



Information Technology at UC Berkeley: Governance, Funding and Structure

Final Report and Recommendations

January 18, 2006

TABLE OF CONTENTS

- I. Executive Summary and Introduction**
- II. Results of the UC Berkeley IT Self-Study**
- III. Five Case Studies that Illustrate Impediments Created by Current IT Governance, Funding and Structure**
- IV. Values and Goals for IT Governance, Funding and Structure**
- V. Recommendations of the Committee to Review IT Governance, Funding and Structure at UC Berkeley**

Appendix A: IT Strategic Planning Timeline

Appendix B: Charge to the IT Self-Study and the IT Review Committee

I. Executive Summary and Introduction

At the beginning of 2005, UC Berkeley's Executive Vice Chancellor and Provost, Paul Gray, appointed C. Judson King, Senior Vice President and Provost Emeritus of the University of California¹, to form a high-level committee to review and make recommendations concerning the organization of information technology (IT) governance, funding and structure at UC Berkeley. During the previous year, a strategic planning process had identified governance, funding and structure as one of six critical IT issues needing such focused attention by the campus.² In fact, it was described as the key enabler of all of the other recommendations that were soon to emerge as part of an overall IT strategic plan.

The subsequent review was conducted in three phases. Provost Emeritus King and EVC/P Gray identified and appointed the Review Committee, comprised of one-half UC Berkeley faculty, staff and students, and one-half members from external institutions, including the University of Michigan, the Massachusetts Institute of Technology, Indiana University, the University of California at Los Angeles, and Sun Microsystems.³ Under the direction of Dr. Jay Stowsky⁴,

¹ Professor King is also Provost Emeritus of the Professional Schools and Colleges at UC Berkeley and a Professor Emeritus of Chemical Engineering.

² The IT strategic planning process has been overseen by Katherine Mitchell of UC Berkeley's Center for Organizational Effectiveness (CoRE). Assisting her in that effort has been a committee comprised of Jack McCredie (UCB AVC-IT/CIO outgoing), Shelton Waggner (UCB AVC/IT CIO incoming), Tessa Michaels (Director of Computing, Business and Administrative Services and Chair of ITAC), and Teresa Costantinidis (Senior Assistant Dean and Chief Operating Officer, Walter A. Haas School of Business).

³ The members of the IT Review Committee are Professor David Messerschmitt (EECS, also co-chair of COMP, the Academic Senate Committee on Computing and Communications), Professor Nick Jewell (Statistics, also former Vice Provost), Professor Robin Einhorn (History, also a member of COMP), Adjunct Professor Robert Glushko (SIMS), Susie Castillo-Robson, (UCB Registrar), Patricia Donnelly (Director of Computing, Boalt School of Law, also vice-chair of ITAC), Joseph Hall, PhD candidate (SIMS), Professor James Hilton (Associate Provost for Academic, Information and Instructional Technology Affairs, University of Michigan at Ann Arbor), Professor Michael McRobbie (CIO and Vice President for Research, Indiana University), Professor Vijay Kumar (Director, Academic Computing, Massachusetts Institute of Technology), and Professor Jim Davis (AVC, Information Technology and CIO, UCLA). Advisory members are Shelton Waggner (AVC-IT/CIO, UCB), Helen Norris (Director of IT, Office of Budget and Finance), Mara Hancock (UCB Educational Technology Service), and Barbara Barnett (UCB Office of Budget and Finance).

interviews and discussions were conducted during the spring semester with members of UC Berkeley's eleven standing IT committees, key senior administrators, select faculty members and nearly 200 additional staff and students. The resulting "Interim Self-Study of IT Governance, Funding and Structure at UC Berkeley" was presented to the Executive Vice Chancellor and Provost in July, 2005. Following that, the self-study's five major findings were presented to the eleven standing IT committees for further comment and revision. They are:

1. UC Berkeley's Chief Information Officer (CIO) does not manage (or necessarily even know about) roughly 2/3 of the IT activity on campus. He is widely viewed only as the director of the campus' large central IT unit, IS&T.
2. The campus process for discussing IT needs, priorities and potential investments (through the 11 standing IT committees) is almost entirely disconnected from the process by which the campus and its units prepare annual IT budgets.
3. Decisions regarding the design, funding, implementation and maintenance of campuswide administrative or "enterprise" IT systems spanning multiple control units across the entire campus (such as human resources and financial management) are often left to the individual units responsible for operating them, without sufficient input from either the CIO or the vast array of academic departments and administrative units that depend on them.
4. The governance, funding and structural roles of central administrative units with respect to research computing (office of research), instructional technology (the office of undergraduate education and instructional technology), and basic computing capability and desktop support (IS&T) are ill-defined and unclear to most people on campus.

⁴ Dr. Stowsky is Associate Vice Provost for Academic Planning and Facilities and Senior Research Associate at the Berkeley Roundtable on the International Economy (BRIE), and a former Associate Dean of School Affairs and Initiatives at the Walter A. Haas School of Business.

5. There are no transparent mechanisms to identify and disseminate IT best practices from any unit to any other unit on campus, e.g. desktop support or customer helpdesk tracking software.

The revised self-study was presented to the Review Committee at the end of July. Among other work, the Committee proceeded to generate five case studies describing IT initiatives that, despite considerable campus support, appeared to be stalled due to existing deficiencies in IT governance, funding and/or structure. During the summer of 2005, Dr. Stowsky presented the case studies to eleven standing IT committees for further comment and revision. They are:

1. Lack of a universal basic standard of computing capability and desktop support for all instructors at UC Berkeley.
2. Need for a multi-year, campus-level approach to funding and upgrading enterprise systems, such as the Berkeley Financial System (BFS) and the Human Resources Management System (HRMS).
3. Difficulties in making available to instructors a standard learning management system for all courses taught at UC Berkeley.
4. Need to identify and disseminate IT best practices and implementations across units or to consistently apply relevant research findings by Berkeley faculty to the design and delivery of IT services.
5. Desirability of standard certification requirements, career ladders, and continuing education opportunities for professional IT staff across the entire campus.

In October, the Review Committee met a second time to hear presentations from the Committee's external members and to generate a set of values and goals with which to guide the development of final recommendations to the EVC/P.

In the late fall, Provost Emeritus King and Dr. Stowsky met individually with each member and advisory member of the Review Committee to refine the values and

goals and to generate an initial set of recommendations to address the issues identified in the self-study and subsequent deliberations. This list of recommendations (with options) was discussed, debated and refined at the Review Committee's final meeting at the beginning of December 2005. They are:

1. The CIO function needs to be strengthened, defined more clearly and distinguished from the function of running IS&T.
2. The CIO should be involved in formulating all campus-level IT budget requests.
3. The CIO should be the key link between input/advice from IT stakeholders and formulation of campus-level IT budgets.
4. There should be a clear way for knowledgeable faculty to interact with the CIO and for the CIO to receive expert faculty advice and draw on highly-regarded faculty partners to advocate for proposed IT investments.
5. The Berkeley campus needs to reorganize, rationalize and enable technology (and other complementary) investments in classrooms and instructional-technology support systems.
6. The Berkeley campus needs to reorganize, rationalize and enable the provision of the IT resources that faculty, students and staff require as part of their expected jobs and roles (including responsibility for a minimum standard level of computing capability and desktop support).
7. The Berkeley campus needs to reorganize and rationalize its approach to hiring and training professional IT staff, to encourage the development of a campus-wide community of IT professionals, and to identify and disseminate best practices.

