INFORMATION TECHNOLOGY ROADMAP

A pathway for ensuring the campuses and institutes realize cost savings by giving them control over the central IT organization’s direction.
University of Tennessee Information Technology Roadmap

Executive Overview

The economic problems around the world have reached the State of Tennessee and the University of Tennessee. Because of the depressed economy, planned budget cuts for The University of Tennessee exceeded $66 million for FY 2009. However, the stimulus package has delayed these cuts until FY 2011. This delay has bought the university two years to plan for the budget reduction.

Information technology at The University of Tennessee is distributed across all campuses and institutes and in many departments. The total expenditures for IT are estimated at $87 million while The Gartner Group has suggested an average budget percentage for IT of approximately 4.3% of the total UT budget or about $69 million. Therefore, the university may be able to reduce IT costs by roughly $18 million, a significant portion of the proposed budget cuts.

It is important that IT do the right things and do them effectively and efficiently. Therefore, IT cost reductions should strategically focus on the elimination of duplicative services rather than unilateral IT budget cuts. Information technology duplication cannot easily be reduced without significant changes to how IT operates. To achieve these goals and realize any fraction of the potential $18 million savings by FY 2011, the following changes will be needed:

1. IT needs to be customer directed. This will require that customers be more engaged in decisions about what services are provided by the central IT organizations. This also necessitates a more transparent IT organization where customers will know service costs, constraints and other service issues.

2. IT needs to be more consistent. This will require that IT develops and follows standards that address technology and internal procedures. Having standards will allow IT to share service delivery and support more effectively. Service quality will improve.

3. UT needs to stop paying for the same thing more than once. This will require that the many duplicative IT services provided across the university be eliminated. Such standardization will result in significant cost reductions.

These steps are critical for IT to achieve the cost savings required to meet impending budget constraints. In addition, these changes will position IT to provide better, continuously improving services.

The objective of this plan is to lay a pathway for the campuses and institutes to realize cost savings by giving them control over the central IT organization’s direction.
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Introduction

Recent national economic problems severely affected the state of Tennessee’s revenue base, which is used to fund higher education. The state’s funding for Fiscal Year 2009 is $1.304 billion. According to The Nashville Tennessean, the US Government’s stimulus package will allow the state to fund higher education at $1.315 billion for FY 2010 and FY 2011, but when the stimulus program ends in FY 2012, the funding will drop to $1.062 billion.

This funding cut projected for FY 2012 has forced the university to make some very difficult decisions. All areas of the university face the question: how to continue achieving a high level of service with less money? Many areas are considering eliminating some services while also looking to reduce spending on remaining services. IT must reduce costs while supporting the rest of the university in their efforts to be more efficient. Plans are underway to position the Office of Information Technology (OIT) to better serve the university for less money.

This report describes the highlights of these plans. It gives an overview of the current situation and provides IT’s roadmap for changes that will improve services while reducing costs. It explains internal changes in OIT that will create a customer-driven service model and allow departments to realize savings. This report also details existing OIT projects and the strategic services that OIT provides. It provides information about the governance advisory board and human capital planning.

Current Situation

According to a 2009 Gartner research report on IT spending in education, the cost of IT averages about 4.3% of an organization’s total revenue. Based on this average the University of Tennessee would spend about $69M for IT.

A 2009 IT study, conducted by OIT, of FY 2008 expenditures showed that the University of Tennessee spent an estimated $87M for IT, or about 5.4% of the total university revenue. More detailed information on IT expenditures can be found in the chart below and in Appendix A.

When compared with the Gartner baseline, the university’s IT costs are an estimated $18 million higher than average.

The 2009 OIT study identified significant areas of duplicative services, and their associated costs, which are believed to be the primary reason for the above average IT cost. These duplicative service costs are the result of central IT services often not meeting customer needs. Over time this has resulted in a distributed IT environment where similar services and support personnel are funded multiple times.
For example, in many cases departments run their own email service, while every campus provides a centralized campus email service. When asked why the campuses and academic departments have chosen to expend their limited resources on something as non-strategic as running an email server, they consistently reply that the central organization has historically not provided the level of service or ability for each unit to tailor the service to their requirements.

The 2009 OIT study, based on human resource data, also found that approximately 30% of IT personnel are distributed outside of central IT organizations. The following list provides specific campus/institute details:

- At UTM, approximately 75 percent of IT is in the central organization.
- At UTC, approximately 70 percent of IT is in the central organization.
- At UTHSC, approximately 55 percent of IT is in the central organization.
- At UTK, approximately 45 percent of IT is in the central organization.
- At UTA, IPS, and UTSI, essentially all IT is managed by the designated IT organization.
- IT personnel are also scattered within the system-wide administration. Athletics, Development, Finance, Government, Public Relations, and Human Resources all have IT staff under various HR job titles.

Recognizing the need to provide services that align with customer needs, OIT conducted a self-assessment. The assessment identified several opportunities for improvement. This report presents OIT’s plan to provide continuous improvement and establish a customer-driven service model. UT’s campuses and academic departments will ultimately drive every aspect of the services OIT provides.

**The Roadmap**

The OIT organization’s new direction will be based on three guiding principles:

1. IT needs to be customer-directed by having its customers establish its direction.
2. IT needs to be more consistent by having all IT staff going in a similar direction.
3. UT should eliminate duplicative services by establishing a customer-driven core set of services to help customers eliminate duplicative services and reduce costs.

OIT will be making changes over the next three years to implement the philosophy outlined above. Each of the changes will be designed to establish consistent processes that will improve customer services while reducing costs.

**Principle 1: IT needs to be customer-directed**

OIT is reinventing itself to cut costs and improve customer relations and services. OIT now (the “as-is”), from the customer’s perspective, is like a mass of spaghetti: a tangled web of contact phone numbers, email addresses, websites, and processes. OIT operates 15 different email addresses and phone numbers for customers to report issues with IT services and ask questions. OIT’s future organization (the “to-be”) will provide a single point of contact for customers and a catalog of
customer-driven services. OIT is developing a service catalog that will define services and service costs, and will identify customers for every service provided. Having a list of current services will allow customers to be involved in determining which services to eliminate or enhance.

Currently, OIT is a vertical organization consisting of several departments, each with a director who reports to the CIO. Many of the departments are segmented into multiple groups headed by an IT manager. In the past, the CIO and/or directors owned projects and services. This vertical way of doing business fostered duplicative efforts inside of OIT, differing service delivery methods, an inconsistent technical architecture, and an organization that worked hard on many projects and services but did not always provide what customers wanted.

OIT’s new direction is toward a horizontal service organization guided by customers who drive the IT services. These customers, rather than the CIO or IT directors, will set the direction for IT. Such customer direction will help ensure that OIT is providing IT services that are strategic and meet the business and operating needs of UT. It will also allow IT to be more proactive instead of reactive.

OIT will designate Service Level Managers, who will work directly with specific customers, advocate for customer interests in OIT discussions, and develop Service Level Agreements (SLAs). Customers will have responsibility for setting their priorities for IT through the Service Level Manager. These customer priorities will drive every effort in OIT.

Service Level Managers will be independent from the OIT line organizations and will be evaluated based on customer input. OIT will also develop processes and standards that will support the improved delivery of services and allow the customers to see into the IT organization to understand the status of each service or project they are using.

**Principle 2: IT needs to be more consistent**

In order to have all IT staff going in a similar direction, OIT must define standard processes and service delivery methods. This will create an organization that runs more efficiently.

Following Enterprise Architecture standards, OIT will create a Technical Review Board (TRB) in 2009, resulting in an established, standardized direction for technologies used inside OIT. Staff will no longer independently select what technology is best for a project. OIT technologies will migrate slowly to the standard architecture, and having that architecture defined will facilitate better decisions and simplify the hodgepodge mix of hardware and software that is currently used.
The TRB will be in frequent communication with all IT across the university about the new processes and tools selected, but at this time, the standards will only be required in the central IT organization. IT units across all campuses and institutes will know OIT’s direction and decisions, and may adopt the standards as a way to save money. OIT customers will also benefit from a well-defined technology toolbox because OIT will make better decisions about solutions and be able to present solutions that are more accurately scoped and delivered on time.

**Principle 3: UT should eliminate duplicative services**

As a customer-driven organization, OIT will be able to provide IT services that meet the university’s needs. When departments understand that OIT can provide the services they need so their duplicative services can be eliminated, they will be able to realize efficiencies and reduce costs. There are many instances of duplicative services across the state. Each campus has many core services that are duplicated at other campuses and services that are duplicated within the campus itself.

For example, a recent survey to determine how many email services were active across the Knoxville campus identified over 100 email services available for use beyond the services offered by OIT. A follow-up survey found that many of those active services were not being managed. In some cases, the email service was inadvertently started, while in other cases, a previous IT administrator started the service and did not mention it upon leaving the department.

Among the email services being managed, some had limited functionality, such as being a send-only service used to notify when a system was down or to pass information from a web system that collected comments. Of the active email services found at UTK, over 25 were full-featured email systems in use by a group or department. Several services were managed by a faculty member or a graduate student. Others were managed by IT personnel in the college or department.

