Consultants Report

Strategic Plan for Information Technology for the University of Montana

Prepared by:
Polley A. McClure
Bruce Maas
Voldemar A. Innus

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University of Montana Strategic Plan for Information Technology

I. Introduction.

President Engstrom has asked the Interim CIO, Loey Knapp, to lead the preparation of a university wide strategic plan for information technology. The Interim CIO has convened a planning team to develop the current draft plan and engaged three external consultants (Bruce Maas, VP and CIO at University of Wisconsin, Madison; Voldemar Innus, Interim VP Finance and Administration at the Buffalo State and a former CIO; Polley McClure, VP Emeritus at Cornell University) to review the draft plan and visit campus to provide advice about it. The consultants “met” with the planning team three times prior to the visit by teleconference and then spent three and a half days meeting with over a hundred individuals on campus.

In one of the teleconferences, the consultants became aware that the planning team was having difficulty in articulating a shared vision of IT for the campus. Because of that, they were not able to recommend appropriate governance, funding or organizational arrangements. Encouragement from the consultants led them to create a draft Vision statement which was discussed and approved by the Cabinet. With that step forward, they were then able to develop a model for governance of IT.

At the time of the consultant visit, proposals for an improved funding model and organizational structure had yet to be developed. Some recommendations along those lines are included in the report below.

During the on-campus visit, the consultants engaged in lively discussion with various interest groups. Almost all of these discussions were positive, constructive and indicated a desire to work together to build the integrated IT function, which everyone agreed was the goal. There was general understanding that IT functions serving all or most of the campus in a similar way could be done more efficiently at scale by a central organization. There was concern about maintenance of the high quality of those services at the level to which departments have become accustomed. There was also general understanding that unique or specialized services only needed by a discipline or area should be mostly provided by an organization located close to those needing those services. And, in general, there will be a need for central and distributed IT staff to work together on almost every service.

One of the most important determinants of success in the future will be the willingness to collaborate across the distributed and central boundaries. The consultants have visited many other institutions desiring to move in this direction and believe that the positive attitudes at UM position your campus well and will greatly facilitate your progress.
The following sections will respond to the request for advice about the current draft Strategic Plan, and for recommendations about governance, funding model, and organization. The consultants have also identified several Enabling Issues, which we believe will be crucial to UM’s ability to succeed in accomplishing the goals identified in the plan. Those are presented in the final section.

II. Assessment of Strategic Plan Goals

The Strategic Planning Working Group has identified a number of key strategic goals of the plan. In this section, we will be commenting on these plans, and identifying areas that are either missing or should be considered. We will pull out areas that are addressed in other parts of this report.

1. IT Infrastructure in Support of University Strategic Goals
   a. Data Center and Data Services
      There was considerable discussion in multiple forums during our visit about this issue. The University of Montana needs to upgrade the core capabilities of data centers. We understand that a working group is gathering information about options, and we recommend that university leaders be provided with information about risks inherent in the current situation, and various options. We also recommend that the University of Montana seek to substantially reduce the number of facilities, consolidate and virtualize as many servers as possible, and create the appropriate level of redundancy and business continuity capability.
   
   b. Network Infrastructure
      There are a number of areas that need to be addressed. First, the university needs to develop a process to inventory primary network components and identify when they need to be replaced. Second, the university needs to make more visible the plan for long term wide area networking with associated costs for connection to and upgrade for use of the next generation 100 gb national Internet2 Innovation Platform. Specifically, internal networking components need to be a part of this plan to take advantage of this capability. Third, the university needs to determine how to fund network capabilities for locations outside the main campus.

   c. Security Systems and Services
      Our advice is to carefully review and communicate institutional risks associated with all areas that have been identified as needing work. Security is an area where extreme amounts of money can be spent in the quest of elimination of risk. Most institutions find a “sweet spot” in which they are comfortable knowing the tradeoffs.
d. Cloud Computing and Hosted Services Initiatives
   As time goes on, more options that save money will become available. It is important to ensure that risks are quantified in the form of legal contractual language. In particular, the University should consider upgrading your email contract with Microsoft to Office 365, which now is being contracted with business associate agreements for HIPAA related issues. Also, the University of Montana should review the present and planned cloud offerings from Internet2 through their NetPlus services. These services require that the campus participate in In-Common identity management in order to use them.