Specific options for carrying out these seven recommendations are discussed in detail in Section 4 of this Report.

II. Results of the UC Berkeley Self-Study

For reasons that are partly historical, partly cultural, and partly reflective of the sheer complexity of a modern research university, UC Berkeley's structure of governance for defining and funding its information technology (IT) investments is distributed across a wide variety of advisory committees, academic departments, and administrative units. There is no common approach to decision-making or any common forum for making final comprehensive assessments of the IT funding strategy for the campus as a whole. At its best, this structure affords the University's divisions and departments a striking capacity for technological innovation and entrepreneurship free of central administrative constraints. At its worst, it results in a divided community of IT "haves and have-nots," riddled with procurement cost inefficiencies, missed application and service improvement opportunities and confusion over IT standards, policies, and priorities. In short, it leads to an IT enterprise that is ultimately less than the sum of its parts.

The good news is that UC Berkeley possesses a modern IT network infrastructure and staff that includes many talented IT professionals. There are examples throughout the Berkeley campus of excellent IT service delivery, expert project management, and approaches to IT proposal assessment and budgeting that enable decision makers to make careful trade offs among cost and performance goals as these are measured against a clear set of IT investment objectives. The challenge is to weave these best practices into a transparent and comprehensive process for reaching campus-level IT funding decisions while ensuring sufficient autonomy and some common set of minimum service standards for all units and departments. This needs to be done while also assuring the continued freedom of all units and departments to exceed those service minimums and to develop unique customer applications, whenever they have the skills and resources to do so. Indeed, a deep antipathy toward more

centralized decision-making as an antidote to organizational fragmentation is perhaps the most universally expressed value articulated by participants in this self-study. However, the organizational fragmentation is real -- both on the IT demand side (in terms of where discussions of IT needs are held and where decisions about IT funding are made) and on the supply side (in terms of how many units provide independent customer support help desks, for both application development and routine support). And it is this fragmentation that makes the coordination and comparison (not centralization) of multi-unit and Campuswide IT investment decisions such an extraordinarily daunting task.

1. UC Berkeley's Chief Information Officer (CIO) does not manage (or necessarily even know about) roughly 2/3 of the IT activity on campus. He is widely viewed only as the director of the campus' large central IT unit, IS&T.

Although the Associate Vice Chancellor for Information Systems and Technology now also carries the title Chief Information Officer, his span of control does not in fact include two-thirds or more of the IT activity on campus, as measured by budget or by staff FTE. This creates two challenges. First, the AVC-IT/CIO is often expected to develop comprehensive strategic plans for campus IT investment even though no academic department or administrative unit other than IS&T is obligated to inform him of its own IT needs or plans. The local department IT services are sometimes based on technologies that are not compatible with other campus units or central systems. Second, the independent IT organizations within some administrative units and academic departments have now evolved to a point where they actually compete with (or at least provide an alternative to) IS&T for providing other units and departments with development assistance for customer applications or for providing routine workstation/desktop support. Yet part of the AVC-IT/CIO's job is the "care and feeding" of the employees of IS&T, which derives a substantial portion of its budget by recharging such services.

2. The campus process for discussing IT needs, priorities and potential investments (through the 11 standing IT committees) is almost entirely disconnected from the process by which the campus and its units prepare annual IT budgets.

Initiatives or ideas for improvement of IT policies, applications, major new administrative systems or network infrastructure may arise anywhere on the campus. One challenge is that there is currently no process for structuring these ideas/initiatives as formal 'proposals' with common features (e.g., resource requirements, expected costs and benefits, relevance to campus priorities) that can be easily compared. In any case, the set of discussions held about these ideas/initiatives by members of the various IT advisory committees, often culminating in a discussion by the E-Berkeley steering committee, currently provide a fairly good opportunity to ensure that such ideas/initiatives are discussed and debated by a wide variety of administrative, faculty and student representatives. However, none of these discussions culminates directly in an actual funding decision, save for the very small pot of money the E-Berkeley steering committee has on hand for so-called "innovation projects" (about \$100K/year compared to a total of nearly \$135 million spent annually on IT at UC Berkeley). The process for actually budgeting for and funding for IT investments on campus is comprised of a separate, and not always parallel, set of discussions. In colleges, schools, and departments, IT funding proposals tend to make their way up to the deans, who may or may not have the resources to fund them or to build them internally. In administrative units, such proposals tend to make their way up to the individual vice chancellors, who again may or may not have the resources to build them internally or to buy them from another provider (on or off campus). Ultimately these proposals make their way into the budget request of an individual dean or vice chancellor, are analyzed by the Budget Office, and ultimately passed to the Chancellor and Executive Vice Chancellor/Provost. Discussions tend to focus on how much of the overall budget request

will be granted, not on its individual components (unless there is a major new initiative proposed). There is nothing in the budget-decision process that would cause these various IT-related budget requests from the organizational units to be considered in more detail, in comparison, or comprehensively, as a group. Nor is there anything to ensure that the advice and recommendations of the advisory committees are systematically applied to the department- and unit-specific budget/funding decisions. Thus there is no sure way to view proposals for IT funding that involve more than one department or unit comprehensively across the entire campus, to trade off one multi-unit IT request or proposal against all the others, or to consider how a decision to fund one single- or multi-unit IT proposal may affect the technical and financial prospects for starting or sustaining all the rest of the units into the future.

3. Decisions regarding the design, funding, implementation and maintenance of enterprise IT systems in use by the entire campus are often left to the individual units responsible for operating them, without sufficient input from either the CIO or the vast array of academic departments and administrative units that depend on them.

Even after the establishment and campus-wide roll out of new central administrative systems, such as the Human Resource Management System (HRMS), these systems are still treated in the annual budget process as if they belong to the single administrative unit/vice chancellor that has functional responsibility for operating the system. While unit sponsorship/functional ownership of a campus system can be a good thing, it is not good for funding decisions about that campus system to be made in isolation from other IT decisions or, indeed, to be pitted against other types of more purely discretionary spending. Instead of being treated as a permanent campus-level commitment, which implies significant non-discretionary spending each year going forward, these systems are reviewed as part of an individual vice chancellor's annual

budget request for incremental new funding. For example, the request for additional funding for BFS (Berkeley Financial System) would be in the budget request of the Vice Chancellor – Budget and Finance for his/her unit; the comparable request for the HRMS system would be in the individual budget request for Business and Administrative Services. Yet virtually every academic department and administrative unit on campus is devoting significant human and financial resources to the population and operation of these campus-wide data bases. The current budget/funding process obscures the true nature of the costs of maintaining, much less expanding, these central administrative systems, whose yearly budgets cannot be simply traded off annually against new proposals for IT spending (including proposed spending for other new central administrative systems -- also known as enterprise systems --, such as a new campus-wide course management system, which right now would come as an individual request from the Vice Provost for Undergraduate Education and Instructional Technology). And, again, although some of these strategic issues are discussed in the various IT advisory committees and the e-Berkeley steering committee, those discussions are disconnected from the annual budget reviews which lead to actual funding decisions.