As a result of the survey, around 40 email services were removed or consolidated within the college or department. The removal of unmanaged email services is important because it reduces security risks by eliminating a common hacker target.

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**Timeline of Steps to Enact Principle 3 within OIT**

<table>
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<tr>
<th>Year</th>
<th>Steps</th>
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| 2008 | • Quantified scope of IT@UT  
       • Estimated at $87M and 785 people (641 FTEs not including students) |
| 2009 | • Establish list of central services from IT  
       • Customers establish ownership of IT services  
       • Document IT technical standards and security policies |
| 2010 | • Central IT services follow consistent standards  
       • Central IT services are “owned” by customers who establish direction  
       • Customers use central services to eliminate duplication and recognize cost savings |
| 2011 | • Minimal duplication of services across campuses and IT service providers  
       • More customers use central services to eliminate duplication and recognize cost savings  
       • IT@UT costs are reduced to industry average of 4.3% (~$69M) for 2012 |
These changes and improvements will give customers a clear pathway to understand that there is strategic value in having central IT provide their common IT services.

**Internal OIT Changes**

To help implement the new direction of focusing on customer-directed services, OIT will implement two industry standards: Enterprise Architecture and Information Technology Infrastructure Library.

**Enterprise Architecture**

Enterprise Architecture (EA) is a strategic information asset base. It defines a mission, the information and technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to changing mission needs. An EA includes a baseline architecture, target architecture, and a sequencing plan.

UT needs an Enterprise Architecture because information technology is constantly evolving. This evolution presents a significant challenge to information technology organizations around the world, and the University of Tennessee is no exception. The newest technologies can be enticing, but they can also be expensive. Using a wide variety of technologies requires support from additional people with unique expertise, on top of the cost of the technology itself. Changing technologies often introduce new technical problems, lowering the quality of the service and creating a drain on budgetary funds. An Enterprise Architecture will allow IT at the University of Tennessee to focus on services rather than technologies.

OIT will implement a Technical Review Board based on Enterprise Architecture standards. The board will move OIT to a consistent and standard technical environment. This will eliminate the use of redundant technologies and services, reducing hardware, software, and support costs.

**Information Technology Infrastructure Library**

Information Technology Infrastructure Library (ITIL) is an internationally-recognized set of standards and best practices for delivering IT services throughout an organization. (See Appendix B for a more detailed description of ITIL.) The ITIL framework defines a common vocabulary that IT organizations can use to help standardize service delivery. Two important terms within OIT’s implementation of ITIL are “Customer” and “End-User.”

- A **Customer** is a person who commissions, pays for, and owns the IT Services.
- An **End-User** is a person who uses the services on a day-to-day basis.

Implementing the ITIL standard will ensure that OIT has a focused and standard way of dealing with our Customers and End-Users. By using standards, OIT will move to a proven model that has been adopted by many IT organizations worldwide.

One module of the ITIL standard calls for the establishment of Service Level Managers. OIT will establish these positions to interact directly with our Customers. A Service Level Manager will be the primary OIT contact for a Customer and will be responsible for ensuring that the Customer’s service portfolio meets the Customer’s needs. The Service Level Manager will also be responsible for writing a Service Level Agreement between OIT and the Customer that defines in detail what services and support are available to the customer. This model ensures that OIT’s services and support are customer driven.

OIT will establish a Service Desk to provide a single point of contact between End-Users and
OIT. This single point of contact will give End-Users a simple and consistent way of contacting OIT to resolve any incident or problem they may be having with OIT services. The Service Desk will use a consistent method throughout the organization, based on the ITIL standard, to resolve incidents and restore the End-Users to normal service operation as quickly as possible.

OIT will use the ITIL standard to implement Change Management and Configuration Management. These two processes will ensure that standard methods are used when making all relevant technical changes to the IT environment and that any such changes are documented and added to the IT configuration model. Using Change Management and Configuration Management will reduce service failure and downtime.

**Existing IT Projects**

OIT must improve the way it does business while fulfilling existing responsibilities and providing numerous services that are used daily throughout the university. (See Appendix C for a list of many of these services.) These operational efforts take a large portion of OIT staff time, which constrains the time available to improve existing processes and implement new processes.

In addition to its existing services, OIT currently has several major projects underway. (See Appendix D for a more detailed table and timeline.) These projects are also a high priority for OIT and must stay on track. All the projects have statewide implications and are planned for implementation over the next couple years. These projects are all targeted at improving service and reducing cost to the university and fit well with OIT’s other efforts. As OIT migrates to a customer service organization, it will maintain its focus and effort on existing critical projects, which include the following:

**Banner**

Banner is a set of student information system software modules available from Sungard Corporation. It is widely used in higher education.

The Banner project is moving along quickly. Currently, effort is underway to prepare the infrastructure across the state to provide the hardware needed and to allow for more secure data communications. This effort should be complete by fall 2009. Detail planning and other preparation steps are also underway. To prepare staff for the new system, training is being delivered at each campus.

All the current effort is pointing toward a set of parallel implementations across the state, starting with the Chattanooga campus and the Health Science Center in Memphis. Both campuses will begin implementing the student admissions module this fall. The admissions module will be implemented in Knoxville in 2010. The Registration module will be implemented at all campuses in 2010. The Financial Aid module will be implemented at UTC and UTHSC in 2010 and at UTK in 2011. UT Martin will integrate their Banner system with the other campus systems in 2010.
TERA
TERA is the new statewide research administration system. It is based on the RAMSeS system from the University of North Carolina and is being adapted for use for the UT system. TERA plans are to have the Proposal Award module implemented on all campuses by the end of 2009. TERA modules that address animal care and human subject management will be implemented on some campuses this year, with the rest implemented in early 2010.

Security
The university's Information Technology Security Strategy (ITSS), adopted in 2007, identified key foundational and functional principles necessary for protecting the information and information systems of the institution. However, the strategy failed to deliver a cohesive plan that guides those responsible for implementation in focusing their energy and resources on the areas with the greatest return on investment.

In addition, the ITSS called for the creation of a program to develop policies and best practices to ensure that the university community has a standard methodology for IT security. To comply with this requirement, a series of best practices were developed internally and incorporated into the university’s existing policy framework. The processes for developing best practices, achieving statewide consensus, and maintaining the best practices, all in an environment of constant regulatory and technological change, have established the need for a more sustainable and strategic methodology for IT policies and best practices.

A new strategic direction is required to address the need for a sustainable security strategy based on national standards. This new strategy will focus first on areas where sensitive information exists, and will minimize productivity impacts and costs on machines that do not have sensitive information.

To achieve the greatest return and to establish a sustainable program, the university will adopt a risk-based security model that leverages standards based security controls. In the risk-based model, OIT and security managers will work with business units to identify the biggest threats to the business and then set priorities for security investments, based on well-established national standards.

Identity Management
A statewide Identity Management effort will seek to give all faculty, staff, and students a common identifier throughout the university system. Currently only UT Knoxville, UT Health Science Center and UT Space Institute are using a common identifier (NetID) that can be used to access statewide computer and network based services. Without a common user identity across the university, each campus is forced to duplicate IT services. UT Chattanooga and UT Martin have widely-deployed campus identifiers used to manage access to campus services, but these identifiers are not used statewide.

A statewide Identity Management system will provide a foundation for all campuses to work together better in the future. Banner, TERA, and other statewide services will be able to use a common identifier to provide shared services across the state. Another goal of the Identity Management project is to develop a common process to manage identities so they will be unique across the state. The system will provide a standard means to add or remove access to data and services that use the common identifier. Standardizing identity management and authorization to multiple services suggests a savings in time and effort.
Directory Services
Directory Services is an extension of the Identity Management effort. Where the Identity Management effort is charged to develop and manage a unique identifier for all faculty, staff, and students, Directory Services provides a way to use the unique identities to authenticate and authorize individuals to use IT services. Each campus has at least one directory service and some campuses are sharing a directory service. The Directory Services project intends to extend the sharing to all campuses, with an ultimate goal of eliminating as many directory service systems as possible.

Best Practice Initiatives

OIT has several projects underway to begin the implementation of ITIL best practices and Enterprise Architecture standards. OIT will first implement the Service Desk, Incident Management, and Change Management components of the Service Support model, and the Service Level Management component of the Service Delivery model. (Project dates can be found in Appendix E.) Configuration Management will be started soon. The project descriptions are:

Service Desk
Presently, users can contact OIT through multiple published telephone numbers and email addresses. The Service Desk will provide a single point of contact between users and the IT service organization. The goal is to reduce confusion for the users about who to call for what services and to ensure that incidents are quickly resolved. OIT’s timeline calls for the single point of contact to be in place in August 2009.

Incident Management
Incident Management works to restore a user to normal service operation as quickly as possible and minimize the adverse impact on business operations. All incidents received by the Service Desk will be tracked using an incident tracking system. Users will receive an email when the incident is called in and when it is resolved. One of the Incident Manager’s tasks is to actively manage incidents, working with individuals and managers within OIT to return users to service as quickly as possible.

The Incident Manager will review incident tickets and compare them against a set of performance metrics, assessing OIT’s success in restoring users to normal service operation.

OIT already has begun implementing the Incident Management process, has named an Incident Manager, and is working to define the incident management process. OIT’s project timeline calls for the process to be implemented in September 2009.

