An External Review of

Information Technology

at the

University of Alaska

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Executive Summary

Within the past three years there has been a great deal of progress in the deployment and use of information technology at the University of Alaska. The University can justifiably be proud of many IT achievements, especially in light of the nearly unique challenges it faces in the delivery of services to such a diverse and geographically dispersed population. Meeting these challenges so well is a clear sign of the extraordinary expertise and dedication of UA's faculty, staff, and leadership. Despite areas of success, however, a number of technology issues deserve the University's prompt attention:

Information Technology (IT) Leadership

- In order to become more effective, the definition of the ITC's mission, its scope of activities, and the roles of its members should be explicitly articulated in the Regents Policy and endorsed by the executive management of the Major Administrative Units (MAUs).
- It would also be beneficial to have the scope of responsibilities of the statewide chief technology officer (CTO) position explicitly defined in the Regents Policy.
- It is strongly recommended that UAF establish a senior management position of chief technology officer with responsibility for all university components of computing, networking, and telecommunications.

Strategic Planning -- The individuals, committees, user groups, and ad hoc task forces looking into IT issues frequently are unaware of related efforts or fail to communicate their decisions to others in a timely fashion. It is recommended that a review of IT planning groups be performed with an eye towards reducing their overall number, improving inter-group communication, and clearly delineating the locus of responsibility for different aspects of IT policy and decision-making throughout the UA system.

Communications -- Communications relating to key IT issues are unusually poor. Explicit attention is required to improve both intra-campus and system-wide communication on such issues. More coherent linkages need to be established between user groups, campus IT advisory committees, central and distributed IT support staff at MAUs, the Systemwide Academic Council (SAC), the Information Technology Council (ITC), the University Business Council (UBC), the Banner Coordinating Team (BCT), senior management and the Board of Regents.

Overall Technology Funding -- While the investment in technology across UA has increased in the past three years, so has the number and complexity of IT

objectives. Not all areas of IT have benefited equally from funding increases and overall the University's treatment of IT as a funding priority still lags behind that of peer institutions. Legitimate cost-benefit analyses of IT at the University are difficult to obtain due to a lack of sufficient data. It is recommended that the ITC and UBC collaborate to identify a set of system-wide measures that can be used to track long term IT investments and benefits.

Campus Technology Funding

- There are widespread differences in the way student technology fees are being used. It would be desirable to examine the allocation of technology fee revenues at the three major campuses to insure that such funds do not lead the institutions to make unsustainable investments in programs or facilities.
- There is some evidence of excessive reliance on recharge revenues to support core IT operations. It is recommended that all three campuses, especially UAA, re-examine their IT recharge policies in order to strike a suitable balance between operating budget resources and fee-for-service revenues.

IT Staffing -- Under-staffing for Banner programming, web development, and end-user support is evident. It is advisable for each campus, especially UAF, to evaluate the staffing resources currently devoted to end-user support, both centrally and in academic and administrative units, to determine whether these resources are adequate. The issue of IT staff support at the extended campuses should be given particular attention.

Banner customization -- While many Banner problems may appear to be intrinsic limitations of the software, this is generally not the case. On the contrary, the technology that drives Banner is extremely robust and, with appropriate customization, the system can be shaped to fit nearly any application required by the University. The key challenge lies in the size of the programming staff. It is strongly recommended that the University review its Banner customization needs and augment the programming staff, especially in the Finance and Student areas. Existing programming staff assigned to specific applications should be reassigned to statewide Information Technology Services. This will provide greater flexibility in addressing the system's overall priorities.

Banner user groups -- The three Banner user groups represent a spectrum of effectiveness: the Human Resources group has functioned well, the Student group has had mixed success, and the Finance group has functioned poorly. While the Student group seems to be heading in the right direction, the Finance group appears to be stalled. It would be advisable for the Banner Coordinating

Team to concentrate attention on this group. In particular, the composition of the group should be examined, the meeting schedule should be increased, and the method of setting priorities should be clarified.

Banner datamarts -- A growing number of universities are finding it extremely helpful to create a uniform "datamart" strategy for administrative offices. By standardizing on a small set of products and procedures for downloading data from Banner, support costs, complexity, and the risk of data problems can be dramatically reduced. At the same time, the issues surrounding unique institutional reporting needs can be proactively addressed. UA should evaluate SCT's own data warehouse product, along with other third-party datamart tools, and should develop a systemwide strategy for dealing with shadow systems.

Instructional technology in the classroom -- Faculty at each of the campuses made comments about frequent failures of technology in the classroom. Indeed, there is some indication that faculty members who have used instructional technologies in the classroom before coming to UA are now hesitant to do so because of concerns about the reliability of the equipment. In order to derive the full benefits of instructional technologies it is important for each of the UA campuses to concentrate more attention on the maintenance and support of classroom facilities.

Distance learning -- Given the need for distance delivery of courses to rural and remote areas of the state, a comprehensive, long term vision of how distance learning can best serve the citizens of Alaska should be undertaken under the leadership of the SAC, in conjunction with the ITC. Such a vision should take into account all available technological means, rural support for IT, as well as tighter coordination of activities among the various MAUs.

Libraries -- While the library directors of the MAUs are represented on the ITC, library information resources and staff are not tightly integrated with the IT infrastructure at any of the MAUs. The missions of each campus library should be reviewed in an effort to bring them into closer alignment with other information, media, instructional support, and IT units, as called for in the Northwest Accreditation guidelines.

