## Proposed Information Technology Strategic Plan

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Proposed Information Technology Strategic Plan

I. INTRODUCTION

A. Purpose of this Document

The Information Technology Strategic Plan (ITSP) is an institution-wide effort to develop a vision and set of objectives for information technology (IT) at UCLA and identify the mechanisms and processes required to achieve that vision. The IT Strategic Plan is intended to align UCLA’s IT services and support with the University’s instruction, research and public service mission and administrative processes. It should promote the cost-effective deployment and management of appropriate IT in support of faculty, students and staff.

Successful planning, implementation and innovation of IT has become a competitive necessity for higher education. Faculty, students and staff are expecting and demanding a level of unprecedented access to IT capabilities and support. To remain competitive and maintain academic quality, UCLA must make the necessary investments in IT and ensure effective management and delivery of IT services and resources.

This report does not recommend IT initiatives and objectives for the individual schools, The College or programs. Rather, it analyzes the effectiveness of institutional IT resources and recommends initiatives that will improve their relevancy and value to the community of scholars, teachers and students at UCLA. There are necessarily many ongoing local academic IT planning projects that are not within the scope of this analysis. In addition, the clinical and patient records systems in the Hospital and Clinical Practices of UCLA were not within scope. A separate Task Force in the Medical Center is examining these hospital-related issues.

B. Background and History of the Project

In June of 1995, the Instruction and Research Computing Committee (IRCC), the standing joint committee of the Academic Senate and administration responsible for coordinating computing efforts across UCLA, was charged by the Executive Vice Chancellor with providing to UCLA’s administration “…an analysis of our current environment and alternative structures with recommendations that can guide us in improving the computing infrastructure.” The IRCC worked during the summer, fall and early winter to produce a report entitled “Recommended Reorganization of Campus Computing,” which won the Chancellor’s acceptance. A strategic plan was then called for that would act as a guide for implementing that report’s basic recommendations.
In response to that call and working under the guidance of the IRCC, staff developed the “UCLA IT Strategic Planning Process.” This process was a logical extension of the work of the IRCC, which set the principles and basic recommendations that were incorporated into the plan’s basic elements:

- **IT Strategic Plan’s Mission Statement** - Ensure that pursuit of the University’s mission is supported by state-of-the-art IT:
  - A n infrastructure capable of accommodating all traffic and connectivity demands, including external network access;
  - A computing environment that encourages faculty, student and staff innovation in education, research and administration;
  - Faculty, student and staff access to the best possible technological resources and support; and
  - A shared governance structure to oversee the management, evaluation and continuing renewal of the IT support efforts.

- **Process Objectives:**
  - Provide a highly visible and open process;
  - Ensure broad-based involvement and concurrence;
  - Encourage collaborative and consensus centered decision making;
  - Recognize past analytic effort; and
  - Incorporate input from industry and higher education leaders.

- **Outcome Objectives:**
  - A vision for the role of IT in UCLA’s future;
  - A process for addressing both immediate and evolving IT needs;
  - Role and responsibility delineation for the management of IT functions (i.e., Departmental/Divisional/School or College/Central Service);
  - Organizational alignments and functional assignments for central IT support;
  - A base for optimizing development efforts and resource allocations; and
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- Provisions for ensuring ongoing technological renewal.

After the initial planning process structure was accepted by the IRCC, it underwent subsequent review by those who were suggested members of the proposed IT Steering Committee. After that committee's subsequent modifications, the planning process was shared and modified based on consultation with the following:

- College of Letters and Sciences (i.e., Provost, Deans, Faculty IT Advisors and Departmental Computing Managers);
- Professional School Deans and their Computing Advisors;
- Computing Support Coordinators representing schools and departments;
- Higher Education Advisors from exemplar universities; and
- IT Industry Leaders.

The resultant planning approach, "UCLA IT Strategic Planning Process," was again submitted to the IRCC and the IT Strategic Planning Committee for review and acceptance prior to actual execution.

The planning process that was approved by the Steering Committee included a heavy emphasis on interviews and focus groups with UCLA personnel. Nominations for individuals who could contribute to the study were solicited from the IRCC, the IT Strategic Planning Steering Committee and Deans. The original target of 100 interviewees was expanded to 160 to accommodate all those who were nominated. The interview input was incorporated into a report created by the IT Strategic Planning Team entitled "Information Technology Interview Themes at UCLA." Coopers and Lybrand prepared an additional report entitled "Key Issues in Information Technology in Higher Education." Both documents were distributed to all interviewees in preparation for their participation in the ensuing focus groups.

Both documents, along with an overview of the planning process, were placed on a well publicized and highly utilized web site (www.it.ucla.edu) for the purpose of keeping the UCLA community informed about this critical project and as a community bulletin board for posting input. That combined input, as well as that from the Higher Education and IT Industry Advisors is incorporated into this draft report.
The following is a list of people who were highly involved in the project.

**IT Steering Committee**
- A.A. Affifi
- Peter Blackman
- Brian Copenhaver
- Winston Doby
- Aimee Dorr
- Charles Kennel (Chair)
- Theodore Mitchell
- Claudia Mitchell-Kernan
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- Gloria Werner

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- Coopers & Lybrand
- Consulting Team

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- Patricia Baxter
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- Fariba Bolandhemat
- Michael Bourdaa
- Al Braunmuller
- Jay Gershen
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- Scott Harvey
- Kate Hayles
- Paul Hoffman
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- William Jepson
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- Alexis Kirby
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- Daniel Klonsky
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- Lydia Kowalski
- Bonnie Mika
- Wayne Miller
- Judy Mitoma
- Sam Morabito
- Neda Navab
- Doug Nelson
- Daniel Neuman
- Pete Nielson
- Kathleen O’Kane
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- Michael Olsson
- Paul Ong
- Bhavna Patel
- Roberto Pececi
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- Edwin Pierce
- Ned Pinger
- Michael Stenstrom
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- Daniel Tran
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- Jim Turner
- David Unruh
- Daniel Valentino
- Michael Van Normen
- Barbara Varat
- Mary Jane Varley
- Michael Vasser
- Anthony Vidler
- Lou Villadsen
- Donna Vredevoe
- Howard Wang
- Scott Waugh
I. INTRODUCTION

Interview and Focus Group Participants

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John Mamer
Pamela Martin
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Roberto Mechoso
Craig Merlic
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David Rombold
Leonard Rome
Robert Rosen
Christopher Russell
Ruth Sabean
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Nancy Schecter
Michael Schilling
Albert Setton
Judith Smith
Laura Soby
Eric Splaver
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Dorothy Webster
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Luann Wilkerson
David Wilson
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Mary Woo
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Arthur Woodward
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James Zack

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C. Explanation of Sections

This document is separated into several sections that address many of the same concepts in differing levels of detail.

- The Executive Summary is the highest level of detail, providing a brief synopsis of the key points in the entire document.
- The General IT Management section describes issues and recommendations with respect to organization, governance and funding. The content in this section is drawn from the detailed analysis contained in the specific IT focus areas. The purpose of the General IT Management section is to present the organizational and management concepts in an integrated and single section, to help the reader understand how the organizational pieces fit together.
- The sections on Instructional Computing, Research Computing, Administrative Computing and Infrastructure and Access describe in detail the specific definitions, issues and recommendations within each IT focus area.
A. Issues and Findings

UCLA is a world class leader in higher education as well as in the application of IT towards its tripartite mission of teaching, research and public service. There are many exciting and worthwhile IT initiatives underway throughout the institution. However, UCLA can do much more to create an environment that encourages and supports the productive and innovative use of IT to enhance teaching, learning, research and administration.

A.1. Many faculty, students and staff want IT support and a technical infrastructure that enables more reliable, effective and innovative use of IT in a variety of academic applications.

- As a paramount concern, the campus community identified the need to provide a reliable, sufficiently powerful network infrastructure that allows for productive collaborations among researchers and that fosters use of electronic communications among faculty, students and staff.
- Some faculty feel there is insufficient support for the use of IT in their research activities. Faculty are concerned about limited access to IT tools (e.g., specialized research computing resources), insufficient assistance in formulating the IT component of proposals and a lack of clarity or consistency regarding support for research technologies that are not funded from extramural sources.
- Many faculty feel that UCLA is not creating an environment that sufficiently enables and encourages effective IT use in the classroom and curricula. Demand for instructional technology support far exceeds supply in many departments. Little funding exists for instructional innovation in some units. Many faculty feel that a more reliable and available infrastructure for instructional IT would enhance the learning experience for all students. This would include IT support in the classroom, academic support services, faculty training, etc.
• There are very few mechanisms that encourage and facilitate sharing of innovative IT usage across the institution. Faculty believe that their colleagues at UCLA are developing interesting and relevant applications of IT in teaching and research that are applicable across disciplines, yet the benefits and knowledge reaped from local developments are rarely shared or communicated across disciplinary boundaries.

A.2. UCLA lacks an institution-wide governance and decision-making structure to ensure that IT resources and projects are aligned with important institutional objectives and subject to evaluation. The result has been a collection of central IT resources that are structured and guided in an ad hoc manner, meeting the needs of a subset of the UCLA community.

A.3. The current organizational structure of central IT resources and the existing division of responsibilities between central and local resources have inhibited the full value and impact of IT across the institution.

• There is no senior executive leader charged with the responsibility of assisting the Chancellor in developing a compelling vision and strategy for IT and advising UCLA’s senior management and the UCLA community on key IT issues.

• Academic computing resources are fragmented across multiple central units, diminishing opportunities for synergy, economies of scale and common approaches and initiatives to support teaching, learning and research uses of IT.

• The mission of central network and telecommunications resources is not sufficiently broad enough to ensure universal access to critical network services and to ensure interoperability of computing systems around the institution.

• The central administrative and academic computing groups lack clear missions, well defined customer sets and clear areas of accountability. This ambiguity generates morale problems and results in user dissatisfaction.
A.4. UCLA's approach to planning, funding and integrating IT initiatives has been ad hoc and fragmented. The result is an IT environment characterized by "islands" of computing capability, unnecessary complexity in technical infrastructures and diversity in technical architectures, all of which are not necessarily in the best interests of the institution.

- UCLA lacks a clear framework, process and criteria for making long term institutional decisions about IT opportunities.
- UCLA's network and systems infrastructure contains areas of high complexity due to local initiatives that have not been integrated into an institution-wide framework and set of standards that would facilitate interoperability and economies of scale in service and support.
- Many schools, The College and departments do not take a proactive approach to maintaining and renewing the value of their IT assets, particularly the desktop computing environments.

A.5. The ad hoc nature of IT funding at UCLA has led to disparities in the allocation of IT resources throughout the institution. This prevents the university from maximizing its limited resources to gain economies of scale, makes it difficult to capitalize on potential revenue generating opportunities, and has led to significant technological obsolescence in some units. It should be noted that there are tradeoffs in costs versus benefits of maintaining UCLA's decentralized decision-making structure. Many economies of scale attainable through centralized IT decision-making go unrealized to allow for the benefits of distributed experimentation and implementation of state-of-the-art IT that meets local needs.

A.6. UCLA's existing administrative and student systems make it difficult for academic and business administrators to access information required for effective decision-making. Most especially, the institution's current financial management systems do not provide the required functionality that UCLA will need in the future to effectively manage its resources, ensure managerial control and maintain compliance with external requirements.
It is critical for UCLA to address these organizational, management and technological challenges. Most of UCLA's peers and competitors are making significant investments and focusing on many of the areas outlined in this report. UCLA must make a set of critical institutional decisions and launch a set of projects and initiatives that will help ensure that UCLA is providing its faculty, students and staff with the technological resources and environment necessary for success in the 21st century.
B. Recommendations

To remain competitive, UCLA must ensure that faculty, students and staff are well served by knowledgeable and helpful IT support staff, useful tools, and a sufficient infrastructure. The potential impact and benefit of IT on teaching, learning, research and administration described in this report is profound. By undertaking this IT Strategic Plan, UCLA can begin to create an environment where faculty, students and staff have the opportunity to use and exploit technology to its fullest potential.

B.1. Many of the recommendations in this report describe projects, initiatives and changes that central institutional management should make to the structure of central IT support and services. The intention of these recommendations is to assist faculty, students and academic administrators in the development and application of IT. The ultimate objectives of the ideas outlined in this report are to:

- Provide a pervasive communications infrastructure that is as reliable as the phone and electrical services, available to all faculty, students and staff, and that allows for multiple levels of electronic communications depending on need (e.g., high bandwidth for specialized research purposes; robust email and WEB services; electronic learning environments for electronic, collaborative learning; reliable remote access to the network, etc.).
- Provide a set of institutional services, directed by faculty representative bodies, that directly improves the ability of faculty to secure IT support for a variety of research computing uses. These services may include technical advice on the IT component of grant proposals, institutional awards for “seed” projects and matching requirements, and access to specialized computational resources.
- Ensure that IT and multimedia-enabled classrooms and labs are widely available to faculty and that appropriate support is made available to assist faculty, students and staff in the use of these facilities.
- Achieve the goal of full ownership of a computer by every student so that widespread IT use becomes possible and faculty can feel confident that students will have the tools and access they need to utilize IT-enabled pedagogies and learning environments.
Proposed Information Technology Strategic Plan

II. EXECUTIVE SUMMARY

- Provide resources and support that enhance the capacity of academic departments’ computing support centers to meet the research, teaching and learning needs of their faculty, students and staff.

- Reinforce these locally based IT computing support centers with central services offering deep technical competencies and clear economies of scale (e.g., visualization and statistical computing expertise, site licenses, training programs, technical guidelines). These central services should be structured to assist local IT staffs in serving their faculty, students and staff as effectively as possible.

- Encourage and enable innovative and productive use of IT at the local level by providing training and services that help faculty exploit IT in their research and curricula and by establishing mechanisms and incentives for interdisciplinary cooperation and cross fertilization.

B.2. Create an effective governance structure for IT that builds on the recently formed Academic IT Board (AITB), consisting of informed faculty and academic administrators.

- Charge the AITB with recommending to the Chancellor key priorities and investments for IT and with ensuring that central IT units are evaluated against reasonable criteria and clear objectives.

- Establish administrative and communications technology advisory committees that will work closely with central IT units, providing useful guidance and advice on key IT administrative and infrastructure issues.

