



University of Washington

Future of Information Systems  
Task Force  
Final Report

---

January 19, 2007

## TABLE OF CONTENTS

<b>Update: January 2007</b> .....	<b>3</b>
<b>I. Executive Summary</b> .....	<b>4</b>
Overview.....	4
Summary of Findings.....	5
Summary of Recommendations.....	6
<b>II. Task Force</b> .....	<b>8</b>
Objectives .....	8
Scope.....	8
Methodology.....	8
Membership .....	9
Stakeholders.....	9
<b>III. Findings</b> .....	<b>11</b>
(1) Current Broad-based Status of IS Across the UW.....	11
(2) Major Issues, Concerns, Areas of Need.....	18
(3) Five-to-10 Year Vision.....	21
(4) Determine and Weigh Alternative Strategies .....	22
(5) Propose a University-Wide strategy for Achieving the Vision .....	25
<b>IV. Recommendations</b> .....	<b>28</b>
1. Overview.....	28
2. Immediate Recommendations.....	29
3. Long Term Recommendations.....	32
<b>V. Appendix List</b> .....	<b>36</b>

## **Update: January 2007**

The Interim Information Systems Futures Report was submitted to Provost Wise in May 2006. The analysis and findings were given immediate and serious consideration. The recommendations were accepted and became high priorities for implementation. The following list summarizes the impressive actions taken in the short time period since the Interim Report was issued:

- (1) To address the fragmentation of IS/IM responsibilities, decision-making and accountability spread across a number of units: a major restructuring of information management, technology, and systems responsibilities at the University including the creation of the new Office of Information Management with a Vice Provost for Information Management/Information Systems and Chief Information Officer.
- (2) To improve knowledge, information, and data management and coordination across the University: a new Data Management Committee responsible for stewardship of data, metadata, and the information base of business processes.
- (3) To create a culture of awareness across the University community: numerous meetings and discussions with deans, administrators, and IT personnel, and adjustments in various advisory groups including ATAC, ITAC (now I-MAC), UTAC, Computing Directors, the IT Resources Sharing Group, and the Catalyst Advisory Group.
- (4) To support administrative and analytic information needs: moving ahead aggressively with the Data Warehouse. Interim funds were provided to the Data Warehouse, and continued funding is recognized as a priority.
- (5) To support classroom and instructional technology improvements: to charge Catalyst with developing a courseware management system by July 2007.
- (6) To better understand the status of systems for (a) research across the UW and (b) the medical enterprise: initiating separate studies to examine needs, concerns, and solutions.

The IS Futures Task Force met for the last time on December 5, 2006 to re-affirm and finalize the contents of the Interim Report. Task Force members were especially impressed with the decisiveness and speed of actions taken since the report was issued. It is clear that there is a strong commitment at the highest levels of the UW to solve the problems identified in the report and to align information systems, management, and technology functions to the goals and aspirations of the University. The Task Force members were pleased to be able to contribute to this effort.

Respectfully submitted, January 19, 2007,  
Mike Eisenberg, Task Force Chair

# I. Summary

## *Overview*

The University of Washington's information technology environment has experienced exponential growth in the past two decades. Computing is no longer limited to e-mail use and a few transactional services. Even ten years ago, we were just beginning to see the impact of the use of microcomputers for teaching, learning, administration, and personal productivity. In 1996, the World Wide Web was still relatively new on the scene. Since that time, the environment changed to include services that provide full multimedia, interactive Web presence and numerous transactional and analytic services. Information systems capabilities and demand for IT services continues to grow exponentially, and the UW must continue to strive to meet the current challenges and prepare for the needs of the future.

In March 2006, Provost Phyllis Wise announced the appointment of the Future of Information Systems Task Force to examine current and future information technology needs. The Task Force studied the needs and strategies for addressing those needs over the next 5-10 years, with the following goals:

- To determine the current status of information services and systems across the University of Washington
- To determine, from a wide range of stakeholders, the major issues, concerns, and areas of need
- To propose a long-term vision of information technology goals for the university
- To propose a strategy for achieving that mission.

The underlying mission of the Task Force is to provide the UW with recommendations to ensure a technology infrastructure for the UW that integrates, enables, and supports the mission and vision of the UW while keeping up to date with current trends. The technology must be flexible, scalable, have depth, and be of superior quality to support the needs and goals of the University of Washington.

To produce such an output, the Task Force turned to various people and institutions for solutions. Stakeholders from all UW campuses gave their input about institutional trends and participated in surveys to assess the future of Information Technology needs. The Task Force held faculty and staff forums and created a university-wide inventory of systems. Other universities and businesses participated in panels to share best practices in Information Management and Technology.

UW's major IT responsibilities include Computing & Communications, the colleges and schools, campuses of Bothell, Tacoma and Seattle, UW Medicine and Medical Centers, Educational Partnerships and Learning Technologies (EPLT), and the University Services Renewal Project (USER Project). Because each organization is responsible for different functions, each has unique concerns and needs, which need to be addressed.

By analyzing current and anticipated needs across the University of Washington campuses, the Task Force is able to make assessments and recommendations to effectively use current resources and determine the best course of action for obtaining new technology. Taking such action is necessary to ensure that the University of Washington will continue to be a leader in education and research.

### *Summary of Findings*

The Task Force found a number of trends that need to be considered and addressed in the coming months and years.

One of the most common complaints is that data storage and management systems are not coordinated or unified. There are a large number of systems that are locally controlled, and it is difficult to know if the collections have relevant, accurate, and useful data. The strength of the current infrastructure is its ability to handle the transactional workload. However, the UW requires more coordination and control in order to assemble consistent information, deliver business products and services, and execute organizational change more quickly.

The Task Force found that the Data Warehouse effort is an important one. Systems must be coordinated to allow the systems to work together. All outside advisors, business and university, stressed the importance of a reliable Data Warehouse to meet analytic needs across the organization.

Current IT funding is inconsistent and inequitable. Some units have extensive financial resources while others do not. All areas of the University require reasonable access to quality IT systems. Baseline academic systems (e.g., classrooms, learning and instructional systems) require reliable, continuous support.

Given the volatility in the marketplace, the current UW strategic approach to systems development makes sense, i.e. leveraging the existing legacy system architecture and performance by developing Web-based interfaces and to provide access to management information through the Data Warehouse.

There is support across the UW for the USER approach to systems development although it requires streamlining, engagement of all levels of users, and a more integrated context for systems development. What seems to be missing is an overall vision of where the UW wants to be in 5-10 years, how various systems development projects fit into the achievement of that vision, and whether we can reasonably expect that vision to be achieved.

Based on our benchmarking data of comparable university environments, the UW is a leader in providing secure wireless facilities to faculty, staff, and student users on campus.

Responsibility for IT planning, implementation, funding, and oversight is divided among many different units. Many respondents noted a fragmentation in the UW organization structure. External advisors emphasized that integration and coordination is essential for an organization to function effectively, efficiently, and securely. Integration and coordination is also needed to identify when the UW can leverage cost savings from economies of scale.

Due to time constraints, the Task Force was not able to assess research administrative systems, systems to support research, or Medical Center systems.

### *Summary of Recommendations*

The Task Force recommends a number of changes. One of the most pressing is developing an underlying structure. Currently, the structure is fragmented with responsibilities, decision-making and accountability spread across a number of units. There is no “buck stops here” approach, and as a result, the UW lacks a clearly defined, coordinated IT strategy.

There also needs to be a culture of awareness across the University community. People at every stage of the information process must understand that the changes to be made are important for the University to function well as a whole. Furthermore, the end users need to be involved and the process needs to be transparent.

Another suggestion was to use the metaphor of a fire fighter putting out blazes. Every time there is an emergency, the IT community is called upon to fix the problem. However, the Task Force believes that it would be more cost-efficient to prevent fires. By maintaining a system of regularly updating and improving IT, the UW eliminates the need to put out fires, because many of them will have been prevented.

Recommendations for the short term include moving ahead aggressively with the Data Warehouse to support administrative goals. Classroom improvements should also be added to the regularly scheduled budget. Also, because the Task Force was unable to adequately study the status of systems for research across the UW or the medical enterprise, we recommend that separate studies be initiated immediately to examine needs, concerns, and solutions.

