portfolio. Moving forward, the College needs to better define the relationship between TAC's recommendations and the College's decision-making bodies. Over time, the College should consider maturing TAC into a steering committee that oversees the implementation of technological projects.

## Client Services

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In the coming year, the department will focus on three services: COS Workstations, Classrooms and Labs, and Employee Support Services. We will also document and develop road maps for the remaining five services: File Sharing, Collaboration Tools, Printing, Telecommunications, and Physical Security. Work in these areas can then be performed in the following years.

The department has updated the College's workstation inventory and is developing a workstation lifecycle to plan for replacements as needed. We will simplify and improve this service by formally defining the College's workstation standard and implementing a system to deploy, update, and continually enforce this standard. Long term, the department needs to explore ways to better support an increasingly mobile workforce and to perform a cost-benefit analysis of virtual desktop infrastructure (VDI) technology to see if this could reduce the College's costs.

The department will follow a similar process with the technology currently deployed in all of the College's classrooms and labs. We will document all of the existing technology and use this to develop a replacement cycle. We will also formally define the standard for classrooms and labs and then incorporate them into the same implementation system used for workstations.

Finally, the department will restructure the HappyFox ticketing system to support the implementation of Service Management as described above. In time, this will allow the department to measure its performance against defined service levels.

## Enterprise Application Services

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The Enterprise Application line of service is the least documented of all lines of service. The department's current focus is on the Enterprise Application Maintenance service. Once significant progress is made in this area, the department will move on to documenting the remaining services to enumerate current needs and lay out road maps.

With the maintenance service, the department is forming an Enterprise Application Steering Committee that will produce and maintain a production calendar, which will indicate when all enterprise application system maintenance will take place within the framework of the College's regular business processes. Once the initial calendar is developed, the committee will meet quarterly to update the calendar with future maintenance tasks. The committee will also be a vehicle for developing an Enterprise Applications Run Book that defines both automatic and manual processes that are performed to maintain enterprise application systems. The department is also moving as many automatic processes that are currently executed in Chron to Automatic so that the College can have greater visibility and control of these jobs. Finally, we are also working to clean the Argos Report database of one-time, partially developed, and antiquated reports.

There are several Enterprise Application projects currently in process or which are planned. These are enumerated under current needs for each service. The workload associated with all of these projects exceeds the capacity of the Enterprise Application team in Technology Services. Consequently, the department will need to work with the Technology Advisory Committee to prioritize these projects in a way that best meets the College's needs.

Lastly, the College has a contract with Ellucian to host many of its enterprise applications, such as Banner, in their cloud. The College spends \$320,000 a year for this service and is deeply dissatisfied with the level of service it receives, particularly at this cost. The contract with Ellucian ends June 2023.



The College needs to explore alternatives to reduce this cost and/or improve the level of service and, if one is identified, move to a new solution before this date.

## Infrastructure Services

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Overall, the department's current objective is to stabilize, simplify, and secure the College's infrastructure. We will also seek to develop a strategy to maintain an infrastructure that will meet the College's needs with limited resources for the foreseeable future.

The data network architecture will be simplified by eliminating unnecessary routing and it will be stabilized by resolving issues related to the Meraki core switches. In the long-term, the department will look to standardize on Cisco Meraki switches for the data network with the goal of eliminating issues related to a mixed vendor environment and reducing total cost-of-ownership (TCO) for both the wired and wireless networks.

With servers and storage, the department will retire or upgrade unsupported operating systems, which will remove a significant security vulnerability. We will also develop a process for regularly upgrading servers to current versions to ensure that these vulnerabilities do not recur. To keep the mission-critical primary virtualization environment up-to-date, the department will also update the operating system on virtual servers as well as the management software on the Nutanix converged technology device. Strategically, the department needs to explore migrating virtual servers to an Infrastructure-as-a-Service (IaaS) environment to decrease costs and improve disaster recovery.

In the realm of information security, the department needs to establish a routine of external intrusion testing to identify and removal potential vulnerabilities and to evaluate whether an independent endpoint protection solution is needed. Formalizing and documenting the user provisioning and de-provisioning process will be the focus within user account management. And, finally, ensuring that all the College's on-premise systems are backed-up to the cloud will be the first step toward developing a mature disaster recovery and business continuity capability.

Overall, the College has an aging infrastructure and the department struggles to maintain infrastructure hardware due to resource constraints. Currently, the department's annual operating budget only has sufficient resources to pay for annual licensing and support for existing infrastructure components; no funds are available for regular replacement. Instead, the department must secure one-time grant funding to replace aging infrastructure components, which makes ongoing maintenance of the infrastructure challenging.



## Logistical Services

This chapter enumerates the accomplishments, details the current needs, and lays out the road map for business processes associated with services that do not directly involve technology but are logistical in nature.

# Service Management

The College of the Siskiyous' (COS) Technology Services department has decided to adopt Information Technology Service Management (ITSM) as its approach to meeting the technology needs of the College. Under this approach, the department defines its work in terms of services that it provides to the faculty, staff, and students of COS.

## ACCOMPLISHMENTS

There has been one thing accomplished in this area.

### Services Identified

The department has identified four lines of service and enumerated the individual services within each line of service.

## CURRENT NEEDS

There are two current needs pertaining to Service Management. Work on both of these needs will extend beyond FY21-22.

### Documentation

The department also needs to document all of the College's information systems. This documentation will consist of two things:

- **Tech Services Library.** A repository of documents stored on the department's SharePoint site. The current need is to document the current configuration for systems used to provide Client Services, Enterprise Application Services, and Infrastructure Services. Additional documentation will be added to this library as time goes on.
- **Tech Services Wiki.** A collection of web pages on the department's SharePoint site that will be collaboratively maintained by all members of the department. The wiki will mimic the structure of the Implemented Services documents but focus on practical information on procedures and tasks.

### Technology Services Portfolio

The department needs to create the "Technology Services Portfolio," a document that describes all of the services provided by the Technology Services department. For each service, this document defines the service, enumerates the customers who receive it, identifies its funding source(s), and sets forth either the Service Level Agreement (SLA) or the Operating Level Agreement (OLA) associated with it.

## ROAD MAP

There is one item on the Service Management road map.

### Establish Regular Service Reviews

Upon completion of the “Technology Service Portfolio” document, the department will establish a regular service review process with customers. This service review will include an analysis of the department’s performance as it pertains to SLAs to identify areas needing improvement and a re-evaluation of the service definition to identify any adjustments that may be needed.

## Project Management

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A project is defined as “a temporary endeavor undertaken to create a unique product, service, or result” (*A Guide to the Project Management Body of Knowledge: Fifth Edition*, 5). The College implements several technology-related projects utilizing staff and faculty from throughout the College simultaneously. Proper management of these projects is essential to their success.

## ACCOMPLISHMENTS

There has been one accomplishment in this area.

### Monday.com Deployed

The Technology Services department has procured *monday.com* as a tool to track all initiatives and projects in the College’s Technology Portfolio.

## CURRENT NEEDS

There is one current need in this area.

### Create Standard Project Management Methodology

The department needs to create a standard project management methodology, including document templates for a Project Charter, Project Plan, Business Requirements, Technical Requirements, Design, and Post-Mortem.

## ROAD MAP

There is one item on the Project Management road map.