B.3. UCLA should make a set of organizational changes to the institutional management of IT (see Proposed Organization and Governance Structure chart, Two Tier Structure and detailed roles and responsibilities listed within the General IT Management section).

- Implement a two-tier service model and framework of IT support that establishes school, college and departmental IT resources as the primary source of support to faculty, students and staff, and central units as a secondary source of support. The role and mission of central IT units should be to provide a baseline IT infrastructure, implement programs that leverage institutional economies of scale and provide services (e.g., training, consulting) that enhance the effectiveness of local IT support staffs.
• Create and fill the position of Academic IT Officer, reporting directly to the Executive Vice Chancellor. This individual should be responsible for overseeing central academic computing resources, leading institutional planning efforts for IT, advising the Executive Vice Chancellor on key academic IT issues, and managing central academic computing units.

• Create and fill the function of Administrative IT Officer, reporting to the Administrative Vice Chancellor. This function should be responsible for overseeing central IT needs for administrative computing and IT infrastructure, ensuring common and consistent approaches to IT planning, articulating UCLA’s vision and strategy, coordinating central resources to meet local administrative and infrastructure computing needs, and providing strong advocacy for IT.

• Move toward a consolidated set of central instructional and research technology services. Begin by consolidating the existing Office of Academic Computing (OAC) unit with IT aspects of the Office of Instructional Development (OID), and restructuring them into an integrated academic computing service unit, called Instruction and Research Information Technology Services (IRITS). Evaluate additional synergies and potential consolidations with other academic computing support units (e.g., IT support within the Office of Residential Life).

• Refocus the mission and services of Administrative Information Systems (AIS) to provide a set of technology development and support services that are aligned with the strategies and needs of the major central administrative units and the business unit “owners” within the schools, college and departments at UCLA. Rename this organization Administrative Information Technology Services (AITS).

• Expand the role of Campus Telecommunications and Network Services (CTNS) to include responsibility for all common access, data, voice and image network services that span the institution. Rename this organization Communications Technology Services (CTS) to reflect its expanded role.

• Create an Information Technology Planning Group (ITPG). The ITPG should be responsible for executing an ongoing planning process, analyzing and proposing institution-wide IT strategies, coordinating and integrating institution-wide IT initiatives and developing and communicating IT standards and guidelines to the UCLA community. The Academic IT Officer should chair this planning group, and the Administrative IT Officer should serve as Vice-Chair.
B.4. UCLA should move forward on a set of technology improvement initiatives aimed at the information and communications infrastructure of the institution. In cooperation with the new governance structure, the IT Planning Group should work towards the following goals.

In the area of technical infrastructure:

- Continue to implement the UCLA Connected Project to ensure universal network access, broadening its charge to include development and communication of LAN/WAN standards and guidelines.
- Commit to providing a universal remote access capability through a common, configurable interface service. Evaluate technical, service and financial options for meeting institutional needs, including the existing Bruin OnLine service.
- Develop a target IT architecture and set of standards/guidelines for administrative systems, networks and desktop interoperability.

In instructional and research computing:

- Develop a set of specific proposals and projects to strengthen institutional support of academic computing, particularly in the areas of access to specialized research computing resources, faculty assistance and support and classroom IT readiness.
- Undertake a detailed analysis of strategies available to UCLA to provide universal ownership of computing resources for all students. On a school and college basis, assess personal ownership and student cluster computing lab options and integrate approaches to achieve economies of scale across the institution.
- Develop mechanisms and vehicles for sharing expertise and innovations in instructional, research and business computing across the institution.
In administrative computing:

- Undertake a comprehensive financial management improvement project that includes a structured analysis of the existing systems and processes, development of business improvement objectives, an analysis of costs and benefits of systems replacement versus other alternatives and an implementation plan for the selected option.

- Undertake a comprehensive project to improve management information and decision support that builds on the success of the Query Database (QDB) project. Evaluate management reporting requirements for academic and business administrators across the institution and evaluate alternative technology strategies for improving access and control of critical information.

- Develop and migrate toward a common technical architecture for administrative systems.

B.5. UCLA should establish new systematic IT funding processes, provide appropriate institutional resources to assist units in achieving baseline IT capabilities, revise its fee structure for supporting central IT services and evaluate opportunities for revenue-generation through IT-enabled content owned by UCLA.

In summary, UCLA, like other higher education institutions, is about to make critical decisions that involve the use of IT. These decisions will provide the foundation for enhancing existing programs and from which new academic programs and services will be launched. The resulting programs and services will determine the image that UCLA impresses on the academic community, future students, potential business partners and funding agencies. The most effective way to accomplish these ends is through an integrated, comprehensive IT strategy. The advantage of that strategy is that UCLA can proceed into the future knowing that it is managing its IT resources wisely and providing a critical technological foundation for continued academic excellence.
A. Overview
A.1. Definition

This section addresses the management and governance changes that must be undertaken at an institutional level to improve IT at UCLA. This section addresses the areas of organization, governance and funding to:

- Ensure leadership and direction;
- Enable sound IT decision-making;
- Ensure the appropriate level of planning;
- Provide direction for IT staff in central and local units; and
- Support IT with appropriate funding approaches.

A.2. Current Management Structure

The IT management environment at UCLA has the following characteristics:

- Certain central IT services report on an interim basis to the Associate Administrative Vice Chancellor (i.e., Office of Academic Computing - OAC, Administrative Information Systems - AIS, Campus Telecommunications and Network Services - CTNS), while other units report to the Library (i.e., Office of Instructional Development - OID) or the Student Affairs Office (e.g., Office of Residential Life - ORL).
- Planning, acquiring, using and managing school and college based IT assets and IT staff is within the province of departments, divisions, schools and The College. This is consistent with UCLA’s decentralized management structure.
- Recently, the Executive Vice Chancellor established an Academic Information Technology Board (AITB) to oversee academic computing. The AITB is expected to be the successor to the Instruction and Research Computing Committee (IRCC) that was established in 1993.
- The budget for IT is divided into central budgets that are allocated from the Chancellor’s budget to central IT groups and local discretionary IT budgets.
B. Key Issues and Recommendations - Organization of IT Resources

B.1. Issues - Organization of IT Resources

The current structure of IT support, that has central units serving institutional and infrastructure needs and local units directly meeting day-to-day user needs, is the most effective and culturally compatible way to structure IT in an organization as large and decentralized as UCLA. However, there are many significant opportunities to improve the value, productivity and effectiveness of institutional IT support.

B.1.A. UCLA lacks a senior representative with responsibility for IT who can help ensure that the institution has a coherent and effective IT strategy. The Chancellor and Executive Vice Chancellor do not have amongst them a peer who is responsible for key IT issues and who is responsible for advising the institutional leadership on how to manage and develop IT capabilities that provide academic, competitive and financial benefits to the University.

B.1.B. The central IT units (i.e., AIS, CTNS, OAC) lack missions that are broadly accepted by the UCLA community, defined customer sets and well-defined accountability measures. The effect of these ambiguities is internal conflict, a wide variety of opinions about the value and effectiveness of central IT units and an environment in which central service providers find it difficult to be successful.

B.1.B. The current division of responsibilities between central and local computing units is unclear and sub-optimizes the cost effectiveness and productivity of IT resources. Many faculty, students and staff are confused about who to turn to for support, and there is some duplication of effort among different units. The lack of integration and coordination between central and local IT groups creates isolated “islands” of instructional and research computing efforts across the institution, negating potential synergy and coordination of similar IT efforts.
B.1.C. The provision of IT support for academic computing (e.g., instructional support, research support, student access) is split and fragmented across many separate units reporting to different vice chancellors. This fragmentation makes it difficult to gain the benefits of fungible resources that can be reassigned depending on need (e.g., borrowing staff to support student training and setup during the early part of the quarter) and makes it difficult to achieve synergy among different aspects of academic computing (e.g., using research technologies within instructional pedagogies). In lieu of a consolidated academic computing organization, each unit must staff up to handle peak loads and requirements without the benefits of “cross-

B.1.D. There is no organized planning function that integrates and coordinates IT issues and projects. There is no set of strategies, operational plans and project definitions that form a coherent and cost-effective whole. The interrelationships among IT functions is becoming highly complex in university environments (e.g., the same infrastructure now supports both academic and administrative computing), and without a coordinating and integrating function that takes an institution-wide view, UCLA will continue to approach IT in a fragmented and ad hoc manner, sub-optimizing the value of IT to the academic institution. For example, administrative systems initiatives have evolved into a patchwork of widely divergent technical environments, making it difficult to reassign staff and gain economies of scale in system maintenance and operations activities.

B.1.E. Like most organizations today, UCLA has difficulty retaining certain types of IT personnel, particularly for administrative computing, due to competitiveness in salary and career opportunities in today’s economy. In addition, IT personnel often feel they are spread too thin and have too many responsibilities. Finally, there is duplication of skill in some areas (e.g., mainframe applications development) and lack of deep skill in others (e.g., client/server, web development).
B.2. **Recommendations - Organization of IT Resources**

**B.2.A. Establish IT representation at the executive level of UCLA.**

- Establish the function of Academic IT Officer with the following responsibilities:
  - Reports to the Executive Vice Chancellor;
  - Chairs the IT Planning Group to ensure integrated IT planning, policies, architectures and protocols;
  - Manages the Instruction and Research Information Technology Services (IRITS) group;
  - Represents research and instructional IT needs for faculty and students at UCLA (e.g., assisting researchers with large-scale consortium projects); and
  - Coordinates with academic units, including the Library, to ensure that plans for IT systems (e.g., digitization, student labs, IT instruction) are synchronized with overall academic IT direction.

- Establish the function of Administrative IT Officer.
  - Reports to the Administrative Vice Chancellor;
  - Serves as Vice-Chair of the IT Planning Group;
  - Oversees Administrative IT Services (AITS) and Communication Technology Services (CTS); and
  - Represents IT needs that support UCLA’s constituents for administrative computing and IT infrastructure.

- Both the Academic IT Officer and the Administrative IT Officer should provide leadership to UCLA’s executives in the following ways:
  - Work closely to ensure common and consistent approaches to IT planning, design and support;
Proposed Information Technology Strategic Plan

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- Articulate and communicate UCLA’s IT vision and strategy;
- Work with Deans and Departmental Computing Managers to coordinate central and local IT needs;
- Advise the AITB on key strategies and issues related to UCLA’s deployment of IT;
- Help develop the rationale for major IT investments;
- Maintain knowledge of state-of-the-art IT;
- Maintain knowledge of IT projects and direction external to UCLA;
- Facilitate cross-disciplinary knowledge exchange; and
- Provide strong advocacy for IT.

In developing this recommendation, we were faced with the question of whether UCLA should have a single IT officer responsible for academic, administrative and infrastructure technologies. This is a difficult issue to resolve, one for which reasonable arguments can be made for both a single and a divided structure.

A single Chief Information Officer (CIO) would provide several potential advantages to UCLA

- Many focus group participants and interviewees expressed that IT at UCLA should be elevated to the executive level in order to capitalize on the potential opportunities new information technology brings in both driving and enabling change, and that a single CIO would provide the necessary representation.
- A CIO would provide a single point of accountability for central IT resources, creating a clear organization, funding and governance structure for UCLA’s constituents.
- There would be potentially easier integration and coordination of initiatives that span IT functions, where issues for academic, administrative and infrastructure computing programs would be resolved with respect to one another.
• The CIO position would be very attractive to potential nominees because of its wide span of control, possibly attracting a wider and deeper group of candidates and improving UCLA’s ability to recruit for the position.
There are also several potential disadvantages to a CIO leadership model at UCLA

- There exists significant risk that the UCLA community will not provide a receptive environment for a position that will be construed by some to be a czar-like role, that may engage in “empire building” and that may elevate the importance of central authority at the expense of local autonomy.

- Some large research universities have found it very difficult to identify and recruit an individual with sufficient expertise and interest in both academic and administrative computing, both of which need substantial and immediate attention at UCLA. On the academic side, the Office of Academic Computing has been without permanent leadership for a number of years. To retain staff and deliver the types of services desired by the academic community will require significant management attention and restructuring of the Office. On the administrative side, UCLA is required by the Board of Regents and the Office of the President to put in place a stronger internal controls structure and corresponding set of new financial management and control systems. To be successful in these areas, UCLA needs focused senior management attention that ensures institutional commitment to both objectives. A single CIO may dilute the institution’s ability to make substantial progress in both academic and administrative domains.

- Many universities and corporations are experiencing a high degree of turnover with their CIO position. UCLA may increase the probability of successful IT management by employing a structure that separates responsibility for academic technology from administrative systems. That structure will allow recruiting senior-level talent in each area and increase the probabilities for success in each domain of IT.

In summary, the structure of organizing academic IT separately from administrative and communications IT may appear to contain unnecessary fragmentation in central IT resources. While some believe that UCLA needs a CIO position to oversee all central IT resources, we conclude that the potential to implement a successful single IT leadership model is low in the current UCLA environment, and that a divided but coordinated structure would be more effective in the short and intermediate term. There are several examples of universities utilizing a dual structure of academic and administrative IT leadership, including Boston University, Columbia University and the University of Southern California.
The proposed IT organization and governance chart below represents a shared governance and coordination IT model that best represents the current culture at UCLA.