4. The governance, funding and structural roles of central administrative units with respect to research computing (Office of Research), instructional technology (Office of Undergraduate Education and Instructional Technology), and basic computing capability and desktop support (IS&T) are ill-defined and unclear to most people on campus.

IS&T is responsible for the campus voice and data network, operation of enterprise systems (financial, personnel, email, student, research, etc.), secure operational facilities, site licenses, and connections to UC, national and international infrastructure (e.g., CENIC, Internet2, Commercial Internet, system-wide payroll, supercomputing, California Digital Library, Melvyl, system-wide

data, etc.). As the primary central administrative unit clearly responsible for IT, many people on campus mistakenly presume that IS&T is also ultimately responsible for providing routine workstation/desktop support and development assistance for customer applications to any academic department or administrative unit on campus. Although IS&T has developed a limited capacity to provide these services, basic responsibility for both support and development assistance was devolved centrally and evolved a long time ago from within the individual departments and units. Similarly, the Office of the Vice Chancellor for Research is often thought to be responsible for “research computing” on campus. Yet requests for funding for various research computing initiatives and improvements are often made by individual PI’s either to their department chairs, their deans, or to the directors of an Organized Research Unit (ORU). Most of the ORU’s report to the Vice Chancellor for Research, but currently there is no formal process by which she can view all of the various research computing requests that come to deans, to ORU directors or in grant proposals processed by the Sponsored Projects Office. So it is very difficult, if not impossible, for her to represent the campus demand for research computing in a comprehensive manner in the annual budget process for her unit, or to identify opportunities to share resources or solve a “larger problem.”

The challenge is even greater, perhaps, for the Vice Provost for Undergraduate Education, who has executive management responsibility for the Educational Technology Service, but has no real way to track or coordinate the individual experiments and requests for funding that arise from hundreds of faculty and graduate student instructors who are using IT in their teaching all across the campus.

Finally, as noted, the dozen or more IT advisory committees, including the e-Berkeley steering committee, have virtually no formal role in the process by which spending for IT on campus is actually budgeted, so, not surprisingly, many members of these committees express confusion about exactly what their role in

the process is supposed to be. Yet people “outside” of the process tend to view IS&T, the e-Berkeley steering committee, the Vice Chancellor for Research and the Vice Provost for Undergraduate Education and Instructional Technology as being “in charge” of the IT activities that are supposedly under their “jurisdiction.”

5. There are no mechanisms to identify and disseminate IT best practices and implementations from any unit to any other unit on campus (e.g., desktop support).

At UC Berkeley, there are more than two dozen IT organizations based in academic departments or administrative units (including more than one group within IS&T) that provide a telephone and/or web-based help desk for users seeking help with routine workstation/desktop problems or the development of customer applications. Some of these organizations use state-of-the-art request tracking software, helping to deliver efficient service and quick customer feedback. Others simply rely on individuals to return phone calls and fix problems on a first-come, first-served basis or on a “squeaky wheel gets the grease” basis. For many people on campus, this lack of consistency creates feelings of annoyance and frustration, either with their own unit’s or department’s independent IT organization or with IS&T, on an almost daily basis. These feelings seem to color their view of the entire IT enterprise at UC Berkeley. Other people on campus, whose needs for service are managed effectively and consistently by ultra-responsive online, telephone, or in-person support, report higher levels of satisfaction with their own support situation and with the entire campus IT organization. The system is so fragmented that there is no opportunity (or reason) for one “service provider” to partner with other provider groups, or be compared systematically to one another in terms of efficiency or effectiveness; thus there is no incentive for managers to adopt organizational routines or products (such as help desk software) that are used by the units that seem to be doing the best job and that have the most satisfied customers. Moreover, the difficulty of sharing costs/resources across units means that

partnering with another unit is often viewed as a sure way to drain or diffuse scarce resources.

A related issue is that innovative ideas and services sometimes arise in individual units, and are implemented there, but there is no systematic process to help identify and “capture” these innovations for the benefit of the larger campus community, including insuring that their implementation is consistent with wider deployment.

III. Five case studies that illustrate impediments created by current IT governance, funding and structure at UC Berkeley

The following five case studies were employed by the Committee to measure the effectiveness of current governance, funding, and structure and identify weaknesses that needed to be addressed.

Case 1. Lack of a universal basic standard of computing capability and desktop support for all instructors at UC Berkeley.

The Academic Senate Committee on Computing and Communications (COMP) has proposed a “basic vanilla” package of computer hardware, software and services for all UCB faculty. What is the likely fate of this proposal under the current governance and funding structure for IT at Berkeley? (Think, for example, of how this proposal is likely to wend its way to the E-Berkeley Steering Committee vs. how it might or might not appear as a funding proposal in a particular unit’s annual budget request). What are some options for changes in the governance structure that would make it more likely that this proposal could be adequately debated, adopted Campuswide, and permanently funded? How would such a proposal, which spans numerous control units on campus, survive the independent budgetary decisions that overlap its scope and the strong tendency to independently design and implement and deploy it in multiple units without resulting in damaging inconsistencies and unnecessary duplication of effort?

Case 2. Need for a multi-year, campus-level approach to funding and upgrading enterprise systems, such as the Berkeley Financial System (BFS) and the Human Resources Management System (HRMS).

The Berkeley campus has been able to develop, adopt and even fund (how sufficiently is a matter of debate) several enterprise-wide administrative systems, including the Berkeley Financial System (BFS) and the Human Resource Management System (HRMS). How did these proposals manage to make their way through the current governance and funding structure for IT at Berkeley? What problems remain with their continued funding and operation? What are some options for changes in the governance structure that would make it more likely that such systems could be adequately debated, adopted campuswide and permanently funded?

Case 3. Difficulties in making available to instructors a standard learning management system for all courses taught at UC Berkeley.

bSpace, the UC Berkeley implementation of Sakai, is moving forward incrementally in pilot form. It has a champion in the Vice Provost for Undergraduate Education and significant technical support from both the Educational Technology Service (ETS) and IST. For bSpace to work, administrative units in charge of classroom design, construction, and assignment must also be engaged, and instructors must be offered training and facilities for access to the system. What is the likely path for bSpace if no changes are made in the current governance and funding structure for IT at Berkeley? Will the campus be successful in eliminating legacy instructional management systems, and focusing resources on this one solution? What are some options for changes in the governance structure that would make it more likely that bSpace systems could be adequately debated, adopted Campuswide, and permanently funded?

Case 4. Need to identify and disseminate IT best practices across units or to consistently apply relevant research findings by Berkeley faculty to the design and delivery of IT services.

UC Berkeley is one of the world's leading sources of innovative IT tools. In addition, several of the more affluent units on campus have pioneered the adoption of advances in research, instructional and administrative computing and in the provision of IT helpdesks and other services. Yet there appears to be no systematic mechanism at Berkeley to assure that "best practices," new services, and implementations, wherever they arise, are identified and assessed for potential adoption campuswide. What happens to innovative tools and practices now? Are they ever picked up and implemented campuswide? What are some options for changes in the governance structure that would make it more likely that innovations could be systematically assessed, considered for adoption campuswide, and permanently funded?

