2003 Information Technology Master Plan

Prepared for

Boston Information Technology Council

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2003 Information Technology Master Plan for UMass Boston

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Introduction. Recognizing the importance of facing the complex constellation of issues involved in information technology, the Boston Information Technology (BIT) Council initiated a project to develop an IT Master Plan for UMass Boston (UMB) at the behest of UMB senior leadership. The BIT Council established a set of goals to be addressed by the Master Plan and engaged Mass Networks Education Partnership to facilitate the process.

The Seven Goals. The BIT Council established the essential goals to be addressed by the IT Master Plan. These goals are:

- **Enhance educational excellence**.

  Use technology to improve learning through appropriate faculty and student training, expansion of online, multimedia, and other electronic resources, and adequate support for research and teaching.
- **Establish cohesive IT governance**.

  Create the structure necessary to enable efficient centralized management with participatory, decentralized input for planning, authorizing, and implementing IT policies.
- **Change the paradigm for technical support, training and professional development**.

  Use the new IT governance structure to foster communication and collaboration within a responsive, client-oriented support, training, and professional development system.
- **Support administrative effectiveness.**

  Employ standards across campus for increased access, interoperability, and efficiency of administrative systems and data.
- **Improve capacity of and access to technical infrastructure**.

  Expand on current infrastructure to create a ubiquitous managed-access environment for a wide array of campus resources.
- **Support a richer community life for UMB stakeholders**.

  Collect campus resources and make them easily accessible to increase awareness and communication amongst the campus community.
- **Align financial resources with UMB IT vision**.

  Institute a measured and consistent budget that realistically reflects the needs of the campus and allows for not only the continuation of current IT initiatives but for future growth.

The Master Planning Process. In order to discover how best the major goals can be achieved, a wide-ranging investigation was initiated, involving the review of UMB planning documents, examination of peer institution reports from across the country, completion of a student survey and student focus group, and additional interviews with more than 60 faculty, staff, students, and administrators across the campus. Presentations were made to the Faculty Council, the College of Management, and the College of Arts and Sciences. *[see*

appendix C for a complete list] A heavily advertised public forum was held, and this document in several iterations has been available on the UMB website (*www,moveITforward.umb.edu*) for public comment for six weeks. Emerging from this investigation was a strong sense of the importance and validity of the seven goals along with widely-shared views on how to move IT forward:

- **Need to Improve Support for—and Impact of—Academic Computing**

  To take better advantage of the opportunities afforded by IT and to maintain UMB's position among its peers.

- **Need for overall Governance Leadership Structure**

  To provide direction, coordination, and management of IT activity

- **Need for Coordinated Strategic Planning & Policy Development**

  To ensure stability and efficiency, while promoting widespread implementation and innovation in all parts of the educational process.

- **Need to Rebuild Trust and Momentum**

  To win over skeptics and create a climate for continued progress.

- **Need to maintain the Infrastructure and User Equipment at Best Practice Levels of Implementation**

  To improve security and remove obstacles that can prevent successful faculty and student use of technology and to maintain UMB's position among its peers.

Summary of Recommendations. Many voices on the campus have offered bold initiatives to bring together fragmented pockets of academic technology, to introduce broad cost-saving initiatives, and to accelerate the agenda for IT innovation in general. This plan offers an approach for ensuring success for all these initiatives by promoting their independent importance while recognizing the value of coordinating their development. The bulk of this document is organized around analysis and actions related to each of the seven original goals. The following list pulls out the major recommendations with a very brief statement about each.

1. **CIO.** Installation of a Chief Information Officer for UMB to marshal existing IT capacity to meet University goals. Consolidation of IT responsibilities will require job reassignments rather than creation of additional positions.
2. **Purchasing.** Implementation of coordinated IT purchasing to reduce costs, promote standardization, and improve strategic IT planning. Savings in the range of $300,000 for UMB and $1.5m for the University of Massachusetts per year may be anticipated.
3. **Wireless.** The wire plant upgrade project will permit installation of wireless access capacity to the Campus Center by June 2004 and subsequently to other buildings.
4. **Faster network connections.** The current upgrade project, enabling switched 100 Mb internet access from all campus desktops, while a significant improvement for many users, is an interim step to state-of-the-art speeds in the near future.
5. **Internet 2.** As part of the University of Massachusetts statewide plan, UMB will become an I2 campus in 2003. Dramatic improvement in bandwidth will satisfy demands for the UMB community for years to come.
6. **Media Center.** The Media Center plan, when fully integrated with the IT Master Plan, represents a remarkable step forward not only by offering coherent, centralized media services to students and faculty, but also by presenting a model for collaboration among campus units with distinct but related expertise.

7. **Desktop Rotation.**The desktop rotation plan will bring all campus stakeholders to a higher level of IT capacity, enabling a significant improvement in individual productivity while dramatically reducing tech support problems. The new four-year rotation plan is expected to cost $270,000 in the current fiscal year and $469,000 for each of the following three years—with no direct charges assessed to the departments—a significant benefit to individual department budgets. *[see appendix 4.1.4]*

8. **Kiosks and Labs.** By deploying computing capacity in accessible locations, students will be able to access information more conveniently and effectively, improving their learning experience and their appreciation of campus life.

9. **Information**. A major effort to communicate to stakeholders answers to all questions regarding rapidly-evolving IT resources will speed access to tech support, training resources, and IT facilities.

10. **Academic Innovation and Instructional Technology.** By uniting the strong but disconnected groups that advance teaching, and provide support for academic technology, the University will form a unit that will lead—and demonstrate—academic excellence**.**

The balance of this document details specific recommendations for each of the original seven goals.

Goal 1. Enhance Educational Excellence

1.0 Academic Technology Overview

Academic Computing: the intersection of instructional innovation and technology-based infrastructure.

Increasingly, effective teaching and learning involve the use of academic computing; by bringing the campus leaders of pedagogical change together with both instructional technology specialists and academic computing experts into a single organizational unit, to be called the **Academic Computing Unit**, the University can both develop new ways of teaching and manage the academic uses of technology without conflict.

Accountability at the crossroads. Some universities have found that the pedagogy specialists want facilities or technical capacity that the technologists have not made available—while simultaneously, the technologists set up technical spaces or tools that educators do not exploit. UMass Boston can ensure a balanced approach to instructional and technological innovation by bringing both these roles into the Academic Computing Unit.

Among many universities emphasizing the separate importance of teaching excellence and academic technology are the University of Arizona, the University of Colorado at Boulder, George Mason University, and the University of Memphis.

[See appendix A - 1.0 for additional discussion and appendix B for an organizational chart.]

1.1.0 Description of Responsibilities

Instructional Innovation. At present a number of departments, organizational units, and individual faculty members at UMB independently promote improvement in pedagogy, frequently using the services and facilities in the Instructional Technology Center. Similarly, technical training of all kinds takes place without central coordination. These independent initiatives will meet with more success when brought together in the newly consolidated Academic Computing unit, which will:

- Coordinate all professional development and technical training for the University regardless of which unit or outside organization actually provides the training.
- Facilitate faculty integration of Prometheus, the use of web-based academic tools, and provide other support requiring expertise with both instruction and technology.
- Leave essential curriculum development and course content decision-making to other units, focusing instead on tools and instruction. Because the fundamental direction for educational change will be determined by the Provost, Academic Computing will maintain a dotted-line relationship with the Provost's office.

Academic Technology. Currently, Computing Services' Academic Computing unit, the Instructional Technology Center, and other groups around the University all provide logistical support, facilities management, technical expertise, and training services. These services should be brought together in the new Academic Computing unit to:

- Manage the Technology-Enhanced Classrooms, all computer labs, the assistive technology facilities, and all media center facilities (although not the media collections, which should be maintained by the Library).
- Control scheduling of all technology-based academic facilities on the UMB

campus. Department or college-based facilities will continue to provide priority use to the units in which they are located. Centralized scheduling will eventually permit more effective use of all computer labs.

- Provide technical support and expert assistance for research-driven computing challenges.

Website Operations. As web-based tools gain wider use for pedagogical purposes, support of academic websites will grow in importance. The Website Operations Unit will therefore collaborate in the academic support effort; the Web Manager will report to the Director of Academic Computing. *[For further discussion on website infrastructure and realignment of roles, see section 5.3.0.]*

Clear division of responsibilities—with one manager. The Academic Computing unit will facilitate pedagogical innovation and professional development for faculty and coordinate technical training for both students and faculty; the new unit will also enable the effective use of technology by deploying staff and technical resources to meet campus requirements. The inclusive organization can adjust roles and responsibilities to assign staff members to a more focused range of tasks: a training specialist, for example, could be freed from dealing with backups, virus protection, and maintenance. A website designer might be exempted from configuring new computers or managing password changes. The new unit, with better coordination of tasks and responsibilities, will prove itself more efficient and effective at improving teaching, supporting instructional technology, and implementing website improvements.

1.2.0 Instructional Innovation

Coordinate and extend current initiatives in instructional innovation.

- The Academic Computing Unit will be driven, ultimately, by academic objectives, and the Director of the unit will therefore maintain a dotted-line reporting relationship to the Provost. Technology will play an increasingly crucial role in the service of academic objectives, as faculty interest heightens not only in pedagogy generally but also in various forms of technically-enhanced learning.
- The mission for the Academic Computing Unit will involve transferring curriculum initiatives into practice, developing methods of improving technical competencies, and facilitating wider use of instructional technology. While much about these topics is outside the scope of the current proposal, the implementation of academic innovation, originating from elsewhere in the University, must be recognized as a driving purpose of the IT organization and hence for the IT Master Plan.

1.2.1 Planning

Planning

- A major threat to any innovation initiative is the current absence of consensus on the desired technology competencies for students and use of technology by faculty. The Academic Computing Unit should assist the Chancellor, Provost, and deans in determining desired academic objectives for student technology competency and information literacy in terms of curriculum and achievement.
- With projected objectives established, the Academic Computing Unit should propose generic prerequisite competencies for various course types and levels (individual courses or activities may have specific requirements—which should be explicitly identified in course descriptions and other documents). Incoming students should be evaluated for technical

competencies—as they are for writing and other skills—and the Academic Computing Unit and others should develop UMB's capacity to bring students up to expectations. George Mason University's *Technology Across the Curriculum* program, by way of example, proposes ten specific IT goals for students and IT skills and literacy competencies at "essential" and "advanced" levels; the competencies are further defined for the humanities, social sciences, sciences, and multi-departmental programs. *[See appendix 1.2.1]*

- The University must define levels of technical supplementation and integration faculty are expected to bring to their courses; the Academic Computing Unit will need to provide requisite professional development to faculty in support of such goals. Innovative faculty members have collaborated with the (current) Instructional Technology Center to develop successful courses; the Academic Computing Unit should extend these efforts using a cost-based model to test both academic impact and financial requirements for successful innovation. Academic innovation comes at a price, but the Pew Charitable Trust's *Program in Course Redesign* has demonstrated around the country that activity-based costing, institutional preparedness, and a trained and motivated faculty can improve learning within financial constraints. *[See appendix A - 1.2.1]*

1.2.2 Strategies

General Strategies for promoting innovation in learning.

- **Actively supporting faculty innovation.** Time and expense associated with course preparation are considered a significant disincentive by faculty. Moreover, academic oversight and financial control of on-line offerings currently appear controversial to many stakeholders, stalemating some initiatives. In response, the Provost must support and encourage faculty use of technology by offering incentives for meritorious accomplishment, determined by annual reviews. Course offerings across the curriculum should *generally* (not every course—not to an identical extent) include increasing levels of technology integration. As faculty become more familiar with Prometheus's tools, for example, they should be expected to move from static posting of syllabi to more interactive technology tools.

- **Aligning curriculum, IT skills training, and competency expectations.**
  - UMB students report the need for better synchronization of curriculum, targeted IT skills training, established levels of competency required for courses, and faculty capacity to coordinate solutions to these issues. Not surprisingly, students indicate that IT skills training is most effective when tied directly to course assignments (faculty are similarly far more motivated to learn new technology when facing a specific teaching challenge).
  - In a survey conducted in November 2002 by Prof. Xiaogang Deng of the Sociology Department, half the students indicated that they would like to see greater use of technology by their instructors. *[See appendix A - 1.2.2]*

1.2.3 Instructional Innovation--initiatives

Examples of specific instructional innovation initiatives:

- **Sharpen capacity to provide teaching support.** To promote innovative uses of technology in the classroom, the Academic Computing Unit can be staffed to provide just-in-time on-site assistance to faculty. The Academic

Computing Unit can collaborate with departments in setting up mentor programs that match technically-savvy faculty members with those with pedagogical experience. The Academic Computing Unit will coordinate with department- or college-paid staff to provide pedagogical support through programs such as faculty liaisons. *[See section 3.2.4]*

- **Expand use of distributed learning** (Teaching that is widely disseminated through technology)*:* Expand the capacity for creating and delivering learning through a variety of technical methods and train faculty in the successful implementation of instructional techniques, including:
  - Traditional distance learning (video-transmitted lectures).
  - Digital enhancements and extensions of classroom interaction.
  - Activities for direct student engagement for advanced or remedial work.
  - Teaching and communication components of Prometheus.
- **Promote Prometheus**. The Director of Academic Computing must champion Learning Management Software (Prometheus or IntraLearn) if widespread adoption is to be achieved. Faculty in all colleges must be supported during the migration to Prometheus as the commonly-accepted tool for communicating basic course information to students and encouraging electronic interaction. Leadership must be proactive in coordinating training and support for Prometheus and developing pilot/mentor programs.
- **Demonstrate successful IT-enhanced course improvement by starting with a highly visible course.** In order to develop the capacity for IT-enhanced curriculum and course management, a significant planning effort is required. Starting with the Pew Course Redesign initiative as a model, the Academic Computing Unit will need to assess readiness at both the institutional and course level, to focus the project on improving student learning, and to complete detailed financial planning. A documented success would persuade wider adoption of innovative instruction.
- **Improve access and awareness of individualized, interactive self-education tools**: Use technological tools to help students extend their learning experiences outside of the classroom through tutorials, activities, references, and research materials. Since technology skills are most effectively acquired when the tutorial is tightly connected to an academic objective, specific modules can be developed so that students can absorb the skills training on a just-in-time yet cost-effective way. In addition, discussion boards and other tools should be available for students to engage in individual and group work on assignments, projects, and study.

1.3.0 Academic Technology

Consolidation of Academic Technology facilities and services.

Academic technology is currently supported by Computing Services, the Instructional Technology Center, the Library, and the academic departments' specialized computer labs. The Director of Academic Computing should manage the labs currently under the Computing Services and the ITC; The Library and departments should continue to manage their own facilities, although campus standards for lab management, once established, will permit Academic Computing to more efficiently support these facilities. Consolidated management of technology-based facilities under Academic Computing will result in more effective service from the faculty point of view and a reduction in operational complexity. By handling the technical and facility issues, the Academic

Computing Unit enables the users of the facilities to focus on their missions without technical distractions.

- **Increasing efficiency and effectiveness**. Like its counterparts at many institutions such as the University of Georgia, the University of Memphis, or George Mason University, Academic Computing will provide a range of services in all technology-based facilities. It is important to recognize the potential benefits to the University of this consolidation.
  - *Efficient operations.* Instead of remaining in a specific building or department, constrained by organizational boundaries, a member of the unit can be assigned to fill in for another staff member whose absence might otherwise require a computer lab to close for a day.
  - *Flexible response to demands.* a facility designated for only one activity, video screening, for example, could be used for a skills training session without requiring approval by multiple department heads. As demands for Academic Computing shift, the unit can respond by retraining staff rather than permitting productivity to decline.
  - *Standardization improves productivity.* By establishing a common set of software applications and practices and procedures for all labs, faculty and students will be able to get work done anywhere without losing time.
- As part of the IT organization, Academic Computing would collaborate closely with the Help Desk, a unit of Computing Services, to coordinate support.
- The Academic Computing Unit would supply expertise to departments, institutes, and colleges for technical planning. *[See Appendix A - 1.3]*

1.3.1 Department Computer Labs

Department computer labs must be migrated towards campus-wide standards for basic operation while still allowing local autonomy regarding the use of specialized hardware and software. As departmental labs adopt common operational protocols and standards, the central Help Desk will be able to assume a more effective support role, although support will remain limited for non-standard software and hardware and for specialized computing tasks. *[See section 2.5.3.]*

1.3.2 Central Scheduling

All technology-based facilities on the campus should be scheduled through the Academic Computing unit. Departmental labs and other facilities, such as the new Clark Taylor Center, should permit priority booking by the hosting department, but a determined effort to more efficiently use campus facilities is required to keep technology costs as low as possible. The purchase of scheduling software, such as CollegeNet's *R25* and *Schedule 25* space management software, is currently under consideration.

1.4.0 Academic Infrastructure

Decision-making concerning technology-centered facilities must be driven by academic objectives.

As demands on the academic infrastructure increase, both the number and type of technology-centered facilities should be expanded in a consistent fashion. Thus, the Academic Computing Unit will oversee all existing and new facilities—regardless of who the principal users are—to ensure adequate planning, support, and standardization. Faculty and staff experience with these facilities suggests

that plans for expansion begin with determination of academic requirements. Though UMB must decide which academic goals it wishes to pursue, regardless of the ultimate goals the following academic infrastructure recommendations are considered baseline based on reviews of peer institutions. *[For statistics about academic infrastructure, see Appendix A - 2.4.]*

1.4.1 Technology Enhanced Classrooms

Technologically-Enhanced Classrooms (TECs).

A TEC is a classroom equipped with a faculty computer and an installed document/digital projector. The TECs are increasingly popular, and as more faculty members become adept at exploiting the capabilities of these facilities, the more the demand for them will increase.

- Create 14 new TECs of varying size to bring the total to 30.
- If the demand is exceedingly large, new TEC carts can be acquired, each with a single laptop and projector that can be easily set up in various rooms. TEC carts are labor-intensive to deploy and limited in utility; the long-range goal should be to increase in the number of TECs.