Proposed IT Organization and Governance Structure

(1) Chair: Academic IT Officer, Vice-chair: Administrative IT Officer
(2) Sub-committee of the AITB
## Roles and Responsibilities Matrix

<table>
<thead>
<tr>
<th>Title</th>
<th>Executive Vice Chancellor</th>
<th>Administrative Vice Chancellor</th>
<th>Academic Information Technology Board (AITB)</th>
<th>Academic IT Officer</th>
<th>Administrative IT Officer</th>
<th>Information Technology Planning Group (ITPG)</th>
<th>Advisory Committees</th>
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</thead>
<tbody>
<tr>
<td>Governance</td>
<td>• Maintain executive responsibility for academic computing</td>
<td>• Maintain executive responsibility for AITS and CTS</td>
<td>• Primary governance body for academic IT</td>
<td>• Determine priorities for academic IT strategy</td>
<td>• Review performance of central academic IT units</td>
<td>• Provide executive level oversight of major institutional system initiatives</td>
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## III. GENERAL IT MANAGEMENT

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</thead>
<tbody>
<tr>
<td>Organization</td>
<td>• Establish and fill executive IT positions</td>
<td>• Represent business process owner and central administration staff</td>
<td>• Represent faculty and academic administrators</td>
<td>• Direct the activities of IRITS</td>
<td>• Direct the activities of AITS and CTS</td>
<td>• Provide coordinating functions between Academic and Administrative IT</td>
<td>• Serve as Chair of the ITPG</td>
</tr>
<tr>
<td></td>
<td>• Organize and charge the AITB</td>
<td>• Establish and fill executive IT Positions</td>
<td></td>
<td>• Serve as Chair of the ITPG</td>
<td>• Serve as Vice-Chair of the ITPG</td>
<td></td>
<td>• Represent constituent needs for administrative computing and IT infrastructure</td>
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<tr>
<td></td>
<td></td>
<td>• Organize and charge IT Advisory Committees</td>
<td></td>
<td>• Represent research and instructional IT needs for faculty and students</td>
<td>• Represent constituent needs for administrative computing and IT infrastructure</td>
<td></td>
<td>• Organize and staff IT Planning Group</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Define and plan implementation of IRITS service objectives</td>
<td>• Define and plan implementation of CTS product and service objectives</td>
<td></td>
<td>• Restructure OAC into IRITS</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Define and plan implementation of AITS service objectives</td>
<td>• Define and plan implementation of AITS service objectives</td>
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<td>• Organize and staff IT Planning Group</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Provide coordinating functions between Academic and Administrative IT</td>
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<tbody>
<tr>
<td>Funding</td>
<td></td>
<td>• Oversee development and deployment of administrative IT resources</td>
<td>• Oversee development and deployment of academic IT resources</td>
<td></td>
<td></td>
<td>• Help develop rationale for major IT investments</td>
<td>• Serve as sounding board for institutional IT resource allocation</td>
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<tr>
<td></td>
<td></td>
<td>• Make admin. IT budget recommendations</td>
<td>• Make academic IT budget recommendations</td>
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<td></td>
<td>• Develop and maintain a standard technology operating and financial model to guide units and schools</td>
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<tr>
<td>Title</td>
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<tr>
<td>Institutional Planning/Coordination</td>
<td></td>
<td></td>
<td>• Advise the EVC on administrative IT initiatives</td>
<td>• Advise EVC on academic IT initiatives</td>
<td>• Work closely with the Academic IT Officer to ensure common and consistent approaches to IT planning, design and support</td>
<td>• Work closely with the Academic IT Officer to ensure common and consistent approaches to IT planning, design and support</td>
<td>• Consult on long-range vision for computing in the specific central unit (i.e., AITS, CTS, ITPG and IRITS)</td>
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<td></td>
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<td></td>
<td>• Provide input to AITB on impact of academic decisions on central administrative IT</td>
<td>• Act as a review body for administrative IT budget and project plans (via ITPG)</td>
<td>• Coordinate central and local IT needs with Deans and Departmental Computing Managers</td>
<td>• Coordinate central and local IT needs with Deans, Central Administrators, Departmental Computing Managers and their respective staffs</td>
<td>• Review and comment on annual central unit objectives</td>
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<td></td>
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<td>• Develop plan for improved financial systems and processes</td>
<td>• Inform UCLA executives on academic computing issues</td>
<td>• Coordinate with the Library to ensure that plans for Library systems are synchronized with overall academic IT direction</td>
<td>• Coordinate with the Library to ensure that plans for Library systems are synchronized with overall academic IT direction</td>
<td>• Ensure existence of a 3-5 year computing plan for central units</td>
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<td>• Develop a plan for improved management reporting</td>
<td>• Provide faculty input and perspective to Administrative Vice Chancellor for administrative IT decisions</td>
<td>• Assist IT units with implementing IT management practices</td>
<td>• Facilitate cross-disciplinary knowledge exchange</td>
<td>• Recommend priorities among competing projects</td>
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<td>• Coordinate with the Library to ensure that plans for Library systems are synchronized with overall academic IT direction</td>
<td>• Provide cross-functional issues management</td>
<td>• Serve as communication conduit between the central unit and schools, The College and departments</td>
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<tbody>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td>• Endorse and communicate common IT standards and guidelines using the ITPG</td>
<td>• Articulate and communicate UCLA's IT vision and strategy</td>
<td>• Develop plan for full student access to computing resources</td>
<td>• Maintain a standard technology operating model in conjunction with other central IT units</td>
<td>• Approve institutional standard technology architectures</td>
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<td></td>
<td>• Develop a plan for common remote access capability using BOL</td>
<td>• Approve guidelines and policies for interoperability of local desktops and networks</td>
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<td></td>
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<td></td>
<td></td>
<td>• Refine and move forward on the UCLA Connected Project</td>
<td>• Advise AITB on key strategies related to deployment of IT</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Develop IT architecture and standards</td>
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</table>
B.2.B. Undertake a program of organizational refocusing to improve central IT management at UCLA. This program should preserve the existing strengths of IT units at UCLA and improve upon them by more clearly aligning services and capabilities with user needs ensuring that each individual and group work together effectively.

- Consolidate central instruction and research computing into one group, Instruction and Research Information Technology Services (IRITS). This unit should consist of the existing OAC organization and OID computing functions focused around information technology (e.g., managing classroom IT, assistance with virtual office hours, developing media presentations) to effectively integrate responses to the IT needs of faculty, students and staff. IRITS should be the major central IT unit responsible for instructional and research computing. The recommended responsibilities of IRITS are provided in detail within the respective sections of Instructional Computing and Research Computing. Non-IT related services provided by OID (e.g., community-based learning, teaching consultation, teaching assistant training) should not be within the scope of IRITS, and IRITS should work in support of OID’s academic objectives.

- Restructure AIS into a new unit called Administrative IT Services (AITS) that provides technological resources and support services to business process owners (e.g., central administrative unit directors) to ensure effective institution-wide administrative systems for all users.
  - This unit should design and deliver administrative system functionality only as requested and guided by the business process owners.
  - Business process owners should be responsible for working with AITS to understand user requirements for administrative systems and data and for technological support of major systems.
  - AITS should be responsible for the technical design of the institution-wide administrative systems to ensure technical feasibility and sound technical operations.
  - It is critical that the central administrative units and AITS work together to avoid duplication of staff and resources and to ensure integration, interoperability and consistency of institution-wide systems.


- Enhance the role of CTNS to become Communication Technology Services (CTS), responsible for providing deep infrastructure services to the UCLA community, including institution-wide network installation and operation, network services such as email, internet access, Bruin OnLine, security and authentication and telephone systems support.

B.2.C. Create an Information Technology Planning Group (ITPG) to support the coordination and planning of administrative and academic IT at UCLA.

- ITPG should provide the budgeting, planning and integration processes required to manage the complexity of central IT services.
- ITPG should act as staff to the Chair of the AITB (see Recommendation C.2.A. within this section).
- The responsibilities of the ITPG should include:
  - Budgetary analysis of administrative, instructional, research and infrastructure computing in conjunction with the Office of Academic Planning and Budget;
  - Academic, administrative and infrastructure technology planning and integration;
  - Design and maintenance of institutional standard technology architectures;
  - Cross-functional issues management;
  - Cross-training, career pathing and professional development opportunities and guidelines for local and central IT units;
  - Development of guidelines and policies for interoperability of local desktops and networks;
  - Administrative, academic and infrastructure project-tracking;
  - Coordination of activities between academic, administrative and infrastructure IT services;
  - Coordination with IRITS and CTS to implement and maintain the establishment of email addresses for UCLA’s entering students;
Reviewing and refining roles, responsibilities and guidelines for Tier One and Tier Two support (as defined in Recommendation B.2.D of this section); and

Establishing vendor strategies that coordinate the multitude of IT-related contractors working with central and local units across UCLA.

- ITPG staff should include individuals with experience in financial planning, technology strategy, technology architecture and higher education;

- The ITPG should be comprised of the following:
  - Academic IT Officer, Chair;
  - Administrative IT Officer, Vice-Chair;
  - Full-time Director and 1-2 Staff Analysts; and
  - Additional staff support as assigned by the Chair and Vice-Chair.

- In conjunction with the central IT units, the ITPG should develop and maintain a standard technology operating and financial model that serves as a guide for administrative units and the schools and college making substantial IT investments. The AITB should review and affirm the model and propose its adoption by the Chancellor. This operating model should address the following issues:
  - Interoperability standards;
  - Minimum desktop and network configuration standards;
  - Generally accepted financial models and budgets for IT projects;
  - Return On Investment (ROI) templates; and
  - IT upgrade and renewal strategies.

- The ITPG should coordinate participation in the planning process from across the institution, organizing the following groups as necessary:
  - Managers of Central IT units;
  - Library representatives;
  - CIOs for the Medical Center and The College of Letters and Sciences; and
III. GENERAL IT MANAGEMENT

- Representatives from the professional schools.
The ITPG should assist the central units, schools, college and departments in implementing proven management practices with regard to IT asset and human resource management. These high-leverage activities may include assistance with:

- Desktop recycling and renewal planning;
- IT resource needs analysis and assistance with recruiting of IT professionals; and
- Creating standard evaluative mechanisms for IT personnel.
B.2.D. Formally define the relationships between local and central IT units to improve clarity and create the highest value and leverage possible from central IT units. This can be accomplished by establishing and adhering to a basic framework and set of principles for a two-tier IT service delivery structure as depicted in the following diagram.

Two Tier Support Structure

Users (Faculty, Students, Staff)
- Help desk
- Immediate technical support
- Discipline-specific expertise
- “Front-line” problem resolution

Tier One (School, College and Departmental IT Staff)
- Local IT support centers in schools, college and academic departments
- Local IT support in administrative units

Tier Two (Central Resources)
- Administration Information Technology Services (AITS)
- Communication Technology Services (CTS)
- Instruction and Research Information Technology Services (IRITS)
- Installation and questions on baseline infrastructure
- Specialized technical consulting and services
- Institutional communication of local innovations
- Specialized training, materials and services
The two-tier support structure and framework should include the following key components:

- Faculty, students and staff should have one person/unit, residing locally, who they can turn to for IT support and requests. Faculty, students and staff should not have to turn to the current complex structure of multiple support units across different applications.

- Support personnel in the schools, college and departments must have an explicit job responsibility to assist faculty, students and staff with IT issues, with corresponding training and support available from central IT.

- Tier one support includes customer support of networked and standalone desktop computers, support for local academic or administrative systems, support for LANs and assistance with, discipline-specific technologies.

- The appropriate central resources are identified and secured only when local IT staff require assistance; the central group acts as a backup and support to the local IT support units.

- Central IT units provide a second tier of support that is a comprehensive and ongoing training and support program for local computing staff. For example, this may include developing training materials and instructional tools that local IT staff deploy to their departments as required.

- Tier two support is provided to help local staffs with IT issues not typically encountered or that require additional deep technical expertise.

- Central IT resources provide a repository of information about local projects, available systems, new technologies or experiments, etc. Central IT shares information through a variety of media (e.g., worldwide web, listservs, newsletters) across local IT units to transfer knowledge across disciplines.

- Central IT units should leverage their expertise and develop a structured program to assist academic and administrative managers in recruiting and evaluating local computing staffs.
• The AITB, based upon staff work of the ITPG, should provide the schools, college and departments with clear planning and budgeting guidelines on resource requirements necessary to meet and maintain effective local computing support.

Stanford University, the University of Pennsylvania and other large research universities are establishing similar models that include information resource specialists working within academic departments to provide IT support as well as collaborating centrally to stay current on technologies, provide guidance on institution-wide standards and provide links to UCLA’s information resources.
C. Key Issues and Recommendations - Governance

C.1. Issues - Governance

C.1.A. UCLA lacks an institution-wide governance structure that ensures IT resources and projects are aligned with important institutional objectives and subject to appropriate evaluative mechanisms. The result has been a collection of central IT resources that have been structured and guided in an ad hoc manner, meeting the needs of only a subset of the UCLA community and creating a wide disparity of local support between academic units.

- UCLA lacks a governance structure for administrative computing. The result of this lack of oversight has been a fragmented computing environment, with many different architectures and strategies that may meet individual unit objectives, but do not create a coordinated and integrated whole. This lack of coordination is manifested as a confusing and complex set of systems for staff to navigate and an unclear sense of institutional priorities with regard to administrative systems.

- UCLA also lacks a governance structure for IT infrastructure. Without a governance process over IT infrastructure, it is difficult to ensure interoperability of local systems with the institution-wide network and systems. Governance alone will not solve this problem, but it can help ensure that central units work jointly with school and college based representatives to develop an institutional architecture that is technologically sound and is responsive to the needs of faculty, students and staff.

- Other central resources and facilities lack formal governance processes to ensure that they have a reasonable and justifiable faculty constituency. The perception among many is that OAC’s high-end computing resources serve the needs of a few, and that the Center for Digital Innovation (CDI) has no clear mission or constituency. Lack of an effective governance process has allowed these entities to consume institutional resources without clear integration with academic or institutional objectives.
C.2. Recommendations - Governance

C.2.A. Implement an effective IT governance structure that provides coordination and integration of IT decision-making for central and local IT needs.

- Establish the Academic Information Technology Board (AITB) as proposed by the Executive Vice Chancellor.
  - Represents both faculty and academic administrators as the primary governance and oversight body for academic information technology and services at UCLA.
  - Informs and advises ongoing decision-making responsibilities of UCLA’s executive management and academic leadership in the area of academic computing.
  - Makes recommendations concerning academic technology-related budget requests and opportunities stemming from a variety of corporate and industrial relationships.
  - Acts as an advisory body to the Executive Vice Chancellor to review IT recommendations brought to it by various constituencies and provide direction on major academic IT issues and projects.
  - Provides formal oversight over the development and deployment of academic technology resources.
  - Periodically reviews the performance of central academic IT units against a set of open and generally accepted standards and measures.
  - Determines the direction and priorities of academic IT strategy in terms of major initiatives and investments of institutional resources.
  - Endorses and communicates institutional standards and guidelines with respect to local systems and networks to ensure a minimum level of access and interoperability among members of the UCLA community.
• Establish Advisory Committees for AITS, CTS and IRITS similar in function to SABs (Service Advisory Boards)
  - Establish the Administrative Information Technology Services (AITS) Advisory Committee to provide input to AITS on administrative computing issues. The responsibilities of this group are outlined in detail in the Recommendations section within Administrative Computing.
  - Establish the Communication Technology Services (CTS) Advisory Committee to provide input to CTS on data, voice and video communications technology issues. The Recommendations section within the Infrastructure and Access section provides detail on the roles and responsibilities of this committee.
  - Establish the Campus IT Advisors to provide input to the IT Planning Group
    ° Composed of departmental computing managers.
    ° Acts as a key liaison and constituency group for the ITPG.
    ° Ensures integration between central and local computing needs.
  - Establish the IRITS Advisory Committee to provide input to IRITS on instructional and research computing issues.
    ° Is formed as a sub-committee of the AITB, consisting of AITB-appointed faculty.
    ° Advises on long-range planning for academic computing.
    ° Ensures integration between instructional and research computing needs across UCLA.
    ° Acts as a sounding board for decisions impacting academic IT.
D.1. Issues - Funding

D.1.A. Some local units do not have sufficient resources to ensure adequate IT for its faculty, students and staff.

