

**Gap Analysis for Information Technology  
At Sacramento State:**  
*A Self-Study*

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## **Introduction**

The California State University system sees information technology as a critical resource, woven throughout the fabric of both system and institutional priorities. The CSU study, *IT Strategic Planning in the CSU: A Study of Best Practices* reflects this view in the statement:

“IT planning should be an integral part of the institutional planning process. IT can and should be a transformative element that supports campus strategic priorities and initiatives. “

This focus on institutional strategic planning for information technology has been noted repeatedly in external reviews of information technology at Sacramento State. In 1998, the IBM/Blackwell consulting group noted the need for the university to “create a new IT leadership and strategic planning structure that addresses the key IT policy and planning challenges facing CSUS.” A consulting report authored by Norm Nicholson in 2004 recommended that “The President should direct that a University-wide Information Technology Strategic Planning effort should be initiated.... The work of this group should be reported periodically, perhaps quarterly, to the President’s Cabinet.” As recently as 2006, the WTC consulting group assessed information technology services on the Sac State campus and identified a critical need to:

“Create a formal, institutional IT planning infrastructure. Move prioritization and funding of technology initiatives to the Presidential and Vice Presidential levels.”

Of major importance for such institutional planning for IT is the CSU-wide strategic shift away from a primary focus on development of administrative systems and infrastructure to a focus on processes that also support:

“... academic transformation, i.e. using technology to create efficiencies in instructional delivery, improve student outcomes, while freeing faculty from more mundane administrative tasks to concentrate on scholarship.”

This new focus is also consistent with the *Strategic Planning Goals* of the Faculty Senate’s Academic Information Technology Committee (2004), which encouraged use of information technology to:

“encourage and support excellence in teaching and learning... ensure that pedagogic uses of technology are considered [and] support the creation and expansion of new forms of scholarly communication and knowledge acquisition....”

This focus on academic applications of information technology is critical, but does not signify that other information technology functions are unimportant. If anything, most IT resources are now so woven into the fabric of all university functions that they often represent ‘utility’ services that are presumed to be baseline institutional priorities. Thus, many IT resources are considered to be institution-wide resources, not resources belonging to any particular division or individual unit (e.g. networks, email, student databases). Due to the campus-wide nature of IT resources, IT planning must also be comprehensive and campus-wide and therefore should encompass planning for the following four broad categories of university service:

- Excellence in teaching and learning
- Quality of the student experience
- Administrative productivity and quality
- Personal productivity

### **Strategic Planning for IT at Sacramento State**

The model for CSU IT strategic planning is shown graphically in Appendix A. The recently completed Sacramento State *Strategic Plan* forms the basis for the prerequisite institutional vision. This Gap Analysis, describing the current IT environment on campus, comprises the second step in the model. Using this Gap Analysis as a baseline, the recently formed IRT Steering Committee, working with the IRT Academic and Administrative advisory committees, will make recommendations for development of a strategic plan for IT at Sacramento State that broadly defines our future IT environment. In addition, those advisory committees, in consultation with the entire campus, will develop needed communication plans and processes for measuring accountability.

### **Recent Reorganization of IT**

In 2007, Sacramento State formally committed to the main tenets of the CSU strategic plan for the organization of information technology by implementing the following recommended actions:

- Created a Chief Information Officer position (CIO) to provide institution-wide leadership over IT resources
- Reflected the high institutional priority placed on information technology by having the CIO report to the President and serve as a Cabinet member
- Began to treat information technology as a critical institutional resource
- Created a new Information Resources and Technology division (IRT) at Sacramento State by combining the existing resources of the former UCCS, UMS, CMS, and BIS organizations.

The primary role of both the Chief Information Officer and the IRT division is to align campus-wide information technology resources with the new *Strategic Plan* for the campus.

### **Purpose of the Gap Analysis**

The purpose of this gap analysis is to use self-study to quickly identify the most obvious gaps in IT services on campus and then to use existing resources to begin to fill those gaps. The study also serves to establish baseline measures from which to measure progress toward future IT goals and plans. This self-study is not intended to replace development of a comprehensive strategic plan for IT at Sacramento State, but is rather meant as a prerequisite to ensure that the required resources and conditions are in place for implementation of a strategic plan for IT by the time that plan is completed in spring, 2008. A gap analysis is also needed to inform planning for campus budgeting, as such budget planning for 2007-2008 will take place well prior to completion of the IT strategic plan.

Critical IT needs are ongoing on campus and will not wait for completion of a formal strategic plan before myriad IT organizational and support issues must be resolved. For example, progress must be made during this current academic year on a range of strategic IT issues noted in this report, including enrollment planning, enhancement of classrooms, enhanced technology support for faculty and students, ongoing support and enhancement of CMS, replacement of critical IT infrastructure, and a host of other issues.

### **Methodology**

The approach used in this study is a simple SWOT analysis that reviews strengths, weaknesses, opportunities, and challenges for IT on campus, with the main purpose of identifying gaps in IT support and services. This report extends that traditional SWOT analysis by also providing background information, outlining a target environment, and making recommendations for quick action to close critical gaps. This analysis is done for each of sixteen categories of information technology service.

One especially difficult task at this stage of planning is the identification of the target environment for each category, in the absence of completed strategic planning for IT. Fortunately, there are numerous existing resources that clearly identify both gaps in service and information technology goals that are likely to be priorities for the campus. These resources include:

- The CSU IT Strategic Plan
- The Educause Core Data Survey of IT in higher education
- Studies of IT organization at Sac State by three separate external consultants
- Cabinet discussion of IT priorities by division, and
- Faculty Senate strategic planning for academic IT (2004)

The Chief Information Officer has culled through these documents to identify both gaps and goals for each of the information technology functions listed. The CIO also sought review of the draft *Gap Analysis* document by members of the three IRT advisory committees, with particular focus on ensuring the accuracy of the descriptions of Sacramento State information technology services.

### **Alignment With Strategic Planning and Previous Studies**

Although the new IRT division was formed prior to formal completion of Sacramento State's new *Strategic Plan*, the outlines of the draft strategic plan were already in place in time to guide both organization and hiring during the initial formation of the new division. In particular, the plans vision statement highlighted the strategic emphasis on use of IT for academic transformation by stating that Sacramento State will "...utilize the best in teaching and learning technology." The information systems managed by the new division were seen as integral to implementation of the three critical priorities of the *Strategic Plan*. Particular attention was paid to matching the resources of the IRT division with "a strategically focused, campus-wide effort to improve recruitment, retention, and graduation rates" [strategic priority #1]. This lead to the early identification of a need for a new focus on both a data warehouse and business analysis tools to assist with improvement of our

enrollment management. In pursuit of this goal, IRT has already re-focused resources to improve both financial aid and advising processes and has used staff vacancies to recruit specialists in IT areas critical to effective enrollment management.

As the handler of critical data elements for all aspects of university planning (e.g. finance, budget, student records, human resources, course scheduling, etc) IRT was also in a good position to immediately enhance support for “an organizational structure and culture that facilitates evidence-based decision-making and purposeful planning....” [strategic priority #2]. Organizational changes and hiring during the formation of the IRT division were aligned with this priority through planning for a campus-wide approach to performance management, the addition of enterprise data storage systems, and planning for acquisition of enterprise budget and planning management systems. IRT resources were also closely aligned with strategic priority #3, which is to “Enhance campus-wide engagement in and responsibility for the resolution of complex issues and in the planning and implementation of campus policies,” with special emphasis on the sub-goal of “Implementing effective communication channels across all levels of the campus.” Information Resources & Technology focused on this third strategic goal by marshalling resources for enhancement of web services, campus email, web portal services, and web based services for both academic and administrative functions. The above efforts to align IRT with key campus strategic priorities was also guided by input from each campus division, based on the Cabinet’s assessment of division IT priorities based on the new *Strategic Plan*.

In addition to the guidance provided by the new *Strategic Plan*, several previous assessments of IT services at Sacramento State provided an excellent head-start for both the Gap Analysis and the early organization of IRT resources. Since these reports were based on copious amounts of feedback from faculty, staff, and administrators campus-wide, these reports were an especially valuable planning resource. Recommendations from those reports specifically related to strategic planning have already been noted above. Other key findings and recommendations related to this IT Gap Analysis are noted below:

#### **IBM/Blackwell Report (1998)**

Recommendations of the IBM/Blackwell report that identified gaps in IT services included:

- “CSUS should expand its current faculty instructional technology efforts...for integrating technology into teaching and learning.”

- “CSUS should develop a student computing strategy that focuses on defined outcomes, funding mechanisms, support, remote access and responsible usage.”
- “CSUS should develop and implement a University-wide IT communication process....” and
- “CSUS should clearly define the roles and responsibilities of all IT providers and IT users.... A critical component of roles and responsibilities is developing a process for providing consistent and reliable technical support for everyone at CSUS.”

### **Tomcheck Report (2000)**

At the time of the writing of his report, David Tomcheck was Assistant Vice Chancellor for Administrative Computing at UC Irvine. This report especially focused on the roles and responsibilities of the then-current UCCS IT support organization at Sacramento State. The consultant concluded that, “Based on interviews and my own observations, UCCS exhibits many of the traditional thinking patterns applied in the earlier days of computing.... Any initiative headed by UCCS is met with serious distrust.” Pertinent recommendations of the Tomcheck report included:

- Review campus IT policies and procedures
- Develop the appropriate model for faculty support in the classrooms
- Review current charge back model for services
- Develop and use performance measures for units with direct support responsibilities for campus users
- Facilitate the selection and dissemination of campus and systemwide hardware and software site licenses
- Provide baseline email services

### **Nicolson Report (2004)**

Norm Nicolson was a senior IT executive from California State University, San Marcos. His report highlighted the following recommendations:

- “Clarify ...level of service that can be expected from various services. Develop metrics for each service and monitor performance against those metrics, with regular reporting of this data to the campus community.”