1.4.2 Multiple use space

Multiple use space in classroom buildings.

Technology-based activity has steadily increased and is likely to continue to grow for the foreseeable future. At present, general use computer labs are crowded, unattractive facilities, with hanging buckets to catch drips. Some of the teaching labs, even though equipped with up-to-date computers, must remain in tight, old-fashioned classroom formation because lack of space precludes more learning-friendly configurations. Moreover, the teaching labs are too small to accommodate standard-size classes of the College of Management The general use labs, the teaching labs, and media production facilities will nevertheless remain in high demand.

When initiating plans for expansion of technology-based educational space, planners find that calibrating the demand for each type of technology and committing specific space to meet the demand is difficult. Now an opportunity to meet all demands—and staff these facilities economically—presents itself. When the Campus Center opens, large spaces in all three classroom buildings will become available. A large, flexible facility can be set up in each building by relocating the equipment from existing labs in the basement of Healey Library to set up the new spaces for use.

- **Multiple Use:** each of the three new facilities can include, in contiguous space, a general use computer lab area, teaching labs of various sizes, and smaller spaces for multimedia use or student cooperative learning groups. As technology needs and uses change, it will be possible to make adjustments without major expense or disruption. Academic Computing should consult with the Registrar and other course planners in determining the sizes and configurations of teaching labs.
- **Efficient Staffing:** With reduced number of entry points for security, staff can monitor all of the work spaces within the lab area. It would be possible to staff each of the three lab areas with a technical support staff person and a media specialist to handle essential media activity; sophisticated media production should be limited to a single location. Additionally, a media viewing area should be set up in the library because the media collection should be housed there.

- **Increase number of lab computers—and opening hours—to meet growing demand.** Throughout the master planning process interviewees repeated the plea for more computers in the labs.
    - Create enough lab space for 350 desktop computers and a 30:1 undergrad-computer ratio. UMB currently has 284 general use computers and an undergrad-computer ratio of 36:1.
    - Have one lab stay open for extended hours and, if demand justifies extension, during the weeks around midterms and finals. Stagger staffing and schedules of labs to accommodate UMB's unique student usage patterns.
    - Create links to software/hardware tutoring which will be available on request and regular open-enrollment sessions for training. *[See section 3.3.0.]*
    - File input (via CD, floppy, etc.) should be available at each lab. Access to network resources (course materials, university info, student records, etc.), the Internet, and personal, secure folders on campus servers should be available with authentication.
- **Department Labs:** Continue to support and standardize existing specialized labs within departments designed for particular applications (e.g., psychology, computer science, etc.). Though these labs are physically located in specific departments, they will permit general use, with scheduling handled centrally *[see above, section 1.3.2.]*. Department or specialized users get priority use and on-site tutoring is available for specialized software/hardware.
    - Create wireless hubs near labs for laptop and PDA access to network and printers. [See below and section 4.1.3]
    - Create extra desks in labs with laptop access only.
    - All computer labs dynamically post the number of available terminals on web so students and faculty know which labs have space.
- **Kiosks**: secured single or double computer stations located at high-traffic areas around campus. No file input allowed (no floppy disks) and no access to CPU itself.
    - Kiosks greatly increase the fixed access points around campus in a cost-efficient and easily supported manner, allowing for greater communication and connectivity for students without wireless laptop connections. Visitors as well as campus community members would be provided appropriate access to Internet and campus information services.
    - Create at least 10 kiosks in such areas as: cafeterias, library lobby, classroom building lobbies and foyers, gym, new Campus Center, etc.
    - Stations only allow authenticated access to network resources, file server, and Internet.
    - Via kiosks, give students access to a wide variety of campus information, such as course registration, course information, drop/add courses, grade reporting, admissions information, admissions status, address change, financial aid inquiry, financial aid status, billing inquiries, fees payment, campus activities, bulletin boards, Placement Office inquiries, medical information, student surveys/elections, ticket information/ordering and Campus Center events.

- Kiosks are inexpensive machines that should only have access to productivity, Internet browsing, and communications software.
- No printing.
- 10 minute time limit that is very loosely enforced.

- **Printer Kiosks:** networked printers located in TECs, computer labs, mini-labs, and library.
  - After authentication, users can print to local printer.
  - Students are currently allowed 10 pages per print job at no cost. This is a simple but effective method of balancing convenience and cost which should remain in effect unless further investigation suggests a change in this policy is warranted.
- **Wireless**: access points for authenticated wireless connection to the campus network.
  - In the new wiring plan, include wireless access points in every classroom and common space on campus, including outdoor areas near buildings.
  - As described in the Campus Center grant proposal, purchase 1000 wireless network cards for laptops to loan or sell at a subsidized rate to students.
  - The wireless access should strive to cover over 50% of the campus, especially areas near existing labs, classrooms, the library, the Campus Center, exterior open spaces, cafeterias, and building foyers. [See section 4.1.3]
- **Video-conferencing facilities:** room equipped for simultaneous digital video and projection.
  - Add 2 new video-conferencing facilities to Campus Center, as described in the grant proposal, and keep existing video-conferencing (ITV) facilities.

1.4.3 General Academic Infrastructure

Coordinating course registration and management for effective use of Labs and TECs. Course registration and scheduling must be more effectively coordinated to ensure that courses are correctly and efficiently scheduled in labs and TECs that can accommodate the correct number of students. TEC and lab locations and sizes should be listed on the web for easy access. If the faculty make their special IT requirements known 60-90 days before the beginning of the semester, the Academic Computing Unit can handle software licensing or lab configuration issues in a timely manner.

Prioritize funding for academic infrastructure. The TECs, labs, and requisite support staff must be consistently funded in order to remain reliable and effectively used.

Adaptive technologies should be incorporated into all new project planning and available in every lab on campus. As technology use becomes ubiquitous, it is imperative that no student is left without appropriate resources and assistance.

1.5.0 Remote Access

Develop a remote access strategy to meet academic and administrative objectives.

- Improve off-campus accessibility for faculty by allowing authenticated access through the web to network resources, school announcements and

bulletins, course information and enrollment data, electronic library resources (such as journals), and web-based course management tools (such as Prometheus).

- Improve off-campus accessibility for students by allowing authenticated access through the web to network resources (such as personal folders on servers), school announcements and bulletins, course information, electronic library resources and catalogs, and web-based course portals (such as Prometheus).
- The remote access plans should parallel the on-campus accessibility of resources that will become available through upgrades to the campus infrastructure. *[See sections 1.4.1 and 1.6.3.]*

1.5.1 Portal Project

UMass Portal Project.

- UMB will participate in the Portal Project initiated by the UMass CIO. As part of this process it will be important to ensure that specifications dovetail with UMB administrative and academic goals and requirements, such as the type and availability of remote and on-campus resources. *[See section 1.6.0.]*
- UMB can become a leader in the Portal Project by creating access to a number of campus resources through its campus portal, which would set the precedent for the larger UMass portal.

1.5.2 Off-campus opportunities

Other access routes.

- Investigate opportunities to improve relationships with feeder schools—Boston K-12 & community colleges—by offering web access to information resources.
- Identify requirements for supporting access for non-traditional students, including available access from any Internet connected home or public computer to campus information, network resources (such as a file server), and course information.

1.5.3 UMB Digital Resources

Improve access to digital resources.

Identify specific requirements—and opportunities—for enhancing academic and administrative objectives by improving access to UMB digital resources such as:

- Email
- Course registration and advising
- Course information
- Grades
- Admissions information and status
- Address changes
- Financial aid inquiries and status
- Billing inquiries and fee payment
- Campus activities
- Bulletin boards and chat rooms
- Student work opportunities
- Student life information—including student interests, expertise, employment opportunities
- Student surveys and elections
- Ticket information and ordering
- Campus events and calendar
- Library, media, and digital resources

1.6.0 Professional Activities

Provide opportunities for faculty to leverage electronic resources for use in their scholarly work.

The Academic Computing Unit should identify, promote, and replicate best practices for use of technology in research and professional activities.

- Work with library to facilitate access to on-line research data and publications. The library should establish the objectives and purposes of such a project; The Academic Computing Unit will collaborate by providing the necessary technology, including required bandwidth, to ensure successful use.
- Create electronic forums for interactions between faculty at UMB and peers at other institutions.
- Increase collaboration among departments and colleges through shared academic database development. For example, the Academic Computing Unit could provide the technology to assist the Art Department with digitizing its slide collection in collaboration with the Library, which could provide cataloging expertise.

1.7.0 Technology Competency and Information Literacy

Promote deepening of information literacy and technology competency.

Supporting the extension of efforts to integrate technology skills and information literacy into the general education requirements as well as higher-level course offerings. The Library, a strong promoter of information literacy, and several departments relying heavily on technology, will benefit from collaborative support from the IT unit.

For this objective, the IT organization serves in a supporting role only. This objective is included in the Master Plan because it raises attention to the academic significance of information technology as a subject of study as well as a tool kit for other academic and communication pursuits.

1.8.0 Collaboration with Continuing Education

Strengthen the collaborative relationship with the Division of Corporate, Continuing, and Distance Education.

The consolidation of IT units and facilities will make new initiatives significantly easier to coordinate, especially for the Division of Corporate, Continuing, and Distance Education (CCDE). Because of the CCDE's significant capacity to raise revenues, the CIO should foster a stronger partnership with the CCDE to develop new programs. Continuing Education revenues could be used to finance the development of new computer lab space, for example, with the commitment to permit priority use for Continuing Education programs.

- The CIO should support Continuing Education's effort to expand offerings through UMassOnLine, providing technical services and Prometheus training to build the professional capacity to offer more on-line courses as well as hybrid (part on-line, part in-class) programs. Continuing Education could facilitate this effort by supporting training or facility expenses.
- The technology-centered facilities on campus should be made available to Continuing Education on evenings and weekends and during the day when not required by other UMB programs. Between semesters and during the summer, CCDE should continue to be considered the prime user of the

campus technology-centered facilities; CCDE should be given an opportunity to book these facilities on a priority basis until near the end of the preceding semester as is the current practice.

Goal 2. Establish a cohesive governance structure to create and implement UMB vision for Information Technology

2.0.0
IT's Strategic Role

Strengthen the capacity of the IT organization to meet UMass Boston's mission.

Information technology has become an essential element of university life, as critical as academic governance or administrative management in enabling the university's fundamental purposes—teaching, scholarship, and service. As David Gray, UMass (statewide) CIO points out, "Just look around the campus: the penetration of Information Technology is apparent at a glance." Rapid IT growth in many universities has resulted in fragmentation of purposes, technology, and management. Many institutions are seeking the economies and leadership that are possible only with central IT management while protecting with the entrepreneurial independence of departments. UMass Boston must establish a simplified IT organization to lead all planners and users of technology to meet UMB goals.

2.1.0
Establish Strong Leadership

Appoint a Chief Information Officer (CIO).

Like all other University of Massachusetts campuses, UMB should hire a CIO, with Vice Chancellor status, to manage information technology. IT leadership presence is required at the executive level to enable innovation across the campus. The CIO will report to the Chancellor, Provost, and Vice Chancellor for Administration and Finance together, for the following reasons:

- The Provost will ensure that the IT organization successfully implements the technology and services required to meet academic initiatives.
- The Vice Chancellor for Administration and Finance will provide similar oversight of administrative needs for technology and services.
- The Chancellor, providing overall leadership and vision, will ultimately direct the CIO's agenda.

An effective CIO will not only understand technology and how to manage it but will also articulate ways to enable improved academic achievement and administrative efficiency through creative and efficient use of technology. By creating a CIO-led IT organization, the University will:

- Publicly proclaim the strategic centrality of IT to UMB's ability to fulfill its mission in all areas—teaching, scholarship, and service;
- Make consideration of IT requirements an integral part of high-level decision making at UMB;
- Empower a campus leader with sufficient status to uphold and promote a progressive IT vision at UMB;
- Establish an organization with the authority and capability of coordinating IT-related activity across a very fragmented campus organizational structure in order to implement the vision and turn the decisions into reality;
- Bring together currently fragmented IT budgetary planning and spending

controls for improved accountability and economy;
- Strengthen UMB's representation in University-wide IT negotiations.

2.2.0 IT Management Team

Establish a small and dynamic team to manage the IT organization.

The three core responsibilities of the IT organization are academic technology, administrative technology, and central computing services. The heads of these three subunits, along with the CIO, comprise the IT Management Team. While Computing Services manages infrastructure and offers support to the entire campus, the two other units will serve the interests of separate constituents, academic and administrative. By separating service provision for these two groups, the new IT organization will overcome the perception that academic computing was inevitably shortchanged because Computing Services reported to the Vice Chancellor for Administration and Finance. Final decision on the division of responsibilities should be made after CIO is hired, but we anticipate that the IT governance team, led by the CIO, will be comprised of:

- *Director of Academic Computing*: Manages instructional innovation and academic technology and infrastructure. The Director of Academic Computing unifies efforts to improve teaching and to extend the use of instructional technology; manages all technology-based facilities including media centers, computer labs, Technology-Enhanced Classrooms, and kiosks; and oversees website operations. The Director of Academic Computing consolidates management responsibilities for the existing units that will be brought together to form the new, more comprehensive organization. Reporting to the CIO, the Director of Academic Computing maintains a dotted-line reporting relationship with the Provost to ensure that academic initiatives are supported by appropriate technology and services.
- *Director of Administrative Computing*: Manages administrative technology, including, eventually, oversight of the PeopleSoft project after major implementation is completed in 2004. This position should be filled to coincide with the winding down of the PeopleSoft project. The Director of Administrative Computing will direct campus-wide initiatives to ensure the effective and efficient exchange of administrative information, focusing on tasks and data beyond the scope of the PeopleSoft project. The Director of Administrative Computing, when appointed, will represent a consolidation of existing roles.
- *Director of Computing Services:* Manages campus wide infrastructure, including the wire plant, telecommunications, networking, server administration, technology purchasing, and essential support services including the help desk. (This position already exists; some current responsibilities—oversight of some academic computing tasks, for example, will be relinquished while others, such as telecommunications, will be added.)

2.2.1 Realigning staff roles

Realign technology subunits into the three divisions of the IT organization.

The CIO will need to clarify staff roles and reporting lines based on specialized expertise and areas of responsibility, in addition to client groups served. The three IT divisions, Academic Computing, Administrative Computing, and Computing Services, follow organizational patterns established at a number of other institutions, including George Mason University and the University of

Memphis.

- The Academic Computing Unit will bring together staff who are currently involved in instructional technology, academic technology, and media services. Working collaboratively in one unit, staff members can be assigned to complete tasks where required, no longer restricted by current organizational boundaries. At present many IT professionals find themselves responding to a range of tasks that are difficult to complete efficiently; the new structure will encourage depth of expertise rather than breadth, raising both quality and efficiency of service and support. As the new organization matures, it will be possible to develop support teams based on client groups served. *[See appendix 2.2.1]*

2.2.2 Website Operations

Relocate website operations to the IT organization.

The web manager should report to the Director of Academic Computing. In keeping with the enabling role of the IT organization, the web manager should relinquish responsibility for website content, concentrating on website development and operations. Control of website purpose and content, however, should remain with the appropriate stakeholders, e.g. vice chancellors for External Affairs and Enrollment Services, the Provost, the independent institutes, and so on. [See section 5.3 for further discussion]

2.2.3 Telecommunica-tions and Wiring

Relocate telecommunications to the IT organization.

As UMB's physical plant has become increasingly wired and modernized, the traditional boundary between telecommunications and computing services has blurred. Telecommunications, due to its increasing convergence with computer networking, should be moved to the IT organization, under the Director of Computing Services.

2.3.0 IT Stakeholders

Strengthen the contribution of campus stakeholders to the IT mission.

Two campus groups, one academic (Technology Oversight Council), the other technical (Committee of Department IT Professionals), should be formed to guide and assist the IT organization.

2.3.1 Technology Oversight Council

Establish a Technology Oversight Council.

The Technology Oversight Council (TOC), successor to the BIT Council, will provide the acumen from across the campus necessary to establish and guide the use of and planning for information technology. The TOC is an independent entity, not a subunit of the IT organization.

Membership: With the Provost and the CIO as co-chairs, the Technology Oversight Council will balance its agenda for academic innovation with practical concerns for enabling progress. The vice chancellors and the College Deans will each select a council member. The Library, Faculty Senate, Student Government, and the Ross Center for Disability Service will also be represented. Members should serve for 3 year terms, a third of the membership seats to be appointed each year. The Technology Oversight Council meetings should be open (unless specific issues warrant otherwise) and all interested parties should be welcome to join the conversation on a non-voting basis.

Mission. The Technology Oversight Council will be charged with:

- Reviewing performance and direction of the IT Organization.

- Ensuring that user voices are heard in the decision making process.
- Providing guidance and oversight to ongoing strategic planning. This role includes:
    - Forming and coordinating project-based subcommittees (representing a balance of campus interest groups) to develop IT initiatives, strategy, or policy.
    - Evaluating college-level and campus-wide success at meeting objectives of strategic IT plans and approving yearly plan renewals.
- Approving all UMB-specific IT policies (as opposed to UMass policies [see section 1.4.3]) proposed by the CIO's staff, subject to appeal by the co-chairs to the Chancellor.
- Disseminating policy decisions to smaller campus units (departments, institutes, centers, and programs) and bringing back requests for policy change for possible action.

Ensure effective oversight. By absorbing lessons of the past and establishing realistic expectations, the Technology Oversight Council's effectiveness can be assured.

