Review of Information Technology at the University of Tennessee

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Executive Summary

Information technologies at the University of Tennessee (UT) are in poor shape. The organization is without a leader, direction or a unifying mission. There is no clear reporting line and the Information Technology (IT) organization is stuck in the middle of a System/Campus power struggle. UT needs to make a conscious effort to mend the IT organization. This should be done in a three-year "turnaround" followed by a long term consistent and continuous improvement. We recommend UT take the following five actions as quickly as possible and communicate the three-year plan to faculty, staff and students with weekly updates:

- Empower a system-wide CIO for an IT turnaround
- Implement an IT Project Management Office (IT PMO) and an IT framework
- Make IT staffing a priority
- Include EVERYONE doing IT at UT in the unified organization
- Adjust the IT budget to support a turnaround (restructure or increase).

Introduction

The University of Tennessee is a nationally recognized public university with a total enrollment of over 45,000 students at four main campuses and three institutes. The university has an excellent reputation, achieving high rankings from many national publications for academic quality in several undergraduate programs. UT is also involved in a wide variety of outreach and research programs that fuel statewide economic development. Efficient IT services that exceed the needs of students, faculty, administration, and support staff are critical for the university to maintain this reputation in the "information age."

At a high level, IT services include the following main areas:

- Administrative systems and applications development and support (e.g., IRIS, Banner, etc.)
- Classroom systems and applications development and support (e.g., Blackboard)
- Telecommunications (telephones, cell phones, cable TV, etc.)
- Network Infrastructure (wired and wireless Internet access, remote access, etc.)
- Identity management, messaging, web and storage services (authentication, e-mail, calendar, instant-messaging, search, home page, phone book, etc.)

- Computer management and support (desktop, cluster, system configuration management, off-the-shelf operating systems and applications software, etc.)
- Help desk and user support
- Cyber security

Oak Ridge National Laboratory (ORNL) has been asked to assess the organization and management of UT IT services to make recommendations for improvement. In particular, ORNL has been asked to look at the balance between management at the UT System and Campus levels and to recommend an effective IT governance structure.

Through numerous interviews with administration, staff, faculty and students, it is clear that the UT IT staff, both central and departmental, are doing their best to provide high-quality services and that many aspects of UT IT are working and meeting customer expectations. The individual staff and middle management appear to be dedicated. Most services work well: payroll runs on time, telephones and networks work well, the help desk provides support, etc.

In contrast, there are several key areas where IT is not meeting the needs of the university and a few areas with the potential for disaster. Most of the problems with these areas can be attributed to the lack of a stable long-term strategy to guide the setting of priorities, budgets and resources. The best examples are the system-wide Exchange™ e-mail conversion project and the Banner™ student information system (SIS) where sufficient resources were not and are not now available to meet desired scope, schedule and budget. The absolute reliance on e-mail service makes any significant outage intolerable. The need for an integrated, state-wide SIS that does not rely on social security numbers is imperative to support ongoing university operations.

Without strong leadership, any well-intentioned and costly standardization projects will crumble over time. UT is not currently deploying a single e-mail system like many of the administration are expecting; rather five different e-mail systems from the same vendor are being deployed.. Over time, the e-mail infrastructure will diverge due to the lack of standardization and centralization. The SIS Banner implementation is currently taking the same approach of independent implementations of a single vendor's product without sufficient project management and change management structures to ensure the varying implementations stay consistent over time.

Roughly 30% of the IT staff do not report to any IT organization. The campuses and system need to determine how to capitalize on these IT resources. Less than 50% of the IT staff at the Knoxville campus (UTK) report to the UTK Office of IT. As a result, UTK is not taking complete advantage of its investment in IT.