Case 5. Desirability of standard certification requirements, career ladders, and continuing education opportunities for professional IT staff across the entire campus.

At UC Berkeley, career IT staff are hired independently by each academic department and administrative unit. Employees tend to view themselves as working for that department and unit and do not feel themselves part of a larger IT professional community campuswide. There appears to be relatively little migration of IT professionals among different units in the course of their careers; indeed, there appears to be a deficit of professional development and career paths/ladders for such staff. Is there any way to address this concern under the current governance and funding structure for IT at UC Berkeley? What are some options for changes in the governance structure that would make it more likely that a more comprehensive, campuswide approach to professional development for IT staff could be developed and adopted?

IV. Values and Goals for the Governance, Funding and Structure of Information Technology at the Berkeley Campus

Our committee agreed upon a number of values and goals that are desirable for the structure, governance and funding of information technology at Berkeley, as follows.

1. Information technology (IT) should support the teaching and learning, research and scholarship, and public service and engagement missions of the university. Campus-wide IT governance, funding, and structure should advance these missions.
2. Governance (who makes campus-wide decisions about information technology and how they are made) and structures should be clear and transparent.
 - a. The role and functions of the CIO for the campus should be clearly defined and should be clearly delineated and differentiated from the role and functions of the AVC for Information Systems and Technology. Governance and funding allocation should recognize that differentiation.
 - b. There should be a close coupling between considerations of the needs associated with campus-wide information technology and the budgeting process; i. e., the decisions resulting from the academic and administrative deliberative mechanisms should be clearly reflected in budgetary decisions.

3. Structures (loci of decision making and incentives) should encourage operational and cost efficiencies.
 - a. For any issues that involve or benefit from the cooperation of several administrative units for effectiveness and/or cost efficiency, responsibility, decision making and accountability should be focused in a single place, utilizing appropriate inputs and consultation. For example, security of computers and computerized data bases requires that standards be set centrally and implemented, reliably, locally. In many cases, the loci of decision making may be a cooperative effort among units with central IT acting as a convener and definer of incentives, rather than a top-down command and control structure.
 - b. Central campus issues should be dealt with centrally.
4. Where possible, governance, funding allocation, and organizational structure should incentivize, rather than prescribe or constrain, so as to preserve the ability of units to address their needs in optimal ways. So while many priorities must be set centrally, many decisions about how these priorities can best be achieved should be made at the school/college level.
5. The substantial differences between campuswide IT services and distributed, locally deployed services should be recognized, while recognizing also that there is a gray area in between them. These distinctions may result in quite different governance, budget processes and/or structures.
6. Governance, funding and structure should foster true partnerships between the CIO and academic and administrative units, and between

IS&T and academic and administrative units, and among the academic and administrative units.

7. Effective mechanisms should be developed for the professional development of information technology staff, to enhance their skills and interchangeability among units, and to promote retention of the best through career opportunities and job satisfaction.
8. Effective mechanisms should exist to enable sharing of information about effective practices and implementations among IT managers and staff across the campus.
9. The nature of user needs and applications changes as the nature of computing, networking and bandwidth change rapidly over time. IT governance, funding, and structure must be appropriate for meeting the nature and capabilities of oncoming IT uses as well as the IT uses of today.

V. Recommendations of the Committee to Review IT Governance, Funding and Structure at UC Berkeley

The Committee has identified seven key recommendations. It has not attempted to come up with a single way to implement each recommendation, but rather has provided in many cases more than one option for consideration. Also, in some cases the alternatives presented are logically coupled, as indicated by “and/or” wording.

Recommendation #1. The CIO function needs to be strengthened and differentiated from the function of running IS&T.

For the CIO to be regarded as a true CIO, it needs to be clear that he is acting primarily on behalf of the campus and is not primarily concerned with the “care and feeding” of the central IT organization, IS&T. IS&T needs to be seen as a vital institutional capacity and resource to address campus IT needs, but campus requirements must be seen as the CIO’s primary drivers for action. The Committee believes that there are some structural changes that can address the problematic perception that this is not currently the case.

Option 1A. A new office, the office of the CIO, should be created outside of IS&T. This office would have its own small staff and budget, controlled by the CIO. The CIO would continue to be a member of the Chancellor’s Cabinet and would continue to report directly to the EVC/P. In addition, the CIO would have the discretion to fund campus-level projects below a certain size, say \$100,000, many of these projects of an experimental or demonstrative nature. For this purpose the CIO would need a small-project budget category, which could effectively be, say, \$1 million per year. The Chancellor and EVC/P would need to approve projects above that threshold. These IT projects should have a defined life expectancy as part of the request process and should have a budget view of no less than three years. The Chancellor and the EVC/P retain control

over the overall size of the CIO's budget and the campus IT budget. But recommendations with respect to priority setting within the overall campus IT budget would be the responsibility of the CIO.

and

Option 1B. A new position of operational director of IS&T should be created. This person should report to the CIO. In addition, IS&T should be renamed, perhaps something like "Information Services," to signal that it is first and foremost a service organization, one that looks outward to identify and respond to the needs of students, non-IT staff, and faculty.

Recommendation #2. The CIO should be involved in formulating all campus-Level IT budget requests.

A second way to ensure that the CIO is truly the Chancellor's key advisor on campus IT matters is to assure that he is fully involved in the formulation of all campus-level IT budget proposals.

Option 2A. The CIO should be thoroughly integrated into the deliberative process of the Budget Office as it formulates proposed budgets for consideration by the senior administration. (This recommendation presumes that the CIO function is sufficiently differentiated from the IS&T function.)

and

Option 2B. No request for technology investment should come to the Chancellor, the EVC/P, the Cabinet, or the budget office without first going through the CIO. This simply means that any vice chancellor planning a technology investment for a campus-level function (e.g., BFS, HRMS) should first work out a joint agreement over the technical details with the CIO. In the rare

instance of a persistent disagreement over such details, the EVC/P or Chancellor, as appropriate, will mediate.

Recommendation #3. The CIO should be the key link between input/advice from IT stakeholders and formulation of campus-level IT budgets.

A third way to guarantee that UC Berkeley's CIO is effective as the chief information officer on campus is to structure all of the input/advice from academic and administrative units on proposed campus-level IT spending as input/advice to the CIO. The Committee has formulated three alternative approaches toward building such a structure.

In each approach, the current e-Berkeley Steering Committee is eliminated and other functions of the current e-Berkeley Program Office are transferred to the Office of the CIO. Except for the Information Technology Architecture Committee (ITAC) ITAC, all of the other current IT-related administrative committees are eliminated, to be replaced by a smaller number of carefully structured advisory and decision-making bodies. COMP would presumably continue to channel advice from the Academic Senate.

Also in each approach, the types of IT decisions subject to campus-level discussion and decision are clearly defined. (All other IT decisions are assumed to remain the purview of individual administrative and academic units.) Campus-level IT decisions (or recommendations to the Chancellor and EVC/P) should be defined as decisions involving the use of campus-owned data, and/or IT systems and support involving more than one academic or administrative unit, and/or decisions above some monetary spending threshold (to be determined).