Change Management
The Change Management process will ensure that standardized methods and procedures are used for efficient and prompt handling of all relevant technical changes within the IT environment. It will provide a mechanism to collect change request information, classify the change to determine processing requirements, and complete an approval process before the change is attempted. The Change Management process will also require appropriate planning and testing before the change is scheduled and implemented. The process also describes the need for documentation and communications.

The Change Management project currently is underway. OIT will deliver a process definition in
early June and will work with each OIT group to implement a change process in July. The project team will continue to research change management tools and develop a requirements document for a tool that will support change management for OIT. This effort will be complete by November and a tool to assist change management will be in place by the end of 2009. In the meantime, each OIT team will be following the Change Management process by processing workflow and capturing change information manually.

**Configuration Management**

Configuration Management provides a logical model of IT infrastructure and services by identifying, controlling, maintaining and verifying the Configuration Items in existence. OIT will identify all of these components, document them, and store them in a configuration management database. Changes to any component will trigger the change management process, and changes will be recorded in the configuration database. Users will be informed of planned changes or outages well in advance.

Managing the Change Management process and the Configuration model will improve service support, reduce the risk of infrastructure and system outages, and improve communication within OIT and with customers and users.

**Service Level Management**

One of the first ITIL modules that OIT will implement is Service Level Management. To better align IT services with business and customer needs, both current and future, OIT will designate several Service Level Managers who will work directly with specific customers and advocate for customer interests in OIT discussions. Service Level Managers and customers will also develop Service Level Agreements (SLAs) that describe specific services, including their availability, change process, and measures (response time, service availability, etc.) for both existing and newly-requested services.

The Service Level Managers will be available and encouraged to participate in any relevant departmental or organizational meetings to gain a native perspective on customer needs and to facilitate better communication with customers about OIT plans and failures. The idea is that these managers will serve as passionate customer champions and advocates within OIT.

Such a structure will also allow customers, rather than the CIO or OIT staff, to set OIT’s directions and priorities. All requests will come through Service Level Managers, and no work will be undertaken that does not come directly from a customer (thus meeting a specific business need). Having a single OIT contact/representative will improve customer service, enable OIT to better understand customers’ needs, and help customers make better internal IT decisions.

Internally to OIT, SLAs will be converted to work requests overseen by Project Managers who will assemble the requisite staff members into a project team. OIT Project Managers and Service Level Managers will work closely together to ensure that customer needs are met in a timely manner. Having one person track all project tasks across multiple groups will also facilitate efficiency and satisfactory project completion.

In 2009, OIT will develop this service process to elicit and maintain input from all customers, including university-wide administration and other UT campuses. The first step in identifying existing OIT customers is to review the budget and identify sources of funding. At the same time, the Service Level Managers will work to develop a catalog of IT services, presented in business terms that can be shared with customers.
Tasks of the Service Level Managers include:
• Develop an OIT Service Catalog
• Identify OIT customers based upon funding
• Map OIT services to customers
• Draft and finalize 2010 Service Level Agreements with customers

Enterprise Architecture Project – TRB
A Technical Review Board (TRB) has been established to determine what technologies OIT should implement. The TRB will define the technical future of Information Technology at the University of Tennessee. The standards the TRB develops will be used by all information technology personnel when making technology development decisions, thus reducing the breadth of technologies in use at the university and allowing IT to focus on services.

Tasks of the Technical Review Board include:
• Establish the OIT technical standards
• Document “as-is” technical architecture in OIT
• Provide an integrated “to-be” vision of cost effective standards
• Support the need for customer driven diversity (not IT staff driven diversity)
• Include a vision for state integration and standards across campuses

One challenge the TRB will have is to determine which technologies will survive over time by looking at the financial stability of the company and the market acceptance of the technology. Much of the TRB’s success will depend on their ability to see the future based on technology research and experience.

The TRB’s first effort will be to determine all the technologies currently in use at the university. This effort will establish a baseline for the future. The TRB will recommend which of the existing technologies should be used and which should be phased-out. Later, the TRB will look further into the future as they continue to refine technologies into a set of standards all of IT can use. Over time, IT personnel at the university will become better-positioned to support a broader range of services. Better depth will mean better service. Fewer technologies will mean lower costs to the university.

The TRB will also establish a process for adding technical solutions that are outside the technology standards. Some unique services may require unique technologies, but OIT will require strong justification for non-standard technologies to be introduced into the environment. The TRB will determine if the new technology should be added to the set of standards or if it should be considered an exception with the service incurring the total cost of the technology.
The Technical Review Board will be a vital part of information technology as they define standards that the rest of the IT personnel will follow. Having standards will reduce costs in both the reduced acquisition of new technologies and the training required to support additional technologies. In addition, service stability should improve as IT personnel will be able to focus on supporting fewer technologies.

**Strategic Services**

Information technology offers many services to support multiple university needs, but some services are considered strategic because of their breadth and ability to address many different needs throughout the university. These services are critical to the university not just because they address multiple needs for the university, but they also provide a standard approach for the delivery of many services.

**Enterprise Resource Planning**

Enterprise Resource Planning (ERP) systems provide an integrated software platform for delivering application services for strategic planning and support of mission critical activities. The University of Tennessee chose SAP to provide solutions for financial and human resource applications around 1999. In 2007, University of Tennessee selected Banner for its Student Information System ERP. In late 2008, the university chose a system from North Carolina (RAMSeS) as an ERP system specific to research (TERA). The university must develop a way to ensure that customers own these business functions and the ERPs meet the customer’s strategic directions and initiatives.

UT’s implementation of SAP is called IRIS. Although IRIS has performed well, delivering core financial and HR services since it was implemented, some users have not always felt IRIS met their needs. In many cases, their concerns are based on a difference in opinion over IRIS priorities. For example, many people would like to see more departmental services that help with managing research funds. Others want direct access to IRIS data. Some people have developed “shadow systems” to augment IRIS to supply more specific features that might have been available from SAP.

The IRIS system is currently supported in a hybrid manner. The functional direction, application configuration, security, and user support are provided by the IRIS project team which falls in the Treasurer’s Office organization. The technical support, including programming, database management, and systems administration reside in OIT. The individuals from both organizations have worked closely together since SAP was implemented.

SAP can be the premier platform for IT solutions for the university. It offers an architectural design for providing a wide variety of integrated and extendable services for the university. All that is required is a high level of commitment from IT and customers, and a governance structure that considers all needs of the university.

The roadmap for SAP includes a shift in responsibilities for a fresh start. SAP needs a broader governance structure and better integration with other IT services. The change in governance can occur in FY 2010 as IRIS adjusts to support the organizational changes being implemented throughout the university. The governance of IRIS should mimic the organizational structure of the university. The functional staff should remain in the business units they support, the technical staff and direction should reside in IT, and the overall governing structure should be owned by the president of the university to ensure that all vice presidents, campuses and stakeholders have an equal voice.
Portal Technology
Much like UT’s three ERP systems, the university has purchased multiple portal systems. A portal system is a user interface into an application. Each ERP system at UT is capable of running its own portal. Vendor licensing of portal systems can cost between $100,000 and many millions of dollars. Meta-portals such as Microsoft SharePoint and Oracle can work with SAP, Banner, and other major applications as needed to deliver services. Additional features usually include:

- **File Storage and Collaboration**: Portal systems can facilitate file storage with a variety of permission options and collaboration with versioning, file locking, and other revision controls.
- **Web Content Management**: The university has thousands of web sites. Many of these web sites were developed and never maintained because of difficulty or because the person who developed the site has moved to another job. Portal systems can be used to assist in such management of web pages.
- **Single Sign-On**: This allows a person to use a single ID and password to access any service in the portal without having to retype their password (if authorized to the service).

Having a large number of services in a common place using common technologies will save time and money. Time will be saved both within IT and by customers. IT will save time by following a path others have followed to implement a service. Customers and users will save time by having services readily available using common access techniques (a portal) and by reducing the training required for new services.

The roadmap for deploying a standard portal technology will partially coincide with campus, college, and department IT elimination of duplicative services. As individual business units elect to terminate providing file storage, the central portal system will be used to replace duplicative services.

Microsoft SharePoint has the largest increase in use for any UT-owned portal technology. Multiple Microsoft SharePoint sites are either available today or are currently being planned or developed. A merger with central IT will allow those separate SharePoint sites to be merged as well. This merger will begin in FY 2010 for the groups ready to merge, but more will merge in FY 2011 and FY 2012.

Decentralized IT Staff
This report is not about a centralization of IT. This strategy does not imply that all IT personnel should be moved to Central IT; unique or special IT requirements may be best serviced by local IT staff. This strategy is simply about the elimination of duplication of services and giving the campuses control over the central IT organization’s direction and service.

LANMAN is a term used to designate the Local Area Network Managers in the Knoxville area. LANMAN consists of departmental and college IT personnel who have been responsible for supporting local IT efforts initiated within their respective department or college. This group is responsible for departmental computer labs, desktop computers and printers, network connections, local file servers, local email systems, and other local applications and servers that were implemented over the years. These departmental IT personnel work closely with central IT on many technology issues and provide a high level of comfort and service to the departments and colleges they serve.