### Enterprise Resource Management

In conjunction with TAC, the department will need to continue on from project management to portfolio management with an emphasis on managing staff\faculty resources across multiple projects. It is crucial that the College properly budget resource hours to ensure that it does not overcommit resources and that projects can be completed on schedule.

## Technology Governance

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Technology governance ensures that technology services are properly aligned with the College’s strategies and objectives. This is accomplished primarily through the Technical Advisory Committee, which consists of staff and faculty representing multiple departments and is chaired by the IT Director.

## ACCOMPLISHMENTS

There have been three accomplishments related to technology governance.

### TAC Charter

A charter was created that defined the purpose, roles and responsibilities, meeting frequency, and membership of TAC.

### Technology Proposal Process

TAC defined the Technology Portfolio, which includes all technology initiatives and projects that are currently being implemented as well as those that have been approved and are awaiting implementation. (For more information on the Technology Portfolio, see the 'Project Management' section below.) It then created a formal process for submitting technology proposals to TAC for evaluation and recommendation.

### SharePoint Site

A SharePoint site was created to act as a repository for all TAC-related documents. The site is also used to formally track all submitted technology proposals.

## CURRENT NEEDS

There is one current need in this area.

### Define TAC Reporting Relationship

As its name indicates, TAC is an advisory body that does not have decision-making authority. Its purpose is to discuss technology needs and make recommendations. The College needs to determine how these recommendations are formally related to the College's decision-making bodies as well as the role these recommendations play in the decision-making process.

## ROAD MAP

There are two items on the Technology Governance road map.

### TAC Evolution into Steering Committee

As technology governance matures, the College should consider evolving TAC's role as an advisory body into a steering committee for technology projects. Once the Technology Services department's project methodology has been formally defined (see the 'Project Management' section below), there will be a need to manage resource hours involved in technology projects. Such tactical decision-making may best be handled by this committee.

# Technology Procurement

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In addition to procuring technology for its own systems, the Technology Services department assists other departments in procuring their own technology, both hardware and software. This assistance includes providing advice, obtaining quotes, submitting purchase requests, and inventorying the hardware asset or software license(s).

## ACCOMPLISHMENTS

No work was performed in this area.

## CURRENT NEEDS

There are two current needs in this area.

#### **ICT Accessibility**

The College needs to procure external resources or develop internal resources qualified to evaluate proposed information and communication technology (ICT) for accessibility requirements and then develop a formal process to perform these evaluations as an integral part of the procurement process.

#### **Software Database**

The College needs to create and maintain a database of all software that is purchased by the College. This database will include information about the type of software (local, client\server, or Software-as-a-Service), the license obtained, and the original funding source.

### **ROAD MAP**

There is one item on the Technology Procurement road map.

#### **Procurement-Related Service Requests**

As part of the effort to restructure HappyFox (see the ‘Employee Support Services’ section in the “Client Services” chapter below), the department needs to create procurement-specific service requests. Specifically, one service request needs to be defined for requesting quotes and procurement and another for requesting deployment of received hardware or software.

This chapter enumerates the accomplishments, details the current needs, and lays out the road map for processes and technologies that are delivered directly to faculty, staff, and/or students at the College.

# COS Workstations

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'COS Workstations' are computers (desktops and laptops) that have been assigned to College of the Siskiyou's employees, both staff and faculty.

## ACCOMPLISHMENTS

No work was performed in this area.

## CURRENT NEEDS

There are five current needs in this area.

### Accurate Inventory

The current inventory of COS workstations needs to be validated to ensure that it is accurate.

### Inventory\HW Lifecycle

Using the COS workstation inventory, a hardware lifecycle needs to be created, indicating which systems need to be replaced in future fiscal years.

### Retire Windows 7

The College has several workstations that are still running the Windows 7 operating system. Extended support for this operating system ended on 1/14/20. Consequently, Microsoft no longer makes security updates for this OS, making its use a security risk. To eliminate this risk, the department needs to retire or upgrade all workstations running this OS.

### Define Workstation Standard

A "COS Workstation Standard" document needs to be created that defines the both the hardware and software standard for all COS workstations. Hardware standards will be applied when procuring desktops and laptops for COS employees. Software standards will be applied when deploying new COS workstations and will be enforced throughout the workstations' lifecycle. This standard will be regularly updated as technology changes.

### Create Workstation Standard Implementation System

The department needs to create a system that will automatically deploy, update, and continually enforce the COS Workstation standard on all systems assigned to employees.

## ROAD MAP

There are two related items on the COS Workstation road map.

### Mobile Workforce

In light of the sudden shift to remote work necessitated by the COVID-19 pandemic, the College should evaluate how to accommodate a more mobile workforce, including the ability to remotely

manage COS workstations. This is especially desirable in an environment where weather often requires campus closure.

#### Virtual Desktop Infrastructure (VDI)

As a small, rural community College, COS is faced with very limited resources for technology. The College should explore using VDI to reduce the costs associated with regular replacement of workstation hardware. VDI could also be an excellent way of accommodating a mobile workforce.

## Classrooms & Labs

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The College has deployed several computer systems to be used in classrooms and labs on both the Weed and Yreka campuses. Some labs are portable so that they can be deployed anywhere.

### ACCOMPLISHMENTS

There has been one accomplishment in this area.

#### New Smart Classrooms

The following classrooms were upgraded to smart classrooms with Zoom technology:

- Weed Campus
  - DLC8
  - McCloud 103
  - McCloud 112
  - Science 110
- Yreka Campus
  - RHSI 121
  - RHIS 123
  - Room 5

In addition, Zoom technology was deployed to the following conference rooms:

- Administrative Conference Room (ACR)
- Board Room (an upgrade of existing equipment, including large TVs to improve visibility for all participants in Board meetings)

#### Smart Classroom Standard Defined

In response to the architects for the theater project, the standard for smart classrooms was defined.

### CURRENT NEEDS

There are five current needs in this area.

#### Documentation

Each classroom needs to be categorized as either a traditional, standard, or smart classroom. Then, the equipment in and configuration of each standard and smart classroom as well as all labs need to be documented.

#### Develop Hardware Lifecycle

The documentation described above will be used to defined the hardware lifecycle for classrooms and labs.



#### Define Classroom\Lab Standard

The department needs to define the hardware and software standard to be used in both traditional and smart classrooms.

#### Incorporate into Workstation Implementation System

The personal computers deployed in classrooms and labs should be incorporated into the same implementation system used for COS workstations (see the 'COS Workstations' section above).

#### Refresh UPS

The Uninterruptible Power Supplies in many smart classrooms are old and failing. As a result, smart classrooms often go offline after a power outage and need to be manually restarted before they are available again. These need to be identified and replaced.

### ROAD MAP

The department needs to work with Instruction to develop a road map.

## Employee Support Services

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The Technology Services department provides technology support services to employees through the Help Desk. Most support is provided via telephone or over the data network but it may also be provided in-person to locations on COS campuses.

### ACCOMPLISHMENTS

There has been one accomplishment in this area.

#### Hire Technician I

The department hired Bethany Golly as Technician I to fully staff the Client Services team.

### CURRENT NEEDS

There are three current needs in this area.

#### Upgrade HappyFox

Currently, the College is running HappyFox 1.0. The company has released version 2.0 and the College needs to upgrade to this version by the end of 2021. This upgrade provides a new look and feel to users but does not alter functionality. Ideally, this upgrade will be executed in conjunction with the restructuring discussed below.