Network backbone upgrades -- If the high-speed backbone circuits being donated by GCI must be paid for beginning in March 2003, there may be a significant budget impact for the University's statewide IT organization. The statewide chief technology officer should continue to work on support arrangements for high-speed backbone circuits and should request additional financial resources if these become necessary.

Bandwidth to rural campuses -- The lack of adequate network bandwidth in Alaska villages is a known problem. The sparsely scattered population in rural Alaska makes it very difficult for private telecommunications companies to provide high-speed services profitably, and it appears that some special arrangements will be needed to assure that such high-speed services are provided to rural residents. The UA statewide chief technology officer should be involved in this effort.

Introduction

This review focuses on the organization, resources, and processes in place for information technology (IT) decision-making and operations throughout the University of Alaska system. It is a management review that examines IT leadership, organizational structure, resources, and the ways in which the sometimes shared, sometimes diverse missions of the major administrative units (MAUs) impact information technology across the University.

In February 2002, Mark Hamilton, President of the UA System, invited a team comprised of Alex Hills, Distinguished Service Professor at Carnegie Mellon University, Martin Ringle, Chief Technology Officer at Reed College, and Steven Zink, Vice President, Information Technology and Dean of Libraries at the University of Nevada, Reno to provide an external perspective on information technology at the University. In addition to examining documents describing IT policies, structures, and resources, the team met with approximately 180 members of the faculty, staff, students, senior leadership (including regents), of the University during site visits to Fairbanks, Anchorage, and Juneau, May 20 to 24, 2002 . The team conducted additional interviews via audio and video conferences.

As indicated in the scope document appended to the report: *Information resources have moved from the periphery of use to a central, daily dependence on their availability and reliability to carry out every aspect of the university's business.* Conversations during the site visits confirmed that the role of information technology at the University has expanded rapidly in the past few years and is now a critical component of nearly all core University activities including teaching, research, recruitment, communication, and administrative operations.

The University can be justifiably proud of many IT achievements. Despite substantial progress, however, there remain areas of IT that deserve attention. The primary purpose of this report is to identify those areas and, wherever possible, to suggest ways to address problems or to take advantage of opportunities.

The report is not intended to offer an in-depth analysis of technical, financial, or personnel issues. Rather, it is designed to provide a management level overview of key areas in IT administration that merit closer scrutiny, either at the system level, the campus level, or both.

Leadership and Organizational Structure

As with any complex university endeavor, the success of technology initiatives depends crucially on leadership and appropriate organizational structures. UA has considerable strength in both respects. There are, nonetheless, areas where improvements would be useful:

- the Information Technology Council (ITC);
- the role of the statewide CTO and campus IT leaders;
- campus IT organizational structures.

Information Technology Council -- Although discussions about information technology occur in numerous contexts across the University, the group that appears to have principal responsibility for IT leadership is the *Information Technology Council*. Composed of the statewide CTO, Controller, Director of Program Development, Academic Liaison, and the heads of IT and libraries from each major campus, the ITC is the crossroads for consideration of statewide IT initiatives, standards, policies, and resource priorities.

Despite successes, the ITC is frequently viewed as being less effective than it could be. In particular, people believe the group neither shares a common vision of IT's strategic role within the University nor is in agreement on a common set of technology priorities. The external review team concurs. Lacking such focus, the ITC has difficulty providing leadership for key efforts, ranging from the development of common standards for local area networks, end-user service levels, student lab support to a system-wide web portal and Blackboard training for faculty.

In order to become more effective, the definition of the ITC's mission, its scope of activities, and the roles of its members should be explicitly articulated in the Regents Policy and endorsed by the executive management of the MAUs.

Statewide Chief Technology Officer (CTO) and campus IT leaders -- Closely related to the fuzziness inherent in the ITC, is an ambiguity in the roles and relationships of the statewide CTO and campus IT leaders. This may simply reflect broader tensions that exist between campus prerogatives and statewide responsibilities. Regardless, the lack of clarity with respect to IT decision-making boundaries and processes tends to thwart initiatives or to slow them down when success may depend crucially on timing.

As with the ITC, it would be beneficial to have the scope of responsibilities of the statewide CTO position explicitly defined in the Regents Policy. Likewise, a

charter for the ITC should spell out the roles of campus IT officers with respect to system-wide IT standards and policy development. While the roles of campus IT officers should be strengthened, it is important that the statewide CTO have sufficient authority to move conversations to completion when consensus proves to be out of reach.

Campus organizational structures -- The IT organizational structures at UAA and UAS seem to be well-conceived, though each faces the challenge of meeting ever-increasing user demands with limited staffing. Organizational circumstances at UAF are different. Unlike the other two campuses, the IT organization at UAF is extremely fragmented. Key technology components, such as the Faculty Technology Resource Center and Telecommunications, are not integrated, and perhaps not even coordinated, with the central IT organization, called the Department of Computing and Communications (DC&C). In addition, as many as 60 individuals in departments, schools, and research institutes provide varying levels of technical and user support to members of the UAF community without benefit of standardized training or coordination.

At UAF, the head of DC&C reports to the Director of Libraries and Information Technology, who in turn reports to the provost. The Director has a strong background in libraries and is the first to acknowledge that he is not fully conversant with all IT issues. While the Director works diligently to carry out his multiple roles, it is likely that IT issues that are critical to the success of UAF's instructional, research, and administrative efforts are not receiving sufficient attention at the senior management level.