The LANMAN group is strategic in today’s environment for the services they perform for customers and users. The departments and colleges will continue to require a high level of service, but as budgets are cut, the services must become more cost-effective. Providing standard services from central IT will offer departments and colleges the opportunity to choose a level of service that matches their needs and budgets. IT will be able (through standards) to offer better support depth
while achieving some economies of scale. As the standardization of IT is realized, customers in the departments and colleges will find they can adjust the level of support they need to match the budgets they have, and IT will be positioned to meet their needs using established Service Level Agreements as a guide.

The roadmap for departments who wish to migrate departmental services into central IT can begin as early as FY 2010 as some departments and colleges realize the need to reduce budgets. The effort to migrate services will likely increase in FY 2011 as other departments and colleges prepare for post-stimulus budget reductions.

**Governance and Advisory Board**

Meaningful project prioritization is essential for intelligent resource allocation. OIT has previously struggled with how to best juggle and reconcile multiple ongoing projects and incoming project requests from various sources. This determination becomes even more important when implementing a customer-driven model because multiple operations and projects will be vying for the same limited resources and no longer constrained by a vertical “silo” approach.

However, these priorities should not be set by the CIO or other members of OIT; they should be set directly by the customers (who provide the funding) themselves. Developing a model in which customers determine prioritization in consultation with one another would facilitate resolution of competing interests and would also result in unique project prioritization (e.g., there would only be one #1 project at a time), thereby removing the need for OIT speculation as to the relative importance of any given work. Such rankings would also more accurately reflect the business needs of the university as determined by the collective governance board.

An example of such a governance structure is the Technology Advisory Board (TAB) for the UTK Technology Fee. The Board advises the CIO on the implementation and expenditure of student fees for technology and is composed of representatives from the Student Government Association, Faculty, Administration, and OIT. Board members meet seven times throughout the year—3 times per semester and once in the summer—and serve two-year, renewable terms.

By mapping existing services (see Appendix C for a complete list of services) to customers based upon funding sources, OIT will create a similar, overarching advisory board from representative customer groups of faculty, students, staff, central administration, and specific campuses. This group would examine current IT efforts to either validate or discontinue them, and would likely seek to standardize the process for evaluating incoming requests based upon such factors such as impact, urgency, benefits, dependencies, ROI, and the customer. As new requests for work are received, this group would also determine which current efforts, if any, should be discontinued or scaled back in order to accommodate the request. In this manner, OIT will ensure that everything it works on is something that its customers want done.
Such IT governance models have been successful at other universities. Per the February 2009 ECAR Research Bulletin entitled “Managing the IT Project Portfolio: A Project Ranking Methodology,” Georgia State implemented an IT Steering Group in spring 2006 that is co-chaired by the provost and CIO and composed of vice presidents, associate provosts, and chair of University Senate subcommittee on Information Systems & Technology. One of their initial tasks was to rank all existing IT projects, and now they meet twice a month to discuss major IT initiatives for the university and to review all new projects for categorization as high, medium, or low priority.

Similarly, the University of Memphis has an Enterprise System Advisory Council (http://www.memphis.edu/itd/governance/esac.php) that sets priorities and makes recommendations to the VP/CIO to share with the Executive Council. The Council meets biweekly and is composed of Assistant VP-level key principals from administrative and academic divisions; Faculty/Staff Senate representatives; core team leads from Finance, Human Resources, Student, and Advancement; and various IT directors (as ex-officio members). Their project approval process incorporates two checklists and project managers who brief the members on the specific details.
Human Capital Planning

The OIT Leadership Team will be a balanced group of 11 staff members who are Service Level Managers or who represent critical areas in OIT. The following positions will be part of the Leadership Team: the CIO, the Chief Technology/Information Security Officer, 4 Service Level Managers, 4 Executive Directors, and the Business Office Director. The resulting Leadership Team will be structured to break down the current functional silos resulting in fewer line managers and more customer representation.

One of the most valuable resources in OIT is the staff. IT is a highly competitive industry and for many years, OIT has not been able to compete salary-wise with local businesses and government bodies. Keeping OIT employees trained, motivated, and retained is a challenge. There are two programs that are designed to meet that challenge: the Employee Performance Management/Review program, which has already begun, and the Career Ladder program, which should be in place by September 2009.

Delivering exceptional customer service requires a well-trained, motivated team. OIT’s Employee Performance Management/Review program allows OIT to track employee contributions and skill level, determine who its best performers are, and provide training and opportunities for staff who need them. Quarterly performance reviews will be used to identify performance issues early, plan more effectively for training, and keep the line managers more engaged in the project activities in OIT.

The Career Ladder program will dovetail with the Performance Management program in that OIT will be able to identify top performers and provide upward career movement based on a set of well-defined criteria. This program will clearly define what an employee will need to do to move vertically or laterally in the OIT organization. With a Career Ladder program, OIT will be able to more quickly reward top performers with promotions or job changes and be able to retain our valuable human resources.
In addition to these two programs, IT personnel will also benefit indirectly from the process changes happening in OIT. The switch to a customer-driven service provider will open new opportunities to those who are more customer-oriented. The implementation of ITIL will provide opportunities for personnel to assume new roles that could lead to management roles later. These new roles will allow some staff to test their interest in management and develop their management techniques before they take on a larger managing role. This opportunity will ease the problem of succession within IT.

**Conclusion**

The university will face a significant challenge over the next three years. The Federal Stimulus funds have replaced lost state revenue funds, but this has only delayed the budget problems. Each department in the university must find ways to survive and thrive on fewer funds.

The plan laid out for OIT uses two years to redefine its organization and meet the budget cuts when they come in FY 2012. By the third year of the plan, significant savings will be realized, and OIT will be positioned to offer the services customers want at a lower cost.

Costs of services include development costs, operational costs, support costs, and termination costs. The changes being implemented by OIT will reduce these costs by enforcing standards that will lower the cost of hardware, software, and staff. Hardware cost will be lowered because similar hardware will be used and can be more easily shared. Software costs can be lowered by sharing software among different services, thus spreading the cost of the software over more services. Staff costs can be reduced by having fewer unique hardware and software solutions that require additional staff to support. Termination of service costs can be lowered because only services desired by customers will be implemented.

The plan being designed and implemented by OIT will address service delivery, service support, and service costs. OIT has selected ITIL as the methodology to implement to meet our challenges. The ITIL methodology places an emphasis on customer direction, consistency, stability, transparency, and accountability. The delivery and support of services will be more consistent because processes are well defined and will be the standard for all IT groups. Customer direction of OIT services, as an integral part of the process, will provide clarification and transparency. Finally, because the processes are more transparent and will include a set of performance metrics, individuals and groups delivering the services will be more accountable.

The plan being implemented by OIT will not be easy. Change is difficult, but necessary to achieve the targeted cost savings. Shared standard solutions will reduce costs while improving many aspects of services. The result will be that Information Technology at the University of Tennessee will meet or exceed the level of IT performance and costs at other universities.
APPENDIX A – IT Financial Tables

The data presented in this section are representative of an analysis created for a 2008 report on IT costs and strategy. These data, updated in June 2009, show that IT expense for FY 2008 was approximately $87 million. It is important to note that the methodology used to compile these data was complicated due to the inconsistent way IT expenditures are accounted for at each campus and within IRIS.

Calculation Components
The calculation of the cost of IT is composed of 4 individual elements:

- Salary and employee benefits for central IT staff
- Operating expenditures for central IT
- Salary and employee benefits for distributed IT staff
- Estimated expenditures for distributed IT

<table>
<thead>
<tr>
<th>IT Expenditures for Fiscal Year 2008</th>
<th>System</th>
<th>UTK</th>
<th>UTC</th>
<th>UTM</th>
<th>UTHSC</th>
<th>UTSI</th>
<th>IPS</th>
<th>UTIA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary and employee benefits for central IT staff</td>
<td>$13,821,270</td>
<td>$6,318,099</td>
<td>$2,421,841</td>
<td>$1,615,351</td>
<td>$3,874,852</td>
<td>$262,302</td>
<td>$727,952</td>
<td>$1,765,274</td>
<td>$30,806,041</td>
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<tr>
<td>Operating expenditures for central IT</td>
<td>$13,078,126</td>
<td>$4,044,506</td>
<td>$1,783,214</td>
<td>$2,622,900</td>
<td>$2,419,311</td>
<td>$172,681</td>
<td>$632,709</td>
<td>$24,753,447</td>
<td></td>
</tr>
<tr>
<td>Salary and employee benefits for distributed IT staff</td>
<td>$1,624,858</td>
<td>$7,480,125</td>
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<td>$394,771</td>
<td>$2,673,425</td>
<td>$12,995,588</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Estimated expenditures for distributed IT</td>
<td>$18,512,023</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$28,524,254</td>
<td>$17,842,730</td>
<td>$5,027,464</td>
<td>$4,633,022</td>
<td>$5,967,588</td>
<td>$434,983</td>
<td>$1,360,661</td>
<td>$1,765,274</td>
<td>$87,067,999</td>
</tr>
</tbody>
</table>

Salary and Employee Benefits for Central IT Staff
The salary and employee benefits cost for staff in central IT organizations was based on actual expenditure information for FY 2008. Three sources were used:

1. Institute for Public Service (IPS) provided salary and employee benefits data.
2. Employee Referential File (EMPREF) data was used for Institute of Agriculture.
3. The IRIS General Ledger for Cost Centers listed previously as being Central IT Cost Centers was used to calculate salary and employee benefits costs. (Note: All staff funded by the central IT Cost Centers were identified as being IT staff, regardless of position/job title.)

