SOUTHWESTERN

Technology Service Life Replacement Plan

Southwestern Oregon Community College

This plan is intended to replace the current technology replacement plan by, identifying goals, objectives, and replacement guidelines for campus technology which are sustainable within college IT standards. This plan will provide details regarding the planning, replacement, redeployment, and disposal of outdated or obsolete computer technology.

Integrated Technology Services (ITS)

2/12/20

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Overview

The college had a previously established a Technology Replacement Plan which identified objectives, and general replacement guidelines for computer technology within college IT standards. In 2008, and due to a funding crisis, the college froze this plan. In the absence of a Technology Replacement Plan, beginning in the fiscal year 2009-10. Since then the college has taken a "one off" approach to technology replacement, which places a higher and higher burden of replacement on the budget as equipment replacement timelines begin to overlap. It is our recommendation the college turn back to a yearly replacement plan of all technology using the Gardner Group TCIO model. The IT Governance Group should assume the task of reviewing and updating the replacement and redeployment guidelines contained herein.

This Technology Lifecycle Replacement Plan includes recommendations regarding projections for replacement and associated costs considerations to be used in planning technology for the college's future. These projection and replacement guidelines are applicable to equipment for faculty, staff, management; equipment for instructional computer labs; and equipment needed to support the college administrative, teaching, and learning, and supporting applications.

The Technology Replacement Plan guidelines will:

- Identify redeploy order for computers, printers, multimedia, network, and domain related equipment.
- Identify computers and related equipment, which have become obsolete and should be disposed.
- Inform replacement costs projection in accordance with Total Cost of Ownership for budgeting and planning purposes.

The guidelines for replacement and maintenance reserves funding established in the college Technology Lifecycle Replacement Plan are listed in the Appendix of this document.

Microsoft System Center reflects the list of equipment supported at the college. For a current list of campus computers: SWOCC System Center Current List **(Create Link to current document)**

Criteria to Replace Computers and Related Equipment

The criteria, which will be used to replace college computers and related equipment, shall be reviewed annually by the IT Governance Group and modified as needed. Seventy percent of all enterprises that extend desktop PC life cycles will not achieve significant reductions in total cost of ownership (TCO). IT systems are in a constant state of upgrade, change and improvement. Thus, IT equipment life cycles are typically shorter than other capital items, ranging from three to ten years, with extended life spans depending on the technology. The anticipated "service life" of SWOCC technology equipment is as follows:

- Audio-visual equipment: 7 years
- Desktop/laptop computers: 5 years
- Specialty desktop/laptop: 3 years
- Generator: 20-30 years
- Network Cabling: 20-25 years
- Network equipment: 7-10 years
- Printers: 5 years
- Servers: 5-7 years
- Telephony Systems: 8-12 years
- UPS: 15-20 years
- UPS Batteries: 3-5 years

The college IT Governance Group will evaluate requests outside of these criteria based on documented and submitted needs within the program review process, taking into consideration production loss with older equipment, and available funds. The IT Governance Group will collaborate with Southwestern IT personnel to assist with prioritization of need.

Redeployment

Computers and related equipment for personnel, existing instructional computer labs, and classrooms will be redeployed by age with documented rationale/criteria within Program Review and Unit Plan process as follows:

- Computer and equipment utilized by students and faculty to access college resources and instruction
- Staff and management to support instruction and college operations

Funds permitting, every attempt will be made to upgrade redeployed computers to meet department needs within minimum college and district standard software requirements, and standards. Exceptions to the redeployment are Perkins (see Appendix) and other grant funded computers and related equipment. The Share Point Inventory database will include the notation as to general fund, Perkins, or grant funded status.

Liquidation and Disposal

Computers and related equipment which have been replaced by new or redeployed units will be liquidated/disposed of in accordance with college policy APP6095 if it is determined that:

- Equipment does not and cannot meet the current college standard configurations
- Equipment has a history of disrepair
- Equipment is older than three years and cannot economically be repaired, or for which parts cannot be acquired
- Equipment has no other college identified use

Costs and Projections for Planning

Costs of ownership span beyond the procurement process. In the lifecycle graphic shown, an IT system or technology requires different types of IT effort, as it moves from a new deployment to an aging service. The various phases include Planning, Procurement, Deployment, Management, Support and Disposition. Each phase requires IT to provide specific IT knowledge and task execution. The ongoing cost of ownership (TCIO) incorporates all expenses for staff, equipment, software licensing, and support to execute those tasks.