The combination of insufficiently placed IT leadership and a fragmented IT organization makes it difficult for UAF to satisfy the existing needs of faculty, students, and staff, and virtually impossible for the institution to take full advantage of the strategic benefits that information technology can provide. Moreover, economies of scale in IT support that are typical at similar universities tend to be elusive at UAF.

In order to address these problems, it is strongly recommended that UAF establish the senior management position of chief technology officer with responsibility for all UAF components of computing, networking, and telecommunications. Subsequently, the university should conduct a thorough examination of IT support in order to develop a coherent strategy for balancing central and distributed staffing, providing uniform training, and improving service levels for all users.

Mission, Policies, and Strategic Planning

The inherent differences in the character and missions of each of the MAUs are reflected in the diversity of approaches taken to information technology. In many respects, this diversity is healthy, since it promotes greater richness of IT resources across the University. Problems arise, however, when such differences impede the development of technology initiatives whose success depends on system-wide cooperation. IT policies and strategic plans relating to access, security, privacy, service levels, administrative information, web presence, network standards, and so forth cannot be effectively established or maintained in a decentralized fashion. This does not mean that they need to be insensitive to the differences among the MAUs. On the contrary, appropriately crafted system-wide IT policies and plans can and should be crafted to recognize the diverse needs of the statewide office, the three major campuses, the rural campuses, and non-traditional distance learners. Two ingredients are essential to the development of such policies and plans: a cohesive planning framework and effective communication channels. UA needs to make improvements in both these areas:

Planning framework -- While there has been a great deal of planning for information technology across the MAUs, it has often been disjointed or incomplete. The individuals, committees, user groups, and ad hoc task forces looking into IT issues frequently are unaware of related efforts or fail to communicate their decisions to others in a timely fashion. Given the increasing importance of information technology, the speed at which it evolves, and the financial challenge of supporting it, undertaking strategic planning in a cohesive manner across the University of Alaska grows ever more critical. It is recommended that a review of IT planning groups be performed with an eye towards reducing their overall number, improving inter-group communication, and clearly delineating the locus of responsibility for different aspects of IT policy and decision-making throughout the UA system.

Communications -- Communication problems in a world of information overload is to be expected and extra efforts must be made to insure that information is disseminated in ways that recipients will find most useful. This is a challenge to all large organizations, especially those that are as complex and as geographically distributed as the University of Alaska.

There are a number of communication issues relating to information technology that are evident:

- IT staff at the system office and the three major campuses indicate that the dialogue among them is insufficient and often lacks focus;

- IT staff at rural campuses believe they are often out of the loop;
- Banner user groups believe they are disconnected from ITC deliberations;
- The Libraries express frustration in disseminating information to faculty about online information resources;
- Faculty and staff at all four MAUs and at rural locations are often unaware of existing technological resources, policies, software changes, and IT practices;
- Senior officers, both campus-based and statewide, are not fully informed about key IT issues.

The effects of such communication problems are far-reaching. For example, quantity discount agreements are not fully utilized, product implementations are needlessly cumbersome, administrative software changes are delayed, and multiple networking standards (such as those for LDAP) create unnecessary confusion and extra work. Sustained confusion exists in many instances, both on campus and off, regarding the appropriate phone number to call to obtain information about a specific problem or concern. As a result, informal means of communication dominate and a good deal of inaccurate information exists. Many of the communications problems are related to confusion over basic IT priorities, resulting in an atmosphere that is less than ideal for strategic decision-making.

Explicit attention needs to be paid to improving both intra-campus and system-wide communication on IT issues. More coherent linkages need to be established between user groups, campus IT advisory committees, central and distributed IT support staff at MAUs, the Systemwide Academic Council (SAC), the Information Technology Council (ITC), the University Business Council (UBC), the Banner Coordinating Team (BCT), and senior management. There needs to be more opportunities for face-to-face contact, including periodic joint meetings of various IT advisory groups. Considerable benefits can also be derived from better use of electronic communication channels such as email, listservs, interactive web pages, and so forth.

Technology Resources

While the University of Alaska suffered through years of static or reduced budgets, overall funding for information technology during the past three years has increased. For example, total expenditures on central computing, supplies, and equipment across all four MAUs rose from $764 per student in FY99 to $821 per student in FY02. At first blush, this is good news. However, such increases may obscure three important facts:

- the University's current IT objectives are both more numerous and more complex than they were three years ago;
- not all funding priorities have benefited equally from rising budgets (e.g., network bandwidth and access has improved substantially while end-user support remains below par in many cases);
- improvements in IT funding resources at UA lag behind those of peer institutions –– UA is still playing catch-up in key areas of IT such as faculty and staff training, equipment refresh programs, and particularly in web application development.

The critical question with respect to IT resources is not how much the University of Alaska is spending but rather how much it is getting for its investment. How cost-effectively are the resources being applied? Unfortunately, this is a difficult question to answer for higher education generally, and even more so for UA. Unlike the private sector, where productivity can be objectively measured and, in many cases, directly linked to IT investments, the benefits of IT in the university setting tend to be less quantifiable. For example, it is difficult to obtain quantifiable metrics for such things as enhancements to the learning environment, expanded access to digital materials, or opportunities to bring research and instruction closer together.