- “Consider allocating University-wide funds to a program to build-out and maintain smart classrooms....establish clear definitions of what faculty need with regard to smart classrooms.”
- “As the demand for instructional and information technology services continues to grow, the University should attempt to benefit from economies of scale by providing resources to meet those needs from a centralized computing organization whenever possible, using mutually agreed upon, clearly defined level of service agreements.”
- “...allocate funds for technology as a budget allocation from the University budget to the extent possible, build trust that all chargebacks are necessary and appropriate...and consider implementing a student technology fee.”

### **WTC Report (2006)**

Finally, the report of the WTC consulting group from Los Angeles made the following pertinent recommendations:

- “Integrate a collaborative approach that actively involves representatives from across the University and leadership at the Vice Presidential level to address...highly critical issues related to securing the University’s information assets....”
- “Develop an operating budget framework for IT services that includes identification of costs as well as factors that potentially impact cost performance.”
- Establish formal, ongoing feedback, assessment, and response processes for the Human Resources, Financial, [and Student ] systems.”
- “Establish formal, ongoing feedback and assessment processes for deployment and use of student computer labs including both open and discipline-specific labs. Also include in these assessment processes periodic evaluation of policies governing size and configuration of these labs. Use the results...to improve overall efficiency and effectiveness of the services supporting these labs.”
- “Establish formal, ongoing feedback and assessment processes for deployment and use of classroom technology. Include in these assessment processes evaluation of related practices such as assignment of classrooms to determine the extent to which these practices facilitate or impede high utilization of classroom technology.”
- “Initiate a collaborative effort that actively involves representatives from across the University and leadership at the Vice Presidential level to address

campus email services. The large number of different email services on campus represents unnecessary duplication of efforts.”

- “Conduct a strategic planning effort to address funding, refresh, and management of faculty and staff desktops and laptops, servers, and ... student systems.”
- “Conduct a strategic planning effort to develop a comprehensive Help Desk and technical support model.”

The service gaps identified in the above reports were carefully factored into the following Gap Analysis. In addition to the four external studies noted above, the Academic Information Technology Committee (AITC) of the Faculty Senate recommended strategic planning goals for IT at Sacramento State in 2004 (FS 04-30/AITC). The first category of goals from the Senate focused on the need for consultation and collaboration on campus-wide technology initiatives; these recommendations are particularly germane to the Governance section below. The second category of goals closely reflects the increased CSU emphasis on academic transformation. Specific goals related to technology and teaching/learning included:

- “Develop and maintain collaborative efforts among faculty, staff, students, and campus administrators in shaping technology services and resources that encourage and support excellence in teaching and learning.”
- “Maintain a strong institutional culture of support for teaching and learning which demonstrably integrates technology and pedagogy.”
- “Support the creation and expansion of new forms of scholarly communication and knowledge acquisition, retrieval, and publishing....”
- “Support the creation of computer based student advisement systems....”
- “Provide appropriate technology to facilitate communication between members of the campus community” and
- “Provide technology that enhances work productivity for both staff and faculty.”

The third and final category the Faculty Senate addressed was Access to Technology Resources, including recommendations to:

- “Provide student access to academic technology resources that facilitates and enhances learning....”
- “...provide academic/program access for students with disabilities in accordance with all federal and State legislation and CSU policies.”

- “Provide training and resources to meet student needs for information competency....”
- “Provide anytime/anywhere student access to technology that facilitates and enhances learning”.
- “Provide students, staff, and faculty with user friendly on-line, Web-based processes for administrative services,” and
- “Establish a faculty-friendly process wherein staff assistance is easily obtained....”

Finally, in 2004 the AITC provided a comprehensive set of recommendations regarding information technology in classrooms. Highlights of these recommendations are:

- “Recommend equipping classrooms with technology that will minimize the equipment the instructor must bring to the classroom and also the time required to set up the technology for use.”
- “Recommend clarification of the process for requesting and being scheduled into a classroom that contains the IT equipment needed by the faculty member.”
- “Recommend that plans be developed to provide for regular maintenance and replacement of classroom technology.”
- “Recommend that a classroom help system be established that provides timely access and response and has a ‘one person, one number’ implementation” and
- “Recommend that an annual IT budget report for classrooms and [computer] labs be developed....”

Both the external reports and the AITC recommendations related to IT at Sacramento State were invaluable in the preparation of the following Gap Analysis.

## **Campuswide IT Issues**

### **Governance**

**Background:** Institutional information technology services at Sacramento State had for many years been split between the Provost’s office (Computing, Communications, and Media Services; Academic Technology and Creative Services), Administration and Business Affairs (Business Information Services), and largely independent college and department IT groups (about 45% of campus-wide IT staffing). This disparate organization of IT on campus made establishing a campus-wide governance structure for IT difficult, at best. Previous attempts at establishing campus-wide IT governance have been widely perceived

as either ineffective or captive of the sponsoring organization. In 2004, the CSU Technical Executive Committee recommended that all CSU campuses treat information technology as a strategic institutional resource, with leadership coming from the executive level. Sacramento State followed this recommendation by creating both a Chief Information Officer position and a new IT division in early 2007. A comprehensive 2003 study of IT governance by Weil and Ross indicates that effective IT governance is the single most important predictor of the value an organization generates from IT.

**Target Environment:** Research indicates that effective IT governance in higher education has the following components: a) clear, easily described structure; b) leadership by a Chief Information Officer who is a member of the university's cabinet; c) involvement by stakeholders representing all major divisions on campus; d) clear alignment with campus strategic planning in all activities; e) active involvement by deans, faculty and other academic leaders, and f) clear and consistent feedback to the campus on outcomes.

**Strengths:** Sacramento State had a robust advisory committee structure for implementation of the CMS project over the last several years, with strong representation from functional areas across campus. These advisory committees sought regular feedback from key constituencies and reported regularly to the campus on outcomes. A clear strength of the newly created campus-wide IT governance environment at Sac State is the presence of an executive structure that follows guidelines recommended by both Educause and the CSU IT plan, *IT Strategic Planning in the CSU: A Study of Best Practices*. That is, the campus has a Chief Information Officer with clear authority over institutional IT issues. This CIO has been given the additional title of Vice President, reports directly to the President, and is a member of the President's Cabinet. Institutional IT issues are regularly discussed at the Cabinet level and the Vice President & CIO is directly involved in both campus-wide strategic planning and budgeting. An advisory structure for campus-wide IT has recently been created, with committees for academic information technology, administrative information technology, and campus-wide policy and security issues. This advisory structure includes clear liaison with the existing Faculty Senate IT committee and includes representation from all key campus stakeholder groups.

**Weaknesses:** Sacramento State has gone at least four years without a clear governance structure for information technology. The previous campus-wide governance group was widely perceived as being ineffective and overly captive to the interests of the previous central IT organization. Decentralized division, college, and departmental IT

support groups experienced significant growth, with little institutional oversight to establish standards, foster efficiency, and eliminate duplication of effort. No campus-wide advisory groups existing to provide guidance and oversight for the central IT group. Much of the direction for administrative computing and networking at Sac State came from CSU system committees and staff, with no clear and effective campus IT governance to adapt system planning to local campus needs. Although campus CMS advisory committees were very effective in overseeing and localizing campus implementation of the PeopleSoft migration, their efforts were often constrained by CSU system mandates and were limited to review of CMS-specific issues.

**Opportunities and Threats:** Sacramento State has provided executive support for development of effective IT governance and planning, with this support and encouragement extending to the Chancellor's Office. This opportunity will be threatened if the new governance structure does not produce outcomes for IT that are perceived by the campus at large as being beneficial.

**Gap Analysis:** The campus has already made significant strides in reaching the target environment for IT governance by both creating a model executive structure for information technology management and by creating an advisory structure for information technology governance that follows best practices. All Cabinet members are actively engaged in strategic IT planning, with all divisions expressing willingness to participate in the new IT advisory structure. While these initial steps are very positive signs, advisory committees are just getting started and development of a strategic plan for information technology, tied to the campus strategic plan, is still several months away.

**Recommendations To Close The Gap:** a) Develop a plan and schedule that will allow IRT advisory committees to draft an IT strategic plan no later than June, 2008; and b) Provide advisory committees with a completed Gap Analysis that will identify key issues for consideration in the IT strategic plan.

## **IT Budgets**

**Background:** Budgets for information technology at Sacramento State have historically been highly decentralized. Separate budgets long existed for the Computer Center, University Media Services, Telecommunications Services, and Business Information Services. In 2004, separate budgets were also split out for Academic Technology and Creative Services and the Common Management System project (CMS). In addition, up to

45% of campus-wide IT funding has been distributed through colleges, departments, and auxiliary enterprises. Acquisition of millions of dollars of IT equipment and infrastructure was rarely coordinated to take advantage of standardization and economies of scale.

In September, 2007, this trend was reversed, when the existing budgets of CCMS, BIS, and CMS were combined into a single budget for a new Information Resources & Technology division (IR&T). The 2007-2008 budget request for the IR&T division resulted in additional institutional funding being provided for both campus-wide information security and the Accessible Technology Initiative (see details below).

**Target Environment:** Operating funding should be provided at or above the average for universities of similar size, as found in the latest Educause Core Data survey. Funding should be adequate to permit allocation or reallocation to meet strategic IT priorities. Budget planning for IT should allow for both elimination of duplication of effort and taking advantage of economies of scale. Annualized funding for replacement of classroom IT, computer labs, and other key IT infrastructure should be built into the university's budgeting at a campus-wide level, rather than provided through unit budgets occasional one-time funding.

**Strengths:** Current campus-wide IT functions (e.g. administrative computing, networking) are budgeted at about the average for higher education institutions of similar size, according to the Educause Core Data survey. A relatively large carry-forward balance in the operating fund for the new division provided a cushion for needed start-up activity for the new IRT division. Nearly half of funding for IRT is provided in All University Expense accounts, providing increased stability for core functions. The CSU system has provided substantial funding for both rebuilding the campus network and enhancing network security, while also operating central PeopleSoft computing services.

