ADMINISTRATIVE RESOURCE MANAGEMENT (ARM) SYSTEM REQUIREMENTS AND SPECIFICATION

A STRATEGIC PLAN FOR UAB ADMINISTRATIVE COMPUTING

Submitted to
The President

by
The Administrative Computing Strategic Planning Task Force

November 13, 1998
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EXECUTIVE OVERVIEW

In early 1998, the President of UAB established the Administrative Computing Strategic Planning Task Force to recommend administrative computing solutions to address UAB's changing academic, research and health care environment. The Task Force consists of representatives of all areas of the University and Health System. It is charged with examining the core needs of the enterprise, determining the scope of the project and the entities to be served, and developing a vision, objectives, constraints and a high-level implementation plan.

UAB has experienced tremendous growth and change over the last 15 years. Revenues have quadrupled and new entities such as the Kirklin Clinic, remote clinics, Triton, the Eye Foundation Hospital, and Huntsville Medical School have been added. To support this growth and expanding mission, UAB requires departmentally-focused administrative processes, management information to support departmental decision making, and enterprise reporting that presents entities such as the clinics and hospitals multi-dimensionally. Although the current administrative applications appear to be supporting basic administrative transaction needs, the pace of growth and change at the University has outstripped the flexibility of the current administrative systems to quickly respond. The current financial, student and human resource applications include siloed design that supports central users of information in functional areas such as Finance, Student Administration and Human Resources but does not provide for the integrated managerial and decision-making needs of the University community at large; older technology that supports applications based on the best practices of the 1970's; and extensive customization and numerous isolated functional solutions that contribute to the complexity of supporting and maintaining the present computing environment.

The need for change is critical. The cost of doing nothing is reflected in the amount of time it takes University personnel to complete routine processes and to deal with the frustrations and inaccuracies of trying to integrate information from different systems and make management decisions based on incomplete information. UAB's lack of a modern application base from which to move forward dramatically affects our administrators, faculty, staff and students. The Task Force interviewed people across the enterprise and found compelling reasons for change.

- The need to incorporate new business practices, new technology, and easy to use applications across the University is acute. Existing systems depend heavily on manual effort to provide missing functionality, data relationships and workflow. This impacts our competitive initiatives, our ability to do our work and our ability to respond to legal and federal inquiries.

- Interviewees consistently reinforced the requirement for flexible integrated applications that accommodate unique entity requirements and relate them within the enterprise. Our current mixed bag of solutions and shadow systems promotes redundancy and error.

- Access to information is a recurring theme expressed by people in all areas of the enterprise. Information is needed to support decision-making at all levels. It is currently difficult to obtain, is not always replicable, is not related across systems and is not defined consistently across the enterprise.

To address continuing growth and change in the University's academic, research and health care environment, the Task Force envisions an environment in which all stakeholders in the institution have ready access to the information required for day-by-day operations, reporting, and decision making. We further envision an environment that enables the institution to respond quickly to external pressures for change and adaptation. To realize this vision it is essential to have integrated information systems that increase productivity, performance and secure information access across the entire enterprise. It is also essential that
the systems deliver an accessible and flexible technical environment that empowers end-users and developers
to manage change quickly and efficiently.

Therefore, we envision an institution that has implemented systems that enable accurate, fast, efficient
tracking and reporting of administrative activities. These systems are designed and implemented to eliminate
redundant entry of information and to minimize the need for generation of paper. That is, information is
entered in such a way that no matter how it will eventually need to be used or manipulated, it can be retrieved
without re-entry and without the need for intensive customized programming. It is possible to query the
systems for answers to specific questions in a straightforward way in order to eliminate the necessity to
generate voluminous paper reports. The systems provide sufficient information in flexible formats to
eliminate the need for departmental "shadow" systems.

To achieve our vision and make it easier to accomplish UAB's strategic initiatives, the Task Force makes the
following recommendations:

• The University implement integrated financial, human resource and student enterprise-wide applications
to support the business processing of all University entities, including those of the hospital and School of
Medicine, whose mission does not require unique processing for particular aspects of its business. Those
entities with unique needs (for example, library acquisitions and clinical patient-related activities) will
provide the necessary detail and roll-up information to the core enterprise systems to provide a complete
picture of the institution as a whole or of its various constituent parts. Although the charge from the
President indicated that a CIO or Vice President for Information Technology would move this effort
forward, the need for quick action is so important the Task Force recommends we not delay waiting for
this position to be established and recruited. In the interim, the President should place the responsibility
for implementation with the VP for Financial Affairs and Administration and the Provost.

• The President and the Health System Board take a unified view of information technology and establish a
clear structure for decision making and responsibility at the executive level. At the present time, there is
no clear mechanism for coordinating, prioritizing and balancing the information needs of the institution
across the administrative, academic and health system wings. Some permanent, executive level entity such
as the proposed Vice President for Information Technology must be established to bridge the academic,
research and health care enterprises without compromising the ability of any of the entities to respond
quickly to changing needs. Information priorities must be set through integrated planning across the
enterprise.

• The University implement integrated financial, human resource and student client/server applications
from a single vendor with proven enterprise-wide experience in a Research I University environment
with a medical component.

• The decision to move forward with integrated client/server applications be accompanied by the adoption
of formal project structure and leadership principles. Project leadership must come from within the
University and not from external implementation partners. Implementing enterprise-wide client/server
applications involves a large investment of University resources. It is crucial from the earliest stages of
the project that University management, project-implementation teams and users assume ownership of
the project.

• The University adopt principles to limit customization of new applications that is outside of the business
rule and workflow framework provided by the vendor. The project should be scoped with simplicity in
mind and controls established to avoid the addition of new requirements to the original specifications.
The University should make every attempt to fit its processes to the vendor’s best practice templates.
• A project Steering Committee determine application implementation schedules based on a combination of University priorities and availability of functionality from the vendor, with the exception of the general ledger which is the key to defining University entity relationships and must be implemented first.

• Evaluations of enterprise client/server applications be based on functionality, cost, flexibility of supporting technology, vendor vision, support and service. Although current functionality is a significant factor in evaluating competing vendor applications, a key criterion for new applications is flexibility to easily adapt to growth and change in UAB’s business needs within a framework that allows ongoing vendor support. A vendor’s proven track record and vision for the future are key components, as our failed experience with TRG demonstrated.

• The University address funding for additional departmental network connectivity and formal, organized desktop support necessary for participation in the new administrative systems in the project budget. University departments utilizing the new applications may require supplemental network connectivity and departmental server capability that is neither a part of nor funded by the University’s ongoing infrastructure upgrade plan. Desktop support services that are adequately staffed and can provide effective training and support throughout the enterprise are another critical component of a client/server environment; without them, UAB cannot take full advantage of information technologies and collaborative services.

In talking with other comparable universities we have learned the total funding required to implement a system capable of handling the computing needs of UAB is between $30,000,000 to $60,000,000 spread over five to six years. To a large degree the total cost for UAB will be determined by the participating entities. The Eye Foundation Hospital has already committed and the Health Services Foundation is in the process of committing to independent financial systems. Their human resource application options are open at this time. The UAB Health System is preparing a strategic computing plan to be completed in September 1998. It is our recommendation that the Health System strategic plan be incorporated into these Administrative Resource Management (ARM) system requirements and specifications. We must plan together to begin integrating information for the enterprise.

2 THE CASE FOR CHANGE

2.1 INSTITUTIONAL GROWTH

UAB has experienced tremendous growth since 1980 when its current administrative systems were developed. This growth is reflected in its administrative processes. Grant monies and total revenues that have quadrupled translate into equipment to purchase, accounts to manage the monies and reports to provide detail to federal agencies. The increases in employees, students, and financial aid recipients mean more paper applications to be processed and evaluated, monies to be disbursed and collected, and ongoing progress to be reviewed.
Table 1 *Growth factors impacting UAB's administrative processes (from Facts and Figures)*

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>14,448</td>
<td>15,850</td>
</tr>
<tr>
<td>Financial Aid Applicants / Funds</td>
<td>8,600 / $12 Million</td>
<td>14,000 / $67 Million</td>
</tr>
<tr>
<td>Employees / Payroll $</td>
<td>9,600 / $136 Million</td>
<td>15,883 / $467 Million</td>
</tr>
<tr>
<td>10 Digit Accounts</td>
<td>175,000</td>
<td>563,000</td>
</tr>
<tr>
<td>POs / PO $</td>
<td>55,000 / $40 Million</td>
<td>113,000 / $227 Million</td>
</tr>
<tr>
<td>Number Square Feet</td>
<td>3 Million</td>
<td>10.4 Million</td>
</tr>
<tr>
<td>Grant $</td>
<td>$49 Million</td>
<td>$248 Million</td>
</tr>
<tr>
<td>Hospital Revenues</td>
<td>$19 Million</td>
<td>$562 Million</td>
</tr>
<tr>
<td>Total UAB Revenues</td>
<td>$261 Million</td>
<td>$1.1 Billion</td>
</tr>
<tr>
<td>Academic Entities</td>
<td>UAB Main Campus</td>
<td>UAB, Huntsville Medical</td>
</tr>
<tr>
<td>Health Care Entities</td>
<td>UAB Hospital, HSF</td>
<td>UAB Health System, HSF, Kirklin, Triton, Eye Hospital</td>
</tr>
</tbody>
</table>

### 2.2 REAL PEOPLES' REASONS FOR CHANGE

The need for change is critical. The cost of doing nothing is reflected in the amount of time it takes University personnel to complete routine processes and to deal with the frustrations and inaccuracies of trying to integrate information from different systems and make management decisions based on incomplete information. UAB's lack of a modern application base from which to move forward dramatically affects our administrators, faculty, staff and students. To better assess the need for change the Task Force interviewed the following faculty, staff and administrators across the enterprise.

- Ms. Mary Beth Adams, Assistant Director, Institutional Research
- Ms. Phyllis Averyt, Financial Manager, UAB Health System
- Ms. Stella Cocoris, Registrar, Undergraduate Admissions and Enrollment Management
- Dr. Dave Corliss, Director Information Services, School of Optometry
- Mr. Doug Edgeton, Associate Dean for Administration and Finance, School of Medicine
- Dr. Ward Haarbauer, Associate Dean and Professor, School of Arts and Humanities
- Ms. Denise Hamilton, Director, and Ms. DeDe Moore, Manager, UAB Hospital Financial Management Office
- Ms. Alesia Jones, Manager and Mr. Roger McCullough, Division Director, Human Resources Management Compensation
- Mr. Reid Jones, Executive Administrator, Ms. Cheryl Colbert, Financial Officer, Ms. Pam Holtkamp, Financial Officer, Department of Surgery
- Dr. Al Lobuglio, Director, Comprehensive Cancer Center
- Dr. Jay McDonald, Professor and Chair, Pathology
- Ms. Diane Moxley, Business Officer, Cell Biology
- Mr. Steve Pickett, Chief Financial Officer, Health Services Foundation
- Mr. Richard Telkamp, CFO/COO, UAB Health System
- Dr. Michael Wyss, Professor, Cell Biology, Basic Sciences Advisory Committee

The need to incorporate new business practices, new technology, and easy to use applications across the University is acute. Existing systems depend heavily on manual effort to provide missing functionality, data relationships and workflow. The following summary statements, extracted from the narratives of the individuals listed above in Appendix B, illustrate the impact of our existing systems on our competitive initiatives, our ability to do our work and our ability to respond to legal and federal inquiries.
• Enrollment Management will have difficulty supporting the President's campaign to increase enrollment with existing administrative systems. (Ms. Stella Cocoris)