Model 3A. Branch or Deputy CIO's (A Federated, Library-like Model)

One approach to designing a new structure for providing IT input/advice from academic and administrative units to the CIO would be to create a set of positions, called Deputy CIO's, for specific functions or areas of the campus. The deputies could be appointed from among the most talented of the current IT managers, with others recruited to the campus as needed. They would report in a "solid line relationship" to the head of their functional unit (e.g., a Deputy CIO for Research would report to the Vice Chancellor for Research), but they would also have a "dotted line" reporting relationship to the CIO. They would also be members of a new campus Council of CIO's, chaired by the CIO.

This structure is similar, but not identical, to that of the Library system on campus. In that system, the branch librarians report to the University Librarian and are members of a Council of Librarians, but they maintain close and collaborative relationships with the deans, faculties and students of the disciplines their branch libraries serve. In the structure proposed here the Deputy CIO's would continue to report to the heads of their functional units, serving as the IT point persons for pertinent vice chancellors and vice provosts.⁵

The Deputy CIO's would be charged with representing the needs and interests of faculty, staff, students and the units in their specific area of responsibility. Where appropriate, these positions could be appointed from existing staff for terms of 24 months and/or could rotate the position within a representative pool. Their "dotted line" reporting relationship to the CIO means that the CIO would collaborate with the deans and senior administrators on hiring and performance reviews, certification and education, as well as identifying opportunities for greater responsibility and career growth across campus. Funding for these positions could be split, for example with 60% from the units and 40% from central funds managed by the office of the CIO.

⁵ Some committee members think that this model would work better if reporting were organized the other way round: the Deputy CIO's would report directly to the CIO, with a dotted line reporting relationship to the heads of their functional units

Unresolved, at this point, is the role of the CIO and deputy CIO's vis-à-vis the academic departments. There are 17 deans of schools, colleges, and divisions of L&S, not counting the Graduate Division, University Extension, International & Area Studies and the L&S Undergraduate Division. One approach would be simply to have 17 Deputy CIO's representing the academic departments, but the Committee believes that such a number is too large. Another possibility would be to divide the academic departments by commonalities of discipline into approximately five areas, which could then lead to a total number of Deputy CIO's on the order of nine or ten. The five Deputy CIO positions for the academic departments could be filled by having the affected deans select one person to represent their area of the campus on a rotating basis for some standard period like two or three years (e.g., the IT manager of the law school would be selected to represent all of the professional schools, followed by the IT manager of the School of Journalism, etc.). One possible grouping of academic departments would be as follows.

1. Humanities and Arts
2. Social Sciences
3. Physical Sciences, Engineering & Chemistry
4. Biological Sciences, Natural Resources, Public Health & Optometry
5. Other Professions

In this model, the input/advice functions of the nine existing IT committees (other than ITAC and COMP) would be transferred to the new campus Council of CIO's. To avoid a proliferation of standing committees, the Council would be empowered to charter temporary sub-committees, task forces or project teams as needed. Thus there would be only three standing IT committees providing input/advice to the CIO: The Council of CIO's, ITAC, and COMP.

or

Model 3B. Status-Quo Plus (Fewer, Smaller IT Committees Chaired by CIO)

This structure would not create any new positions. It would rationalize and replace the existing committee structure by organizing a new set of committees (7 total instead of the current 11) around several of the IT critical issues defined during the IT strategic planning process. These are: Teaching and learning; research; privacy, security, reliability and access; and the student and alumni experience. Some committees would be eliminated (e.g., the e-Berkeley Steering Committee), others would be recast as advisory to the CIO, accountable for analysis and decision making for specific areas impacting IT architecture and expenditures. The charge and membership criteria for each standing committee would be clarified and/or re-defined. Committees would include:

Retention of:

1. ITAC
2. COMP (The Committee suggests that the Academic Senate make the CIO an *ex officio* member of COMP).

Creation of:

3. Committee on Technology Teaching and Learning (CTTL)(Replace ETC)
4. Committee on Technology in Research (CTR)(New)
5. Committee on Privacy, Security, Reliability and Access (CPPSRA)(Replace CISC and DSC)
6. Committee on Student Services (CSS)(New)
7. Committee on Development and Alumni Services (CDAS)(New)

Each one of the committees would be chaired or co-chaired by the CIO and would, to the extent possible, minimize overlap in participation so that key staff are not spending also much of their valuable time in committee meetings. CTTL,

CTR, CSS and CADS would be co-chaired by the Vice Provost for Undergraduate Education and Instructional Technology, The Vice Chancellor for Research, the Vice Chancellor for Student Affairs, and the Vice Chancellor for University Relations, respectively. Nominations for membership on these committees from the academic units would be supplied by the deans, both to ensure that the deans recognize the importance of the committees as avenues for input on campus IT issues and to ensure that members will in fact function as representatives of their deans and their home departments and not solely as independent experts. Together with COMP, which would continue to represent the Academic Senate voice on IT issues, and ITAC, which would continue to represent the campus' IT managers, these committees would serve to organize input on IT investment and policy to the CIO. The CIO would be responsible for managing the processes by which this advice is formed, compiled and taken forward to the Chancellor, Executive Vice Chancellor/Provost and/or Cabinet for funding.

The CIO is the decision-maker on IT infrastructure and architecture and is a joint decision-maker with executive owners on the programmatic and investment objectives for campus systems. The executive sponsor of major enterprise or administrative systems (e.g., HRMS, e-Travel, BFS, etc.) should include the end users of those systems in decision-making processes regarding those systems (particularly with respect to the design of functional elements). The CIO should also be a party to those discussions, so that the CIO is more intimately knowledgeable about end-user needs.

Again, the Committee feels that, for this structure to work, the relationship between the CIO as CIO and the CIO as head of IS&T must be addressed sufficiently. If the CIO interacts with these committees as the head of IS&T, the conflict of his being seen as an advocate for that organization against other IT units on campus will not have been resolved (see Recommendation #1, above).

or

Model 3C. Two Service Layers, Two IT Structures: Campus-Wide Computing and Local Computing

This alternative would divide campus IT into two structures, one for campus-wide computing and one for local computing. The two would be governed differently. All campus-wide computing would report directly up to the CIO, in a sort of corporate model. Local computing would continue to report to heads of academic and administrative units, but local IT managers would also have a dotted line reporting relationship to the CIO organized through mandatory membership in ITAC.

IT units responsible for campus-wide IT functions would either become part of IS&T and report directly to the CIO (a very big change) or would have a new dotted line reporting relationship to the CIO, organized through ITAC.⁶ Local computing would be organized along different lines, depending on local needs as defined by department chairs, deans, directors, and senior administrators. But local IT managers would be organized through ITAC to provide input/advice/information to the CIO, and vice versa. The main point is to rationalize what is a “local” system and should be managed locally and what is managed centrally by IS&T.