**Weaknesses:** Pre-existing IT budgets were often allocated for priorities that are not consistent with current needs (e.g. media production services, cable TV operations). Funding for CMS has been heavily allocated toward consulting services that are not appropriate for support of ongoing administrative computing functions. There is no existing campus process for routinely identifying replacement funding for computers, classrooms, computer labs, or critical IT infrastructure. Little or no emphasis has been placed on using CSU capital funding for classroom technology, classroom renovation, or IT infrastructure. Large components of essential IT service (e.g. classroom scheduling, anti-virus) have never been built into identified ongoing budgets.

**Opportunities and Threats:** The campus has the opportunity to take advantage of a possible new compact for 2008-2009 funding of academic IT initiatives. A threat exists in that the campus must demonstrate a commitment to providing adequate baseline IT funding in order to be considered for such additional IT funding from the CSU. The declining state budget situation makes this new compact increasingly unlikely.

**Gap Analysis:** Although overall IT funding provided to the new division was average when compared with peer institutions, that funding was also unbalanced across needed information technology functions. For example, the majority of pre-existing IT funding was provided in support of networking and server management, rather than in the academic support areas highlighted in strategic plans. Little funding was provided for staffing and other resources for academic support services such as classroom support, computer labs, or student technology services. Entire IT functions that are extremely common throughout higher education IT (e.g. computer hardware support, classroom support, database administration, data warehousing) have received little or no funding in the past. Adequate funding was provided for the actual transition to CMS from legacy systems, but little attention was paid to the needed subsequent transition to ongoing operational support for critical campus administrative computing needs.

**Recommendations To Close Gaps:** 1) Rebalance existing funding away from little-used legacy services and towards under-funded areas, with an emphasis on enhancement of academic support; 2) Rebalance existing CMS funding away from large-scale consulting needed for project implementation and towards long-term strategic staffing needs; 3) Conduct comprehensive campus-wide budget planning for replacement of computers, classrooms, computer labs, and other critical IT infrastructure; 4) Conduct analysis of capital funding needed for enhancement of classrooms and other academic IT facilities; 5) Plan for effective utilization of new funding for information security and the Accessible Technology Initiative; and 6) Plan for reallocation of existing All University Expense funds toward current priorities (i.e. realign those funds with IT infrastructure refresh, classroom support, computer lab replacement, and academic support needs noted above).

### **Accessible Technology Initiative (ATI)**

**Background:** All CSU campuses are under an executive mandate to take specific action to correct deficiencies in the accessibility of web resources, instructional materials, and IT procurement processes. In addition, Sacramento State is committed to expanding access to

the campus by all students on an equitable basis. The Vice President & Chief Information Officer is the Executive Sponsor for Sacramento State's ATI initiative, while all three of the areas of emphasis of the ATI fall primarily within the purview of the campus-wide IT organization. The campus ATI initiative was initially planned with advice and assistance from the University Committee on Information Technology Accessibility (UCITA); during fall semester, 2007, the UCITA assisted the Executive Sponsor with preparation of detailed plans for campus implementation of the web, instructional materials, and procurement initiatives of the ATI. More recently, an ATI Steering Committee and three ATI working groups were organized to provide assistance with implementation of those plans. In order to fund implementation of the ATI initiative at Sac State, a budget request for all-university funding was submitted and funded beginning in 2007-2008.

**Target Environment:** The target environment is defined in detail in the three ATI plans noted above. Specific targets are set in those plans for improving the accessibility of all campus websites and all instructional materials, as well as for improving the accessibility of IT procurement. Ultimately, the target environment is to ensure that all such materials and processes are equally accessible to all students, staff, and faculty.

**Strengths:** Sacramento State is one of the few CSU campuses to date that has provided ongoing funding for support of the ATI. This funding allowed for the immediate hiring of an interim ATI Coordinator and the definition of two new positions to support both accessible web development and accessible instructional materials; those positions are expected to be in place by April, 2008. Remaining funding will be used to create an accessible procurement position and acquisition of hardware and software required for improvement of the accessibility of technology campus-wide. The Executive Sponsor has the full support of the President, while most ATI programs at Sac State have been introduced cooperatively with the Provost and other Cabinet members (e.g. accessible textbook adoption with the Provost). An ATI forum held during the fall semester, was co-sponsored by the Faculty Senate and Provost and was both well-attended and well-received.

**Weaknesses:** The ATI is truly a campus-wide initiative that requires the active involvement of all faculty and staff. Such involvement is difficult to obtain, given competing priorities. While the new ATI staffing will certainly help, many other faculty and staff members from across campus will need to cooperate by participating in required work



to improve the accessibility of websites, instructional materials, and procurement in a timely manner.

**Opportunities and Threats:** Sacramento State's strategic commitment to the ATI is entirely consistent with the campus commitment to improving access and retention of students. The Chancellor's Office places strong emphasis on implementation of the ATI and has provided some additional central resources to assist campuses with implementation. The main threat is the sheer scope of the ATI project. For example, there are more than 10,000 existing baseline websites that must be retrofitted on our campus in the next year. This huge task represents only a fraction of the total work that's required under the ATI.

**Gap Analysis:** Sacramento State has already closed much of the gap in resources required to achieve the target environment, through appropriation of an ongoing budget for the campus ATI. However, huge gaps still exist between the specific targets noted in the three ATI implementation plans and actual progress on campus. Even exceptional effort over the remainder of this school year will likely fail at achieving those ambitious goals. Much work will be needed to build additional specific support for the ATI within colleges and departments for the gap to be closed.

**Recommendations to Close Gaps:** 1) Complete hiring of new ATI staff as quickly as possible; 2) ATI working committees should define a work plan that allows for substantial progress on web, instructional, and procurement plan goals for this school year; 3) A permanent ATI Coordinator role should be created by the end of this school year; 4) A communications plan should be created to involve increasing numbers of faculty and staff in ATI work.

## **Help Desk**

**Background:** The central IT organization has long operated a Help Desk that provides technical support for computer-related problems. That Help Desk provisions and supports email and other accounts for all Sac State students, provides online chat and remote desktop support, maintains a work-order tracking system, and accommodates walk-in, phone, and e-mail requests for clients from across campus. The Help Desk is open more than sixty hours each week, including some evening and weekend hours. Strong Help Desk

software (HEAT) is used by Help Desk staff and is also made available to other technical support users across campus.

**Target Environment:** The goal is to create a Help Desk that provides a single point of contact for all users for all relevant technical questions. Ideally, a user would not have to figure out who to call to obtain support for a particular geographic location or technical problem – the Help Desk would sort this out for them and provide quick access to the most appropriate resources.

**Strengths:** The campus already has access to professional help desk software that has robust features for tracking and referring problems, providing a knowledge base of answers, and being distributed to other users across campus. The Help Desk has extended hours of operation, three full-time staff members and numerous experienced student employees. A well-developed website provides useful features to users across campus. Finally, an existing IRT staff member has recently been reassigned to spend full-time enhancing operation of the HEAT Help Desk software.

**Weaknesses:** Both external and internal studies have indicated weaknesses in previous Help Desk services and related technical support. Multiple help desks across campus create confusion for both users and technical consultants. Vacancies in central Help Desk staffing have prevented enhancements to both help desk software and help desk services. Minimal training courses and application support have been offered to the campus. Few units outside the central IT group have adopted cooperative use of Help Desk services and software.

**Opportunities and Threats:** IR&T has already consolidated CMS Help Desk staff and services into the central Help Desk and has also consolidated Help Desk and Classroom Services first tier support into a single location in the AIRC Building. This will allow for substantial synergies and cross-fertilization among the increased staff assigned to Help Desk duties. In addition, IR&T has been able to use an existing position vacancy to create an additional expert-level Help Desk position. These enhancements to Help Desk staffing provide substantial opportunity for IR&T to move toward the target environment. The main threats are the confusion that exists among users about where they should go to get technical support and the legacy perception of inadequate Help Desk service.

**Gap Analysis:** Additional staffing assigned to the Help Desk will allow the central IT organization to make rapid progress toward creating the target environment, improving services for those who use the central Help Desk. However, gaps in service will continue to exist across campus, unless progress is also made in creating a single point of contact for technical support that's equally effective for all users regardless of location and problem.

**Recommendations to Close Gaps:** 1) Complete hiring of expert Help Desk position as quickly as possible; 2) Create work-flow processes to improve CMS support for faculty; 3) Re-purpose existing senior Help Desk position to focus on development, support, and dissemination of the HEAT software.; and 4) Focus on the creation of coordinated liaison with other units for effective referral of inquiries to appropriate functional staff.

## **Information Security**

**Background:** Following a strong recommendation from the CSU Chancellor, Sacramento State created an Information Security Officer (ISO) position within the former CCMS organization in mid-2006. This position was transferred under the Chief Information Officer and the new IRT division beginning in March, 2007. The CIO requested and received all-university funding for campus-wide information security support beginning in August, 2007. This new support will be used to create two critical information security staff positions that will report to the ISO, as well as operating funding for security operations, software, and consulting. The original ISO decided to return to work outside of higher education in late summer, 2007; a search was completed for her replacement in January, 2008. Again following guidelines from the Chancellor's Office, Sac State conducted its first information Risk Assessment Questionnaire survey in October, 2007, with full results expected to be reported later this month. During November to January, 2007, the campus Center for Information Assurance and Security conducted a comprehensive vulnerability scan of the campus network. This vulnerability scan has been completed, with mitigation efforts underway at the time of the writing of this report.

**Target Environment:** The target environment is one in which critical information stored and used on campus is protected from disclosure and compromise at an extremely high rate of probability (e.g. 99.9%). The campus will have comprehensive and strong information security policies and practices, along with the resources to effectively monitor and implement those policies and practices. Sacramento State will conduct annual risk and vulnerability

assessments and will follow up to remove any and all risks and vulnerabilities detected. A culture will develop on campus wherein everyone participates in the protection of information security.