• Because our systems don’t work together, we waste time worrying about how to accommodate the differences. (Dr. Mike Wyss)

• The existing Human Resources, Financial and Student systems are hard to learn and encourage errors because they are driven by obscure codes that cause frustration for infrequent users who have to use or reconcile data across the systems. (Dr. Ward Haarbauer)

• We must be able to automate business rules for data consistency and aggregation so that the reporting is replicable and not dependent on the person(s) that produces it. (Ms. Phyllis Averyt)

• If existing central services offered options to provide necessary information, much of the administrative overhead and shadow systems wouldn't be needed. (Dr. Jay McDonald)

• Much of the supporting information for our creative solutions to the problem of worker shortages caused by high employment rates is tracked manually and is not available to departments who use the online system to respond to employee and legal inquiries. (Ms. Alesia Jones)

• Many of the rules for combining and validating data to prepare the monthly hospital financial statements reside in the heads of two people and not in documented, automated business rules. (Ms. Denise Hamilton)

• Shadow systems developed by the graduate and professional schools have resulted in duplication of data in multiple database programs and, hence, duplication of effort, the potential for error, and inefficiency. (Dr. Dave Corliss)

• As requests for information grow more frequent and complex, the problems resulting from depending on data from multiple sources, some of it in non-replicable hard copy, grow more severe. (Ms. Mary Beth Adams)

• There are a number of existing systems that provide key information that are either homegrown or unsupported by vendors and depend on a small number of people to sustain them--these systems are vulnerable to various business risks. (Mr. Steve Pickett)

• Currently it is difficult for the Health System corporate offices to pull together financial and human resource data across all Health System entities, including those that are integral parts of the University, because many of the entities run different financial systems and operate under different policies. (Mr. Richard Telkamp)

• Research departments spend large amounts of money on shadow systems that reconcile inconsistencies and tie together information from the independent systems into one related data set. (Dr. Al LoBuglio)

• The University has changed its business processes to be more responsive to the departments but these processes are not reflected in the systems that support them, resulting in inaccurate information for decision making and extra work at the department level to track the financial implications of research. (Ms. Diane Moxley)
Clinical departments prepare five budgets: one for the University through the SOM, one for the Hospital, one for the HSF, an “All Funds” Budget for the UAB Health System and a separate salary summary schedule for the Provost—if we are to lower costs at the department level we must be able to do similar tasks once instead of five times. (Mr. Doug Edgeton)

Neither the University's nor the Foundation's existing financial and human resource systems have strong ad-hoc reporting capabilities. (Mr. Reid Jones)

Interviewees consistently reinforced the requirement for flexible integrated applications that accommodate unique entity requirements and relate them within the enterprise. Our current mixed bag of solutions and shadow systems promotes redundancy and error.

Access to information is a recurring theme expressed by people in all areas of the enterprise. Information is needed to support decision making at all levels. It is currently difficult to obtain, is not always replicable, is not related across systems and is not defined consistently across the enterprise.

2.3 HISTORICAL PERSPECTIVE

During 1995-1996 over 200 UAB faculty and staff spent 18 months defining a strategic agenda and goals for “one great University.” Resulting strategic initiatives in partnerships, responsibility centered management and student recruitment and retention have increased demands for more departmentally focused administrative processes, management information to support departmental decision-making, and enterprise reporting that presents entities such as the clinics and hospitals in multi-dimensional roles. The planners recognized that effective management of the University requires administrative processes and information systems that:

- Provide the tools to support accountability, management and decision-making at all levels
- Make routine processes more intuitive and departmentally focused
- Provide an infrastructure to make it easier for students and faculty to do what they have come to UAB to accomplish
- Make choices that maximize future performance and flexibility

The University contracted with The Robinson Group (TRG) in early 1996 to implement a new client/server student information system emphasizing recruitment, retention, advising and class availability. TRG backed out of its contract. After examining other alternatives, in early 1997 the Student Information System Oversight Committee recommended that UAB contract with PeopleSoft to implement its client/server student system. PeopleSoft's software availability dates were projected to be very close to the year 2000. Reports from other institutions implementing PeopleSoft revealed significant unbudgeted costs for consulting. Given these factors, the Interim Provost decided not to go forward at that time.

As an interim measure the Provost established a Student Information System Management Advisory Committee (SISMAC) to assess the current system, review unmet current needs and analyze alternatives to address them. SISMAC concluded that demands for better student service and better strategic information have stretched the capabilities of the current system. It recommends that the University move to the PeopleSoft system after year 2000 initiatives in the current system are completed.

The financial and human resources areas also began investigating departmentally-focused financial and human resources systems in 1996. The efforts were put on hold when the chief business officers of the UAS

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1 UAB President Dr. J. Claude Bennett, UAB Reporter, February 3, 1995 and June 12, 1995.
campuses began investigating consolidation of administrative computing applications across the system. The resulting August, 1997 Coopers & Lybrand (C & L) feasibility study found that, because of the diversity of business processes among UAS campuses, consolidation of administrative computing at this time would increase costs without any identified improvements to service quality.

C & L specifically addressed UAB's administrative processing and recommended UAB develop its own plan for upgrading its administrative applications to address continuing growth and change in its academic, research and health care environment. These UAB recommendations include:

- Develop a clear Strategic Information Technology Plan for Administrative Systems describing technologies, products, and their application over 3 to 5 years.
- Undertake only high-priority modifications to the existing systems while the plan is being developed. All short-term planning should be done with migration to new technologies in mind.
- Adopt commercial-off-the-shelf applications and tools for the majority of application needs.
- Consider adoption of client/server architecture and development tools (e.g., relational databases, three tier architectures, and object oriented programming languages)

3  TASK FORCE CHARGE

In early 1998, President Reynolds established the Administrative Computing Strategic Planning Task Force to evaluate and recommend administrative computing solutions to address UAB's changing environment. The Task Force consists of the Associate Vice Presidents of Finance, Human Resources, and Provost Office representatives, deans, the chief business officers of the Health System, Health Services Foundation, and the Kirklin Clinic, Information Technology officers from participating areas, and faculty and departmental representatives. The Task Force is charged with examining the core needs of the multiple organizations, determining the scope of the project and the entities to be served, and developing a vision, objectives, constraints and a high-level implementation plan. The Task Force has used the results of the previous enterprise-wide strategic efforts to address computing issues as a foundation upon which to build.

4  VISION, OBJECTIVES AND CORE NEEDS

We envision an environment in which all stakeholders in the institution have ready access to the information required for day-by-day operations, reporting, and decision making. We further envision an environment that enables the institution to respond quickly to external pressures for change and adaptation. To realize this vision it is essential to have integrated information systems that increase productivity, performance and secure information access across the entire enterprise. It is also essential that the systems deliver an accessible and flexible technical environment that empowers end-users and developers to manage change quickly and efficiently.

Therefore, we envision an institution that has implemented systems that enable accurate, fast, efficient tracking and reporting of administrative activities. These systems are designed and implemented to eliminate redundant entry of information and to minimize the need for generation of paper. That is, information is entered in such a way that no matter how it will eventually need to be used or manipulated, it can be retrieved.

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without re-entry and without the need for intensive customized programming. It is possible to query the systems for answers to specific questions in a straightforward way in order to eliminate the necessity to generate voluminous paper reports. The systems provide sufficient information in flexible formats to eliminate the need for departmental "shadow" systems.

The systems are very user friendly and training required is minimal. They are flexible enough so that modifications can be made over time, as needs change. They follow accepted standards for data storage and retrieval so that unanticipated needs can be addressed in the future without extensive customization and reprogramming. They promote rather than hamper the ability of the enterprise to examine its business practices and make changes in processes when necessary.

5 RECOMMENDATIONS

5.1 SCOPE AND ENTITIES TO BE SERVED

To achieve our vision and make it easier to accomplish UAB's strategic objectives, the Task Force recommends that the University implement integrated financial, human resource and student enterprise-wide applications to support the business processing of all University entities, including those of University Hospital and School of Medicine, whose mission does not require unique processing for particular aspects of its business. The applications should include such processes as student recruitment and admissions, registration, student billing, personnel and benefits administration, recruitment and selection of faculty and staff, grants management, purchasing and accounts payable, financial reporting and budgeting. University entities with unique needs (for example, library acquisitions and clinical patient related activities) will provide the necessary detail and roll-up information to the core enterprise systems to provide a complete picture of the institution as a whole or of its various constituent parts. Although the charge from the President indicated that a CIO or Vice President for Information Technology would move this effort forward, the need for quick action is so important the Task Force recommends we not delay waiting for this position to be established and recruited. In the interim, the President should place the responsibility for implementation with the VP for Financial Affairs and Administration and the Provost.

The President has legal responsibility for all University entities, including University Hospital and the twelve schools. The UAB Health System is comprised of University entities such as the Hospital and the School of Medicine and non-University entities such as the Health Services Foundation and the Eye Foundation.
Hospital. Both the University and the Health System must have ready access to integrated enterprise-wide information that supports operational and long-range decision making. Integrated information systems, utilized by all University and Health System entities, increase information access not only at the executive level but also across the entire enterprise. University entities, as co-participants in the envisioned applications, will automatically achieve integrated information. The Eye Foundation Hospital and the Health Services Foundation are in the process of committing to independent financial systems. While there may be compelling business reasons, particularly with financial data related to the Health Services Foundation, not to fully integrate at this time, supplying roll up entity level information across applications is essential.

Integrated planning is essential to define and provide the information required across the entities. Integrated planning must begin with definition of the business requirements to be accommodated by integrated applications and the information requirements of the various entities. Focus groups of representatives from all appropriate entities including the Hospital, Foundation, University Administration and departmental users must participate in specification definition.

5.2 COMPLEXITY

The Task Force recommends that the President and the Health System Board take a unified view of information technology and establish a clear structure for decision making and responsibility at the executive level. At the present time, there is no clear mechanism for coordinating, balancing and prioritizing the information needs of the institution across the administrative, academic and health system wings. Some permanent, executive level entity such as the proposed Vice President for Information Technology must be established to bridge the academic, research and health care enterprises without compromising the ability of any of the entities to respond quickly to changing needs. Information priorities must be set through integrated planning across the enterprise. This is the only way to make optimal use of information technology and reduce the cost of ownership across the University. The academic, research, and health services components of the University have different missions and business processes. Each also has different demands placed on it by internal administrative reporting structures and external agencies as well as different time constraints for meeting those demands. This complexity is not going to change, but the information technology that we deploy should address the common needs and transcend the boundaries that impede the integration of information at the administrative levels.

5.3 INTEGRATED APPLICATIONS FROM A SINGLE VENDOR

The Task Force recommends that the University implement integrated financial, human resource and student client/server applications from a single vendor with proven enterprise-wide experience in a Research I University environment with a medical component.

5.3.1 CHARACTERISTICS OF SINGLE VENDOR CLIENT/SERVER APPLICATIONS

Integrated client/server applications from a single vendor provide a common look and feel for users of the system and a single method of defining business rules and workflow (paperless) processes. The applications are developed with a single set of development and database tools and allow uniform training for users and IT staff. Enterprise-wide client/server applications have the following characteristics that distinguish them from older mainframe systems:

- Driven by institution-wide business rules, databases and workflow automation
- Utilize new databases, architectures and tools that are more flexible and allow quicker response to change in the University
- Complex by virtue of their modularity and dependence on the network
• Demand user participation ("Business rules are political issues not technical issues. Technology cannot replace the political process necessary for making decisions and coming to consensus in an organization.") 3

• The institutional costs for implementation and long term maintenance are higher than they are for traditional mainframes systems

• Large vendors are spending $100M in research and development and thousands of man-years in application development and new technology evaluation

• Vendors are working with leading universities to provide components and best practice templates

5.3.2 ALTERNATIVES CONSIDERED AND ELIMINATED

The Task Force examined and eliminated from consideration two alternate strategies to handle growth and change: enhancing and web-enabling existing administrative systems and purchasing and implementing the "best of breed" of new client/server applications from multiple vendors.