#### Restructure HappyFox

The department needs to restructure the HappyFox ticketing system along the four lines of service and facilitate reports comparing the department's efforts with Service Level Agreements.

#### Office Space\Storage

The department needs to re-evaluate the office space and storage needs of client services. The current arrangement of technician workspaces is segregated, undermining collaboration efforts and making the area appear unapproachable to users. What's more, the area is often crowded with equipment that has been received and needs to be stored. While the department has a large storage area outside of the office, it lacks climate control and, consequently, is ill-suited to storing most technological equipment. The department needs to identify more space in which to store

and equipment and to re-arrange the technician workspace to assist in collaboration and make the area more approachable to users.

## ROAD MAP

There are two items on the Employee Support Service roadmap.

### Automated Workflow for Service Requests

The department needs to improve service by implementing automated workflow in HappyFox for service requests, such as user provisioning requests, to ensure compliance with defined business processes.

### Integrate Help Desk and Asset Software

The department uses HappyFox as a help desk ticketing system and Asset Panda for asset tracking. The department needs to look at integrating the two systems so that asset information can be utilized within the help desk tickets.

## File Sharing

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Users in the College share unstructured data (i.e. data files) through file shares maintained by local Windows servers.

### ACCOMPLISHMENTS

No work was accomplished in this area.

### CURRENT NEEDS

There is one current need in this area:

#### Documentation

The current file share infrastructure needs to be documented, including a list of shares, a description of their purpose, and the permissions assigned to those shares.

## ROAD MAP

There is one item on the file sharing road map:

### Migrate to the Cloud

The department should explore migrating unstructured data from file shares on local Windows servers to cloud-based storage. Specifically, individual data could be migrated from home folders to OneDrive while collaborative data could be migrated from file shares to SharePoint or MS Teams (see 'Collaboration Tools' below). This would allow the department to retire the File Sharing Service.

## Collaboration Tools

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The department provides several tools that allow staff and faculty to collaborate with one another as well as with students. Through the Chancellor's Office, the department provides Zoom for video conferencing, chat, and online classes. It also provides Microsoft Teams for video conferencing, chat, online classes, and file sharing.

## ACCOMPLISHMENTS

There have been two accomplishments in this area.

### Zoom Sub-account Creation

Zoom licensing for staff and faculty is provided by the California Community Colleges Chancellor's Office (CCCCO). As a result, management of COS Zoom user accounts had to be performed by the CCCCCO and some configurations could not be performed specifically for COS. The department worked with the CCCCCO to create a sub-account for COS that allows the department to manage its COS Zoom user accounts and make COS-specific configuration changes.

### Closed Captioning for Zoom

The department implemented Otter for Business so that artificial intelligence can be used to provide closed captioning in Zoom meetings.

## CURRENT NEEDS

There is one current need in this area.

### Develop Standards and Procedures for MS SharePoint and Teams

The department needs to design standards and procedures for the use of MS Teams and SharePoint so that it effectively meets the College's needs and then develop a plan to implement these tools for all departments.

## ROAD MAP

There is one item on the Collaboration Tools road map.

### Fully Implement MS SharePoint and Teams

The road map consists of executing the plan to implement MS Teams and SharePoint to all departments.

# Printing

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The department provides printers to users throughout the College. In many cases, these are multifunction printers that may also photocopy, scan, and/or fax.

## ACCOMPLISHMENTS

No work was performed in this area.

## CURRENT NEEDS

There is one current need in this area.

### Documentation

The department needs to document the existing printing infrastructure and then perform a service evaluation to determine where improvements can be made. The service evaluation also needs to include a cost-benefit analysis of existing contracts.

## ROAD MAP

The roadmap will be produced by the service evaluation discussed above. This will include plans to address the expiration of the College's copier lease in July 2024.

# Telecommunications

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The department provides Voice-Over-IP (VOIP) telecommunications services to both the Weed and Yreka campuses.

## ACCOMPLISHMENTS

No work was performed in this area.

## CURRENT NEEDS

There is one current need in this area.

### Documentation

The department needs to document the existing telecommunication infrastructure and then perform a service evaluation to determine where improvements can be made. The service evaluation also needs to include a cost-benefit analysis of existing contracts.

## ROAD MAP

The roadmap will be produced by the service evaluation discussed above.

# Physical Security

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The department provides technology to enhance security on COS campuses. This includes surveillance cameras and electronic locks for doors.

## ACCOMPLISHMENTS

There were two accomplishments in this area.

### New Security Cameras for RHSI

Two new security cameras were installed around the RHSI building on the Yreka campus.

### Informacast Reimplementation

In November 2019, the College's Voice-Over-IP (VOIP) system was upgraded. At that time, the license for Informacast, an emergency mass notification system that integrates with the phone system, was not renewed and lapsed. In November 2020, this software was purchased and re-implemented.

## CURRENT NEEDS

There is one current need in this area.

### Documentation

The department needs to document both the existing security camera and electronic locks and then perform a service evaluation to determine where improvements can be made in each area. The service evaluation also needs to include a cost-benefit analysis of existing contracts.

## ROAD MAP

There are two items on the Physical Security road map.

#### External Speakers for External Communication

The College needs to explore the installation of outdoor speakers that can integrate with the Informacast emergency notification system so that messages can be conveyed to those outside, particularly on the athletic fields.

#### Service Evaluation

The roadmap will be produced by the service review discussed above.



This chapter enumerates the accomplishments, details the current needs, and lays out the road map for processes and technologies related to services that pertain to software applications that support the College's business processes rather than individual users.

# Enterprise Application Maintenance

Enterprise application maintenance encompasses all work needed to keep systems and the integrations between them operating efficiently in support of the College's business processes.

## ACCOMPLISHMENTS

There were three accomplishments in this area.

### Hire Systems Analyst

The department hired Max Michelin as Systems Analyst to provide a much-needed second resource on the Enterprise Application team.

### Evisions Upgrade

The Evisions server was upgraded from version 5.2 to 6.4.

### Security Review and Improvements

The department switched its approach to Banner security from a direct object-based model to a role-based model. We then worked with all departments to review existing permissions and make changes so that they are granted on a need-to-access basis. Finally, we developed a new process and form for granting or modifying Banner access permissions.

## CURRENT NEEDS

There are five current needs in this area.

### Enterprise Application Steering Committee

The College needs to form a committee consisting of representatives from all user groups to oversee coordinate, plan, and schedule maintenance activities.

### Production Calendar

The College needs to create a production calendar that indicates when all system maintenance activities will take place within the framework of the College's regular business processes. This calendar should be centrally accessible in electronic form.

### Run Book

The College needs to create a run book that defines both automatic and manual processes that are performed to maintain its enterprise application systems.

### Clean Argos Report Database

The Argos server's report database has a significant number of one-time, partially developed, antiquated reports. The College needs to go through this database to identify and remove such reports from the system.

### Move Chron Jobs to Automic

Most automatic processes in the College's Banner system are executed in Chron. Since this application is maintained by the Ellucian Cloud staff, the department cannot directly manage or even view the logs for these processes. Instead, all information has to be obtained from and all changes have to be made by the Ellucian Cloud team. Experience shows that this is a slow and cumbersome process. The College needs to move as many of these automatic processes from Chron to Automic so that it has direct access to the logs for these processes and can make needed changes on its own.