More specifically, the factors contributing to the Total Cost of Ownership for IT Technology include:

Acquisition Costs - These costs contribute to the original procurement of the technology:

- System Design: The new technology will require design by internal resources or external partners/consultants, which include the following tasks that could be iterative.
  - Analysis and inventory of the current environment's capabilities and limitations
  - Design of new environment
  - Research of the possible solutions
  - Documentation of solution, management presentation and approvals
  - Creation of the bill of materials/RFP for the new solution

- IT Hardware/Software Equipment: This can include:
  - Server hardware and software
  - Workstation hardware and software
  - Network hardware and software

- Warranties, ongoing hardware/software support and licenses

- Acquisition Process: In procurement, the following tasks would need to be executed:
  - Development of the RFP
  - Advertisement to potential bidders
  - Execution of the bid process/bidder management
  - Funding allocation or financing options
  - Ordering, receiving, and processing the IT technology solution.

- System Implementation: This includes all tasks with bringing the new technology into production.
  - Equipment configuration
  - Migration from existing hardware and software platforms
  - Conversion of data from existing environment
  - Testing functionality and acceptance
  - Corrections to new environment as needed
  - Downtime during conversion to the new system.

Hidden Acquisition Costs may include:

- Diminished Performance:
  - Old system performance issues before new system is brought online.
  - Conversion from manual processes, which may result in work slowdowns or reduced performance as the new system, is being learned.
  - First day/week/month implementation issues that need to be corrected.
  - Functionality changes that make the new technology more difficult to use.

- Facility Improvements: These changes might be needed in order to accommodate the new technology.
  - Room/Floor space construction or refurbishment
  - HVAC/power improvements
  - Rack/cabinet changes or additions
  - Space reallocation or equipment rearrangement
  - Security costs: secure entry doors, electronic security (card readers, motion detectors, security cameras)

- Network Upgrades:
  - Additional copper/fiber cabling
  - Network ports and bandwidth increases required to support new equipment
  - Patching.

- Training:
  - Administrative and operational training for IT support staff.
  - End-user training on features, functions and operations new of the technology.
- Insurance: Equipment damage/theft and replacement costs.

- Decommissioning: These are costs associated with the disposal of the old equipment.
  - Recycle fees for disposal of old electronics if applicable.
  - Disassembly of equipment
  - Termination of support agreements/partnerships (ie. CompuTrace removal)

Ongoing Costs – These are costs associated with keeping the new technology running.

- System Maintenance:
  - Maintenance including backups, log file analysis, storage restructuring, security procedures, and other tasks.

- System Upgrades:
  - Assessment of upgrades to enable performance enhancements or correct issues.
  - Redesign of expanded system.
  - Procurement of additional items such as software licenses, memory, disk, CPU expansion, and SFP cards.
  - Configuration, testing and implementation

- User Changes:
  - Ongoing modifications of the technology to address changing user requirements
  - Application customization/additions
  - Password, network access, or location changes.

- System Management:
  - Daily/weekly/monthly management of each system is required to maintain peak performance
  - Identification of potential problems with upgrades/configurations
  - Optimizing performance and operations.

- Staff Augmentation: hiring of additional staff or consultants to provide expertise required for new or advance systems deployment.
- Ongoing Training:
  - Training for IT staff on new or modified processes and functionality.
  - Development and distribution of user training and updates.

- System Downtime: Scheduled or unscheduled downtime/maintenance that creates a disruption of service to Southwestern students and staff.
- Audit: Internal or external audit procedures for new technology (ie. Network security).