Although the current administrative applications appear to be supporting basic administrative transaction needs, the pace of growth and change at the University is beginning to outstrip the flexibility of the current administrative systems to quickly respond. Drivers for replacement of the financial, student and human resource applications include siloed design that supports central users of information in functional areas such as Finance, Student Administration and Human Resources and not the managerial and decision-making needs of the community at large; older technology that supports applications based on the best practices of the 1970's; and extensive customization and numerous isolated functional solutions that contribute to the complexity of supporting and maintaining the present computing environment.

Table 2 Comparison of alternative strategies

<table>
<thead>
<tr>
<th></th>
<th>Enhance Existing Systems</th>
<th>Integrated Client/Server</th>
<th>Best of Breed Client/Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalyst for business process change</td>
<td>No</td>
<td>Yes</td>
<td>Somewhat</td>
</tr>
<tr>
<td>Supports enterprise-wide business rules</td>
<td>Yes, through customization</td>
<td>Yes</td>
<td>Yes but each vendor does this differently</td>
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<tr>
<td>Common look, rules, workflow, tools, training</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Rapid deployment of value-added functions</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Based on 1990s best practices</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Takes advantage of vendor R&amp;D</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Built-in technical obsolescence</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Flexible architecture</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Estimated Investment</td>
<td>$5m to $10m</td>
<td>$30m over 5 years</td>
<td>&gt;$40m over 5 years</td>
</tr>
<tr>
<td>Accommodates Health Systems without major customization</td>
<td>No</td>
<td>Likely</td>
<td>Likely</td>
</tr>
<tr>
<td>Flexible Architecture</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Major Vendors</td>
<td></td>
<td>PeopleSoft, SCT, DataTel, Oracle in 1999, SAP in 2000</td>
<td>PeopleSoft, Oracle, SAP, SCT/Banner</td>
</tr>
</tbody>
</table>

Independent applications from multiple vendors, or "best of breed" add additional levels of complexity for both users and information technology staff. There are no current industry standards for tools and software. Major vendors use different ones, resulting in mixed look and feel for the users and more to learn and

remember when using the applications. UAB would have to build interfaces among multiple vendor systems, making them more expensive to implement and maintain than other options. While there are more vendors to choose from in a mixed vendor environment, best of breed decisions by their nature are made independently (in silos) making it difficult to apply enterprise-wide solutions.

5.3.3 CANDIDATE VENDORS WITH RESEARCH UNIVERSITY EXPERIENCE

Forty of the top 100 research institutions have partnered with vendors to implement new client/server administrative systems. These institutions are among the first higher education clients to implement these applications. Thirty of the 40 have chosen the integrated suite of applications from PeopleSoft. They are experiencing average implementation costs of $30 million over a 5 year period (see Appendix A). The costs include a significant amount of implementation consulting to fit higher education practices to the software (i.e. to develop the chart of accounts, University structure, document workflow), provide technical knowledge transfer (technical support for database and hardware tuning, learning People Tools, converting legacy data) and to implement systems concurrently and quickly to meet year 2000 deadlines.

<table>
<thead>
<tr>
<th>Table 3 Major Client Server Vendors</th>
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<tbody>
<tr>
<td>PeopleSoft</td>
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<tr>
<td>Years in Business</td>
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<tr>
<td>Total Clients</td>
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<tr>
<td>Higher Ed Years</td>
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<tr>
<td>Higher Ed client/server clients</td>
</tr>
<tr>
<td>Top 100 Research clients</td>
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<tr>
<td>Health Care Clients</td>
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<tr>
<td>Finance and Human Resources systems</td>
</tr>
<tr>
<td>Student System</td>
</tr>
</tbody>
</table>

- a. Majority older mainframe application users
- b. Estimated
- c. Student system only
- d. Worldwide

5.4 PRINCIPLES FOR PROJECT STRUCTURE AND LEADERSHIP

The Task Force recommends that the decision to move forward with integrated client/server applications be accompanied by the adoption of formal project structure and leadership principles. Project leadership must come from within the University and not from external implementation partners. Implementing enterprise-wide client/server applications involves a large investment of University resources. It is crucial from the earliest stages of the project that University management, project-implementation teams and users assume ownership of the project. Early "buy-in" from the whole organization fosters the cooperative environment necessary for a successful project implementation. Assuming ownership involves:

- Employing tiered leadership
- Dedicated, formally trained project teams
- Involving end users

4 This section is adapted from PeopleSoft Corporation’s, Implementing PeopleSoft Successfully, 1997.
Tiered leadership involves formation of a steering committee of University executives to provide the project team with policy clarifications and assistance in resolving key tradeoffs. It includes a single overall project manager (and/or three lead functional managers responsible for finance, human resources and student) who is dedicated full time to the project, coordinates overall activities and is a full member of the steering committee. Another important factor is executive sponsorship to bring visibility to the project and communicate the new systems' role in meeting the University's overall objectives. CIO's, CFO's and project managers from Ohio State, Duke, University of Michigan, Penn, Minnesota and Cornell who are implementing the administrative applications we are considering, stress having "lots of support and commitment from the top" and hiring a project leader with accountability and authority to make decisions across all impacted organizations.

Dedicated, formally trained project teams should drive implementation of the applications. The most successful teams include a blend of functional, technical, end-user and management expertise. Universities who have gone through trial by fire recommend that project team leadership be senior people who know the business processes and are the hardest to spare and keep dedicated to the project. Project teams should be built so 30-40% will staff the departments when the project is over. Other universities have used both technical and functional implementation partners and reengineering consultants to augment the project team; but all recommend that the consultants not lead the project.

The user community as a whole will eventually own the new systems. Some end users will participate on the project teams and in the business process definitions. It is important to keep the total user community...
involved in the changes the project is bringing about. Early communication about the business objectives to be achieved and ongoing publicity about system decisions and functionality will encourage them to take an active role in the project. Users must be prepared for the scope of business change; it is much bigger than they are expecting.

5.5 SCOPE MANAGEMENT

The Task Force recommends that the University adopt principles to limit customization of new applications that is outside the business rule and workflow structure provided by the vendor. The project should be scoped with simplicity in mind and controls established to avoid the gradual addition of new requirements to the original specifications. The University should make every attempt to fit its processes to the best practice templates provided by the vendor. It is important to define a process for managing factors such as interfaces, conversions and bridges to older systems involved in customizing the software. By tightly controlling custom changes, we can control implementation costs and reduce the cost of future upgrades.

Veteran institutions recommend that we not change the systems. "The only problems we had we created ourselves because we modified the code." "The terminology and approach are different than our old ways of doing business but they fit together once you understand them." Focusing on simplicity fosters momentum. Concentrating on the applications' “sweet spots” instead of differences from what we are doing now allows faster implementation and quick wins. We should implement the applications that have the greatest chance of success in the shortest time first. Duke, Cornell and Michigan advise implementing General Ledger first; "future decisions depend on it and you'll waste time interfacing to your old systems if you don’t."

5.6 INFRASTRUCTURE SUPPORT

The Task Force recommends that the University address funding for additional departmental network connectivity and formal, organized desktop support necessary for participation in the new administrative systems in the project budget. UAB has begun a six-year plan to upgrade the campus network infrastructure to meet the bandwidth requirements of research, education, and administrative applications. The UAB Health System is completing a three-year plan to upgrade the clinical infrastructure. The plans are integrated to provide seamless interface. UAB is also a charter Internet 2 consortium member and has received several grants for concurrent networking efforts that further expand campus network capabilities. The resulting infrastructure will have the capability to support distributed decision making and a client/server environment at UAB. The network upgrade does not extend to local area networking equipment within departments, however. University departments utilizing new applications may require supplemental network connectivity and departmental server capability that are not funded through the network plan.

The UAB Health System provides full desktop support for all areas of University Hospital and the Kirklin Clinic. There is no comparable entity at the University. The ability of the campus central service organizations to provide necessary end-user technical assistance is extremely limited. To alleviate this problem, some of the larger departments on campus hire their own computer staff, contract with other University entities or employ the services of external consulting firms. Many users have no support. Support services are a critical component of a client/server environment; without them, UAB cannot take full advantage of information technologies and collaborative services. Desktop support services that are adequately staffed and provide effective training and support throughout the enterprise are another critical component of a client/server environment; without them, UAB cannot take full advantage of new technologies and collaborative services.

This recommendation implies a more formal, organized academic computing environment with adequate resources not only to support desktops but also to encourage collaboration and technology supported learning and teaching among schools, departments and centers that is consistent with UAB purposes and
goals. This should be done while working with all existing strengths and capabilities of UAB.

5.7 HIGH-LEVEL IMPLEMENTATION PLAN

The Task Force recommends that a project Steering Committee determine application implementation schedules based on a combination of University priorities and availability of functionality from the vendor, with the exception of the general ledger which is the key to defining University entity relationships and must be implemented first. Current University priorities include a strategic student recruitment initiative, identifying best purchasing practices among the UA system campuses, recruiting faculty and staff, and continuing to attract research funding. Student prospecting and admissions do not depend on the chart of accounts and could proceed concurrently with general ledger. Purchasing and accounts payable provide immediate payback in utilization of electronic workflow. Grants management is only recently available from major vendors and could be implemented a little later in the schedule to allow time for other schools to shake out problems.

Integrated client/server systems for higher education have been available only since 1995. These applications meet basic business needs, however, more specialized functionality such as advancement and grants management are still under development by both PeopleSoft and Oracle. Table 4 lists the application modules and availability dates from two major vendors.

Table 4 Availability of Integrated Application Components

<table>
<thead>
<tr>
<th>Modules</th>
<th>PeopleSoft</th>
<th>Oracle</th>
<th>Modules</th>
<th>PeopleSoft</th>
<th>Oracle</th>
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<tr>
<td>FINANCE</td>
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<td>HUMAN RESOURCES/PAYROLL</td>
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<tr>
<td>General Ledger</td>
<td>Yes</td>
<td>Yes</td>
<td>Human Resources Personnel</td>
<td>Yes</td>
<td>Yes</td>
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<td>Administration</td>
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<td>Billing/Receivables</td>
<td>yes</td>
<td>Don't Know</td>
<td>Recruitment</td>
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<td>Purchasing and Payables</td>
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<td>Yes</td>
<td>Yes</td>
<td>Time, Attendance and Labor</td>
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<td>Asset Management</td>
<td>Yes</td>
<td>Yes</td>
<td>Benefits Administration</td>
<td>Yes</td>
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<td>Sponsored Research Mgmt</td>
<td>Q4,1998</td>
<td>Yes</td>
<td>Training and Development</td>
<td>Yes</td>
<td>Yes</td>
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<td>Treasury Management</td>
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<tr>
<td>Campus Community</td>
<td>Yes</td>
<td>Q3,1999</td>
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<tr>
<td>Student Recruitment/Admissions</td>
<td>Yes</td>
<td>Q3,1999</td>
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<td>Student Records</td>
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<td>Registration and Class Scheduling</td>
<td>Yes</td>
<td>Q3,1999</td>
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<td>Advising and Degree Audit</td>
<td>Yes</td>
<td>Q3,1999</td>
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<td>Financial Aid</td>
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<td>Student Financials</td>
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<td>Q3,1999</td>
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<td>Academic Workload</td>
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<td>Advancement</td>
<td>Q4,1998</td>
<td>Don't Know</td>
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</table>

Based on the experience of other research universities, replacing the University’s core financial, human resource and student applications with integrated client/server applications is at least a 5-year project. The majority of the first year is spent in project team training, technology implementation, prototyping, becoming familiar with the applications and definition of workflow and business rules.
Table 5 Possible Implementation Schedule

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<td>General Ledger</td>
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5.8 SELECTION/EVALUATION CRITERIA

The Task Force recommends that evaluations of enterprise client/server applications be based on functionality, cost, flexibility of supporting technology, vendor vision, support and service. UAB is constantly changing its business processes. The functionality upon which we base decisions today may not be the functionality required tomorrow. Although current functionality is a significant factor in evaluating competing vendor applications, a key criterion for new applications is flexibility to easily adapt to growth and change in UAB’s business needs within a framework that allows ongoing vendor support. A vendor’s proven track record and vision for the future are key components, as our experience with TRG demonstrated. Ease of use, single sign-on, consistency, common navigation, common reporting and workflow tools are also important criteria that impact how much the user has to know to use applications and the technical knowledge needed to support them.