Long term recommendations include making use of innovation and integration to develop new solutions. The Task Force has determined that it is important to evaluate the lifespan of the legacy systems and build from that line of knowledge. Academic technology should be a top priority of the university. However, funding must make that happen. Funding concerns are among the most widespread of this study. Currently, the UW seems to fund reactively—as crises or new needs arise. Clearly, a more planned and systematic approach is preferred, one that allows the University to be proactive in creating and maintaining information and technology systems that support our goals and core functions. Nearly all of the recommendations of this report require adequate and reliable funding if the situation is to improve.

Finally, we heard over and over from nearly everyone about almost every aspect of information systems, that “it’s not really about technology; it’s about business practices.” We need to determine what we want to accomplish and how we want to do it. Then, we will be able to design and implement appropriate and successful information systems.

## **II. Task Force**

### ***Objectives***

The Future of Information Systems Task Force created this report to assess the current status of Information Technology, determine future needs, and prepare strategies to accommodate those needs across the University of Washington campuses. According to the current understandings of the Task Force, a gap exists between UW's vision and the ability of the current IT environment to support that mission. Therefore, the Task Force is working to bridge that gap by understanding the areas of concern and needs, and determining a future strategy.

By pulling together a wide variety of resources and stakeholders with various interests and backgrounds, the Task Force was able to build a clearer picture of the strengths and weaknesses of current IT systems. After constructing the picture, the Task Force was able to come up with a plan to fill the gap between IT systems and the institutional vision.

### ***Scope***

For this study, the Task Force assessed institutional trends in relation to Information Technology across the Bothell, Tacoma, Seattle campuses and Medical Centers of the University of Washington.

Information Technology at the UW supports a number of important processes. The Task Force assessed the following IT functions:

- Communications
- Research
- Student/Teaching and Learning
- HR/payroll
- Finance and Budget
- Access to Information
- Medicine.

The Task Force also assessed current IT systems in place across all UW campuses to determine status, challenges and future needs within those campuses. Another important step in the process was looking at similar universities for ideas and assessments of successes and failures (See Appendix 21).

### ***Methodology***

The Task Force looked for input from a number of people across the UW community. The group actively sought feedback and ideas from faculty, staff, and students and encouraged people to participate in scheduled interview sessions and online surveys.

The Task Force also conducted interviews with stakeholders on Institutional Trends and Future IT Needs. The interviews helped to determine upward trends across departments

and colleges and the importance of technology infrastructure. Stakeholders articulated their perceptions of the greatest challenges for developing a technology infrastructure to support an institutional vision and future initiatives. The interviews also assessed the needs of future IT systems. Task force members asked participants to list the attributes of excellent information systems at the UW and their perceptions of the strengths and weaknesses of the current UW information systems. Participants provided valuable input on the types of data and information they would be using in the next 10 years. Finally, Task Force members asked participants to name some of the national and international best practices for information systems and determined what models could be adopted for the UW (See Appendices 11-13).

Another valuable source of information came from Faculty Staff Forums, which allowed faculty and staff from the UW to voice their opinions about needs and concerns.

The Task Force turned not only to the stakeholders and current systems users, but to outside resources as well. Panels of business leaders and IT specialists from other universities provided valuable insight into successful strategies to approaching this project. Using that insight, the Task Force compiled best practices in Information Management and Technology to apply to the UW (See Appendix 6).

The Task Force divided into four working groups or subcommittees to focus on specific areas and hone in on possible solutions for needs. The subcommittees took responsibility for the following areas:

- Systems-State of UW Subcommittee – Charter: Pull together various efforts that are underway. Involves metadata, scope of current systems, approaches and assumptions of current systems, locus of control, authority, and ownership, and degree of autonomy.
- Needs Subcommittee – Charter: To define stakeholders and conduct interviews, define interview questions and processes. Stakeholders, existing documentation, key offices, programs, and projects, and focus groups were included in the definition process.
- Institution Subcommittee – Charter: To define where the UW is going in the next five years and how our information infrastructure will support doing this. Vision, goals, and values of the UW, components and structure of the UW, key questions, trends, and potentially disruptive events were identified in this process.
- Benchmarking Subcommittee – Charter: To research who is successful and what the options are for the UW.

### ***Membership***

The following people are members of the Future of Information Systems Task Force and contributed to this report:

- Ann Anderson, Assistant VP/Controller
- Shawn Brixley, DXARTS
- Kelly Campbell, Director, Finance & Administration School of SW
- Ana Mari Cauce, Executive Vice Provost

- Walt Dryfoos, AVP, Advancement Services
- Mike Eisenberg, Chair, Dean Emeritus, Information School
- Gary Farris, Director, Finance & Administration, Graduate School
- Eric Godfrey, Co-chair, Acting VP, Student Affairs
- Sara Gomez, Director, Administrative Information Services
- Jeanne Marie Isola, Co-chair, Director, Strategic Initiatives Office
- Mary Fran Joseph, Executive Director of Finance & Systems Medicine
- Mary Lidstrom, Vice Provost for Research
- Jim Loter, Director of Computing Services, College of Engineering
- Mary Melanson, Director of Finance & Administration, Arts and Sciences
- Todd Mildon, University Registrar
- Brent Stewart, Faculty Senate Representative
- Joanne Suffis, Interim Vice President, Human Resources
- David Szatmary, Vice Provost, UW Educational Outreach
- Betsy Wilson, Dean of University Libraries
- Alan Wood, Interim Vice Chancellor, Academic Affairs.

See Appendix 22 for contact information.

### ***Stakeholders***

See Appendix 21.

### **III. Findings**

#### **1. THE CURRENT, BROAD-BASED STATUS OF INFORMATION SYSTEMS ACROSS THE UNIVERSITY OF WASHINGTON**

The subcommittee on the state of UW IT systems conducted a meta-analysis of past studies and solicited new input to build a current inventory of systems. The findings are as follows:

##### ***Data storage and management is not unified or coordinated***

UW systems involve a large amount of data on administrative, teaching, learning and research functions. This data resides in a wide number of locations, databases, document servers, etc. There is currently no coordination of data repositories, although some efforts to develop uses of centralized data warehousing are underway.

Currently, data are stored at many different levels: university, college, school, department, and administrative offices. Some data are redundant and others inconsistent. Most troubling, there are no established “definitions” for key data, and often databases from various units do not mesh.

Because of the lack of coordination of data and storage, many systems solutions have been implemented locally, rather than broadly. This has created solo efforts, exacerbating the incompatibility of data systems and increasing the number of local or “shadow” systems that reside in a single school, department, or office.

Policies to guide data processes are often local: the management of data (which includes ensuring that it is complete, authentic, accessible, and secure) has been the onus of various business units (including schools, colleges, and departments). Furthermore, data storage and archiving are not systematically implemented; some units are significantly more advanced than others in using electronic records and processes.

##### ***Data systems are numerous and locally controlled***

Building on previous work by a number of groups (including the IT Resources Sharing Group, Internal Audit, C&C, and Registrar’s Office), information on over 600 systems was gathered for this report. An added challenge is that systems are continuously changing; in fact, there is a steady stream of systems in various phases of development. While the inventory is far from complete, it does give insight into the scope and complexity of data, systems, and needs.

The greatest number of these systems is used to support Finance and budget (111 systems), Students, teaching and learning (105), and HR and payroll (70). A detailed breakdown is represented in the following chart:

*Figure 1: Systems by process*

<b>System Type:</b>	<b>Number:</b>
Finance and Budget	111
Students, Teaching and Learning	105
HR and Payroll	70
Communications, Infrastructure, Middleware	47
Access to Information, Reporting, Business Intelligence	43
Facilities, Transportation, Space	33
Unknown, Other	22
Research and Grant	11
Clinical	5

Select university offices/departments account for many more systems than others. The top five offices/departments account for 47% of the systems inventoried. The top five include the School of Medicine (162 systems, 27% of inventory), Computer Science and Engineering (50), Student Financial Services (28), UWB Information Systems (25), and the Registrar (18).

*Figure 2: Top 5 Offices/Departments by System*

<b>System Location:</b>	<b>Number:</b>
School of Medicine	162
Computer Science and Engineering	50
Student Financial Services	28
UWB Information Systems	25
Registrar	18

Some of these systems fall into the category of unsupported or “shadow” systems that perform functions or hold data outside the authorized UW system structure. These systems are created by individuals, small groups or departments who feel the current systems are not meeting their needs, or who do not trust the larger systems. In some cases, these shadow systems are localized copies of larger databases, or servers running “under the desk.” The large number and specialized nature of UW School of Medicine systems suggests that a separate inventory and needs assessment should be done for this portion of the campus (See also Appendix 14).

