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Information Technology Strategic Plan 2015

**10/30/2015**

### **Unit Mission Statement:**

COE IT strives to provide highly competent service and support to the COE community. To achieve that mission we explore the frontiers of technology and education; deliver solutions that our community can leverage and build upon; respect the independence and creativity of our IT staff and customers; and openly share knowledge and results.

### **Unit Self-Assessment**

College-wide IT staff members meet annually to develop a comprehensive list of strengths and weaknesses. The resulting SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), attached as Appendix A, informed all of the recommendations contained in this report.

### **Standards of Excellence**

Information Technology Shared Services will measure its success through a variety of qualitative metrics such as the use of client surveys, analysis of our aspirational peer schools, and performance of our achieved short-term and long-term objectives. Faculty and staff feedback will be extremely important as we identify and address critical college-wide issues.

### **IT Shared Services Vision**

We strive to provide exceptional and competent service and support to the college of Engineering. In our work, we value:

- gaining knowledge to implement new technologies and solutions to assist our community with the ever changing landscape of technology and education
- producing work that is accurate and complete so that others may use and build on our efforts
- working in an environment that allows IT staff to independently and creatively pursue challenging problems.
- honesty with each other about successes and failures, and transparency with our customers so they know what we're doing to help them
- creating resilient, robust systems that avoid predictable failures (so we can all sleep at night).

The unit proposes to advance this vision by annually identifying a series of immediate (6-month), short-term (18-month), and long-term (3-year) projects. Each project will address a weakness or threat that has been identified in the attached SWOT analysis. Project phases may span multiple years depending on scope and complexity. The following list represents a prioritized list of projects that the IT Shared Services has identified for the 2015-16 academic year.

**Immediate Projects (target completion date: 6 months)**

**Aggie Desktop** – COE IT staff constantly build new desktop and laptop systems for faculty, staff, and graduate students. Each Department has a different process for creating these new systems. This process will be standardized across all units to eliminate duplicative processes, systems, and work to build and manage Windows and Mac desktop computers. This will free up IT resources to focus on research support and other activities. The new voluntary desktop offering will make most software packages a single user click to install and will support self-administration.

**Leverage Central Student Helpdesk** - Utilize student IT staff to perform low level, well documented work for all COE departments/units. Move supervision from Computer Science (CS) to College-wide group, while ensuring CSIF's needs continue to be met. Work with CS IT staff to perform a smooth transition from the existing support model to the new model. This is an 'opt in' initiative that CS can consume at whatever level works best for them.

**Security Program** - Perform a security assessment of COE based on findings of UC-wide effort assessment and UC Davis Cyber Security survey results. Establish a robust security incident response process to quickly contain compromised systems. Institute a “no shame” approach to security incidents while widely communicating breaches in order to learn and adapt to threats.

**Commitments tracking system** - Adopt a system to track all MOUs, SUF allocations, bridge funding, and temporary allocations e.g., TA allocations. System will remind stakeholders of key events, report on status, and incorporate some light finance capabilities. (Voted by COE MSOs as most urgent need.)

**CMS** – The COE uses the Wordpress Content Management System (CMS) to allow non-IT personnel to easily edit website content through a standard interface. This CMS currently supports the majority of the faculty and Department websites across the COE.

In 2015-16, IT staff will provide more flexible mechanisms for faculty to link to research web pages from the core web addresses associated with the College web site. The College will attempt to maintain a standard “look and feel” for all pages with standard addresses (ex. faculty.coe.ucdavis.edu/user\_name) but will provide flexibility for other lower level links to point to personal faculty sites rather than to COE web servers.

In 2015-16, IT staff will extend the COE website offerings to graduate students.

**COE Computing Cloud** – The COE computing cloud provides a cost-effective, scalable replacement for aging hardware across the college. Many production systems such as departmental webservers, file servers, and application servers have been migrated to the COE cloud over the past 3 years when aging hardware reached the end of life. This approach reduced costs and provided increased reliability due to automated failover.

In 2015-16, the remaining services in CS and ECE that are candidates for migration will be reviewed by the appropriate Department and migrated as desired by those Departments.

The costs of operating the COE cloud over the past 3 year period will be reviewed and plans for the continued offering of these services will be formulated. Possible options include renewal of the COE cloud (requires hardware purchase and staff replacement due to eventual retirement), outsourcing of the COE cloud to a commercial vendor, or a return to a decentralized system (not recommended, but considered for the sake of completeness). The costs, flexibility, security, and other advantages / disadvantages of each option will be reviewed and recommendation will be made to the Dean.