Some IT work is performed by personnel who do not hold an IT job/position title, and the converse is also true. To maintain consistency with the Gartner methodology no effort was made to identify/reconcile such occurrences.

Headcount and FTE figures for central IT were determined from EMPREF data generated from IRIS. The cost for these employees was pulled from the actual ledger values. Undergraduate student workers (student assistants) within central IT was reported as headcount only because they do not individually occupy a distinct position in IRIS. However, graduate students (GA/GTA) do occupy IRIS positions and therefore were included in the total FTE number.

Finally, it should be noted that the number of student workers is seasonal. During the summer months the number of student workers is significantly less therefore, the number of student workers and their associated cost are likely understated.
<table>
<thead>
<tr>
<th>Account</th>
<th>FTE</th>
<th>Headcount</th>
<th>Salaries &amp; Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knoxville Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E010152002 OIT CTS-Labs (STF)</td>
<td>5</td>
<td>5</td>
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<tr>
<td>E010152003 OIT CTS-Services (STF)</td>
<td>11</td>
<td>24</td>
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<tr>
<td>E010152005 OIT Educ Tech (STF)</td>
<td>7.75</td>
<td>23</td>
<td>506,797</td>
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<tr>
<td>E010155005 OIT ITES-Classrooms</td>
<td>3</td>
<td>3</td>
<td>202,816</td>
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<tr>
<td>E010155010 OIT Educational Technology</td>
<td>15.75</td>
<td>17</td>
<td>1,021,407</td>
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<tr>
<td>E010158 Banner Student System Implementation</td>
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<td>1</td>
<td>107,076</td>
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<td>E010159 Customer Technology Support</td>
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<td>94</td>
<td>3,243,720</td>
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<td>E010159002 Digital Media Services</td>
<td>2</td>
<td>6</td>
<td>144,218</td>
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<tr>
<td><strong>Total</strong></td>
<td>85.6</td>
<td>173</td>
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<tr>
<td>UTSI</td>
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<td></td>
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<tr>
<td>E020450 Computer Services</td>
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<td>4</td>
<td>262,302</td>
</tr>
<tr>
<td>UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E040156001 TF-Network SRVS</td>
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<td>134,324</td>
</tr>
<tr>
<td>E040156008 TF-MEDIA RSRS</td>
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<td></td>
<td>128,204</td>
</tr>
<tr>
<td>E040156009 TF-HELP DESK</td>
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<td></td>
<td>276,902</td>
</tr>
<tr>
<td>E040156011 TF-STUDENT LABS</td>
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<td>88,305</td>
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<tr>
<td>E040156021 TEACHER RESOURCE CEN</td>
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<td>77,452</td>
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<tr>
<td>E040156034 TF-STDT PRINT SYS</td>
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<td></td>
<td>66,700</td>
</tr>
<tr>
<td>E040156040 TF-UNIVERSITY ADMIN</td>
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<td>968,703</td>
</tr>
<tr>
<td>E042210 Computer Center</td>
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<td>17</td>
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<tr>
<td>E042210002 ADM COMP OPS</td>
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<td>225,577</td>
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<tr>
<td>E042215 ACADEMIC COMPUTING</td>
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<td></td>
<td>162,217</td>
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<tr>
<td>E042215003 Info Support Services-Student Lab</td>
<td>1</td>
<td>21</td>
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<tr>
<td>E042215004 ICSS-Help Desk</td>
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<td>22</td>
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<tr>
<td>E047275 Network Services</td>
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<td>4</td>
<td>36,631</td>
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<td><strong>Total</strong></td>
<td>36.5</td>
<td>65</td>
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<tr>
<td>UTM</td>
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<tr>
<td>E052210 Information Technology Services</td>
<td>23.5</td>
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<td>1,315,476</td>
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<tr>
<td>E052211 UTM Technology Services</td>
<td>5</td>
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<td>299,876</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28.5</td>
<td>50</td>
<td>1,615,351</td>
</tr>
<tr>
<td>UTHSC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E073901 ITS Computing Systems</td>
<td>6</td>
<td>6</td>
<td>604,461</td>
</tr>
<tr>
<td>E073901001 Student Technology</td>
<td>0.5</td>
<td>1</td>
<td>34,596</td>
</tr>
<tr>
<td>E073901002 ITS Chief Information Officer</td>
<td>5</td>
<td>5</td>
<td>449,007</td>
</tr>
<tr>
<td>E073901003 ITS Customer Technical Support</td>
<td>12</td>
<td>12</td>
<td>733,640</td>
</tr>
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<td>E073901005 ITS Infrastructure Network</td>
<td>9.4</td>
<td>10</td>
<td>711,525</td>
</tr>
<tr>
<td>E073901008 ITS Telephone Services</td>
<td>8</td>
<td>8</td>
<td>487,413</td>
</tr>
<tr>
<td>E073901012 ITS Application Development</td>
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<tr>
<td><strong>Total</strong></td>
<td>52.3</td>
<td>54</td>
<td>3,874,852</td>
</tr>
</tbody>
</table>
Operating Expenditures for Central IT

IT Operating Expenditures in the central IT organization were determined in one of three ways:

1. Actual operating expense information based on FY 2008 data (excludes IPS and UTIA).

   The total IRIS actual expenditures from the General Ledger for each cost center, was used to calculate central IT expenditures including salaries, employee benefits, and operating expenses for all central IT Cost Centers.

2. IPS provided actual operating expense information for FY 2009 versus the FY 2008 information that was used elsewhere, and verbally indicated that the FY 2008 expenses were $100K less based on their budget documentation.

3. Operating expenditures for the UTIA were not included as it does not have budgets that are exclusively IT.

The inclusion of recoveries from other departments dilutes the line item expenditures of operating expenses. Therefore, recoveries were added to these costs.
### Central IT Non-Labor Expenditures for Fiscal Year 2008

<table>
<thead>
<tr>
<th>Category</th>
<th>System</th>
<th>UTK</th>
<th>UTC</th>
<th>UTI</th>
<th>UTHSC</th>
<th>UTI</th>
<th>IPS</th>
<th>UTIA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel</td>
<td>230,049</td>
<td>51,005</td>
<td>17,253</td>
<td>30,120</td>
<td>25,064</td>
<td>329</td>
<td>19,022</td>
<td>355,241</td>
<td></td>
</tr>
<tr>
<td>Motor Vehicles</td>
<td>106,650</td>
<td>20,620</td>
<td>11,430</td>
<td>-</td>
<td>8,406</td>
<td>-</td>
<td>147,245</td>
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<td></td>
</tr>
<tr>
<td>Media Processing</td>
<td>22,604</td>
<td>12,554</td>
<td>2,948</td>
<td>5,306</td>
<td>1,037</td>
<td>-</td>
<td>45,349</td>
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<td></td>
</tr>
<tr>
<td>Utilities &amp; Fuel</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>4,781,630</td>
<td>86,093</td>
<td>117,346</td>
<td>106,124</td>
<td>688,140</td>
<td>75,125</td>
<td>65,121</td>
<td>4,646,290</td>
<td></td>
</tr>
<tr>
<td>Maintenance &amp; Repair</td>
<td>735,028</td>
<td>313,564</td>
<td>246,359</td>
<td>161,021</td>
<td>159,080</td>
<td>1,417</td>
<td>1,616,250</td>
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<td></td>
</tr>
<tr>
<td>Professional Services &amp; Memberships</td>
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<td>36,382</td>
<td>210</td>
<td>258,379</td>
<td>146,110</td>
<td>467</td>
<td>589,362</td>
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</tr>
<tr>
<td>Computer Services</td>
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<td>1,930,069</td>
<td>796</td>
<td>11,284</td>
<td>3</td>
<td>301,192,024</td>
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<tr>
<td>Supplies</td>
<td>4,418,106</td>
<td>2,380,384</td>
<td>754,520</td>
<td>642,484</td>
<td>596,069</td>
<td>81,615</td>
<td>525,166</td>
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<tr>
<td>Supplies</td>
<td>13,006</td>
<td>1,040</td>
<td>1,250</td>
<td>-</td>
<td>3,060</td>
<td>-</td>
<td>15,670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment &amp; Capital Outlay</td>
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<td>52,014</td>
<td>2,900</td>
<td>-</td>
<td>2,900</td>
<td>-</td>
<td>101,370</td>
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<tr>
<td>Contract &amp; Special Services</td>
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<td>434,303</td>
<td>899,598</td>
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<td>8,657</td>
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<tr>
<td>Service Department Credits</td>
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<td>830,613</td>
<td>150,065</td>
<td>692,978</td>
<td>29,550</td>
<td>434,983</td>
<td>12,355,700</td>
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<td></td>
</tr>
<tr>
<td>Total Central IT Operating</td>
<td>615,049</td>
<td>3,026,253</td>
<td>1,550,889</td>
<td>1,374,208</td>
<td>1,217,437</td>
<td>(262,302)</td>
<td>632,709</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Central IT Operating</td>
<td>14,995,080</td>
<td>1,280,829</td>
<td>232,323</td>
<td>1,266,687</td>
<td>1,301,874</td>
<td>434,983</td>
<td>19,611,665</td>
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<td></td>
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<tr>
<td>Estimated IT Intercompany</td>
<td>2,323,022</td>
<td>1,060,576</td>
<td>25,761</td>
<td>-</td>
<td>100,000</td>
<td>2,912,453</td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>10,276,126</td>
<td>4,044,898</td>
<td>1,783,214</td>
<td>2,692,905</td>
<td>2,419,311</td>
<td>172,681</td>
<td>632,709</td>
<td>24,753,447</td>
<td></td>
</tr>
</tbody>
</table>