e. Universal Accessibility
   The issue of accessibility came up in multiple forums. We feel it is important that senior leaders consider forming a campus-wide committee with a charter that includes responsibility for identifying issues and making recommendations for addressing those issues. This is broader than an IT issue, so committee representation should reflect that fact. In particular, purchasing must be involved due to the need to ensure that vendors of software provide products that are compliant with university accessibility requirements.

f. Identity Management
   We have two recommendations in this area. The University of Montana should move ahead with implementing the InCommon identity management framework developed by Internet2. Second, the university should now move ahead with a unified Active Directory framework that provides services for all parts of the campus without requiring the need for local account provisioning.

2. IT Enterprise Structure, Governance and Funding
   a. IT Structure and Reporting Lines
      This is being addressed comprehensively in another section of the report

   b. IT Governance Structure
      This is being addressed comprehensively in another section of the report

   c. IT Funding Model
      This is being addressed comprehensively in another section of the report

   d. IT Service Delivery processes
      The University of Montana would benefit substantially from implementing an ITIL (IT Infrastructure Library) framework. This is a multi-year process which would significantly reduce the number and complexity of issues resulting in outages.
e. IT Policy framework
The university should do a peer and EDUCAUSE literature review to determine what IT policies are typically in place at other universities, and develop a plan for creating the most important policies first.

f. Operating and Purchasing Efficiencies
The single largest opportunity to realize operating efficiencies is to review roles and responsibilities of central and distributed IT, and seek to provide economies of scale for services that are needed across the campus. This is work that should be done with participation of individuals representing the various interests on campus. Using the Service Layers framework to do this would help the process. There are also opportunities related to buying at scale by standardizing on laptops and desktops, buying on a quarterly basis, and developing a consistent campus desktop image or images (if both Windows and Apple computers are part of the portfolio). There are also opportunities related to bulk buying of software, buying at levels that include other universities, and taking advantage of Internet2 NetPlus services.

3. IT for Teaching, Learning, and Research
a. Academic and Research Computing
Moodlerooms has been used successfully at the University of Montana. In order to jump-start additional faculty use of blended or hybrid, and fully online courses, the university should consider additional investments in staff with pedagogy support skills. A small group of individuals with excellent pedagogy skills can effectively serve a large number of faculty and programs. They could also provide support so that coming innovations such as eTextbooks could be piloted (such as the Internet2 and EDUCAUSE eText pilots) in anticipation of greater use in the future. eTextbooks can result in significant cost savings for students if they are acquired at national aggregation levels.

A key group of faculty researchers is ready to participate in a plan to create a shared advanced computing infrastructure service. This service would feature high performance and high throughput computers in a shared facility, with base levels of service available to all faculty, and the option of faculty purchasing and adding on their own dedicated “cores”. The heart of such a facility would be shared “facilitators” whose role is to work with faculty to assist them in setting up and running their data analysis. Joe Glassy has developed a plan which, with additional input and participation, could be used as the framework in this area. Sharing advanced computing resources is a national trend and current best practice.
b. Classroom, Computer labs, and Tech Lounges
The University of Montana has set a goal of having 100% of classrooms technology enabled by 2020. In addition, the Library has begun plans to fundraise to create a library learning commons. This represents an opportunity now to substantially involve faculty with active learning expertise in the design of these facilities. There is a growing body of literature which indicates that properly designed spaces can enhance learning.

c. Technology literacy and innovation
The University of Montana needs to consider the role of technology in teaching and learning. The starting point should be the curriculum, and any strategic changes that are desired. From this will flow the digital learning design, which needs to be a collaborative effort between faculty and staff with digital pedagogy skills. And only after those two parts, should the campus consider digital learning platforms. In effect, this establishes institutional requirements (learning outcomes) first, then aligns the technology in way that supports the learning goals and scaling goals of the institution.