- *History*: Previous oversight and policy development committees, on this campus and elsewhere, have not always met with success: major previous efforts promoting innovation have languished for lack of budget or continuity in leadership to implement them. Projects initiated with the joint support of the Provost and CIO stand a greater chance of eventual implementation.
- *Balanced expectations*: It is critical to establish the right balance of authority for the Technology Oversight Council. An activist Council, as a conduit for communication on IT issues, can build campus-wide consensus on major IT policy decisions. But other universities have watched similar groups wither or hibernate because of undefined purview or lack of authority. Since the council will be co-chaired by the CIO and Provost, access to key decision-makers will be ensured, but the vitality and credibility of the Council will be maintained only if authority remains vested with the majority of its members, subject to appeal by the co-chairs to the Chancellor.

2.3.2 Committee of Departmental IT Professionals

Committee of Departmental IT Professionals.

The Committee of Departmental IT Professionals will provide a technically-based reality check on IT issues as seen from the department and college level. The Committee is a successor to the current Technology Information Sharing (TIS) Group and formalizes their role, advisory function, and membership. If the Technology Oversight Council is an oversight group, the Committee of Departmental IT Professionals could be labeled an "insight group," basing its recommendations to the Technology Oversight Council and the IT organization on members' experience and expertise with meeting departmental technical demands and providing specialized user support.

Membership: The membership of the Committee of Departmental IT Professionals will be similar to the TIS Group. All UMB IT technical staff will be eligible to attend meetings to represent their constituencies and specific areas of expertise; members will determine committee leadership roles.

Mission: The Committee of Departmental IT Professionals will strengthen communication and collaboration on technical issues and end-user experience across the campus and throughout the UMB IT community:

- Exchange knowledge on new technologies and client-centered technical solutions, deployment problems and workarounds, focusing on both highly technical and reality-based issues.
- Recommend policies and protocols for Technology Oversight Council action.
- Discuss requirements for and the delivery of tech support.
- Discuss shared challenges in strategic planning.
- Provide feedback to the IT Management team and the Technology Oversight Council.

Department-level IT expertise is a valuable resource for the whole campus because of practical hands-on experience, close relationships with end users, and an understanding of the opportunities and pitfalls in implementing campus-wide policies and technology. Encouraging collaboration among these often isolated experts and giving them a forum to voice their opinions to campus IT leaders can lead to efficient, cooperative support of departmental issues as well as more effective and economical deployment of new IT resources.

Other institutions have found value in similar groups. Georgia State's Information Technology Support Committee and University of Arizona's Network Managers Group were established to meet similar needs. *[See appendix 2.3.2]* By establishing a formal channel for communication between Department IT Professionals and UMB leadership, the University will be assured that departmental perspectives are part of the campus-wide decision making process. This Committee is a feedback mechanism to centralized IT groups (such as the Technology Oversight Committee and the IT Management team) from those who understand local IT needs the best.

2.4.0 Empower IT Leadership

Empower IT leadership: strategy, budget, and policy.

The essential role of the IT organization is to enable academic and administrative success by providing appropriate technology (including strategic planning, IT tools, training, and support). In order to succeed in its essential role as enabler, the CIO must be vested with the authority, subject to appropriate checks and balances, to oversee UMB IT strategic planning, to manage the budget for campus-wide (not departmental) IT activity, and promulgate IT-related guidelines and protocols to support campus goals. Without these authorities, the CIO will face an insurmountable barrier to overcoming the fragmentation that characterizes IT at the University.

Further, the scope and communication channels of the IT leadership will lead to far greater efficiencies and intelligent planning. Duplication of services will be eliminated because they will all fall under the same umbrella, connecting and consolidating currently disparate and isolated groups. This streamlining process alone can produce enormous gains in terms of cost savings, productivity, and employee morale.

2.4.1 Strategic Planning

Strategic Planning.

The CIO must have authority to implement campus-wide strategic planning and management of information technology, subject to appropriate review and consent by the new Technology Oversight Council.

The CIO shall initiate an annual cycle of IT strategic review, planning, and implementation at campus, college, and department levels, driven by outcome-based planning and supported by distributed expertise, using a collaborative

approach that recognizes best practices as well as entrepreneurial innovation. The CIO should join the University's strategic planning process now underway. Beginning in the Spring of 2004, all colleges and departments should complete a 5-year strategic IT plan. These plans should be updated annually, and consolidated as part of the IT organization's annual strategic review process. This collaborative effort will encourage the articulation of future needs and opportunities, affording participants the opportunity to prioritize planning and implementation.

By routinely discussing departmental experimentation and exploration of new technologies, best practices and lessons learned for campus-wide replication can be readily exchanged for more effective testing and deployment.

2.4.2 Budget

Budget.

By consolidating budgetary responsibility to match areas of management responsibility, the CIO can eliminate duplicative services, prioritize technical investments, and encourage campus-wide economies in such areas as:

- Interoperable campus-wide data sets *[see section 5.1.0]*
- Consolidated email *[see section 6.1.0]*
- Learning Management System Software (e.g. Prometheus) [section 1.2.3]
- Service Level Agreements for tech support [section 3.2.2]
- Bulk purchasing and standards [section 2.6.0 and 2.8.0]
- Web-based administrative functions [section 1.6.2]
- Campus-wide server, wiring, and desktop deployment [section 4.1.0]

2.4.3 Policy

Policy.

Throughout this document the word "policy" refers to UMB-specific procedures, protocols, and guidelines to ensure effective use of information technology at UMB. Formal policy is in fact the responsibility of the University of Massachusetts Board of Trustees, promulgated through the Information Technology Council. The use of the term "policy" as shorthand for UMB procedures, guidelines, and protocols does not imply any attempt to undercut or supersede university wide formal policy. *[See appendix A - 2.4.3]*

By establishing from the outset an effective process for making and enforcing policy relating to the use of IT at UMB, future discussions will remain focused on the merits of the issue at hand. The policy process should include opportunities for both bottom-up and top-down initiatives, input, and participation. The Technology Oversight Council will provide a crucial role in gaining campus consensus on major policy decisions.

2.5.0 Responsibilities and Boundaries

Clarify Boundaries.

The extent and limits of the IT organization's responsibilities must be clear to the University community. Ground rules for deployment and management of IT assets must be set that balance the need for campus-wide monitoring of security, reliability, and interoperability with the need for local department-based independence. Such balance will be achieved by establishing a review-and-approval protocol for all campus IT initiatives and by clarifying roles and responsibilities as described below:

2.5.1

Review department-level IT initiatives and acquisitions.

Review Dept IT plans

- Strategic decisions and new deployments with the potential to materially affect data throughput or security at the campus level *must* be approved by the CIO.
- Customized development of specialized research or administrative applications with minimal security or bandwidth implications will *not* require approval at the technical level, but the CIO may wish to review the project and make suggestions concerning redundancy or interoperability issues and cost-effective methods of support, training, and maintenance.

2.5.2 Define Dept IT reporting responsibilities

Define department-level IT staff reporting responsibilities.

Currently, most department IT professionals work in relative isolation, often without collaboration or backup. After establishing clear standards for department-level IT operations, the central IT organization should require routine reporting by department-level IT staff, on topics such as security and disaster recovery planning. By communicating regularly with Computing Services on routine technical issues, Departmental IT staff will improve the reliability of local technology and services.

2.5.3 Dept servers

Centralize responsibilities for department-level servers.

The IT organization should move to centralized server management in the interests of cost efficiency, reliability, and security. The transition away from department-level server management will happen gradually, to avoid service disruption, and will accommodate exceptions where necessary to maintain maximum flexibility for some departmental activity. The optimum time for server migration will occur when local servers are upgraded or replaced or when local departmental IT staff leave the University. George Mason University used a similar strategy for migration without disruption.

- At present many departmental servers are typically located in vulnerable environments. Security, redundant electrical power, appropriate fire detection and suppression equipment, and adequate heating, cooling and ventilation cannot be provided on a cost-effective basis in dozens of separate department-level facilities. Since upgraded facilities are required for central network operations, whether or not departmental servers are centralized, planning capacity now for both central and departmental servers would result in significant long-term savings. [See section 4.2.0]
- Department server management has generally not been characterized by rigorous attention to backups (including off-site data storage), frequent virus protection updates, regular maintenance, and sufficient documentation.
- As increasingly sophisticated networking configuration is required, local IT staff will need to complete extensive training to remain qualified to manage local networks; such a focus on networking will reduce their capacity to attend to application-level concerns that most directly affect their departmental clients. Centralized server management can be handled on a cost-effective basis by highly qualified central staff responsible for many servers in a single location or by outside vendors.
- As part of the standardization process [section 2.6.0, below], a protocol for network server management should be established to protect data, ensure security, improve reliability, and facilitate efficient external technical support. If departments are unable to move toward a new campus standard, their servers should be relocated to the central facility.
- Most department IT professionals, when asked, acknowledged the benefits and savings in this proposal. As trust builds through the provision of

reliable service and increased communication, departments will welcome the benefits and cost savings of centralized server management.

[For further considerations on the advantages and disadvantages of centralizing departmental servers, see appendix A - 2.5.3.]

2.6.0 Standardization

Introduce standards for Information Technology.

The University has maintained an open approach to IT innovation and experimentation. But the legacy of this uncoordinated approach is a mixed collection of hardware and software of all ages and specifications. As a result, planning is difficult, training and documentation requirements are complex, and support is inefficient and often insufficient, frustrating users and service providers alike. The single most frequent recommendation of all interviewees in the fact-gathering stage of the Master Plan Project was a plea for standards. Information technology strategic plans from around the country argue in unison for standards as the most effective single approach to lowering support costs and improving interoperability.

2.6.1 Protocol for setting standards

Establish a protocol for setting campus standards.

In order to gain consensus on standardization, stakeholders must plan for both stability and change: acknowledging that standards will evolve, end user goals may differ, and impact on existing or future IT systems will vary. The CIO should propose, and the TOC should discuss and approve, a protocol for setting standards that will include criteria for technical evaluation such as product quality, accommodation of open source standards, compatibility with existing systems, and interoperability. Standards should permit flexibility rather than demand uniformity, and the standard-setting process should include methodology for handling exceptions and change over time. *[See appendix A -2.6.0]*

2.6.2 HW & SW standards

Technical standards for hardware and software.

The number of different software applications and hardware system types in use on the campus must be reduced. In UMB computer labs across the campus there are at least 38 different types of computers with at least 20 different operating systems. An exhaustive audit of individual computers in all offices would significantly increase the number of different machines. There is no central inventory at present to verify the extent of the problem.

As standards are promulgated, training and support will become more efficient—partly because demand for support should decline as machines and software become more reliable, and partly because the complexity of support issues should decline. Interoperability and reliability of IT systems will increase. These standards can be discussed and implemented over time as part of the desktop replacement policy. [See section 4.1.4]

2.6.3 Network Standards

Network Standards.

Best practices for network management at UMB must be documented and disseminated. This will speed deployment, save money, enhance effectiveness of technical expertise, and ensure security and reliability of systems. Campus standards for server operations should include details for the following, in order to assure campus-wide coordination, reliability, and support:

- Business continuity planning, system documentation
- Backups, routine maintenance

- Virus protection
- Network access
- Server configuration, security updates

Additionally, all network installations should be brought up to standards (as defined by BICSI: see appendix A – 2.6.3) for:

- Adequate space (secure; protected from fire and floods; sufficient size)
- Appropriate heating, ventilation, and cooling
- Uninterruptible power

The departmental server centralization initiative will dovetail with the implementation of network standards.

2.6.4 Support Standards

Service, Support, and Development standards.

The CIO should identify client/user expectations for tech support, website development support, and access to technical documentation. This will lead to increased campus-wide confidence in IT operations when the IT organization provides clear yardsticks with which to measure performance based on quality of service and time required to complete tasks. *[See Appendix A - 2.6.4]*

2.6.5 Administrative Information Standards

Administrative Information standards.

The Director of Academic Computing will coordinate access to systems and information by improving the relational integrity of data, particularly administrative information such as course registration data, across the campus. At present, course information on departmental websites does not uniformly match "official" UMB web pages. Standard campus (and UMass) data definitions and protocols should be established for mapping data from legacy systems that will remain in use until the PeopleSoft system is completely implemented. The Director of Administrative Computing should facilitate information exchange among—and, over time, reduce dependence on—splinter/shadow systems.

2.7.0 Project Development

Establish IT project development protocols.

The CIO, in collaboration with other campus planners, should create a streamlined process for handling the development of all campus IT projects. A departmental proposal should receive one-stop attention from specialists in facilities, telecommunications, networks, application development, and training. Together these project advisors not only will supply expert guidance to ensure successful project implementation but also will ensure that standards are met for vendor due diligence, campus resource provision, IT system capacity, and provider support. Systematic project development will speed project implementation while encouraging individual and departmental innovation and entrepreneurship.

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Goal 3. Change the Paradigm for Technical Support, Training and Professional Development

3.0.0 Overview

Overview.

The IT organization can initiate significant improvement in campus confidence in IT support by instituting a new service model: bringing services to the client rather than waiting for the client to seek assistance from the IT organization. Computing Services staff members, though few in number, have consistently gone out of their way to resolve complex problems. However, with an unregulated range of technology in use across the campus, support staff have a difficult time determining which problems to resolve first and which should simply be refused as beyond their scope. Currently, they do not deny support to any campus user or group.

Technology has been known to migrate into widespread use without assistance from technical evangelists—3M Corporation's Post-It Note being a celebrated example. But in a resource-constrained organization, the IT organization can collaborate with client champions who assertively promote new services or technical capabilities to end users, thereby using time and scarce resources more effectively. Similarly, by providing multiple pathways to access FAQs, how-to instructions, guidelines, and procedures, the IT organization will improve communication with campus constituents, stimulating a renewed sense of trust *[see below].* The expense of this extra effort will be offset by improved productivity, wider adoption of innovations, and a general rise in technical competencies.

Yet none of this will be possible without a well supported, well funded, and well trained IT staff. Currently, UMB loses numerous qualified employees to private industry in the Boston area because UMB cannot compete in terms of job requirements and compensation. As a result, the UMB IT group continually operates with vacancies and a large portion of the staff is under qualified or under experienced, forcing them to learn on the job.

3.1.0. Background

Scope creep creates support crunch.

The demands for technical support and training expand with the number of IT users, the sophistication of technology, and the complexity of tasks technology is expected to complete.

User abilities and demands vary more than ever. While some end users are still looking for the power switch or the "any key", others are raising difficult questions that only highly-trained experts can answer. IT professionals have attempted to rise to the challenge, but, inevitably, 'scope creep' has blurred the lines between configuring technology and using it effectively. Instead of simply setting up a statistical software application or training a user in its use, the IT expert is more than likely expected to supply analytical expertise. A web design specialist may show an instructor how to set up course web pages—and end up either teaching remedial graphic design or creating the website for the client.

Lack of standards creates a multiplicity of problems: Unfortunately, perhaps, computers can continue working for decades; instead of only supporting late-model computers and current software, help desk staff find themselves occasionally passing as technical archeologists, attempting to configure antiques

to handle complex tasks, and then turning to the latest innovation for which drivers or documentation are still pending.

3.1.1. Reduce need for support

Reduce need for support and training where possible.

Since technical support is expensive and labor-intensive, reducing unnecessary demands for these services will improve support levels generally.

- *Improving software and hardware reliability:* Downtime and user errors can be reduced by replacing older equipment and encouraging standardization.
- *Improving the campus-wide basic IT skill set:* User errors and questions will decline when sufficient training opportunities are brought to members of the campus community.
- *Making self-service assistance easier to locate*: Users will be more likely to solve their own problems if they have a choice of methods for seeking help such as website FAQs, self-service on-line trouble tickets, and how-to documentation. Self-service help tools must be monitored for effectiveness. These multiple pathways for self-help must be linked to maximize their effectiveness.
- *Sharing support costs:* Since UMass campuses share many similar demands for documentation and backup support, a joint effort to collaborate on standardized documentation and 3-tier (or 4-tier) 24x7 backup support will improve customer service at reduced expense. By alternating late-night telephone help, for example, the UMass campuses can stretch their support services at reduced cost.
- *Avoiding unplanned support obligations:* By including an IT organizational review as a part of all strategic planning initiatives, sufficient documentation, training, and support should be accounted for, and unplanned demands on support staff should be reduced.

3.1.2 Key users

Training key users to help colleagues.

A cadre of key users (staff and faculty) can be trained to provide basic support to departmental colleagues. The key-user cadre would be especially helpful when large-scale software or hardware deployments are planned. Key users can be significantly more effective when basic standardization of software and hardware has been implemented. In fact, standardization is likely to stimulate increased informal assistance from workmates.

3.1.3 Technology Assistants Program

Increase use of work-study students.

Students who participate in an effective training program can provide highly effective peer support. George Mason University's Technology Across the Curriculum Program includes special training for students called Technology Assistants Program (TAP). Such a training program is likely to significantly improve the quality of student-provided support.

3.2.0. Defining organizational expectations

Define—and meet—organizational expectations for support and training.

Help Desk: a central function. the recommendations for changes in governance will provide new impetus—and new opportunities—for more effective provision of technical support. Computing Services should continue to manage the Help Desk because technical assistance crosses academic and administrative boundaries;

administrators and faculty alike will be using similar desktop computers running the same operating systems and similar office and administrative software; furthermore, since all users share similar computing tasks, it makes sense to begin the support process with Computing Services even if a user's question requires referral to Academic or Administrative Computing.

Service benchmarks. To untangle the current complexity of support, Computing Services needs to establish benchmarks for response time, task completion, and end-user satisfaction *[see below]*. With a clearer understanding of how best to contribute to efficient and effective use of technology on the campus, the division—and limits—of support and training responsibilities can be established. This difficult process should be leavened, however, by the simple reality that many problems will be resolved, as one veteran put it, "by reasonable bandwidth and better personal computers." To define organizational expectations, begin with the objectives: define desired impact of improved support:

- Determine which IT tasks require prioritized support. Describe criteria used to make this decision.
- Determine which services will *not* be provided, which systems or hardware will not be supported locally; provide assistance in establishing support contracts with outside vendors for nonstandard technology. Assist users in migrating away from obsolete or unsupported technology.
- Establish simple interim methods of getting the end user back to work. For example, with standardized computers and data stored on the network, support staff should simply provide the user with a loaner computer if the problem cannot be resolved in 15 minutes. The significant increase in customer satisfaction easily justifies the cost of a few loaner computers.