**Network Enhancements** – Wiring in Kemper Hall is in need of replacement to deliver reliable service to the units housed in that building. A cost sharing agreement will be negotiated with the campus and wiring upgrades will be completed in 2015-16. In addition, the new wiring and coverage will allow the retirement of the CS network.

IET has consistently delivered a reliable and well received wireless network called MoobileNet/MoobileNetX on the UC Davis campus. In 2013-14 and 2014-15 wireless access points for MoobileNet/MoobileNetX were added throughout COE. This coverage has allowed for the retirement of older adhoc wireless networks. In 2015-16, additional wireless access points will be added to address gaps in coverage, with the goal to eliminate the need for personal wireless routers in the COE.

**Disaster Recovery.** In 2013-14, UC Davis negotiated a contract with Crashplan to provide disaster recovery for personal computing devices. In 2014-15, the availability of this disaster recovery mechanism was widely advertised to the faculty, staff, and students. In 2015-16, we will continue to advertise this disaster recovery mechanism.

**Automatic Updates.** In 2013-14, the COE IT committee recommended that all faculty members adopt automatic software updates using the “BigFix” client installed on computing devices. The BigFix software automatically installs updates to common programs that are commonly exploited by hackers. Faculty opting out of the automatic update program were requested to sign a waiver stating that they understand the UC Davis network security policies and would maintain software updates manually.

In 2015-16, the COE IT committee will once again publicize the availability of the automatic update software and recommend that all faculty explicitly opt into the program.

**High Performance Computing.** In 2014-15, the first phase of the high performance computing (HPC) system was implemented with the benchmarking of new equipment and the retirement of older equipment. The operation and maintenance of the new

systems was guided by the policy paper on HPC written and unanimously approved by the COE IT committee.

In 2015-16, the first phase of the HPC system will be opened to all COE faculty.

**Consolidate Instructional Labs** – Computing staff have a tremendous amount of expertise running instructional labs across the college. IT will leverage this expertise and develop standards for running labs. These standards will include hardware life-cycle management, authentication, authorization, software distribution, and student staffing.

In 2014-15, COE IT staff ran a pilot study using virtual workstations hosted by the COE cloud in two of the Academic Surge instructional labs. This “thin client” model makes it easier for students to access computationally demanding licensed software from their personal computing devices. It also reduces the future costs of replacement workstations in computing labs.

In 2015-16, the results from the pilot project in the instructional laboratories will be examined by the IT committee and recommendations for future configuration of instructional labs will be made.

**Remote Access** - In 2013-14, IT staff implemented a Virtual Private Network to allow secure access to COE resources from outside the physical college. Instructions describing how to access the VPN are available at <http://technology.engineering.ucdavis.edu/services/network-services/virtual-private-network-vpn-service/>.

In 2015-16, the IT Committee will consider if use of the VPN should become mandatory, and if other remote access tools should be blocked.

### **Short-Term Projects (target completion date: 18 months)**

**Comprehensive Security Assessment** – Network and computer security is essential to ensuring all technology operations of the College continue unimpeded. Security vulnerabilities create potential risks to institutions information, reputation, and ability to deliver programs. A comprehensive security assessment is needed to identify potential weaknesses and risk mitigation strategies. The outcome of this assessment will inform future investments in hardware and staff time.

**Research Support** – Efficiencies gained in all other areas will enable IT staff to focus on more complex issues that have direct or indirect benefit to faculty research. In addition to infrastructure improvements such as data storage and network, IT will be available for project-specific work such as support of programming, specialized webs sites, version control systems, cluster support, etc. IT will work with faculty to define specific services

and rates including these in grant proposals when appropriate for direct charge, and assist faculty with including these in grant proposals while remaining competitive. In all, this effort will provide faculty with more responsive expertise, rather than inconsistent support or outsourcing and losing the revenue potential.

**Knowledge Base** - In 2014-15, work will continue on a searchable knowledge base created from user requests. Once complete, a Service Catalog will also be posted to streamline Helpdesk support while reducing staff training and empowering users to find some solutions on their own (Tier 0). Note that this item was formerly listed under “Short Term Projects (6 months)” but it has proven more difficult to implement than originally anticipated and thus was moved to “Short Term Projects (18 months)”.

**Service Catalog** – IT must clearly identify the services which are provided either internally or externally to the College. A catalog will not only articulate which services are provided, but also clarify which services are beyond scope and should be delivered elsewhere.