The Committee was concerned about drawing a bold line between academic and administrative computing and so the campus is split, in this model, between service layers. There can be campus-wide applications and implementation

⁶ What makes transition to this model difficult is the fact that many administrative units developed their own IT shops precisely because they either were not satisfied with the service they were getting from IS&T and/or wanted, for internal reasons, to have more direct control over their own IT resources. Nevertheless, a model like this works well at many research universities and should at least be considered for UC Berkeley. Here again, a sufficient differentiation between the role of the CIO and that of the head of IS&T is needed.

strategies for research and education, e.g. learning environments, research computation and data storage; also, it can be difficult to characterize certain functions as either academic or administrative, for example, the role of the library or the role of the registrar's office in a course management system.

In this model, the current set of 11 IT committees would be replaced by just four administrative IT committees, ITAC and three new standing committees representing each of the main customer groups that use IT on campus (plus COMP, which would continue to channel advice on IT policy to the CIO):

- i. Academic units
- ii. Students
- iii. Administrators/Staff

Common to the other alternatives recommended here, these committees would be chaired or co-chaired by the CIO. Again, it would be useful for the CIO to be an *ex officio* member of COMP.

Recommendation #4. There should be a clear way for knowledgeable faculty to interact with the CIO and for the CIO to receive expert faculty advice and to draw on highly-regarded faculty partners to advocate for proposed IT investments

Whatever the structure of IT input/advice to the CIO, and however the CIO role itself is strengthened, the Committee believes that the CIO must have a clearer way to receive and solicit input/advice from the faculty, particularly members of the faculty who are well-known and highly-regarded for their scholarship in disciplines related to information technology and its applications. One way to ensure this is for the CIO to continue to report directly to the Provost, a relationship that the committee strongly supports. Other options are:

Option 4A. The CIO should work with the EVC/P to create a “kitchen cabinet” of Faculty IT advisors. This would be not be an administrative committee, but a discussion group co-hosted by the EVC/P and the CIO, to help them think about “big picture” IT strategy for the campus. Membership would include both faculty with major research and teaching interests and strong scholarly reputations in computer science and related disciplines, faculty who have experience managing computing laboratories or computing services connected to their home departments, and importantly faculty representing major intensive-user groups. Although the committee believes that such relationships between key faculty IT experts and the CIO should be established informally as a matter of course, this represents a departure from current practice and so requires a bit of a formal push to become established (or perhaps re-established) as part of the campus culture.

and/or

Option 4B. The CIO and the Vice Chancellor for Research should co-develop all proposals related to research computing. This would enable the Vice Chancellor for Research to partner fully with the CIO in formulating these proposals and in advocating on behalf of these proposals with her Faculty colleagues. It is especially important that the Vice Chancellor for Research and the CIO work with the directors of the Organized Research Units on campus, most of which report to the Vice Chancellor for Research, to develop a comprehensive approach to research computing needs and proposals. (In the deputy CIO model, the Vice Chancellor would have a deputy CIO of her own to serve as her technical expert on such proposals). A similar partnership should be created between a faculty-administrator with clear responsibility for developing proposals related to instructional computing for undergraduate, graduate and professional school courses. Options for reorganizing the role of the Vice Provost of Undergraduate Education and Instructional Technology and/or creating a Board of Directors for Investments in Classrooms are discussed below.

and/or

Option 4C. The Academic Senate should be requested to consider making the CIO an *ex officio* member of the Academic Senate, distinct from the affiliation with COMP).

Option 4D. The CIO should be made an *ex officio* member of the Council of Deans.

Recommendation #5. The Berkeley campus needs to reorganize, rationalize and enable technology (and other) investments in classrooms and instructional-technology support systems.

The current structure of governance and funding greatly complicates the task of designing a strategy for developing and funding a comprehensive strategy for enabling classrooms to utilize instructional technology, assigning the most enabled classrooms, and selecting and developing campus-wide educational platforms. Five different administrators currently bear some part of the responsibility for achieving this task (and indeed for achieving any task related to planning and sustaining investments in classrooms on campus).

Option 5A. Create a Governing Board on Classroom Investment to coordinate planning, funding, and implementation of investments in classrooms on campus, including IT investments. The Board should include the CIO, the Vice Provost for Undergraduate Education and Instructional Technology, the Vice Provost for Academic Planning and Facilities, the Vice Chancellor for Facilities Services, and the Vice Chancellor for Student Affairs . The Committee recommends that the board be chaired by an eminent member of the Berkeley faculty, to be appointed by the EVC/P.

and/or

Option 5B. A consolidated budget for classrooms should be created drawing on those parts of the budgets of the offices of the five administrators who currently bear some responsibility for classrooms.

and/or

Option 5C. The role of the Vice Provost for Undergraduate Education and Instructional Technology needs to be clarified. Currently the combination of the instructional technology role with the undergraduate education role creates confusion about whether the office is also responsible for instructional computing directed toward graduate students and students in the professional schools. If all of the planning for instructional technology is to be focused in the office of this Vice Provost then she and the CIO should co-develop all campuswide proposals related to instructional computing; this would enable the Vice Provost to partner fully with the CIO in formulating these proposals and in advocating on behalf of these proposals with her faculty colleagues. (In the deputy CIO model, the Vice Provost would have a deputy CIO of her own to serve as her technical expert on such proposals).

Recommendation #6. The Berkeley campus needs to reorganize, rationalize and enable the provisioning of the IT resources that faculty, students and staff to do their work (including responsibility for a minimum standard level of computing capability and desktop support), and also use these resources as a lever to encourage campus instructional and research programs in strategic directions.

Option 6A. Information Systems and Technology (IS&T) should be internally organized around user groups. (This is considered a “modern” approach in the IT community.) We propose that the user groups be (a) student services, (b)

business services, (c) research, (d) teaching and learning, and (e) infrastructure (access, data center, security, etc.). This will result and organization that is more outward looking, focusing primarily on the wants and needs of distinct user groups and providing information, training, and capabilities better tailored to the needs of those groups. Then whenever a cross-cutting initiative occurs that is not infrastructure, it should be a collaboration of these organizations.

and/or

Option 6B. Regarding the academic side, it is natural and maybe even necessary to have a local IT support organization responsible for and answerable to each department.⁷ The role of such an organization is providing helpdesk functions and helping users with localized issues (such as procuring, installing, and supporting discipline-specific applications. In many cases, this organization may be shared among departments, e.g. an L&S organization that serves a number of humanities departments, and another that serves a number of social science departments. However, these organizations should NOT be as all-inclusive as is the case today. They should focus not on the “core”, but only on those aspects that make desktop computers and network access operational and easy for the user. There should be a reporting structure back to IS&T. Then IS&T (which, as noted earlier, should probably be renamed) could focus on higher-level “rational commonalities” and also on the more sophisticated aspects of user support. Regarding the latter, there should be an escalation process in place so that the user support personnel in the units can focus on the human

⁷ A tension that underlay much of the committee deliberation is between commonality and diversity, especially as relates to the needs of individual academic departments. Compared to other universities represented among our membership, Berkeley errors on the side of diversity, with much responsibility for IT dispersed among largely independent service organizations. We strongly endorse the notion that many IT-related functions are best performed by organizations that are locally owned and controlled, but at the same time we believe that Berkeley currently goes too far in this direction, resulting sometimes in both dysfunction (such as a lack of interoperability, a fragmented environment as viewed by students crossing disciplinary boundaries, and constrained staff career opportunity) and lost opportunity (such as efficiencies through resource sharing or the ability to expand innovations from one area to others).