---

### Salary and Employee Benefits for Distributed IT Staff

The salary and employee benefits cost for distributed IT staff was calculated based on the July, 2008 data from the IRIS Employee Referential File (EMPREF). The EMPREF file was used to closely coincide with actual expenditure information for FY 2008 used in other elements of the overall calculation. This file was used to manually identify the total salary, FTE, and headcount for all distributed IT staff. The process included a search for IT job titles and position titles within the employee file as the means of determination. Those titles that contained “IT” or clear IT related descriptions were considered a valid match. The specific titles included:

- IT Administrator I, II, III & IV
- IT Analyst I, II, III & IV
- IT Assistant III
- IT Manager
- IT Specialist I, II, III & IV
- IT Supervisor II
- IT Team Leader
- IT Technologist I, II, III
- Senior IT Technologist I & II

It is plausible that some IT staff may have a job/position title that does not reflect their IT responsibilities. It is also plausible that some non-IT staff have job/position titles that are meant for IT personnel. To maintain consistency with the Gartner methodology no effort was made to identify/reconcile such occurrences.

Additionally, no attempt was made to determine/include the cost for student workers outside of the central IT cost centers.
**Distributed IT Personnel**

<table>
<thead>
<tr>
<th>Campus</th>
<th>FTE</th>
<th>Headcount</th>
<th>Salary w/ Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knoxville Campus</strong></td>
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<tr>
<td>Regular FTE</td>
<td>114.9</td>
<td>118.0</td>
<td>$7,284,709.93</td>
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<td>Term Employees (FTE %)</td>
<td>6.6</td>
<td>12.0</td>
<td>$195,414.55</td>
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<td><strong>Total</strong></td>
<td>121.5</td>
<td>130.0</td>
<td>$7,480,124.48</td>
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<td><strong>UTSI</strong></td>
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<tr>
<td>Regular FTE</td>
<td>13.0</td>
<td>13.0</td>
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<td>Term Employees (FTE %)</td>
<td>1.25</td>
<td>2.0</td>
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<td><strong>Total</strong></td>
<td>14.3</td>
<td>15.0</td>
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<td><strong>UTM</strong></td>
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<tr>
<td>Regular FTE</td>
<td>9.0</td>
<td>9.0</td>
<td>$394,770.89</td>
</tr>
<tr>
<td>Term Employees (FTE %)</td>
<td>0.0</td>
<td>0.0</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9.0</td>
<td>9.0</td>
<td>$394,770.89</td>
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<td><strong>UTHSC</strong></td>
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<tr>
<td>Regular FTE</td>
<td>40.5</td>
<td>42.0</td>
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<td>Term Employees (FTE %)</td>
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<td>3.0</td>
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<td><strong>Total</strong></td>
<td>41.5</td>
<td>45.0</td>
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<td><strong>System</strong></td>
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<tr>
<td>Regular FTE</td>
<td>22.0</td>
<td>22.0</td>
<td>$1,624,857.79</td>
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<tr>
<td>Term Employees (FTE %)</td>
<td>0.0</td>
<td>0.0</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22.0</td>
<td>22.0</td>
<td>$1,624,857.79</td>
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<tr>
<td><strong>TOTAL REGULAR FTE</strong></td>
<td>199.4</td>
<td>204.0</td>
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<td><strong>TOTAL TERM EMPLOYEES</strong></td>
<td>8.9</td>
<td>17.0</td>
<td>$269,175.17</td>
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<td><strong>TOTAL DISTRIBUTED IT PERSONNEL</strong></td>
<td>208.2</td>
<td>221.0</td>
<td>$12,995,587.19</td>
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**Estimated Expenditures for Distributed IT**

The estimated IT operating expenditures outside of central IT organizations was estimated based on actual expenditures to known IT vendors. Costs were accumulated by vendor utilizing IRIS data. (For example, payments to Dell Computer outside of the IT organizations are included in Distributed IT Expenditures.) A listing of approximately 125 vendors was used to compile the $18.5 million figure.

It is important to note the following inclusions / exclusions:

- UT Bookstore expenses were included in this total based on departmental purchases of IT equipment via the UT Bookstores.
- Procurement card transactions were not included in the total because the data was not readily available in the IRIS system.
- While vendor payments for IT items specifically charged to expense classifications such as supplies or contract / special services were included in the total, the converse is not true. No attempt was made to specifically review all expense classifications for IT expenditures.
### Vendor Expense

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<tr>
<th>Vendor</th>
<th>Expense</th>
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</thead>
<tbody>
<tr>
<td>Dell Marketing Group</td>
<td>$6,855,406.60</td>
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<td>Apple Computer, Inc</td>
<td>3,069,540.13</td>
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<td>Paciolan</td>
<td>781,662.24</td>
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<td>Gateway</td>
<td>775,215.32</td>
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<tr>
<td>SAP</td>
<td>676,766.25</td>
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<tr>
<td>Cbord Group</td>
<td>574,665.10</td>
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<tr>
<td>Pomeroy IT Solutions</td>
<td>556,238.34</td>
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<tr>
<td>UT Batelle - WAN Network</td>
<td>500,000.00</td>
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<tr>
<td>OCE Imagistics- All</td>
<td>453,630.75</td>
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<tr>
<td>Microtech Computers Inc</td>
<td>403,644.99</td>
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<td>AT&amp;T</td>
<td>341,276.45</td>
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<tr>
<td>Waveguide</td>
<td>326,792.25</td>
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<td>Compview, Inc.</td>
<td>321,203.67</td>
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<tr>
<td>Sungard</td>
<td>248,670.40</td>
</tr>
<tr>
<td>Others</td>
<td>2,627,309.80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$18,512,023.29</strong></td>
</tr>
</tbody>
</table>

### Definitions

This section lists the working definitions used for the purposes of performing the calculations.

**Information Technology (IT)**

The scientific, technological, and engineering disciplines and the management technologies used in information handling, communication, and processing; the fields of electronic data processing, telecommunications, networks, and their convergence in systems; applications and associated software and equipment together with their interaction with humans and machines. (source: Texas A & M University, http://infosat.tamu.edu/students/glossary.htm)

**Intercompany Transactions**

These are financial transactions that occur between central IT units such as networking or telephone charges.

**Central IT**

The departments at each campus whose primary responsibilities include providing IT services across the campus. The following cost centers were considered part of central IT.
In addition, IT related staffing and operating expenditures were included for the Institutes of Public Service (including CTAS and MTAS) and the UT Institute of Agriculture (including Extension, Ag Experiment Station, and Vet Med) as provided by the CIOs of those entities.

**Gartner’s Benchmarks**

Gartner issued a report titled “IT Key Metrics Data 2009: Key Industry Measures: Education Analysis: Current Year” (Gartner ID Number: G00163977) that establishes the following IT cost benchmarks:

- *Education IT Spending as a Percentage of Revenue: 4.3% Average*
- *Education IT Spending as a Percentage of Revenue for Organizations >$1 B: 2.6% Average*

**Methodology**

Data used to create the financial tables in this document were reviewed for intercompany transactions within the central IT organizations. Where obvious, those transactions have been eliminated. The inclusion of such intercompany transactions could materially overstate or understate both the income and expenses related to the information presented. In order to present these data in a consolidated format, standard methods of departmental budgeting and accounting for IT income and IT expenditures would need to be adopted by the university and all campuses and institutes. The information in the tables is simply cumulative budget and accounting data as available in the IRIS financial system for IT-related accounts. The data presented here, as compiled, were not prepared in accordance with standards pronounced by the Governmental Accounting Standards Board (GASB).
The ITIL standards OIT will implement address two major areas: Service Delivery and Service Support. The first modules that OIT will implement are Service Level Management, Service Desk, Incident Management, and Change Management.

Note: The following information comes from the Pink Elephant consulting group’s document “The ITIL Story” at: http://www.compaid.com/cainternet/ezine/the_itil_story.pdf

**Service Delivery**

The ITIL Service Delivery model deals with identifying and recording IT service levels, financial management, capacity, service continuity, and availability. It defines the following processes:

**Service Level Management**
Service Level Management's goal is to maintain and improve IT service quality through a constant cycle of agreeing, monitoring and reporting IT service achievements. Service Level Management instigates actions to eradicate poor service and allow a stronger relationship to develop between IT and its customers.