The business IT experts who met with the Task Force noted that complex organizations with diverse centers of power often have larger numbers of shadow systems. These can be either temporary, such as after a business merger, or permanent, as when the diverse centers deliver value through marketing groups and web development teams. They strongly advised reducing the number of shadow systems in order to assemble consistent information, deliver business products and services, and execute organizational change more quickly.

Because this is a preliminary report, the inventory work will continue. Members believe that continued work is valuable and politically viable, but that the subcommittee should determine which inventory data is needed most to support the next phase. It is probable

that the subcommittee will need to find ways to fill certain gaps in broad systems categories, specific high-profile or critical systems missed earlier, and key attributes, such as satisfaction, of some of the already documented systems.

Another reason to continue the inventory of campus systems relates to security and compliance. In order to maintain effective security measures, coordinators must have a complete inventory. The Information Security Office will be a key partner in the inventory effort, and will serve as consumers for the inventory project.

The need for a continuous inventory is an important conclusion of the Task Force. Simply recognizing the need for the effort and helping the inventory effort move forward has already been a great service for the UW. But even more importantly, considerable work needs to be done to analyze, compare, and summarize the various systems.

***The strength of the current infrastructure is the ability of current systems to handle the transactional workload.***

The current UW administrative transaction systems appear capable of handling the current transactional workload. Comments by respondents verify that the UW provides a solid network backbone and technical infrastructure. This study also found that the UW transactional systems are high-speed, high-volume connections that provide adequate “uptime.” One question is how long our legacy systems will be able to deliver this level of service. For example, UCLA has determined that its legacy system will serve the needs of its campus to 2015, but not likely beyond that. The UW has no similar assessment of the long-term viability of its underlying transaction systems.

***There are differences of opinion about the effectiveness of current UW transaction systems.***

There is less agreement about whether the administrative transaction systems provide the range of services and functions desired by various business units. The plethora of shadow systems, particularly in schools and colleges, indicate that there are needs that are currently unmet centrally. Alternatively, these systems may exist because we do not have coordinated institutional processes, and units are “reinventing the wheel” unnecessarily: the functionality may exist but there is no awareness of it. Therefore, while legacy systems seem capable of handling the current workload from a transactional perspective, questions remain as to whether they are capable of handling expanded functions and especially the ability to create workflow and financial reports out of the transactional data. And, even if they are able, is it advisable to develop new services and functions based on our legacy systems? These questions also relate to the centralized-decentralized and organizational findings also raised in this section.

***Locally-developed solution efforts have been successful***

The UW has internally developed a number of solutions on campus, including web-based tools and middleware applications implemented for various business units. For example,

respondents reported the extension of a single sign-on and authentication to more applications as strengths of internal development. Other examples of well-received solutions cited by respondents include:

- Middleware: MyUW, UWNNetID, ASTRA
- Web-based Tools: OPUS, SAGE, Financial Desktop, ESS

Other user systems noted as valuable include:

- Library systems
- Catalyst tools.

### ***The UW Strategic Approach to Systems Development***

The current approach to leveraging the existing legacy system architecture and performance is to develop Web-based interfaces, provide access to management information through the Data Warehouse, invest in best of breed systems (build or buy), and develop and integrate middleware. The USER (University Services Renewal) Project started in 1997 with the mission to "transform University of Washington support services, enabling our community to be more effective and efficient in carrying out the institution's educational, research, and public service missions." The USER approach was created to engage end users and technical developers in teams that would challenge the old ways of doing business and create new ways, using Web tools. This approach was accompanied by a decision not to go with an Enterprise system but rather to build Web applications that interacted with legacy systems.

Innovative systems have been developed with the USER development model, and others are in the pipeline. Successful systems include eProcurement, Financial Desktop, System to Administer Grants Electronically (SAGE), and HR and Payroll. Cases studies of some of these systems are available online (<http://www.washington.edu/user/>). There is support across the UW for the USER approach to systems development. Comments about ways to improve the USER approach include:

- Look for ways to streamline the process: USER projects seem to take a long time to initiate and complete.
- Provide a broader, unified and integrated context for systems development and individual projects. A frequent comment to the Task Force was that the UW lacked a clear long-term vision for IT systems. Where do we want to be in 10 years and how will the various USER projects fit together to take us there? Both the business and university panels emphasized the desirability of a clear systems vision and integration of projects and systems.
- Recognize that success of projects requires involving at least four major sets of players involved:
  1. the end-users of systems (often based in the schools and colleges);
  2. the information/services providers (often based in central administrative offices);
  3. the project managers;
  4. the systems developers.

Successful projects are collaborations and partnerships among all four groups.

### ***The Data Warehouse***

In 2003 the “Data Warehouse Program” was officially established to lay the foundation for integration of several disparate central applications for reporting purposes. To date, it provides significant value in support of several central operational systems and central office analytic needs (See Appendix 8). Some of the accomplishments to date have been:

- Acquiring and integrating of student enrollment, financial transaction, and HR payroll data;
- Enabling of several operational applications (i.e. FDI, OWLS, SAGE, etc.);
- Facilitating key institutional analysis (i.e. CSR, Labor Negotiations, HCA Overpayments, etc.);
- Producing several online report types (i.e. Online Check Register, Enrollment Cubes);
- Supporting production of complex reports (i.e. Annual Report, President Cards).

Despite the accomplishments of the “Data Warehouse Program,” the existing approach is not meeting the needs of University-wide users. Accessing and analyzing the data is difficult and information is not available for making timely and informed decisions. Most troubling, capabilities are not yet available for use across the UW—particularly by the schools, colleges, and campuses.

The good news is that these concerns can be addressed, and the Data Warehouse can become one of the foundations of effective systems at the University of Washington. All outside advisors, business and university, stressed the importance of a reliable Data Warehouse to meet analytic needs across the organization. There is no question that the UW needs a user-focused, efficient, and secure Data Warehouse, and the Task Force will recommend changes to and major support for the Data Warehouse.

### ***IT funding is inconsistent and inequitable***

Many individual units (campuses, schools, colleges, departments, offices) fund local systems development through their own resources, Student Technology Fund allocations, or other means, while others do minimal local development. Some groups have the necessary resources to succeed, others do not. In departments with significantly large budgets such as the School of Medicine, or significant expertise such as Computer Science and Engineering, there are disproportionately large numbers of information systems. Other departments that lack fiscal or knowledge resources are at an unfair disadvantage.

The ITAC process has improved the fairness of requests and allocations of Provost Office funding for individual systems development projects. The ITAC process carefully assesses the merits of proposed development projects and provides a rank order of recommendations and priorities.

What seems to be missing from the ITAC process is an overall vision of where the UW wants to be in 5-10 years, how various systems development projects fit into the

achievement of that vision, and whether we can reasonably expect that vision to be achieved. Therefore, while the ITAC process is an improvement over past practice, it does not provide an integrated approach to systems development that ensures a clear and attainable set of goals. It's not always clear whose priorities are being served and whether priorities are able to be adjusted. These concerns are closely tied to the similar concern noted above in relation to the USER approach.

### ***Wireless***

Based on our benchmarking data of comparable university environments, the UW is a leader in providing secure wireless facilities to faculty, staff, and student users on campus. The \$7.5 million UW Wireless Initiative has implemented a multi-phase roll-out of centrally managed wireless infrastructure, which should cover the majority of campus within the next 3 years. In addition, the UWNetID authentication system provides secure, flexible access. While these are important advantages, there is still progress to be made in providing campus-wide wireless, which is in greater demand as students and faculty bring more technology to class. Approximately half of campus buildings and common spaces are slated to be wireless by the end of 2006, with the remainder to follow or be upgraded to current standards by the end of 2008. Two buildings (Electrical Engineering and the Paul Allen Science and Engineering) manage their own departmental wireless access. Providing campus-wide wireless access permits the UW to leverage student-owned technologies to reduce demand at campus computer clusters, while permitting innovative technology use in classrooms.

### ***Data Center***

Facilities and space for IT at the UW appear to be at a crisis point. A Data Center Task Force, chaired by Marilyn Cox, is working to define the scope of the problem, identify long-term needs of the UW, investigate alternative solutions, and make recommendations. Resolving this issue will be important to meeting future information systems needs at the University of Washington.