- The overall state of IT in many units is of significant concern. Faculty are still using old 286 machines, no LAN exists, and the available support staff is inadequate in certain academic schools and departments.

- Local decision-makers (e.g., Deans, Administrators) have had to make difficult tradeoff decisions between IT needs and other departmental needs without benefit of guidance or a framework to help them assess the short and long term implications of their IT funding decisions.

- Declining budgets and increasing IT costs have created a discrepancy in the ability of local schools, college and departments to adequately fund important IT needs. While the institution has made attempts to fund local academic IT needs (e.g., UCLA Connected), there still exists a gap between the current and desired states of IT at the local level.

- Strict local funding cannot guarantee consistent, institution-wide capabilities for IT projects or ongoing needs required by local units.

- Priorities for non-IT equipment or resources (e.g., chemicals, furniture, pianos) can appear to outweigh the need to replace obsolete hardware and software. However, there is a long term, insidious cost to not maintaining the currency of departmental IT in that it can be much more expensive to “catch up” than to continually maintain the currency and value of IT assets.

D.1.B. UCLA does not systematically prioritize funding for IT projects.

- There is no formal process or structure for planning capital intensive information technology projects and determining relative IT needs across the institution.
• While grant funding supplies much of the need for IT within research, it is insufficient in meeting the universal IT needs not only for research, but also for instruction, administration and ensuring an adequate network infrastructure.
D.1.C. Many local units feel the chargeback fee structure for central IT units needs clarification.

- Funding for portions of some central IT units is charged back to local units without direct correlation or explanation as to the purpose of the charge. For example, data network charges are part of the telephone bill as an undefined tax.

- Additionally, local units believe that AIS chargebacks do not adequately reflect the nature of the charges and the systems or services they address (i.e., there is no direct correlation between a charge and its related system).

D.1.D. There are opportunities to exploit untapped potential in revenue generation utilizing UCLA’s internal IT resources and capabilities. Digitization of the film archives, electronic publication of unique special collections material (e.g., Los Angeles Times photo morgue) and content provided through Bruin OnLine are a few examples of the resources that could offer revenue potential for UCLA.

- UCLA should investigate the costs and benefits of the required capital outlays for each potential revenue-generating digitization project to determine its economic value in the immediate and long-term.
D.2. Recommendations - Funding

D.2.A. Establish a new overall funding process that ensures a rigorous and systematic planning approach for funding major IT projects.

- Large scale campus IT initiatives should be subjected to a rigorous planning and prioritization process.
  - Project sponsors should prepare an initial feasibility analysis, that includes clear statements regarding:
    - Project objectives and business case
    - Estimated costs and benefits
    - Potential number of users impacted
    - Identification of project owner/ sponsor
    - Initial strategy for project phasing
    - Assessment of technical feasibility
  - Projects that are competing for significant capital resources (i.e., network upgrades, new administrative systems, desktop upgrades, IT enabled classrooms, etc.) should be compared and ranked according to clear and well communicated criteria by the appropriate advisory and management committees.
  - For projects that are deemed most critical, the Office of Academic Planning and Budget and the Capital Programs Office should identify potential sources of capital and create a multi-year plan for matching sources and uses of funds for IT projects.
  - This type of planning process shares some characteristics with capital planning processes used by many universities to develop multi-year construction and renovation plans for University facilities.
Examples of criteria that the Chancellor and the governance and advisory committees should consider using when prioritizing institutional IT investments include:

- How closely aligned the project is to UCLA’s institutional strategic objectives. For example, proposed projects could be evaluated in light of whether they help accomplish one of the Chancellor’s key objectives of fostering interdisciplinary collaborations.
- How necessary the project is to respond to the needs and expectations of the UC Board of Regents, the California state government, and the public.
- How broad the project impact is across the UCLA community.
- Whether there is a project Return on Investment (ROI) that helps justify the project in financial terms.
- Whether the project is feasible, technologically sound and has high or low risk.
- The ultimate impact of the project on the quality of teaching and research.

**UCLA should provide institutional funding to help schools maintain a level of minimum technical standards and to address the unmet IT project needs at the school and college level. Without institutional support, there are few practical alternatives for upgrading the IT resources and providing necessary IT support in many academic units. These criteria described above should be applied at the institutional level for campus-wide IT projects. In addition, UCLA needs clear criteria for providing academic units with additional resources for IT. These “local assistance” criteria could include:**

- The degree of IT renewal required in the local unit.
- The ability of the local unit to implement and manage additional IT resources.
- The consistency between the local unit request for IT resources and the local unit academic plan and strategy.
- The virtue of enhanced IT in maintaining academic quality and equity of access.
- The potential for additional IT resources to be leveraged for future growth and/ or matching potential from other sources.
Funding recommendations from the Instructional and Research Computing Committee report dated January 1996 should be revisited for relevance and potential implementation within the scope of the recommendations within this report. These include addressing the following components:

- Establishing funding mechanisms that support innovation and entrepreneurship.
- Providing a separately allocated pool of resources to support entrepreneurial instructional and research computing activities.
- Making available on a regular basis matching funds to support local computer initiatives.

**D.2.B. Evaluate IT-enabled opportunities for revenue-generating opportunities.**

- Capitalize on new information technologies that allow UCLA to become a “content broker.”
- Extend outreach to aggressively seek partners in using IT to market UCLA’s content.
- Determine feasibility and potential benefits of using UCLA’s IT-enabled resources (e.g., research publication database, digitized film archives) to coordinate with industry and provide new revenue streams to the University.
- Consider factors that may be barriers to UCLA’s efforts in this area, such as complicated intellectual property issues, start up costs and market competitiveness.

**D.2.C. Revise the structure for obtaining funding for central IT services**

- Provide a minimal level of funding for baseline services that extend across UCLA to all constituents (e.g., network connectivity, baseline central IT support, infrastructure).
- Fund additional layers of discretionary services (e.g., increased network bandwidth, deep consulting expertise) through user fees based on usage.
  - Network services must be clearly demarcated and outlined based on usage. Telephone bills should provide a detailed listing of which services are being provided and how much each service costs.
Fees for administrative systems that are charged back to user departments should be more clearly outlined and identified as belonging to specific spending “buckets.”

D.2.D. Implement guidelines and policies for local funding of IT that help the schools, college and departments understand the implications of their local IT funding decisions.

- Consider recommending a minimum level of spending on IT resources for baseline technical needs, equipment renewal and technical support for IT projects.
- Establish a model that defines options and tradeoffs related to funding sources (e.g., extramural, vendor partnerships, institutional grants).
- Define cost metrics for baseline technology guidelines (e.g., desktop computers, classroom audio/visual equipment, student lab equipment) that help local units integrate IT needs into short and long term financial projections.
- Coordinate through ITPG and the schools, college and departments a detailed analysis on funding of current and future IT needs as well as funding of migration paths for new technology. An example migration path might be choosing to replace current 286 computers with Pentium processor machines while waiting for multimedia chip technology to mature over a three year time period. Units need to understand the financial implications of these types of strategies.
E. Benefits

The following benefits should be achieved through the recommendations in this section on organization, governance and funding.

- Provides appropriate IT leadership that allows both academic and administrative computing interests to receive full and adequate attention to meet the multiplicity of needs at UCLA.
- Establishes a clear vehicle for injecting meaningful faculty and academic administrator input into the use of institutional resources and setting of IT priorities.
- Reduces the potential for UCLA to consist of “islands of technology” that miss opportunities for interdepartmental and institutional synergy.
- Allows central units to focus on high value institution-wide services that enable local computing support staff to serve their constituents, make the IT support function easier and clearer for end-users to navigate and create an effective and productive network of IT support across the institution.
- Provides guidance and support to central, school, college and departmental units that help ensure effective planning and budgeting for IT projects.
- Allows greater flexibility of reassigning IT resources to tasks outside narrowly defined functions to enable synergy between instructional, research and student computing that is difficult to realize today.
- Provides resources for objective assessment of IT proposals and strategies.
- Ensures appropriate funding mechanisms to elevate the level of technical competence and resources at UCLA.
A. Overview
A.1. Definition

Instructional Computing consists of information technology tools, methods and services which allow faculty to improve their teaching and provide an enhanced learning environment for students, including:

- Improved and expanded faculty/student communications (e.g., email, online chat rooms, virtual office hours);
- Improved instructional logistics and communications (e.g., electronic syllabus, electronic submission of homework, online answer sets);
- New student work review options (e.g., electronically published student work for peer and instructor review);
- Expanded and improved classroom and laboratory instructional methods (e.g., simulation and visualization applications);
- Use of alternative learning delivery mechanisms, (e.g., satellite, video, cable, Internet) to allow for delivery of course content beyond the boundaries of the UCLA campus to non-traditional students, (e.g., single parents, corporate staffs, international students, and other universities, etc.)
- Faculty IT access to electronic materials (e.g., digital library, multimedia) as well as electronic instructional tools and methods to develop and use those instructional materials (e.g., office access, dial-in access, access in classrooms and labs);
- Student IT access, including support, to electronic library materials, Internet resources and other materials to accomplish studies and for self-directed learning (e.g., student clusters, residence hall networking, dial-in access);
- The IT infrastructure needed to support the above uses (e.g., WWW, file servers, news servers, courseware acquisition and distribution); and
- Wired classrooms with audio/visual equipment and computer projection and instructional laboratories.
A.2. Current Management and Support Structure for Instructional Technologies

UCLA provides instructional computing support through a complex variety of central and local services, reflecting the complexity and decentralized nature of UCLA.

- The Office of Academic Computing (OAC) manages Bruin OnLine, maintains a student computing lab and provides consultation and training to faculty on instructional technologies.
- OAC and Administrative Information Systems (AIS) jointly manage the Computer Support Coordinator (CSC) program.
- The CSC program consists of local CSCs in departments providing advice, problem consultation, LAN administration, hardware maintenance and application development.
- The Office of Instructional Development (OID) provides media and equipment resources, media consultation, access to media-equipped classrooms, access to networked classrooms and equipment demonstrations.
- The Registrar’s office assigns general assignment classrooms.
- The University of California Library plans to acquire access to digital information as it becomes available, to digitize unique materials in its own collection that do not pose major copyright problems and continue acquiring important scholarly print resources as required.
- The UCLA Library sponsors Internet classes for faculty, students and staff.
- The Student Technology Center (STC) provides help desk support, machine setup and applications training.
- The College Library Instructional Computing Commons (CLICC), jointly sponsored by several campus groups (i.e., OAC, OID, Humanities Computing, Social Sciences Computing and the Library), provides access to general and instructional applications for students with a Bruin OnLine account.
- Departmental student clusters across the institution provide specialized teaching and learning support (e.g., SEAS, Public Policy, AGSM, Medical School).
- Local user groups are available for training and instruction (e.g., CNUG, LANet, Campus Web Publishers).
• The Center for Digital Arts is in development.
• The Center for Digital Innovation (CDI) has been dormant due to a lack of clear purpose and direction, but now has a defined budget and leadership.
B. Key Issues and Opportunities

B.1. Although there are multiple resources and departments supporting instructional IT throughout UCLA, the institution has significant opportunity to use IT more widely and more substantively in instructional activities across UCLA.

- Although there are many pockets of IT innovation and use at UCLA, there are many faculty who are averse to using IT for instruction, are not comfortable with instructional technologies or are slow to adapt to new technology. However, increasing numbers of incoming students, many of whom are computer proficient, may prefer that faculty use IT in instruction and be dissatisfied with non IT-enabled teaching and learning experiences.

- There is a need for a systematic approach to prepare students for using computers and accessing information. Problems with library literacy, understanding how to effectively use library resources, are exacerbated by the rapid growth of electronic information retrieval systems. UCLA must address the changing role of the Library as a result of the potential for digitization of scholarly materials.

- Some faculty wanting to use IT for instruction are not receiving sufficient help to be successful. Many reported an insufficient number of available, skilled support staff.

- Because of their existing budgets and the size of UCLA, central IT support organizations (e.g., OAC, OID) cannot reasonably reach every part of the institution.

- Local support units report difficulties in attracting and retaining qualified IT staff in the competitive Los Angeles environment.

- The CSC program is considered ineffective in sharing information with all parts of the institution, so faculty are often unaware of IT instructional tools available to them.

- There are no mechanisms for coordinating training and support across the institution, so gaps and duplications exist.
B.2. The current infrastructure does not support consistent use of IT for instruction. There are an insufficient number of IT-equipped classrooms, and faculty cannot be sure that the network and application access they need will be available, reliable, consistent and easy-to-use in any given classroom.

- Classrooms have network access in only some of the buildings (i.e., Moore Hall, Fowler Museum, Public Policy, Powell Library).
- Network access equipped auditoriums are often booked because of seating capacity while their network connection goes unused.
- It is difficult for faculty to request an IT-enabled classroom once classroom scheduling for the quarter is complete.
- Connecting to the network in a GACNet classroom doesn’t guarantee network or server reliability.
- The large number of software packages used at UCLA is not well-coordinated with a central site license program that allows faculty to know what is available.
- Faculty perceive that they often will lose lecture time because of failed technology.
- Classrooms are configured differently, requiring adjustments by faculty who move from classroom to classroom.

B.3. There are no institution-wide minimum levels or standards of computer ownership, presenting equity issues to institutional policy makers and limiting the ability of faculty to incorporate electronic teaching techniques into courses.