3.2.1. Criteria

Identify criteria for success starting with customer satisfaction.

A major effort to develop a responsive customer-service approach is required if campus confidence is to be regained.

- Emphasize—and advertise—a one-stop centralized, simplified system characterized by ubiquitous access, frequent communication, and multiple pathways to support resources (web-based FAQs, on-line manuals, trouble-shooting how-to 'cookbooks').
- Establish service benchmarks: determine, monitor, and publish expected response times for certain types of problems.
- Focus on providing excellent service for the common problems that keep work from getting done, and publicize success in meeting users' needs.

3.2.2. Systematize Delivery

Systematize the delivery of technical support.

The Director of Computing Services should bring together department-level staff and Computing Services staff to define the roles and responsibilities for support provision. When UMB's technical community systematizes campus-wide support, the CIO can invite other UMass campuses to participate.

- The tech support organization should be centrally managed but support staff should be located as near to the end user as possible. This "federal" model is employed by University of Colorado at Boulder and the University of Maryland. Support professionals will develop familiarity with the individuals he or she supports; with effective supervision, staff can be assigned to academic areas they are temperamentally best suited to support *[see appendix A - 2.1].*
- *Standardization*: Hardware and software standards will include the limits of

responsibility for support; reduction in obsolete technology will eliminate the necessity for the most inefficient types of support delivery.

- Standardized support protocols should include a four-tier system, beginning with a self-service level, which includes appropriate documentation, how-to instructions, FAQs, and self-service trouble tickets provided by the HEAT Help Desk system; telephone, email support, or an instant message system should be used for secondary assistance. The nearest tech support specialist can visit the customer as third option; and finally, a campus expert can be called if the matter is still unresolved.
- Establish formal Service Level Agreements with outside vendors for specialized support for exceptional circumstances.
- The key to support is not only providing efficient, cost effective service, but managing expectations. If campus customers can expect a standard, acceptable pattern of service, the IT organization will gain their trust.

3.2.3. Organize resources

Update Help Desk for support and management insight.

- The help desk should be an up-to-date central repository for all computing documentation, hardware inventories, FAQs, and services offered. The Help Desk must assertively seek information on all new IT deployments in preparation for providing support.
- Continue migration to the HEAT Help Desk System, support its use with standards and centralized information, and share help desk information with Dartmouth and Lowell campuses to promote efficiency.
- Analyze help-desk data to determine when a central training class or outreach effort would be more efficient than merely continuing to offer support.

3.2.4. Outreach

Improve support for hard-to-reach and technically-underserved campus groups.

- Create multiple pathways for provision of technical support, through newsletters, in kiosks, on the UMB website, or by telephone.
- Take support services to the customers by going out to the departments and proactively market help services to campus to increase awareness of what is available.
- Create a centrally-managed shared support service specifically for under funded departments in order to reduce the gap in technological capacity between these departments and those with more ample resources.
- Involve students in technical skills programs (in a practicum component, possibly) in the provision of support.
- Enlist faculty liaisons within departments (key users) who can assist their peers with minor issues on an ad-hoc basis. There would be no compensation for faculty liaisons, so they must be faculty or staff who are technically savvy and enjoy helping others. On-line discussion boards or other means of informal communication will be instituted to allow the faculty liaisons to interact with one another and the central IT organization (support, desktop support, etc.).

3.3.0 Training

Administrative and academic competencies.

When senior campus leadership approves the definition of administrative and academic competencies for faculty and staff, all three IT unit directors will

develop a plan to align professional development, skills training, and information literacy instruction with those objectives. If requested by the Provost, other University units such as the Library will be invited to participate in this process. The IT organization must proactively deliver training and other support services to the campus. In recognition of the value of increasing the technical competency of administrative and academic staff members, training must be encouraged and fully supported by management across the campus.

Training ahead.

All IT projects, including software and hardware upgrades, should include an assessment of training requirements (along with associated costs), which take into account current user competency levels, anticipated tasks, and time to complete training. Users will be strongly encouraged (and in some cases required) to complete training before new equipment is deployed to their desks, since the incentive is clear and the timing is apparent. The lasting benefit for the University is the methodical improvement of the collective organizational skill set.

- For the desktop replacement plan to be effective, there must be adequate training when each system is replaced. This training should continue through the life of the machine, providing a foundation for all future upgrades.
- Technical training, to be effective, should be geared towards specific objectives such as word processing templates for form letters or using Excel for customized presentation of PeopleSoft data.

3.3.1 Coordinating Training

Central coordination of all training.

Training and professional development will be coordinated by the Academic Computing Unit, as the central repository of campus training issues, although the actual instruction will be done by several units: the Academic Computing Unit will focus on pedagogy, the impact of technology on learning and technical skills; the Library will handle information literacy instruction. Other training topics, involving Human Resources or PeopleSoft deployment, even if offered by outside groups, should still be scheduled through the Academic Computing Unit.

Monitoring training requirements. The training efforts of these (and other) groups should be carefully coordinated. Because the IT organization will recognize training needs because of Help Desk requests, training groups and the Help Desk should maintain a regular dialogue.

*Other training considerations***.**

- The Academic Computing Unit should offer to new faculty—and adjunct instructors—a comprehensive professional development and skills training program designed to meet goals determined by the Provost. The program will likely include instructional topics, IT skills, and UMB administrative tasks and Human Resource responsibilities.
- Computer-based training that supplements other learning opportunities should be maintained as an important component of the constellation of training alternatives.

3.4.0 Web support

Restructuring website support roles.

By clarifying and distributing the responsibilities for website development and infrastructure vs. web content and communication, the University will benefit from

a more cohesive website characterized by straightforward navigation, more timely content, and higher standards of accessibility. As independent and departmental websites migrate into a more integrated site under the UMB imprimatur (proposed in section 5.3), support issues will become simpler.

- Technical issues and template development will be handled by the Web Manager.
- Design issues involving pedagogical impact will require the attention of the Center for Instructional Innovation.
- Content providers, e.g. the office of the Vice Chancellor for External Affairs, the Instructional Innovation Unit, and the colleges and departments, will be able to focus on their roles as communicators without needing to focus time and energy on underlying technical issues.

3.5.0
Staff Retention

Technical Staff retention.

In order to adequately provide the support and training described in this document, the IT staff at UMB must be adequately qualified and those that are qualified must be retained. This becomes increasingly important as the number of computers, labs, and IT responsibilities around campus grow tremendously. The following recommendations will help UMB achieve this goal, which is critical to the level of service they provide.

- **Create a different pay scale for technical employees of UMB.** Some universities, private businesses, and the Commonwealth of Massachusetts have a separate pay scale for computing professionals because they recognize there are special demands and needs for these positions. First, IT professionals are highly sought after, even in a down economic cycle, and they often move between jobs. To retain them for a longer period of time, which is essential for the smooth operation of computing systems, other organizations sometimes pay this employee group more than other employees with commensurate experience and seniority. This is especially important at UMB because they are competing against the general Boston business community, which is one of the largest concentrations of technology companies in the US. Based on research of the current Boston IT job market, UMB pays between 10-60% less than its peers in higher education and private industry.
- **Offer pay raises according to technical skills and responsibility, not management level.** Aside from merit increases, IT staff, like many others on campus, only receive pay increases when the number of people they supervise increases. Pay increases should be tied to level of technical mastery and the responsibility. For instance, when a network administrator, previously responsible for three servers in a department, is asked to manage all the servers in a building, she should merit a pay increase.
- **Offer significant professional development/training opportunities.** Those in the technology industry need to continually update and improve their knowledge and skills. As part of such a fast-moving field, if they do not keep up to date, they lose their ability to implement appropriate technological change for the University, which should maintain a steady evolutionary pace. Over time the University risks a gradual decline in technical expertise without even incurring any staff turnover. Training targeted to the University's expectations for technical change should be offered to IT staff, with the expectation that they should keep their skills up to date.

Goal 4.	Improve Capacity of and Access to Technical Infrastructure on and off the campus.

4.0.0 Infrastructure & Access

In order to make technology and information available to all members of the UMB community, provision of useful tools and ubiquitous access to diverse constituents must be developed. The capacity and flexibility of the UMB network must be significantly expanded to handle current and future educational and administrative requirements for data exchange, access, and security.

Because infrastructure improvements require a long planning horizon—as much as 20 years—it is important to articulate as clearly as possible the future impact of and possibilities for Internet 2, wireless networking, dark fiber, GRID computing, and other emerging technologies. Infrastructure planning must begin with a clarification of academic and administrative objectives that technical innovations are intended to address.

Wire plant and network installation, the most "technical" aspects of IT, frequently require detailed planning well in advance of the factors that ostensibly drive infrastructure improvements. Nevertheless, to the extent possible, the administrative and academic purposes for infrastructure enhancements should be articulated, not only to justify the expense but also to forge consensus for objectives enabled by impending improvements in bandwidth and accessibility. Careful planning should also include contingencies for handling uncertainties about the future direction of technological innovation.

At UMB current data demands already exceed the capacity of certain network components; future administrative and educational activities will require a significant expansion in bandwidth and storage. As teaching practices evolve and expectations for remote accessibility grow, the importance of secure, authenticated access to UMB systems will only increase.

4.1.0 Infrastructure Improvements

Infrastructure Improvements.

Wiring, wireless installation, access on- and off-campus, and academic infrastructure *[see also section 2.4.0].*

4.1.1 Wire Plant

Wire plant.

A comprehensive, multiphase project to update the campus wiring plant is already in the initial stages, and technical and academic representatives need to ensure it stays on track. The plan envisions blow-tube technology which permits installation of appropriate cabling to meet demand when it is required, virtually eliminating the speculative installation of cable based on current understanding of future use in specific locations.

- The implementation plan should include construction plans that take into account UMB academic and administrative near-term priorities and weak links in the infrastructure (such as, Library wiring, bandwidth bottlenecks, flat network structure).
- Other technical decisions will be best understood in the context of academic and administrative objectives that will be supported by enhancements in:

- Remote and wireless access *[see below]*
- Digital storage
- Training and support

4.1.2 Remote Access

Remote Access.

The UMass Portal Project, currently in the initial stages, will eventually provide remote access for all UMass stakeholders. New opportunities will emerge. The Technology Oversight Council should:

- Seek partnerships with external organizations to provide remote access to UMB resources—coordinating with the Boston Public Library using e-rate resources, for example.
- Identify on-campus outreach programs with the potential for collaborating on remote access projects.

4.1.3. Instructional Technology

On-campus access.

Identify how students can best use technology to improve their learning experiences. Additional planning will require more specific understanding of student interests and needs. Academic and administrative units (e.g. Student Life, Academic Support, among others) must describe purposes for which the new technology is acquired and provide program support to students to ensure effective use. The following are examples of technology improvements that would benefit students:

- UMB network access –on- and off-campus
- Kiosks strategically located around campus that include both desktops and hookups for laptops *[see section 2.4].*
- Create wireless access points for both laptops and PDAs in high traffic areas of campus (e.g., Campus Center, cafeterias, library, computer labs, building foyers, etc.) *[See section 2.4].*
- Faculty and student disk space available on-line and at any of the labs on campus *[See section 1.6.0].*
- At least one computer lab will be open and staffed 24x7 during midterms and finals, and other labs will stagger their staffing and hours to accommodate UMB's unique student life and schedule *[See section 2.4].*
- Pervasive adaptive technologies

4.1.4. Desktop Replacement Plan

Desktop Replacement Plan.

The REPLACE program, announced just as this Master Plan document reached its final form, creates a major opportunity to improve university operations, raise productivity, and decrease support problems by replacing standard desktop computers for all full-time campus users at least once every four years.

- One-fourth of all campus desktop computers will be replaced each year at no direct cost to the department receiving the equipment. *[see appendix A-4.1.4].*
- All new computers will be purchased according to hardware and software purchasing standards. *[See section 7.2.0].*

4.2.0 Technology Environment

Technology environment.

In order to adequately serve the need of the community, Computing Services' principal server facility must be relocated to space that meets standards for security, electrical power, ventilation, and protection from floods and fire.. Recent power failures, one causing severe disruption in email service, highlight

the need for remediation. The potential vulnerabilities of fire, flooding, and security are all significant, and business continuity planning and technology disaster recovery planning and rehearsal are essential. As far as facilities are concerned, the following criteria should be used when the new facility is established:

- **Controlled environment**: the temperature, humidity, and physical access to server rooms must be constantly monitored and controlled sufficiently. This includes raised floors, well-maintained plumbing and surfaces, adequate ventilation, and fire suppression equipment.
- **Universal power supply**: all server rooms or critical computers must have their own power source and protocol for power outages. This power source must be drawn independently of the university's supply during emergencies.
- **Space**: servers or critical computers must have an adequate physical space to prevent overheating, unnecessary wear, tampering, and other conditions that contribute to their premature failure.
- **Consolidation of department servers**. Because proper environmental controls are essential for reliable IT services, upgrading dozens of separate server facilities with generators, improved ventilation, security, and fire suppression is not possible, from a budgetary point of view. Consequently, building appropriate central facilities to handle department servers will provide the most cost-effective way of ensuring secure and reliable technology for the university. *[See section 2.5.3 and appendix A – 2.5.3]*

4.3.0 Future Technologies

Future technologies.

Develop R & D methodology for managing examination of promising technologies. The R&D protocol should support initiatives at department or college level as well as at the central campus level.

- On-campus clearinghouse committee to promote collaboration, evaluation, and replication of successful pilot projects.
- TADS. A UMass cross-campus consortium, as part of the UMass-wide Information Technology Council, fosters collaboration among innovators on all campuses. With a strengthened IT organization, UMB should be positioned to advocate accelerated action to benefit all campuses.
- Develop protocols for identifying, testing, and implementing best practices.
- Possible method to facilitate grant funding: add 1% surcharge on department IT budgets to support R&D.

Goal 5. Support Administrative Effectiveness

5.0.0 Administrative Effectiveness

Although the PeopleSoft project dominates all University of Massachusetts administrative technology activity, there are several issues requiring the attention of the Director of Administrative Computing, a new position recommended by this plan. Among these issues are: standards for non-PeopleSoft data, expected technical competencies, and shared access to administrative information. The Manager of Administrative Computing will support the urgency of innovations required by individual administrative units while forestalling the proliferation of expensive, inflexible splinter or shadow

expose departments to loss of crucial information.

The PeopleSoft project was never intended as a panacea; moreover, major components are as much as two years away from activation. In the interim, previous improvement efforts particularly the Administrative Redesign initiative, should be reviewed for possible reactivation, ensuring consideration of insights distilled from extensive work by members of the UMB community.

5.1.0 Collaborative planning

Ongoing strategic planning.

Maintain collaborative strategic planning in response to growing demands for administrative information.

- PeopleSoft applications and existing splinter systems should be integrated, where possible.
- Initiatives to provide access to commonly-required information should consider campus-level concerns for data integrity while recognizing that departments must act more quickly than campus consensus usually permits. The Director of Administrative Computing can help balance these priorities by establishing common data definitions (see below).
- Data standards and information sharing among all Vice-Chancellor-led groups will benefit from IT organizational leadership. A Data Stewards Council modeled on the University of Arizona's similarly-named group, should oversee this effort to maintain consistency and clarity of common data elements and consensus of academic and administrative departments. Linkage to stakeholders in all UMass campuses must be maintained and the Director of Administrative Computing will oversee this Council.

5.2.0 Technical Competency Standards for Administrative Staff

Establish competency standards for administrative computing.

To improve administrative efficiency even while PeopleSoft applications migrate into active use, and to prepare staff for further technical innovations on the horizon, administrative staff must be strongly encouraged to bring their IT skills to an acceptable level of competency.

- Determine standards: Conduct an organizational audit specifically designed to establish administrative IT competency standards: as part of the general standardization process, determine skill sets required for administrative groups, common campus-wide tasks, and, where applicable, job titles.
- Survey administrative staff to determine levels of training required.
- Develop training and implementation plan for raising campus-wide administrative skill set to standards.

5.3.0 Website

Strengthen UMB website with new governance, policy, and training initiatives.

The challenge: The UMB website currently cannot fully serve the University's needs because of policy strictures, lack of authority to manage uncontrolled website development, and staffing limits that prevent effective updating of the majority of site pages.

- The official site policy for all University of Massachusetts websites requires an unwieldy requirement for accuracy.
- A security (and data integrity) risk exists with approximately one-third of

websites running (without approval from Computing Services) on UMB networked computers with unverified firewalls.

- On some departmental pages, apparently, course information does not match "official" information, causing confusion for students and faculty alike. Fourth, because of the inability to coordinate all website development, navigation through the semi-official parts of the website is difficult, and many pages are years or months out of date.

Website integration: UMB's website—both official and unofficial portions—should be unified to improve overall quality of appearance, currency of content, accessibility, navigation, and ease of use. To enable these improvements, changes in governance, policy, and production management should be instituted. Unfinished website policy has prolonged conflicts and uncertainties concerning accessibility, accuracy, and responsibility, yet the lack of clarity has not discouraged the unregulated growth of many independent, unconnected website projects.

Policy and management: To raise the website to a new level of effectiveness, website management should shift to the IT organization; the University of Massachusetts should be asked to modify or reinterpret restrictive policy; and a campus website oversight team, with representatives from the major web stakeholder groups, should recommend policy to govern website content. The CIO should determine, with approval of the Technology Oversight Council, a new policy for website management.

5.3.1. Website Policy

Website policy.