### ***Systems supporting learning and teaching have made some progress.***

The *2005 Faculty and Student Surveys on Educational Technology* provide insights into the current status of academic technology as well as some of the needs:

- Support for general-access technology facilities and services is high among both instructors and students.
- Students want more course materials available online including required websites for every course. Faculty do not want to see this mandated.
- Faculty members want more opportunities to use technology to support their instruction. In particular, they want better access to technology in classrooms.
- The addition of wireless access in classrooms is likely to have substantial impact on classroom instruction.
- Interest in Web-based tools, such as electronic portfolios and online discussion boards, is high.

The Academic Technology Advisory Committee (ATAC) has worked with various offices, particularly the Office of Undergraduate Education, the Office of Learning Technologies, and University Libraries to better coordinate efforts to improve classroom and instructional technology. While there is no regular biennial allocation of funds for classroom support, temporary funding of \$1.25 million was allocated in the last biennium, and \$1 million (to date) this biennium. The ATAC submitted a budget request for almost \$3 million for this biennium and \$4.5 to fully fund classroom and electronic learning technology improvements at the UW (See also Appendix 7).

***Research administrative systems – not able to determine due to time constraints***

The research administrative systems of the UW, until recently, have been locally managed by the originating departments and schools. Steps have been taken in the last few years to automate the central system for internal approval and routing for proposals. However, full electronic submission of proposals, auto-filling of forms, and seamless integration with the grants.gov systems (cradle-to-grave handling) are still years away. A number of unit-specific systems exist to enable electronic management and compliance, but no central, accessible database allows distributed access to proposal or award information. This year the UWISE system was introduced to manage human subject applications, but was pulled from use within months due to the need to completely rewrite forms as part of the accreditation process. This problem underscores the difficulty of developing a system that meets needs at the time of design, but lacks the flexibility to adapt to a rapidly-changing compliance landscape.

***Systems to support research– not able to determine due to time constraints***

A strong need exists campus-wide to address a variety of computing-related research needs. These include (but are not limited to) data storage and management systems, data and document sharing systems that could accommodate multiple research groups both on campus and off, algorithm development for data mining, systems for remote operation and data access at off-campus facilities, and high performance computing capabilities. Although this task group did not have time to assess this problem in any depth, it is clear that as research becomes more data-intensive, more remote, and more interdisciplinary, these needs will only increase. The UW is a recognized leader in developing networking and communications technologies and providing outstanding capabilities. If the UW is to maintain its position as a premier research institution, we need to continue these efforts as well as to focus on meeting the computing-related research needs noted above.

A Research Technology Task Force should be assembled and charged with assessing research computing needs on campus and recommending strategies and funding models for providing the appropriate infrastructure to support the research effort of the future at the UW.

*Medical center systems – not able to determine due to time constraints*

The Medical Center and School of Medicine are vast business units, comprising many times the information systems of most schools, departments and offices. The complexity of the Medical Campus, its unique mission as a learning institution and care provider, and its wide-ranging resources make it difficult to include in this limited survey. An ongoing system survey and analysis will help define how the Medical Campus will best fit in the UW's overall system planning and architecture. At this time, not enough is known to make recommendations aside from further study.

**2. DETERMINE, FROM A WIDE RANGE OF STAKEHOLDERS, THE MAJOR ISSUES, CONCERNS AND AREAS OF NEED**

The Task Force formed a subcommittee to examine comments from stakeholders about the major issues, concerns and areas of need. The subcommittee worked with a wide range of stakeholders and determined the following needs to be met.

*Currently lack a campus-wide IT strategy and leadership*

The UW currently lacks a campus-wide IT strategy and clearly-defined and organized leadership. Many respondents noted a fragmentation in the UW organization structure. External advisors emphasized that integration and coordination is essential for an organization to function effectively, efficiently, and securely. Integration and coordination is also needed to identify when the UW can leverage cost savings from economies of scale.

For example, purchasing software for the entire UW might often be more cost-effective than single departments buying software. This was discussed in detail at UTAC meetings, and a recent proposal was submitted to the Provost, but was not funded at this point in time.

Another example is the issue of desktop support. A number of years ago, the UW settled on a decentralized model for desktop support. More recently, there is an expansion of central support services through Nebula. The outside business advisors and a number of internal respondents raised questions about the value of a decentralized model—for quality support, efficiency, and security.

The UW needs to come up with clear requirements for selecting IT solutions to maintain consistency of performance and security across campus. Leadership should also determine the effectiveness of IT solutions and provide and use consistent metrics to measure success.

Currently, responsibility for IT planning, implementation, funding, and oversight is divided among a number of units including Computing & Communication, the Office of the Executive Vice President, the Office of the Provost Office, the Office of Learning

Technologies, the Office of Undergraduate Education, and the UW Education Outreach office, as well as IT operations in the various units. There are also the advisory committees: UTAC, ITAC, and ATAC. The nature and intent of the relationships among these groups related to IT—including authority, responsibilities, and lines of communication and reporting—is understood by few (if any). The system is so fragmented that there is no “buck stops here” approach, which should change.

Universities and business increasingly have a clearly defined information systems-services-technology unit headed by a CIO – chief information officer, equivalent in status and authority to the CFO and COO of the organization. This unit and position is responsible for coordinating, overseeing, and planning for all information and technology systems organization-wide. It will be recommended that the UW review and consider revising its structure vis-à-vis information and technology.

***Analytic data (Data OUT) is lacking or difficult to acquire***

It is difficult to acquire analytic data at the UW due to a number of reasons. Therefore, one solution would be a system integration that will provide bridges among departmental systems and databases. Users must understand information about the data to be retrieved, and having adequate metadata would assist information retrieval efforts. Furthermore, interfaces vary widely and need to provide a way to compare data without a great deal of technological expertise and manipulation. To provide meaningful comparisons of data, systems need to be integrated to connect departmental systems and databases.

One example where having similar systems is useful is the desktop computer. Not having consistent information across departments, schools and colleges undermines the importance and mission of interdisciplinary education. Having similar systems would also allow for greater purchasing power and support. Stronger support systems would be beneficial, as the current operating systems are expensive to maintain. The solution is better organization of systems that would permit various organizations to communicate more effectively.

***Consistent approach to data storage (Data IN) is lacking***

The Task Force found that a consistent approach to data storage is needed, and to achieve that goal, a number of other needs must be met. A dictionary of data terms must be built to facilitate consistency among databases with common purposes. Maintaining consistency between similar databases will satisfy another need of enabling a system-wide use of metadata.

The subcommittee found that consistent policies are needed to ensure the completeness, authenticity and security of networked data. Data warehousing needs to promote integration and transparency across business and academic units.

### ***Current tension between centralized and decentralized IT solutions***

In any large organization, there needs to be a balance in policy between the decentralized institutional culture and the centralized nature of high-level accountability and decision-making (See Appendix 15). The UW is no different in this need, and currently there is tension between centralized and decentralized IT solutions. To ensure success in the rapidly changing environment of IT as well as the integrity and security of our systems, the UW must assess that tension and determine the best course of action for the next 5-10 years.

Tools that permit flexibility, such as locally-created report formats, and consistency, like campus-wide data accuracy, are simultaneously needed to reduce dependence on “shadow systems.” Enabling the use of such tools will have a marked effect on the conflicting focus of central or decentralized IT solutions.

In every IT setting, there must be an appropriate and effective blend of security and accessibility in all data platforms and infrastructure. Security and accessibility are necessary and must perform regardless of the context.

The Task Force also focused on the need for transparency across the organization. Those involved should have knowledge of, and input on, any decisions that will be made that affects the users. Currently, there is a widely-held belief that the leadership functions in fire fighting, not fire prevention. End users should be able to see that higher leadership is taking responsibility for actively preventing problems, not simply solving them. Problems need to be anticipated and dealt with ahead of time as much as possible.

### ***Daily heroics***

One of the problems discovered by the committee is the issue of “daily heroics,” meaning that people who encounter problems with the system are often able to cobble together solutions, but those solutions are often not the result of the system working efficiently. There is a general understanding that users are able to do their job in spite of the systems, not because of it. And while they are often successful in completing various tasks, the time and resources used are a tremendous waste if another system could be more efficient.

### ***Funding approaches do not always permit equitable IT solutions***

After examining the number of different funding approaches at the UW, the subcommittee found that those models do not consistently enable equity across IT solutions. Therefore, the group feels it is necessary to create centrally-funded IT solutions and to coordinate other IT funding efforts to reduce the effect of disparate funding and unmet decentralized needs.