In cases where objective measures exist, such as the differential cost of delivering instruction to residential, local, and remote learners across the system, UA is at a further disadvantage due to the lack of accurate and timely data. One cannot produce plausible cost-benefit analyses of IT expenditures in the absence of key benchmarks such as the number of courses that rely on specific software packages, the percentage of students who own computers, the real number of technical and user support staff (both central and distributed), and so forth. Information of this nature is either missing or extremely difficult to obtain across the MAUs, particularly at the campus level. Without it, the University's IT investment may well appear to be a black hole, especially when viewed from the perspective of senior officers or regents.

At present, there is little evidence that the campuses have the means to track their IT expenditures in detail nor a way to support their IT strategic planning efforts with solid fiscal models. In part, this is due to the highly decentralized nature of IT across the University. In order to address this problem, it is recommended that the ITC and UBC collaborate to identify a set of system-wide measures that can be used to track long term IT investments and assess benefits. Only by developing and using common measures across all MAUs can the

University of Alaska hope to establish a coherent overview of IT investments and a sound basis for making long term budgetary decisions.

While it is difficult to make specific funding recommendations in light of a dearth of data related to IT expenditures, some observations are nonetheless possible in some areas:

- student technology fees;
- recharge policies;
- IT staffing.

Student technology fees -- There are widespread differences in the way that student technology fees are being used. For example, student technology fees at UAF have helped to swell the number of computer labs to 61 that house a total of 718 machines. While many of these labs may be intended for specialized use, this is nonetheless an extraordinary number of labs for a university the size of UAF. Sustaining a reasonable refresh cycle for this equipment will place a growing burden on technology fee funds, thereby diminishing resources available for other curricular uses of technology. It would be desirable to examine the allocation of technology fee revenues at the three major campuses to insure that such funds do not lead the institutions to make unsustainable investments in programs or facilities. In particular, the use of technology fee funds to underwrite equipment refresh cycles for student labs should be carefully analyzed.

Recharge policies -- At UAA, a system of recharge mechanisms has been implemented to support many IT operating costs. While this is a common strategy at most public universities, the extent to which UAA relies on such revenues is unusually high. The strength of this strategy is that it tends to improve cost-effectiveness by reducing casual or unnecessary consumption of IT resources. Limited operating budget funds can be concentrated on the most critical cost-centers.

However, the strategy also has its weaknesses. It can have the effect of discouraging central IT support and coordination, undermine existing or proposed campus standards, and serve as a disincentive on the part of the faculty to incorporate IT into their instruction. Information technology funding models that rely too heavily on recharge revenues can obscure chronic under-funding of the central IT operating budget. They may thereby enable an institution to claim that information technology is a strategic priority despite the fact that it is not funded as such.

Perhaps the most important problem with excessive reliance on recharge funding is the fact that it promotes "have" and "have not" departments. Departments that have sufficient funds to pay recharge fees are also well-positioned to purchase their own computing equipment and IT staff support. Departments who lack sufficient discretionary funds can neither obtain central IT services nor purchase their own. Over time, they become "technologically impoverished" and unable to compete well with peers at other institutions.

It is recommended, therefore, that all three campuses, especially UAA, re-examine their IT recharge policies in order to strike a suitable balance between reliance on operating budget resources and fee-for-service revenues.

IT Staffing -- Every university, to a greater or lesser degree, has struggled in recent years with the problem of keeping IT staff size in line with the explosive growth in the use and complexity of technology. UA is no exception. All four MAUs can point to areas where additional IT staff would be extremely helpful. Some areas, however, are especially critical: Banner programming, web development, and end-user support.

End-user support involves an array of services, many of which are below par at UAF, UAA, and UAS. At UAF, for example, there are 19 staff fte in the Department of Computing and Communications. This is a remarkably small number of IT staff for a school of more than 4,000 students and, to a great extent, is the cause of many of the IT problems reported by faculty and staff. It is advisable for each MAU, especially UAF, to evaluate the staffing resources devoted to end-user support, both centrally and in academic and administrative units, to determine whether these resources are adequate.

Information technology support at the extended campuses is also very problematic. Perhaps this stems from inadequate financial resources to recruit and retained qualified staff, or a lack of such people living in (or willing to move to) small Alaskan communities, or central IT organizations at the MAUs that do not see support to the extended campuses as a high priority. Regardless of the reason(s), the issue of IT staff support at the extended campuses should be given particular attention.

Administrative Computing

As with almost any complex, off-the-shelf software package, the SCT-Banner system requires a considerable amount of process analysis and re-engineering to establish a tight fit between business practices and software capabilities. Unfortunately, when Banner was purchased, the University faced staffing

constraints, financial limitations, and implementation scheduling requirements that prevented it from undertaking the level of analysis and re-engineering needed to take full advantage of Banner's potential. As a result, the system has done a poor job of handling some tasks and has been wholly inappropriate for others. In order to address these problems, there has been a concentrated effort to customize the software in order to make it conform to existing business practices.

This effort has yielded greater success in some areas than in others. For example, modifications to the Finance and Human Resources systems requested at the statewide level are evolving at a reasonable pace. Modifications in Banner Student, requested by both statewide and campus offices, are slower to appear. Modifications in the Finance system requested by campus offices have been so slow that some offices have become convinced that Banner is simply incapable of meeting their needs and have become increasingly reluctant to even submit change requests.