aspect and the most common problems, and more specialized or sophisticated needs are escalated to an experienced team at the campus level. This approach works relatively well in the networking area today. There is an analogy to primary, secondary and tertiary medical care.

and/or

Option 6C. While desktop support operations should continue to report to local units in academic departments and research centers, desktop support in units responsible for providing administrative services should be united under a single structure reporting either to the Deputy CIO for Administration, or into IS&T.

and

Option 6D. Academic units shall be expected, however, to provide at least a common basic or “vanilla” standard of user support for faculty, other instructors, students and staff. The CIO shall work with COMP to define that minimum standard. Deans should be expected to provide this standard, either through a local IT support organization or by retaining on-call IT support services from another unit. In order to encourage faculty, student and staff utilization of these services, they should not be recharged to the user.

and/or

Option 6E: Complex computing environments intermix and often cross organizational boundaries two or three times in providing a service. IS&T should focus not on direct end-user support, but rather on providing backup to local support organizations in more sophisticated or unusual issues, freeing the local organizations to focus on user-context-specific issues and more routine requests. All functional organizations and distributed technical teams should use some type

of case tracking system (currently some units have sophisticated web-based case or job tracking systems; most do not). Alternatively, all functional IT service units should adopt a web-based case or job tracking system, with minimum functionality defined centrally.

Recommendation #7. The Berkeley campus needs to reorganize and rationalize its approach to hiring and training professional IT staff, to encourage the development of a campus-wide community of IT professionals and to identify and disseminate best practices.

The Committee feels that this set of recommendations is necessary in order to address a serious problem with IT governance and structure on campus; namely, the fragmentation of IT organizations has the unintended side effect of limiting career development and opportunities for IT staff, and indirectly compromising the quality of personnel we are able to attract and retain. However, most if not all of these recommendations are judged to be recommendations to the new CIO, rather than to the EVC/P.

Option 7A. IS&T should arrange for or provide training and certification for all IT personnel campus-wide.

and/or

Option 7B. The CIO (and/or ITAC) should create means of sharing ideas and good practices among units by a newsletter and/or a web-site workspace. Such a workspace should have the feature of actively signaling participants so that they do look at it regularly. Enable facile communication among unit IT professionals and IS&T, and among unit professionals themselves (B-space, list serve, continual internal communication, etc.)

and/or

Option 7C. Information technology personnel could be afforded the opportunity for rotational assignments in other units, as a matter of career-development policy. This would provide many benefits, including the spread of best practices, greater respect for other organizations and their special challenges, and greater visibility for the most talented staff (with attendant career opportunities). However, the committee acknowledges that not all IT professionals have the same set of skills; IT expertise in certain specific areas takes a long time to develop and many units simply cannot do without their subject matter experts for any length of time. Nevertheless, managers should regard such rotational assignments (or some form of temporary job sharing) as one option for providing career development opportunities, when feasible.

and/or

Option 7D. ITAC should survey the units repeatedly to determine the effectiveness of governance on IT matters. IT managers and staff should review each other annually; for example, a visiting committee of IT managers might review and make recommendations to the IT unit in University Relations, etc., etc. This would serve to spread best practices and other information, including information about job openings in different IT units.

and/or

Option 7E. The CIO should consider incentive-based salaries for certain categories of information technology personnel. This might be coupled with opportunities for rotation between IS&T and units and vice versa, i. e., provide an incentive for rotation. Such an initiative would likely require close coordination with the UC Office of the President and the campus Office of Human Resources.

and/or

Option 7F. The CIO should consider zero-based funding for classes of information technology activity, with recognition that may result in turnover of personnel whose skill sets are not current. The CIO already has the authority to eliminate career positions through a reorganization, but a change of this magnitude would benefit in any case from close coordination with the Office of Human Resources.

and/or

Option 7G. The CIO should consider additional opportunities to contract for, or purchase, services rather than providing them in house.

and/or

Option 7H. For the convenience of unit administrators, faculty and staff, the CIO should consider providing or contracting for basic-level web-site design services. (Consider also enlisting the services of SIMS and EECS students to conduct surveys and interviews to identify requirements and design patterns for campus web sites and web applications, and marketing students at the Haas School to design a campaign to advertise the existence of such services to faculty, staff and students.)

and/or

Option 7I. The CIO (and/or ITAC) should reinforce its existing mechanisms for enabling IT personnel anywhere on campus to apply for openings in other IS&T or IT units. Currently many IT staff do not feel encouraged to pursue career development in this manner.

VI. Conclusion

The members of the Committee to Review IT Governance, Funding and Structure at UC Berkeley would like to emphasize that the recommendations contained in this report are directly tied to the success of the campus IT Strategic Plan. The ambitions described in the Strategic Plan with respect to the deployment of information technology to sustain the pre-eminence of UC Berkeley in research, teaching and learning, the student experience and other areas cannot be achieved unless the Berkeley campus revamps its approach to IT governance, funding and structure along the lines of the options detailed in this report. We leave the details of implementation up to the academic and administrative leadership of the campus, but we urge them to travel in the direction toward which this report is pointing.

Appendix A.

UC Berkeley Campus-wide Information Technology (IT) Strategic Planning
Timeline and Outcomes, 2004-05

Phase 1 Spring 2004	Phase 2 Summer/Fall 2004	Phase 3 Spring/Summer/Fall 2005	Phase 4 Fall 2005 & beyond
<p>UC Berkeley IT Guiding Principles developed and adopted:</p> <ul style="list-style-type: none"> ▪ Support for teaching and research ▪ Integration and inclusion ▪ Security and reliability ▪ Ubiquity ▪ Ease of use ▪ Alignment ▪ Information technology excellence <p>Current and emerging IT challenges and opportunities identified and synthesized into six Critical IT Issues for UC Berkeley to address.</p> <p>Academic department chairs surveyed by the Academic Senate Committee on Computing and Communications</p>	<p>Critical IT Issue #1: Teaching and Learning Teaching and learning trends identified and emerging issues at the intersection of teaching, learning, and technology drafted by Vice Provost Christina Maslach and others:</p> <ul style="list-style-type: none"> ▪ Support of research-based learning ▪ Support of active/interactive learning environments ▪ Information access and usability ▪ Copyright and intellectual property management ▪ A campus organizational structure for effective teaching and learning <p>Critical IT Issue #3: Research Research trends with implications for IT identified and research challenges requiring IT support identified and prioritized by COMP, Vice Chancellor Beth Burnside, and others:</p> <ul style="list-style-type: none"> ▪ Basic IT resources ▪ Technical support ▪ Advanced collaborative and multi-site research ▪ Data stewardship and digital asset management ▪ High-performance computing, simulation, and visualization environments <p>Critical IT Issue #4: Security, Reliability, and Access Information Technology Architecture Committee (ITAC) identified priority issues:</p> <ul style="list-style-type: none"> ▪ Security: Large number of unmanaged or mismanaged computers on our network. Lack of adequate resources to bring campus 	<p>Critical IT Issue #2: Student Experience from Prospects through Alumni (added 6/05) Administrative and Student Systems Computing Subcommittee identified priority issues:</p> <ul style="list-style-type: none"> ▪ Service demands and expectations of students are outpacing the current service delivery models. ▪ The importance of revenue generated from students, parents, and alumni has changed considerably. ▪ Students are best served by staff and faculty who have access to student information that is seamlessly integrated and used throughout the campus. ▪ Students are best served when the University can officially account for all students with the State, and demonstrate its compliance with the growing range of regulations and policy changes in many areas. <p>Critical IT Issue #5: IT Governance, Funding, and Structure Campus-wide IT self-study coordinated by Jay Stowsky. An external/internal IT Review Committee chaired by Provost Emeritus Jud King reviewed findings and will develop governance recommendations.</p> <ul style="list-style-type: none"> ▪ The IT investment process is disconnected from the campus funding and budgeting process. ▪ A "silo-specific" and incremental budgeting approach is applied to central administrative systems. ▪ The AVC-IT/CIO does not manage (or necessarily know about) two-thirds or more of the IT activity on campus. 	<p>Develop forward looking vision for IT at UC Berkeley</p> <p>Critical Issue # IT Expertise & Coordination to be explored.</p> <p><i>Note:</i> The six Critical IT Issues are not in priority order. The sequence was selected so that IT needs for supporting UC Berkeley's teaching/learning and research mission could be identified first, and</p>