- There are local differences in computing requirements (i.e., AGSM requires laptop ownership, the Medical School requires desktop ownership, other schools have no computer requirements).
- Determining appropriate minimum standards of computer ownership is difficult in UCLA’s highly decentralized environment. Academic disciplines have significantly different approaches to instructional computing.
Many students without computers cannot respond easily to their academic requirements (e.g., accomplishing computer-oriented coursework).

A key strategic issue facing UCLA is how to ensure fair and full access to electronic services and instruction for all students. Without clear guidelines, policies and sufficient resources, achieving the benefits of IT-enabled learning will continue to be problematic.

B.4. Faculty cannot be sure that undergraduate students have access to computers or the ability to use IT instructional tools.

- While the Library has made strides in this area, no single group is clearly responsible or accountable for helping undergraduates with IT.
- Students are confused about who to go to for technical support.
- There are numerous help desks and support centers at UCLA that are providing overlapping or uncoordinated support.
- There is overcrowding at common computing facilities, indicated by long lines at students labs (CLICC, OAC).
- It is difficult for students to access their Bruin OnLine accounts remotely during peak hours.
- It is problematic for faculty to utilize email for homework submission and electronic dialog if access is difficult for some students.
- Economically advantaged students have an increasing advantage over students with minimal financial resources, and without stronger and more consistent IT support this gap will widen.
B.5. **UCLA is a national leader in IT instructional innovation in some programs, but faculty in focus groups felt that UCLA could do much more with a coordinated management focus.**

- Distance learning is being actively pursued at local levels, while opportunities to establish institution-wide economies of scale or leverage local developments are being missed. Though OID provides some videoconferencing capabilities, faculty pursuing distance learning opportunities (e.g., in the School of Dentistry) are essentially on their own with respect to institutional infrastructure and support. Some other universities are beginning to develop institution-wide approaches to distance learning to take advantage of economies of scale and to channel resources into potential market opportunities (e.g., University of Michigan developing a virtual auto college).
- Faculty are not specifically rewarded for developing new instructional IT.
- Some faculty feel that UCLA honors good teaching but doesn't reward instructional innovation.
- The existing faculty review process is considered unsatisfactory by some faculty to spur more innovation of instructional IT.
- Spending time developing new instructional techniques takes time away from other priorities (i.e., instructional content, research). Faculty believe they are penalized by taking valuable time to innovate with instructional IT, and developing instructional tools nearly always takes a back seat to conducting research and publishing.
C. Recommendations

C.1. Restructure central and local services to provide a coherent and effective support structure for faculty using instructional IT.

- Move toward consolidating all central resources providing IT instructional support into one integrated organization, Instruction and Research Information Technology Services (IRITS), in order to improve coordination, allow for fungible resources and provide a simpler management structure for central support.
- Implement a two-tiered support system for faculty, students and staff. The first tier consists of local computing support staffs that provide need-based training, responsive technical support and a “knowledge network” for information sharing, and the second tier consists of the central IRITS unit.
- Departments assign every faculty member to an identified local support staff with appropriate skills.
- The local unit should be in a position to trade-off other instructional priorities for additional support or make a case for increased local funding if support is insufficient (see Funding Issues and Recommendations within the General IT Management section).
- Every local support staff should have clear roles and responsibilities (e.g., faculty training, courseware configuration, support for specific tools and techniques).
- Local support staff should coordinate all support resources to individual faculty and serve as the “front line” for technical support (e.g., training of faculty in multimedia and distance learning techniques).
- Second-tier, central IRITS support should provide clearly-defined, high-leveraged, core instructional services for local support staff. These services should include:
  - Instruction support services for local computing resources;
  - Leadership in developing standards and guidelines;
  - Site licensing of instructional software;
  - On-site assistance when requested by local support staffs;
- Classroom and IT lab configuration and setup services;
- Coordination with ITPG and CTS to implement and maintain the establishment of email addresses for UCLA’s entering students;
- Commodity instructional services, such as class email lists, newsgroups, file and web services; where these services are specific to instructional needs in the school, college or department, they would be mounted locally;
- Clearinghouse and knowledge consulting for IT instructional tools (e.g., training materials, documentation) used across UCLA, regularly sharing the knowledge to first-tier support; and
- Organizational advice to school, college and department administrators in establishing and managing Local Computing Support Units and a potential career path for local staff.

• These central services should be managed by the Academic IT Officer and governed by the Academic Information Technology Board (AITB) as described in the General IT Management section. Additionally, the AITB should perform the following tasks related to instructional computing:
  - Review and comment on institution-wide instructional computing initiatives and plans;
  - Review and comment on the operational budget and operating plans of IRITS;
  - Periodically review the performance of IRITS based on open and measurable criteria; and
  - Ensure that academic input is obtained in the design of IRITS programs.

• IRITS should work closely with the IRITS Advisory Committee to ensure decision-making and long-term planning for instructional computing receive important faculty input.

A single academic computing unit that focuses on the technological elements of both instructional and research support will allow for a level of integration between students’ learning experiences and faculty’s research activities that is difficult to achieve today. To be truly effective, this integration must also occur at the school, college and department level. However, an integrated central group can help train local IT staffs in both research and instructional technologies so they can, in turn, support faculty efforts to integrate research experiences and approaches into the curriculum. In addition, a well integrated central academic computing unit can help ensure
that institutional labs and classrooms are sufficiently equipped and staffed to enable faculty to demonstrate research-oriented computational activities that have instructional value.
While consolidating instructional and research computing into one organization provides many benefits to users of computing resources, some universities maintain separate instructional and research technology organizations. An advantage of separating the two is to ensure that instructional computing receives continued focus without being absorbed or overshadowed by priorities for research computing. In either case, UCLA must clearly demonstrate a commitment to supporting instructional technology by dedicating resources to its efforts, and faculty should participate in providing feedback for decisions made in this area.

There are many examples to be found of both integrated (e.g., University of Southern California, University of Florida) and separately maintained (e.g., Stanford, University of Michigan) instructional and research computing organizations. Additionally, examples of similar two-tier support structures described above may be found at universities such as Pennsylvania and Emory.
C.2. Coordinate, through IRITS, ITPG, the Library and the schools and college, IT planning, training and support for student computing. Specifically, each school and college should address the following issues:

- Develop and recommend hardware standards for student computing (e.g., cluster configuration and management, printing, residential networking, remote access, support for student usage);
- Develop standards for student applications (e.g., email, web browsing, word processing);
- Create policy for student computer literacy and coordinated support;
- Assign and delegate student IT support to appropriate organizations, with confirmation and endorsement achieved through the AITB.
- Assess models of requiring student ownership of computers (e.g., AGSM, the Medical School), considering the incentive role provided by quality residence hall and dial-up network access for students;
- Assess strategies and make recommendations based on intensive consultation with students on whether to implement a technology fee and at what level;
- Assess and recommend best methods for preparing students for IT-based instruction and learning (e.g., use of standard IT services, access to electronic library and instructional materials);
- Support the ongoing efforts of the Library to digitize or convert to electronic text all library resources.
- Involve the Library in coordinated efforts to determine space allocation for undergraduate student computing needs as well as access to digitized library materials through new on-line systems (e.g., Data Research Associates contract to replace ORION); and
- Develop a student support organization or subcontract to IRITS to provide needed services. School and college specific organizations, working with the departmental support units, the appropriate advisory committees and the ITPG should develop the needed standards and services.
While it is a common belief that students should have access, how they obtain it must be further analyzed. Refer to the White Paper entitled “Computers For All Students: A Strategy for Universal Access to Information Resources” by Mark Resmer, James R. Mingle, and Diana Oblinger.

C.3. Improve the management of IT classrooms and instructional computer laboratories by developing equipment standards and implementing a more proactive, structured and comprehensive classroom management process.

- Inventory existing IT classrooms and labs, publish a comprehensive listing of institution-wide resources on the WWW and collect standard measurements of classroom use, problems and mean-time-to-correct.
- Develop a set of standards and guidelines for all IT-enabled classrooms, seminar rooms, lecture halls and instructional labs (e.g., room darkening, lighting, audio/visual and computer projection).
- Coordinate scheduling to ensure effective use of IT-enabled general assignment classrooms.
- Coordinate management of IT-enabled general assignment classrooms between Tier One and Tier Two support.
- Audit classrooms and teaching labs annually to compare current status against standards and develop proposals for upgrades.
- Review and upgrade plans for expanding and upgrading institutional classrooms based on a comprehensive needs analysis and consultative planning process.
- Aggressively pursue implementation of more IT-enabled classrooms with funding from a central budget for general assignment classrooms supplemented by grant proposals. New IT classrooms and labs will require an additional operating budget to maintain and replace the equipment, which must be factored into institutional, school, college and departmental financial plans.

Pennsylvania State University, among others, have operationalized many of these practices in order to maximize the value from their instructional facilities.
C.4. Assess the need, implications and potential costs of providing sufficient computer access for every student through an appropriate coordination of labs and personal ownership. This objective may be best accomplished by encouraging each school and college to closely examine the issue, providing internal consulting resources to assist the schools and college in the analysis and coordinating the results.

- Consider offering desktop and laptop computers with baseline software, hardware and network configurations to all students.
- Consider the ramifications of requiring student computer ownership, such as potential increased demand for student computer labs as has been seen in the Medical School.
- Consider providing substantive financial aid resources for students who do not have an adequate computer upon enrollment, based on their needs within a specific discipline.
- Provide students with a menu of options to fund computer purchases, including rent, purchase or loan.
- Consider implementing a student fee to create a central fund dedicated to providing more rental computers or purchased computers for student use, supplementing the fund through the Chancellor’s budget.
- For each school and college, assess the distribution of students among different categories of computer ownership capability, determine current access levels through existing labs and ownership programs and develop appropriate policy and funding strategies to ensure universal access.

Harvard College, Dartmouth College and Pennsylvania State have college-specific IT planning and coordinating bodies working toward some of the goals described above.
C.5. As faculty stated in the focus groups, UCLA should encourage faculty innovation of instructional IT methods through an institutional commitment and enhanced recognition of success.

- Develop and recommend a peer-reviewed, institutionally-funded grant program that provides equipment, expertise and release time to promising instructional IT projects, giving special consideration to projects obtaining their own extramural funds or with a history of success. This program should expand and improve upon the Chancellor's Committee on Instructional Improvement Program (CCIIP) as appropriate.
- Provide consulting assistance for developing internal grant proposals and requests for extramural funding through the two-tiered support structure.
- Create a communications portfolio of successful innovations at the second-tier support structure to share within UCLA and beyond (e.g., Chemistry Department’s virtual office hours, Dental School’s on-line interactive case studies).
- Consider establishing clear rewards for excellence in IT instructional innovation and integrate them into existing reward structures (e.g., prizes, financial rewards, tenure consideration factor, promotional factor).
- Establish a central “defined effort” instructional innovation support group comprised of faculty and local computing support staff to partner with IRITS to track and pilot promising new instructional technologies (e.g., distance learning, multimedia techniques), to provide consultation to faculty project proposals and to identify and seek synergy among UCLA’s instructional innovations. This mission could be included in the role for the Center for Digital Innovation.
- Ensure that ITPG coordinates ongoing integration of successful projects using instructional IT.
• Consider undertaking an institution-wide review of distance learning programs and plans. Appoint a single individual within IRITS with responsibility for coordinating distance learning programs so that resources required (studios, TV-equipped classrooms, consulting expertise, vendor contracts, business planning, etc.) are shared among units wishing to pursue distance learning opportunities. Outreach programs, beyond the traditional 18-22 year old full time student, is a fast growing segment of higher education in this country and globally. Other large research universities are beginning to make significant investments in this arena and non-traditional competitors are emerging (e.g., Western Governors University, University of Phoenix). Those institutions that do not have a strategic plan and capability in this area may be at a competitive disadvantage in the 21st century.

Emory University has an active and successful faculty innovation grant program and on-campus instructional technology tracking and development capability.
D. Benefits

The following benefits should be achieved through the recommendations in this section:

- Systematically organizes and provides high-leveraged, institution-wide services such as software licensing and training;
- Provides a publicly understood level of support close to the client for local control, responsiveness and understanding of client needs;
- Systematically identifies and publicizes successful models of improved teaching and learning from within UCLA and beyond, thereby encouraging faculty to try these methods;
- Improves efficiency in using the limited number of existing IT classrooms and IT-enabled labs across UCLA;
- Provides needed student services most cost-effectively and tailored to individual school and college structures;
- Incent faculty and encourages more innovation;
- Creates a basic ability to track important instructional innovation technologies and to provide limited support for faculty contemplating projects;
- Provides a vehicle for coordinating, supporting and extending strategic UCLA distance education exploration (e.g., UNEX/THEN, School of Dentistry) and other strategic instructional IT (e.g., multimedia);
- Creates an institutional organization to evaluate and understand emerging instructional IT (e.g., distance education technologies) which may have a profound effect on how instruction is delivered at UCLA;
- Achieves synergy between instruction and research (e.g., introducing research techniques in the classroom is a highly effective instructional technique); and
- Creates opportunities for reassigning staff as needs change (e.g., research IT staff assist instructional computing staff in classroom setups during peak periods of the semester).
A. Overview
A.1. Definition

Research computing is comprised of the IT methods and tools useful for faculty and graduate students in conducting their investigations. By definition, research involves extending the boundaries of subject area knowledge, and IT is often critical to the success of these endeavors. An inability to obtain or invent the right IT tool may mean that research simply cannot occur.

Research computing at UCLA today includes the following:

- Basic PC and workstation computing activities involving technical word processing and standard research tools (e.g., Excel, math algebra systems, statistical packages);
- Sophisticated research communication tools (e.g., email, WWW publishing, document sharing, electronic grant submission, network based collaboration through video conferencing and electronic white boards);
- Access to a growing set of electronic scholarly journals and other digital text, citation databases and multimedia resources;
- Analytic tools adapted to discipline-specific research (e.g., data mining, visualization, simulation, high performance computing, high resolution imaging); and
- High performance computing and high-end workstations used to conduct research projects (e.g., Silicon Graphics machines for Virtual Los Angeles).