Options for website implementation must be clarified, along with responsibility for content and accessibility. We suggest:

- *Integrated development:* Web manager builds sites and templates to meet departmental goals; department staff, trained as content providers (rather than site developers), supply and maintain content. Templates are validated for accessibility standards (section 508) and technical quality by the web manager while content is validated by department; these pages would be hosted on UMB servers.
- *Alternatives include:*
    - *Centralized development*: All development and content provided by web manager; all validation by web manager; website would be hosted by UMB. This option would require significant expansion of staffing to the central website team in order to meet demands for website expansion and updates.
    - *Independent development:* Site development, including content, developed and validated entirely by department. Hosting on UMB servers would be permitted only after independent verification of accessibility and certification of content by the department.
    -

5.3.2. Website production guidelines

Managing website production.

Assuming the Integrated Development model is selected as the most flexible and efficient option, the following steps should be taken:

- With the guidance of the website oversight team and the Technology Oversight Council, establish policy to ensure appropriate levels of local control and responsibility for content and design.
- Develop a clear set of guidelines for site development and maintenance.

- Academic Computing will build a training program to prepare departmental staff members for participation in the integrated development process.

Goal 6. Support an Enriched Community Life for UMB Stakeholders

6.1.0 Campus Communication

Campus Communication.

A campus-wide communications committee should be established to determine purposes and means of enhancing UMB's capacity for communication among stakeholders.

- Email and other forms of electronic information exchange will receive wider, more effective use if on-campus access is improved (kiosks, other facilities) *[see section 2.4.1]* and if off-campus access is improved *[see section 4.1.3]*. Additionally, faculty and students alike may require training in both skills and awareness of these communication tools.
- By developing a database of student interests, skills, and experience from information collected during registration, campus employers and student groups can connect more readily with interested students.
- Other potential opportunities include on-campus webcasts of sporting events, governance meetings, cultural events, and club meetings.

6.2.0 Student Life

Support student use of technology through purchasing assistance programs, expanded email services, on-campus disk space, convenient network access around—and off—the campus. A more detailed survey must be conducted to identify ways to strengthen the UMB experience for all students.

6.3.0 Entrepreneurship

Explore possibilities for supporting entrepreneurship for both faculty and students as a means of encouraging individual achievement and campus-wide opportunities.

Goal 7. Align Financial Resources with UMB IT Vision

7.1.0 Funding Models

Innovation requires financial commitment. Many voices have been raised to acknowledge the growing significance of technology's impact on UMB's mission. Using seven benchmarks provided by the COSTS project, a review of IT budgeting and staffing suggests that UMB, compared to other institutions of its size and type, spends significantly less on information technology and attempts to meet its institutional academic goals with far fewer IT staff members.

Overall, a review of UMB's COSTS project data suggests that UMB's IT budget is insufficient to meet the needs of a Carnegie Class M1 or M2 University. UMB appears to be in the bottom 20% of comparable universities in IT spending. IT staff members at UMB have more than twice the number of persons to support as do their peers at the median university. Data compiled for the COSTS project review from UMass Boston does not reflect all IT spending or personnel at the departmental level. *[See appendix A - 7.1.0]*

Significant savings will accrue from concerted efforts to reduce costs by

coordinating technology planning and by centralizing commodity-level purchasing and services..

7.2.0
Cost Savings & Standardization

Implement cost-saving standardization and purchasing protocols.
Significant cost savings will accrue from continued implementation of campus-wide, and when possible university-wide, procurement policies and practices, not only immediately but subsequently through simpler, effective support.

Computing Services estimates that the pending proposal to centralize purchasing, covering printers, toner cartridges, computers, and data projectors will save the University a conservatively estimated $$1.5 m of which UMB's portion is estimated at $300,000 per year. (this was entire UMass, not UMB-- On a relatively "small" purchase of 317 computers in July 2002, UMB saved $135,000. The project to centralize departmental servers will also result in campus-wide savings, although the principal benefit will be a significant increase in productivity of department-level IT professionals and an improvement in the reliability and security of data transmission and storage.

Centralized purchasing will continue to result in significant savings only if:

- The procurement policies include both incentives for participation and disincentives for non-participation.
- Purchasing policy dovetails with replacement policy *[See section 4.1.4].*
- The strategic planning process is properly maintained.
- The ability to meet off-schedule demands for new equipment is anticipated by the purchase of a small number of extra computers at each cycle.
- Additional equipment or higher-end standards are allowed, but the user must pay the added costs.

The ability to purchase non-standard equipment (e.g. Macs) is permitted under certain circumstances.

7.3.0.

Grant opportunities

Grant opportunities.

Because of its urban location and diverse demographic profile, UMB is well positioned to seek grants from corporate and federal sources. The Massachusetts Biotechnology Council has suggested that UMB become the Biotech center for Boston; the possibility of other corporate grants is demonstrated by the Clark Taylor Center, funded by TMP Worldwide, parent company of Monster.Com, and Jeff Taylor, its founder. Other opportunities include partnerships with corporations seeking technology training and workforce development.

7.4.0.
Budget Practices

Budget practices.

Develop policy for budgeting large, multiyear projects using standard Total Cost of Ownership (TCO) practices, accounting for upgrades, maintenance, training, and support. As is frequently the case at many universities, computer purchases made in the final days of a budget cycle result in uncoordinated growth of technology assets; such purchases usually fail to take advantage of bulk purchase pricing.

7.5.0. Master Plan Renewal

Master planning: an ongoing process.

As a matter of standard planning practice, the Master Plan and associated budget processes require annual renewal. The process of evaluating and updating the Master Plan requires establishment of appropriate milestones and indicators.

Department and College-level IT Plans should also be developed, with assistance from the IT unit and/or the Technical Oversight Council. These plans should be reviewed by the Technical Oversight Council to ensure that the campus-wide IT planning process addresses UMB requirements as efficiently and effectively as possible.

Appendix A

Goal/Objective	Additional Discussion
1.0	**Importance of consolidating instructional innovation** Should the "academics" report to the Provost while the "technologists" report to the CIO? For many universities the evidence of struggle with this question is suggested by a complicated hierarchy characterized, ultimately, by a division of responsibilities and a corresponding loss of cohesion—and accountability. In a relatively small university like UMass Boston, the reporting lines are less significant than the clarity of accountability and the strength of vision of the University leadership. Faculty will be more interested in knowing where to go and whom to talk with to improve the impact of teaching than in hierarchy. Experience of University of Colorado at Boulder: "If CU-Boulder were to take only one finding from this study, it would be that instructional design expertise is as crucial to the successful and effective integration of technology into teaching and learning as is technical expertise. The University should make every effort to ensure that these components of educational technology are less disparate and more coordinated on campus to the end of improving instruction and making the most effective use of technologies available" *http://www.colorado.edu/Committees/itc/etsp/peers2000.html*
1.2.1	**George Mason University's *Technology Across the Curriculum (TAC)* Program** The TAC won the 2001 Educause award for Systematic Progress in Teaching and Learning. It includes an integrated approach that strengthens faculty competency, curriculum development, assessment of student competency, and technical and content-based support. See http://cas.gmu.edu/tac/index.html **The Pew Grant Program in Course Redesign: Disciplined Innovation?** **1. Institutional Readiness** The institution must **want to reduce costs** and increase academic productivity. The institution must **view technology as a way to achieve strategic academic goals** rather than as a general resource for all faculty and for all courses. The institution must **set goal to integrate computing into the campus culture.** ▪ Ubiquity and access ▪ Universally-adopted essential campus IT skill set. The institution must have a **mature IT organization** to support faculty integration of technology into courses. The institution must have a demonstrated commitment to learner-centered education. The institution must have established ways to assess and provide for learner readiness to engage in IT-based courses. The institution must recognize that large-scale course redesign using information technology involves a partnership among faculty, IT staff, and administrators in both planning and execution. **2. Course Readiness Criteria** Select a high-enrollment course, possibility of capital-labor substitution. Faculty must be ready (trained) & willing, with the capacity to identify and evaluate desired learning outcomes and possessing knowledge of ???? **3.Instructional Task Analysis and Financial Planning.** The goal: reduce faculty & staff time (on per-student basis) by transferring tasks to IT, analyzing instructional tasks using Activity-Based Costing approach. Reviewers will then compare operational costs – to ensure sustainability, amortize start-up costs over course lifetime, secure grants etc. **4. Conclusion: Focus on readiness to ensure success, costing and evaluation to prove it.** *For further information: http://www.center.rpi.edu/PewGrant.html*
1.2.2	**UMB College Student Computer Use Survey.** In an initial effort to catalog student attitudes toward technology, Prof. Xiaogang Deng and his Research Methods class surveyed 130 students in a non-random sample. Although the results must be treated as suggestive rather than definitive, 52% of the students indicated that UMB was not providing sufficient computing resources; a survey of more than 400 students in September showed that only 40% of students felt they hadd access to computers whenever they needed to. An In-depth look at student attitudes toward and use of technology could prove extremely useful in guiding some aspects of technology planning.

2.1. Establish Strong Leadership	**The need for IT Leadership**

University of Massachusetts

- All campuses have CIOs except UMB: equal representation at UMass level is critical to supporting UMB interests in major UMass decisions (I2, authentication/authorization, PeopleSoft, joint purchasing, other joint ventures)
- Internal dispersion of authority, planning, support: budgets, innovation, productivity suffer from insufficient standards, collaboration, cohesive strategy.

University of Arizona: Why We Need a CIO Now (2000)

- We have no focal point to find out what is happening in IT. There are many offices and individuals involved and no one has the big picture relative to what is happening or where we are going.
- There is no vision or clear and agreed upon information technology strategic direction. While there is a formal information technology strategic plan, with a series of goals and objectives to achieve specific activities in place, it is necessary to have someone responsible for continually updating this document and insuring that it adequately expresses the needs of the campus and is taken seriously.
- Solutions to IT problems develop, in various offices or volunteer groups, to address a particular need, but in an uncoordinated and inefficient manner when viewed from the perspective of the whole university.
- People are asking IT questions however we are unable to quickly answer. Vendors are working with selected units, which has resulted in large impact decisions being made without the full effect on the university discussed in advance.
- We are not represented nationally, or within the state, at levels equal with the other two Arizona universities.
- We are about to implement a large-scale administrative systems upgrade/replacement.
- The pressures for a CIO will continue to increase and the longer we wait the more we will postpone addressing important questions.

Emory University: IT Strategic Plan 2002—Possible Barriers to Success. Unlike many major universities Emory does not have a senior administrator who manages IT activities from an enterprise perspective. This is even true for the academic side of the institution, which has independent IT units in every school and most administrative areas. As a result of this organizational dynamic IT resources are not taken into consideration in senior level discussions about direction and priorities. There is also significant waste to the institution because of inefficiencies inherent in this uncoordinated approach to IT.

University of Colorado IT Master Plan 1998: During the past several years the campus has attempted to compensate for the decentralized IT organization and governance structure by establishing several coordinating committees, including the Chancellor's Policy Board on Information Technology (CPBIT) and, more recently, the Information Technology Council (ITC). While these committees have realized some improvement, the use of committees to manage and coordinate IT resources is very time consuming, delays efficient decision making, and lacks the accountability necessary for effective management.

Since information technology is a strategic resource that supports the campus' primary mission, it must be managed at a strategic level to effectively provide the IT services faculty, students, and staff increasingly depend upon. To develop an effective governance and organizational structure for IT, several critical success factors should be considered, as follows.

- *Focus on Customers:* The new organization and governance structure must focus on the IT requirements of the campus that will best serve the goals of supporting instruction, research, and student life. This customer focus includes providing and supporting the services customers most need.
- *Effective Feedback:* The success of IT services can only be judged by the customers of those services. Success at a strategic level must be judged by those responsible for the strategic leadership of the campus. The IT strategic plan should be continuously updated and improved in order to adapt to continuing changes in technology and customer needs. Although standard benchmark measures of service can provide objective feedback, these should be supplemented with feedback from representative faculty, students, and staff.
- *Focus on Continuous Improvement*: Incorporating the feedback received, continuous improvement of service delivery and service levels is essential. The IT organization must develop processes to measure service levels and find ways of improving services. The leadership of the IT organization must be charged with the responsibility for getting the job done right, and continually finding ways to do the job better.
- *Effective Planning*: The CIO should be part of the group that considers IT issues at the highest level of campus academic and administrative planning. Institutional plans should efficiently and effectively deploy and support the campus' IT resources, including the identification of the costs and alternatives for IT resources critical to the proper financing of IT services. Effective planning should include participation by campus and university management and representative leaders from the faculty, students, and staff.
- *Distributed Support, Centrally Coordinated*: The IT organization must strike an appropriate, cost effective balance between distributed and centralized management of IT service delivery. Distributed support should focus on the success of academic and administrative units, be responsive to local user needs, and have a degree of autonomy in determining departmental priorities. The central IT providers should coordinate the delivery of distributed support, ensure economies of scale (e.g., in the

acquisition of training and standard software and hardware) are available to all units, retain negotiating power with vendors, and determine minimum standards to deliver a consistent quality of service. The support model should be the four-tiered model discussed in Section 7.0, which identifies a combination of self-help, distributed local user support, and centrally-coordinated delivery of core services.

- *Effective Financing*: IT technologies continue to evolve rapidly, resulting in continuous improvement in efficiencies and economics. This requires regular adjustments in budgeting and financing strategies, as adequate resources are necessary for a successful IT environment. Effective financing requires leadership and financing structures that provide accurate cost information and incentives to decision makers to integrate financing decisions with other institutional plans. The CIO should provide leadership in the campus budgeting process to secure appropriate resources for IT needs.
- *Appropriate Advisory Structure:* Advisory structures to IT organizations vary with the particular organizational model used and tend to reflect the culture of each particular institution. Some highly participatory institutions have many advisory committees at all levels of the organization; others rely upon faculty committees or another existing advisory/governance structure. CU-Boulder's advisory structure should: (1) include representation from all campus constituencies; (2) incorporate campus input into long and middle range planning; and (3) have the flexibility to create topical planning ad hoc committees for certain critical issues.

2.2.1	**Further discussion of support client-based support teams.**

- University of Colorado at Boulder established Distributed Academic Technology Coordinators (DATCs) to provide technology support based on academic units (e.g. College of Business, College of Arts & Sciences – Humanities, College of Arts & Sciences – Natural Sciences, College of Arts & Sciences – Social Sciences). The DATCs work with faculty directly and coordinate their support with the Faculty Teaching Excellence Program (equivalent of the proposed Instructional Innovation Unit.

  [http://www.colorado.edu/its/facultysupport/dacts.html]
- University of Maryland uses a similar approach: "Academic Technology Coordinators, (ATCs) are discipline-oriented consultants who promote academic use of technology and services; serve as a liaison between the college, OIT, and other campus technology units; and provide personal assistance to faculty members. They may also be able to put you in contact with other campus faculty members who are using technology in ways that are of interest to you." [http://www.oit.umd.edu/Faculty/]
- Discipline-specific teaching support. In a presentation at the Annual Conference of the National Learning Infrastructure Initiative, San Diego, CA Jan 29, 2002, Sally Jackson (University of AZ CIO) and David G. Brown (Wake Forest) assert that the "services" model of support meets with only limited success, because, to be effective for a specific discipline, generic technology requires not only technical expertise but familiarity with the specific discipline. Jackson and Brown suggest further that the following academic areas require different experience and intellectual focus:

Humanities	**Natural Sciences**	**Social Sciences**
• Patient time-horizons • Often beyond copyright • Comparative analysis • Searching new perspectives • Language as well as thought • Multi-cultural • Essay based • Word processing	• Driven by hypothesis testing • Large processing power • Fluent with instrumentation • Data based decisions • Comfortable with teams • Internationally connected • Taxonomies & classifications	• Frequent teaming • Bias toward interaction • Preference for action • Rapid obsolescence • Costly databases • Data-based decisions • Statistics

[http://www.fcii.arizona.edu/dlearn/ppt_lts/wq6r61kt.htm]

2.4.3	**Policy**

For further information on Policy at University of Massachusetts, see: http://www.umassp.edu/policy/ and http://www.umassp.edu/itc/subcommittees/policy/charter.html The Policy Subcommittee of the UMass Information Technology Council (ITC) is responsible for drafting IT policy and guidelines for adoption by the UMass Board of Trustees. All efforts to clarify IT usage and practice at the local campus level is of course subject to policy adopted by the Trustees. In practical terms, however, pending action by the UMass ITC, the Technology Oversight Council may be able to promote sensible guidelines and best practices with more alacrity for the UMB campus than has been experienced at the university-wide level: the official website policy has been in draft form since August 4, 1999, and the last action by the Policy subcommittee, as published on the website, was dated June 21, 2001.