<p>(COMP) to ascertain the status of faculty computing.</p>	<p>systems into compliance with minimum standard. Need for IT security related education and cultural change.</p> <ul style="list-style-type: none"> ▪ Reliability: Need reliable centralized backup service, funding, physical network infrastructure, computing security, and physical environment for information and services. ▪ Access: Ubiquitous access to appropriate IT infrastructure and services. Missing or inadequate middleware components impede access. Physical infrastructure. 	<ul style="list-style-type: none"> ▪ Central administrative roles are unclear with respect to instructional computing, research computing, and campus IT services. ▪ There is no mechanism to encourage IT managers to migrate toward "best practice" for either customer application development or workstation and desktop support. 	<p><i>then used to inform the governance structure discussions and recommendations.</i></p>
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UC Berkeley Campus-wide IT Strategic Planning
Critical IT Issue #5: IT Governance, Funding, and Structure

Effective information technology governance, funding, and structure were identified during the spring of 2004 as one of the six critical IT issues that UC Berkeley must address in order to survive and thrive during the next five years. The overall goal of this review is to determine how well UC Berkeley is being served by its current approach to IT governance, funding allocation, and organizational structure, and to recommend how it can be improved so that it is more effective and efficient.

IT Governance, Funding, and Structure Self-Study Charge

The charge of the IT Self-Study is to describe how Information Technology at UC Berkeley is governed, funded, and structured. Beginning in March 2005, Project Manager Jay Stowsky will lead a self-study of UC Berkeley's IT governance, funding, and structure guided by EVCP Paul Gray, the IT Planning-to-Plan team⁸, and the Review Committee.

1. Map UC Berkeley's current state

Describe how IT at UC Berkeley is governed, funded, and structured by examining questions such as:

- Governance: How are IT decisions made and priorities set? By whom?
- Funding: How is funding allocated for IT spending, including technology acquisition, staffing, and services?
- Structure: How are IT functions/services and staff currently organized on campus?

2. Identify possible models

Identify models for IT governance, funding, and structure that support superior performance in comparable higher education, non-profit, and corporate institutions. Also identify any models that have not been successful and why.

IT Governance, Funding, and Structure Review Committee Charge

The charge of the IT Review Committee is to develop recommendations for Information Technology governance, funding, and structure that will advance UC Berkeley's IT Guiding Principles, and effectively and optimally serve the IT

⁸ Teresa Costantinidis, Chief Operating Officer and Senior Assistant Dean, Haas School of Business; Jack McCredie, Associate Vice Chancellor, Information Systems and Technology/IST, and Chief Information Officer; Tessa Michaels, Chief Technology Office/Resource Development, Business and Administrative Services; Shel Waggener, Director, Central Computing Services-IST; Katherine Mitchell, Organizational Development Consultant, Center for Organizational Effectiveness/CORÉ, IT Strategic Planning Process Consultant.

needs of users for teaching and learning, research and discovery, and student services and administration. The Review Committee convened by Chair C. Judson King will:

- Examine the findings from the Self-Study.
- Explore how these current states help and/or hinder UC Berkeley.
- Taking into account UC Berkeley's unique environment and the campus' emerging IT priorities, recommend alternatives for IT governance, funding allocation, and organizational structure that effectively and optimally support UC Berkeley's mission, IT guiding principles, and user needs.

Initial Questions for the Self-Study of IT Governance, Funding, and Structure⁹

Part 1: Map UC Berkeley's current state

Governance - *How are IT decisions made and priorities set?*

- A. What process is used to determine UC Berkeley's IT priorities? Who is involved?
- B. How are UC Berkeley's strategic IT decisions made? By whom? By what processes? Tactical decisions? Technology decisions?
- C. How are UC Berkeley's IT priorities and decisions aligned with campus strategies? "Local" strategies?
- D. Who creates IT policy? Who has final authority? Who enforces it? How?

Funding - *What is spent on IT technology, staffing, and services?*

- E. How much money is spent on IT technology, staffing, and services on the Berkeley campus?¹⁰ Where is it spent? For what?
- F. What are the funding sources?
- G. What funding sources pay for which technology, staffing, and services?
- H. What incentives and disincentives result from the current approach to funding allocation and budgeting?

Structure - *How are IT functions/services and staff organized on campus?*

- I. How many UC Berkeley employees are involved in IT? How are they classified? Where do they work?¹¹
- J. What types of IT staffing models exist on campus? What level of staffing resources exist in which settings?
- K. What types of IT services does IST offer? What types of IT services are offered by individual divisions/units? What is potentially duplicated? What is not? Why?

⁹ What is in and out of scope related to IT at UC Berkeley must be defined. See <http://technology.berkeley.edu> background document about in/out of scope for planning.

¹⁰ Need to define the types - "buckets" - of services to be examined.

¹¹ Include student employees

Demand

- L. Which campus divisions/units require only common/standard IT services?
- M. Which campus divisions/units require unique IT technology, staffing, and/or services? What are they?

Services

- N. What types of IT hardware are used at UC Berkeley? For what purpose(s) are they used? Which unit(s) purchases the hardware? Who pays for and provides maintenance?
- O. Which software applications are used at UC Berkeley? For what purposes?
- P. How many different versions of each application exist? Who supports them?
- Q. How many and what percentage of classrooms at UC Berkeley are fully equipped for instructional computing? How many are partially equipped?
- R. What is the distribution of 'wired' classrooms among general assignment classrooms and among divisions? Who paid for them? What funding sources were used? What criteria are used to assign them?¹²
- S. How is software licensing managed?

User Satisfaction

- T. What is the user satisfaction level with selected services (to be determined)?

¹² If classrooms are examined, do we also need to examine the other location where teaching/learning and research/discovery take place such as labs, faculty offices, etc.?