The Infrastructure and Access section of this report proposes a basic IT capability that provides for high-speed, high-function network access to researchers as required. This section addresses organizational, service and governance issues in support of research technologies.
A.2. Current Structure for Research IT Support

Support for research technologies is provided on a central level by the Office of Academic Computing (OAC) and a set of on-line information resources; research faculty also rely heavily on local resources in the lab, department, school or college for IT support.

- OAC provides central research computing support in the following ways:
  - Helps researchers write NSF grants;
  - Supports research activities on the IBM SP/2 cluster complex and Visualization Laboratory;
  - Augments research support services available in departments, schools and college as well as national and international super-computer centers;
  - Provides resources for parallel computing, numerically intensive computing, scientific visualization, statistics, large databases including the U.S. Census, standard compilers, scientific subroutine library and other software applications;
  - Provides access through Bruin OnLine to email, Internet services such as telnet and File Transfer Protocol (FTP) and on-line information systems including ORION and InfoUCLA;
  - Offers support services through the OAC User Relations office, general consulting, code clinics and training classes; and
  - Publishes technical documentation and other publications in paper and electronic formats.

- The Library successfully provides the role of teaching faculty to do research using electronic information tools (e.g., full text databases, on-line abstracting and indexing tools).

- As part of its efforts to provide digital library resources, the Library, in cooperation with other UC libraries, is negotiating licenses for digital journal content, with an initial emphasis in the sciences. Additionally, digital content for the humanities and social sciences disciplines is being acquired as it becomes available.

- The Finance Office and Sponsored Research are jointly developing with IBM a comprehensive grants management system called R-NET.
• Various information sources and subscription services for funding are listed on the WWW (e.g., IRIS, SPIN, FEDIX, TRAM).
• UC-ACCESS provides information on research collaboration, resource sharing and technology transfer among UC's nine campuses, three Department of Energy National Labs, industry and the general public.
• UCLA's sponsored research web site provides numerous sources of IT information and is also geared toward external donors.
• The North Campus Initiative is an expansion of sponsored research support services, by Sponsored Research, for Humanities and Social Sciences faculty.
B. Key Issues and Opportunities

B.1. Many researchers at UCLA feel that they do not receive sufficient support for the use of IT in their research activities. They want better access to IT tools, help in formulating the IT component of grant proposals and an equitable process for allocating the use of central resources (OAC).

- These specialized communication needs include network services that can accommodate high bandwidth communications, multimedia and full-motion video. Faculty with these needs have had to be entrepreneurial and create their own communications capabilities.
- Faculty report insufficient general access to research computational tools, such as visualization, data mining and large data manipulation tools.
- Faculty have expressed a need for increased digitization of library materials.
- Faculty have expressed a need for more help identifying, configuring and costing IT components of research project proposals in order to accurately develop project budgets and design the necessary research system.
- Faculty report inequities in the use of OAC supercomputing resources. The general perception is that a very small fraction of the University’s faculty (i.e., 10-15) use most of the computing cycles, while a larger number of researchers (i.e., 500) use OAC’s consulting time.

B.2. There are opportunities to improve UCLA’s management and strategies with regard to IT resources funded from external sources.

- Grant proposals are prepared without consideration or provision for the full costs of needed IT. Maintenance and support costs are frequently overlooked and therefore place an unplanned burden on operating budgets or go underutilized after the grant period.
- Faculty perceive a significant lack of institutional funding for matching IT equipment required to complete a research project (e.g., $45,000 specialized piece of video equipment that enables a $2 million donation from IBM). The result can be project rejection or delay.
• Extramurally provided equipment is not always interoperable with UCLA’s technology infrastructure, making it difficult to ensure compatibility with the institution-wide network and the availability of ongoing technical support.

B.3. **UCLA does not have clarity on its direct institutional commitment to IT for unsponsored research and the technologies required to support these activities.** Some research-oriented universities (e.g., Michigan) provide certain levels of unsponsored research support to serve a variety of purposes, including “jump starting” new faculty, funding research in areas not widely supported and providing graduate students with facilities needed for dissertation research.

• UCLA addresses these challenges in a series of school-based, college-based and ad hoc institutional arrangements which are confusing and frustrating to some faculty and graduate students.
• Some faculty feel that existing funding structures and arrangements are not equitable.
• There is no clear, publicized statement of UCLA’s goals for unsponsored research support and the principles and mechanisms under which institutional resources will be allocated.

B.4. **UCLA has significant opportunities to increase the level of collaboration among researchers in the innovative use of research IT.**

• Almost all of the school, college and department based research facilities function completely independent of each other, and there is no mechanism to facilitate the transfer of knowledge and experience across the institution.
• There is recognition among faculty leaders that certain research technologies are highly applicable to multiple disciplines. For example, large database manipulation algorithms being developed by researchers in Theater, Film and Television could be useful to clinical researchers in the Medical School who are analyzing digitized patient x-rays and scans.
• Some faculty perceive their research techniques as proprietary and are apprehensive about sharing their IT expertise electronically because of immature electronic copyright laws and what they perceive as a potentially insecure network.

• There are no financial or other incentives to encourage sharing of research expertise outside of one’s department.
C. Recommendations

C.1. Create a clear governance and policy structure through the Academic Information Technology Board (AITB) for reviewing all institutional research IT support with a mission and role as follows:

- Develop clear policies, goals and principles for institutional research IT support. These principles should apply to central IT groups and include policy concepts such as:
  - Staff resources providing research IT support will be a defined effort (i.e., a fixed amount for a fixed period of time);
  - Support for specific research projects will be peer reviewed, limited in time (e.g., 2-3 years) and will require evidence of reasonable effort to acquire external funding;
  - Priority for allocation of sponsored research support will be given to projects where such funds match external funds and other high-leverage situations;
  - Central or collaborative research facilities must be justified and governed by faculty and must periodically reapply for funding; and
  - Priority for funding research facilities will be given to consortia where there are opportunities for cost sharing by the participating research projects.

- Ensure that there is general faculty understanding of the process for funding institutional research IT resources;
- Review and comment on the budgets and plans for research computing services, and ensure that the services are providing cost-justifiable value to UCLA’s researchers; and
- Advocate the appropriate level of overall funding for unsponsored research support.

These are necessary but difficult policy challenges that universities solve in a manner consistent with their culture and governance. Therefore, UCLA will need to implement this type of program carefully to ensure broad faculty participation and support. If there is no structured debate and process for allocating institutional resources to unfunded research, UCLA will experience frustration among faculty and perhaps use its resources unwisely.
C.2. Coordinate all central research IT activities within the Instruction and Research Information Technology Services (IRITS) group to provide expert knowledge and facilitation of IT functions critical to research, particularly those that cross research disciplines. The services of IRITS with respect to research computing should include:

- Providing high leveraged research support services to local computing resources;
- Expanding and strengthening pre-grant IT consulting support to ensure that faculty are fully aware of the requirements for network access and interoperability and the implications of their IT decisions;
- Facilitating the creation and operation of institutional research facilities that would benefit multiple departments (e.g., high-performance computing facility, imaging lab);
- Coordinating the dissemination and administration of institutional IT research awards and funds under the direction of the AITB and the Vice Chancellor of Research;
- Coordinating faculty involvement for participation in the Internet II project, the UC San Diego application and other major external research IT initiatives;
- Providing expert knowledge on IT functions critical to research that crosses disciplines and projects (e.g., data capture and archival methodologies);
- Collaborating with the Library to identify opportunities for digitizing library materials;
- Coordinating with Communication Technology Services (CTS) and the Library to ensure that network standards and guidelines meet the need for researchers to have reliable, state-of-the-art network access to materials needed for their research;
- Identifying and sponsoring vehicles for sharing uses of research IT (e.g., listservs, Web sites, internal newsletters, forums and colloquia);
- Defining the effort that is fully funded within the general operating budget and subject to periodic AITB review and recommendation; and
- Working with the IRITS Advisory Committee as a sounding body for evaluating decisions on research computing.
C.3. Promote IT mechanisms for increased collaboration among researchers.

- Evaluate methods for adapting faculty processes to encourage IT-related collaboration and knowledge sharing across disciplines.
- Create guidelines for electronic dissemination of research results that improve publication efficiency and address security concerns.
- Establish a set of internal communication vehicles that serve to inform and educate researchers on innovative and transferable uses of research IT.
D. Benefits

The following benefits should be achieved through the recommendations in this section:

- Improves synergy in the area of research IT that serves to improve the overall quality and competitiveness of UCLA’s research activities;
- Provides a vehicle for faculty influence over use of institutional resources of research IT;
- Ensures that projects needing support have the opportunity to obtain it and reduces inequities in research IT support across the institution;
- Increases faculty understanding and acceptance of unsponsored funding of research IT;
- Informs researchers and UCLA in advance when they will be integrating new state-of-the-art IT which may require special efforts by IRITS and by the researcher; and
- Provides mechanisms to improve collaborative sharing of innovative IT use across the institution.
A. Overview
A.1. Definition

Administrative computing refers to computing applications that support administrative processes that are institution-wide. Its purpose is to improve the capability to cost-effectively manage UCLA’s resources and serve the administrative needs of faculty, student and staff constituents. Administrative computing includes:

- Systems and tools to provide financial transaction processing, asset management resource monitoring and control (e.g., Purchasing/ Accounts Payable system, General Ledger);
- Student administration systems (e.g., Student Billing and Accounts Receivable, URSA on-line);
- Human resource management tools (e.g., Employee Database - EDB);
- Development and alumni services (e.g., BSR Advance application);
- Management reporting and decision support systems (e.g., Query Database - QDB); and
- Miscellaneous special purpose systems to meet unique needs of specific units (e.g., Auxiliary Services, Facilities).

- Administrative Information Systems (AIS) delivers application development, maintenance and operational services to the business process owners.
- AIS directly supports end-users in the schools, college and departments through selected development and support efforts (e.g., QDB, internal consulting).
- Each school, college and department is responsible for providing and maintaining its own local administrative applications and office productivity environment.
- Departmental shadow systems are universally utilized to integrate data from different applications and to provide timely and useful management information at the school, college, division and department level.
- The technical architecture for the institution applications (e.g., finance, human resources, student systems, Library systems) is primarily mainframe-based (i.e., IBM ES/ 9000) with 3270 terminal emulation.
- Client/ server architecture is used for selected systems (e.g., QDB and the BSR Advance system).
- QDB and EDB provide access to consolidated financial and administrative data, although these applications are new and currently limited in functionality and use.
B. Key Issues and Opportunities

B.1. Participants in the IT planning process consistently identified administrative computing governance as the most critical area of improvement in administrative computing. Lack of a governance structure makes it impossible to coordinate and integrate administrative computing initiatives and services.

- A public planning process does not exist for defining needs and building consensus on administrative computing decisions.
- The priority setting process for administrative applications is unclear to managers in schools, The College, departments and central units.
- Lack of governance is cited as contributing to poor application integration and inefficiencies in development, implementation and support processes.
- End-users complain about “unfunded mandates” that occur when an administrative application requires increased desktop processing power which they must purchase.
- Standards for administrative applications are not clear to the end-users, resulting in administrators having difficulty planning and budgeting for technology.

B.2. Confusion exists about who is responsible for each application and its associated data and where to seek assistance when problems arise.

- The support structure for administrative applications differs for each application. For example, users call the Registrar’s office for support on student systems and AIS for support on the QDB.
- Computing Support Coordinators (CSCs) provide a first line of support, but they cannot master all applications.
- Business units and central help desks at the Office of Academic Computing (OAC) and AIS are all providing end-user support.
Variations in the roles and responsibilities among the business units, AIS and end-users have led to conflicts over “data ownership” issues.

Development efforts are organized differently for each application. For example, the roles and responsibilities of IT staff for the new University Relations application (i.e., BSR Advance) differ from those used for the research administration application (i.e., R-NET - IBM), which is user managed.

B.3. The increasingly diverse technical architecture for administrative systems makes it more difficult and expensive to maintain applications and support users. UCLA has no clear program for standardizing the structure of applications on a specific technical architecture model.

Most of the existing applications currently operate on the IBM ES/ 9000 mainframe, but recent and new development (e.g., BSR Advance system, URSA On-line) is client/ server based.

In addition, many miscellaneous administrative systems (e.g., R-NET) operate on separate servers throughout UCLA. This diversity makes it difficult to provide the level of integration desired by users.

Decisions on technical infrastructure (e.g., database environment, operating systems) for each application have no institutional framework or standards on which to rely. UCLA is moving toward an environment where economies of scale in infrastructure support and expertise will be difficult to achieve.

Many universities (e.g., Yale, Stanford, Harvard) are moving toward a common technical architecture that helps to ensure maximum interoperability of applications, increased operating efficiency, contained training costs, improved security and maximum flexibility for staff assignment.

B.4. The current administrative computing environment does not provide sufficient management information to decision-makers in the schools, college and departments or UCLA’s executive leadership.

School, college and department administrators find it difficult to consolidate decision support information (e.g., financial data, personnel statistics) they require from the existing applications.
• Staff in the schools, college and departments spend significant amounts of time and resources recompiling needed data into local shadow systems to monitor their operations and make better planning decisions.

• QDB has filled part of the need for access to financial data, but there is no “owner” for the QDB, so all funding, training and support must be accommodated by AIS. Without a business unit system “owner,” the project may be at risk as resources are diverted to projects with clear sponsorship and funding.

• Departmental managers would like to see the breadth of information in QDB expanded to include additional information (i.e., student data, space planning data).

B.5. There is widespread consensus that the current financial system will need to be replaced or significantly enhanced in order to improve UCLA’s ability to monitor and control its finances and comply with external control requirements.

• The financial systems are up to fifteen years old and are no longer supported by the vendor. They consist of multiple customized applications, and there is no upgrade path for them.

• The existing financial applications are not sufficiently flexible to support process improvements such as streamlining, workflow changes and internal control improvements.

• There is no vendor upgrade path for these systems because of extensive modification.

• Managers must maintain extensive shadow systems to increase access to financial information not readily available from the mainframe.