Fund Name	FTE	BUDGETS AS OF JUNE, 30, 2007 Salary	Operating	Recoveries	Total	Revenue	JOB TITLES OUTSIDE OF CENTRAL IT
Space Institute							
Computer Services	2.35	$ 210,504	$ 132,722	$ -	$ 343,226	$ -	1.00
Total							
Chattanooga							
Computer Services	14.00	$ 736,089	$ 381,995	$ (168,063)	$ 950,021	$ -	
Academic Computing	9.00	107,449	-	-	107,449	$ -	
Student Lab	-	109,229	23,294	-	132,523		
Help Desk	5.00	127,160	32,130	-	159,290	$ -	
Telephone Services	8.00	349,722	190,306	(540,118)	-	$ -	
Total	36.00	$ 1,429,849	$ 627,915	$ (708,181)	$ 1,349,283	$ -	12.25
Martin							
Computer Services	26.85	$ 907,764	$ 660,399	$ (649,445)	$ 918,718	$ -	
Telephone Services	4.77	211,070	213,039	-	424,109	$ -	
Help Desk	9.69	250,764	103,339	(354,103)	-	$ -	
Total	41.31	$ 1,369,598	$ 976,777	$ (1,003,548)	$ 1,342,927	$ -	4.00
Health Science Center							
Chief Information Officer	1.00	$ 98,533	$ 25,730	$ -	$ 124,263	$ -	
Business Office	3.00	173,145	12,522	-	185,667	-	
Sys Admin/DBA	11.00	736,438	374,171	(492,000)	618,607	-	
Network	10.00	746,482	935,717	(657,163)	919,036	-	
Telephone Services	8.40	478,700	707,976	(1,036,051)	150,625	-	
Administrative Applications	12.90	948,091	28,998	(132,042)	743,037	-	
Help Desk	10.99	713,751	178,351	(130,000)	762,902	29,000	
Total	57.29	$ 3,787,139	$ 2,163,065	$ (2,447,256)	$ 3,303,937	$ 29,000	35.90
Knoxville Campus							
Innovative Technology Center	17.39	$ 713,054	$ 82,111	$ (334,960)	$ 460,205	$ -	
Engineering Services Classrooms	3.00	129,957	100,386	-	229,943	-	
Help Desk	44.74	3,082,702	575,444	(466,459)	3,191,687	-	
Digital Media Services	3.25	151,972	89,761	-	241,133	-	
Total	68.38	$ 4,078,685	$ 848,202	$ (801,419)	$ 4,122,968	$ -	154.47
UT Administration[1]							
Chief Information Officer	8.30	$ 579,516	$ 63,261	$ -	$ 642,777	$ -	
Business Office	23.00	1,129,235	561,435	(457,251)	1,233,419	-	
Printing/Imaging Services	15.00	847,399	180,148	(500,000)	327,537	-	
Engineering Services	18.00	719,968	841,388	(592,345)	969,009	50,647	
IT Security Office	11.01	684,913	150,884	-	835,797	-	
Sys Admin/DBA	40.21	2,790,848	1,617,231	(40,000)	4,368,079	-	
Network	35.30	2,129,537	2,140,370	(2,749,880)	1,519,027	240,000	
Administrative Applications	43.00	2,976,191	248,024	(60,000)	3,164,215	-	
Web Services	6.00	456,162	71,555	-	527,717	-	
Telephone Services	48.50	2,350,324	5,708,598	(8,052,173)	6,749	-	
IRIS (SAP ERP)[2]	24.38	1,270,131	716,145	-	1,986,276	-	
Total	272.70	$ 12,754,330	$ 10,958,198	$ (11,994,398)	$ 11,718,130	$ 290,647	2.00
Institute of Agriculture							25.00
Institute for Public Service							30.00
TOTAL	472.03 [2]	23,627,294.00	15,707,679.00	(16,954,802.00)	22,380,171.00	319,647.00	264.52

(1) Serves UT Extension, Agriculture Experiment, Veterinary Medicine, Knoxville Campus, UT Administration, Institute for Public Service, and provides some services to the UT Chattanooga, UT Martin, Health Science Center, and Space Institute campuses, such as statewide video services, statewide contracts, Security, policy and oversight.