Vendor proposals will conform to the rules of the University-required bid process. The Task Force will appoint an evaluation team of functional, technical, user and management expertise to review candidate administrative applications and recommend a University solution. Detailed demonstrations and verbal presentations will be required of participating vendors to allow UAB to interact with the proposed software.

Table 6 Evaluation Criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>Ability to meet the requirements of all categories of system users</th>
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</table>
**5.9 PROJECTED SCHEDULE OF EVENTS**

The table below lists a possible timetable for selecting enterprise applications. Two concurrent activities may impact this schedule. The Eye Foundation is currently implementing a Financial System scheduled for completion mid-1999. The Health System Foundation must replace its current financial System because of year 2000 considerations and will select a new one by January 1999.

*Table 7 Milestones*

<table>
<thead>
<tr>
<th>DATE</th>
<th>MILESTONE</th>
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<tr>
<td>October 1, 1998</td>
<td>Task Force reviews final draft report to President</td>
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<tr>
<td>November 13, 1998</td>
<td>Task Force report presented to President</td>
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<tr>
<td>November 15, 1998</td>
<td>Final Financial, Human Resources, Student specifications due</td>
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<tr>
<td>December 4, 1998</td>
<td>Informational briefing to the Board of Trustees</td>
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<tr>
<td>December 10, 1998</td>
<td>RFP, prepared by a subset of the Task Force and representative administrative and departmental representatives, sent to vendors</td>
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<tr>
<td>January 11, 1999</td>
<td>Deadline for receipt of proposals from vendors; processing of proposals begins</td>
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<tr>
<td>January/early Feb</td>
<td>Detailed demonstrations by top 2 vendors</td>
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<tr>
<td>February 15, 1999</td>
<td>Evaluation committee identifies top vendors to Administrative Computing Strategic Planning Task Force</td>
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<tr>
<td>March 1, 1999</td>
<td>Results of RFP process presented to President</td>
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<tr>
<td>March 1 - March 31</td>
<td>Negotiations with top vendor</td>
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<tr>
<td>April 10, 1999</td>
<td>Results presented to Board of Trustees Finance Committee</td>
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<tr>
<td>May 7, 1999</td>
<td>Presentation of recommendation to Board of Trustees</td>
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**6 RFP CRITERIA**

**6.1 ARM SYSTEM USERS AND INFORMATION REQUIREMENTS**

6.1.1 **Users**

Good information management is the glue that holds a University together. Information enables University stakeholders and the institution to make better decisions. To appreciate the types and organization of the required information we must define the end users of the administrative applications.
First and foremost are the stakeholders. Stakeholders are "any person, group or organization that can place a claim on an organization's attention, resources or output or is affected by that output." Stakeholders include students, faculty, staff, alumni, patients, industry, federal granting agencies, state agencies, and the local community. The information they need can be provided directly to them via Internet, interactive voice response and kiosk or indirectly through an advisor, a staff member, faculty members, research and academic department officer or University administrator. In this view these latter users can be considered to be intermediate in spite of the fact that they will technically spend more time in front of the computer screen than the stakeholders will. These users are, in addition, those who are responsible for gathering the information and ensuring its accuracy.

A third group of users includes those who monitor outcomes and, in the ideal, make data-driven policy decisions based on available data. These too are end users.

6.1.2 COMMON INFORMATION REQUIREMENTS

These three user groups have some common information requirements. First, all the information about stakeholders must be available from a common source. For example, every piece of data about a student from recruitment, through admission, enrollment, graduation, and beyond should be accessible to the other two groups of users (with proper security clearance, of course) at any time and from any place. Grant administrators should have access to applicable space, human resource, and financial data to track current research spending and respond to internal and external reporting requirements. Departments should be able to track purchases from requisition to completion, and personnel, open positions and job applicants throughout the employment process.

The necessity of having a common data source leads logically to the second information requirement: point-of-contact data entry and decision making. When, for example, a student interacts with a recruiter, an admissions officer, a financial aid officer, an advisor, faculty or any other appropriate administrative person, that person must be able to call up that student’s record, make any changes necessary, and have those changes immediately accessible throughout the system. Research areas must be able to manage and control grant information prior to its being recorded in the general ledger and have that data accessible to all appropriate departmental and administrative staff. Academic areas must be able to share information internally and across offices. These users should also be able to make immediate decisions based on up-to-date information.

This ability to make immediate decisions leads to the third information requirement: everyone must operate under the same set of rules related to students, programs and business processes. Policies regarding such things as admissions requirements, transfer credit articulation, accounting rules, budgeting, purchasing, equipment accounting and human resource processes must be embodied in a set of rules that are stored in the system and accessible to everyone at all times. Furthermore, when it is necessary to change them it should be possible to do so without extensive reprogramming. The people who are responsible for developing the rules should be able to change the rules within the restraints established by the system as a whole. A fourth information requirement is the ability to easily define workflow and automate it using a standard messaging system. The intermediate groups of users should be automatically notified when tasks need to be completed. Students should be notified of the deadlines. Policy and decision-makers should have standard reports available on a regular basis and be notified of any tasks that they need to perform. Automation ensures that the right people do the right things at the right time.

6.1.3 Operational Vs Informational Systems

The information described in the previous section is part of the operational system, which consists of programs, processes, and data. Operational systems are defined by the following:

- They run the business on a second-to-second basis.
- The data they contain is a current and largely real-time representation of the state of the business.
- Individual events (or transactions) in these systems are generally limited in scope, are rather simple, and often result in an update of the data.
- They are optimized for fast response time for predefined transactions and have a special focus on performance of update transactions.
- They are used by people who deal with customers or products on an individual level, for example, clerks, sales people, and administrators.
- The customers themselves increasingly use them.

Information used for aggregate reporting and long-range planning is a part of the informational systems. System users and stakeholders deal primarily with operational system data while decision-makers deal primarily with informational systems. A complete reporting solution requires tools to support all of the University’s reporting needs: production reporting, detailed financial analysis, ad hoc query and reporting, data mining and multi-dimensional analysis. These tools must be integrated with the applications and the business rules that define complex data relationships to allow decision-makers to access informational data without having to understand how the data is stored. Informational data has the following characteristics:

- They are used to manage and control the business.
- The data [are] historical or point-in-time; that is, [they] represent a stable view of the business over a period of time or at a particular point in time.
- Optimization is for inquiry rather than update.
- The use of these systems is loosely defined and may be wholly unpredictable.
- Managers and end users use them to understand the business and make judgments and decisions based on this knowledge.

6.2 General Functional Requirements

6.2.1 Requirements

The Task Force identified several functional requirements for administrative applications and ordered them on the basis of their potential impact on stakeholders, the system users, and decision-makers. These

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6 This section is adapted from Devlin, B. Data Warehouse: from architecture to implementation. Addison Wesley Longman, Inc. 1997.
functional requirements are listed here in descending order of impact with an accompanying description of what they mean.

Ensure data integrity. In the present context we assume that the technical requirements for data integrity have been met and use the term here in a broader sense. It means that the data are accurate, that required data are always present, that the meaning of codes in particular fields accurately reflect institutional policies, that data are not overwritten and that the meanings of specific codes do not change over time. These data characteristics are essential to both the operational and informational systems.

Enhance University administrative functions. It is essential that the processes for the operational allocation of resources and for program planning be incorporated into the system.

Enhance user access to data. System users, stakeholders, and decision-makers require access to the data that are stored in the system for decision-making purposes. This means that different views of the data should be readily available for answering standard questions. It also means that queries should be easy to perform for answering non-standard questions.

Enhance user friendliness. User friendliness is a subjective judgment about how easy it is to accomplish what needs to be done. The goal of designing user friendly systems is to provide interfaces that both novice and experienced users can navigate easily and determine from the appearance of each screen what functions can be performed without consulting a manual. It means providing a consistent interface so that once a user learns how to perform certain basic tasks, he or she can expect the functions performed to be applicable throughout the application. It also means that help functions are quickly accessible.

Provide point-of-contact data entry and decision making capability. System users who interact with stakeholders should be able to view and update any information that is essential to enabling stakeholders to make decisions about their relationship to the University. All information that does not require intermediary action should be updated directly by the stakeholder. These updates should be reflected throughout the system immediately so all operational data that anyone is viewing are current.

Automate workflow. Many processes require parallel tasks to be coordinated and timed properly. The best way to make sure that deadlines are met is to create a system that monitors progress and notifies the responsible persons of the status of various tasks.

Utilize a common relational data source. All pertinent information about a stakeholder or departmental entity should be available to all types of users at any time from any place with proper security. The data source should be in standard relational database form to make it easier to access. This compliance increases the range of tools that can be used to access the information and expand the functionality of the system.

Provide common reporting and decision support tools. The ability to access data easily and in a standard manner throughout the enterprise will enhance user access to administrative data and is essential to departmental management and decision-making.

Create a centrally managed set of rules. It is essential that University policies be accurately embodied in the administrative applications and be consistently applied. This means that user cannot override policy unless specifically granted permission to do so.

Enhance flexibility, ease of development and maintenance. Provide flexibility to support ongoing innovation for improving administrative services and rapid response business processes change. This flexibility must not be provided at the expense of ongoing vendor support.
Provide general interface ability with other enterprise systems such as patient care. The University will continue to operate other enterprise systems that are more specialized in their application. The core business applications must provide a simple method to include and provide data to and from these systems.

Provide common software and client/server tools. A single set of tools reduces costs, application complexity, training requirements and simplifies the application enhancement and maintenance process.

Single sign-on and security. Single sign-on and security across applications enhances user access to data and directly impacts the user friendliness of the system.

Built-in transaction monitoring. The ability to identify who has changed what and when they did it creates an audit trail within the database itself and enables quicker problem identification and resolution.

Ability of units to add unique rules to core set of rules. Unique rules enable distributed management while operating within the parameters and process established by the enterprise.

Ability of units to add unique functionality to system. Departments have unique data requirements that impact their operations. A system must allow enhancement without adversely affecting the ability to apply maintenance and upgrades, as they become available.

Enhance user access to system. The program that allows users access to the system should be readily available, easy to install, and user friendly. Novice users should be able to quickly learn the fundamentals of running the program and navigating within it.

Provide easy student and employee access to personal information. Students should be given more responsibility for assessing their own progress whether it is application status, financial aid, how much they owe, or their progress toward a degree. Employees should be able to determine benefits status and provide accurate address information directly. They, therefore, should have access to all the available information whether they are standing at a kiosk, meeting with an advisor, or accessing the administrative data with a web browser.