Adding to the problem is a lack of clarity on the part of some managers at UA regarding Banner's actual capabilities and limitations. In its traditional (non-web) version, Banner can be quite cumbersome, especially for those at the management or executive level. Lacking sufficient training to understand how to make good use of Banner, some managers have become extremely critical of the system and have elected to pursue alternative software packages. This has produced an increasingly complex mosaic of data processing strategies, adding to an already stressful situation for many staff members.

The perceived shortcomings of the Banner system, and the way it is deployed, managed, and supported, are varied. Some of the complaints voiced by staff in campus offices are these:

- Report generation is inadequate, primarily in the Finance System. While the data may be stored effectively, retrieving it in manner suited to the requirements of monthly management reports is difficult and in some instances nearly impossible. As a result, many campus offices have given up on Banner entirely and have set up soft ledgers or other "shadow systems" to meet their financial reporting needs. In addition to the extra labor required for dual data entry and periodic reconciliation, this approach tends to produce inconsistencies –– and in some cases, incompatibilities –– between local and centralized databases. It also increases data processing costs by rendering software support and data entry more complex.

- Some Banner rules (primarily in the Finance System) are not sufficiently flexible to accommodate existing operational needs. For example, at UAF,

the atypical work schedules of police and fire fighters do not fit neatly within Banner's payroll options. As a result, a shadow system is required in order to insure that payments to these workers are properly made and recorded.

- Students cannot use Banner to do "what if" scenarios for planning their course schedules or assessing their remaining degree requirements. The growing complexity of faculty advising brought about by cross-registrations, online courses, and non-traditional learning programs, make online features such as these all the more important for a seamless statewide higher education system.

- Although there is a statewide 800 Help Desk number, campus-based staff are concerned that calls to this number do not resolve user questions in a satisfactory manner. In many cases, staff report that they receive no feedback as to whether a problem has been solved, is being worked on, or is beyond the capacity of the staff to address.

While many Banner problems may appear to be intrinsic limitations of the software, this is generally not the case. On the contrary, the technology that drives Banner is extremely robust and, with appropriate customization, the system can be shaped to fit nearly any application required by the University. However, customization requires sufficient programming staff and at UA, there are too few Banner programmers to meet existing needs. As mentioned earlier, it is strongly recommended that the University review its Banner customization needs and augment the programming staff, especially in the Finance and Student areas. In addition, existing programming staff assigned to specific applications should be reassigned to statewide Information Technology Services. This will provide greater flexibility in addressing the system's overall priorities. A combination of temporary and ongoing appointments might allow ITS to move quickly without creating an unsustainable long term staffing burden.

Staffing, however, is not the only source of Banner problems. There are several other areas that deserve attention:

- efficacy of Banner user groups;
- notification of software changes;
- development of datamarts;
- Banner web products.

Banner user groups -- The three Banner user groups represent a spectrum of effectiveness: (1) the Human Resources group has functioned well; (2) the

Student group has had mixed success, due in part to the complexity and diversity of MAU needs; and (3) the Finance group has functioned poorly. While the Student group seems to be heading in the right direction, the Finance group appears to be stalled. It would be advisable for the Banner Coordinating Team to concentrate attention on this group. In particular, the composition of the group should be examined, the meeting schedule should be increased, and the method of setting priorities should be clarified.

Notification of software changes -- Many staff members at campus offices indicate that Banner software changes are not communicated to them in an effective and timely manner. Indeed, during the site visits, it was observed that staff in some offices were unaware of changes that were well known to staff in other offices. It would be helpful for the statewide ITS organization to maintain a set of "Banner update" web pages and to use monthly emails to alert campus-based staff to review the most recent changes.

Datamarts -- A growing number of universities are finding it extremely helpful to create a uniform "datamart" strategy for administrative offices. By standardizing on a small set of products and procedures for downloading data from Banner, support costs, complexity, and the risk of data problems can be dramatically reduced. UA should evaluate SCT's own data warehouse product, along with other third-party datamart tools, and should develop a systemwide strategy for dealing with shadow systems.

Banner web products -- Although Banner web interfaces for Student, Financial Aid, and some parts of Human Resources are installed or are in the process of being installed, much more of Banner's potential value to the University could be tapped by adding web interfaces in areas such as executive decision support, recruitment and retention analysis, management reporting, and so forth. We strongly encourage statewide ITS to pursue this further.

Academic Computing and Libraries

While the use of Banner across the UA system may force the University to examine its business practices broadly, nothing comparable has prompted a holistic look at academic strategies. This lack of examination of common methods and objectives stands in stark contrast to the announced intention to provide students throughout the University of Alaska with a seamless curriculum. The statewide adoption of the Blackboard course management software is a step in this direction, but more cohesive planning regarding the use of information technology and its support for the academic side of the house is clearly needed.

In this section, we focus on three areas:

- instructional technology;
- distance learning;
- libraries.

Instructional Technology -- Just as faculty must be encouraged to incorporate proven instructional technology into classrooms, faculty must be consulted in the design of classrooms on the campuses. Different disciplines use classrooms in quite different ways. There is little evidence that this is a regular occurrence across the UA system. When encouraging faculty to embrace instructional technology, buy-in is required in as many facets of instructional technology adoption as possible. This is an area that deserves attention on all the campuses.