**Strengths:** Sacramento State is one of a few CSU campuses to have both an ISO position and a dedicated information security budget that supports additional security staff and operations. We are also one of the few campuses to have completed a self-assessment of information security risk and vulnerability. Information security efforts have the full support of the President and Cabinet.

**Weaknesses:** Two information security positions are vacant and are not expected to be filled until March, 2008. It was initially quite difficult to get many college and department IT personnel to engage with the recent risk and vulnerability assessments. Information security is not generally treated as a priority by many on campus. The 2007 risk assessment showed significant deficits in key areas of information security practice, while the vulnerability assessment showed a high number (>700) of critical vulnerabilities on campus computers, including vulnerabilities on servers housing confidential identity data.

**Opportunities and Threats:** Sacramento State was fortunate to hire an experienced information security professional (ISO) this year and also has the opportunity to hire additional experienced staff members for handling specific information security tasks. Sac State can take quick advantage of CSU resources by adopting both new system-wide information security training and system-wide information security policies (both due by June, 2008). The Chancellor continues to make information security a critical system-wide priority. The chief threat is the general lack of priority placed on information security by both users and IT staff members across campus, as well as the lack of follow-through in implementation of security policy and practice.

**Gap Analysis:** The additional resources provided by both the campus and the CSU should allow the central IT organization to make rapid progress in developing campus-wide security policies and procedures. However, strong campus-wide cooperation will be required for effective implementation of those new policies. Experience this year has shown that we can effectively implement annual risk and vulnerability assessments, although greater cooperation from IT support groups across campus will be required. Much work will be needed to close the gap in understanding of the importance of information security

across campus. Campus leaders across the board will have to become more involved in actively supporting implementation of information security policies and practice.

**Recommendations to Close Gaps:** 1) Complete hiring of new security staff as soon as possible; 2) Complete reports on risk and vulnerability assessments and disseminate widely across campus; 3) Formally adopt CSU information security policies and disseminate across campus.

## **Web Services**

**Background:** From the inception of the [www.csus.edu](http://www.csus.edu) website in 1995 until mid-2007, there has been only one web support position in the university-wide IT support group. Although a so-called Webmaster position was filled in 1999, this was created as a mid-level classified position that had little authority over campus web policies, standards, or procedures. While a central web server and web support structure exists and is used by a large number of campus departments, the lack of robust central web services and staff caused many groups to either put up their own web servers or seek off-campus web hosting solutions. Few departmental staff members who support web services have formal training in web development; most campus websites are supported by positions that are not focused on web support, such as administrative assistants, student assistants, general IT support staff, and faculty members. Thus, the implementation and use of the Web at Sacramento State has grown organically rather than in planned fashion. Web servers, sites, and applications have been built across campus on an as-needed, reactive basis for more than ten years. In general, the Sacramento State web infrastructure has developed without campus-wide support, organizational structure, or coordination. The recent addition of requirements for accessible websites has added to the challenges facing Web Services.

**Target Environment:** A recent survey of the information technology needs of the university's divisions indicated that web services are critical to nearly all aspects of university function. Web services are mentioned frequently as being critical to needed improvements in campus communications, while both external and internal evaluations of IT at Sac State have noted the strategic need for the improvement of administrative and academic services using the Web. Given this priority, Sacramento State requires a web support structure that, at a minimum: 1) Provides campus-wide leadership in the creation of web policies and standards, web communications strategies, and the identification of

campus-wide strategic priorities for the improvement of business processes using the web; and 2) Provides the infrastructure and expertise to meet the training and support needs for web development within campus departments.

**Strengths:** The single central web position at Sacramento State was staffed by a highly qualified individual with a Masters Degree in the web development field; the position was also recently upgraded by the CIO to true campus-wide Webmaster status. Although working with limited resources, each division at Sac State is strongly committed to the development of quality web services for faculty, staff, students, and other clients. The Webmaster has created standard web development templates that have been used effectively by many departments across campus. A position from the former Business Information Services that was largely focused on web development was recently moved under the Webmaster, immediately providing an additional staff member for campus-wide Web Services. Using new funding provided to the Accessible Technology Initiative, the division was also able to create a third web position to focus on the retrofitting and development of websites for accessibility.

**Weaknesses:** Web expertise in colleges and departments continues to be spotty and lacking in specific web development expertise. University Advancement, which works with IRT to develop and support external-facing websites, is currently down two key positions involved in the coordination of campus websites. Existing web policies on campus are at least eleven years old and are seriously lacking for today's needs. No group on campus is officially assigned to create or enforce campus web policies, campus web branding guidelines, or web usability standards. Although central web support services are growing, needed services are too new to have yet had a significant impact on the campus. The main web development tool used most commonly by the campus (Dreamweaver) is complex and most suited only for professional web designers. The lack of a system for web content management is a significant barrier to development of efficient, coordinated web development across campus. The significant decentralization of web development has led to a lack of coordination and the development of redundancies and inefficiencies in web deployment. The lack of web expertise has also led to a focus on static web pages, with little interactivity and sophistication.

**Opportunities and Threats:** The Chancellor's Office has provided opportunities by placing significant emphasis on enhancement of web services through attention to the Accessible

Technology Initiative, emergency web services, and the development of a system RFP for web content services. Increased emphasis on the development of self-service functions for faculty, staff, and students provides significant opportunity for development of interactive web services likely to be heavily used. Student interest in the use of web services is extremely high, with faculty/staff interest rapidly growing. External threats include the competitive job market for quality web developments, lack of resources for new positions, the heavy and growing demand for the application of web resources to accessibility issues, and a lack of trained resources for departmental web development.

**Gap Analysis:** Given the widely shared, almost assumed, criticality and priority of web services to every campus division, it's hard to avoid the conclusion that current web resources at Sacramento State are seriously deficient. The two positions currently available for campus-wide web support are inadequate even for meeting institutional and division needs for strategic use of web resources. Given that gap for even strategic priorities, there is little if any resource available to meet the critical needs of campus departments for web expertise and support. While current web servers are adequate for immediate needs, content-management tools for making those resources readily available and easy-to-use for users across campus are lacking. In particular, the campus has few resources available for creating the type of interactive, user-friendly web services needed for quality customer service.

**Recommendations:** 1) Staffing should be increased for institutional web services as quickly as feasible; 2) An organizational structure should be created adequate for the creation of institutional policies for web communications and web development; 3) Tools for web content management should be provided to the campus, adequate to support the web development needs of all users; and 4) Resources should be provided to allow for the development of interactive web 2.0 services that enhance self-service and customer support.

## **Academic IT Issues**

### **Academic Computing**

**Background:** Most of Sacramento State's peer institutions have defined academic computing units that concentrate IT resources on support of computer labs, operation of

instructional computing systems (e.g. Learning Management Systems, web portals, classroom computing, etc), email and file systems for faculty/student use, research computing, and other academic functions. In fact, 72% of peer institutions nationwide have such academic computing units, according to the latest Educause Core Data Survey. Historically, Sacramento State has rather organized all IT resources under a Computing Center concept, without particular emphasis on supporting academic needs. The result of this tendency was that few positions within the Computing Center were dedicated to support of computing specific to academics. Over at least the last ten years, support of academic computing on campus has become highly decentralized, with nearly all colleges developing their own computer labs, file storage systems, classroom computing, and even email systems. As supported by external studies noted in the introduction to this report, a common perception in the colleges is that the Computing Center was not willingly inclined to provide services to academic areas and, if they did, wanted to charge colleges and departments too much for the privilege.

**Target Environment:** In short, resources for support of academic computing should be robust and should predominate in the central information technology support organization. Support of computing resources for the enhancement of teaching and learning should receive particular emphasis with robust support for use of computer labs, learning management systems, use of classroom technology, portal services, instructional software, digital storage, transmission and communications of instructional content, academic communication, wireless computing, online learning, and faculty/student use of computers and technology for teaching and learning.

**Strengths:** Central computer labs are well managed and relatively modern, while many college computer labs receive concentrated support from local IT staff. A major refresh of key computer labs took place during 2006-2007. Wireless computing has already been enhanced and expanded to cover most of the campus, while a wireless laptop loan program for students is set for launch within a few weeks. A 24-hour study area for student use of both computer lab and wireless computing resources has been established in the AIRC and is already heavily used by students.

**Weaknesses:** Few central or decentralized IT positions have been focused exclusively on support of academic computing or classroom use of technology. Central Computing Center staff members were typically focused on technical issues and support of basic infrastructure



and have rarely been involved in direct support of the needs of academic users. Only one pre-existing position exists for support of central computer labs that are some of the most heavily used computing facilities on campus. College IT staff are not provided central support for academic support functions through the development of standards for software and hardware for academic use and have had charges imposed by the central IT organization for provision of the most basic services for server management and storage. Support for use of academic software on campus has been extremely spotty.

**Opportunities and Threats:** Sacramento State has had the unique opportunity to fill a large number of existing vacancies created by both normal turnover (eleven positions) and the retirement of eleven previous employees of the Computer Center. Working with the Academic Information Technology Committee, the new CIO first defined a position for an Assistant Vice President for Academic Computing and filled that position in August, 2007 with a manager with more than twenty years experience focused on academic IT support. This manager serves as the senior management executive under the CIO, in order to ensure a priority is placed on academic support. Although other areas of academic computing are treated separately in the analysis below, they will all be carefully coordinated by the new AVP (i.e. classroom and computer lab services, desktop support, student technology support, and web services) to ensure enhancement of the support of computing and technology for teaching and learning. An additional potential opportunity is provided by the emphasis on academic computing resources planned in the new CSU compact for the coming fiscal year, although the state's fiscal crisis is seriously threatening this promising initiative. Threats are presented both in the legacy of weak staffing for support of academic computing and in the long hiring process required to fill vacancies with new skills required for support of the target environment.

**Gap Analysis:** As noted above, gaps exist in nearly every area of academic computing support. Staffing is inadequate for support of computer labs, classroom use of technology, operation of academic servers, academic software operations, and development and support of LMS and portal services (separately discussed below).