Implement enhanced productivity tools. Imaging, character recognition (including fax), interactive voice response units, web-enabled forms, routable electronic forms enabled through workflow, CD-R technology, and common single sign-on are examples of the envisioned technologies.

Enhance user skills. Training is essential to data integrity and users’ abilities to enter and access data.

Reduce paper handling. This is one of the prerequisites for data integrity. Paper records can be lost, required information may not be entered into the system, and data entry errors can occur when multiple people are responsible for data input and filing.

Eliminate the need for ancillary databases. Ancillary databases contain data that are not stored in the main administrative databases. They most likely have arisen because it is often easier for users of the system to meet the specific needs of their units by creating their own systems than it is to have changes made to the main system. These databases often contain data that are not properly synchronized with the main application databases. Furthermore, they often require entering data in both places. If administrative applications are to operate with a consistent set of rules and current data that are accessible from any workstation, it is essential that the need for these databases be reduced and eliminated if possible.

Eliminate double data entry. Double data entry occurs when there are multiple databases. Double data entry increases the potential for errors. Eliminating double data entry is another prerequisite for data integrity.
Eliminate manual data entry. Manual data entry is time consuming and increases the potential for errors. Where it is possible the University should receive and transmit data electronically.

6.2.2 INTERDEPENDENCIES AMONG FUNCTIONAL REQUIREMENTS

It is clear from the above definitions that there are interdependencies among these functional requirements. These are illustrated in Figure 3. The unfilled boxes represent the requirements defined above. The filled boxes represent solutions designed to meet these requirements. The arrows are to be read as “If...then...” statements. For example, “If you enhance user access to the data, then you eliminate the need for ancillary databases.” Consequently, “If you eliminate the need for ancillary databases, the you eliminate double data entry points.” And so on.

Figure 3. Interdependencies among the functional requirements

We realize that there may be alternative representations of these interdependencies, as well as additional arrows, but we feel that this captures the essentials. Any specific requirement defined by a user of the system should be represented in some way in the diagram. Furthermore, it should represent the impact of any one requirement on other requirements.

There are a number of key points to note about this representation. First, the functional requirement with the highest judged impact, ensuring data integrity, is directly dependent on the greatest number of other functional requirements. These include reducing paper handling, eliminating double data entry points, enhancing user skills, automating workflow, and creating a centrally managed set of rules. Some of these requirements were individually ranked fairly low on the impact scale, but together they have a significant impact on data integrity. If you work backward from these you can see that these functional requirements are, in turn, dependent on several
of the proposed solutions, client/server applications, enhanced productivity tools such as electronic data interchange, voice and imaging, a common data source, and a data warehouse.

The second thing to note is that point of contact data entry and decision making has multiple arrows converging on it and no arrows pointing to any other requirement. It is the end point that everything else supports. It represents the interface between the stakeholders and the information required to make good decisions and, hence, good progress.

The third notable aspect of the diagram is that the functional requirement of enhancing University administrative/business processes has multiple arrows converging on it and only one arrow out. That single arrow out is, however, a critical one since it represents the concept that business processes of the University are critical to good decision making at all levels.

In summary, the essence of the diagram is this: data integrity is critical to the two key processes of enhancing University business processes and enabling users to make good decisions. Everything else is subordinate to these three elements and tells us what is necessary to meet these functional requirements most effectively.

6.3 TECHNICAL AND FUNCTIONAL SYSTEM REQUIREMENTS

6.3.1 VISION AND GENERAL FUNCTIONAL REQUIREMENTS

The vendor must describe how the proposed enterprise solution supports the tactical aspects of the University's Administrative Systems vision and general informational and functional requirements as presented in Sections 4, 6.1 and 6.2.

- The successful vendor must offer an integrated software solution for Student, Human Resources and Financial Management applications. Vendors who offer only one or two of these software applications do not meet the mandatory criteria.
- The proposed integrated software solution for Student, Human Resources and Financial Management applications must be available in release level code and commercially available in the marketplace at the time of purchase. It must include the functional and general areas listed below in sections 6.4, 6.5 and 6.6.
- The proposed integrated software solution for Student, Human Resources and Financial Management applications must be subject to routine upgrades through an established version control process.
- The proposed integrated software solution for Student, Human Resources and Financial Management applications must utilize two or three tier client-server architecture.
- The system must utilize a full graphical user interface (GUI).
- The vendor must have two or more enterprise wide software licenses and/or implementation contracts for central administrative systems for the proposed integrated software solution with institutions classified as Research I institutions by the Carnegie Foundation for the Advancement of Teaching (hereinafter referred to as Carnegie I institutions). Respondent should list all Carnegie I institutions where they have completed installation of any of their systems in the last two years. The list should include the systems installed, a contact person, and a telephone number.

6.3.2 YEAR 2000 COMPLIANCE

- The vendor must warrant fault-free performance in the processing of date and date-related data (including, but not limited to, calculating, comparing and sequencing) for the proposed administrative software. Fault-free performance includes, but is not limited to, the manipulation of
data with dates prior to, through and beyond January 1, 2000, and shall be transparent to the user.

- Software products, individually and in combination, shall successfully transition into the year 2000 with the correct system date and correct calculations which utilize or refer to the date data, without human intervention, including leap-year calculations. Software products, individually and in combination, shall also provide correct results when moving forward or backward across the year 2000.

6.3.3 WEB ENABLEMENT

- Web-enabled software: The vendor should use web-enabled software, installed and managed entirely on servers, eliminating desktop software installation and upgrades. The vendor should utilize commercial web browsers that provide HTML and Java capabilities on the desktop and communicate with one or more application servers using standard HTTP and TCP/IP networking.

- Web-based application creation tools: The vendor should be able to provide a tool for creating Web based applications that can be viewed with any industry standard browser software. These applications must be able to be deployed over the Intranet or the World Wide Web without requiring reprogramming to move from one environment to the other.

6.3.4 TECHNICAL SYSTEM CAPABILITIES

- Development tools: The software should be delivered with application development tools that provide the University with the ability to customize and manage the application without compromising the ability to apply software upgrades. Development tools should have the ability to model data, define database structures, create and modify panels, construct program logic and develop help screens.

- Data management tools: The software should provide data management tools to secure the application, migrate data between databases, backup and restore databases to the moment of failure, automate the upgrade process and support mass data imports.

- New release upgrades and customized changes: Changes made to application programs should be automatically distributed to the desktop.

- Query tools: A query tool should be provided to permit users to access application data through a standard desktop graphical user interface without the need to write SQL statements. Additionally, an on line analytical processing tool (OLAP) should be provided to work with the data in the application. The OLAP tool should be ODBC compliant.

- Reporting tools: A fourth generation reporting tool should be provided with the application to allow for the creation of SQL based reports. A number of standard reports should be provided for each of the functional areas giving the University a template from which to construct customized reports.

- Workflow tool: A workflow tool should be provided with the application to automate and control the flow of information throughout the University. The workflow tool must be capable of authentication, messaging and rendering application information.

- Imaging: The software applications should be able to accept imaged documents for storage and retrieval and integrate data of imaged documents into the application database.

- Voice Response and World Wide Web: The software application should be able to utilize touch-tone interactive voice response and World Wide Web for student registration and human resource benefits administration.

- EDI: The applications should support the use of EDI for purchasing, accounts payable and student SPEEDE transactions.

- ISO 9002 compliance: Software applications should be ISO 9002 compliant.
• Open Systems Environment: Respondents MUST document, for the proposed solution, a commitment to open systems standards and practices. It is not the intention of this provision to require the use of a particular operating system or hardware platform but to insure that this procurement is compatible with the development of UAB's information technology resources.

• Security: The applications should support a single sign-on across all applications and provide auditable levels of security that address data, telecommunications access and hardware.

6.3.5 ADDITIONAL INFORMATION

In addition, the vendor must provide information on the following:

• A listing of the database management systems which can be used with the proposed integrated software solution. List the database management system used to develop the application.

• A description of the server, network, and client environment required for successful implementation of the integrated enterprise software solution, including providing anticipated response time for at least 80% of the interactive on-line transactions. List the platform used to develop the applications.

• Third-party desktop software components

• Forms generation tools

• Other vendor products (middleware, operating System software, hardware) the vendor believes are required to successfully implement the proposed integrated software solution and how they are used.

• Error handling across all parts of the applications

6.4 STUDENT INFORMATION SYSTEM CAPABILITIES

The student information application must provide service first and foremost to the student. It must streamline existing business processes with the latest available technology and provide a competitive edge for the University to attract and retain the best students available.

The following list gives the functional and general areas that must be included in the application. The vendor must respond to each item, stating whether or not the software supports that function and the market availability date of the function. If there is a third-party software product integrated with the vendor application to provide the functionality, state the product name, vendor name, address and phone number, cost and knowledge of vendor's continued support for integration in the future.

• Student Recruitment and Admissions
• Tracking and Reporting Progress
• Registration
• Class Scheduling
• Provide Financial Support (Financial Aid)
• Assess and Collect Fees (Student Accounts Receivable)
• Academic Workload
• Advising including Degree Audit
• Loan Management
• Residential Life
• Advancement
In addition the following general requirements should be met:

- Student personal database integrated with Human Resources employee database
- Interactive Voice Response support
- World Wide Web based application development support
- Student financials integrated with the General Ledger in the financial application
- All student applications must be tightly integrated

[Detailed functional specifications to follow]

6.5 HUMAN RESOURCES INFORMATION SYSTEM CAPABILITIES

The human resource information application must provide the University with the ability to manage its human resources. It must streamline existing business processes with the latest available technology and provide a competitive edge for the University to attract and retain the best employees available. It must enable the University to process applications efficiently, record and track employment history, manage compensation, training and development, and administer benefits.

The following list gives the functional and general areas that must be included in the application. The vendor must respond to each item, stating whether or not the software supports that function and the market availability date of the function. If there is a third-party software product integrated with the vendor application to provide the functionality, state the product name, vendor name, address and phone number, cost and knowledge of vendor’s continued support for integration in the future.

- Human Resources Personnel Administration
- Recruitment and Hiring (Applicant Processing)
- Payroll, including out-of-state tax application, and Payroll Reporting
- Time, Attendance and Labor
- Wage and Salary Administration
- Benefits Administration
- Training and Development
- Flexible Spending
- Position Control
- Non-resident alien administration
- EEO reporting

In addition, the following general requirements must be met:

- Interactive Voice Response support
- World Wide Web based application development support
- Integrated with Finance General Ledger and Budgeting applications
- Integrated with Student Financial Aid and Registration applications
- Support integrated document imaging and workflow
• All human resource applications must be tightly integrated
• Interface with the Kronos Time and Attendance System
• Human Resources employee database and the student personnel database should be integrated

[Detailed functional specifications to follow]

6.6 FINANCIAL INFORMATION SYSTEM CAPABILITIES

The financial systems must record and provide the University with the ability to manage its finances. It must enable the organization to process, administer and control financial information within the GASB (Governmental Accounting Standards Board) and FASB (Financial Accounting Standards Board) fund accounting guidelines. All accounting practices must be AICPA (American Institute of Certified Public Accountants) compliant. The application must provide support for budgetary management, cash flow control, encumbrance accounting (purchase orders and salaries), gift and grant accounting and project year-to-date tracking.

The following list gives the functional and general areas that must be included in the application. The vendor must respond to each item, stating whether or not the software supports that function and the market availability date of the function. If there is a third-party software product integrated with the vendor application to provide the functionality, state the product name, vendor name, address and phone number, cost and knowledge of vendor's continued support for integration in the future.