The availability of instructional technology and the encouragement of its use is difficult if the technology is not supported in the classroom. Hours of extensive work and collaboration with faculty to bring instructional technology into their teaching can be lost by substandard equipment in the classroom, failure of the technology during class time, or poor support and maintenance of the classroom as a learning space. Faculty made comments about frequent failures of technology in classrooms at each of the campuses. Indeed, there is some indication that faculty members who used instructional technologies in the classroom before coming to UA are now hesitant to do so because of concerns about the reliability of the equipment. In order to derive the full benefits of instructional technologies it is critical for each of the UA campuses to concentrate more attention on the maintenance and support of classroom facilities.

The statewide acquisition of the Blackboard course management system (CMS) has great potential to enhance teaching and learning activities across the entire UA system. However, there are aspects of its use that require substantial support. For example, even though the product is easier to use than rival CMS packages, faculty still require training and ongoing user support in order to master the software. Likewise, many faculty must have curricular development assistance to enable them to incorporate the technology into their teaching in an effective manner.

The more courses that take advantage of the Blackboard CMS, the more cost-effective it becomes for the University to deploy and support it. However, this raises two issues: First, not all faculty are comfortable using this type of software. Some faculty, especially those who have considerable teaching experience, may be reluctant to alter their pedagogical styles or to re-shape their

course materials in order to use Blackboard. Efforts to compel such usage are often counter-productive. Inducements in the form of peer assistance, course release time, sponsored workshops, and one-on-one tutorials are likely to produce more positive outcomes.

The second problem is campus buy-in. While UAF and UAA are moving towards adoption of Blackboard as a campus standard, UAS has focused much of its efforts on "UAS-Online," a customized version of a CMS originally developed at the University of Arizona. Though some UAS faculty have attended Blackboard training offered at UAA, many seem to be quite comfortable with UAS-Online and are not especially interested in moving away from it. In the short term, this may be satisfactory. In the long term, however, the increasing overhead of maintaining the UAS-Online software, the advantages of having a common CMS package across the UA system, and the numerous other obligations of UAS's IT staff, suggest that adoption of Blackboard would be a preferable strategy. UAS should review this issue in terms of where it wants to be in five to ten years.

Distance Learning -- During the 1970s and early 1980s, higher education in Alaska was widely regarded as being a national, if not international, model for the delivery of courses and curricula over large territorial expanses. Ironically, as universities throughout the country moved towards the adoption of distance education initiatives in the 1990s, Alaska lost ground. Clearly, UA has the experience to play a leadership role in distance education.

Given the need for distance delivery of courses to rural and remote areas of the state, a comprehensive, long term vision of how distance learning can serve the citizens of Alaska should be undertaken under the leadership of the SAC, in conjunction with the ITC. Such as vision should take into account all available technological means, rural support for IT, as well as tighter coordination of activities among the various MAUs. UA will need to maintain a battery of technologies to accomplish its educational mission since many areas of the state do not presently have access to the high bandwidth required by a growing number of instructional applications.

While distance learning may appear to be distinct from traditional modes of instruction, this is misleading. In most respects the tools and techniques used in distance learning are converging with those of classroom instructional technologies. Increasingly, local students near the MAUs are taking so-called "distance education courses" due to the convenience and availability of online course materials. The newly hired director of UAF's Center for Distance Education in the College of Rural Alaska is well aware of this convergence. His emphasis on increasing the availability of tools and assistance for instructional

design, curricular development, and computer-mediated education, are as relevant to classroom instruction as they are to distance learning.

Perhaps due to its smaller size, UAS has been able to move rapidly to adopt and integrate instructional technology and distance learning into its curriculum. As much as a quarter of UAS's total student headcount now falls into the category of distance learners. While not as focused on distance learning as UAS, UAA is developing strength in the area of instructional support with plans to hire instructional designers to further engage faculty in incorporating instructional technology into their courses. Efforts at both UAS and UAA are supported by their central IT organizations.

Comparable efforts at UAF are proceeding more slowly. The Center for Distance Education lies outside the central IT organization and it appears that there is comparatively little coordination between the two groups. This requires faculty to seek assistance with instructional technology, distance learning, and classroom technology support from multiple sources. In many cases faculty themselves must supply the primary impetus to pursue instructional technology or distance learning initiatives.

Libraries -- While the directors of the libraries of the MAUs are represented on the ITC, library information resources and staff are not tightly integrated with the IT infrastructure at any of the MAUs. The missions of each campus library should be reviewed in an effort to bring them into closer alignment with other information, media, instructional support, and IT units, as called for in the Northwest Accreditation guidelines. The rapidly evolving nature of information resources demands a tighter integration with IT delivery to insure that the latter is maximally responsive to the needs of the academic community.

Campus libraries should move with all possible speed to the use of web interfaces for client services. Increasingly, such interfaces are becoming a comfortable standard for obtaining any and all types of information. In times of rapidly evolving information formats, too many libraries worry about how to continue what they have always done. Perpetuation of this legacy fails to acknowledge a fundamental shift in the way that many students, faculty, and others undertake their research. It is essential that the libraries recognize the growing expectations and greater technical sophistication of the post-Gutenberg generation of information users. The technological innovations that accompany new information resource formats also provide a means for the University of Alaska to level the playing field with better-funded institutions.

New digital information resources, especially full-text documents need to be made as accessible as possible to the growing number of students and scholars

accustomed to the ease of use of the World Wide Web. This requires a broader focus for libraries. Library staff need to be more proactive in helping faculty to integrate their resources with classroom instruction. There has never been a better time to become partners in instruction through the rise in the use of instructional technology.