Funding must permit the UW to achieve consistency with observed best practices and support innovation and scalability of those practices. Decisions of whether to build-or-

buy should be made at the higher levels and should focus on the strategic advantages in relation to business practices and achieving organizational goals derived from these decisions.

The built-at-home systems are currently falling short of the mission of meeting users' needs across the institution. There is tremendous disparity between groups with access to great financial resources, such as the School of Medicine, or knowledge, such as Computer Science and Engineering, to other departments with fewer resources. A central funding strategy would enable the overseers to determine the best method of funding equitably across all departments.

### **3. FIVE TO TEN YEAR VISION: WHAT THE UW SHOULD BE AIMING FOR**

The UW should be aiming for a number of specific goals for systems in order to accomplish the overlying task of achieving the university's vision for excellence in education, research, and service. The Task Force determined that the goals for the next decade should include the following:

- Flexible, extensible systems that will respond to the demands of tomorrow.
- Systems that are closely aligned to UW vision and goals.
- Systems that add value to our core missions: education, research, service.
- Cost effectiveness with long-term viability.
- Systems that maximize our most valuable assets—particularly faculty time and effort. Note from the University Handbook, Section 24.31 “The principal functions of a university are to preserve, to increase, and to transmit knowledge. Its chief instrument for performing these functions is its faculty, and its success in doing so depends largely on the quality of its faculty.”
- Issues of security need to be paramount. Secure, reliable data storage and accessibility that meets UW and other compliance requirements.
- Centralized data management practices, transparency and consistency of data flow.
- UW everywhere—extending campus IT systems and capabilities beyond the Puget Sound.
- Respond to changing educational practices, including virtual campuses.
- Reduced need for IT expertise for business functions.
- Solid leadership.
- A need for system interfaces which support data-driven decision making.
- IT that supports the core functions of the UW and provides a strategic advantage wherever possible.

The University of Washington should be seen as a leader among peer institutions in our information systems infrastructure and approach, taking advantage of our expertise and Seattle location.

Lastly, from everyone about almost every aspect of information systems, we heard over and over, that “it’s not really about technology; it’s about business practices.” We need to determine what we want to accomplish and how we want to do it. Then, we will be able to design and implement appropriate and successful information systems.

#### **4. DETERMINE AND WEIGH ALTERNATIVE STRATEGIES TO ACHIEVING THE VISION**

After examining approaches by other large businesses and peer universities, the benchmarking subcommittee identified a number of strategies. These are offered at the end of this section. But first, the subcommittee provides a summary of benchmark findings and a comparison to our own situation (See also Appendix 5).

##### *Summary of Central Trends/Themes/Findings*

- It should not require investing approximately \$100 million to implement Enterprise Resource Planning (ERP)\* solutions but it does. The fact that it is expensive was well grounded with experience at all of the institutions we looked at that had implemented ERP systems and with businesses that had gone the same route.
- There are no silver bullets: no solution set, purchased or otherwise, gets you everything you want, when you want it, for the price you are willing to pay.
- There is instability and consolidation in the vendor world with fewer options. Oracle acquired PeopleSoft, JD Edwards, and other companies and plans to implement a merging of software through its Project Fusion. Those universities who have implemented ERP are expressing concerns and considering their long-term options.
- Transaction data, systems and services versus analytical data, systems and services—it is important to distinguish the difference in these and systems solutions, especially when talking about ERP systems. ERPs are primarily about transaction data services. Data Warehouse approaches tackle analytical needs.
- Business process change is a consistent theme across the board regarding ERPs. We need to understand campus readiness for taking on this amount of change. Technology is a small part compared to this. Systems are not the drivers/enablers; it’s about where the UW wants to be and what it wants to be known for. Then we can implement an IT strategy that supports this vision.
- It is critical to the success of any implementation to have the right project team structure in place. It is important to have the right skill sets, integrated business and technology teams, and strong leadership and sponsorship. IT does not lead; it is (or should be) a collaborative or embedded partner.

---

\* Enterprise Resource Planning Systems, most often referred to by the abbreviation “ERP,” are large-scale, integrated computer systems designed to meet the full range of organization-wide business processes, e.g., student information, finance, payroll, human resources. Major ERP vendors include Oracle, PeopleSoft (recently purchased by Oracle), and SAP.

- Building better analytic information systems is a top strategic priority at the institutions we've interviewed. An important subcomponent of these analytic systems efforts is the effective collection and publication of metadata. Data warehousing and business intelligence initiatives are the preferred way to pursue these goals.
- Strong executive sponsorship and funding commitment is a key factor in the success of data warehousing initiatives.
- Vendor ERP solutions are not effective at providing analytic data. If we implement an ERP, we'll still need to build an analytic Data Warehouse as a separate effort. However, ERP systems potentially provide better platforms for providing the data to populate the Data Warehouse.
- Some schools are planning to leverage their legacy systems (including some built on mainframes in COBOL) for another 10 years or more by adding data warehousing functionality and easier-to-use web interfaces to the legacy enterprise architecture. Some institutions see this as a way to achieve desired analytic and transactional system improvements in less time and for less money than is typical for an ERP implementation. However, it is important to understand that this approach still requires significant expenditure if significant results are to be realized.
- It is not viable to implement an ERP at a university without extensive customization. (Doing so loses too much of the institutional knowledge and memory that represents much of a university's strategic strength.) Customization makes both implementation and support more complex and more expensive. In the university context, it is far from clear that ERPs are less expensive or less complex to support than legacy systems. However, productivity improvements and opportunity cost savings are generally not considered in this comparison.
- ERPs cannot provide a fast or inexpensive solution to the transactional system needs we have identified. The fact that most schools express satisfaction with their vendor ERPs is worthy of note, but this should not drive the decision to follow this road.

### *Strategic Comparisons for the University of Washington*

The existing strategy for administrative systems at the University of Washington can best be described as doing as much as possible with the least investment of resources. The strategy is defined around extending legacy systems and buying best of breed software solutions at the application level. There is no long-term vision beyond extending the legacy systems. There is no commitment of resources over the long-term to drive development in any other way.

This is in stark contrast to our peers. Nearly 60% of our peers have implemented ERP systems to support one or more of their primary administrative systems. This highlights several key things: 1) Leadership at other institutions has made improving their core administrative systems a priority; 2) They have committed significant funding around this priority; 3) They see these systems as an integral part of their overall business strategy. Other institutions, like UCLA, have made extending their legacy systems a strategic

priority. But, unlike the UW, UCLA and others are putting significant resources behind this strategy. UCLA, for instance, will spend \$20 - \$30 million in new money over the next five years to extend their legacy systems for the next ten years.

Regardless of which direction UW takes with its administrative systems, it is necessary to put the resources behind this decision. We cannot expect to achieve the results we want to achieve without a commitment of resources to do the job. We need a long-term planning effort that is inclusive and collaborative across the university landscape to look at these systems in detail and to make the case for which direction we should take. “Back of the napkin” approaches are no longer acceptable. They tend to be reactive and will cost more in the long run as well as misdirect strategic effort down less than optimal pathways.

## **Strategies to Consider**

### ***Top-level leadership***

There is a tremendous emphasis on top-level leadership sponsoring IT initiatives. Strong executive sponsorship plays an important role in the success of all information technology initiatives.

### ***Analytic information systems***

Building better analytic information systems should be to be a top strategic priority. Interviewed institutions placed great emphasis on having the capacity to analyze information. An important part of those analytic systems efforts is the collection and publication of metadata, which has proven useful. Data warehousing and business intelligence initiatives are the preferred method to pursue and achieve those goals.

Vendor-supplied Enterprise Resource Planning solutions are not effective at providing analytic data. Therefore, even if the UW implements an ERP, the UW must make a separate effort to also build an analytic Data Warehouse.

### ***Options: Use of legacy systems, ERP, open-source/consortia***

Legacy: Several universities examined by the subcommittee are planning to rely on their legacy systems for another 5-10 years by adding more user-friendly web interfaces to the legacy enterprise architecture and by implementing a Data Warehouse for analytical information needs. Some institutions believe this method will take less time and financial resources to achieve the desired analytic and transactional system improvements than a typical ERP implementation. However, this method still requires significant expenditure to obtain effective results.

ERP: Implementing an ERP at a university without extensive customization is not viable. Without taking into account the unique needs and information of a university, much of the institutional knowledge and memory can be lost. Such information is a large part of a

university's strategic strength. However, customization makes implementation and support most complex and expensive. Therefore, in the context of a university setting, it is unclear that ERPs are cost-effective or less complex to support and maintain than existing legacy systems.