2.6.0	**Standardization: Accounting for change and exceptions**

Efforts to standardize software and hardware must begin with the acknowledgement that standards will constantly evolve, that standards will apply differently to some user groups, and that the reasons for establishing standards for some technology will vary according to impact on the UMB campus. At the outset it should be noted that in some cases dual standards may permit the simultaneous use of competing technologies. Factors influencing the standardization process can be grouped as follows:

- **Technology life cycle**.
  - *Beta Phase*. New technology, soon after introduction, is evaluated by sophisticated users or IT professionals with the capacity to review usefulness and reliability. Until the new product is commercially released—and approved for use at UMB—general users should refrain from adopting unproven technology.
  - *New Release Phase*. When new technology is commercially released, power users or other key groups can be expected to adapt and integrate existing uses. Once a new product is selected for eventual designation as "standard", IT staff will prepare training and support documentation in advance of general deployment.
  - *Standard Phase*. Mainstream products require full support, effective documentation, and appropriate integration with custom or specialized systems. With fewer different software or hardware systems to support, IT staff should be able to support standard items in greater depth, with better documentation and training.
  - *Obsolete Phase*. When a standard product is replaced by a new one, the predecessor becomes obsolete. Training efforts will shift to the new standard product. A sunset date should be set, after which support will no longer be available. New implementations of obsolete items will be strongly discouraged, and efforts should be made to assist transition to the new standard before the sunset date.
  - *Orphan or Non-Standard Phase.* This phase describes two classes of IT products—those that formerly were designated as standard, and aging products that were in use when the standardization process began but were never given the "standard" imprimatur. All general users will be expected to have adopted a successor standard after the item passes from Obsolete to Orphan status. Special arrangements must be made to continue use of non-compliant items, since orphaned items can cause network, security, or support problems, and inhibit interoperability with other tools, groups, or users. It is also worth noting that the benefits of a campus-wide technical skill set cannot be realized unless minimal efforts to remain within the boundaries of common practice for IT-based tasks.
  - *Disallowed.* Not actually a "phase": disallowed software and hardware is determined to be a risk to the University system because of vulnerability to breaches of security or disruption to network operation. When discovered it will be disabled, removed, or disconnected.
- **User groups**. Not all campus constituents require the same degree of flexibility; not all departments require the same degree of customization or special attention around technology issues. Consequently, standardization is likely to vary somewhat according to the environment or task load. It should be noted, however, that standardization does not imply the imposition of uniformity—guidelines will always be accompanied by exceptions.
  - *General users*. By moving assertively toward a high level of standardization with commonly-used IT tools, efficiency and productivity are likely to improve because support and training can be tailored to meet specific administrative objectives. The IT organization must place a high level of priority in providing the support required for effective use of standard technology. Peer-level expertise sharing, job flexibility, and an increased degree of competency in all administrative workplaces should improve morale as well as effectiveness.
  - *Innovators and investigators*. Certain departments—Computer Sciences, for example—can be expected to experiment with new technology as a matter of routine. Communication channels among these early adopters—and between the early adopter groups and the IT organization—should remain open to encourage collegial knowledge sharing, but these groups should be encouraged to manage innovation within the following constraints:
    - Technology that represents serious threat to the operational reliability or security of the campus network should be isolated or quarantined.
    - Experimental status does not exempt innovators from adherence to any campus standards for backups, documentation, virus protection, or security protocols.
    - New uses that have the potential to dramatically affect network throughput should be negotiated in advance of deployment.
    - Support, training, and documentation will generally not be supplied by the IT organization for experimental activity, but if new technology appears headed for adoption as standard, the experimental users may share documentation and testing tasks with the IT organization.
    - If users assert the right to use non-standard technology where common, standard alternatives are available, practical, and affordable, the IT organization may withhold support, training, and other services for any computer on which non-standard software is loaded.
  - *Power Users*. Many academicians and administrators who require specialized tools (that are not widely used) will need to negotiate service level agreements with the IT organization. Power users may be asked to share in documentation or feasibility review for adopting new technology as standard.
- Levels of Training and Support. As suggested above, the more standardized the technology, the greater degree of documentation, training, and support the IT organization should be expected to provide. Transition to standards should be encouraged through training opportunities, assistance with data and systems migration, and the like.
- The Selection Process. Additional discussion is required to outline how technology is selected for designation as "standard" for

UMB. Decision criteria for cost, consensus, product quality, accommodation of open source standards, compatibility, and interoperability all need to be considered.

Model Summary. The following table outlines the relationship between technology phases and anticipated user groups, support, training, and degree of compliance with standards.

		Technology Phase					
		Beta	**New Release**	**Standard**	**Obsolete**	**Orphaned, non-standard**	**Disallowed**
Component of Standard	User access to IT Resource	Available only by special arrangement	Available upon certification of readiness: Plan includes compatible equipment, user training, TCO review.	Available to entire campus (few exceptions) Most bulk purchasing and site licensing involves this category	Not available for new installation. Set a sunset date to define non-compliance	Not available for new installation. user agrees to loss of support	Prohibited
	Support	By special arrangement	Limited; test and document	Available	Available until sunset date	None	None
	Training	By special arrangement	Limited: IT unit prepares for scaling up use	Available	None	None	None
	Designation	Experimental	Provisional	Standard--Recommended	Obsolete--Upgrade advised	Non-compliant Use discouraged	Disallowed
	Purpose	Test, research, evaluate	IT unit prepares to migrate new tools into general use	Normal use	Permit transition period for upgrades	Permit slow-adopters to postpone upgrades	None: Threat to network
		Typical Users					
		Early Adopters For research and Innovation--where technology is strategic component	*Power users* For public communications (websites, scholarly pubs)	*General Users* For campus wide individual, dept. & class uses	*General Users* For campus wide individual, dept. & class uses	*Special Users* Must accept tradeoff: freedom to be non-compliant means limited or no support	

2.6.4

Service Level Agreements

Computing Services' existing Acceptable Use Policy (http://email.umb.edu/acceptable_use.htm) includes not only user privileges and responsibilities but also expectations for service delivery by Computing Services. The excerpts below represent *the departure point* for a general campus wide SLA.

2.0 Computing Services' responsibilities
Computing Services operates a variety of services for its clients, and assures its clients that these services will be reliable. By reliable we mean that the services will operate according to schedule, efficiently, correctly, and securely. Computing Services will take any action necessary, including unannounced inspection of a client's files, network traffic, denial of access, and instigation of formal University disciplinary procedures, in order to protect the reliability of the services and the security of information. In addition to the policies and responsibilities discussed in this document, Computing Services will also rely on other relevant University documents, such as University of Massachusetts Policies and Guidelines when appropriate.

2.1 UMB Network services
Computing Services maintains connections to various networks, and considers these connections to be among the most vital of our services. Computing Services has a responsibility to help maintain the reliability of computers and networks at other sites. Computing Services will treat any attempt to compromise the reliability of another computing system through the University's computer network as if the attempt were directed at Computing Services' computers.

2.2 Moderate security
Computing Services makes every effort to ensure that the information in its systems is secure. By secure we mean that the information stored in the computer will be safe from unauthorized access, and that Computing Services won't lose the information. It is important to realize that Computing Services cannot make these guarantees absolute. Clients have a variety of levels of security available, and must choose the level appropriate for their own information.

2.3 Privacy
Computing Services will only inspect the contents of non-public files to protect the reliability of its services. Computing Services makes no attempt to censor any information held on its systems. Computing Services may be called upon to provide information and/or files to law enforcement agencies for the express purpose of assisting in active criminal investigations.

2.4 Backup
Computing Services runs regular file backups on its computers. Theoretically, in the event of a computer failure, it is possible to recover all information stored in a computer at the time of the last backup. There are, however, occasional problems with these restorations that can result in other lost information. Computing Services does not restore email messages or mailboxes except in the sole case of a total system restore when recovering from some type of computer disaster.

3.0 Client responsibilities
Computing Services clients must bear certain responsibilities in order to continue using Computing Services resources. Responsible clients are necessary if Computing Services is to provide reliable services. Computing Services computer systems are not immune to tampering. Computing Services relies on its clients to refrain from deliberate attempts to abuse the systems. Computing Services clients are responsible for contacting Computing Services prior to undertaking any activity that Computing Services could interpret as compromising the reliability and security of computer systems and networks. Several other specific responsibilities are described below.

3.1 Proper Use
Computing Services computers and networks are funded by a variety of State and University sources. University employees and students may use Computing Services resources only for work done for the University, and only when it is appropriate that the work be supported by public funds. Personal, for-profit activities are explicitly forbidden.

3.2 Sharable Resource
Computing Services resources are limited, and shared by many clients. To avoid performance problems and/or unnecessary expenses, clients must refrain from initiating activities that consume an unreasonable amount of resources.

3.3 Unauthorized Access
Clients must only access information that belongs to them, is permitted to them, or is public. Clients must not attempt to decode, crack, or discover passwords that belong to others. Computing Services may remove clients who are found to possess programs that could be used to access private information that belongs to others.

Clients can ensure the privacy of their own information by being careful to NEVER share a password with anyone. Do not send passwords through e-mail, because others can easily scan e-mail messages looking for them.

3.4 Harassment
Computing Services clients must not use University resources to harass others. This is considered a serious offense that Computing Services will pursue according to University regulations. Computing Services considers displaying or sending of un-requested, objectionable (as defined by the recipient) material to others to be harassment.

Clients may not use University resources to support inappropriate activities on any network, even if the activities don't interfere directly with University resources. Computing Services will pursue allegations of inappropriate network activities with the utmost diligence.

3.5 Back-up files
Clients are responsible for maintaining their own multiple, current back-up copies of valuable or critical information to insure against inadvertent loss by Computing Services.

3.6 Pay attention to Computing Services Information
Computing Services may at times use its systems to provide clients with important information. We ask that clients pay attention to announcements and/or requests in order to protect themselves from unnecessary difficulties.

2.21

Reorganizing IT Governance can lead to significant improvement in IT impact.

- Catholic University of America, under a similar set of circumstances, engineered a major IT turnaround, using a hybrid approach, establishing "…A new structure to blend centralization and decentralization in an effective manner, a dynamically responsive environment for both growth and collaboration.

1. How did we do it?

Created strategic IT plan
Extended network infrastructure
Developed desktop standards
Created centralized help desk
Consolidate email systems
Implemented ERP systems
Standardized teaching tools
Changed IT staff reporting and evaluation in academic and administrative departments
Centralized Web servers

2. Network Infrastructure

Gigabit Ethernet Backbone
Desktop and standards
Standardization of hardware and software cannot be done in a decentralized manner.
Computer Leased/Replacement Program
Printer Standards
Campus Software Agreements

3. Centralized Help Desk

Single point of contact for all IT services
Support a wide-range of campus technology
Knowledgeable staff
Walk-in assistance
Feedback and follow-up
Enterprise Email
Implemented Microsoft Exchange and consolidated all Email Systems and standardized client.
VMS Mail
CC Mail
Unix mail
Old Clients- Pine, Netscape, Eudora

4. Law School Email Migration

ERP systems
Installed PeopleSoft Financial System
Installed PeopleSoft Student System
Install PeopleSoft HRMS (future)

5. Other Systems

Install Institutional Advancement System (future)
Installed Scheduling System
Installed web portals
Standardized Teaching Tools
WebCT

6. IT staff liaisons in Academic department

Direct communication with centralized IT management

Law School	Nursing School
Architecture	Engineering
Art & Sciences	Philosophy
Religious Studies	Music
Library Science	Metropolitan College

Centralized Web Servers

7. Why our Hybrid Model worked

From Campus point of view
A transformed reputation
Cost savings in academic departments
Eliminated management headaches in academic departments
Increased services

From University's point of view
Positioned our institution for changing technology
Best way to plan for operation and maintenance
Enabled use of Standards through the Campus
Enabled us to Negotiate licenses and enforce copyrights
Enabled us to establish priorities and funding alternatives

Source: Bringing IT All Back Home Centralized Systems in a Decentralized Climate

2.3.0	**Define a technology "ladder"**
	▪ College, Department, and course considerations. Campus-wide guidance for technology integration will likely require college and departmental review for relevance and impact.
	▪ By establishing an orderly progression of steps, faculty members can methodically introduce new teaching methodologies without expectations of sudden change.
	▪ Possible steps:
	  ▪ Static syllabus on-line
	  ▪ Threaded discussions
	  ▪ Hybrid course offering (lectures on line, in-class discussion)

2.3.2	**Committee of Departmental IT Professionals** ▪ University of Arizona's Network Managers Group acts as liaison between end users, the campus Network Managers, and CCIT *(Center for Computing and Information Technology)* Telecommunications to represent needs, concerns, and future plans on networking matters. A subgroup of the Network Managers Group called NetVision advises CCIT on future technologies. See ▪ At Georgia State University "…for several years, the Information Technology Support Subcommittee, which consists of the local information technology support staff from units having such staff and representatives from the institutional information technology support units have been meeting in joint planning and collaboration sessions. This group has been able to identify critical issues relative to information technology and make recommendations to the Senate Information Systems and Technology Committee. (Georgia State University *Information Technology Strategic Plan 2000-2005*, page 4)
2.4	**Benchmarking Academic Technology** ▪ Educause research and numerous university web sites indicate undergraduate student-general use computer ratios of anywhere between 30:1 to 10:1 [http://www.educause.edu/consumerguide/social.asp# ▪] with some universities (including peer George Mason) in the 7-8:1 range. They caution, however, that these numbers can be very misleading. A university with a 10:1 ratio of out-of-date computers is far worse off than a university with a ratio of 20:1 of state-of-the-art machines. Thus, any ratios and raw numbers must be coupled with a consistent desktop replacement policy to be consistent. [See section 2.5] ▪ To lower the undergraduate student-computer ratio to 10:1, UMB would need to add 729 computers to its current total of 284 in general use labs. To achieve a 30:1 ratio, UMB would need to add 54 computers. The statistics on general computer lab usage demonstrate that there are only a few times (during midterms and finals) that the labs reach 100% capacity. Given this fact, the goal of a 30:1 ratio and an additional 54 computers seems like a reasonable goal for UMB. Adding 54 more computers would bring the general use total to 338. Assuming that there are already departmental labs not included in this total, 350 is an easily attainable goal. ▪ The proposed multi-use spaces should be large enough to set up a variety of configurations for teaching and lab use. When calculating the number of square feet required, consideration should be given to work space for lab supervisors, and for printers and other equipment. At present the rooms housing the teaching labs are too small for any configuration other than standard classroom-style arrangements. Teaching labs in the new multi-use spaces should be configured to accommodate classes scheduled to use the labs; the registrar and college schedulers should be consulted. The College of Management, for instance, has had to use labs with 20 or 24 computers for classes with 36 students. ▪ Statistics from the Campus Computing Project (2001) indicate that only 6% of public universities had their entire campus covered by wireless network access. On average, public university had 12% of their campus covered. By seeking a 50% goal, UMB could be a leader in wireless access. [http://www.campuscomputing.net/summaries/2001/index.html]
2.5	**Desktop Replacement** ▪ For a similar desktop replacement plan from a peer of UMB, see the University of Missouri – St. Louis's policy. [http://www.umsl.edu/technology/clientservices/]

2.5.3 Centralizing Departmental Servers

Current Status of departmental Local Area Networks	Arguments in favor of Centralization	Arguments against Centralization
Security		
Environment *Current Status* typically… ▪ Security is less than optimal. ▪ No uninterruptible power supply (UPS); no auxiliary power ▪ Insufficient Heating, Ventilation, and Air Conditioning (HVAC) ▪ No fire suppression equipment ▪ No automated emergency communication ▪ Some LANs depend on substandard local network devices	*Centralization advantages* ○ Significant overall improvement in operating environment. The expense can be shared by all dept servers at a fraction of the cost of improving and securing the facilities for all individual department LANs. ○ A central server facility must meet technical requirements for: ▪ Bandwidth ▪ Physical security ▪ UPS and auxiliary power ▪ Heating ventilation, air conditioning ▪ Fire suppression ▪ Emergency communication	*Centralization disadvantages* ○ Centrally-located equipment is inconvenient for Dept IT staff (on rare occasions when physical access is required) ○ Unless central facility meets appropriate technical requirements, reliability will not be assured.
Data & Access *Current Status* ○ Uneven implementation of password protection ○ Computers running websites or providing remote access are vulnerable to intruders.	*Centralization advantages* ○ Standard password update policy is easily enforced. ○ Intrusion less likely to affect dept servers when centrally located	*Centralization disadvantages* ○ Variations in levels of departmental security may be difficult to accommodate, an inconvenience for departments with low security risk ○ Assistance for forgotten passwords or similar support may be somewhat less immediate.
Risk Management *Current Status* ○ No pattern of scheduled, routine maintenance; unknown probability of downtime, data loss ○ Unreliable environment increases vulnerability to IT disaster recovery problems ○ Uneven security and infrequent virus updates raise risk of intrusion and virus corruption	*Centralization advantages* ○ Scheduled maintenance, routine application of security patches and virus updates, and documented performance verification increase reliability and uptime. ○ Regulated, secure environment significantly reduces likelihood of physical disaster, vandalism, or service interruption due to power failures.	*Centralization disadvantages* ○ Improved risk management depends on competence of central IT staff who have no dept-level stake in lost data. ○ Central environment must build track record for reliability before dept IT staff will trust it.

2.5.3, continued

Reliability		
Backup		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Many departmental computers are not backed up at all. ○ Individual dept LAN backups are inefficient at best—many staff run small backups. ○ No standard practice for off-site tape storage for dept-level backups. Individual researchers are responsible for their own backups in some depts.	○ Centralized backup of all data: an automatic, frequently repeated process. ○ Centralized backups are far more efficient. ○ Routine backups include strict protocols for documentation, multiple generations, and off site storage.	○ Unless centralized backups are tested routinely, they may not be considered trustworthy. ○ Restoration may be slow unless specific service level agreements can be maintained.
Virus Protection		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Many departments update virus data files infrequently—some monthly, some rarely. ○ Often, a lack of routine virus surveillance on dept machines	○ Automatic virus protection of all servers can be easily and efficiently maintained on a daily-basis. ○ Departmental desktop computers can be configured for automatic routine virus protection upgrades.	○ a 'monoculture' server farm can be vulnerable if a virus is successful in penetrating network defenses.
Maintenance		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Routine maintenance often not performed ○ Documentation frequently inadequate; no campus-wide formats or protocols in common use. ○ Management of licensing is inefficient at a dept level, given relatively small numbers.	○ Routine maintenance is a hallmark of a centralized server facility ○ Documentation is far easier to maintain in a multiple serve environment. ○ Security patches, system upgrades, and hardware replacement are significantly easier to perform in a controlled environment by specially trained network experts. ○ Licensing and record keeping is far easier to manage centrally.	○ Trust depends on providing dept level IT staff with easy access to maintenance logs and documentation of security patches and licenses for their centrally managed servers. ○ Work orders for software upgrades may not occur within timeframes desired by dept
Uptime		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Local system disruptions, when they occur, have been longer and more costly than they should be. ○ Disruptions occasionally require intervention by external consultants. ○ Lack of standards and documentation significantly inhibit the ability of central IT staff to supply second-tier support, especially when department IT staff are on	○ A central facility, properly configured, maintained, and monitored, is far less likely to encounter disruptions. ○ Properly trained staff are less likely to require external support; if outside help is needed, a standards-based installation will simplify external intervention. ○ Centralized documentation is easier to maintain; a central facility is more economical to staff to handle contingencies.	○ Uptime is never 100%. Skepticism will decline only when a track record for reliability is established. ○ Protocols designed to improve reliability can be restrictive—innovation may be constrained.

vacation.		