• End-users feel that mainframe character-based interfaces, as opposed to client/server applications, are not user-friendly and require additional staff training to maintain the data.
C. Recommendations - Organization of IT Resources

C.1. Create an institution-wide Administrative Information Technology Services (AITS) Advisory Committee comprised of business process owners (e.g., Finance, Purchasing, Student Affairs) and Associate Deans for Administration from the schools and college. The Library should also be included to represent both an academic unit and an administrative unit. The AITS Advisory Committee should have the following functions and responsibilities:

- Develops a long range vision for administrative computing at UCLA;
- Reviews and comments on annual objectives and plans for AITS;
- Ensures that a 3-5 year administrative computing plan is in place and has sufficient community support;
- Recommends priorities among competing projects;
- Reviews and approves guidelines and standards for administrative systems architectures (e.g., database standards, operating system standards, development environments, minimum desktop configurations);
- Provides executive level oversight of major institution systems initiatives (e.g., new financial system);
- Serves as a sounding board for institutional decisions on administrative computing resource allocations and priorities;
- Ensures accountability of business unit owners to meet the needs of their end-users; and
- Serves as a communication conduit between AITS and the schools, college and departments.

Many other large, decentralized research universities have established governance or “executive oversight” groups with similarities to the one described above, including Harvard, Yale and Stanford.
C.2. Refocus and clarify the roles and responsibilities of each participating group in institution-wide administrative computing activities and projects.

- The central administrative computing unit, Administrative Information Technology Services (AITS), should be responsible and accountable for:
  - Technical architecture design and development;
  - Technical systems design, development and maintenance of administrative systems;
  - Technical project management;
  - Implementation of system development life cycle methodology;
  - System installation and configuration;
  - Technical standards development;
  - Central server operations for institution-wide administrative information systems;
  - Ongoing technical maintenance for the applications;
  - Design and second-tier support of standard, end-user reporting and data manipulation tools;
  - Management of hardware platform availability, performance and cost effectiveness; and
  - Staying abreast of technology trends and developments in administrative computing.

- The central business units (e.g., Finance, Human Resources, Student Affairs) should be responsible and accountable for:
  - Functional needs analysis;
  - Project definition;
  - Business process assessment, design and improvement;
  - Project oversight and sponsorship based upon an agreement with AITS;
  - Application-specific training and support;
  - Institution-wide functionality and specific management information; and
  - Training and support for local computing support staffs.
• The schools, college and academic departments should be responsible and accountable for:
  − Providing “first line” local support on institution-wide applications to faculty, students and staff
    through the provision of local computing staffs;
  − Ensuring that local computing support staffs receive training, guidance and support from central
    business process units;
  − Needs analysis and requirements development for end-user query, reporting and data
    manipulation functions; and
  − Developing, maintaining and supporting local applications.
• AITS should provide technical services and support directly to the central business units that own each
  administrative system as well as to a range of academic and administrative units. The type, level and
  cost of support should be clearly defined in annual and project-specific Service Level Agreements that
  are negotiated on a case-by-case basis within an agreed framework. This framework should include the
  following basic principles:
  − Central business units should coordinate development of their technical staffs with AITS to
    determine the level and quality of available support and potential assistance;
  − The cost of AITS support should be based on an agreed “cost plus” basis that allows AITS to
    maintain its technical currency and ability to recruit and retain quality staff;
  − Performance of AITS staff will be reviewed periodically against measurable performance criteria;
  − The business units should work in partnership with AITS, supplying the resources, management
    and direction necessary for project success;
  − All applications should have an identified business unit “owner” who pays for the system. If no
    owner exists (e.g., for a legacy system), then the system should either be eliminated or a business
    unit owner assigned. AITS should not be the owner of any administrative systems. For example,
    QDB is a successful administrative system that should have ownership assigned to one or more of
    the business units responsible for its data.
C.3. Develop and migrate toward a common technical architecture for institution-wide administrative systems. UCLA should be moving toward a technical architecture that supports interoperability, open systems design and economies of scale in technical support, development and operations. This common architecture should contain the following components:

- Easy to use, Web-based, intranet interfaces for casual and non-PC end-users;
- A graphical, Windows, PC-type interface for higher-volume, more sophisticated users;
- Relational, SQL-based, non-proprietary database environment such as DB2, Oracle, Sybase or Informix;
- Use of packaged software for applications for which viable vendor solutions are available;
- Common security tools and standards;
- Common system development methodologies and CASE (Computer Aided Software Engineering) tools;
- Common workflow and routing software for automating processes and forms; and
- Open standards for integrating data among systems across the institution.

C.4. Enhance institutional efforts of providing integrated and timely management reporting directly to end-users in the schools, college and departments. UCLA should expand its QDB efforts to encompass greater functionality and use among the academic user community.

- Identify a clear sponsor, such as the Administrative Vice Chancellor, for the integrated management reporting function.
- Involve end-users in decision-making efforts.
- Create a function within AITS to implement and support comprehensive data warehouse tools (e.g., OLAP - On-Line Analytical Processing) for administrative information to support DSS (Decision Support System) and EIS (Executive Information System) queries.
- Utilize a Web-based query capability with an intuitive, natural language command structure to minimize training and ensure compatibility with the minimum standard desktop systems at UCLA.
• Integrate data from the new financial system with data from other institution-wide administrative information systems (e.g., Student Records, Human Resources).
• Include projection and scenario analysis capability in the tool to assist with the development of school, college and departmental budgets and forecasts.

Many large research universities have embarked on a similar program. For example, UC Berkeley, Rochester and Arizona State have all created an “Information Architecture,” with a strong data warehousing component to provide end-users with integrated management reporting and decision support capabilities.

C.5. Expand UCLA’s planning efforts for replacement of institution-wide financial monitoring and control systems. Key objectives that should be accomplished during this planning phase include:

• Create a work team to plan for new financial systems involving the Finance project already in progress;
• Clarify and communicate the goals, objectives and scope of the project;
• Analyze business processes for improvement opportunities;
• Design process improvements to enhance control and efficiency;
• Define business and technical requirements for the financial system;
• Evaluate and select application strategy options and vendor solutions against business requirements, technical architecture standards and desktop standards;
• Develop strategies for change management and institutional support related to the implementation of new financial systems; and
• Develop high-level implementation strategy, detailed workplan and resource estimates for the next phase of work.
• Support cost-effective financial controls to address accountability for resource use.

Many universities of equal complexity to UCLA (e.g., Michigan, Cornell, Harvard) have recently initiated projects to replace their core financial systems.
D. Benefits

The following benefits should be achieved through the recommendations in this section:

- Releases departmental resources by reducing need to maintain shadow, local databases that duplicate data maintained centrally;
- Provides an institutional process for gaining support for major administrative system initiatives, establishing institutional priorities and developing institution-wide architectural standards;
- Ensures alignment between administrative computing projects and institutional objectives and priorities;
- Improves accountability mechanisms for ensuring appropriate use of resources;
- Allows for greater fungibility of technical resources and economies of scale in training and support;
- Improves management information for monitoring, planning and control purposes;
- Enhances distribution of management information to decision makers;
- Implements a stable and flexible technical infrastructure that can easily adapt to new requirements; and
- Clarifies the relationship and roles of all parties involved in the development and maintenance of administrative systems, reducing conflict and confusion.
VII. INFRASTRUCTURE AND ACCESS

A. Overview
A.1. Definition

This section describes how UCLA should provide appropriate network and desktop capabilities to faculty, students and staff. “Infrastructure” refers to the campus backbone network, local area networks, physical and virtual linkages between buildings, links between UCLA and the outside world and required configurations for personal computers. “Access” refers to the ability of UCLA’s faculty, students and staff to connect to systems and services necessary for their functions.

A.2. Current Organizational Overview

• Campus Telecommunications and Network Services (CTNS) is responsible for managing UCLA’s data and voice networks and was recently merged from two separate organizations, Campus Network Services and Telecommunications.

• CTNS provides the following services for UCLA:
  − Local and remote network connectivity to UCLA’s backbone network;
  − A set of customer services that includes telecommunications consulting, customer service, product support, training and public communications (e.g., campus directory); and
  − Design, engineering, installation, maintenance and operation of UCLA’s telephone system, cable television system and the campus backbone data network.

• CTNS manages the UCLA Connected project, which was initiated in 1995. It most recently completed a pilot project (IBN) that implemented network connections in three UCLA buildings and is planned for institution-wide rollout over the next year.

• Local Network Coordinators in the schools, college and departments maintain LANs hooked into the campus backbone network.

• Other major network operations exist. The Medical School and the Anderson Graduate School of Management (AGSM) maintain WANs connected to the campus backbone network. The Medical School provides direct ISDN access for selected faculty.
The Office of Academic Computing (OAC) operates a Microcomputer Support Office (MSO) that acquires and administers software site licenses, advises ASUCLA on its computer resale program and manages the Bruin OnLine (BOL) service. CTNS manages the Bruin OnLine modem pool.

There are local differences in computing requirements for students (i.e., AGSM requires laptop ownership, the Medical School requires desktop ownership, other schools and The College have no computer requirements).
B. Key Issues and Opportunities

B.1. There are opportunities to improve the clarity of CTNS’s mission and role as well as implement an effective governance structure for network planning and decision-making.

- There is no formal consensus regarding the boundaries of central network services (i.e., determining if the network stops at the wall plate, closet, floor or building).
- There is no formal consensus regarding the specific services that need to be provided by a central network group.
- No formal vehicle exists to effectively inject faculty review and support into central network decisions.
- There is wide agreement that an effective network infrastructure is now a strategic requirement for UCLA. Without a clear definition of central services required to achieve this objective and a vehicle for ensuring institutional support, CTNS will find it increasingly challenging to be successful within the UCLA environment.
- While UCLA Connected is viewed as a successful ongoing project, it will need institutional direction on how emerging technologies (e.g., Gigabit Ethernet, Switched IP) will be potentially migrated into the plan in the coming years.

B.2. The complexity of UCLA’s network topologies causes significant technical support, trouble-shooting and customer service difficulties.

- For certain institutional segments (e.g., College of Letters and Sciences, Medical School), network services are provided by three entities: CTNS for the campus backbone, school or college based WAN operations for the school or college WANs and department-based operations for LANs.
- The standard UCLA service model defines the schools and college as responsible for locally required network applications and local access and CTNS responsible for connectivity to institution-wide applications and Internet access. Some departments within the schools and The College provide Internet access to their constituents.
• Some schools, The College and departments are responsible for ensuring student access, yet many students receive access to certain institution-wide services through Bruin OnLine.
• Lack of standards for networking across different levels inhibits interoperability.
• This level of complexity causes three major problems:
  − The network structure in place in some schools or The College (i.e., local WANs) is not standardized, making for a more complex environment to ensure a secure network than a single WAN environment;
  − Trouble-shooting network failures is difficult, with extra work required to identify sources of failure; and
  − Some users are confused as to who supports their particular configuration and who is responsible for problem resolution.
• Email applications differ across the institution (e.g., Simeon, Eudora, MS Exchange, Pegasus), compounding interoperability problems, creating confusion for users and limiting directory capabilities.

B.3. Though UCLA is currently investigating options and developing a business plan for improving remote access, remote access to institutional network services is currently problematic for many faculty, students and staff.

• Faculty, students and staff must pay long distance charges to access UCLA modems outside of the local calling area.
• There are frequent delays in establishing a network connection due to high demand.
• Despite recent investments in expanded modems, demand continues to absorb new capacity.
• As distance education programs become more common and alternative work arrangements increase, the ability of UCLA to provide reliable, secure and fast remote access to institutional network services will become increasingly mission critical.
B.4. There is no institution-wide plan for continuous renewal of IT equipment for faculty, students and staff.

- Insufficient planning for technology upgrades has resulted in disparate and antiquated computing resources in many schools, The College and departments.
- There is inconsistent computing capability at the desktop level across the institution.
  - Some faculty, students and staff have no computers; others have old 286 machines; others have Pentiums, Silicon Graphics workstations and other advanced machines.
  - Decisions on equipment upgrade and replacement are decentralized, resulting in an uneven mix of policies and acquisition procedures across the institution.
- Universal use by faculty, students and staff of central services is difficult to accomplish in this inconsistent environment, where the wide range in quality and age of equipment makes it difficult to ensure minimum configurations for use of administrative applications and network services.

Without general consensus on minimal standards for desktop computing, it will be impossible to achieve the full benefits from the significant investments UCLA makes in new administrative systems, network access and information resources.
C. Recommendations

C.1. UCLA should migrate toward a set of standards to guide the UCLA Intranet and provide optimal integration and connectivity of distributed services.

- UCLA should complete the UCLA Connected Project, designed to install a minimum configuration of Switched Ethernet (10Mbps) network connection in every classroom and office at UCLA.
- A single wide area network standard that supports the entire institution, developed through a consensus-oriented process, will make it easier to support electronic communication and collaboration among faculty, students, staff and external colleagues. It will reduce the complexity and redundancy inherent in supporting the existing network structures.
- All new network installations that would make it difficult to connect to the single wide area network standard should be discouraged. The schools, college and departments should be encouraged to replace any proprietary network with those conforming to connectivity standards as developed and recommended by CTS in conjunction with UCLA departments and approved by the IT governance structure. The uniformity of network configurations within the standard should help ensure universal access to needed network services and information resources.
- The UCLA Connected Project must incorporate institutional input to remain flexible to accommodate future changes in technology as well as renewal of aging network technology. The ATM standard within UCLA Connected should be periodically evaluated to determine whether it is the best solution in the long term. Emerging technologies (e.g., Gigabit Ethernet, Switched IP) should be considered for potential migration when they are proven and ready for a production environment.
C.2. The role of CTNS should be expanded and clarified to ensure continual improvements in the availability and consistency of network services.