## ROAD MAP

There are five items on the ERP Maintenance road map.

### Standard Electronic Signature Solution

As remote distance learning becomes more common, the College needs to enhance its ability to receive documents with electronic signatures. Currently, some departments use Adobe Sign while others use DocuSign. Many departments do not have any ability to receive electronically-signed documents. The College needs to implement a single software solution for processing electronic signatures that is available in all departments.

### Reduce Dependence on Consultants

Currently, the department engages the services of consultants, remote programmer analysts, to provide technical expertise and troubleshooting assistance with Banner. The College needs to deepen the skill set of its existing staff so that resources currently used for consultants can be used for permanent staffing. This will reduce the department's dependence on consultants, increase the number of resource hours available for projects, and give the ability to develop staff internally.

### SSB 9 Upgrade

The Self-Service Banner interface needs to be upgraded to the current version. This is a significant effort that will require significant staff time and expertise from outside consultants.

### Re-evaluate Ellucian Cloud

The College spends \$320,000 a year to have Ellucian host its Banner system in the cloud. The College's experience with this service has been poor. Response and resolution times on high priority issues have been unacceptably high. The same is true of routine requests. The College could utilize another cloud provider and employ its own support person for less than the current cost and significantly improve the level of service. The College should explore the work effort and costs associated with making such a transition in order to perform a cost-benefit analysis of this option. The existing agreement with Ellucian Cloud ends in June 2023. Consequently, any efforts to move to another cloud provider would have to be executed in FY22-23.

### Shared ERP through CCCCCO

The California Community College Chancellor's Office (CCCCO) has initiated a project to consider the development of a Common Data Platform (CDP) that would be available to all districts in the CCC system. The CDP's objectives are to lower costs, improve support, align business processes, increase agility and resiliency, and reduce technical and functional staff effort. The Chancellor's Office has engaged Huron Consulting to develop a roadmap for the implementation of the system and develop a systemwide budget projection. At the request of the Chancellor's office, COS is participating in this process by providing information about our current operations and costs.



Because COS has a significant interest in the realization of the CDP's objectives, the department will continue to assist in the CDP's efforts.

## Student Application Service

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The Student Application Service encompasses all technologies and work processes that enable all business processes pertaining to the student life cycle from application to graduation.

### ACCOMPLISHMENTS

There was one accomplishment in this area.

#### SWACAP Fix

The SWACAP form in Banner that is used to correct bad applications from CCC Apply before importing into Banner had been broken for an extensive period of time. The department worked with staff from the original form developers at Ventura Community College to identify the cause and resolve the issue.

### CURRENT NEEDS

There are four current needs in this area.

#### Documentation

The department needs to document the technologies and work processes associated with Student Application Services and then perform a service evaluation to determine where improvements can be made.

#### Electronic Transcripts

The department needs to complete the project to implement the integration with the National Student Clearinghouse to provide electronic transcripts to students.

#### eLumen Online Catalog

The department needs to assist Instruction in the initial use of the eLumen Online Catalog software to produce the catalog for the 2021-2022 academic year.

#### CVC Exchange

The California Virtual Campus (CVC) is a web site created and maintained by the California Community Colleges (CCC) Chancellor's office. It allows students to search for and enroll in online courses offered at community colleges throughout the state. Currently, the College of the Siskiyous (COS) provides information about its courses to the CVC through a data file that is automatically created and updated on a daily basis.

The CVC Exchange project seeks to improve this interaction through two phases. Currently, the department is implementing the first phase in which the daily file upload is replaced by an Application Programming Interface (API) that allows the CVC web site to dynamically retrieve course information from the College's Student Information System (SIS), Banner, as needed. In the second phase, the existing API will be further configured to write registration data received through the CVC web site into Banner. This phase will require the creation and modification of several business processes to accommodate this new method of registration. In phase II, the CVC web site will be configured to use the COS' payment gateway, TouchNet, to process payments for the course from students.

## **ROAD MAP**

The roadmap will be produced by the service evaluation discussed above.

# **Instruction Application Service**

---

The Instruction Application Services encompasses all technologies and work processes that enable all business processes pertaining to the delivery of instruction to students.

## **ACCOMPLISHMENTS**

No work was performed in this area.

## **CURRENT NEEDS**

There is one current need in this area.

### **Documentation**

The department needs to document the technologies and work processes associated with Instruction Application Services and then perform a service evaluation to determine where improvements can be made.

## **ROAD MAP**

The roadmap will be produced by the service evaluation discussed above.

# **Financial Aid Application Service**

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The Financial Aid Application Service encompasses all technologies and work processes that enable all business processes pertaining to providing financial assistance to students.

## **ACCOMPLISHMENTS**

No work was performed in this area.

## **CURRENT NEEDS**

There is one current need in this area.

### **Documentation**

The department needs to document the technologies and work processes associated with Financial Aid Application Services and then perform a service evaluation to determine where improvements can be made.

## **ROAD MAP**

The roadmap will be produced by the service evaluation discussed above.

# **Academic Advising Application Service**

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The Academic Advising Application Service encompasses all technologies and work processes that enable all business processes pertaining to the providing of academic advice and counseling to students.

## ACCOMPLISHMENTS

There was one accomplishment in this area.

### Assumed Scribing Responsibilities

Previously, scribing within DegreeWorks was performed by Enrollment Services in conjunction with an outside consultant. This responsibility was transferred to the Systems Analyst\Programmer position, thereby eliminating the need to engage an outside consultant for this regular business process.

## CURRENT NEEDS

There are two current needs in this area.

### Unified Student Interaction System

Students have a variety of interactions with various programs within Student Services such as Financial Aid, Counseling\Advising, TRIO, and the ASC. Each program has its own software application to record information about these interactions. The department needs to work with Student Services to identify and implement a single system to store information concerning these interactions that will meet the following requirements:

- **Student Narrative:** a unified student interaction system will allow staff from all programs to record information about student interactions that will be visible to staff in other programs so that their interactions can be viewed as a single narrative.
- **Data Collection and Reporting:** the system needs to be able to store and report on data needed for state and federal reporting.
- **Scheduling:** the system will provide a web-interface that allows students to schedule appointments with staff from various programs online.
- **Integration:** the system should integrate with existing systems such as Banner, DegreeWorks, and Outlook.

A couple of years ago the College purchased and began to implement SARS Anywhere software but this project lost momentum and was never completed. The current licensing expires December 2021. The College needs to first determine whether SARS can adequately meet this need and, if so, complete its implementation. Otherwise, a new solution will need to be identified, procured, and implemented.

### Documentation

The department needs to document the technologies and work processes associated with Academic Advising Application Services and then perform a service evaluation to determine where improvements can be made.

## ROAD MAP

There are two items on the Academic Advising Application Services road map.

### Service Evaluation

A more complete roadmap will be produced by the service evaluation discussed above.

### Degree Works 5.03 Upgrade

Plans need to be developed to update the DegreeWorks application from version 5.0.1 to 5.03.

## Finance Application Service

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The Finance Application Service encompasses all technologies and work processes that enable all standard accounting business processes.

### ACCOMPLISHMENTS

There were two accomplishments in this area:

#### Third-Party Billing

The department implemented the third-party billing module within Ellucian Banner.