IT Total Cost of Infrastructure and Operations

In the Information Technology industry, Gartner, Inc. is regarded as a leading information technology research and advisory company. The Gartner Group (now Gartner, Inc.) originally introduced the concept of **Total Cost of Ownership (TCO)**. Gartner defines total cost of ownership (TCO) for Information Technology (IT), as "…a comprehensive assessment of information technology (IT) or other costs across enterprise boundaries over time…including hardware and software acquisition, management and support, communications, end-user expenses and the opportunity cost of downtime, training and other productivity losses". Total cost of ownership analysis attempts to define both the obvious costs for acquisition and ongoing support and the so-called "hidden" costs of ownership across the full ownership life or life cycle of the acquisition. The Gartner model uses the IT Key Metrics Data (ITKMD) to calculate a price for infrastructure and operations with recommended IT staffing levels.

In defining ownership life, Southwestern ITS takes into account the following areas influencing the useful lifespan of IT systems:

- **Economic life**. - The number of years for which the IT system provides more value to Southwestern than it costs to own, operate, and maintain. When ongoing costs exceed returns, the IT system is considered to be beyond its economic life.
- **Service life**. - The number of years the IT system is actually in service providing appropriate functionality and performance for the requirements at Southwestern Campuses.
- **Depreciation life -** The number of years over which financial systems charge depreciation expense.

While the economic life may be a factor in which upgrades should be planned, the service life is more often the defining factor. Southwestern ITS currently uses the service life for determination of equipment life. In IT, discrete systems and technologies present different life cycles to analyze. For example, tablets and laptops exceed their service life in functionality and usefulness faster than Enterprise server systems. If a computer can no longer do the job needed by the staff, faculty or student, then replacement becomes mandatory because the device has reached the end of its useful service life.

TCO can also be adjusted on the staff side by adhering to a few Best Practices, such as:

- Stable ITS Organization: A stable staff keep deployments of desktop, server, and database environments consistent and focused.
- Vendor/Equipment Standardization: With standardization Southwestern gains a purchasing advantage, and is able to reduce incompatibility issues, support issues, administrative costs.
- Training: Professional training for staff allows for confidence in all support tasks, and resolving end-user concerns.

To quantify the ongoing cost of operations, Gartner Inc. released a Total Cost of Infrastructure and Operations (TCIO) model in 2016. This model addresses "Technology Domains," like Southwestern's, including Data Center, Networking, Client computing and Service Desk. It contains costs in each domain including operating and capital expenditures, generate an annualized TCIO.

Gartner's TCIO model assigns the costs[1] on the following table for the 2019-20 fiscal year:

Gartner Costs per Platform (Categories of Equipment)

Platform	Units	2019 TCIO/Unit/Year	Net Cost
Windows Server	163	$6,063	$ 988,269.00
Linux Server	6	$9,215	$ 55,290.00
Storage	200	$2,190	$ 438,000.00
LAN Per Port	2530	$109	$ 275,770.00
Voice Network	200	$678	$ 135,600.00
Client Computing	1112	$1,106	$ 1,229,872.00
Multimedia Equipment[2]	55	$555	$ 30,525.00
		IT TCIO	**$ 3,122,801.00**

Note: Every attempt has been made to verify information in this table. However, equipment changes occur continuously within each office/department. This working document may be subject to change. The college will utilize "best practice "to quantify and verify IT equipment totals, by utilizing IT management software such as SharePoint.

These values quantify funding costs for the Southwestern Technology Service Life Replacement Plan. Using these values we are able to calculate a yearly Total Cost of Infrastructure and Operations for Southwestern ITS, which would align Southwestern with the ideology of IT as a service rather than IT as a "one-off" purchase. In the one-off purchase model there exists a chance for overlapping "one-off" purchases to occur in the same funding year. The resulting condition may have outcomes such as:

- Only one capital expenditure would be purchased in that funding year resulting in increased risk of critical systems failure, lower productivity, and increased maintenance costs associated with deferring capital purchases.
- All capital expenditures would be purchased through a financed option and debt would be spread across multiple funding years. This would result in an overly restrictive operating budget, an inability to react to emergent needs, and the possibility of overlapping financing plans.

These scenarios would lead to lower productivity operating obsolete/outdated and out of service contract equipment for our community, students, and staff, or an multi-year impact to the ITS budget which would affect the ability to fulfill capital purchases as planned in subsequent funding years.

We are currently in a scenario where 70% of our operating environment of desktops and laptops (see figure 1 in Appendix), 40% of our server environment, and almost 100% of our network environment are now or will become obsolete on all campuses in 2020.