- Because of the recent merger of CTNS and new responsibilities as recommended in this report, UCLA should consider renaming CTNS along the lines of “Communication Technology Services (CTS),” which reflects its broader mission toward being a provider of electronic communications.
- CTS should be focusing on the following functions in addition to its current activities:
  - Acting as the primary institutional source of the standard operating WAN, intranet and remote access services (e.g., authentication and access control);
  - Managing the access and infrastructure portions of Bruin OnLine to ensure integration with institutional network plans and network operations;
  - Working with the ITPG to develop and communicate standards for connectivity and access, including maintenance of standards related to common object brokers, middleware, electronic commerce, data warehousing sourcing and extracts and other network and communications related issues;
  - Coordinating network installations across the institution to ensure appropriate configurations and connectivity;
  - Providing a single point of contact for expert advice and consulting on network issues;
  - Ensuring an appropriate level of coordination with local network coordinators;
  - Offering Virtual LAN management technologies to the schools and college preferring not to manage their own LANs;
  - Developing and recommending a strategy to ITPG for network services across the institution (e.g., printing);
  - Coordinating with IRITS and ITPG to implement and maintain the establishment of email addresses for UCLA’s entering students; and
  - Evaluating new network technologies and maintaining an ongoing plan for improvements to the campus backbone network and integration with external initiatives (e.g., Internet II).
VII. INFRASTRUCTURE AND ACCESS

- CTS should work cooperatively with local network coordinators to identify needs and technical options for LAN/WAN configuration and determine the best infrastructure choices.
- CTS should provide a set of standard central services to all faculty, students and staff (e.g., email, Internet access, wall plate access to campus backbone, access to library systems). CTS should also offer an additional menu of services that would be selected by local units. These additional services may include LAN installation and management as well as network consulting.
- These service objectives will require training and recruitment of new personnel skilled in network services such as VLAN, ATM and object brokers.
- CTS should examine outsourcing the maintenance, operations and support of hardware, such as switches, routers, servers and other physical infrastructure. In the corporate sector, organizations typically realize an average of twenty percent operating cost savings by outsourcing hardware maintenance and support.
- UCLA should view Bruin OnLine as an access tool for faculty, students and staff to use UCLA’s network resources. BOL has two components, one of access, requiring expertise in networking and operations technology, and the other of functionality, requiring content provision by academic departments. Management of Bruin OnLine as an access tool belongs within the organizational unit responsible for network access (CTS). However, there are other options worth consideration, for example, maintaining BOL within IRITS. Before finalizing the organizational responsibilities for BOL, UCLA should develop and confirm its long-term direction for BOL and assign accountability to the units with appropriate expertise.

C.3. Establish the Communication Technology Services (CTS) Advisory Committee comprised of local support and network managers from the schools, college and departments. The CTS Advisory Committee should have the following functions and responsibilities:

- Reviews and comments on annual objectives, plans and recommended standards from CTS;
- Serves as a sounding board for institutional decisions on IT infrastructure resource allocation and priorities;
• Serves as a communication conduit between CTS and the schools, college and departments; and
• Periodically assesses the performance of CTS and the Administrative IT Officer.

C.4. Provide and control remote access to UCLA’s network through a common, configurable user interface product.

• Investigate the current BOL product to determine whether it is the appropriate common interface tool to the UCLA intranet. If so, BOL software should be upgraded to accommodate interoperable CORBA-compliant object request brokers that allow for integration with various software applications.
• Configure the tool for specific users in a “tool kit” framework that provides access to specific academic and administrative applications depending on need.
• Maintain the tool in a manner similar to commercial software products, requiring a central support function that is responsible for revisions, upgrades and distribution of the product to the local units. Local units would in turn be responsible for user installation.
• Use the tool to provide access to a wide variety of content, including library systems, student records and instructional materials.

C.5. Develop an ongoing technological renewal policy and program to create specific minimum guidelines for upgrading desktop and laptop computers in the schools, The College and administrative departments.

• Formulate the policy through the Information Technology Planning Group (ITPG) in consultation with the central procurement and finance function.
• Streamline procedures for disposition of assets that involve reusing computers for faculty, students and staff as well as donations of equipment to charities or K-12 schools.
• Construct agreements with suppliers that have built-in upgrade provisions and timelines.
VII. INFRASTRUCTURE AND ACCESS

- Write the replacement policy so that it includes life expectancy of equipment purchases, transition of equipment and software and recycling sources for old equipment.
- Evaluate the level of local needs on a prioritized institution-wide basis through the ITPG.
- Encourage and assist local units to allocate a specified portion of budget toward continuous renewal of desktop resources.
- Establish a central fund to deal with special equipment replacement “emergency” requests due to local funding gaps.
- Prioritize, allocate, audit and monitor emergency requests through the central purchasing and financial control function in coordination with the ITPG.
- Develop a set of baseline technical requirements needed for every desktop at UCLA and a set of stratified standards indicating optimal equipment requirements for specific users.
- Publish standards and guidelines through the ITPG with coordination from the AITB.
D. Benefits

The following benefits should be achieved through the recommendations in this section:

- A minimum level of technical capabilities for everyone at UCLA;
- Economies of scale on integration and connectivity of distributed services, with benefits accruing to local departments;
- A networking center of expertise that understands key issues and the importance of stability and reliability in a changing technological environment;
- A standard network operating model that provides access to all constituencies (i.e., “haves and have nots”);
- Potential for providing specialized capabilities for researchers with special needs (e.g., high bandwidth);
- Management of remote access that is potentially transparent to the user;
- The ability of users to focus on content and not access method;
- Proactive and easy hook-up for new students unfamiliar with Internet access technology and choices;
- Ability to address the ongoing needs of changing technology and obsolescence;
- Appropriate asset accounting, inventory control and asset disposition; and
- Distinction of role for IRITS that focuses on research and instructional needs as opposed to access methods.
In the tables below, we outline a set of planning, organizational and technical projects that should be initiated to implement the recommendations in this report.

<table>
<thead>
<tr>
<th>Recommended Action Items</th>
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| 1. | Organize and charge AITB  
• Finalize mission  
• Appoint members  
• Develop, review and refine protocols and policies | Governance | Executive Vice Chancellor | Jun. 1997 |
| 2. | Refine and move forward on the UCLA Connected Project  
• Include institution-wide WAN standards and guidelines within project scope  
• Establish implementation project team  
• Develop detailed implementation plan | Technical | Administrative IT Officer | Jun. 1997 |
| 3. | Review and refine IT Strategic Plan with appropriate groups  
• Solicit feedback from the UCLA community  
• Refine and approve plan with Steering Committee | Institutional Planning | AITB | TBD |
| 4. | Define and plan implementation of CTS product and service objectives  
• Identify and evaluate product and service alternatives  
• Develop transition plan linked to the IRITS transition plan to the new service model | Organizational | Administrative IT Officer | Sep. 1997 |
## Recommended Action Items

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Type</th>
<th>Responsibility</th>
<th>Target Completion Date</th>
</tr>
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<tbody>
<tr>
<td>5.</td>
<td>Define and plan implementation of AITS service objectives</td>
<td>Organizational</td>
<td>Administrative IT Officer</td>
<td>Sep. 1997</td>
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<tr>
<td></td>
<td>- Define and confirm core services</td>
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<tr>
<td></td>
<td>- Assess impact on central administrative units</td>
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<tr>
<td></td>
<td>- Restructure organization to provide defined services</td>
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<td></td>
<td>- Develop transition plan</td>
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<td>6.</td>
<td>Conduct fast track faculty review of proposed Academic IT Officer and Instruction and Research Information Technology Services (IRITS) to identify immediately actionable recommendations</td>
<td>Institutional Planning</td>
<td>AITB</td>
<td>Oct. 1997</td>
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<tr>
<td>7.</td>
<td>Establish and fill IT executive positions:</td>
<td>Organizational</td>
<td>Executive Vice Chancellor, Administrative Vice Chancellor</td>
<td>Jan. 1998</td>
</tr>
<tr>
<td></td>
<td>- Establish and fill Academic IT Officer position</td>
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<td>- Establish and fill Administrative IT Officer position</td>
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<tr>
<td></td>
<td>- Establish and fill Director of IT Planning Group position</td>
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<td>Note: not all positions may require new personnel</td>
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<td></td>
<td>- Establish financial systems work team</td>
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<td></td>
<td>- Analyze business process and information/ control requirements</td>
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<td></td>
<td>- Assess existing financial systems capabilities and viability</td>
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<td></td>
<td>- Identify and evaluate technical options</td>
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<td></td>
<td>- Develop long term financial systems improvement plan and business case</td>
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</table>
## VIII. IMPLEMENTATION PLAN

### Recommended Action Items

<table>
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<th>No.</th>
<th>Project Name</th>
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<th>Responsibility</th>
<th>Target Completion Date</th>
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<tbody>
<tr>
<td>9.</td>
<td>Organize and charge the Administrative Advisory Committees</td>
<td>Governance</td>
<td>Administrative Vice Chancellor</td>
<td>Jan. 1998</td>
</tr>
<tr>
<td></td>
<td>• Establish AITS Advisory Committee</td>
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<td></td>
<td>• Establish CTS Advisory Committee</td>
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<td>10.</td>
<td>Organize and staff IT Planning Group</td>
<td>Organizational</td>
<td>Academic and Administrative IT Officers</td>
<td>Jan. 1998</td>
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<tr>
<td></td>
<td>• Establish infrastructure and supporting processes</td>
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<td></td>
<td>• Recruit/ reassign staff members</td>
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<td></td>
<td>• Define detailed planning objectives and milestones</td>
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<td></td>
<td>• Define overall communication and change management program</td>
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<tr>
<td>11.</td>
<td>Restructure OAC into IRITS</td>
<td>Organizational</td>
<td>Academic IT Officer</td>
<td>Jan. 1998</td>
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<tr>
<td></td>
<td>• Perform detailed functional review of instructional IT resources across central administration</td>
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<td></td>
<td>• Design new organizational structure that consolidates synergistic functions</td>
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<td></td>
<td>• Develop transition plan and implement</td>
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<td></td>
<td>• Establish management reporting work team</td>
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<tr>
<td></td>
<td>• Develop institution-wide needs analysis</td>
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<td>• Identify and evaluate technical options</td>
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<td></td>
<td>• Develop short term improvement projects and business case</td>
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### Recommended Action Items

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<tr>
<td>13.</td>
<td>Develop plan for common remote access capability using BOL</td>
<td>Technical</td>
<td>Administrative IT Officer</td>
<td>Jan. 1998</td>
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<tr>
<td></td>
<td>• Integrate into CTS and establish project team</td>
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<td></td>
<td>• Identify and evaluate product and technology alternatives</td>
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<tr>
<td></td>
<td>• Develop business plan for new BOL product</td>
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<tr>
<td></td>
<td>• Determine implementation priorities and sequencing</td>
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<td></td>
<td>• Launch first phase of BOL strategy</td>
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<tr>
<td>14.</td>
<td>Organize and charge the Academic Advisory Committees</td>
<td>Governance</td>
<td>Executive Vice Chancellor</td>
<td>Mar. 1998</td>
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<tr>
<td></td>
<td>• Establish IRITS Advisory Committee</td>
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<td></td>
<td>• Establish the Campus IT Advisors</td>
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<td>15.</td>
<td>Define and plan implementation of IRITS service objectives</td>
<td>Organizational</td>
<td>Academic IT Officer</td>
<td>Jun. 1998</td>
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<tr>
<td></td>
<td>• Confirm definition of core services</td>
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<td></td>
<td>• Evaluate and modify institutional commitment to unfunded research</td>
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<td></td>
<td>• Evaluate and modify institutional commitment to instructional technology</td>
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<td></td>
<td>• Support unfunded research and instructional technology support</td>
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<td>• Develop operating plan and budget</td>
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<td></td>
<td>• Develop transition plan to new service model</td>
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<tr>
<td>16.</td>
<td>Define and plan implementation of institution-wide two tier support structure</td>
<td>Organizational</td>
<td>Director of IT Planning Group</td>
<td>Jun. 1998</td>
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<tr>
<td></td>
<td>• Convene working group of school and college representatives to develop</td>
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<td></td>
<td>• Recommend detailed changes to schools, The College and central IT</td>
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<tr>
<td></td>
<td>• Organizational structures</td>
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<td></td>
<td>• Develop transition plan</td>
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</table>
## VIII. IMPLEMENTATION PLAN

### Recommended Action Items

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Type</th>
<th>Responsibility</th>
<th>Target Completion Date</th>
</tr>
</thead>
</table>
| 17. | Develop proposal for IT architecture and standards  
     • Develop and refine minimum desktop standards and guidelines  
     • Develop and refine minimum administrative system standards and guidelines  
     • Develop and refine minimum instructional software standards and guidelines  
     • Develop and refine minimum cross discipline research computing standards and guidelines  
     • Develop communications and roll-out plan | Technical | Director of IT Planning Group | Jun. 1998 |
### Proposed Information Technology Strategic Plan

#### VIII. IMPLEMENTATION PLAN

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Type</th>
<th>Responsibility</th>
<th>Target Completion Date</th>
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<tr>
<td>18.</td>
<td>Develop plans for full student access to computing resources</td>
<td>Technical</td>
<td>Academic IT Officer</td>
<td>Jun. 1998</td>
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<tr>
<td></td>
<td>• Develop planning guidelines and support for schools and The College</td>
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<td></td>
<td>• Analyze and develop school and college specific strategies for universal student access</td>
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<td>• Integrate school and college based student access strategies as appropriate</td>
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<td></td>
<td>• Inventory IT readiness of institutional classrooms and labs</td>
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<td></td>
<td>• Develop classroom and lab upgrade plans based on results of school and college needs and strategies that allow for economies of scale among schools and The College</td>
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<td></td>
<td>• Develop improved institutional classroom and lab management processes</td>
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<td>• Appoint an individual within IRITS with responsibility for coordinating distance learning programs</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>Asynchronous Transfer Mode</td>
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<td>CCIIP</td>
<td>Chancellor’s Committee on Instructional Improvement Program</td>
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<td>CDI</td>
<td>Center for Digital Innovation</td>
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<td>CIO</td>
<td>Chief Information Officer</td>
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<td>College Library Instructional Computing Commons</td>
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<td>Campus Network Users Group</td>
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<td>CORBA</td>
<td>Common Object Request Broker Architecture</td>
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<td>WWW</td>
<td>Worldwide Web</td>
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</table>
The following reports and working papers provide insight into the development of this report.

**Bruin OnLine Report**
Completed by the Bruin OnLine project team in April 1997

**Focus Group Notes (interim work product from IT Strategic Planning project)**
Collected by IT Strategic Planning Team and distributed to participants January 1997

**Information Technology Interview Themes at UCLA**
Prepared by IT Strategic Planning Team in November 1996

**Key Issues in Information Technology in Higher Education**
Prepared by IT Strategic Planning Team in November 1996

**Recommended Reorganization of Campus Computing**
Prepared by the IRCC in January 1996

**Service Advisory Board (SAB) Proposal**
Prepared by the Responsibility Center Management (RCM) team in March 1997

**UCLA Connected**
Prepared by the IBN project team within CTNS in March 1997

**UCLA Information Technology Strategic Planning Process**
Prepared by IT Strategic Planning Team in September 1996