#### Purchase Orders in SSB

The department implemented the purchase orders module with Ellucian SSB 8.

### CURRENT NEEDS

There is one current need in this area.

#### Documentation

The department needs to document the technologies and work processes associated with Finance Application Services and then perform a service evaluation to determine where improvements can be made.

### ROAD MAP

The roadmap will be produced by the service evaluation discussed above.

## Human Resource Application Service

---

The Human Resource Application Service encompasses all technologies and work processes that enable all business processes pertaining to the management of staff, faculty, and student workers.

### ACCOMPLISHMENTS

No work was performed in this area.

### CURRENT NEEDS

There is one current need in this area.

#### Documentation

The department needs to document the technologies and work processes associated with Human Resource Application Services and then perform a service evaluation to determine where improvements can be made.

### ROAD MAP

The roadmap will be produced by the service evaluation discussed above.

# Payroll Application Service

---

The Payroll Application Service encompasses all technologies and work processes that enable all business processes pertaining to the payment of wages and the provision of benefits to employees.

## ACCOMPLISHMENTS

No work was performed in this area.

## CURRENT NEEDS

There are two current needs in this area.

### Documentation

The department needs to document the technologies and work processes associated with Payroll Application Services and then perform a service evaluation to determine where improvements can be made.

### Implement FLAC

The College purchased Ellucian's Faculty Load and Compensation (FLAC) module in order to automate much of the payroll process. Unfortunately, it has encountered significant obstacles in the implementation of this module. The College needs to fully implement the FLAC module in order to fully realize its benefits.

## ROAD MAP

The roadmap will be produced by the service evaluation discussed above.

# Library Application Service

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The Library Application Service encompasses all technologies and work processes that enable all business processes pertaining to the library services to students.

## ACCOMPLISHMENTS

There was one accomplishment in this area.

### Migrate from WMS to Alma

The department migrated the College's cloud-based library management system from Worldshare Management System (WMS) to Alma. This required the creation of new integrations between Banner and Alma.

## CURRENT NEEDS

There is one current need in this area.

### Documentation

The department needs to document the technologies and work processes associated with Library Application Services and then perform a service evaluation to determine where improvements can be made.

## ROAD MAP

The roadmap will be produced by the service evaluation discussed above.

# External Technology Service

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This section differs from the previous sections in that it does not discuss services provided by the Technology Services department but instead examines technology services that are provided by other departments in the College. Thus, what follows are not the accomplishments, current needs, and road map for the services (which would be developed by the other departments), but the accomplishments, current needs, and road map for the department's efforts to support these services.

## PUBLIC WEB SITE

The appearance and content of the public web site is the responsibility of the Web Links team, which consists of the Distance Learning Coordinator and an Instructional Support Specialist. The Technology Services department supports the underlying servers.

### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### *SSL-Only Web Site*

To improve security and follow current industry best practice, all of the College's public web site content should be secured with digital certificates (i.e. SSL).

### Road Map

There are two items on the public web site road map.

#### *Common Branding on SSO Sites*

The College needs to look to implement the same look-and-feel (i.e. brand) on all of the web sites that utilize the College's single sign-on (SSO) solution.

#### *Content Management System*

Currently, the Web Links team makes changes to the content and appearance of the public web site by modified HTML code through Adobe Dreamweaver. The College should consider adopting a content management system (CMS) that will allow users to make basic content changes on their own.

## RESEARCH AND EVALUATION

The Research and Evaluation team is responsible for assisting departments throughout the College in meeting governmental reporting requirements and in performing data analysis to assist in decision-making.

### Accomplishments

No work has been performed in this area.

### Current Needs

There is one current need in this area.

*Retire Oracle ODI Implementation*

Several years ago, the College used grant funding to deploy Oracle ODI in the Ellucian Cloud. The funding source is no longer available and, consequently, licensing for this solution can no longer be maintained. The department needs to retire this solution from the Ellucian Cloud.

**Road Map**

The department needs to work with Research and Evaluation to develop a road map.





This chapter enumerates the accomplishments, details the current needs, and lays out the road map for processes and technologies related to services that provide the underlying technological infrastructure needed to support the other services.

# Data Network

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This section enumerates the accomplishments, details the current needs, and lays out the road map for technologies with the College's data network.

## INTERNET CONNECTION

The College's Internet connection is a critical component in the Network Infrastructure on which nearly all of IT's services depends. Consequently, improving the performance and reliability of this connection is a departmental priority.

### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### *Independent Mobile Hotspot for IT*

The department needs to have a mobile hotspot that provides an independent Internet connection through a mobile data service. This will allow the IT department to troubleshoot Internet connectivity and to test external access on-site.

### Road Map

There are two items on the Internet Connection road map.

#### *Increase Bandwidth*

The bandwidth on the existing connection through CENIC is 1Gb, but is capable of increasing to 10Gb. Currently, 1Gb is sufficient. However, as Internet usage increases, the College will need to look at increasing the bandwidth. Such an increase can be expected as the College intends to build additional lodges to house another 300+ students. Increasing the bandwidth will result in increased operational costs for the CENIC connection.

#### *Dual Connection*

The single CENIC connection represents a single point of failure. If this connection fails, those on campus cannot connect to essential resources on the Internet such as the Student Information System (Banner) and technologies used for online classes such as the Learning Management System (Canvas), Zoom, and Microsoft Teams. The College could eliminate this single point of failure by implementing a second Internet connection to the Yreka campus. This would require securing additional funding for a second connection as well as a second firewall to secure the connection. (For further discussion, see 'Road Map' under 'Yreka-Weed Connection' below.)

## YREKA-WEED CONNECTION

The College has a private data circuit that connects the Yreka campus to the Weed campus. This connection is vital to the Yreka campus because it is used by nearly all IT services on campus.

### Accomplishments

No work was performed in this area.

### Current Needs

There are no current needs in this area.

### Road Map

There are two items on the Yreka-Weed connection road map.

#### *Monitor Utilization*

So far, the 100Mb bandwidth on this connection has been sufficient, but the IT department will need to monitor utilization of this link to see if an increase in bandwidth is needed.

#### *Dual Internet Connection*

As discussed in the 'Road Map' for the 'Internet Connection' above, the single CENIC connection represents a single point of failure for both the Weed and Yreka campuses. The Yreka-Weed connection is another single point of failure for the Yreka campus. If this link fails, the Yreka campus loses access to both the Internet and resources on the Weed campus such as the College's file servers and the phone system. Implementing a second Internet connection would eliminate the single point-of-failure for the Internet. What's more, if a VPN was established between the Yreka and Weed campus as a secondary route, the single point-of-failure could be eliminated for the resources on the Weed campus as well.

## NETWORK SWITCHES

Network switches are the devices that provide network connectivity between all devices on the College's data network. Thus, they are the primary means by which the Data Network service is provided. Because all IT services are dependent on this service, these devices must be capable of providing the level of service these other services require.

### Accomplishments

Over the last year and a half, there were two accomplishments in this area.

#### *Partial Edge Switch Refresh*

Technology Services obtained grant funding to procure refurbished Cisco switches to replace antiquated switches on the edge of the network. These switches have been deployed.

#### *Documentation*

The College's current network architecture and configuration has been documented in the "Infrastructure Services – Implemented Technology" document.

### Current Needs

There are two current needs in this area.