**Recommendations to Close Gaps:** 1) Complete reorganization by moving staff from other areas to refocus those positions on academic support; 2) reallocate positions to create needed leadership for the creation of robust classroom, software and web services units; 3) consolidate Classroom Services and Help Desk functions to create staffing synergies; and 4)

Immediately reallocate resources for creation of prototype classrooms, a laptop loan program, and a new Student Technology Center.

### **Academic Technology & Multimedia**

**Background:** For twenty years at Sac State, technology services for faculty were largely provided by University Media Services (UMS). Such UMS services were primarily focused on multimedia production and audio-visual support for classrooms, but were later supplemented by more computer-based academic technology services such as support for online learning and consultation/training on use of computer software applications. In late 2004, three small units that were previously part of UMS (i.e. Production and Creative Services, Academic & Information Technology, and Distance and Distributed Education) were moved to create the new Academic Affairs department of Academic Technology and Creative Services (ATCS). The primary purpose of ATCS is to assist faculty with the creation of instructional materials and the use of technology in support of instruction. Approximately twenty of the positions in the current ATCS are state-supported, while an additional nine in the Creative Services area are supported primarily by contract work with external state agencies. ATCS utilizes its state-supported staff primarily for online course development and support (6 FTE), multimedia production support (5 FTE) and training, instructional design and consultation (4 FTE). ATCS staff members are available to help faculty with online course development, development of learning materials, and training in techniques for using technology in the teaching/learning process. Consultation services are provided through the presence of consultants in the Faculty/Staff Resource Center and through an open lab for faculty each Friday in the Center. Specific training is also offered in web design, and use of office productivity tools, interactive multimedia tools, and digital imaging.

**Target Environment:** Faculty members should have access to support services that meet a wide variety of teaching styles for the preparation of both multimedia and on-line instructional and research materials. Robust training should be available for those faculty members who choose to prepare their own instructional materials. Expert instructional design staff and services should be available to assist faculty with matching those materials to pedagogical needs. Training services should be extended to students, as resources allow.

**Strengths:** Faculty members at Sac State have access to robust support through ATCS for both training and use of WebCT and for development of multimedia instructional materials. Training services are provided to faculty through the well-equipped Faculty/Staff Resource Center in the AIRC. Several ATCS staff members have significant interest in additional training on pedagogical aspects of the design of instructional materials. Faculty use of and satisfaction with support of on-line learning through WebCT appear to be high.

**Weaknesses:** Services and staff tend to be weighted towards support of traditional multimedia, a legacy of that same emphasis within the previous University Media Services. While some faculty members continue to make heavy use of these traditional services, overall faculty awareness and utilization of such services is low. Academic technology staffing is heavily based on technically oriented ITC positions, whereas such positions throughout higher education tend to rather be filled with more educationally focused professionals. Many, if not most, of the instructional materials used today are on the web, yet services focused on web development have not grown in proportion to demand.

**Opportunities and Threats:** Use of on-line and web-based learning materials is growing rapidly. Accreditation requirements that learning outcomes be both defined and assessed will rapidly grow the need for instructional design assistance (as opposed to assistance with just development of interactive multimedia). At the time of writing this analysis, all academic departments are working on the definition of such learning outcomes. Accessibility requirements for instructional materials imposed by the Accessible Technology Initiative will place new burdens on faculty that will require concerted assistance from academic technology support services. While both the assessment and accessibility issues provide opportunities for the profile of those academic technology support services to be raised, they also present a significant threat if faculty members don't feel their needs for service are being met.

**Gap Analysis:** Faculty awareness of the availability of assistance for both preparation of instructional materials and instructional design needs to be raised. Concerted efforts should be made to find out the types of support and means of delivery most needed by faculty. Resources for placing instructional materials on the web and for instructional design should be enhanced, with special emphasis on resources to help faculty and departments meet accreditation and accessibility requirements.

**Recommendations to Close Gaps:** 1) Develop and create a survey to discern faculty need for assistance in the preparation of instructional materials; 2) Involve ATCS in a cooperative venture to enhance technology training for both faculty and students; 3) Involve ATCS in the creation and operation of a new Student Technology Center; and 4) Create an Accessible Instructional Materials position to assist faculty.

## **Classroom Services**

**Background:** Services to classrooms were provided by University Media Services from 1984 through mid-2007. Over that time period, staffing dedicated to directly supporting faculty in the classrooms dropped from seven staff positions to only four staff positions. Through the 1980's and 1990's, emphasis was placed almost exclusively on the use of audio visual equipment in classrooms (e.g. video, slides, 16mm films); in fact, Sac State had a sophisticated system in place to facilitate semi-automated playback of audio-visual materials from a central location during that time period. Part of the reason for the aforementioned drop in staffing is attributed to the way technology use in classrooms has changed. While, in the 1980's 15-20 deliveries of equipment to classrooms occurred during each hour of the day, by the 1990's such deliveries had dwindled due to the installation of computer projectors and DVD players in many classrooms. As use of the computer for instruction was increasingly emphasized in lieu of audio-visual media during the 1990's, Sacramento State also experimented with installation of computers in a few classrooms beginning in 1997. While most institutions of higher education accelerated such use of computers in classrooms, Sac State abandoned such installations in classrooms shortly after this initial experiment. It was decided instead to encourage use of laptops in classrooms, although little effort was made to provide adequate numbers of laptops for use by all faculty members who wanted them for classroom use. Many faculty members complained about the need to carry and set up computers in classrooms, while others complained they did not have laptop computers or needed software available to them for classroom use.

A so-called 'smart classroom' standard was developed on campus in the 1990's that included a ceiling-mounted computer projector, a wall panel for connection of a laptop computer and other devices, a screen, and a DVD/VCR player. This standard was provided to about 150 of the 230 general university classrooms on campus by 2006. However, little work was done to enhance the poor physical quality of those classrooms in which the so-called 'smart technology' was placed. Sac State's long-time manager of classroom services

describes Sacramento State's classrooms as "designed with a 'bare bones' look that was modern at the time, but allowed for little consideration of actual teaching conditions. The buildings are constructed of concrete, both floors and walls....Most rooms still have chalkboards....The rooms are, to be plain-spoken, dust magnets."

**Target Environment:** In short, classroom services should be capable of meeting the priority needs of all faculty members who teach in those classrooms. Classroom teaching technologies should be easy-to-use, flexible enough to meet a wide variety of faculty teaching styles and student learning styles, and adequate in quantity to meet scheduled needs. Classroom support staffing should be adequate to both maintain all classrooms in excellent working order and to support emergent faculty needs for day-to-day support in the use of teaching technologies. Scheduling processes for matching faculty with classrooms that match their need for teaching technologies should be highly reliable. Ongoing institutional funds should be identified for both maintenance and renovation of campus classrooms.

**Strengths:** Sacramento State has a large number of general university classrooms equipped with computer projectors, screens, and DVD/VCR players. Many of those projectors were replaced in 2006-2007. Funds have already been committed for the enhancement of both infrastructure and teaching technology in two prototype classrooms in Sequoia Hall. Planning is underway to provide similar infrastructure and technology for new classrooms in Benecia Hall and the Old Bookstore.

**Weaknesses:** The frequent mention of inadequate classrooms and classroom teaching technology in both internal and external reviews of IT on campus is solid evidence that our classroom infrastructure is weak. Less than 5% of classrooms at Sacramento State have built-in computers for use by faculty, while the average incidence of classroom computers among peer institutions in the Educause core data survey is 64%. The availability of laptop computers for faculty use in classrooms is spotty at best, while the requirement for faculty to carry and set up laptops and other equipment to classrooms is unacceptable, running counter to recommendations of the Faculty Senate's AITC. In addition, this lack of built-in computers in classrooms makes use computers difficult and inequitable and often leaves faculty members lacking in the proper software for class use. Classroom physical infrastructure is weak, especially in areas required for adequate use of teaching technologies (e.g. lighting controls and acoustics). Design of new classrooms and repair of

classrooms is typically handled by Space Management, without adequate academic input. Both processes for faculty scheduling of classrooms and the number of smart classrooms are inadequate to assure faculty access to classrooms that meet their needs. Staffing for classroom support has decreased at the same time both faculty demand for such support and the number of classrooms have increased dramatically. Resources for support of classrooms have been overly concentrated on the use of video services and other 'old-line' media services, rather than on the use of computers and networking increasingly needed by faculty.

**Opportunities and Threats:** As the California State University system plans for a new compact with emphasis on teaching and learning technologies, the opportunity exists to identify new resources for classroom teaching technologies. The creation of several new model classrooms on campus this year will allow for increased faculty input on the adequacy of the improved design. In the current poor budget environment, there is a significant threat that new resources required for improvement of the physical infrastructure of existing classrooms will be difficult to obtain. Capital resources from the CSU have not traditionally been provided in large quantity for classroom infrastructure needs.

**Gap Analysis:** The incidence of teaching technologies in Sacramento State's classrooms ranks in the bottom ten to twenty percent of institutions across higher education, at best. This fact is reflected in the inability of faculty members to get access to the teaching technologies they need in campus classrooms. The university must plan to move toward at least the median incidence of teaching technologies in classrooms among peer institutions. Classroom support staffing must be enhanced to allow meeting faculty needs. Resources need to be realigned toward support of the use of computer-based and network technologies for teaching and learning. Processes for the identification and design of new and renovated classrooms need to be changed to include direction and feedback from both academic and information technology areas.

**Recommendations to Close Gaps:** 1) Prototype classrooms in Sequoia and Benecia halls should be used as an opportunity to work with faculty to create campus-wide standards for further enhancement of classrooms; 2) Planning should take place as soon as possible to define baseline funding required to repair and replace the existing classroom infrastructure and technology, to prevent further deterioration; 3) Both short and long-term funding

should be identified for the addition of enhanced teaching technologies in classrooms across campus; 4) Immediate action should be taken to improve the organization and staffing of classroom support services; 5) Immediate action should be taken to improve both scheduling processes and the identification and design of classrooms at Sacramento State.