Some good first steps in this direction have already been undertaken. The UAS library has the closest working relationship with IT services and may have an opportunity in the short term to become a vital part of the new information environment by reallocating staff to more closely support instructional and IT efforts. UAA is providing statewide leadership in negotiating with publishers for statewide full-text electronic resources. On the other hand, the UAF libraries have a strong concentration on special collections. While these special collections are laudable projects, such emphases, if they are at the expense of the current and future information environment, merit reassessment.

Using the UAF libraries as a guide, the University of Alaska's purchasing power is among the lowest of land grant institutions. UAA, while not supporting the breadth of programs offered by UAF, has a relatively small budget for a student population of its size. All University of Alaska libraries are assisted through cooperative multi-type library consortia agreements, but this cannot overcome sustained low funding.

Networking

The division of network responsibilities between the statewide IT organization and the three universities is defined in President Hamilton's June 24, 1999 memo to the Chancellors and other senior officials of UAA, UAF, and UAS. This division of responsibilities seems to be well understood by all who are involved, and it seems to be working well.

There are relatively few complaints about network services from users or campus IT staff members. There are, however, some indications of difficulties in network maintenance and operation at some of the extended campuses. For example:

- The bandwidth available in Alaska villages, where some UA students are located, is generally inadequate for distance education needs.

- Some of the circuits used in the UA high-speed backbone are being provided through a donation by GCI which ends in March 2003. Provisions for continuing this service do not appear to be in place.

- At UAF, network and telephone services are provided by two different organizations, which are widely separated organizationally within UAF. Network service is provided by the Division of Computing and Communications, which reports to the Director of Libraries and Information Technology, who, in turn, reports to the Provost. Telephone service is provided by Facilities Services, which reports to the Vice Chancellor for Administrative Services.

- Lack of adequate cable plant in some UAF buildings causes delays in providing new network connections. UAF Facilities Services upgrades cable plant when new buildings are built or when old buildings are renovated.

Generally, the University's data and telephone networks appear to be providing adequate service. There are no indications that these networks are failing to meet current needs, and there are few complaints about network and telephone service. However, there may be some difficulties with network maintenance on the extended campuses similar to the IT staffing difficulties mentioned earlier in the report. Since IT support staff, working with central support staff, normally maintain local area networks, resolving the IT support issues on the extended campuses can also be expected to resolve network support issues.

The lack of adequate network bandwidth in Alaska villages is a known problem. The sparsely scattered population in rural Alaska makes it very difficult for private telecommunications companies to provide high-speed services at a profit, and it appears that some special arrangements will be needed to assure that such high-speed services are provided to rural residents. The situation is similar to that which existed in the 1970s, when the State of Alaska intervened to insure the provision of basic telecommunication services. It now appears that some intervention may be needed to assure the provision of high-speed network services. The State of Alaska Department of Administration recently issued a

Request for Proposals, seeking a study of this situation and recommendations on how the State can assure that high-speed service is provided in the villages. The statewide chief technology officer should be involved in efforts by the State of Alaska to improve the availability of high-speed network services to the residents to Alaska villages. The availability of such services is critical to the University's delivery of educational services to village residents.

If the high-speed backbone circuits being donated by GCI must be paid for beginning in March 2003, there may be a significant budget impact for the University's statewide IT organization. The UA statewide chief technology officer should continue to work on support arrangements for high-speed backbone circuits and should request additional financial resources if these become necessary.

The provision of network and telephone services by two different organizations within UAF is part of a larger situation in which general IT support services are provided through multiple UAF organizations, and it appears that some consolidation is appropriate. The consolidation of IT services at UAF under a chief technology officer, as recommended earlier in this report, would address this problem.

Although the lack of adequate cable plant in some buildings at UAF causes delays in providing new network connections, the approach being taken by Facilities Services in upgrading cable plant when new buildings are built or when old buildings are renovated is a reasonable one. It is unlikely that available resources will permit a more aggressive approach to upgrading cable plant and, under the approach being used by Facilities Services, all of the cable plant will eventually be upgraded. UAF should continue to upgrade cable plant when new buildings are built or when old buildings are renovated.

Conclusion

With respect to information technology, the most important question that the University of Alaska needs to answer is this: Is there a shared vision of IT as a strategic tool, capable of advancing the mission and objectives of the University? From the perspective of an external review, the answer to this question is *no*. Rather than being understood as a tool to support a variety of critical objectives, at the campus as well as at the system level, some view IT as a competitor to those objectives. In such cases, there seems to be a sense that a dollar assigned to IT is a dollar taken away from teaching, research, recruiting, facilities, libraries, student services, or other cost centers. In general, this attitude is a mistake. Each of those areas, and many more besides, is a beneficiary of information technology resources. It is vital to understand that when IT priorities are properly defined, every dollar spent on IT is a dollar invested to further the core objectives of the University. This is why it is vital to have the best possible information technology leadership, decision-making processes, and communication practices.

It is worth emphasizing that information technology has a special role to play at the University of Alaska -- and in the State of Alaska more generally -- by making possible new connections between urban centers, rural villages, and remote areas. In this regard, Alaska faces challenges unlike those of any other region of the United States and the uses to which it puts information technology can be uniquely productive. Working closely with the State and the private sector, UA should pursue ways to bring the best educational opportunities to those who have traditionally had the least access to them.