#### *UPS Refresh in IDFs*

The College experiences frequent power outages, particularly on the Weed campus. While there is a generator to provide back-up power on the Weed campus, there is normally a brief interruption as the supply of power switches to the generator. This temporary loss of power has caused network switches in several IDFs to shut down and then boot up when the power is

restored, causing a network outage. Several of these switches provide power-over-Ethernet (POE) to phones. This means that the both the Data Network Service and Telecommunications Service are disrupted. The College needs to deploy Uninterruptible Power Supplies (UPS) to provide sufficient power during the power switch so that these services are not disrupted during a switch in power.

#### *Redeploy Second Meraki Core Switch*

The College has two Meraki MS25 switches deployed at the core of the network. One of these switches has malfunctioned to the point that, if it is brought online, it takes the entire network down, even after being restored to factory defaults. This switch needs to be replaced and brought into back into service in the network core.

### Road Map

There is one item on the road map for network switches.

#### *Standardize Network Switch Vendor*

The College has experienced a number of issues rooted in having a mix of two network vendors: Cisco and Meraki. To avoid these issues, the College needs to standardize on a single network vendor, either Cisco or Meraki. Tech Services needs to perform a cost benefit analysis to determine which best meet the needs of the College and then lay out a plan to migrate fully to that vendor. The licensing for the Meraki switches ends August 2023 so a path will need to be set by FY23-24.

## LAN CONNECTIONS

Local Area Connections (LAN) are the connections from endpoints to network switches as well as connections between buildings on the same campus.

### Accomplishments

No work was accomplished in this area.

### Current Needs

There is one current need in this area.

#### *Documentation*

The department needs to document the connections that exist between building on both campuses.

### Road map

There are five items on the LAN Connections road map.

#### *Evaluate Network Drops\ Punch Panels*

Many of the COS buildings and the network drops and patch panels within them are over two decades old. The communication infrastructure in these buildings needs to be evaluated to determine where it is need of replacement.

#### *New Theater*

The College launched a project to build a new theater and arts building on the Weed campus. The internal wiring and LAN connections for this building will need to be designed and deployed.

#### *Replace Multi-mode Fiber w\ Single-Mode*

Over time, the College should replace older multi-mode fiber links with single-mode fiber.

### *Fiber to Stadium*

The athletic department has expressed interest in extending a fiber connection to the stadium to better support streaming video. A cost estimate and funding for this connection will be needed.

### *New Lodges*

The College has initiated a project to construct additional lodge buildings. The internal wiring and LAN connections for this building will need to be designed and deployed.

## **WIRELESS NETWORK**

The wireless network makes the College's internal network available to mobile devices such as laptops, tablets, and smart phones.

### **Accomplishments**

There were two accomplishments in this area.

#### *New Wireless Access Points*

Two additional wireless access points (APs) were deployed in the last year. One access point was deployed to the kiosk to support the school's COVID-19 screening process. Another was deployed to the Life Science Building to improve service in that building.

#### *Consolidate SSIDs*

The department eliminated the WeedGuest and YrekaGuest SSIDs leaving just one publicly accessible SSID (COS-PUBLIC) for both campuses.

### **Current Needs**

There are two current needs in this area.

#### *Develop Coverage Maps*

Tech Services needs to create maps for both the Weed and Yreka campuses that indicate where wireless network coverage is provided and, by implication, where it is not. This map would become part of the Data Network SLA so that there is a formal understanding about where coverage can be expected.

### **Road Map**

There are two items on the Wireless Network road map.

#### *Wireless System Refresh*

The current wireless network infrastructure was purchased and deployed in the summer of 2017. The AP licenses will expire in June 2023. As a result, these licenses will need to be extended in FY22-23. In addition, Tech Services will need to evaluate the AP hardware to determine what when they will need to be replaced.

#### *Wireless Network Service in Lodges*

Usage of the wireless network in the existing lodges, particularly as a result of the COVID-19 pandemic, has increased beyond what was intended in the original design. Further, the College will be constructing new lodges that it is anticipated will have approximately 350 additional beds. Consequently, the College will need to reassess how the wireless network is provided to the lodges in order to accommodate the significantly increased usage and to ensure that it is available for educational needs while still providing for reasonable recreational usage.

## VIRTUAL PRIVATE NETWORKS

Virtual Private Networks (VPNs) allow the College to securely extend its internal network over a public network. This takes two forms. The most common is a client-server VPN in which a single computer connects to the College's internal network through the Internet. Another is a network-network VPN in which two networks create a private link over the Internet.

### Accomplishments

There was one accomplishment in this area.

#### *Implement Palo Alto Global Protect*

The College deployed a new Palo Alto (PA) 3260 Next-Gen firewall to replace a Cisco ASA firewall. The network-to-network VPN between the College's internal network and the Ellucian Cloud was migrated from the Cisco VPN to the PA3260. In addition, the PA's Global Protect client-server VPN has been deployed to Tech Services staff. (For more information, see the 'Firewall' section in the "Information Security" chapter.)

### Current Needs

There is one current need in this area.

#### *Retire Cisco AnyConnect*

Current, the Cisco ASA firewall is still in production to support the Cisco AnyConnect VPN that has been implemented to all departments. All users need to be migrated to the PA Global Protect VPN so that the Cisco ASA, which is out of support and approaching end-of-life, can be retired. (For more information, see the 'Firewall' section in the "Information Security" chapter.)

### Road Map

There are three items on the VPN roadmap.

#### *Two-Factor User Authentication*

Currently, users only need to provide a password to access the VPN. This makes the VPN vulnerable to dictionary-styled attacks. To strengthen security, the College needs to implement two-factor authentication for VPN access.

#### *Workstation Authentication*

Currently, users can access the VPN from any computer on which they have installed the VPN client software. This means that users can connect from computers that do not have the College's standard security settings and tools. This presents a significant security risk. To eliminate this risk, the College needs to add workstation authentication to the VPN so that only COS-issued systems can connect through the VPN.

#### *Azure Cloud*

As discussed in the "Servers and Storage" chapter below, the College roadmap calls for migrating locally hosted servers to the MS Azure cloud. This will require establishing a network-to-network VPN between the COS network and the College's Microsoft Azure tenant.

## ROUTING

Routing is the flow of network traffic between VLANs within the college's network as well as out to and in from the Internet.

### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### *Documentation*

The department needs to document what devices perform layer-3 routing functions, where and what static routes have been defined, and what dynamic routing protocol(s) have been deployed.

### Road Map

There is one item on the Routing road map.

#### *Architecture Evaluation*

Once the current routing architecture has been documented, it should be evaluated to determine what if any changes should be made to make improvements, including a reduction in the number of VLANs.

## IP SERVICES

IP Services are the services that are needed to implement the TCP\IP protocol. Currently, the College uses the Domain Name System (DNS) to provide host name to IP address resolution both internally and externally as well as the Dynamic Host Configuration Protocol (DHCP) to dynamically allocate IP addresses.

### Accomplishments

No work was performed within this area.

### Current Needs

There is one current need in this area.

#### *Documentation*

The department needs to document how DNS is configured both for internal and external (i.e. Internet) host name resolution as well as how DHCP has been deployed in the internal network.

### Road Map

There is one item on the IP Services roadmap.

#### *Configuration Evaluation*

Once the current IP services configuration has been documented, it should be evaluated to determine what if any changes should be made to make improvements.