4. IT for Institutional Administration, Decision Making, and Innovation
   a. Enterprise Computing Systems
      The governance of Banner is being addressed comprehensively in another area of the report. With regard to the overall IT enterprise portfolio, we feel it is important to use a “Service Layers” approach and discuss which services should be provided more centrally at scale, and which should be provided locally based on unique local needs. Areas such as data centers, networking, Banner, and storage systems can be delivered effectively at scale, resulting in lower overall expenditures and higher overall effectiveness. This discussion should be facilitated, and should have the backing of Deans and Vice Presidents prior to staff being drawn in.

   b. Electronic Business Processes
      We believe there are overall savings to be gained from a systemic approach to process improvement. Those leading the effort need the backing of senior leaders, and the skills necessary to do this work.

   c. Data Warehouse and Reporting/Data Analysis
      This is an area of opportunity. Initial work should be identifying who are the data owners, and clarifying role expectations. Data owners should engage substantively in the process to prioritize next steps.

   d. Multi-Campus Computing Systems
      This should be explored whenever it offers economies of scale, assuming sufficient networking to do this.
5. IT to Enhance Student Life
   a. Student Technology Roadmap
      This is a subset of the overall technology roadmap and should involve student governance.
   
   b. Accessibility and Mobility
      See earlier statement on accessibility. An effective mobile strategy requires a base layer of networking connectivity to be successful. Given the wireless challenges on campus, they must be addressed first. Mobile strategies include both applications for devices, and mobile web. Mobile web is easier to maintain and should be considered a priority.
   
   c. Electronic Communication
      Centralizing on Microsoft Office 365 would be a good step forward in creating a unified platform for calendaring, and a consistent approach.
   
   d. Social Media
      Offices that support students need to determine where social media fits on their roadmap. Given that social media is often free, the choice to use it depends on the business case.

6. Other Areas (not mentioned in report)
   a. IT Staff Development
      The University of Montana needs to have a comprehensive plan for technical and soft skill development for both central and distributed IT professionals. This investment can be phased in, but will provide enormous rewards in the form of productivity.
   
   b. Multi-Year Action Plan
      All known significant expenditures need to be documented on a spreadsheet that shows projected needs over a 5 year period. This should be updated and provided to the President’s cabinet at quarterly intervals.
   
   c. Compensation Issues
      The University of Montana needs to review compensation practices for IT professionals across campus. In our short visit, we noted that there are inexplicable differences. The review should be conducted by a small working group including HR, the CIO, and someone representing distributed IT units. Efforts should be made to create consistency and the ability for staff to move from central IT to distributed units, and vice versa, more easily.
III. IT Governance

We were asked to make recommendations for the IT Governance structure at the University of Montana. An EDUCAUSE Center for Applied Research bulletin provides the following excellent overview. The highly recommended full report is located at http://net.educause.edu/ir/library/pdf/ERB0524.pdf:

“Decision making about information technology (IT) can be confusing, especially in institutions as complex as colleges and universities. On the one hand, new technology is emerging and evolving at an ever-increasing rate. On the other, budget reductions, tuition discounting, and escalating IT costs make funding IT one of the most pressing issues facing higher education today. Adding higher education’s typical shared governance approach to the decision-making process will raise the level of complexity even further.

In higher education, how decisions are made about institutional priorities, strategies, goals, and major resource allocations, and who is held accountable for these decisions, are functions of institutional governance. Governance structures and processes can range from straightforward and transparent to complex and opaque, and ensuring effective processes is as important or more so than the specific allocations themselves. This is the environment in which strategic and resource allocation decisions must be made. When you can’t do it all and you can’t involve everyone, how do you decide?

One way is to clearly define and come to institutional-level agreement on just who has a say in, and who will be held accountable for, decisions related to investments in IT and how those decisions are made. A Center for Information Systems Research (CISR) briefing from the Massachusetts Institute of Technology (MIT) Sloan School of Management highlighted six key questions the institution’s senior leaders should not relinquish to their IT leaders Each of the questions relates to aspects of IT governance. The first three deal with strategy: How much should we spend on IT? Which business processes should receive our IT dollars? Which IT capabilities need to be organization-wide? The second three deal with execution: How good do our IT services really need to be? Which security and privacy risks will we accept? Whom do we blame if an IT initiative fails? The institution’s senior leaders, including but not limited to the chief information officer (CIO), need to be involved in this determination of how to best use IT to generate value for their institution. Just as an institution’s senior leaders must be involved in and understand the governance of the organization’s financial, physical, and human assets, they need to be involved in and understand the governance of the institution’s information and IT assets.