Another weakness is that ERPs cannot provide fast or cost-effective solutions to the identified transactional needs. Additionally, all available ERP systems have analytic data shortcomings. It is important to again note that some university leaders have commented that their schools are very satisfied with their vendor ERPs.

Open source/consortia: One relatively new and potentially promising approach is the "open source/consortia" solution (also referred to as "community source software development). Indiana University is leading this effort on the instructional systems side (the Sakai project), and their approach may also have promise for baseline administrative systems.

The goal of the Sakai Project (started in 2004) is to build and deploy a unified course management and collaboration environment of applications for higher education. The Project began in January, 2004. Indiana, Michigan, Stanford, and MIT are major players in Sakai. The challenge is for universities to get together to share development expertise and costs and do something meaningful in a reasonable time frame. The UW is involved with Sakai as a partner; however we currently do not actively use Sakai systems. Our Catalyst team is currently studying Sakai and other options to meet learning systems needs at the UW.

Indiana is also leading the community source effort for financial administrative systems (Kuali - <http://www.kuali.org/>) and will be going live with the initial phase of the implementation in the fall of this year. This is a model that is already in place and they are actively seeking partners for future phases of development (in areas such as Budget, Procurement and Research Administration).

## **5. PROPOSE A UNIVERSITY-WIDE STRATEGY FOR ACHIEVING THE VISION**

### ***Flexibility of vision and systems***

The UW itself is currently undergoing significant review and analysis. The overall vision of the university is being synthesized and strategic direction examined. We recognize that a reliable, secure, integrated information systems infrastructure is essential to fulfilling that vision and supporting the strategic direction.

### ***Overall Approach***

The options for overall approach to systems design, development, and implementation currently are: purchase an ERP (and other systems), develop locally (including selecting

“best of breed” vendor-supplied applications), or relying on an open source/consortia effort. Given all the considerations, the preferred approach is to continue with local control and development in the short-term while giving serious consideration to become more actively engaged with the open source/consortia effort.

Also, we should not rule out vendor-provided solutions. What drives us away from this approach overall, is not the vendor commitment or the system itself. By nearly all accounts, these systems are significantly better than what we have to work with. What really drives us away is the cost of these systems and our perception that it is not a cost-effective, long-term solution. Hopefully, the marketplace will become more clear in the next few years. In the meantime, no significant or long-term local development should be undertaken unless we are sure that there are no vendor-supplied, cost-effective solutions that will meet our needs.

In making decisions regarding systems development, we should ask two central questions:

1. Is there a reasonable, cost-effective “best of breed,” open-source or vendor supplied solution that will meet most of our needs?
2. Regarding strategic information systems and services, what will give us a competitive advantage? When does a system need to be “truly excellent” and when is being “good enough” sufficient to help us meet our institutional goals?

For administrative functions, we should determine the life expectancy of our legacy transaction systems, focus attention and resources on the Data Warehouse to meet analytic needs as well as to define data requirements and limitations of our transaction systems, and develop an integrated and unified vision for systems that coordinates development and replacement.

We should also determine if there are serious needs that are not able to be met by the Data Warehouse or the transaction system. For example, are the financial statements available to units sufficient to meet our needs? The Data Warehouse is unlikely to be able to meet this need. Are we able to do so with our current financial system?

For academic functions, we should establish baseline biennial funding for classroom technology and move to develop flexible and coordinated learning technology systems across service units (e.g., Learning Technologies, Libraries, C&C, UWEO) focused on meeting the needs of departments, schools, colleges, and campuses.

For research and medical center functions, we need to fully determine needs and develop a long-term plan.

### ***Centralized – Decentralized control***

A key strategic decision for information systems is to determine the degree of centralization-decentralization related to supporting the UW vision and direction. With the exception of networking and communications, the trend over the past decade at the UW can be characterized as increasingly decentralized. That approach should be re-evaluated in light of much of what has been described above: wide variability in funding, changing needs, security and compliance, new developments in information systems and approaches, and institutional changes.

Schools and colleges need to be involved in defining and planning central-decentral functions and determining IT needs. In the past ten years, it seems that central functions and offices have been the driving force behind systems development at the UW. Systems end-users are often the focus, but these are really “intermediate” end-users who provide services to the ultimate end-users in schools, colleges, campuses, and departments. These ultimate end-users are an important part of the equation and must be included in the process along with the project managers, systems developers, and services providers. To remedy this situation, the UW needs to re-evaluate and realign systems development to ensure representation at all levels.

### ***Review, revising, and widely communicate the UW IT organizational structure.***

As noted, the UW organizational structure and lines of authority, responsibility, and coordination are known and understood by few. The structure should be reviewed, affirmed or revised as desired, and widely communicated to the University community.

### ***Top-level leadership and Support***

One of the most prevalent findings related to establishing an effective university-wide strategy for achieving an integrated information systems support infrastructure is that support for change must come from all levels, with strongest support from the upper administration.

Top-level leadership needs to understand, support, and lead efforts to achieve the vision. The Task Force strongly agrees that the leadership plays a key role in implementing new systems. The president, provost, the provost’s office, deans, and central offices must act cooperatively to bring this vision to actualization.

## IV. Recommendations

### 1. OVERVIEW

After thorough investigation, evaluation, and discussion the Task Force offers “lessons learned” in terms of overall themes, followed by immediate and long-term recommendations for the UW to consider.

The major theme synthesized from nearly all of the findings and subsequent recommendations is that the UW requires a change at the structural level. The Task Force found that the current IT structure is fragmented with responsibilities, decision-making and accountability spread across many different units including Computing & Communication, the Office of the Executive Vice President, the Office of the Provost, the Office of Learning Technologies, the Office of Undergraduate Education, UW Educational Outreach, as well as IT operations in the various schools, colleges, campuses, and departments. There is currently no final “buck stops here” approach, and as a result the UW lacks a clearly defined, coordinated IT strategy. The result is an infrastructure that is falling short of its potential.

A second theme is the importance of integration of data and systems—horizontally across system types and vertically at every level of the organization. Regardless of the degree of centralization (which should be strategically determined and planned), we require common and consistent data management including definitions of terms, taxonomies, structures and relationships, and tools and approaches.

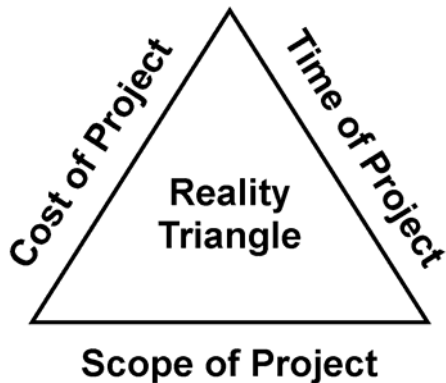
Transparency throughout the operation is another key theme. There is a need for determining and widely communicating the organizational structure, financial and other resources, priorities, short- and long-term plans, and processes for decision-making. All stakeholders must be aware of the baseline and changes as planned or made. There are a number of different levels of users; it is important to involve true end users, services offices, project managers, and systems oversight and programmers. Coordination from all levels is crucial, and everyone must be aware of the changes and the reasons behind them. The UW needs to adopt a culture of awareness; too often, the end user is not exposed to the administrative level, and implementing a new system can create tension if the reasoning is not understood. Furthermore, there must be an equity and awareness of availability of IT resources.

Regarding funding, a piece-meal, “fire-fighting” approach should be replaced by one that takes care of maintaining the baseline across functions while supporting planned development to achieve strategic organizational goals. Funding should be coordinated and consistent while seeking to provide for flexibility and innovation.

Realistically, the Task Force members realize that this will require trade-offs and prioritization. There are a number of approaches to making these kinds of difficult decisions. For example, as noted in the Findings section, the UW should determine when a support system can be “good enough” and when strategic advantage is so important that

the system warrants being “excellent.” Since we recognize that faculty and staff time are our greatest assets, systems that significantly save time for faculty and staff may be priority candidates for excellence. Another approach to making difficult decisions related to information systems development that resonated with the Task Force was the “reality triangle” offered by John (Barry) Walsh of the University Information Systems at Indiana University (see figure 4.1).

*Figure 4.1: Reality Triangle*



The three sides of the triangle make up the components needed for managing a project with the IT organization: cost, scope, and time. The basic principle is that you can control two variables of the triangle, but the remaining one must be adjusted accordingly. For example, if you want to cut the cost of a project and you want to maintain the timeframe, you would need to narrow the scope. Or, if you wanted to expand the scope and narrow the time to completion, the cost will increase significantly (See Appendix 18).