### **Desktop Support and Computer Labs**

**Background:** Desktop and lab computers have become simply an essential tool for most faculty, staff, and students. When our campus computers fail to operate properly, our work tends to grind to a halt and we all look for an almost immediate fix. Support of desktop computers at Sacramento State is highly decentralized. The central IT organization manages only 500 of the more than 3,000 staff computers on campus, with the remainder supported by college and department staff members. Since campus desktop computers are split into multiple, locally controlled ‘domains’ (i.e. groups for management and control), it is difficult or impossible for either economies of scale or security controls to be attained through central distribution of services such as anti-virus or operating system updates. Maintenance of desktop computers is also highly decentralized at Sac State, with each unit handling its own warranty work, maintenance, and parts ordering. No formal standards exist for specification of desktop computers or laptops and little organized coordination of equipment replacement or software licensing occurs.

Many students are highly dependent on campus computer labs and the software and high-speed network connections they provide. Of the nearly 3,000 student computer lab seats on campus, just more than 500 are available to all students and faculty as general university computer labs. A loose association of computer lab technicians meets irregularly to find commonalities in lab management, but no formal processes exist to prioritize needs and allocate campus-wide resources for essential student computer labs.

While some computer software is acquired and managed centrally (e.g. Microsoft Office), most computer software is acquired on an *ad hoc* basis by individual departments. Little campus-wide licensing or cost-reduction is done on a planned basis.

**Target Environment:** Simply put, the service environment should be adequate to guarantee the availability and good working order of faculty/staff desktop and student computer lab computers nearly 100% of the time. Both desktop support and computer lab personnel campus-wide should work together to eliminate duplication of effort, improve

efficiency, reduce costs, and gain economies of scale. Services that can best be implemented campus-wide (e.g. networking, storage, authentication, account management) should be offered so they flexibly meet the needs of personnel who provide local IT support to departments and colleges. Software acquisition should be coordinated campus-wide to allow for cost savings through standardization, bulk buying, and other economies of scale.

**Strengths:** Desktop support services are generally located in departments close to users, making contact with support staff easy for many users. Computer labs are often managed by staff members who work closely with faculty members using the lab for teaching, ensuring good local knowledge of curricular needs. Central procurement and licensing occurs for some essential software (e.g. Microsoft products and anti-virus). IT staff members tend to purchase common types of computers, making many computer support issues similar across campus. The central IT organization has vendor certified computer technicians and some access to desktop management tools (e.g. Altiris, E\*Policy Orchestrator). Computer lab managers campus-wide have agreed to cooperatively implement both lab utilization software and a common computer lab inventory.

**Weaknesses:** Decentralization of desktop and computer lab support is often inefficient in use of scarce resources, due to lack of standardization, lack of bulk procurement and the failure to license software campus-wide. The lack of a single network domain for desktop computers makes it difficult or impossible to efficiently implement distribution of software and desktop management and security tools. Decentralization of support often leaves individual users confused about who to call for a desktop problem. The lack of coordinated warranty coverage and desktop maintenance causes the campus to pay substantially more than it should for computer maintenance. Lack of coordination of software licensing grossly inflates the cost of academic software and creates the undesirable outcome of 'haves and have-nots' across departments. Replacement of both desktop and computer lab computers is done in an *ad hoc*, uncoordinated fashion, leaving many outdated computers with no replacement resource identified.

**Opportunities and Threats:** The new Information Resources & Technology division has identified existing resources that allowed creation of a new Manager for Hardware and Software support, plus a dedicated computer hardware support staff position. A vacancy due to a retirement will be used to additionally create a new campus-wide Software Coordinator position. The Provost and Chief Information Officer have agreed to cooperate



in the creation of a plan for replacement of both faculty/staff desktops and priority computer lab equipment. The main threats in this area are the CSU-wide budget shortfalls and the strong campus culture of both autonomy and decentralization in desktop and computer lab support.

**Gap Analysis:** Little resource currently exists for needed planning and coordination of desktop support on campus. Until this resource gap is filled, it will not be possible to make progress on increasing coordination and efficiency of desktop and lab procurement, software acquisition, maintenance, and support. Even with provision of some of the needed resources identified above, the lack of a common campus network 'domain' prevents effective implementation of coordinated and efficient desktop, software, and security services for all. While some colleges and departments have strong desktop support services, others are seriously lacking. Closing these gaps will be difficult unless additional resources are allocated to assist 'have-not' departments.

**Recommendations to Close Gaps:** 1) Complete hiring of Manager of Hardware and Software Services and additional hardware support position in IR&T; 2) Complete implementation of computer lab inventory and utilization tools and report results to campus on a regular basis; 3) Complete hiring of Software Coordinator and identify 'low-hanging fruit' that can rapidly decrease costs and increase efficiency; 4) Complete study of campus-wide desktop and computer lab replacement.

## **Distance Learning**

**Background:** Distance learning technologies have been used for the delivery of credit courses at Sacramento State for nearly twenty-five years. During the 1980s and 1990s, microwave video transmission and cable television distribution were the primary means of delivery. The campus started a strong working relationship with the Sacramento Cable TV Consortium (SECC) in 1984 that has lasted for more than twenty years. In addition, the campus operated a satellite video uplink truck for origination of programming. Sac State built three video-based studio classrooms in Library II and also operated comprehensive video production services in that same facility to support local video origination. Two additional video studio classrooms were opened in the AIRC building in 2006. More recently, video streaming has begun to supplant live video delivery as the preferred means

students use to receive video courses. On-line learning has been slow to catch on at Sacramento State, but is still used for the delivery of up to ten on-line courses each year.

The DDE program was managed since its inception on campus (1984) by University Media Services, but was moved under Academic Technology & Creative Services in 2004. A part-time faculty coordinator directs day-to-day planning, supported by other staff members and numerous student assistants who provide logistical support. The IR&T division provides support for all distance learning infrastructure, including video distribution services, on-line learning systems, and on-line streaming services.

**Target Environment:** The CSU is now focusing on the development and delivery of asynchronous on-line learning, in order to improve access and relieve pressure on the physical infrastructure of growing campuses. Sacramento State would like to increase its use of online learning by first emphasizing increased use of hybrid learning models that combine face-to-face and asynchronous on-line learning. Planning is currently just underway to define the long-term campus approach to on-line learning, so the ultimate target environment for distance learning is still ill-defined. It is clear, however, that the trend is toward on-line distance learning resources delivered in asynchronous mode.

**Strengths:** Sacramento State has a long tradition of using distance learning for the delivery of credit courses. While small, a strong cadre of faculty members continues to be interested in teaching distance learning courses. The supply of video facilities for delivery of programming exceeds the demand.

**Weaknesses:** Sacramento State has continued to emphasize real-time delivery of video-based courses, while the vast majority of other higher education institutions have changed to an emphasis on asynchronous on-line delivery. Thus, while the campus has strong resources to support video-based education, resources for asynchronous on-line distance learning are relatively weak. Maintaining the existing video infrastructure on campus (both equipment and facilities) is expensive and increasingly difficult to justify as students shift to use of computer-based video streaming even for video courses. National trends clearly show high growth in online learning and a gradual decline in use of video-based learning.

**Opportunities and Threats:** The advent of CSU-wide on-line resources for remedial math and Chemistry provides a significant opportunity. The Provost, Director of Academic

Technology, and CIO are actively engaged in creating a plan for distance learning to meet strategic needs for the future at Sac State. The opportunity to hire a new faculty DDE coordinator in early 2008 provided a significant opportunity to engage in research and analysis that will help to reposition DDE for the future. The long emphasis on video delivery, the cost of maintaining and replacing that infrastructure, and declines in the use of synchronous video delivery are all threats to repositioning Sacramento State's DDE program.

**Gap Analysis:** A large gap exists between the current DDE resources available and the target environment of increased on-line and hybrid learning. Resources for online learning will need to be created or repositioned. A plan for future use of DDE needs to be created quickly so needed repositioning can begin.

**Recommendations to Close Gaps:** 1) Develop a plan for DDE that is consistent with the campus strategic plan; 2) Hire a new DDE coordinator who can both maintain enrollments in existing DDE programs and assist with the transition to on-line learning; 3) Plan to reduce costs to operate SECC and electronic distribution systems that are declining in use, while repurposing funding toward on-line learning.

## **Learning Management and Portal Systems**

**Background:** Learning Management Systems (LMS) and web portal services have become nearly ubiquitous on higher education campuses. Sacramento State is no exception, as it has been using the WebCT LMS for nearly ten years and introduced the MySacState portal service in mid-2007. WebCT is now used by more than half of teaching faculty members and by more than three-quarters of Sac State students. Academic Technology and Creative Services regularly offers a comprehensive series of training workshops for faculty on the use of WebCT, including training on communication tools, blogs, journals, assessment and quizzes, grade book, and other specialized functions. Information Resources & Technology provides comprehensive services for management of the day-to-day operation of WebCT systems, which comprise management of application servers, databases, and links to student information. IR&T funded a major upgrade of the WebCT system from a basic version to a robust and redundant enterprise version over the summer of 2007. In short, Sacramento State's LMS has become a mission critical resource that is supported accordingly.

While most higher education campuses have had web portal services for students for at least several years, Sacramento State did not introduce student portal services until mid-2007. The portal that was introduced as MySacState was an extension of the PeopleSoft software (i.e. CMS) and was focused only on providing web access to student and human resources information over the web. This portal was not designed to offer campus-wide web portal services focused on the students' academic and student life, typical of those found at other CSU campuses (e.g. San Luis Obispo and Chico).

**Target Environment:** The campus should operate a learning management system that is capable of providing highly reliable use by all faculty and all students. This LMS should provide a range of services based on careful assessment of faculty/student needs and should be easy to use and update. Training and support should be provided that is adequate for all critical campus needs. Sacramento State should also operate a comprehensive campus-wide student web portal. The portal should be a one-stop-shop where students can gain access to all critical academic, financial, and student life information. The portal should also serve as a central tool for access to email, campus announcements, and official campus information. The LMS and web portal should be closely and seamlessly integrated.