2.5.3, continued

Departmental IT Management		
Standards		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Only limited campus-wide standards are observed at the level of departmental LANs ○ Standards for equipment, software, security, maintenance, documentation have not been established.	○ Establishing standard technical specifications for all IT assets will make planning, configuration, maintenance, and upgrades more cost-effective and time-efficient. ○ Standards for IT operations will significantly improve reliability. It will be possible to develop new models for support and staffing.	○ Unless the project to centralize departmental servers will accommodate specialized operating systems and applications, a number of departments will resist the initiative. ○ Requiring adherence to networking protocols may appear arbitrary.
Strategic Planning		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Departmental IT planning is frequently done in isolation, resulting in unnecessary expense, redundant capacity, or failure of external vendors to deliver results. ○ Unforeseen consequences: New department-level initiatives have created major bandwidth problems for the university. ○ Departmental initiatives have received insufficiently coordinated expert assistance from campus experts.	○ Expansion or upgrade of new IT capacity will require collaboration of central network and department IT staff. ○ A new protocol for strategic planning will reduce unnecessary expense and improve the likelihood of success for all new IT innovations.	○ Local independence will be challenged by central interests in economy and interoperability. ○ Experimental or ad hoc initiatives are likely to be difficult to support centrally.
Department level IT staff		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Department level IT staff members wear many hats: network manager, software & hardware specialist, website developer, database administrator, instructor, desktop repair expert. ○ Usually self-taught—good problem-solvers. Since training on all topics is not feasible, some IT staff solve problems in non-standard ways. ○ Insufficient staff backup (if any)—local IT staff can be stressed by lack of support.	○ Department IT staff, freed from network support requirements, can focus on departmental purposes and uses of IT, not networks. Department staff should become more efficient and productive contributors. ○ Training can be more directly aligned with departmental purposes for IT ○ Central management of servers will reduce stress and isolation.	○ Reduction in autonomy. ○ Potential for finger-pointing: department supervisors demand results from local IT staff who may be powerless to make changes fast enough.

2.5.3, continued

Central Network IT staff		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ Unprepared to handle special dept LAN custom configurations where documentation is inadequate. ○ Lack authority to make many changes ○ Informal collegiality is good, but formal communication is inadequate	○ Efficiently repeat same routine maintenance, security patch upgrades, backups, and documentation on many servers. ○ Training matches requirements ○ Staff backup is easier; documentation would allow outside vendors to provide supplementary assistance	○ Distant from Dept data owners—accountability, responsiveness, and reliability must be proven ○ Onus to develop track record of consistent communication.
Cost		
Current Status	*Centralization advantages*	*Centralization disadvantages*
○ It is reasonable to assume that maintenance of departmental LANs requires more staff time on a per-machine basis than is optimal. ○ Because departmental labs are not centrally scheduled, they are not used optimally, and are sometimes entirely idle. ○ Some labs were originally cobbled together with more determination and entrepreneurial spirit than sound technical planning. Such facilities can be difficult to upgrade incrementally. Improving reliability with sufficient documentation and external tech support would be expensive. ○ The next generation of servers will require sophisticated configuration to meet pending standards for security, more difficult to set up than previous devices.	○ Whether or not departmental servers are centralized, a major facility upgrade is required for central computing services in order to meet required standards for security and to reduce the risk of environmental disruption (loss of power, floods, etc.) Since many of the upgrade costs are fixed—not dependent on the number of servers protected—the additional costs to be allocated to departmental servers are relatively low. ○ Future planning for departmental labs should include central scheduling (with departmental priorities assured) so that lab use will remain cost-effective. ○ Maintenance and upgrade costs should decline significantly, offsetting the initial expense of centralizing server management.	○ If it ain't broke: Many department computers have provided years of cost-effective service. Downtime goes with the territory. ○ The cost of centralizing must include migration of applications including reliability and performance testing. Some migrations may not be cost-efficient.

2.6

Portal

- In an Educause survey of top IT issues for universities, medium and large universities rank "Enterprise portal" as the 4th most important upcoming issue.
- The Campus Computing Project (2001) indicates that 28% of public universities already have a portal in place, while 15% have no portal planning whatsoever. Other public institutions are in some sort of planning stage.

2.6.3

Network Standards

BICSI (Building Industry Consultant Services International), a non-profit telecommunications association that defines standards for network cabling installation. http://www.bicsi.org/

2.7

Potential cross-disciplinary IT projects

- Establish a digital image database for use by any department, although the Art History Department would be a logical initial starting point. Options include: James Madison University's MDID (http://cit.jmu.edu/mdidinfo/). Careful thought is required to meet specific requirements for indexing and image quality required by various disciplines (e.g. Art History vs. Biology).

  Ref on educational impact: See Educause Quarterly 2:2002: Lessons Learned:
  "Education about technology and its integration into the teaching and learning process is critical for all project stakeholders. Design of instructional systems, however, is increasingly collaborative. It involves not only instructional designers and faculty, but also providers and supporters of the institution's technological infrastructure — from technical trainers to network designers to audiovisual specialists. With the MDID, involvement of technology classroom managers and audio-visual specialists came late. Inclusion of all potential stakeholders at the onset of the project would have provided a smoother road for ongoing development."
- A number of departments have expressed an interest in GIS activity.

3.3

Training issues

[integrate smartforce training into this section: see http://smartforce.umb.edu/]

3.5

IT Salaries

Based on a current opening at UMB for a Senior Network Administrator, the following are a sampling of annual salaries from the Boston area. With some of the resources, it was impossible to distinguish a Network Administrator from a Senior Network Administrator, so both were included in the comparison.

Bridgewater St	55-65k	median = 60k*
UMB	64-77k	median = 71K
Northeastern	56-92k	median = 74k
MIT	65-160K	median = 112K
Harvard	80-150K	median = 115K
Salary.com	69-87K	median = 78K
Techiegold.com	76-100K	median = 88K

*Bridgewater State also offers $1,000-$1,500 training allowance in addition to free Cisco and Microsoft certification programs and $1,100 personal IT equipment allowance. Salary raises are tied to technical expertise and certification. Bridgewater assumes that equivalent positions in Boston would command an additional $10,000 in salary.

4.1.4

Desktop Rotation Plan, *approved 12/13/02*

RENEWAL PLAN FOR COMPUTER EQUIPMENT (REPLACE)

Beginning in January 2003, the University of Massachusetts Boston campus will initiate a four year standardized computer replacement program for faculty and staff. This program is a recognition that having reliable computer equipment has become a necessity for nearly everyone who works on the campus. The program is called the **RE**newal **PLA**n For **C**omputer **E**quipment (**REPLACE**) Initiative.

Purposes of the REPLACE Initiative

The purposes of the REPLACE Initiative are the following:

1. To ensure that all full-time personnel, faculty and staff, have relatively up-to-date computers with which to perform their duties.
2. To remove the perception among departments that some programs are better funded for the purchase of computer equipment

than others.

3. To use efficient purchasing methods, particularly bulk purchasing, to reduce the per unit costs of computer equipment.
4. To provide for a standard computer platform that can be efficiently supported by Computing Services.
5. To establish central purchasing and inventory control of computer equipment so that we can have an improved asset management system for computers.

Description of the REPLACE Initiative

The REPLACE Initiative is intended to replace aging computer equipment used by full-time faculty and staff who are state-funded or funded by trust funds. The REPLACE Initiative does not apply to faculty and staff who are funded by grants or contracts as the cost of such equipment should be included in the overhead recoveries. The REPLACE Initiative also does not apply to specialized users such as those that need computers other than PC-based because of their activities or to students or to student computing laboratories. Student computing laboratories will continue to be funded by through the IT fee paid by the students. Students may, however, take participate in the bulk purchase process and take advantage of special discounted rates. Computers will be purchased centrally through a bulk purchase by Computing Services and will be distributed to the various vice chancellor units in proportion to the number of their full-time faculty and staff.

The computers will be purchased on a four-year cycle. The vice chancellors will be allocated a number of computers each year based on the number of full-time employees and then will reallocate them to their separate departments. Department heads will allocate computers among faculty and staff. Not all faculty and staff have the same computer needs and some power users may receive a new computer more frequently than once every four years and some user with fewer needs may get a new computer less frequently. Old computers will be returned to Computing Services for evaluation, redeployment, and disposal.

The basic desktop computer provided by the REPLACE Initiative will be financed from general revenues of the campus. It will be a sufficiently robust machine that will use a standard software and e-mail configuration. There will be opportunities to upgrade the basic desktop computer, either for a more advanced monitor or to a laptop model, but the cost of such upgrades will be charged to the units where the faculty and staff are assigned.

The REPLACE computers, although assigned to departments and faculty and staff throughout the campus, will be the property of the Computing Services Department. Computing Services will be responsible for deploying, servicing, repairing, removing, replacing, and redeploying such equipment.

Discussion of Issues

1. Why Buy Computers in Bulk?

We have clear evidence of the advantage of group purchasing of computers as shown by a bulk purchase made last summer by UMass Boston in conjunction with UMass Lowell. Together the campuses purchased 1057 Dell computers and saved $449,225 ($425 per computer) when compared to the normal quoted price by Dell for higher education institutions. The Management Council of the UMass system has reviewed these results and will be recommending that all the campuses of the system get together to make similar purchases several times a year. We should continue to see such savings in the future.

2. How Will the Computers be Distributed?

Although computer equipment is in use throughout the campus, there is a wide discrepancy in the age and the computing power of this equipment amongst the various departments. The purchase of computers has been a local decision made often at the departmental level. Some departments have made updating computers a larger priority than other departments. This disparity seems unfair. Computing Services also has difficulty providing support to the wide variety of computing environments that has developed from such a decentralized process.

Table 1. Distribution of Computers	**Phase 1** Jan 03 – Jun 03	**Phase 2 –4** Jul 03 – Jun 06	**4 Year Total**
Academic Affairs	127	221	790
Administration & Finance	48	82	294
Chancellor's Office	1	2	7
Student Affairs	10	18	64
Communication/Community Affairs	2	4	14
Institutional Advancement	2	3	11
Enrollment Services	10	18	64
Total	**200**	**348**	**1244**

Under the REPLACE Initiative, the campus will ensure that, over a four year cycle, all full-time employees will be provided adequate computers in order to do their jobs. The REPLACE Initiative will distribute computers based on the ratio of full-time employees in each unit to the total of full-time employees on the campus. Our most recent count of full-time employees indicates that there are currently 1,245 at UMass Boston. On average the REPLACE Initiative will distribute approximately 311 computers. Note that since we are half way through the academic year at the beginning of the REPLACE Initiative, we will only be installing 200 computers in the first phase. In subsequent academic years, beginning in the Fall 2003, the REPLACE Initiative will distribute 348 computers for the next three years to fully phase in the Initiative. The pro forma distribution

numbers are indicated in Table 1. In addition, the number of computers distributed will also be adjusted each year to reflect changes in the number of eligible full-time faculty and staff.

3. Will Laptops or Other Upgrades be Available?

The REPLACE Initiative estimates that the cost per computer will be approximately $1,350 for the standard desktop. Some employees may prefer the use of laptop machines, which are more expensive. Others employees may need LCD or flat screens to reduce eyestrain or to reduce the loss of desk space to the monitor. Under the REPLACE Initiative, such options will be available. However, such needs will have to be identified in advance of the bulk purchase and the incremental cost of the upgrade will have to be born by the individual vice chancellor unit. Because of the need to get the program started in January 2003, it will not be possible to supply optional laptop computers in the first phase of the program. A limited number of computers with LCD monitors will be available in the first phase, however. Vice chancellors must request this upgrade from Computing Services and be repaired to pay the incremental cost of the more expensive monitors.

4. When Would the REPLACE Initiative Begin?

Computing Services will make the first purchase of replacement computers in January 2003 and will begin installing them immediately thereafter. The second wave of the REPLACE Initiative will occur this summer with computers installed by the beginning of the Fall semester. The third wave would happen a year later and for following years.

5. How will this be paid for?

The budget for FY 2003 has $300,000 set aside for this program which will pay for the first 200 computers. This will not be sufficient to fund the necessary 348 computers in the following three years, which will cost about $470,000 to purchase. Depending on budget conditions next year, the additional funding may be allocated from curriculum trust fund revenues or from an increase in the trust fund administration charge.

As note above, the costs of upgrading to laptops or to LCD screens will be borne by the departments or vice chancellor areas that request them.

6. Why Should We Implement the REPLACE Initiative Now?

Given our continuing financial issues on campus, it would appear difficult to begin such a computer renewal program at this time. However, it is just such a fiscal climate that makes the REPLACE Initiative even more important. As mentioned earlier, the REPLACE Initiative means that computers would be purchased in bulk, saving hundreds of thousands of dollars. Individuals and individual departments would not be out paying published rates. Instead, the campus will be using our joint market power to get better savings. It is clear from the data that computer equipment is pervasive on campus and necessary for outr operations. Therefore, the issue is not really if we are going to buy new computers but really how much will we pay for them. In addition, by purchasing computers with a standardized platform, the level of service that can be provided by Computing Services will be improved because they will not have to support as many unique machines and applications.

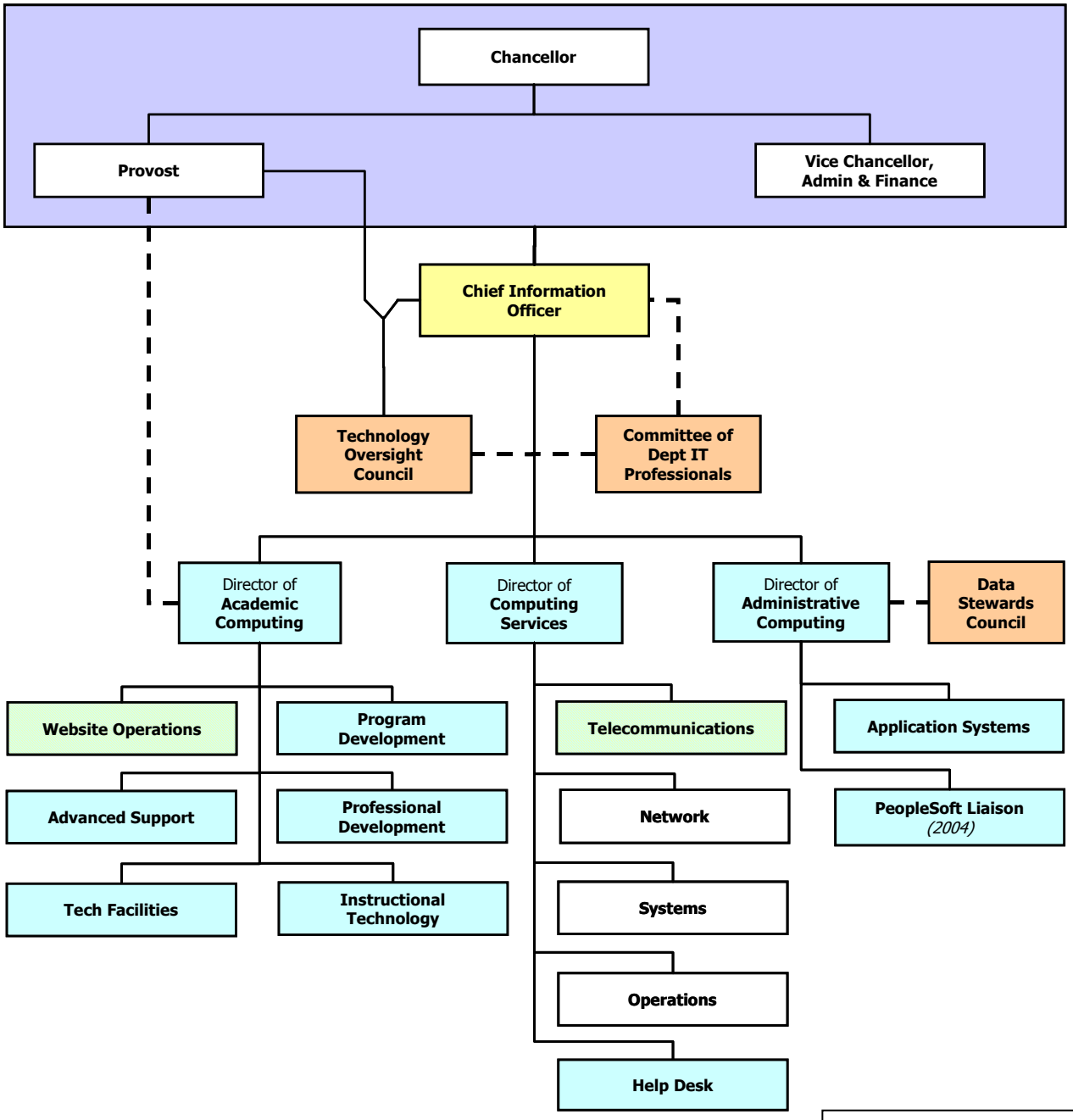
7.1.0

Benchmarking IT spending. Source: *7 Benchmarks for Information Technology Investments*, by David Smallen and Karen Leach. *Educause Quarterly* Number 3, 2002, pp 22-27. For additional information on the COSTS Project: **http://www.costsproject.org**. UMB COSTS data compiled October 2002 by Odile Breton for Computing Services.