Designing a simple and clear approach to IT governance will lead to increased effectiveness. This research bulletin will provide an overview of IT governance and explain why such governance is important.

The current state for governance at the University of Montana is best described as “ad hoc.” The central organization has struggled to provide even a base level of common services with very limited resources. As a result, individual units outside of central IT with budget authority make largely autonomous decisions about technology investments that are driven by local needs, and informed by perceptions of both the availability and quality of central services. The result is uneven quality
and availability of service, inefficiency due to duplication and some mistrust within the community.

IT is a very new profession compared to the other functions of higher education. Our institutions have adapted as we have moved from the mainframe era, with proliferation of personal computers starting in the late 70’s, to local area networks in the 80’s, and client-server architectures in the 90’s, and now to an internet-based set of services delivered through campus data centers and through public and private cloud services.

The governance structure for the University of Montana should optimally be designed in a way that considers current and emerging trends and best practices in IT service delivery, as well as the unique mission, vision and values of the campus. As an institution that has tended to favor informal approaches until recently, work needs to be done to ensure a more plan-ful and strategic approach to decision making.

The 16 member IT Strategic Planning Team appointed by President Engstrom began the process of identifying a decision-making framework prior to engagement with the consulting team. During the phase in which the Planning Team and consultants had phone conference calls prior to the in person engagement, the consultants requested that the Planning Team engage with the President’s Cabinet to discuss and formalize an IT vision. We requested that the Cabinet be provided with several options to consider, from IT being viewed strictly as a utility, like electricity, to IT being core to the strategy of the university.

Prior to our arrival on campus, the Cabinet did discuss and endorse three components of a comprehensive vision, starting with a statement about short term aspirations, then describing intermediate term aspirations, and ending with a description of select long term aspirations. That Vision Statement is now included in the Strategic IT Plan. The vision statement was immensely helpful to the Planning Team and the consultants, it that it provided a road map to begin to develop the framework for governance. Knowing where the campus intends to be in the future is essential information in order to create decision-making structure to help get there.

Based on a full understanding of the vision, and feedback from the consultants, the Planning Team created a first-cut governance structure, and provided that to the consultants. This preliminary structure, in our view, under-represented both top (cabinet level) university officers, and middle-level line of business managers. In effect, it tended to perpetuate the model of IT professionals having responsibility for decisions over which they do not have funding and management authority. It was an excellent start, but was neither inclusive enough nor responsive to the matter of institutional project prioritization.

After discussions between the consultants and the various constituency groups during our first two days on campus, the consultants felt that the Planning Team
should work on version two of the IT Strategic Plan Governance framework, and present this framework to the broader IT community on Thursday, the last day of our visit. The intent of this exercise was to have a subset of this representative 16 member team work through some key issues, and then have a town hall meeting in which the larger planning group could react.

That IT Strategic Plan Governance Framework is now included as a part of the IT Strategic Plan. It creates a process where individuals who are representative of all campus interests, at varying levels in the University of Montana organization, can both engage and be accountable. *It is important for the University of Montana community to understand that the consultants and Planning Team together created an environment in which many perspectives were expressed, questions were asked, and in the end, we asked if there was general agreement about this structure. We can report that there was general consensus expressed about the framework, and thus we feel that this structure as outlined can serve as an effective foundation for continuing discussion and refinement.*

The framework is intended to provide opportunities for proposals that align with the strategic vision of the university to be inserted at various levels of the organization. We recommend that President Engstrom identify some meaningful level of resources to support initiatives in support of the Strategic Plan. Members of the community (central or distributed offices or individuals) may compete for those resources by proposing projects. For example, a group of interested research faculty may propose a shared Advanced Computing Infrastructure service that positions the University of Montana to enhance the potential for faculty to compete for research grants that had previously been precluded by the lack of high performance computing services available to them. This could be introduced by the Vice President for Research, if he was a sponsor of this request, or it could be submitted by a Dean or Deans, or by the faculty themselves. Central IT might bring forward a proposal to upgrade the campus firewall and backbone network. A coalition of central and distributed IT might propose construction of a campus shared data center.