• General Ledger
• Payables including travel and entertainment expense
• Purchasing
• Budget Planning and Monitoring
• Asset Management
• Receivables/Billing (non-student)
• Inventory
• Treasury Management
• Pre and Post Award Sponsored Research Management
• Space Management

In addition, the following general requirements must be met:

• The Financial system must fully integrate with Human Resources and Student Systems
• All Financial applications must be tightly integrated
• The application must support electronic data interface standards (EDI) and integrated document imaging and workflow
• World Wide Web based application development support.

[Detailed functional specifications to follow]
6.7 VENDOR EVALUATION INFORMATION

6.7.1 VISION
- The vendor should describe its vision for bringing new functionality to the market, possibly at an ever-increasing rate, while supporting a growing installed base.
- The vendor should describe the vertical industries in which it specializes.
- What changes does the vendor see in the way it charges for its products and services? How does it plan to utilize new or emerging technology in its products?
- What role does the vendor see for service and support in the future and how does it plan to shift to the different roles?
- How does the vendor plan to fund its growth three to five years from now? How will its products be marketed and sold?

6.7.2 EXECUTION
- How do the vendor's key financial ratios compare to its competitors and industry averages?
- Is the vendor investing in its current and future product lines at the same rate as its competitors?
- Can the vendor fund its vision? If not how much control will be lost to acquire the resources to fund the vision and how will this affect the vendor's ability to shape the vision?
- What is the history of timely product completions?
- What is the difference between what was promised and what was delivered?
- List the history of systems sales volume in terms of the number of systems and sales values for the last 5 years.
- What is the level of participation of minority and women-owned business partners?

6.7.3 SERVICE AND SUPPORT
Service and support, both pre-installation and post installation, are of significant importance to the University. Pre-installation support includes external resources to help with implementation. Post-installation support includes release management, timeliness, ease of installation and support, the ability to migrate customized modifications, and migration to new technologies.

<table>
<thead>
<tr>
<th>What onsite support resources are available? What off-site resources are available? Include number of people, qualifications and number of site-days.</th>
<th>Implementation</th>
<th>Post-Implementation</th>
</tr>
</thead>
</table>
b. What are the channels for obtaining the resources (e.g. from the vendor or through consultants)? What is the vendor involvement if external resources are recommended?

c. Describe the level of expertise of the resources in the areas of knowledge of best practices of the package, technical expertise, functional expertise, and prior successful implementations.

d. Describe the functional, technical and operational documentation provided with the system. Please provide samples.

e. Will the vendor supply the functional and technical training? Will it be on or off-site? Describe the training.

6.7.4 SYSTEM UPDATE PROCEDURES AND SUPPORT ISSUES

- Describe the tools and procedures used by other customers to migrate to future releases.
- Describe the procedures in place to complete system modifications mandated by state and federal organizations.
- Describe the resources and procedures available to University staff to resolve technical difficulties. Include escalation, prioritization and communications methods.
- Describe the mechanisms in place to handle product enhancement requests.
- Describe user group meetings and other user communication strategies.

7 FUNDING PLAN

7.1 CONSIDERATIONS

In talking with other comparable universities we have learned the total funding required to implement a system capable of handling the computing needs of UAB is between $30,000,000 to $60,000,000 spread over five to six years (see Appendix A). To a large degree the total cost for UAB will be determined by the participating entities. For example, if the UAB Health System (University Hospital, Health Services Foundation, Triton, Prime Care) were not a participant in this Administrative Resource Management System that would significantly lower the purchasing price of the system. At the very least, it is critical from the outset that we determine who the participating entities are in this project. The Eye Foundation Hospital has already committed and the Health Services Foundation is in the process of committing to independent financial systems. Their human resource application options are open at this time. The UAB Health System is preparing a strategic computing plan to be completed in September 1998. It is our recommendation that the Health System strategic plan be incorporated into these Administrative Resource Management (ARM) system requirements and specifications. We must plan together to begin integrating information for the enterprise.

Of the $30,000,000 to $60,000,000 price, approximately one-third of this expense will be for new hardware and software and the balance is attributed to implementation costs. Those costs include 1) training time, 2) external implementation support and 3) internal implementation support (release time for UAB employees to work on the project).
Initial (Year 0) funding considerations are:

1. Software License Fees
2. Hardware Costs (Net; assuming trade in of existing equipment)
3. Implementation Support (External)
4. Implementation Support (Internal, as defined above)
5. Training (End User and IS)
6. Install at remote sites (Huntsville, Selma and Montgomery assuming UAB Health System participation)

Ongoing Expenses (Year 1):

1. Processing Costs (hardware maintenance plus network costs)
2. Support Costs (Client/Server support costs)
3. Systems Development Costs (Enhancements)
4. On-Going End-User Training
5. Depreciation on equipment?

Ongoing Expenses (Years 2-5):

1. Annual Software Maintenance Fee (best data indicates this should be about 18% of software license fee)
2. Processing Costs
3. Support Costs
4. Systems Development Costs
5. On-Going End-User Training
6. Depreciation on equipment?

One possible implementation scenario has been outlined in the following table. Estimated prices for the modules noted in years 0 – 2 are based on UAB Enrollment (FTE) of 12,022, Employees 15,833 and a Budget of $1.04 billion. Costs for years 3-5 do not include estimates for new components software vendors may develop such as a Space Management component.

Please note, for purposes of the following estimate we have elected to include 6 years of pre-paid support along with the Software License Fee in the year a particular component is added. Information we have reviewed indicates vendors often provide a significant discount on this expense for pre-payment and allow us to lock in support at a fixed percentage of the license fee at the time of purchase (typically, 18%). Technically, support does not begin until the year after the component is added.

One additional note about this estimate has to do with what is included in each of the components. In the Financial component we would expect the following sub-components: General Ledger, Accounts Payable, Accounts Receivable, Asset Management, Purchasing, Budgets, Inventory, Project Costing, Sponsored Research Management and Billing. The Student Administration component includes: Admissions, Student Records, Student Financials, Financial Aid, Academic Advisement and other vendor specific Student Administration sub components. The Human Resource Management component includes sub components that handle: Human Resources, Payroll, Benefits, Time and Labor and Flexible Spending Administration.

Table 8 Cost Estimate Scenario
### Year 0

| Financials Management System | $1,950,000  
| Software License Fee (Fin.) | $1,755,000  
| Hardware and Database Costs | $10,000,000  
| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| Costs for Remote Sites | $1,000,000  
| **Total Year 0 Est. Costs** | **$20,504,999**

### Year 1

| Student System | $900,000  
| Software License Fee (Student) | $810,000  
| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| **Total Year 1 Est. Costs** | **$7,509,999**

### Year 2

| HRM System | $1,650,000  
| Software License Fee (HRM) | $1,485,000  
| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| **Total Year 2 Est. Costs** | **$8,934,999**

### Year 3

| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| **Total Year 3 Est. Costs** | **$5,799,999**

### Year 4

| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| **Total Year 4 Est. Costs** | **$5,799,999**

### Year 5

| Implementation Support (Ext.) | $1,933,333  
| Implementation Support (Int.) | $1,933,333  
| Training | $1,933,333  
| **Total Year 5 Est. Costs** | **$5,799,999**

The sum of each of the estimates for years 0-5 in the table above totals $54,349,994. Given experiences of other similar institutions this number falls within the planning range. The committee that compiled this report strongly believes UAB can avoid some of the more costly mistakes other Universities have made and that our actual costs will be less.

### 7.2 Funding Sources

Funds for the initial hardware and software purchase could come from one of two sources. The first option is bond funding. The second is to place an internal assessment on the participating units. Funds for non-hardware and non-software expenses are not allowable for a bond issue. As such, funds for software maintenance fees, processing costs, support costs, systems development costs, on-going end-user training and equipment depreciation will have to derive from a combination of internal assessments and departmental operating budgets.
## APPENDIX A: CLIENT/SERVER IMPLEMENTATION BUDGETS FROM SELECTED INSTITUTIONS

<table>
<thead>
<tr>
<th>Institution</th>
<th>Budget Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell</td>
<td>$31M (external costs for all 3 core systems, $60M with internal labor)</td>
</tr>
<tr>
<td>Emory</td>
<td>$17M (external costs for Human Resources and student) *</td>
</tr>
<tr>
<td>Ohio state</td>
<td>$29M (external costs for Human Resources and finance only, $52.5M with internal labor)</td>
</tr>
<tr>
<td>U Michigan</td>
<td>$30M (external costs for all 3 systems, $75M with internal labor and cost overruns)</td>
</tr>
<tr>
<td>U Penn</td>
<td>$10M (external costs for finance only)</td>
</tr>
<tr>
<td>Vanderbilt</td>
<td>$22M (external costs for all 3 core systems) *</td>
</tr>
<tr>
<td>Duke</td>
<td>$18M (external costs, procurement and student only) *</td>
</tr>
<tr>
<td>Georgetown</td>
<td>$14M (external costs for finance and admissions only) *</td>
</tr>
<tr>
<td>Yale</td>
<td>$30M (external costs for all 3 core systems)</td>
</tr>
<tr>
<td>U Minnesota</td>
<td>$40M (external costs for Human Resources and student, includes $ to backfill project staff duties in operating departments)</td>
</tr>
<tr>
<td>U Utah</td>
<td>$19M (external costs for all 3 systems and growing for additional consulting)</td>
</tr>
</tbody>
</table>

* = Early in implementation phase and don’t know full costs
APPENDIX B: CASE FOR CHANGE NARRATIVES

The following narratives describe real peoples’ need for change.

B.1 MS. MARY BETH ADAMS, ASSISTANT DIRECTOR, INSTITUTIONAL RESEARCH

UAB’s Institutional Research Department is responsible for reporting and analyzing student-related data for various state and federal agencies as well as University administrators and decision-makers. The department’s primary information resources are the centrally supported student information system, STARS, and the independent student systems of the first professional programs (MD, DMD, and OD). As requests for information grow more frequent and complex, the problems resulting from depending on data from multiple sources, some of it in hard copy, grow more severe.

First professional data is not integrated with the rest of the student data and is provided on paper reports. This causes several complications. First, Institutional Research is unable to access replicable data from the first professional systems. The information UAB submits to ACHE is subject to audit, and should that happen, the first professional programs would have to duplicate and substantiate the data previously provided. Second, it is difficult to provide trend data for data elements not included on the first professional school reports. Often this data is available but adding it to the manual reports can take several weeks. Finally, although all offices work to prevent such an occurrence, it is impossible to be certain that first professional students are not double counted if they enroll in a course outside their program.

In a time in which most processes are being streamlined for efficiency, Institutional Research is operating in circumstances which grow increasingly inefficient with the amount of information they are called upon to provide. Ideally, all UAB students, regardless of program, will be on a single system making it possible for all users to have access to timely, consistent, integrated information.

B.2 MS. PHYLLIS AVERYT, FINANCIAL MANAGER, UAB HEALTH SYSTEM

The office of the Director of Health System Finance prepares semi-annual Funds Flow reports that provide financial snapshots for the clinical departments. These reports are used for a variety of analyses, including ratio analysis which may be used to compare department to department, measure their strengths, revenue generation, track trends, and benchmark them against MGMA standards and other academic institutions.

Multiple sources of data are used to prepare the All-Funds statements, including but not limited to: the University and Foundation financial systems, the Hospital TSI system (cost accounting system), VA data from clinical departments, VA-IPA data from University Grants & Contracts Admin, Deans’ allocations from SOM Dean's Office, faculty data from the Human Resources system and the Medical Education Information System, Hospital schedule of transfers, and MGMA reports.