Consistent with this theme of making difficult choices (as well as the other themes noted above), the Task Force offers two sets of recommendations:

- (1) Recommendations desirable and necessary for immediate action.
- (2) Recommendations for long-term action.

The underlying currents of both sets are a stronger, more transparent and accessible structure; alignment with vision and goals across the organization; integration among all systems; and emphasizing what the university needs to do well to maintain a competitive advantage.

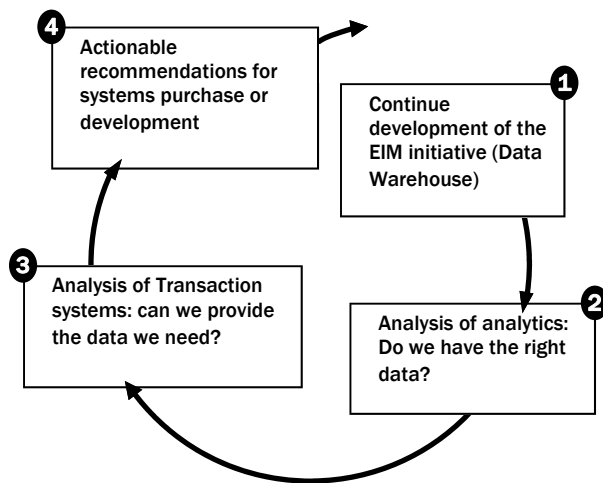
## **2. IMMEDIATE RECOMMENDATIONS**

The following recommendations are for immediate action and need no further evaluation, study, or articulation by the Task Force or other body.

### *Support the Data Warehouse*

Moving forward aggressively with the Data Warehouse Project should be a priority of the UW. The Data Warehouse is the solution recommended by all for providing the analytic capabilities desired by schools, colleges, campuses, departments, and various administrative units. Thus, the Data Warehouse is important for strategic advantage. In addition, moving ahead on the Data Warehouse Project will move us forward with data management and integrity issues including identifying data and functional needs from other systems, particularly the legacy transaction system.

*Figure 4.2: Feedback Loop – Data Warehouse and Transaction*



There is a proposal for the Data Warehouse on the table, the Enterprise Information Management (EIM) Initiative, and the Task Force recommends the implementation of the Enterprise Information Management (EIM) to support both academic and administrative goals (See Appendix 9).

While the original Data Warehouse Program made a start at establishing fundamental infrastructure and integration of central systems, the Task Force agrees with the proposal to move to the next level:

- Establish a new governance structure to facilitate decisions and set priorities
- Expand information access beyond central offices to other colleges and departments
- Lead the development of formal EIM architectures, standards, and strategies
- Implement, provide training, and support new and improved business intelligence tools
- Provide the capability to quickly respond to emerging information management needs
- Build and maintain outstanding service level agreements for all stakeholders

To establish the EIM Initiative, Computing and Communications, in conjunction with the Strategic Initiative Office, have outlined three phases for accomplishing the goals. One of the most immediate steps in Phase 1 involves hiring a new project manager in the Strategic Initiative Office and forming a new committee called the Information

Improvement Team (IIT). The Task Force recommends that the IIT membership be reviewed. Such a review should focus on ensuring full representation of “movers and shakers” from across the university.

The EIM Initiative has a unique opportunity to become a transformational agent in meeting the enterprise information and reporting needs of the University. By bringing an enterprise focus to information management, the University will realize significant value in process improvements, risk mitigation, and strategic decision making. The key to success is executive sponsorship with a shared vision for this program. In addition, the program needs to get past the expert user stage and reach out to a mix of data consumers and a wide range of proficiencies who will act together to assist the EIM.

### ***Fund Classroom Improvements and Learning Technology Systems***

The Academic Technology Advisory Committee (ATAC) has worked with various offices, particularly the Office of Undergraduate Education, the Office of Learning Technologies, and University Libraries to better coordinate efforts to improve classroom and instructional technology. While there is no regular biennial allocation of funds for classroom support, temporary funding of \$1.25 million was allocated in the last biennium, and \$1 million (to date) this biennium. The ATAC submitted a budget request for almost \$3 million for this biennium and \$4.5 to fully fund classroom and electronic learning technology improvements at the UW.

### ***Consider changes in organizational structure***

As noted, the Task Force found that the current IT organizational structure is severely fragmented, and poorly designed to deal with the University's complex and rapidly expanding IT responsibilities. The decision-making and accountability mechanisms are illogical and inefficiently spread across many different units. There is widespread agreement among the Task Force that UW needs a clearly defined, and well integrated IT reporting structure with authority and responsibility at the very highest level.

Therefore, the Task Force recommends that the UW give immediate consideration to the creation of an Office of Information Management to handle this demanding challenge. The Office of Information Management would be responsible for strategic information management and a fully coordinated integration of information systems and services throughout the UW.

Possible responsibilities of the Office of Information Management include:

- Vision, goal setting, and strategic planning for information services university-wide
- Coordination and integration of information systems and services, university-wide
- Knowledge, information, and data management
- IT governance, security and compliance

- Identifying and establishing short-range, mid-range and long-range objectives for information technology investments
- Ensuring that information and technology needs of the full range of university are met
- Establishing, implementing, and overseeing a standard process for information technology project management
- IT project portfolio management, oversight, and implementation
- Application of consistent project methodology to support successful IT projects
- Continuous review and assessment of existing systems in relation to needs and alternative solutions.
- Improve and extend the USER approach to all systems development projects
- Innovation and creative problem-solving.

### ***Continue and expand systems inventory***

Todd Mildon, University Registrar, should continue to lead the systems inventory effort. This should be closely coordinated with Kirk Bailey, Chief Information Security Officer to determine security and compliance effectiveness. The effort should also expand:

- To determine which inventory data is needed most to fill certain gaps in broad systems categories.
- To identify specific high-profile or critical systems missed earlier.
- To assess key attributes, such as satisfaction and functionality of all documented systems.

Considerable work needs to be done to analyze, compare, and summarize the various systems inventoried. We expect that concerns and issues will be raised by this further analysis effort and by unmet identified by the Data Warehouse project. As noted above, responsibility for continuous review and assessment should rest with the new Office of Information Management.

### ***Medical Centers and Research***

The Task Force was unable to adequately study the needs, situations, and solutions for research across the UW or the medical enterprise. Both are very large and the Future of IS Task Force was not able to devote adequate time or resources to fully understand the issues or to make effective recommendations. We recommend that separate studies be initiated immediately to examine needs, status, concerns, and solutions. These studies should involve widespread representation across the UW community.

## **3. LONG TERM RECOMMENDATIONS**

### ***Innovation and Integration (Vision)***

The University of Washington should actively seek out long-term solutions for long-term problems. One of the findings of the Task Force is that the UW tends to fix permanent

problems with temporary solutions, which are neither useful nor cost effective. Innovation and integration are keys to establishing more permanent solutions to those problems. Data warehousing is the initial step, but the remaining gaps need to be found. Some of the best practices listed by this report should be used as part of the baseline operation of the UW.

### ***Evaluate life expectancy of existing systems***

One proposed solution was to examine legacy systems to determine how those can best be leveraged. During the panel of other university IT leaders, the Task Force found that UCLA plans to maintain its legacy systems through the year 2015. This serves as a reminder that it is possible to use existing systems to accomplish future goals. The Task Force recommends that the UW determine the expected lifespan of our legacy transaction administrative system and the costs (financial and staff) along with benefits and limitations of doing so.

### ***Approaches to legacy transaction administrative systems***

The options for overall approach to systems design, development, and implementation currently are: purchase ERP (and other systems), locally develop, or the open source/consortia.

Given all the considerations and volatility in the marketplace and the desire to extend our capabilities through the Data Warehouse, the recommended approach of the Task Force is to continue with local control and use of vendor-supplied, best-of-breed solutions in the short-term. Local development should be undertaken only when no other choice is available. This may be a case in which in the short-term, it is sufficient to be “good enough.”

For the long-term, we should give serious consideration to become more actively engaged with the open source/consortia effort. We should also monitor developments in the ERP world and follow the UCLA approach of continually assessing whether their “extending the legacy system” approach exceeds that of an ERP solution. The bottom line is that we should keep our option open.