Southwestern ITS recommends moving to an "IT as a service" model, and adopting a more proactive approach to IT infrastructure, to increase access, productivity, and student achievement in a new sustainable model of IT planning.

[1] See Replacement and Reserve Funding Guidelines in Appendix

[2] See Appendix for definition

APPENDIX

Replacement and Reserve Funding Guidelines

Yearly TCIO is calculated for each resource by first multiplying the amount of needed equipment by the average cost of replacement, adding the staffing cost allocation (see figure 2), and dividing by the expected service life of the asset. To calculate the per unit TCIO, divide the yearly TCIO by the total number of assets. This allows us the ability to properly forecast the yearly budget impact on each IT resource in the service life replacement plan, to maintain a sustainable level of IT services to our students, staff, and community.

- Suggested replacement: Evaluate and replace yearly, up to 1/5 of the oldest computer/equipment utilized by students. Rationale: Warranties expire in five years' time. Equipment older than five years often requires expensive repairs and updates that can cause productivity loss and an increase in staffing cost allocation. ITS will exercise its discretion in relocating used computer equipment to the end of service life cycle using the following recommendation.
    - Allocate equipment and technology with the goal of maximizing useful life from *performance* users to *standard* users
        - Proposed *performance user definition*: Number crunching, high excel spreadsheet, database, power user with multiple window user, graphic intense, high end proprietary software
        - Proposed *standard user definition*: A standard user is someone who uses word processing, kiosk machine, basic internet usage
    - Identify and publish each year a standard configuration for *performance* users, and *standard* users.
- Suggested replacement: Evaluate and replace yearly, up to 1/7 of the oldest network, multimedia equipment, and servers. Rationale: Server and network equipment warranties expire in 7 years' time. Equipment older than seven years often requires expensive repairs and updates that can cause productivity loss and an increase in staffing cost allocation. Multimedia equipment becomes incompatible and obsolete within seven years, and often requires extensive configuration and updates that can cause classroom disruption, and meeting delays. ITS will exercise its discretion in relocating used multimedia equipment to the end of service life cycle using the following recommendation.
- Suggested replacement: Evaluate and replace yearly, up to 1/8 of the oldest IP phones. Rationale: Warranties expire in seven years' time, but the expected life of the systems are 8-12 years. Equipment older than eight years often requires expensive repairs and configuration that can cause productivity loss and cause staffing cost allocation to increase. ITS will exercise its discretion in relocating used computer equipment to the end of service life cycle using the following recommendation.

- Suggested reserves: Establish a replacement and repair fund for needs beyond the suggested replacement plans. Rationale: When maintenance contracts/warranties are allowed to expire, but equipment is not replaced, a contingency fund for repairs, maintenance/replacement is needed. Capital requests are considered once a year. This additional fund addresses needs that arise throughout the year, outside unit plan update.
    - Reserve 2-3% of the annual IT budget for replacement and upgrading of equipment including but not limited to PC, server, media equipment, network, voice, and software.

Multimedia and Related Equipment Definition

Multimedia includes any instructional media technology, which is currently used in the classrooms by Southwestern faculty and staff. Multimedia equipment is also referred to as Instructional media technology which includes LCD/laser projectors, document cameras, external DVD players, IPV and Zoom video conferencing equipment, any network appliance associated with video conferencing and streaming media, and sound reinforcement (amplifiers, processors, wired and wireless microphones, speakers and assisted listening devices).

Additional Charts and Tables

Figure 1.

# of Units in 6yr plan	# of Units 7yrs or Older	Total Systems	% Obsolete
293	805	1098	73%
Desktops	Desktops	Total Desktops	% Obsolete
254	561	815	69%
Laptops	Laptops	Total Laptops	% Obsolete
39	244	283	86%

Notes: figures taken from SharePoint database, and are based on IT best practice for data collection.

Figure 2.

Resource	TCIO cost per year	Staffing Cost Allocation
Windows servers	$6,063	45%
Linux Server	$9,215	50%
Storage	$2,190	26%
Client Computing	$1,106	40%
Data Network	$109	43%
Voice Network	$678	37%
Multimedia Equipment	$555	40%