The IT Strategic Planning Committee has created a framework in which this can happen at any level, BUT, ultimately requires the senior leaders of the university to consider it in the context of other important priorities. The framework provides the opportunity for the CIO to identify dependencies that might impact either the timeline, or even the viability of proposals given the state of current and planned infrastructure. The framework must include statements of clear roles and responsibilities of each layer of the governance groups.

*The single most important aspect of the IT Strategic Plan Governance Framework is that Deans and Vice Presidents MUST all buy in to this process, AND support it. If different leaders send mixed signals to the broader University of Montana community, we believe that this framework has little chance of being successful.*
In addition to this critical IT Strategic Plan Governance framework, we have identified two additional areas where governance structures are needed.

First, if the University of Montana wants to create the greatest likelihood that an integrated approach to IT decision making takes place, a structure that provides a forum for both distributed IT leaders and central IT leaders to discuss campus IT operational issues needs to be created. We believe that this should be a representative group guided by a formal charter which clearly lays out Guiding Principles, membership, and roles and responsibilities. One of the most important aspects of this group will be the expectation for two-way communication: communication back to their stakeholder community, and communication within this group of peers. We will provide Interim CIO Loey Knapp with examples of structures that have been utilized by other universities. It is our belief that this group should be led by the CIO with great care to evenly represent the interests of both central and distributed units.

Second, the University of Montana needs to address the issue of Banner governance. Banner is the major enterprise system on campus and has been managed with no formal change control process. Individual functional offices request changes of central IT, or assign their own IT staff, without regard to overall institutional priorities. These efforts are well-intended, and tend to serve interests of individual offices. However, Banner has a very high level of customization, which has occurred because Montana was an early adopter when functionality was immature, and because there is no systemic approach to reducing customizations at periodic intervals.

Banner is an ERP system that has a number of major stakeholders. They include the Provosts Office (Registrar function), Finance and Administration (multiple functions), and Student Affairs (multiple functions). IT plays a support role for enterprise systems, and should be overall responsible for the technology infrastructure and integrity of the systems. We strongly believe that a charter needs to be developed for the Banner stakeholder offices to make decisions as a group, and elevate significant issues when necessary, to the Cabinet. To continue down the path of a highly customized Banner environment means that the University of Montana is spending funds (mostly time of staff in both central IT and functional offices) unnecessarily, and is not getting the full benefit of the system that has been purchased. A formal Banner Team should be set up to oversee and coordinate all significant decisions about implementations, upgrades and changes to the local Banner instance. This team should include senior representatives of all functional offices that rely on Banner as well as central IT staff responsible for supporting it. The team should be led by the CIO or the designated representative from that office (often a Director for Enterprise Systems). Again, the consultants can provide examples of enterprise system governance groups which have proven to be effective.

To summarize this section on governance, we believe the University of Montana is positioned to take advantage of more inclusive and formal IT governance processes.
to better align with the UM 2020 Strategic Plan. In particular, UM 2020 says ”The University will model transparency, systematic communication and sound decision-making to ensure that resources are marshaled to achieve UM’s mission. We believe that our recommendations in this section closely align with this goal.

IV. Strategic Funding of Information Technology

The Cabinet has adopted a vision for Information Technology at the University of Montana. This vision addresses the short term, mid-term and long term information technology objectives in support of the UM 2020: Building a University for the Global Economy.

A funding strategy for Information Technology also needs to be developed to support the successful planning and implementation of this vision in an integrated and institution wide manner.

1. The Current Budgetary State

Currently, funding for maintenance and investment in support of Information Technology Services at the University of Montana is provided separately to Central IT and to the academic and administrative units of the institution. It is clear that the result of this approach is inadequate funding for Central IT to provide the basic core infrastructure and enterprise services needed to properly support the University of Montana. As a result, this approach has fostered the development of institutionally expensive duplicative services offered throughout the university to compensate.