### **Long-Term Projects (target completion date: 3 years)**

**Video Conferencing / Distance Education** – Distance education introduces new opportunities to extend the exciting research and learning happening here at UC Davis beyond the traditional classroom. New advancements in technology make providing electronic access to our courses affordable.

**Online Education Tools** – Online education has emerged as a focus point for more effective teaching styles in higher education. Many faculty members desire to experiment with different styles of online education to determine the best approach that enhances the student outcome. Hardware and software is needed to support the development of online classes in the college. A survey will be conducted to identify the most common tools currently used for online education and instructions on how to access these tools will be prepared for the college faculty. Hardware and software will be purchased as needed to support these goals when they are not available from another UC unit.

**Customer Relationship Management (CRM)** – Understanding who our customers are and their relationships with the College and each other is critical to the success of the organization. A CRM will allow the College to begin tracking and understanding these relationships so that critical business decisions can be made. A CRM system will enable the College to connect prospective students with alumni in their area of interest. It can also provide insight into the faculty research areas for external affiliates. The CRM system becomes a central tool for building relationships with our constituents.

**Database Cleanup** – The College maintains several shadow databases using non-standard database tools. A comprehensive analysis will need to be completed in order to determine the best migration strategy for each of these systems, especially focusing on the availability of outside services that meet the information needs.

### **Next Steps**

This strategic plan represents a framework for future college-wide IT efforts. While not specifically a work plan, it does provide an outline for projects that IT will focus on. Additional planning will be needed for each project to determine the scope of work, impact to stakeholders, and project budget. Many of these individual projects will be multi-year/multi-phased as necessary to successfully deliver new services, while ensuring continuity of service to existing systems. IT will continue to engage the community throughout the implementation of this plan to re-evaluate college-wide priorities ensuring IT continues to meet the needs of faculty, staff, and students.

## Appendix A

### Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis (completed in 2015)

STRENGTHS
<ul style="list-style-type: none"><li>- Computer classrooms</li><li>- Management of student assistants</li><li>- Competent IT staff</li><li>- Better use of outside/commodity services</li><li>- Some staff are backed up</li><li>- Good disaster recovery for infrastructure systems</li><li>- Able to provide “hand-holding”/personal attention</li><li>- CS: Monthly meetings w/ management</li><li>- Internal communication (COE IT)</li><li>- Student help desk</li><li>- UCDBuy/UC contracts drive pseudo hardware standards</li><li>- SSC Purchasing provides visibility</li><li>- Software licensing within COE</li><li>- Password management among IT staff</li><li>- Courage to try new things/seen as innovators</li><li>- Sense of humor</li></ul>
WEAKNESSES
<ul style="list-style-type: none"><li>- Communication from IT to the College</li><li>- Critical research data is not consistently back up</li><li>- Ill-defined processes</li><li>- Aging infrastructure</li><li>- Zero to little depth of coverage</li><li>- Inconsistent service levels/inefficient systems management</li><li>- Lack of hardware standards</li><li>- Lack of documentation across COE</li><li>- No asset management</li><li>- Outdated Disaster Recovery Plan</li><li>- No HPC skills</li><li>- DO Mac server is over 10 years old</li><li>- Non-compliance with CyberSafety policy standards</li><li>- Limited training for IT staff and users</li><li>- Four IT staff members are nearing retirement</li><li>- Inconsistent/incomplete onboarding and offboarding of new faculty and staff</li><li>- Still have many shadow systems</li></ul>
OPPORTUNITIES
<ul style="list-style-type: none"><li>- Improve customer awareness of available services</li><li>- Improve Service Catalog: use the campus standard and facilitate hardware purchases</li></ul>



- Expand student help desk to cover all of COE
- Improve support ticket escalation and prioritization processes
- Participate in UC-wide group that set workstation configuration standards
- Create a single repository of all software
- Provide software packages to users via self-service mechanism
- New leadership in COE
- Work with IET to share communications
- Adopt password manager tools such as Last Pass for all COE users
- Take greater advantage of existing services such as BigFix and ServiceNow
- New technologies such as improved public cloud and containerization/Docker
- Uniform Guidance changes what and how we charge research grants

#### THREATS

- Poor perception of desktop support
- Lack of campus Adobe contract
- Challenging environment for establishing new licenses at the campus level
- Students acting as systems administrators without formal training or knowledge
- Pending warranty expiration for private cloud and network infrastructure
- Research support can consume all available time
- We are actively targeted by bad actors (see Penn State)
- Security compromises could significantly damage the reputation of our College
- COE is growing fast with ever greater needs but no sign of new resources
- NAT routers are a significant security threat