At the same time, we will continue to gather information to make decisions beyond the short-term as follows:

- The Data Warehouse project will provide feedback regarding the data in the legacy systems, define data requirements and limitations of our transaction systems, and point to concerns, issues, and needs.
- The life span determination for our legacy transaction systems will give us some indication of the capabilities and costs over the next 8-10 years.
- Active participation in the open source/consortia efforts will give us direct awareness of latest developments, efforts and choices of our peers, and a better sense of preferred long-term strategies.

A key strategic decision for information systems is to determine the degree of desired centralization-decentralization related to supporting the UW vision and direction, security and compliance, and performance. Schools and colleges need to be involved in defining and planning central-decentral functions and determining IT needs. The recommended organizational changes speak to this as well.

### ***Expand and improve the USER approach***

As noted, innovative systems have been developed with the USER development model, and others are in the pipeline. The findings regarding suggested improvements should be considered and implemented as appropriate:

- Look for ways to streamline the process.
- Provide a broader, unified and integrated vision for systems development and individual projects.
- Engage all stakeholders in the process: end-users of systems (often based in the schools and colleges), the information/services providers (often based in central administrative offices), project managers, systems developers.

### ***Academic technology***

There should be baseline biennial funding for classroom technology and learning systems maintenance, improvements, and innovation. Through ATAC, the UW is moving towards coordinated and flexible learning technology systems across service units (e.g., Learning Technologies, Libraries, C&C, UWEO) focused on meeting the needs of schools, colleges, campuses, and departments. Minimal funding of \$2-3 million per biennium should be allocated to academic technology needs.

Relative to learning systems including course management, an analysis is underway to determine needs across the UW and the most effective and efficient way to meet those needs. Careful consideration will be given to increasing our participation in the open source/consortia (e.g., Sakai) project.

### ***Funding***

The most widespread recommendation of the Task Force about funding is that the goals outlined in this report are not possible without the necessary funding. A consistent investment must take place to maintain and support the UW's competitive advantage. In order for that to happen as recommended above, ongoing needs must be defined. Research and the Medical Centers should be studied further and coordination should begin immediately. The previous recommendation on academic technology funding should also be a regular budget item. The University must be proactive in the approach of maintaining systems, rather than reactive to needs after those needs are recognized and announced. The cost of having a regular budget for classroom support and technology for learning and teaching is minimal and highly cost effective.

Another recommendation by the Task Force is that the UW look to be more creative with how it gains and allocates money. Other options should be explored, for example, some universities have a renewable funding strategy, in which units repay development costs over time, which can then be used for new developments. It would be worthwhile to examine successful models of other universities and businesses to determine the best course of action for the UW.

Some members of the Task Force report that the University is in a financial crisis. The Findings section of this report discussed the “daily heroics” of those involved with IT challenges (p.19). Despite the fact that most people are successful in their day to day work, many face challenges presented by the current IT structure. The users “put out fires” often, but the Task Force recommends that we seek to emphasize “fire prevention.” This leads to greater worker productivity and is therefore more cost-effective. While there may not currently be an emergency, there is no way to know if it is simply because users are going above and beyond and struggling to make the system work for them.

Lastly, Security and financial management are crucial to maintaining systems. The university is placed at significant risk if there is a breach in security, and strong security must remain a priority. There needs to be a commitment throughout the organization to maintain safe and secure systems across all levels of the campus, and that commitment must be funded adequately.

## V. Appendices

1. 4/21/06 Update on C&C Resources for Administrative Systems  
Update on accomplishments in 2005 and goals for making base, including core systems of production support and maintenance, more efficient for 2006  
Sara Gomez, Computing and Communications  
Created: April 21, 2006 (7 pages)
2. 4/21/06 UW Information Systems Strategy  
Overview of major administrative systems and status report  
Weldon Ihrig & Sara Gomez, Computing and Communications  
Created: April 21, 2006 (12 pages)
3. Agency Technology Infrastructure  
Overview of mission critical application systems and database information, including UW Medical Centers  
Systems-State of the UW Subcommittee  
<http://www.washington.edu/dis/itportfolio/infrastructure.html>  
Last accessed: May 8, 2006 (7 pages)
4. Approach to Fiscal Year 2006 Budget Decisions  
Themes and objectives guiding the Fiscal Year 2006 Budget Decisions  
University of Washington  
<http://www.washington.edu/dis/itportfolio/06budget.html>  
Last accessed: April 12, 2006 (1 page)
5. Benchmarking Draft Report  
Report of findings by the Benchmarking Subcommittee of the IS Futures Task Force, including research strategies, trends and lessons learned from other institutions and businesses  
Benchmarking subcommittee  
Created April 26, 2006 (7 pages)
6. Business Leaders Panel Discussion  
Agenda and participants of the Business Leaders Panel Discussion  
Benchmarking subcommittee  
Last updated: April 19, 2006 (2 pages)
7. Catalyst Projects – Educational Technology  
Overview and Findings of educational technology study at the University of Washington: Report of 2005 Instructor and Student Surveys  
Office of Learning Technologies  
[http://catalyst.washington.edu/projects/edtech\\_2005report.html](http://catalyst.washington.edu/projects/edtech_2005report.html)  
Last updated: February 1, 2006 (3 pages)
8. Data Warehousing  
Goals and outline of new Enterprise Information Management Initiative  
Systems-State of the UW Subcommittee  
<http://depts.washington.edu/isfuture/docs/dw.doc>  
Created: January 2006 (1 page)
9. EIMI Funding Proposal  
Goals, assessment, needs of Enterprise Information Management Initiative  
Weldon Ihrig, Phyllis Wise, Ed Lightfoot, Eric Godfrey

- Created: February 2006 (5 pages)
10. FINAL CC Group Needs Assessment
    - Needs assessment questionnaire and results of surveys
    - Needs assessment subcommittee
    - Created: March 22, 2006 (10 pages)
  11. Future of IS
    - Institutional Subcommittee discussion graphic
    - Created: February 22, 2006 (2 pages)
  12. Institutional Trends Assignments and Questions
    - Institutional Trends and Needs Assessment Subcommittees
    - Created: March 27, 2006 (1 page)
  13. Institutional Trends Interview
    - Including needs assessment – interview questions
    - IS Futures Task Force
    - Created: March 3, 2006 (1 page)
  14. Systems Inventory
    - Survey questions and results of means and sample size
    - Future of IS Task Force
    - Created: April 28, 2006 (1 page)
  15. Layered Services Viewpoint
    - Explains concept of layered accountability
    - Jim Davis, UCLA
    - Discussed: April 24, 2006 (3 pages)
  16. Major Processes Vision
    - Outlines major UW processes supported by IS, includes a draft version of vision for UW
    - Future of IS Task Force
    - Last accessed: April 23, 2006 (1 page)
  17. Planned Investments-Projects
    - Descriptions, schedules and cost estimates of planned/proposed technology investments
    - Systems-State of UW Subcommittee
    - <http://www.washington.edu/dis/itportfolio/>
    - Last updated: August 2005 (2 pages)
  18. Reality Triangle
    - Model to balance time, money and scope of projects
    - John (Barry) Walsh, Indiana University
    - Discussed: April 24, 2006 (1 page)
  19. Regents Goals and 5 Year Targets
    - Lists goals and 5 year plan for Regents from 2001
    - Strategic Emphasis Committee, Board of Regents
    - <http://www.washington.edu/dis/itportfolio/goals.html>
    - Created: September 21, 2001 (2 pages)
  20. Roles and Responsibilities
    - Lists expectations for divisions within IS
    - Systems-State of the UW Subcommittee

<http://depts.washington.edu/isfuture/docs/RolesAndResponsibilities.pdf>

Last updated: January 16, 2006 (20 pages)

21. Stakeholders

Lists persons or committees interviewed

Future of IS Task Force

Last updated: April 23, 2006 (3 pages)

22. Task Force Members

Names and titles of those serving on the IS Futures Task Force

IS Futures Task Force

<http://depts.washington.edu/isfuture/TaskForceMembers.pdf>

Last updated: March 13, 2006 (2 pages)

23. Technology Investment

Project summaries of current investments

C&C, Strategic Information Technology Plan, IT Portfolio 2005

<http://www.washington.edu/dis/itportfolio/>

Last updated: August 2005 (3 pages)

24. UW Portfolio Overview

Overview of major UW IT responsibilities

C&C, Strategic Information Technology Plan, IT Portfolio 2005

<http://www.washington.edu/dis/itportfolio>

Last accessed: May 8, 2006 (13 pages)