IT receives state funding for a portion of the salaries that the organization incurs, some central funding for IT Utilities (ongoing costs for things that affect all of campus such as software maintenance, some network costs etc) but no capital funds. In addition, a fairly substantial portion of the overall budget in support of Central IT is also provided by charging the university community for access to data ports, for telephone services, for application support, and for the development and provision of other requested IT services.

Since the base budget that Central IT receives from the university directly is not sufficient, Central IT sets rates for its charged services to ensure that all annual expenditure obligations are met. There are several issues of concern that are raised from this approach.

First, a charging scheme that sets rates based on budgetary need, rather than actual cost, endangers a broader set of needed services should there be drop in demand for these cost recovery services. In addition, the artificially high rates Central IT is forced to charge has incentivized distributed units to “do their own thing” rather than participate in the core university-wide services. This drives further decentralization and lack of coherence in the IT infrastructure, which will operate poorly and be more costly in the long run. For example there are now enterprise wide applications deployed across the campus and duplicative services are offered by many offices and areas across the campus(e.g. EMail systems, space scheduling, computer labs, help desks, etc.). In addition to being
costly, and most importantly, these fragmented services result in a confusing and frustrating IT support infrastructure for faculty, staff, and students.

Second, if services that are viewed to be ubiquitous are subject to cost recovery, their deployment across the institution will be uneven and unpredictable, resulting in a failure to meet institution wide objectives and expectations. There are two very clear examples of the negative impacts of that on the institution. Port charges do not represent the true cost of the provision of that service. The charge retards needed access by the university community to the network, and the charge is a point of unneeded irritation between Central IT and the distributed community. The funding strategy for wireless deployment on campus has also caused challenges. While there is a strong universal desire to have wireless access across the institution, the requirement that distributed units need to pay for that deployment in their areas has meant that it is only deployed where the distributed community has had the ability and desire to do so. In both of these instances institutional objectives are not met and a large part of the university community blames Central IT for not understanding or addressing the basic IT requirements of a university in the 21st century.

In summary, there has not been sufficient funding to ensure the necessary core IT infrastructure for the campus, including a campus network that has not kept pace with the growth and demand of the university and an inability to take full advantage of the campus connection to the national network. Furthermore, the university's data center is antiquated and located in a facility that is not appropriate for a data center in a university in the 21st century. The current funding model of Central IT is not positioned to support UM 2020.

2. Recommendations
There is a need for the University of Montana to develop a new funding strategy that can support the vision for Information Technology that has been approved by the Cabinet.

The development of the new funding strategy should start with an examination of the current funding model for Central IT. Strong consideration should be given to eliminating all charge backs that retard, or negatively impact, the development and implementation of the IT vision. Many institutions today are doing away with charge backs for the basic communication services like data ports, telephones, wireless access, etc. Central IT should be provided with institutional funding to offset the loss of funds that were provided by the charge backs.

Then, Central IT needs to examine its existing budget to determine how much of that budget supports its staff and their ongoing operational support, how much is required for supporting existing IT institutional infrastructure, and how much is available for new initiatives.

To provide new additional funding for existing IT services, as well as new initiatives, institutions today are either moving to a general “tax” to units based on a formula representing student credit-hours, staff/faculty FTE, facilities square feet and research funding level, etc. or by establishing, through the
institutional budget process, a campus wide IT budget to address the needs identified through the IT strategic planning process. In developing an institution wide budget for IT, campuses have used combinations of state provided operating funds, tuition revenue, indirect cost recovery funds, capital funds, as well as regularly increasing student technology fees. These varied funding sources need to be part of a consolidated and holistic pool of resources available to support the implementation of the IT Strategic Plan. As a central pool of institutional funds available for this purpose, the expenditure of these funds need to be part of the university wide IT planning and implementation process. In particular we noted that currently the student technology fees are planned and expended as a separate resource, independent of other IT resources and other IT plans. In the future, student technology fees, just like the other sources of support, need to be part of the IT governance process to implement the projects and programs of the IT Strategic Plan. The particular funding model chosen by an institution to provide resources to support the IT Strategic Plan depends on existing institutional funding policies and practices and campus culture. It is very important that the development of the Strategic Funding Model occur at the same time and pace as the implementation of the governance structure for IT. Successful priority setting for projects and project portfolio management will only occur if there is the capacity to address, in some predictable fashion, the priorities that are supported by the governance structure of IT. Over time as the IT governance process and the IT planning and implementation process evolve there should be an expectation that efficiencies will emerge that will provide resources for the further investment and maintenance of IT in support of the IT Vision.