**Strengths:** Sac State now has an enterprise-class LMS system that is capable of handling greatly increased usage by both faculty and students. That system has good staff support both for users and for the system itself. The MySacState portal in Peoplesoft was successfully introduced and provides good self-service access to student and human resources information.

**Weaknesses:** The database system that is integral to WebCT has a single point of failure and needs to be upgraded to a redundant system. Mechanisms for disaster recovery need to be provided for WebCT, since it is a mission-critical system. The MySacState portal is limited in scope and is not intended to function as a true enterprise student web portal. Current staffing for portal development and support is weak.

**Opportunities and Threats:** Funding has been identified for both improvement of WebCT databases and creation of a true enterprise portal for students. Timing of the introduction of the portal is crucial, in that failure to introduce along with mandatory student email by

late spring will threaten the success of the project. The Chancellor's Office has initiated an RFP for possible replacement of campus Learning Management Systems. While this RFP provides a significant opportunity to evaluate alternatives to WebCT, it also threatens to increase campus costs for WebCT, while also creating considerable uncertainty for faculty and students.

**Gap Analysis:** Planning needs to be completed for both redundant databases and disaster recovery for the campus LMS. Careful evaluation of the results of the LMS RFP needs to take place in consultation with faculty and students. A comprehensive campus web portal for students needs to be developed for introduction no later than fall semester, 2008.

**Recommendations To Close Gaps:** 1) Institute redundant LMS databases by February 1, 2008; 2) Develop pilot version of a student portal for introduction by April 1, 2008.

### **Student Technology Support**

**Background:** Support of student use of information technology has not received significant emphasis at Sacramento State. We have one of the lowest ratios of campus-wide computers per capita of any CSU campus. Previous policies of both CCMS and ATCS focused almost entirely on support of faculty and staff IT needs and in some cases even prohibited support of students. The only areas of IT support that consistently focused on students were the Help Desk and computer labs (both central and college).

The new IT division is being created with an entirely different focus that considers support of student use of technology to be central to the mission of both the campus and the division.

**Target Environment:** Students will have access to technology support that is at least equivalent to that provided to faculty and staff. Students will be supported in their use of technology as assigned by faculty members for completion of course work. Students will be able to access technology resources at anytime and from any place by using a single all-purpose, university-provided account. They will have access to a one-stop student portal that will provide ready access to all or most student resources. Students will have access to training and other resources that will allow them to use technology effectively for learning.

**Strengths:** Bluntly, Sacramento State has few strengths in student technology support at this time. Students do have access to widespread wireless networking; the recent provision of 24-hour access to such wireless networking in the AIRC study areas has been extremely well received. The interest of the Associated Students in improving student access to technology is a significant strength.

**Weaknesses:** In most cases, Sacramento State does not make technical resources that are readily available to faculty available to students. Students do not have ready access to support in the use of classroom technology and do not have ready access to needed equipment through the classroom equipment pool. The services of ATCS are not generally available for student use. Campus email services are used by few students and such services have not been actively promoted to students.

**Opportunities and Threats:** One-time funding is available to provide start-up funding for initiation of both a wireless laptop loan program for students and a Student Technology Center. The cabinet has agreed to focus on the development of robust email and portal services for students that will greatly enhance access to student technology resources. The principle threat is the huge task of communicating with our large student body about those service enhancements and convincing students to use those services. The campus will have to plan carefully to ensure being able to keep up with expected robust student demand.

**Gap Analysis:** A very large gap exists between the target environment described above and current resources and practice at Sacramento State. Resources from most central IT units noted in this document must be redirected to contribute to support of student technology initiatives. Gaps in ongoing funding for support of new student technology initiatives must be filled.

**Recommendations to Close Gaps:** 1) Provide initial rollout of new student email and portal services by April 1, 2008; 2) Open and expand access to 24-hour Hornet Lounge facilities in the AIRC Building; 3) Initiate a soft opening of a new Student Technology Center by late spring, 2008; 4) Initiate a new student laptop loan program by mid-spring, 2008.

## **Administrative IT Services**

### **Administrative Computing**

**Background:** Nearly all higher education institutions own and operate so-called “enterprise resource planning” (ERP) systems that provide mission-critical support for human resources, finance, and student information systems. For many years during the 1980s and 1990s, Sacramento State operated its own ERP systems, the latest being the SIS+ system operated on an on-campus IBM mainframe computer. This system was superseded by the new CSU- operated Common Management System (CMS/Peoplesoft) platform beginning in 2003. The CMS Finance and Human Resources modules were the first modules to come on line in April, 2003, followed by implementation of the CMS Student Administration system in 2006-2007. Implementation of each of these CMS systems took many months and enormous amounts of staff time, involving multiple upgrades and iterative implementation of new service modules. The final phases of implementation of the CMS transition are still in process, with completion of the final Student Administration, Human Resources, and Finance upgrades and enhancements to be completed by spring, 2008. Upgrades of existing CMS modules are already planned, with upgrade to the 9.0 version of Finance planned for mid-2008.

While essential to mission critical services throughout campus, the CMS baseline system run by the CSU Chancellor’s Office does not by any means encompass the entirety of administrative computing services required on campus. First of all, each CSU campus must implement enhancements and local customizations of CMS baseline services on its own. Second, critical functions required to fully implement the PeopleSoft software on campus (e.g. data warehouse and performance management services) are not planned to be implemented by the Chancellor’s Office for at least two years and therefore must be handled by the campus. Finally, numerous critical administrative computing functions are not part of CMS at all, including the Ad Astra classroom scheduling system, faculty evaluations, test scoring, the My Sac State student portal, parking services, and many other functions.

**Target Environment:** Like any higher education campus, Sacramento State needs to have administrative IT resources that are capable of supporting ongoing operation of essential financial, human resources, and student services systems used by faculty, staff and students on a daily basis. In addition, IT resources need to be provided to allow the campus to adapt the baseline PeopleSoft system to meet local strategic needs (e.g. modifications to support our enrollment and advising initiatives, support of essential business functions, and

creation of enhanced portal services for self-service). It's critical that this enhanced environment for administrative computing allow for the introduction of data mining services and business analytics that will provide critical information for strategic enrollment, human resources, and budget planning. In addition, the administrative computing environment must be capable of continuing support for critical services not supported by CMS (e.g. classroom scheduling, parking, and tracking of learning outcomes). Finally, administrative computing services must be able to support critical identity management initiatives that are essential to campus information security.

**Strengths:** The campus has experienced a very successful transition from the old ERP system to the new CMS system, when compared to most other institutions. All new CMS functions will be in operation by mid-2008, providing significant new enhancements for student services, financial and human resources functions. A strong cadre of faculty and staff from across campus have been trained in the use of CMS, while numerous IT staff members have gained valuable skills in the development of customizations that will be required on campus.

**Weaknesses:** The almost exclusive focus on transition to the new CMS baseline as required by the Chancellor's Office has prevented the campus from attending to critical enhancements and customizations of many administrative functions, creating a serious backlog of such projects. Since much of the implementation of CMS was done through intensive use of expensive external consultants, the campus is unavoidably saddled with a substantial bond payoff plan to pay the cost of those consultants. The dependence on CMS consultants has in many cases left both IT staff and functional staff ill-prepared to take over functions previously performed by consultants. Many faculty and staff are experiencing fatigue from the long process of transitioning to CMS and are frustrated by the changes imposed on their daily work habits. There is also a wide-spread perception on campus that CSU management focused too much on supporting CMS infrastructure and technology, rather than on customer service. This lead to a related concern that CMS staff were not concerned with supporting user administrative needs.

**Opportunities and Threats:** The campus is fortunate to have adequate budget resources already identified for the operation of CMS and other administrative support functions. The accompanying threat is that resources that have been used for years to support consulting for the CMS transition must be quickly repurposed to create staff positions and



other resources that are essential for ongoing operation of administrative computing services.

**Gap Analysis:** The campus was severely lacking in staff resources required for adequate support of both ongoing CMS operations and critical customizations of CMS to meet local needs. Essential functions such as database administration, programming, data warehousing, business analytics, and data reporting were severely lacking in both staff and operating resources and were further weakened by retirements in critical areas. In many cases (e.g. data warehousing) substantial one-time investment in software and hardware resources will also be required. Additional requirements already included in the campus strategic plan will exacerbate the already apparent gaps (e.g. greatly increased requirements for enrollment reporting and improvement of campus communications).

**Recommendations to Close Gaps:** 1) Leadership of the Administrative Computing Services unit must be quickly solidified and made permanent; 2) Vacancies in key areas of administrative computing support (student services, human resources, finance, and data services) must be filled quickly with qualified staff; 3) Funding previously used for critical skills provided by CMS consultants must be quickly transitioned into permanent staff positions for both ongoing administrative computing support and for enhancement of baseline CMS functions; 4) The campus must proceed to develop a local data warehouse and the resources to use that data warehouse for strategic planning; 5) Staffing and other resources must be quickly aligned with the strategic priorities for enrollment management, advising, evidence-based decision-making, and communications.

## **Telecommunications Services**

**Background:** Sacramento State has operated its own telephone services for many years, under the auspices of the former University Telecommunications Services (UTS). In March 2007, UTS became part of the Information Resources & Technology division under the new Chief Information Officer. On-campus telephone services are handled through comprehensive facilities located in the AIRC building, where Telecommunications Services operates a large telephone switching system, call accounting systems, call-in modem services, voice mail and intelligent voice response systems, and teleconferencing systems.

All campus telephone service, maintenance and billing is handled through Telecommunications Services, including national and international long-distance services and cell phone services. Contracts and facilities exist with all major cell phone providers for enhancement of cell phone service on campus.