## DATA CENTERS

A data center is a room that is dedicated to housing deployed technological equipment. The College has three data centers: a server room and network communication room on the Weed Campus and a server room on the Yreka Campus. This sub-section focuses on power, climate control, and security for these data centers.

### Accomplishments

No work was performed in this area.

### Current Needs

There are three current needs in this area.

#### *UPS in Network Communications Room*

The Network Communication Room stores equipment that is used for telecommunications and wide area network connections. Currently, this equipment is connected to a collection of workstation-class devices, which are unreliable and insufficient in the event of a power outage. A data center grade UPS is needed to reliably provide power after a power outage.

#### *Strengthen Network Communications Room Security*

Currently, the Network Communications Room can be accessed by anyone with the general access key (#45). Access to this room should be limited to those with a more restricted key (#49).

#### *Complete Documentation*

The department needs to complete document of the climate control systems and UPSs in the data center.

### Road Map

Two items are currently on the Data Center road map.

#### *Environmental Monitoring*

The department needs to explore better methods for monitoring and notifying the environment (such as temperature and humidity) in its data centers.

#### *Dedicated Climate Control in Network Communications Rooms*

Currently, climate control is provided to the Network Communications Room with the same system that is used for the rest of the building. The department should perform a cost-benefit analysis to determine if a dedicated climate control system is needed.

#### *Redundant UPS in Yreka Server Room*

Currently, there is only one data center-grade UPS in the Yreka Server Room. The department should perform a cost-benefit analysis to determine if a redundant UPS is needed.

Once the documentation has been completed, the road map will be expanded.

## Servers & Storage

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This section enumerates the accomplishments, details the current needs, and lays out the road map for the College's servers, both physical and virtual.

### **WINDOWS SERVER OPERATING SYSTEMS**

The department has established the Microsoft Server as the standard server operating system (2019 is the current standard). Other server operating systems are only used when (1) Windows Server cannot be used and (2) support for the server operating system is provided by an external vendor.

#### Accomplishments

No work was performed in this area.

#### Current Needs

There is one current need in this area:

#### *Retire Unsupported Operating Systems*

The College currently has four servers running the Windows Server 2003 operating system and one running Windows Server 2008. These OSs are no longer supported by Microsoft. (The end-of-life date for 2003 was 7/14/15 and for 2008 was 1/14/20.) Consequently, Microsoft no longer

makes security updates for these OSs, making their use a significant security risk. To eliminate this risk, the department needs to retire all servers running these OSs.

### Road Map

There are four items on the Server Operating System road map:

#### *Establish a Server Operating System Standard*

The department needs to develop a “COS Server Standard” document that defines both the hardware and software standard for all COS servers. Hardware standards will be applied when procuring new servers. Software standards will be applied when deploying new servers and will be enforced throughout the servers’ lifecycle. This standard will be regularly updated as technology changes.

#### *Create a Server Operating System Standard Implementation System*

Once the standard is defined, the department needs to create a system that will automatically deploy, update, and continually enforce the COS Server standard on all Windows servers.

#### *Windows Server 2012 Upgrade*

The College currently has 25 servers running the Windows Server 2012 operating system. Microsoft has scheduled this OS’s end-of-life for 10/10/23. The department needs to develop plans to upgrade servers that are currently running this OS over the next two years.

#### *Windows Server 2016 Upgrade*

The College needs to transition the process of upgrading its server operating systems from the end of the OS lifecycle towards the beginning. The College currently has 16 servers running the Windows Server 2016 operating system. Microsoft has scheduled this OS’s end-of-life date 01/27/27. To start this transition, the department will need to develop plans to upgrade servers that are currently running 2016 over the next three to five years. Ideally, the department will find opportunities to upgrade this OS earlier than this.

## **VIRTUALIZATION**

The College has two virtualization environments. The primary virtualization environment, which hosts most of the College’s virtual servers, utilizes the Windows HyperV hypervisor. The telecommunication virtualization environment, which hosts servers needed for the telecommunication environment, utilizes the VMWare ESX hypervisor.

### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### *Documentation*

The department needs to document both virtualization environments and then perform a service evaluation to determine where improvements can be made.

### Road Map

The roadmap will be produced by the service evaluation discussed above.

## **STAND-ALONE SERVERS**

Stand-alone servers are physical servers that run a single operating system, applications, and store data locally.



### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### Documentation

The department needs to document all stand-alone servers and then perform a service evaluation to determine where improvements can be made. Specifically, a determination needs to be made of there is a legitimate business or technical reason such servers cannot be virtualized.

### Road Map

The roadmap will be produced by the service evaluation discussed above.

## **HYPER-CONVERGED TECHNOLOGY**

The College has deployed a Dell Nutanix device, which combines server and storage hardware into a single device. This device runs the College's primary virtual server environment.

### Accomplishments

No work was performed in this area.

### Current Needs

There are three current needs in this area.

#### Extend Warranty\Support

The current warranty and support for the Nutanix device expires March 31, 2022. In FY21-22, the College will need to extend this for another year.

#### Software Upgrade

The department needs to upgrade the Nutanix management software. As a prerequisite, the Windows server operating systems running on each blade within the device need to be upgraded from Windows Server 2012 to the current standard, 2019.

#### Documentation

The department needs to document the Nutanix device configuration.

### Road Map

While it may be possible for the College to extend the warranty\support for another year, the College will need to replace the device in FY22-23. The College needs to explore three options: replacing it with another hyper-converged device, replacing it with standard rack-mounted servers and a storage array, or migrating to Infrastructure-as-a-Service (IaaS). See the "Infrastructure-as-a-Service" section below.

## **Information Security**

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This section addresses various technologies that are used to secure the College's information systems.

### **FIREWALL**

The College has a single firewall deployed to protect the College's internal network from threats on the Internet.

### Accomplishments

There was one accomplishment in this area.

#### *New Firewall*

The College deployed a new Palo Alto (PA) 3260 Next-Gen firewall to replace a Cisco ASA firewall. It is licensed for Threat Prevention, to block malicious software, and Wildfire, to utilize cloud-based data analysis to dynamically adjust to threats.

### Current Needs

There is one current need in this area.

#### *Retire Cisco ASA*

While the role of the firewall has been switched from a Cisco ASA to PA-3260, the Cisco ASA is still deployed to provide VPN services. Clients need to be migrated from Cisco AnyConnect to Palo Alto GlobalProtect so that the Cisco ASA firewall can be retired.

### Road Map

There is one item on the Firewall roadmap.

#### *Intrusion Testing*

The College needs to establish a program to perform periodic intrusion testing to detect any unnecessary access through the firewall.

## **ENDPOINT PROTECTION**

Endpoint Protection involves securing endpoints within an Information Security system – such as desktops, laptops, and mobile devices – from malicious software.

### Accomplishments

No work was performed in this area.

### Current Needs

There is one current need in this area.

#### *Perform Evaluation*

The College currently utilizes Windows Defender, an application included within the Microsoft Windows operating system, for endpoint protection. The College needs to evaluate the effectiveness of this solution to determine if an additional solution is needed.

### Road Map

The Endpoint Protection road map will be defined after the evaluation mentioned above.

## **MONITORING AND SECURITY INFORMATION AND EVENT MANAGEMENT (SIEM)**

The College uses Solarwinds software to monitor activity on the College's data network and to view activity logs from various nodes on the network.