V. Organization

At present the IT function at the University is organized into a central IT group and several groups of various sizes and levels of organization located in central administrative units, individual colleges/departments, and specific research groups. About half of the identified staff on campus are in the central organization and half in distributed units. There is no formal agreement about the domains of responsibility of these organizations and as a result there are duplications and gaps in service provision.

The consulting team was asked for recommendations about potential ways to better organize the IT function to help accomplish the goals of building an integrated IT function across the institution and increasing efficiency by eliminating duplication. We listened carefully to central and distributed IT staff as well as faculty and administrators as they talked about the current organization and their ideas for improvement.
As a result we are recommending an evolutionary approach aimed to improve communication and efficiency. We believe that this approach will be less disruptive and more effective than an immediate radical change since it will allow for experimentation and for staff to “grow into it”. Inherent in this recommendation is also that the recommendations above about governance especially will be implemented. If not, then the organizational change will have to be more rapid.

Step One: A search should be initiated to identify a Vice President for IT and CIO for UM. The position should report to the President and serve on the Cabinet. When appropriate, the CIO should meet with the Deans to address more specific academic IT issues. The position description for the CIO should make clear that the institution will expect the person hired to equally represent central and distributed IT functions and lead the institution’s evolution to a more integrated, efficient and effective state. The office should represent and speak for the whole IT enterprise. While possible candidates must have requisite technical and managerial expertise, special attention should be given to their collaborative and positive leadership talents. This is a job requiring wide vision and insight and the capacity to build trust between the CIO office and other functional areas as well as to be a facilitator of the development of trust among others.

Step Two: Each Dean and Vice President should identify one individual to serve as the senior manager of the IT functions within the unit. The job titles might be Director or whatever indicates senior standing within the unit. The position should report to someone in the Dean/Vice President’s office and take responsibility for management, oversight, and representation of the unit’s IT functions. The individuals in the positions should be good communicators and operate in a collaborative leadership role.

The CIO should convene these IT managers along with the senior directors from central IT at least monthly to address issues related to improving operational performance. One very important issue is the articulation of specific roles and responsibilities of central and distributed IT units with respect to the service layers represented in the Strategic Plan. These roles and responsibilities may differ somewhat among units, but it is important to have a written memorandum of understanding (MOU) of the agreements. As these discussions take place, there will be instances in which it makes more sense for the central unit to perform some functions that some distributed units are currently doing and vice versa. The memo of understanding should specifically identify these potential points of change.

Step Three: The distributed and central IT managers should develop plans for moving the identified functions along with relevant staff and funding to the appropriate distributed or central organization. The CIO should lead the development of an overall plan of exchange that results in the rationalization of IT services overall. As these exchanges take place, the parties should negotiate and document standards of service.
Step Four: The distributed IT managers’ reporting lines may be changed to report 50% to the CIO’s office and 50% to the office of their Dean/VP. This reporting relationship will facilitate the next step of work aimed at developing potential new services together and further improving efficiency. The CIO and managers should stay open to every opportunity for developing shared facilities and services while continuing to meet the specialized needs of the units.

For example, the current five Helpdesks might be consolidated into a single unit with an initial central triage unit that would refer callers to more specialized centers located near their clients. The planned rationalization of computer labs on campus might produce a single integrated set of facilities, some of which would advertise their specialized hardware and software related to disciplinary needs, while others would provide a common, basic set of equipment and applications. The staff who currently work on almost completely separate Banner segments should be united into a Banner team that, while maintaining their specialized expertise by functional area, could develop better cross-functional understanding of systems.

As this happens and as the current over-customization of Banner is systematically reduced over time, we expect that significant staff time will be freed up to accomplish new work that cannot be done now. Another area ripe for collaboration is desktop support. Many institutions are developing a set of basic hardware and applications that can be managed remotely. While not every user will be adequately supported by the standard image, a growing number will experience much better support at much lower cost in this way.