**Financial Management For IT Services**
Financial Management is the sound stewardship of the organization’s monetary resources and supports the enterprise in planning and executing its business objectives. Within an IT organization this process is visible in three main areas: budgeting, IT accounting and charging.

**Capacity Management**
Capacity Management enables an organization to manage resources in times of crisis and predict the need for additional capacity in advance. It describes the procedures necessary for planning, implementing and running this process.
IT Service Continuity Management
IT Service Continuity Management describes managing an organization’s ability to continue providing a pre-determined level of IT service following an interruption to the business. This may range from an application or system failure, to a complete loss of the business premises.

Availability Management
Availability Management’s goal is to optimize IT infrastructure capability, its services and the supporting organization. This results in a cost effective, sustained level of service availability that enables the business to meet its objectives.

Service Support
The ITIL Service Support model describes the related components that provide stability and flexibility for IT services. It deals with identifying and recording IT configuration items, incidents, problems and changes. It defines the following function and processes:

Service Desk (Function)
Service Desk is not a process but a function. The Service Desk’s objective is to provide a single point of contact between users and the IT service organization. The ITIL Framework provides guidance about creating and operating a Service Desk to provide an efficient channel of communication between the user community and the IT provider.

Incident Management
The Incident Management process aims to restore normal service operation as quickly as possible and minimize the adverse impact on business operations. This ensures that the best possible levels of service quality and availability are maintained.

Problem Management
The process of Problem Management diagnoses the underlying cause of the incidents identified by the Service Desk. It arranges for correcting errors in the IT infrastructure and performs proactive problem prevention.

Configuration Management
Configuration Management provides a logical model of the infrastructure or a service by identifying, controlling, maintaining and verifying the Configuration Items in existence.

Change Management
The Change Management process ensures that standardized methods and procedures are used for efficient and prompt handling of all changes to minimize the impact of change related incidents on service quality. Consequently, change management aims to improve the day-to-day operation of the organization.

Release Management
Good resource planning and management are essential to package and distribute a release successfully to the customer. Release Management takes a holistic view of an IT service change to ensure that all aspects of a release, technical and non-technical are considered together.
APPENDIX C – OIT Services

Business Information Systems
• Alumni/Development
• Business Intelligence
• Document Imaging
• E-Commerce
• Finance & Accounting
• Human Resources
• Payroll

Communication and Collaboration Services
• Cable TV
• Calendar
• Collaboration & Social Computing
• Conference Calling
• Content Management
• Emergency Notification
• Enterprise Search
• Network Connectivity
• Messaging
• Mobile Device
• Telephone/Fax
• Video Conferencing
• Webcasting/Podcasting
• Web Portal

Instructional Technology
• Classroom Technology
• Course Delivery Services
• Instruction Evaluation & Testing
• Online Course Services

Professional & Technical Services
• Consulting
• Digitization & Media Duplication
• Computer Labs & Print Services
• Managed Services
• Risk Assessment
• Security
• Software Distribution
• Technical Support
• Technology Evaluation
• Training
• Video Production
• Volume Software Licensing

Research Information Systems
• Data Acquisition & Analysis
• Research Administration
• Research Software
• Research Systems Support

Student Information Systems
• Admissions
• Advising
• Curriculum
• Financial Aid
• Registration
• Room Scheduling
• Student Accounting
• Student Records
### APPENDIX D – Customer Services / Projects

#### Application Projects

| Statewide Banner | 2009 May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | 2010 Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Q1 | Q2 | Q3 | Q4 |
|-------------------|---------|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| UT Chancellors | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Health Science Center | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Knoxville | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Martin | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

| Statewide TERA | 2009 May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | 2010 Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Q1 | Q2 | Q3 | Q4 |
|-----------------|---------|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| UT Chancellors | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Health Science Center | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Knoxville | | | | | | | | | | | | | | | | | | | | | | | | | |
| UT Martin | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

### Other Applications

- Online Key Statement
- Promote OPI Faculty Annual Reviews
- OPI OPR Validation Status
- OBI Support pack and Upgrade

#### UTK Student and Faculty Services

- Student ID
- Unix Accounts
- OBI System
- OBI Tracking
- OBI Support

#### IT Infrastructure

- Statewide Identity Management
- IT Service Desk
- Network Services
- Systems and Operations
- Security

### System SharePoint Deployment

- SharePoint 2010 Rollout
- SharePoint 2013 Rollout
- SharePoint 2016 Rollout
- SharePoint 2017 Rollout

### Other Infrastructure

- Phone & Network upgrade in UTK Football Stadium
- Ethernet modems are more user-friendly
- Wireless Upgrade
- System OBI Deployment
- System OBI Datacenter
- System OBI Datacenter

### Upgrade to Exchange 2016

- Asset Management (SITEMAP)
- Windows Server 2012

**Notes:**

These are estimated dates and will evolve as projects begin to be re-prioritized by customers.
APPENDIX E – OIT Internal Milestones

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Monthly Entire Services Offered by OIT</td>
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<td></td>
</tr>
<tr>
<td>Monthly Customers who fund OIT</td>
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<tr>
<td>Map Services to Customers</td>
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<tr>
<td>Appoint Service Level Managers</td>
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</tr>
<tr>
<td>Draft Service Level Agreements with Customers</td>
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<tr>
<td>Work 2010/11 Budget based on customer input</td>
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<tr>
<td>Prepare Service Level Agreements with Customers</td>
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<tr>
<td>Validate IT Organizational Structure to customer</td>
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</tr>
<tr>
<td>24x7 monitoring of critical user services</td>
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<tr>
<td>Service Desk</td>
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<tr>
<td>Establish shared Service Desk functionalities in OIT</td>
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<tr>
<td>Form OIT Staff on Service Desk</td>
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<tr>
<td>Consistently Service Desk to a single RDC for all of OIT</td>
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<tr>
<td>Implement Incident Management Function</td>
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<tr>
<td>Technical Standards</td>
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<tr>
<td>Establish Reference and OIT Specific Architectures</td>
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<tr>
<td>Document “As-Is” technical standards</td>
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<tr>
<td>Develop “To-Be” technical standards</td>
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<tr>
<td>All New OIT projects begin to follow “To-Be” standards</td>
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<tr>
<td>Change Management</td>
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<tr>
<td>Realign existing change management processes</td>
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<tr>
<td>Leadership Team agreement or new OIM processes</td>
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<tr>
<td>Present to OIT staff</td>
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<tr>
<td>Outline requirements for future automation</td>
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<td>Human Capital Management</td>
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<tr>
<td>Employee Performance Reviews</td>
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<tr>
<td>Human Capital Appraised by HR &amp; Implemented</td>
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</table>
The following is a draft of minutes from the Information Technology presentation given by Scott Studham on June 17 to the Research, Outreach, and Economic Development Committee of the University of Tennessee Board of Trustees. These minutes will be presented for approval at the next meeting of the committee.

UT Information Technology Strategy

Mr. Stansberry introduced Mr. Scott Studham, UT’s Chief Information Officer, to make a presentation on the UT Information Technology Strategy. Mr. Studham began by stating he had been at UT for 90 days in his position as CIO and was the CIO at Oak Ridge National Laboratory for the last four years. Most of the data he would provide originated with his predecessor, Dr. Jesse Poore.

Mr. Studham noted three areas for focus:
1. Costs
2. Security
3. Strategic systems such as Banner, TERA and leveraging our SAP System to make it an enterprise-wide system allowing access of real-time information and statistics.

Much of the time during the last 90 days has been spent in deciphering real IT costs at the university. This is the area Dr. Poore spent the last year exploring as well. It is an on-going discovery process. Mr. Studham showed graphics of IT spending and noted that the numbers were intentionally missing from the graphs due to the continued high uncertainty in total IT costs. If gross cost of IT is figured, the amount for annual IT spending is estimated between $80-90M. When the $90M total is compared with a Gartner report on spending for UT-peer higher educational institutions, UT is spending 5.4 percent of UT’s gross revenues on IT while our peers are spending 4.3 percent on IT. This would imply UT is spending $10-20M more than other universities of our size are spending on IT. The question then becomes, why and what should be done about this discrepancy. The largest component of the “why” involves the duplication of services, where people are providing “repeat” services. For example, there are still over 100 different email servers being used. Each server requires operating and applications software (Windows, Microsoft Exchange, Lotus Notes, etc.) that could cost from $0-$20,000, and the hardware alone for each server costs $2,000 each. In addition to email direct costs, there are equipment, storage, backup, and personnel costs for supporting services plus equipment, staff and telephone costs for networks and related services.
Historically, three strategies were used to try to remedy this situation. The first approach (used in 1996) was to cut the central IT budgets at each campus. The result was that costs for 1997 were the same as costs in 1996 because the staff eliminated from the central IT organizations was hired by the colleges and departments. This is largely why there currently is a fragmented IT structure in place resulting in the duplication of services and staff basically providing the same services.

The second strategy was to try to consolidate the ~750 people at UT whose jobs are classified as IT into an unilateral IT hierarchy culture. This approach proved highly stressful, created a large degree of dissatisfaction among IT staff and their departmental customers, but would have resulted in savings.