Funds Flow Reports give a complete picture of the clinical departments and provide information for decision making, but producing them is tremendously tedious and labor intensive and takes two months of manual effort. Then, the validation process takes place with the department administrators. The systems that contain the data don’t define or relate the data in the same manner. They provide data in different formats and record it inconsistently across departments. The principles that provide consistency, determine how the data is validated and how it maps to the reports, is largely dependent on a few people’s knowledge of the statements, not automated in the systems that produce the data.
Last year, UAB started working with the University Health System Consortium and 5 other academic medical centers who are implementing similar Funds Flow reporting process. The consultants (E&Y) who worked with UAB to develop the initial process are working with the other institutions to ensure that data are collected and presented consistently. The consortium participants can now compare clinical and research revenue and costs per physician by department. The list of institutions will expand to 14 next year, which will increase the benchmark data.

UAB Health Systems is extending the Funds Flow process to the Basic Sciences Departments and plans to prepare the Funds Flow statements on a divisional basis for the Department of Medicine.

Due to the extremely labor intensive nature of the process, the University must work toward an automated infrastructure that supports this valuable process. The key is to have application systems that contain data that mean the same thing across all areas of the enterprise and allow easy extraction of information for analysis. We must be able to automate business rules for data consistency and aggregation so that the reporting is replicable and not dependent on the person(s) that produces it.

B.3 MS. STELLA COCORIS, REGISTRAR, UNDERGRADUATE ADMISSIONS AND ENROLLMENT MANAGEMENT

The President has pledged to build undergraduate enrollment to 22,000 over the next few years with students from Alabama and its neighboring states. Building enrollment involves tracking prospective students throughout the recruitment process, managing the documentation of those who apply, and maintaining vital information on those who enroll. Enrollment Management will have difficulty handling the increased prospect, applicant and student volume inherent in the new campaign with existing administrative systems.

UAB builds its prospect pool from many sources, including agencies, award programs, SAT and ACT databases, high school lists, and personal contacts. Extending recruitment to new states means more contact sources to manage. Currently, admissions staff spends an inordinate amount of time interacting with multiple computer systems. A list of prospect names may be processed by as many as three separate systems to “scrub” the list, record contacts, and prepare correspondence. Another disadvantage of the existing systems is our inability to analyze effectively the types of sources and contacts that are most likely to yield new enrollments. If the prospect pool were managed more effectively and efficiently, admissions staff would have more time to spend in personal contacts with prospective students.

Once students apply, processing their applications currently requires considerable manual effort. Applicants apply using only paper documents. They receive routine communications through mass-produced letters signed and stuffed into envelopes by student assistants. Counselors contact applicants with missing documents via more correspondence that is manipulated by multiple computer systems. A fully integrated student information system would incorporate electronic data interchange (EDI), allowing us to eliminate the time-consuming process of manually posting the academic record of each applicant. In addition, it would build in utilization of desktop word processing products to handle correspondence and sign letters, track contact successes, capture counseling notes, use the web for applications and provide data to tele-counseling systems for contacting students with application errors.

In order for UAB to achieve its enrollment goals, student recruitment must be complemented by retention efforts to maintain enrollment. Students currently encounter multiple problems that affect their retention, including oversubscribed classes, the inability to plan and register for future terms, enrollment in classes for which they are not prepared, and being shut out of classes they need to graduate. Features such as prerequisite checking, wait listing for closed classes and multi-term registration are standard in integrated student applications.
Some of the desired features described above could be built into our existing applications at considerable expense in time and effort, but they would not take advantage of the automated workflow and business rule definitions that newer systems provide. Integrated student applications start with best recruitment and retention practices and provide a new framework on which to build.

It is unlikely that UAB will reach a decision to proceed with new systems soon enough to help with our immediate recruitment and applicant processing needs. Enrollment Management may have to proceed with an interim solution to address the recruitment initiatives directed by the President and is currently investigating systems on the market.

**B.4 DR. DAVE CORLISS, DIRECTOR INFORMATION SERVICES, SCHOOL OF OPTOMETRY**

While the graduate school and all of the professional schools use procedures for admissions and enrollment management that have much in common with those used for undergraduate students, they have all developed their own in-house Student Information Systems to meet their particular needs such as integrating clinical and class schedules and interfacing with centralized application services. Each system, in turn, provides information to the University's central system for financial aid determination, billing, and official transcript generation. The in-house systems are antiquated and suffer from the same problems as the University system: e.g. inability to access information, non user-friendly interfaces, and inability to be easily modified and in some cases year 2000 incompatibilities. This has resulted in duplication of data in multiple database programs and, hence, duplication of effort, the potential for error, and inefficiency.

Faced with urgent problems, the School of Optometry recently purchased a client/server application from Applied Business Technologies (ABT) at a cost of $140,000 that will require 6-8 months to implement. There were two major reasons why the decision to purchase decision was made instead of joining the existing University system. First, since user complaints about the school's and the University’s existing systems stem from the inherent nature of the technology, not the implementation of the technology, there was little to gain from moving Optometry's operations to the University system. The second reason was that Optometry feared that its specific needs would be in a queue along with everyone else’s. Given the small number of applicants and students in the program, Optometry assumed that the payoff to University as whole would be higher if the computer center concentrated on undergraduate program issues. The issues of support and the need for action due to year 2000 constraints loomed large in the decision.

Optometry's concerns about participating in an enterprise-wide system are shared many other areas of the University. The school's decision to purchase its own system is also an example of the cost of not taking action on an enterprise-wide system. Optometry will invest a lot of people resources in its new system. These personnel will develop a sense of ownership and personal investment that will be difficult to transfer to the new University system that follows. Optometry views its solution as an interim one if the University implements an enterprise solution that provides value added over Optometry's new system and allows sufficient internal control over those things that are unique to Optometry's program. If the enterprise client/server systems provide what they promise, these two criteria should be easily met. But the school's internal motivation to participate will be lost.

**B.5 MR. DOUG EDGETON, ASSOCIATE DEAN FOR ADMINISTRATION AND FINANCE, SCHOOL OF MEDICINE**

The School of Medicine reports to many administrative units. These reporting relationships include but are not limited to the following: University Administration, the UAB Health System, University Hospital, the Health Services Foundation and the VA. Each of these entities utilizes different financial languages and manages information with independent financial systems that do not relate to similar data in the same way.
For example, in order to evaluate revenue it is necessary to gather data from each entity and interpret what each means with regard to financial terms such as “income.” In other cases, clinical departments must tie together principle investigator, grant dollars, research and other support space and grant related expenses to make management decisions about the financial viability of programs, projects and in some cases investigators. A great deal of this information is managed by independent systems that do not relate the data in a common format. To determine that Dr. XYZ has 3204 square feet of space, uses 30% of it for research activities, has expenses of $16,656 and brings in $46,000 in “income” requires departments to spend a considerable amount of time coordinating information from current best of breed systems. Space information is updated only once a year. Human Resources information on faculty appointments and degrees is not electronically up to date. Electronic images of CV’s are not a part of the current Human Resources system and in many cases are kept in incompatible departmental paper filing systems.

Preparation of the annual budget is another complicated process faced by departments in the medical school. Clinical departments prepare five budgets, one for the University through the SOM, one for the Hospital, one for the HSF, an “All Funds” Budget for the UAB Health System and a separate salary summary schedule for the Provost. Each entity requires similar information in different formats and time frames. The University budget is prepared in May-June, the Hospital budget is usually prepared in the April-May, the HSF budget is usually prepared in August-September, the “All Funds” budget is prepared in May-June-July and the Provost salary spreadsheet is prepared in July-August. Much of this work is prepared in advance of two major grant award dates. We receive a significant number of grant awards in July and October and thus departments that depend heavily on research funding are at a disadvantage in predicting their funding for the next fiscal year during most of our budget period(s).

We believe that integrated systems that are easily updated and relate different types of data to common entities will lower departmental costs and provide timely information for decisions. Further, we feel an enterprise wide system containing integrated information that spans all entities will be more accurate, easy to access, provide a base from which to collapse our multiple time frames into one and save time and effort in the departments. If we are to lower costs at the department level we must be able to do similar tasks once instead of four or five times.

B.6 DR. WARD HAARBAUER, ASSOCIATE DEAN AND PROFESSOR,
SCHOOL OF ARTS AND HUMANITIES

The existing Human Resources, Financial and Student systems are hard to learn and encourage errors because they are driven by obscure codes that cause frustration for infrequent users who have to use or reconcile data across the systems. The systems use similar but different identification attributes such as school, division, executive level and affiliation codes to cross-reference departmental information. Contradictions are easy to cause and hard to discover. Departments waste a lot of time trying to fix them. Department efforts are made more difficult because the systems use codes instead of words to access the information. Faculty must remember that "40" means "summer term" to enter or look up current information. This makes it hard to train new people.

The existing systems don't track all information needed to advise students. Departments spend an excessive amount of time advising because there are no automated records of fulfilled requirements. Both faculty and advisors advise students. All keep manual records that they hand back and forth. This often results in missing information, students being advised differently on the same requirement and students becoming frustrated by errors and inconsistencies.

There are a range of frustrations, problems and oddities in the current systems that could be fixed but probably won't be because of the time and effort involved for such a large number of low payback items to have a cumulative effect. Newer integrated systems start at a high level of ease of use and incorporate
current student and business practices such as advising and common organizational definitions. The departments will be motivated to make new systems work that make daily life better and information more available and usable. New systems will allow them to think about things they can't think of now because of the frustrations and time it takes to do business.

B.7 MS. DENISE HAMILTON, DIRECTOR, AND MS. DEDE MOORE, MANAGER, UAB HOSPITAL FINANCIAL MANAGEMENT OFFICE

The current University financial system is based on fund accounting and doesn't fit well with hospital accrual-based accounting needs. New systems must allow the Hospital to operate like other hospitals, the University to operate under University and state rules, and pull data together where needed.

The hospital's monthly financial statements are prepared manually from multiple reports provided by the University financial system, worksheets from General Accounting and Equipment Accounting, and online lookups of audit adjustments. Specific totals are picked out of 100 page reports. Timing problems with audit adjustments cause manual calculations. The adjustments are booked in an artificial ledger (ledger 9) and not directly against the affected accounts, are left open for several months after the fiscal year end, and are not reflected in departmental financial statements. Many of the rules for preparing the monthly hospital statements reside in the heads of two people and not in documented, automated business rules.

The hospital prepares University budgets to satisfy state requirements. After budgets are entered in the University's modeling system, they are downloaded to the Hospital TSI system. The TSI system provides the capability to flex the fixed University budgets based on actual patient volumes. The hospital uses the flexed budgets to monitor financial performance by cost center instead of the University budget. The hospital has to budget and report in two ways, one to manage functionally by operating department (e.g. pharmacy, administration) and the other to reflect the service lines that manage patients (e.g. Cardiology in Surgery). It uses the TSI reports for both areas. University reports are not used for budget comparisons. The Hospital Financial Management Office spends a lot of time reconciling and tying hospital and University data together. New systems that provide consolidation of financial information into one automated monthly statement, book year end adjustments against actual accounts and allow more flexible rule definitions to address business entity needs will simplify management reporting and make it more reproducible and accurate.

B.8 MS. ALESIA JONES, MANAGER AND MR. ROGER MCCULLOUGH, DIVISION DIRECTOR, HUMAN RESOURCES MANAGEMENT COMPENSATION

UAB's Human Resources Management Compensation Department is responding creatively to high employment rates and shortages of workers with critical skills in the Birmingham area. These creative solutions have included new compensation structures and new ways to assess worker skills in relation to job titles. However, the existing Human Resources system (HURS) is unable to completely handle any of the new structures.