Benchmark	Comparable Universities: Carnegie Class M1&M2		UMB
1. Budget Profile: How IT budgets are allocated	Personnel costs	50%	81%
	Hardware	27%	13%
	Software	8%	2%
	Contractual exp	6%	1%
	Student Help	4%	3%
	Other	6%	1%
2. Level of Budget Support for IT: *Per capita IT support.* (Total IT budget divided by total campus population)	75th percentile	$847	
	Median	$643	
	25th percentile	$510	$447
3. Budget Impact: IT's significance as indicated by its proportion of total institutional budget	Typical range:	3.6% to 6.2%	
	Median	4.9%	3.8%
4. People supported per IT Staff Member	75th percentile	158	
	Median	126	
	25th percentile	83	86
5. Computers supported per IT Staff Member	75th percentile	149	
	Median	86	
	25th percentile	56	27
6. Staffing Profile by service area	Student Support	21%	48%
	Curricular Support	9%	3%
	Admin info systems	16%	6%
	Helpline	10%	6%
	Network support	8%	23%
	Desktop computer repair	6%	1%
		6%	3%
	Hardware, software	7%	6%
	Web support	2%	1%
	Training	6%	2%
	Admin, Planning	6%	0%
	Other		
7. Computer availability ratio of total campus population to total number of computers *(people per computer)*	75th percentile	5.3	
	Median	4.2	
	25th percentile	3.0	3.8

Appendix B

Proposed Organizational Chart



- CIO reports to Chancellor, Provost, and Vice Chancellor for Administration and Finance.
- CIO and Provost co-chair Technology Oversight Council
- Director of Academic Computing maintains dotted-line reporting relationship to Provost.

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Appendix C: Master Plan Process: Interviews and meetings

Name	*title & office*	*interview date*
Peter Morneau	Business Manager, Gerontology Institute	23-Jul-02
Kim Miller	Asst. Dir. for Academic Computing	23-Jul-02
Nancy Ramsdell	Assoc. Dir. for Special Projects	23-Jul-02
David Mackenzie	Vice Chancellor of Administration & Finance	24-Jul-02
Christine Armett-Kibel	Dean of College of Arts and Sciences	24-Jul-02
Phil Quaglieri	Dean of College of Management	24-Jul-02
Michael Shiaris	Chair, Biology Dept	24-Jul-02
Apurva Mehta	Library, Head, IT Services	26-Jul-02
Ismael Ramirez-Soto	Dean, Graduate Studies and College of Public and Community Service	26-Jul-02
Reebee Garofalo	Professor, College of Public and Community Service	26-Jul-02
Dirk Messelaar	Dean, Division of Continuing Education	26-Jul-02
Kitty Galaitsis	Division of Continuing Education	26-Jul-02
Stephanie Janey	Dean of Student Affairs	26-Jul-02
David Cesario	Registrar	30-Jul-02
Joe Peters	Webmaster	30-Jul-02
Richard Eckhouse	Associate Dean, Faculty of Science, CAS	30-Jul-02
Charlie Boland	Director of Computing Services	30-Jul-02
John Ciccarelli	Special Assistant to the Chancellor for Economic Development	30-Jul-02
Forrest Speck	Director, Auxiliary Services	31-Jul-02
Jennifer Brown	Director, Institutional Research	31-Jul-02
Sara Baron	Director, Instructional Technology Center	31-Jul-02
Chris Hogan	Associate Dean of Student Affairs	31-Jul-02
Bill Perry	Systems Administrator, Computer Science Department	7-Aug-02
Janet M Wagner	College of Management	7-Aug-02
Clara Jennings	Dean, Graduate College of Education	7-Aug-02
Robert Morris	Professor, Computer Science Department	8-Aug-02
Jack Looney	Chair, Geographic and Earth Sciences	8-Aug-02
Louise Smith	Dean of Liberal Arts Faculty, CAS	8-Aug-02
Kathy Teehan	Vice Chancellor for Division of Enrollment Management	8-Aug-02
Helen Kelley	Computing Services	9-Aug-02
Anthony Roman	Center for Survey Research	9-Aug-02
Steve Coleman	Computing Services	9-Aug-02
Kristine Alster	Adult Gerontological Nursing	9-Aug-02
Oscar Gutierrez	College of Management	14-Aug-02
Deborah Boisvert	IT Curriculum Coordinator, Div of Corporate, Continuing and Distance Education	21-Aug-02
Paul O'Keefe	Director, Sponsored Research	29-Aug-02
Sherry H. Penney	Professor, Center for Collaborative Leadership, College of Management	29-Aug-02
Steve Schwartz	Chair, Psychology Dept	29-Aug-02
Michael Pollard	Psychiatry Dept	29-Aug-02
Frank Casey	PeopleSoft Project Director	29-Aug-02
Bill Mahoney	System Administrator, Earth and Geographic Science	30-Aug-02
Peter Adams	Administrator of Information Technology, CPCS	4-Sep-02
Joan Becker	Associate Vice Provost for Academic Support Services	4-Sep-02
Terry Mortimer	Vice Provost for Academic Support Services	4-Sep-02
Joyce Morgan	Director of Student Life	6-Sep-02
Paul J. Fonteyn	Provost and Vice Chancellor for Academic Affairs	19-Sep-02
Jo Ann Gora	Chancellor	19-Sep-02
Robert Stevenson	Biology Dept	24-Sep-02
Peter Langer	Associate Provost	24-Sep-02
Mark Schlesinger	Director, Communication Studies	24-Sep-02
Richard Tenney	Emeritus Professor of Computer Science	24-Sep-02
David Gray	UMass CIO	28-Sep-02
Jack Wilson	CEO of UMassOnLine & VP, UMass	28-Sep-02
Jeff Thompson	CIO UMass Lowell	7-Oct-02
Nancy Stieber	Chair, Art Dept	11-Oct-02
Xiaogang Deng	Professor of Sociology	11-Oct-02
Daniel Ortiz	Interim Director, Libraries	12- Nov-02
Janet Stewart	Interim Associate Director, Libraries	12- Nov-02
George Holt	Libraries	12- Nov-02
Mary Simone	Educational Support	21-Nov-02
Cynthia Jahn	Academic Support Services	25-Nov-02

Groups	Event date
Technical Information Sharing Group	18-Sep-02
Tony Marcinkiewicz	Computing Services
Peter Adams	Admin of Info Systems, CPCS
Steve Anderson	Admin of Info Systems, COntinuing Ed
Caroline Cappuccio	Asst Dir, ITC
Steve Coleman	Asst Dir, Networking, Computing Services
Leonard David	Sys Admin, Computer Science
Paul Foster	Dir Tech Operations, Physics
Chris Goldy	Asst Dir Labs, Psychology
Donna Hill	PC Network Admin, Computing Services
John Jessoe	Director, Distance Learning
Binh Ly	Network Mgr, ITC
Terry MacAskill	Network Mgr, Library
Tony Marcinkiewicz	Assoc Dir, Computing Services
Rick Martin	System Programmer, Computer Science
Apurva Mehta	Dir Library Info Systems, Library
Kim Miller	Asst Dir, Labs, Computing Services
Jamil Moosavifard	Asst Dir, Server Admin, Computing Services
Bill Perry	Sys Admin, Computer Science
Joe Peters	Webmaster, University Web Admin
Jamie Soule	Asst Dir, Operations, Computing Services
Jeff Wade	Tech Coordinator, Distance Learning

Groups	Event date
College of Management	30-Sep-02
Instructional Technology Center	15-Oct-02
MoveITforward public forum	28-Oct-02
UMB Faculty Council	04-Nov-02
Delta Sigma Pi student society	06-Nov-02
Computing Services Department	13-Nov-02
College of Arts & Sciences Senate	18-Nov-02

Appendix D: Implementation Timeline

UMB IT Master Plan Action Steps and Timeline

Note: the initial steps in this plan—principally, hiring the CIO—will result in the arrival of a major decision-maker on the campus. While some initiatives can begin before the CIO is established, it is assumed that extensive detail in planning steps at this time is not warranted.

Objective	Responsibility	Incremental Cost
Implement Immediately		
Begin search for CIO	**UMB Leadership**	
○ Bring Internet 2 to campus. ○ Add larger bandwidth to campus-wide infrastructure. ○ Institute 4-year desktop rotation plan	**Director of Computing Services**	$461,000 – first year
Complete by June 30, 2003		
Hire CIO	**UMB Leadership**	$137,000 / year
○ *Create IT Management Team* under the CIO: Appoint Director of Academic Computing Appoint Director of Computing Services and reorganize current departments. ○ *Relocate Telecommunications* to Computing Services. ○ *Create IT advisory groups*: Technology Oversight Committee (TOC) and Committee of Department IT Professionals. ○ *Create a Data Stewards Council* to initially report to the CIO, but eventually will be under the Director of Administrative Computing. ○ *Establish a Communications Committee*.	**CIO**	
○ Reorganize department to reflect new mission. ▪ Move Instructional Technology Center (ITC) ▪ Web Operations to Academic Computing. ○ Begin expanded availability of computing facilities: extend opening hours of General Use Labs. ○ Plan central computing facility	**Academic Computing**	$14,000 / year
○ Reorganize department, including addition of Telecommunications. ○ Centralize responsibility for department-level network infrastructure. ○ Establish routine reporting by the departmental IT staff with Computing Services. ○ Develop benchmarks and criteria to make customer satisfaction the first priority. ○ Make self-service support easier to locate and understand. ○ Create and implement hardware and software standards.	**Computing Services**	
○ Approve hardware and software standards.	**Technology Oversight Council**	

○ Establish reporting/feedback by the departmental IT staff to Computing Services ○ Recommend protocol for including adaptive technologies in all new projects. ○ Recommend changes to central help desk operations	**Committee of Department IT Professionals**	
○ Survey Campus shadow and splinter systems to assess requirements for campus data exchange	**Data Stewards Council**	
Complete by December 31, 2003		
○ Create a different pay scale for IT staff. ○ Offer initial 20% pay increase to IT staff and give future pay raises to IT staff according to technical skills and responsibility, not management ○ Approve and fund plans for central computing facility upgrade and technology-based multi-use facilities	**UMB Leadership**	$550,000/yr
○ Implement cost-saving standardization and purchasing protocols (Defined by TOC, above) across UMB campus. ○ Develop professional development program for IT staff. ○ Complete implementation plan for technology-based multi-use facilities	**CIO**	$102,000
○ Create data standards – initial phase	**Data Stewards Council**	
○ Survey department computer labs to identify technical status of labs before gaps campus-wide standards are set.	**Committee of Department IT Professionals**	
○ Establish competencies for administrative computing. ○ Approve network standards. ○ Approve support and service standards.	**Technology Oversight Council**	
○ Hire 20 more students ○ Integrate ITC and Web Operations into organization. ○ Manage scheduling of all technology-based facilities. ○ Coordinate course scheduling and room assignments with Registrar. ○ Promote Prometheus through a highly visible course. ○ Create desks for laptop-only use in General Use Labs. ○ Centralize coordination of all IT training. ○ Adaptive technologies included in all new projects. ○ Plan 14 new Technology-Enhanced Classrooms ○ Plan Kiosks. Install and Evaluate pilot kiosk.	**Academic Computing**	$100,000 /year
Create 14 new Technology-Enhanced Classrooms. ○ Create 10 kiosks around campus with a particular emphasis on high-	**Computing Services**	$44,000 per year with onetime cost of $52,000 $14,256 / year and

traffic areas o Create 10 MB of network accessible disk space for each student and 100 MB for each faculty member o Implement recommended changes to Help Desk Operations, including support and service standards o With Academic Computing, develop *Key User* program. o Implement network standards		one-time cost of $15,000 $15,840 / year
Complete by December 31, 2004		
o Approve competency standards as appropriate for students and staff	**UMB Leadership**	
o Complete 3 multi-use computing facilities in classroom buildings o Complete feasibility study on migrating to funding based on fee for service o Strengthen cooperative purchasing within UMB and with Lowell and Dartmouth. o Review and update IT Master Plan and IT budget. o Consolidate current positions to create Director of Administrative Computing position.	**CIO**	*To be determined*
o Add the equivalent of 2 teaching labs in the multi-use spaces. o Take responsibility for all academic computing facilities and services on campus o Appoint Director of Administrative Computing	**Academic Computing**	$70,500 /year and $35,000 one-time cost
o Create a campus portal for students and faculty to access campus resources remotely. o Create wireless access for 50% of campus. o Create wireless access near General Use and Department Labs. o Create a one-stop service and support center. o Systematize delivery of service and support. o Share support functions with Lowell and Dartmouth.	**Computing Services**	
o Assume oversight of Data Stewards Council from CIO.	**Administrative Computing**	
o Develop technology competencies for faculty and students. o Align technology competencies with specific courses and departments. o Approve updates to IT Master Plan.	**Technology Oversight Council**	
Complete by December 31, 2005		
Review and extend IT Master Plan	**CIO**	
o Approve updates to IT Master Plan	**Technology Oversight Council**	

Appendix E

Cost of Proposals with Annotations and Assumptions

Objective	Recommendation	*One-time Cost*	Continuing Annual Cost
CIO	**Hire CIO**		**$137,000.00**
Based on salary statistics from Compuworld and the Chronicle of Higher Education of CIOs at doctoral educational institutions and considering the budgetary climate of UMB, $137,000 is a fair total compensation package for the proposed UMB CIO.			
Desktop replacement plan	**330 new computers each year**		**$561,000.00**
The desktop replacement plan calls for a 4-year life-cycle for desktop machines of full time staff and faculty. This works out to approximately 330 computers each year. At an average cost of $1,700 each for standard desktop machines (the plan does not replace high-end desktops and laptops), this means that it will cost $561,000 per year to implement this plan. These computers are being purchased, not leased, so they can be passed on to the rest of the campus where they are needed as they are replaced during the next buying cycle. $300,000 has already been allocated to Computing Services to begin the desktop replacement plan.			
IT staff retention	**Increase salaries and budget for professional development for 51 central IT staff**		**$656,880.00**
Given that the average annual salary for central IT staff is $54,400 (total salary of $2,664,552 for 49 staff), the budget calls for an additional $12,880 for each staff member. (This includes the 2 positions that are currently unfilled, which brings the total up to 51.) Part of the IT staff retention plan is to significantly improve salaries for IT staff and the budget calls for a 20% average increase ($10,880 per staff person). The remainder ($2000) of the $12,880 for each staff person is for professional development.			
Technology-Enhanced Classrooms (TECs)	**14 new TECs**	**$51,800.00**	**$43,797.60**
The 14 new TECs will each have a faculty computer ($2400), a digital projector ($5000), a VCR ($250), remote control and connection equipment ($3000), a screen ($250), and furniture for this equipment ($700). (The $2400 cost for each computer is broken down in the following manner: $1600 for the hardware, $300 for the software, and $500 for networking equipment and wiring. Each piece of technology is leased unless otherwise noted.)			
Expanded student services	**Student and faculty network storage space**		**$15,840.00**
To give each student 10 MB of disk space and each faculty member 100 MB means creating a disk array with approximately 300 gigabytes of storage capacity. The cost is approximately $40,000, which includes a disk array, controller, rack space, power supply, and backup.			

Continued

Objective	Recommendation	One-time Cost	Continuing Annual Cost
General Use Labs	**24x7 staffing during**		**$14,000.00**

The staffing necessary for 24 x 7 use of the General Use Labs will originally be for only midterms and finals (8 weeks), seven days a week (7 days), for the 10 hours that the Labs are currently not open (10 hours), and for a cost of $25 /hour. The $25 /hour assumes that only 1 lab will be open and that it will be staffed by a student during this 10 hours; it includes the salary of the student and all other expenses.

Multi-use Facilities	**Space Renovation**		**Unknown**

As the new Campus Center opens, a large amount of space will become available in other buildings around campus, and in particular, in the classroom buildings. By converting some space in each classroom building, UMB can create multi-use computing facilities. These spaces can be configured to house General Use Labs, Teaching Labs, Media Centers, and small group spaces. The cost to renovate the different spaces in the classroom buildings can vary tremendously depending on the current state of the infrastructure. Due to the uncertainty about the specific location of the multi-use facilities, it is impossible to estimate a cost for renovation.

Multi-use Facilities	**2 new teaching labs**	**$35,000.00**	**$70,488.00**

The new teaching labs within the multi-use spaces will each have an average of 35 student machines ($2400/each) and desks and chairs for each of these machines ($700/each). In addition, each lab will have a faculty computer ($2400), furniture for this computer ($700), and a digital projector ($5000).

Kiosks	**10 new kiosks**	**$15,000.00**	**$14,256.00**

The 10 kiosks will each have either 1 or 2 computers (for an average of 1.5 computers each at $2400/each), a desk for each computer ($500/each), and special tamper-proof casing for the computers ($500/each).

Technology Assistants Program	**Hire 20 more student assistants**		**$100,000.00**

Given that the average annual compensation for student IT assistants is approximately $3,400 (total compensation of $185,500 for 55 students) and accounting for training for each student, the budget calls for $5,000 for each student.

Infrastructure Improvements	**New Server Space**		**Unknown**

As more department servers are migrated to Computing Services and as new servers are needed for central computing functions, the existing server space will become even less suitable to housing these critical servers. Eventually, the core of the campus network infrastructure needs a need physical location and building a new facility, rather than renovating the current space, is the best course of action. By creating a new space, UMB can plan for expansion, build environmentals specific for the site, and create a state-of-the-art facility. With so many factors unknown, it would be impossible to estimate a cost for this new server space.

Centralize purchasing of hardware and supplies			**est. ($300,000)**

Given the huge volume of computer hardware, software, printers, ink cartridges, paper, digital projector bulbs, and other supplies that UMB purchases each year, there could be tremendous savings if these were consolidated into campus-wide, and when possible university-wide, purchases. For instance, $400 can be shaved off the price of each Dell desktop when purchased in large quantities. This savings is not out of the IT budget, but rather is a savings across the entire UMB campus. The $300,000 figure is a rough, conservative estimate of savings on all current purchases that are made at the department level with individuals paying non-competitive prices. Only if the whole campus groups their purchases together can this large savings hope to be achieved. Note: part of this savings is already reflected in the computer prices used in the desktop replacement plan and throughout this cost analysis.