The list of potential projects will grow as new opportunities to consolidate and share are discovered through the IT managers working together with the dual focus on increased overall institutional efficiency and, where needed, specialization to disciplinary needs and cultural differences. The IT managers will see their professional focus elevated from only the “local” to “institutional and local”. The IT staff will have opportunities for career advancement as a result of being part of this larger integrated unit and their movement from unit to unit should be facilitated.

The pace of evolution of this integrated and distributed IT function will be determined by the needs and experience of UM itself. The CIO should serve as the catalyst, facilitating the changes as they are worked out by the IT managers together. The steps outlined above are generally sequential, but may proceed in parallel as that readiness develops.

**VI. Enabling Issues**

There are a number of enabling issues that the University of Montana needs to consider to support the IT vision and the development and implementation of the institutional IT strategic Plan.
1. Role of Senior Leadership
The support and active participation of senior leadership in the development and implementation of the IT Strategic Plan is critical to its success. Institutional IT Strategic Plans and their implementation cut across all academic and administrative areas and therefore the senior officers (President, Provost, and Vice Presidents) need to work collaboratively to ensure that their areas are fully integrated and working together in a positive team environment across the campus to achieve the objectives of the IT Strategic Plan.

2. Information Technology Planning Principles
In Section 3 –IT Governance, an EDUCASE Center for Applied Research bulletin (http://net.educause.edu/ir/library/pdf/ERB0524.pdf) was referenced. This bulletin outlined the five key governance decision domains. The first on that list was: IT principles- how will IT create business value? A set of IT principles need to be established for the University of Montana to provide guidance for the priority setting of projects and the management of the project portfolio.
Some universities, whose vision has been to be at the forefront of technology development and adoption in support of higher education, have adopted a set of IT principles to reflect that vision. They have often been at the “bleeding edge”. Their projects, budgets and risk tolerance reflect that.

Other universities have developed a more conservative approach to the IT principles to guide them. For example, at the University at Buffalo, the following IT Principles were adopted by the institution:

University at Buffalo IT Principles
• Stay ahead of the demand curve
• Stay in the mainstream
• Consciously build on existing investments
• Focus on continuous improvement
• Leverage wherever possible (utility functions)
• Focus human capital on competitive differentiation
• Optimize human capital & equipment investment
• Utilize project management & benchmarking
• Be an early follower

These IT principles were observed during the budget and project priority setting process of IT governance at the University at Buffalo.

The IT Planning Principles at the University of Montana need to reflect the IT vision that has been adopted by the Cabinet and needs to support the strategic plan of the university: UM 2020

3. Training and Development
It was clear from our visit that, across the campus, training for staff is uneven and insufficient. An assessment needs to be conducted to determine training and development programs for staff so that they can fully take advantage of existing
applications and infrastructure and that they are properly prepared for new technology initiatives.

In addition, training and development should also be considered for staff to facilitate cross-organizational as well as cross-functional teamwork. This includes a strong need for leadership development, project and requirements management development, and soft skills development. All of these approaches are needed to create a community that has the full skill set needed to support the Montana mission and vision. It is very important that funding models are determined so that all IT staff, regardless of organizational placement, have this opportunity.

Recommendations in this report include removing all possible customizations currently part of the UM Banner implementation. These customizations were developed over the years to allow the (initially immature) software to mimic then-current business processes. In order to remove them, the future processes will need to be changed to match the capability of the greatly improved “vanilla” Banner. It is important that a sufficient number of staff be trained to serve as business process specialists to serve as the process experts working with functional mangers, and their staff, to redesign how work will be done and to ensure that the “vanilla” banner works accordingly.

5. Project Management
From anecdotal examples provided in our interviews, it is clear that formal project management techniques and principles are not being generally employed for IT projects on campus. Most institutions have begun to move toward use of project management tools because they provide improved project outcomes, in terms of quality result, timeliness, and lower cost. It is important that a sufficient number of individuals are provided training and development in project management to ensure that all future projects benefit from the deployment of those skills.