When HURS was implemented in the early 1980's, UAB had one compensation structure. In the past five years we've added 4 new structures; research broadbands, senior administrator broadbands, modified broadbands that span at least 3 grades, a 4 step job rate structure for Facilities, and are currently developing an information technology broadband that will relate skills assessments to position in the band. Much of the supporting information is tracked manually and is not available to departments who use the online Human Resources files to respond to employee and legal inquiries.
The Health System is one important area that illustrates these issues. It has several patient care pay tracks for nurses and patient care technicians that are market driven. The hospital has historically positioned itself at no lower than third in the local market. The minimum salary changes frequently for these 2000 people. The current system cannot make mass change and departments must submit paperwork or electronic turnaround documents to accomplish these changes. Minimum wage changes affect an equal number of people and are processed similarly. The current system was designed for simpler times and is not flexible enough to respond to rapidly changing methods of compensation.

Fixed increment payments (FIPs), incentive pay eligibility, incentive pay and HSF funding are tracked manually by Human Resources. Departments and administrators must remember that the salary that displays on HURS does not reflect these additional amounts. This information often comes into play in legal depositions. Human Resources must manually adjust computer-generated reports that support UAB testimony. The knowledge of our compensation rules is contained in people's heads, not in business rules that are supported by information systems. The University is at risk from turnover and retirement in these areas.

B.9 MR. REID JONES, EXECUTIVE ADMINISTRATOR, MS. CHERYL COLBERT, FINANCIAL OFFICER, MS. PAM HOLTKAMP, FINANCIAL OFFICER, DEPARTMENT OF SURGERY

The Department of Surgery must look at its total economic picture across multiple entities of the University, the Health System, and the VA. Relating data from the different entities is like dealing with apples and oranges - it is similar but different. The department is spending an inordinate amount of time making it fit together.

The Foundation system provides financial information by physician; the University financial system doesn't have this critical capability. The University system allows Surgery to do cost funding and detailed analysis of financial data that it can't do with the Foundation application. Financial officers spend several days each month reconciling data. Many departments use Priority Software to tie together financial, space and grant data for grant management. New applications must include this critical component if they are to replace this software. New applications must also be able to support the different business requirements of the University and hospital entities. They must provide tools that let each entity take advantage of the best practices of its particular line of business as well as provide for shared core services and information. They must allow each area to do its business well, instead of all to do it mediocrely.

Neither existing financial or human resource system has strong ad-hoc reporting capabilities. A key feature of new applications must be easy-to-use management reporting tools that allow data aggregation at many different levels and easy integration of planning data into the production environment once it is approved. For example, the department must look at funding sources by person by division, evaluate where people fall within their ranges and plan salary increases accordingly. New systems must make it easy to do the analysis and use the approved results to automatically apply salary increases to the affected areas.

B.10 DR. AL LOBUGLIO, DIRECTOR, COMPREHENSIVE CANCER CENTER

The deans of our colleges are responsible for decision-making regarding space, budget, recruitment, etc. at the request of department chairs, center directors, and internal planners. Deans must have accurate management information to evaluate the requests. The basic information needed to manage research support services is grant funded dollars, space for research, direct costs and indirect expense recovery dollars. The infrastructure support pieces that provide this information operate independently and report to different vice presidents. Historically, each built data systems to satisfy the internal and external reporting demands of their respective VPs, not to manage resources or provide data to various University components. Research departments spend large amounts of money on shadow systems that reconcile inconsistencies and tie together
information from the independent systems into one related data set. If new systems are able to provide departments with information that relates research dollars to research space, state dollars to space used for education and hospital dollars to service components, they will eliminate the need for shadow systems.

Space Management provides total square footage by type of use to the state and for indirect cost reporting purposes. Utility costs are allocated based on space data. In the past, the administrative assistants, research assistants and clerical staff who filled out space utilization reports decided what administrative units the user faculty member represented. This produced inconsistencies and inaccuracies. The Office of Grants and Contracts Administration keeps up with grants awarded and dollars promised. They group grants by responsible department based on information provided by the administrator who submits the grant. The Finance department collects dollars as they come into the University. In the past, Finance credited grants to the department administrative entity reported to be fiscally responsible for the grant, a process that allowed multiple grants for the same faculty member to be assigned to different departments or other entities.

Over the last three years, the School of Medicine Research Advisory Committee and, more recently, the Indirect Expense Recovery Committee has reevaluated the allocation process and produced a new schema for assigning infrastructure components based on the departmental structure of the University. Thus, space is identified by the occupant and his/her department, grants and IER are credited to the department of the Principal Investigator, and expenses are distributed to the departments based on the space used by the faculty of the department. Costs are based not on how much space a department like Microbiology has assigned but on how much space Microbiology faculty use for research. Grants Administration, Space Management and Finance are working with the committee to eliminate inconsistencies, utilize the new mechanism and provide more accurate information for the shadow systems. When this is accomplished, deans will have real data to ask questions about how space is used and to hold researchers accountable for the cost of their research.

Changing business processes using the current unrelated systems is difficult and time consuming. The changes to the new schema began over a year ago and are not yet complete. Newer, integrated applications relate different types of data across the institutional structure, making it easier to tie together information managed by multiple areas. They also take advantage of integration tools that allow systems to be changed quickly to address new business needs.

B.11 DR. JAY MCDONALD, PROFESSOR AND CHAIR, PATHOLOGY

The Department of Pathology handles much of the administrative work for its faculty and PI's because of the difficulties many of them have dealing with administrative applications. Marcia Weiss and Lynn Rodin spend most of their time buffering PI's and faculty from grants administration, human resource, budgeting and accounting interfaces. Pathology has set up shadow systems to make things easier for the PI's. If existing central services offered options to provide necessary information, much of the administrative overhead and shadow systems wouldn't be needed.

Because of the problems coordinating information in the current systems, it will be difficult to build trust in new systems. The University must work with key users like Marcia and Lynn to define what is needed. New systems must have the flexibility to allow departments to meet individual requirements as well as provide information needed centrally. We must prototype new systems in high profile departments that have shadow systems and get their testimonials about the value added. Investigators will adopt new systems if they see new capabilities that allow them to work more effectively and produce savings in time. If the President takes a leadership role in the project, gets the support of the deans and undertakes a campaign to involve people at various levels of the University, departments throughout the University will participate.

B.12 MS. DIANE MOXLEY, BUSINESS OFFICER, CELL BIOLOGY
The Joint Health Sciences received over $42 million in grants in 1996. Grants are awarded to a Principle Investigator (PI) who has a primary affiliation with a particular department such as Cell Biology. The grant dollars are split into program projects headed by sub investigators who collaborate across several departments. This is a part of the overall University strategy to give departments more responsibility for operations and decisions. Unfortunately, the limitations of the existing financial systems artificially push decision-making back up to the dean's office.

Our current financial system does not allow individual projects within a larger Program Project Grant to be affiliated with the department of the sub-investigator. All of the projects are affiliated with the department of the PI. As a result of this action, the PI gets credit for the total direct and indirect costs of the entire grant. The sub-investigators need to have their portion of the larger grant affiliated with their own department for two important reasons. JHS departments are participating in the "all funds budget" that reports how much direct and indirect cost each department's faculty generate each year and calculates the faculty "productivity ratio." Secondly, indirect cost recovery dollars are now returned to the departments by the School of Medicine. The school must perform manual calculations to determine how much to distribute to each department because the sub-grants are not affiliated with each sub investigator.

Our central financial systems show Cell Biology with $5 million in grants; however, the true amount is $3.5 million because of associated program projects in other departments. When a multi-project grant is affiliated with a PI's department, the sub-investigator and his financial staff cannot view the on-line financial data. Requisitions for multi-project grants must be processed through the dean's office instead of by the responsible sub investigators. Sub investigators must be able to access financial information about the status of the dollars for which they are accountable to make research decisions, but this information is available only to the PI.

UAB's financial systems were implemented in the late 1980's when UAB had less than $50 million total grant dollars and controls were more centralized. The University has changed its business processes to be more responsive to the departments but these processes are not reflected in the systems that support them. This results in inaccurate information for decision-making and extra work at the department level to track the financial implications of research.

B.13 MR. STEVE PICKETT, CHIEF FINANCIAL OFFICER, HEALTH SERVICES FOUNDATION

The Foundation's (HSF) major cross-system information needs are concentrated in the departments rather than at the central HSF level. Departments are trying to grapple with information from the HSF, University and school information systems. Currently this requires huge manual effort. A lot of information is gathered however it is hard to access it. New systems must be able to easily bridge information across systems where it is needed.

During the budgeting process, if department A adds a physician, the costs are allocated between the School of Medicine and HSF. The Foundation estimates the grant dollars and practice revenue the physician will produce and makes a contribution through the clinical side to UAB for a portion of his salary. Under the current Financial and Human Resources systems, it is difficult to determine how much of a physician's time is used for teaching, research, administration and clinical practice. New systems must make it easier to track this data and to add new categories as business practices dictate.

The Health System requires combined Hospital and HSF entity information for multiple financial analyses. The Hospital provides strategic and marketing perspectives such as service line costs and patient demographic data. There are a number of other systems that provide key information that are either homegrown or unsupported by vendors and depend on a small number of people to sustain them. These
systems are vulnerable to various business risks. As we implement new systems, we must take advantage of
the best practices inherent within them and not modify them to the extent that we lose the ability to utilize
future vendor support.

B.14 MR. RICHARD TELKAMP, CFO/COO, UAB HEALTH SYSTEM

The Health System corporate offices must be able to pull together financial and human resource data across
all Health System entities, including those that are integral parts of the University. Currently this is difficult to
accomplish because many of the entities run different financial systems and operate under different policies.

The Foundation handles the bulk of the non-hospital health services computing activity. The Health System
is beginning a strategic planning effort to look at new systems for insurance, clinics and foundations that
consolidate information and satisfy Health System needs. The University has different needs. The Hospital
must fit in with both the Health System and the University. Common applications from the same vendor may
be the answer if they can be run separately for some Health System needs, together for others like fixed
assets, and can share information easily between the two.

The Hospital and Medical Center perform some time-consuming financial reporting and budgeting activities
solely to fulfill state requirements. As we work together to define new business processes to take advantage of
new systems, we must spend time defining why we are doing things and how we might do them more
efficiently. Coordinated planning on the front end as we look at new systems will make it easier for all areas
to support common activities and accommodate state and federal reporting needs.

B.15 DR. MICHAEL WYSS, PROFESSOR, CELL BIOLOGY, BASIC SCIENCES
ADVISORY COMMITTEE

UAB's existing administrative systems encourage paperwork and don't provide information departments need
to track the status of work in progress. This prevents efficient use of faculty and staff time.

UAB depends on paper in important business areas that are minimally computerized. Receiving has no
automated system to enter receipts. Items sometimes get delivered to the wrong area or sit in Receiving
because the delivery information is incorrect and Receiving can't match the item to an order. UAB practices
"negative receiving" in which departments prevent payments to vendors by reviewing paper reports and
notifying Accounts Payable if they haven't received an item. Departments can't track purchase orders from
requisition through receipt and may disallow payment for items that are somewhere at UAB. Newer systems
allow bar-coded entry of receipts and automated tracking of orders and items throughout the system.

Existing administrative systems don't share common information. The Effort Report illustrates these
incompatibilities. Departments provide detail on the amount of effort spent of research and educational
activities through paperwork that is hand carried to various offices and duplicates information provided to
the grants, human resource and student systems. Because the systems don't work together, we waste time
worrying about how to accommodate the differences. Faculty will support new systems that make it easier for
them to devote time to research and teaching.