In addition to handling all campus telephone services, Telecommunications Services also is responsible for all telephone and network infrastructure, both on-campus and at auxiliary locations. The majority of that infrastructure is state-of-the-art, following implementation of the ITRP build-out of telecommunications wiring in 2006-2007. The telecommunications unit recently assisted with design and installation of a new campus police dispatch system and also purchased comprehensive emergency communications software and hardware.

**Target Environment:** All telecommunications facilities and services should operate at the so-called '5 nines' level of reliability (i.e. 99.999% reliability). Services should be up-to-date and should reflect the latest user needs. As all communication services move to the network, traditional telecommunications services should be aligned with network services to gain efficiencies.

**Strengths:** Campus telecommunications services currently meet the stringent 99.999% uptime standard cited for the target environment. Most of the telecommunications wiring on campus is of the latest, most capable design. Telecommunications systems for new facilities (e.g. Recreation and Wellness, new residences) have been designed to the latest standards. Modern services, such as PDA cellphones, emergency communications, sophisticated call management, and intelligent voice response have been introduced in a timely manner.

**Weaknesses:** Funding was insufficient to complete modernization of the entire campus wiring infrastructure. Several critical buildings, such as Sacramento Hall, were omitted from upgrades. In addition, much of the telecommunications infrastructure in auxiliary buildings has not been upgraded in many years and will begin to create critical problems in coming years. Plans for introduction of Voice Over IP telephone services across campus have been delayed. Needed convergence of telecommunications and network services has not occurred, leaving those similar services in separate organizational silos. No funding has been identified for newly identified needs for emergency communications campus-wide.

**Opportunities and Threats:** Sacramento State has provided ongoing funding for critical telecommunications infrastructure primarily through reliable all university expense appropriations. Individual department phone services are primarily supported with self-support charges, as is typical of most higher education campuses. This stable funding provides the opportunity for telecommunications planning to depend on a reliable, long-term source of funding. The primary threat is that replacement of existing telephone infrastructure (e.g. telephone switches) represents one of the largest expenditures facing the university over the next few years.

**Gap Analysis:** Significant gaps exist in only three areas of telecommunications service: 1) Voice Over IP Services have been substantially delayed; 2) Infrastructure in several critical campus and auxiliary buildings is becoming outmoded and needs to be replaced; 3) Funding for emergency communications services needs to be stabilized and services enhanced.

**Recommendations To Close Gaps:** 1) Plan with the Budget Office for a three year replacement cycle for critical telecommunications equipment; 2) Plan with auxiliaries for replacement of outmoded telecommunications infrastructure; 3) Rapidly implement first three phases of campus emergency communications.

## **IT Infrastructure Services**

### **Network Services**

**Background:** Due to its strong network support staffing, Sacramento State has long been recognized as a leader among the CSU institutions in the quality of its network facilities and support. Primary network support comes from both the Network Services group and the Telecommunications Services group, both within the new IR&T division. Thanks to the CSU-sponsored ITRP network replacement project, the campus has robust network services throughout most of the campus. In addition, new state-of-the-art network equipment and facilities in the AIRC building provide an infrastructure that is often the envy of other higher education institutions. This infrastructure for networking will be further enhanced through the upcoming ITRP Phase 2 implementation, which will upgrade campus core routers, enhance network security, and improve redundancy of service. In addition,

Sacramento State will be the alpha campus for implementation and testing of internal network security procedures.

Campus residence halls are fully networked and upgraded to ITRP standards used elsewhere on campus. Plans have already been made to add state-of-the-art network services to both planned new residence halls and to the new campus Recreation Center. At the same time wired networked has been enhanced on campus, wireless networking has also been dramatically improved. Wireless networking campus-wide has been recently replaced with the latest CSU-standard equipment, providing greatly enhanced coverage, security, and management features. Demand for network services and bandwidth continues to increase, but network resources appear adequate to meet this growing demand for years to come.

**Target Environment:** The campus should provide readily available, highly reliable, and secure high speed network services to all users who require it. The entire campus network should be able to be managed and coordinated from a central location, to ensure highly reliable service for all. Network services should be converged as appropriate with telecommunications services, eliminating duplication of service and gaining economies of scale.

**Strengths:** Sacramento State truly has a state-of-the-art, high-speed, robust and reliable network infrastructure. The network support staff is recognized as one of the most skilled and experienced within the CSU. Network security has been good, with no serious network intrusions experienced.

**Weaknesses:** Network services suffer from the same problems of decentralization and lack of coordination as many other IT services noted above. Numerous colleges and departments have showed reluctance to standardize and coordinate on campus-wide directory, identity management, email, and network security initiatives. In the case of one college, the network itself is separate from the campus network; this alone may cost the campus significant new dollars for CSU-funded network refresh. Several key auxiliary entities use campus network services, but do not reimburse the campus for bandwidth use and service. The ITRP project did not fund upgrade of significant portions of campus buildings and auxiliary facilities, leaving islands of fair to poor network service.

**Opportunities and Threats:** Since Sacramento State staff members have been heavily involved in rollout of CSU-supported network services, we are in a very good position to take advantage of ITRP 2, network security and other centrally provided services. The addition of campus information security funding allows for the addition of a network security specialist position, while an additional vacancy allows for addition of backup network infrastructure staff. Primary threats are the presence of large pockets of old network infrastructure (particularly in auxiliary areas) and the continued practice of colleges and departments duplicating network services. In addition, migration to Voice Over IP Services (VOIP) for telephones will create significant new pressures on network services. Annual network vulnerability assessments will also place significant pressures on network staff.

**Gap Analysis:** Although few serious gaps exist in central network services, the lack of completion of network build-out in some state-supported buildings and many auxiliary buildings is a serious gap that must be addressed. As noted above, additional gaps exist in consistent compliance with campus-wide network standards. Inadequate utilization of CSU-provided network ports, caused by lack of standard network use in colleges and departments creates a serious potential gap in system-provided funding.

**Recommendations to Close Gaps:** 1) Planning should take place quickly to identify the means to close the gaps in network infrastructure build-out; 2) The campus should create a single network directory structure, with the ability for all areas to continue to effectively manage local network needs; 3) Cabinet consideration needs to be given to policy requiring campus-wide adherence to network standards and security practices; 4) A plan should be created to significantly increase utilization of network ports over the next year; and 5) Planning should take place to consolidate network and telecommunications services.

## **Operating System Services**

**Background:** Support of central servers and software services was long the primary focus of the services of the Sacramento State Computer Center. Together with Network Services staff, the combined OSNS (Operating Systems and Network Services) comprised nearly half of the staff of the Computer Center and about 25% of the previously combined Computer Center and Media Services group (CCMS). The group also accounted for the bulk of Computer Center spending. This was not an unusual state of affairs in the 1990's, as nearly

all higher education campuses focused on building a robust and reliable IT infrastructure. This emphasis on IT infrastructure itself was strongly supported both by infrastructure funding provided by the CSU and by the emphasis on IT infrastructure during construction of the new AIRC building at Sacramento State. That emphasis on building IT infrastructure required a strong campus staff to carry out those initiatives. Sacramento State was fortunate to have one of the most skilled and experienced operating systems staffs in the state during this time period.

The CSU IT strategic document, "What CSU Information Technology Leaders Will Do" (March, 2005) noted that:

"The CSU is undergoing a transition from a period of acquiring and installing technology to one of expanding its uses and integration throughout the entire fabric of the institution."

This transition means that the role of operating systems support will need to change as the new IT division is formed on campus. Operating systems support must change from being the central focus of IT services to being a service function focused on support of strategic IT initiatives campus-wide.

**Target Environment:** Operating systems support will become aligned to meet the server management, directory services, identity management, application support, and storage needs of both central IT academic/administrative IT units and the needs of IT users campus-wide.

**Strengths:** The Operating Systems unit has some of the most experienced and skilled IT technical staff on campus, with numerous staff members able to provide leadership on key technical issues campus-wide (e.g. email, storage, server operations). This strong expertise will be further enhanced by the addition of an expert in identity management. The majority of servers available to the group are in excellent working order, while a new enterprise storage system will be installed in early spring, 2008.

**Weaknesses:** The retirement of the long-time manager of operating systems support, as well as two additional retirements in OSNS, will leave significant gaps in skill and experience that will need to be replaced. Operating systems staff have been able to assume funding for operations and equipment replacement in the past, but will now have to adapt

to the need to develop comprehensive plans that align such purchases with IT strategic planning. In particular, operating systems staff will need to plan strategically for replacement of 'machine room' infrastructure. Little attention has been paid in the past to the development of automated monitoring tools for systems management.

**Opportunities and Threats:** Strategic demands for enhancement of campus communications (i.e. web, email, and portal services) will place significant new demands on operating systems staff, as will increased demands for information security. Demand is increasing rapidly for management of server security by campus-wide IT staff. The addition of an enterprise storage system in the AIRC is likely to increase this demand further. This provides significant opportunity for the operating systems group to 'shine', but will also require adaption and change of current practices.

**Gap Analysis:** A leadership gap will be created with the departure of the long-time manager of this area; significant attention will need to be paid to replacing that position with leadership consistent with changing IT support needs. Significant gaps exist in the ability of the operating systems organization to meet new needs for services in the areas of identity management, security, server and application monitoring, and email/portal services.

**Recommendations to Close Gaps:** 1) Hire manager for reconfigured OSNS group by April, 2008; 2) Hire new staff members for identity management and operations; 3) Complete study of resources needed to provide greatly enhanced email and portal services to students, as well as server and storage services for campus-wide use.

## Conclusion

This *Gap Analysis for Information Technology at Sacramento State* will form the basis for the development of a campus-wide strategic plan for information technology on campus. Primary responsibility for development of this plan will rest with the IRT Steering Committee, supported by the work of the IRT Academic Computing Advisory Committee and the IRT Administrative Computing Advisory Committee. In addition, the *Gap Analysis* will be distributed widely across campus, as a basis for wide involvement of the campus at

large in providing feedback and comment on the development of the strategic plan for information technology.



## Appendix 1: Basic IT Strategic Planning Model