The third strategy is the one being proposed. Much thought has gone into the new strategy, as well as input from IT industry giants such as Gartner. There will be a central IT organization that is run like a business where services are provided and standardized. Campuses and departments will know what services are available from the central organization and, consequently, they can determine the amount of additional services they need for their departments. The cost savings can be recognized by the department by eliminating duplicative IT equipment and staff costs. The idea is to allow the departmental cost-savings, but to report the gross expenditure in a consistent manner.

To accomplish this, a change must be made in the way the central IT organizations are run. Mr. Studham showed a slide representing the current approach with a CIO line-organization focus. Currently, IT staff set annual project priorities from an “internal” perspective. The proposed approach will have a customer/user perspective where customers will create a list of project priorities. This approach is based on a national standard on how to run an IT organization known as ITIL. The IT priorities are developed with service-level managers working with IT customers. The central IT organization will be able to inform chancellors and campus leadership of available services and to notify them of services being duplicated on their respective campuses. Mr. Studham showed a “road map” of the IT plan to stabilize a customer-owned, core set of services whereby customers can eliminate duplicative services and reduce costs.

In 2008 former CIO Dr. Poore quantified the scope of IT at UT as approximately $60-90M in expenditures (depending on if it was the gross or net IT cost) and 762 IT staff. Mr. Cates asked what comprised the difference in the gross and net expenditure figures. Mr. Studham replied that the difference is that one set counts recoveries coming primarily from restricted accounts. Mr. Talbott asked if the true net cost was somewhere near $75M. This would be the approximate range, Mr. Studham said.

In 2009 IT will move to a service-level manager function and customers will set the direction. Documentation of IT contracts with existing customers, IT technical standards and security policies
will be established. In 2010 departments and colleges will transition into these central services and eliminate duplication of services for recognized cost savings. By 2011 and 2012, IT costs at UT are to be reduced to the industry average (~$70M).

Chancellors have been most supportive in this effort. Mr. Wharton asked if UT has standardized equipment and software. Mr. Studham said it does not at the present time, but this will be done in future plans. Mr. Wharton asked if UT should have a transparent network to allow anyone within the university to access information as well as provide for the sharing of sensitive information and knowledge across the campuses. Management and CIOs at the campuses agree that secure collaboration and a community access enterprise should be in place. Below these levels, however, there is disagreement and technical resistance to commonalities.

An example of this is the need for a common User ID to enable the sharing of services and information across campuses. In the statewide ARRA stimulus capture process, one of the first goals was to set up a document-sharing location where people could log in and see real-time working documents. Clearly an IT enterprise spending $90M a year should be able to do this. As it turned out, this goal was not possible, and UT is about 10 years late in regard to implementing this process. Each campus has its own way of dealing with IDs and account management processes, which creates a great deal of frustration when trying to implement a shared resource.

Mr. Murphy noted that if problematic management issues were occurring at levels below top management and CIO levels, this obstruction should not be tolerated and the obstructing individuals should be removed from those positions. Mr. Stansberry noted a “velvet glove” approach was often appreciated, but a more substantial approach may be required to be effective.

Mr. Studham discussed several factors, any one of which could derail the strategy of transitioning to a customer-driven central organization: Computer security is the number one concern. State-wide common identities are immediately needed in order to share services across the campuses. We need to leverage SAP as the system-wide “system of record” to allow real-time information, quickly deploy Banner (model Student Information System), and TERA (which would enable manual, paperwork-driven grant review processes). These are multi-year projects. The first fruits of TERA are anticipated this summer; the first fruits of Banner will be seen at UTC this fall (it will be a phased-in implementation of a couple of years). Mr. Studham noted that there is often difficulty in new processes; people resist change of any sort, even “good” change.

A “report card” with key performance indicators on how each campus is doing will be issued to grade factors such as:

a. maintaining and improving security,

b. TERA and Banner implementation,
c. state-wide ID implementation,
d. services and costs taking place and,
e. progress towards plans for reducing duplication.

This report card approach will help to bring visibility to what is taking place in the organization. Mr. Studham has discussed this procedure with Acting President Simek and has his support.

Mr. Stansberry thanked Mr. Studham for a clear and direct statement of what needs to be done for IT at the university. However, he stated the University of Tennessee does not have an additional $20M and he suggested that by the end of the stimulus funds the IT strategy should be fully implemented and the savings fully realized. Dr. Simek stated the report card will help accomplish this strategy. There will be no choice to “opt out” of the plan except where there is a rational reason to do things in a different way. Dr. Millhorn added that Mr. Studham’s instructions are to “fix the problems.” He will need Trustee and campus leaderships’ support to accomplish this goal. Mr. Stansberry asked how many employees are involved with the problem areas and was told 760 in total, 350 reporting directly to Mr. Studham and the rest distributed within departments and other units.

Mr. Cates noted that within a business context the luxury of long-term negotiation for something that needs to be handled within a certain amount of time would not be considered. In addition, with the considerable number of servers across the campuses and the sense that it may not be known what is on many of these servers, each campus CIO and each department should produce an inventory of what servers they have and what is on each server. Sensitive information such as social security numbers and other such information are possibly in jeopardy. Mr. Studham said such an implementation has begun inside the central organization, although there is, to some degree, a defensive resistance to this procedure. Mr. Cates said UT is in a crisis situation and action needs to be taken to make immediate improvements.

Mr. Talbott asked for clarification in the Gartner peer number of 4.3 percent of spending as a percentage of revenue and if that number translated to $1.8B total revenue. Mr. Studham replied that it would be $1.6B for 2008. Mr. Talbott noted this would be a 1 percent in savings if the 4.3 percent level was reached. Mr. Stansberry said members needed to leave the meeting with a clear understanding that IT at UT would not delay deployment of strenuous means to effect adjustments for drastic improvement and asked if this mandate required an action item. Dr. Simek said the program as Mr. Studham has outlined would have the required $~20M by the time stimulus funds have run out. Dr. Millhorn noted that IT’s strategic success is not only a matter of funds but UT’s interaction with other institutions and partners, such as our collaborative interaction with ORNL, depends on this success as well. Mr. Studham said that he is able to commit that by the end of the stimulus money UT IT will be able to quantify and track funds being spent. This will then allow
university leadership to determine if more or less should be spent to strategically operate IT. The Gartner number is a target. We do not currently understand why UT is spending more than this target number. We have the largest academic supercomputer in the world and this may mean we decide to spend more than our peers on wider-end networking. This will be a decision to be made by executive management. Currently most IT decisions are being made at the local levels.

Mr. Murphy asked for an explanation of why it is so difficult to capture IT costs. Mr. Studham said there is no standard method of accounting in place at the current time at the local levels. If computer software is purchased from a business office supply store, it is difficult to obtain this kind of transaction.

Mr. Stansberry requested that Mr. Studham take the application project timeline and break it into measurable, quantifiable, identifiable steps and present this information at the next ROED Committee meeting. Mr. Cates also suggested that this request be amended to ensure that any internal assistance Mr. Studham may need to accomplish this task be supported.

Dr. Beauvais Lyons (Chair of the University Faculty Council) was recognized by Mr. Stansberry. The members of this Council are very interested in discussing these IT issues. Most of this situation evolved over the course of years due to inadequate IT resources. From an entrepreneurial perspective, in terms of an individual investigator or faculty member with a research and/or teaching objective, there are oftentimes inadequate resources available to these individuals for the work they need to perform. There are, thus, a number of systemic problems that have created the situation with which Mr. Studham is now challenged. He noted he looks forward to working with Mr. Studham on these challenges from the faculty perspective. It is not simply a situation of individual faculty members or departments working “around the system” and being obstructionists. They are working around the system because they get better service through their own servers. The real challenge is a cultural one created by a history of inadequate IT organization. Mr. Stansberry said that no matter the cause of the problem, $20M is not available and the IT problems at UT must be managed. Mr. Murphy noted that the luxury of having everybody “doing their own thing” in the past can no longer be tolerated. From the Board’s standpoint, these issues must be addressed no matter the reason for their creation. The university cannot afford the duplicative costs associated with individuals operating under their own devices. Dr. Lyons suggested this seemed to be more a carrot than a stick mentality for this situation since faculty and their servers must be moved into a functioning centralized IT system, and asked if this is the desire of the Board. Mr. Studham again acknowledged the past history and inadequate centralized IT structure forced departments to build their local services. The proposed strategy is to operate central services in such a way as to offer departments a documented amount of storage, uptime and other functions thus allowing them to choose if they
need to duplicate these functions at a local level or if the central services need to be modified.

The first step in this process is to build a service catalog committing central functions provided by centralized IT. Mr. Stansberry noted that needed services must be provided at a central level and they must be used by the local organizations. Mr. Cates asked if most applications would be on desktop or at some central-use computer location. Mr. Studham noted that most enterprise (Banner, TERA, IRIS, etc.) services are at central locations. Everything else would be on the desktop. Email and similar services are commodities which should be out-sourced to Google, Microsoft or some entity which provides email. Mr. Horne asked if a coordinating committee should be established to look at these issues. Mr. Studham noted a Technology Review Board has been established to study and discuss these ideas and issues.

Mr. Stansberry thanked Mr. Studham and noted that, in the interest of time, the next presentation on the agenda should be made.
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