Finally, we would encourage the University and its component units to periodically review, with outside assistance if possible, the status of information technology with special attention given to strategic planning, internal communication, technology resources, and end-user support. Regular evaluation in these areas is the best way to insure that IT investments are being appropriately prioritized and are not simply disappearing down a black hole of technology spending.

Appendix: UA System Review of Information Resources

This external review will examine the organization, resources, and processes in place for information resources decision-making and operations throughout the University of Alaska system. It is a management review. The review will be conducted by a team of three experts from other institutions of higher education.

Background

Information technology is a key facilitating infrastructure for all academic and administrative services at the University of Alaska.

Information resources considered in this review include the systems and networks owned, leased, or operated by the university, the software and data resident on them, and the staff directly involved in provision of services offered over those systems and networks. Information resources include academic and administrative computing, library systems and core IT infrastructure in support of research.

The University of Alaska has four major administrative units (MAUs) and each has a central Information Technology unit. The organization and responsibilities of each are different. There is a mix of centralized and decentralized services at both the system and campus levels. For instance, at the University of Alaska Fairbanks, libraries and information technology are under one unit while at the University of Alaska Anchorage and the University of Alaska Southeast libraries and information technology are separate units.

System information resources planning and oversight is through the UA Information Technology Council. Information Resources Policy and Regulations govern the activities of information resources staff throughout the system.

Information resources have moved from the periphery of use to a central, daily dependence on their availability and reliability to carry on every aspect of the university's business. This review is to see if the organization has kept pace with the needs of the university and the technologies and services to meet those needs.

Scope

The review will focus on three main areas:

- Organizational Structure
- Resources
- Shared Missions & Objectives

The review will ask these questions:

- Are campus, major administrative unit and system needs being met by current IT resources?
- What gaps exist between system needs and services, and how might those gaps be bridged?
- Is the current IT governance and organization at the MAU and system level adequate (i.e. reporting structure, authority, integration in planning process) to ensure that the highest priorities of the institution are addressed?
- How are IT planning and decisions carried out at the campus level; at the system level?
- How are resources to meet information service needs identified and allocated at the campus and system level?
- Are the total resources allocated sufficient to meet current and anticipated needs?

- Is there a shared view of missions and objectives between the central MAU Information Resources units across the system and between those units and the academic and administrative leadership at the MAU and system level?
- How much flexibility is there within existing missions among the MAUs for IT needs to be fulfilled without incurring expensive and unnecessary duplication?
- What opportunities are there for joint or cooperative services among the System's campuses and with institutions outside the System?
- Are there alternatives in information resources governance, organization and planning that the University of Alaska should consider?

Evaluation Team

The information resources team is composed of three leading professionals with extensive experience in both higher education and information services.

Martin Ringle is the Chief Technology Officer for Reed College in Oregon. Dr. Ringle is President and Chief Executive Officer of the NorthWest Academic Computing Consortium (NWACC), a group of 31 research universities and four-year colleges in Oregon, Washington, Alaska, Idaho, Montana, and North Dakota. Additionally, he is chair of the Board of EDUCAUSE, an organization of 1,800 educational institutions in the US and abroad.

Alex Hills is Distinguished Service Professor at Carnegie Mellon University. Dr. Hills also has considerable experience in Alaska. During the early 1980s he served under Governor Jay Hammond as Deputy Commissioner of Administration. In the mid-1980s he was Executive Director of the University of Alaska Computer Network. He is also a past faculty member in the Department of Engineering at the University of Alaska Fairbanks.

Steven Zink is Vice President, Information Technology and Dean of Libraries at the University of Nevada, Reno. Dr. Zink has been active nationally and internationally in the area of information policy as well as in the development of new forms of electronic information services. Over the last decade, he has led a successful and innovative merging of all facets of information technologies and libraries into a seamless unit at Nevada.

Methodology

The team will collect information through a series of interviews with key administrators, functional owners and users of information services, and information resources staff. These will be conducted in the main during visits to Anchorage, Fairbanks and Juneau during the week of May 20, 2002. Prior to the visits the team will have reviewed relevant background documents (mission statements, organizational charts, budget summaries, and so forth). For key administrators, staff, faculty and students not available during that week, interviews will take place by voice or videoconference.

While the team, working with the system CTO, has identified some key groups to interview, each MAU will arrange for specific individuals for the team to meet with during their visit. The team will also meet with members of the Board of Regents as schedules permit.

This review will be a broad assessment of needs, organization, process and resources. It will not be a detailed inventory of assets, nor a user satisfaction survey, nor an in depth financial analysis. It will not be a comprehensive review of technologies and applications. It may indicate the need for further examination of any of those elements as well as others.

To better focus their efforts, the team will divide their information gathering into three general areas:

- Academic Services (Steve Zink): instructional support, distance delivery, and libraries

- Administrative Services (Martin Ringle): core institutional information systems/support
- Network Services (Alex Hills): connections between systems, campuses and people

Each member of the team will concentrate efforts on one of the three areas. There are significant areas of overlap among all three. None can be examined in isolation, but this breakdown will provide focus and allow the team to cover a broad spectrum of issues in a short time.

Results

The team will meet with President Hamilton at the conclusion of their visit for an exit discussion of their preliminary findings. This will be followed up in approximately 6 weeks with a brief written analysis delivered to the President. The written report will address the questions outlined above and suggest areas for further evaluation. It will also indicate areas to consider for immediate attention and possible alternatives to consider in the organization and deployment of information resources.