### Accomplishments

There was one accomplishment in this area.

#### *Upgrade Solarwinds*

In response to a high-profile security breach in the Solarwinds software, the department upgraded to the latest version of Solarwinds that removed the known vulnerability.

### Current Needs

There is one current need in this area.

#### *Evaluate No-cost Solutions*

In light of significant budget constraints, the department needs to evaluate shareware solutions that may be able to provide similar capabilities free of cost.

### Road Map

A road map will be set once a determination is made whether to move to shareware solutions.

## **PERSONAL INFORMATION SECURITY PROGRAM**

The College of the Siskiyous (COS) values the privacy of its students, faculty, staff and all with whom it interacts and has implemented a “Personal Information Security Program” to ensure that personally identifiable information (PII) is properly safeguarded, whether stored physically or digitally. To this end, the department performed a preliminary risk assessment and created the initial “COS Personal Information Security Program” for the 2020-2021 academic year. This document will be updated each summer for the following academic year. Regular production of this document fulfills one of the requirements of the Gramm-Leach Bliley Act (GLBA) and is provided to external auditors to indicate compliance. The document sets forth an Action Plan which includes both the ‘Current Needs’ and ‘Road Map’ for this program. Technology-related components of the plan are incorporated throughout this document, while non-technological components, such as end user training, are covered only in that document.

# User Account Management

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This section discusses technologies associated with identity management and authentication.

## **ACTIVE DIRECTORY**

The College uses Microsoft Active Directory (AD), both local and Azure, as its primary identity management and authentication system.

### Accomplishments

There was one accomplishment in this area.

#### *SSO Restructuring*

The College’s Single Sign-On (SSO) architecture was restructured. CAS5 was removed as an authentication provider and all applications utilizing SSO were directed to Azure AD for authentication. In addition, accounts were migrated and deleted so that all student accounts exist only in Azure AD while all employee accounts exist in both local and Azure AD.

The following applications were integrated in this SSO solution:

- Adobe Creative Cloud
- Barracuda spam filtering system
- Canvas learning management system
- CCC Application System administrative console
- DSAIM accessible information management system
- Ellucian Banner ERP system
- HappyFox help desk ticketing system (both Technology Services and Research & Evaluation portals)

- Microsoft Office 365 application suite
- Pear Deck Add-in for MS Teams
- Tutortrac tutoring management system
- Zoom video conferencing

### Current Needs

There are two current needs in this area.

#### *Active Directory Upgrade*

The local Active Directory forest and domain levels are Windows Server 2012. This needs to be upgraded to Windows Server 2019.

#### *Global Address List segregation*

With both employees and students in the same Azure AD domain, the default Global Address List (GAL) includes both, which presents a large list and increase the likelihood of accidentally selecting a wrong recipient. The department needs to determine how to segregate the GAL to address these issues.

### Road Map

There are two items on the Active Directory road map.

#### *Regular Active Directory Upgrades*

The department needs to regularly upgrade the Active Directory forest\domain so that it corresponds to the current operating system standard.

#### *Separate Student Domain*

The department needs to explore the possible benefits of developing a separate Azure AD domain for student accounts.

## **PROVISIONING\DE-PROVISIONING PROCESS**

This section discusses the technology and business processes used to create and retire user accounts for both employees and students.

### Accomplishments

There was one accomplishment in this area.

#### *Replace ADAP w\ Scripting Process*

Because Ellucian's Banner Enterprise Identity Services' (BEIS) Active Directory Account Provisioning (ADAP) cannot be used to synchronize accounts in Azure AD, the department replaced it with an internally developed data export and scripting process.

### Current Needs

There is one current need in this area.

#### *Develop and Document a Formal Process*

The department needs to work with the Human Resources department to develop and document a formal process for provisioning and de-provisioning accounts for employees. This process will include on-boarding new employees from a technological perspective.

### Road Map

There is one item on the road map.

### *Retire Scripting Process*

While the scripting process mentioned above allows the department to automatically create accounts in Azure AD, it must be maintained by the department and is vulnerable to changes in Microsoft's PowerShell scripting commands and syntax. Consequently, the department should monitor BEIS ADAP development to see if it adds the ability to create accounts in Azure AD.

## Infrastructure-as-a-Service (IaaS)

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Infrastructure-as-a-Service (IaaS) allows an organization to move its technological infrastructure, such as servers and storage, from local hardware to a vendor's cloud (i.e. Internet presence).

### **AMAZON WEB SERVICES**

The College currently utilizes Amazon Web Services (AWS) to provide IaaS for the College's public web site.

#### Accomplishments

No work was performed in this area.

#### Current Needs

There is one current need in this area.

##### *Documentation*

The existing AWS implementation need to be documented and evaluated.

#### Road Map

A road map for AWS will be developed after the documentation and evaluation describe above.

### **AZURE**

Microsoft Azure is Microsoft's IaaS offering. The College does not currently utilize Azure for IaaS so, naturally, there are no accomplishments and current needs in this area.

#### Road Map

The College needs to explore migrating its local servers and storage to Microsoft's Azure as possible way to reduce costs and improve business continuity and disaster recovery (see this section below).

## Business Continuity\Disaster Recovery

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This section focuses on the technology and business processes design to make the College's information systems resilient in the face of disruptions and disasters.

### **DATA BACKUP\RECOVERY**

Data backup is performed so that, if data is accidentally lost or damaged, it can be restored.

#### Accomplishments

No work was performed in this area.

#### Current Needs

There is one current need in this area.

### *Full Cloud-based Backup*

Currently, the College backs up all of its data locally. Only some systems are backed up to the cloud. To improve the College's ability to recover lost or damaged data (particularly ransomware), all backups need to be made to the cloud.

#### Road Map

There is one item on the Data Backup\Recovery road map.

#### *Identify Requirements*

The College needs to define the requirements for archiving data so that the department can configured a data backup routine with the appropriate restore points.

## **BUSINESS CONTINUITY**

Business continuity is the ability of a technological infrastructure to experience component failures and still be able support business process.

#### Accomplishments

No work was performed in this area.

#### Current Needs

There is one current need in this area.

#### *Identify Single Points of Failure*

The department needs to evaluate the current information system architectures to identify individual components that, if they fail, would result in the failure of critical information systems.

#### Road Map

There is one item on the Business Continuity road map.

#### *Eliminate Single Points of Failure*

The department needs to develop a plan to, wherever possible, eliminate single points-of-failure to improve the College's business continuity.

## **DISASTER RECOVERY**

Disaster recovery is the ability of a technological infrastructure to restore services after they have been interrupted by a disaster.

#### Accomplishments

No work is accomplished in this area.

#### Current Needs

There are two current needs in this area.

#### *Identify and Prioritize Critical Systems*

The department needs to work with the College to identify critical systems. These systems then need to be prioritized in relation to one another to determine possible recovery order.

#### *Enumerate Potential Disasters and Probability*

The department needs to enumerate potential disasters that could adversely impact the College's information systems and then determine the probability of each. This information will be used to determine which disasters should be the focus of disaster recovery.

## Road Map

There is one item on the Disaster Recovery road map.

### *Develop Disaster Recovery Plan*

The College needs to develop a formal Disaster Recovery Plan. As a part of that plan, the department needs to develop a plan to recover information systems to support the College's critical operations after a disaster.