(2) 39.13 FTE are student employees

(3) Reports outside of central IT organization

The primary issue is that over the years many UT IT services have grown bottom-up to meet specific needs and have not benefited from an overall strategy. There is clear evidence of inefficiencies, technical challenges, and a lack of cohesion between centrally and locally provided services. Priorities are often set at the local level without the benefit of the "big picture." Conversely, priorities are also sometimes set at the institutional level without due consideration of local requirements.

These conditions have been recognized for a long time and there have been many attempts to address this situation with varying degrees of success. The primary approach has been to reorganize and change the IT management balance between the UT System

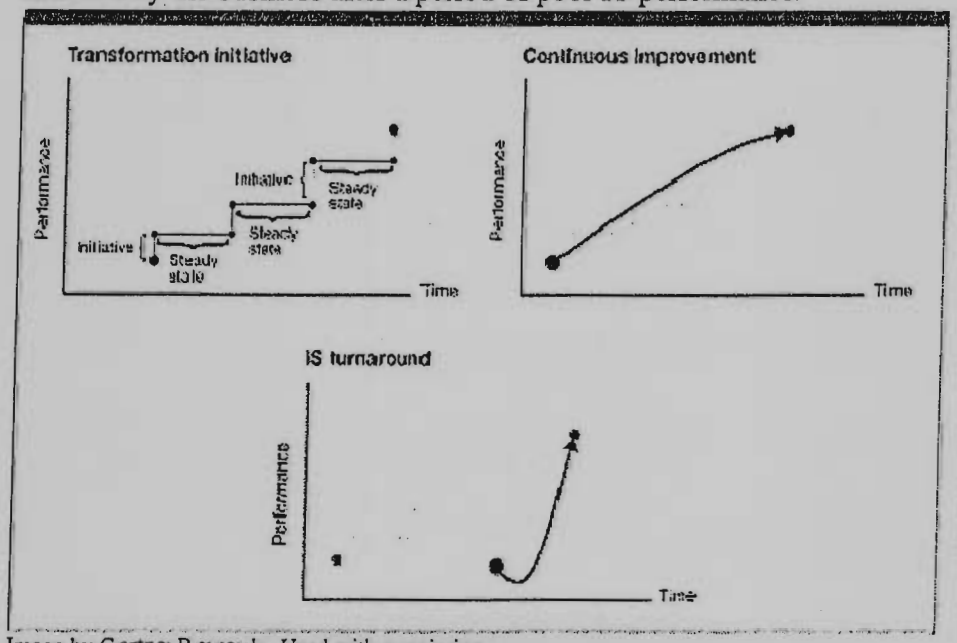
and the individual campuses. It should be noted that some of these attempts might have realized more success if they had been supported longer term.

Continuous changing of the management balance has had the most adverse effect on the Knoxville campus due to both size and complexity and to the co-location of system and campus management. The Chattanooga, Martin and Memphis campuses are smaller and more remote and have had sufficient local leadership at the chancellor level to enable the setting of stable priorities.

In particular, the absence of a strong CIO with the full support of both the system and the campus administrations has been very challenging to the IT operations of the Knoxville campus. There has been no way to set and enforce stable priorities.

All of the above has lead to the "crisis of confidence in IT" mentioned in the previous assessment. There are four IT best practices when improving IT performance:

- **Transformation initiatives** are specific projects that address a particular issue. Implementing ITIL, a program management office (PMO) or office of the CIO are examples of transformation initiatives.
- **Continuous improvement** improves performance incrementally through individual projects. Lean Six Sigma and total quality management are two continuous improvement approaches.
- **Steady-state management** manages performance as the CIO handles performance issues and problems individually.
- An **IT turnaround** involves a concentrated effort to dramatically improve IT performance by making radical changes to IT processes, personnel, skills and the business organization. Unlike transformation initiatives, IT turnarounds are initiated by the business after a period of poor IT performance.



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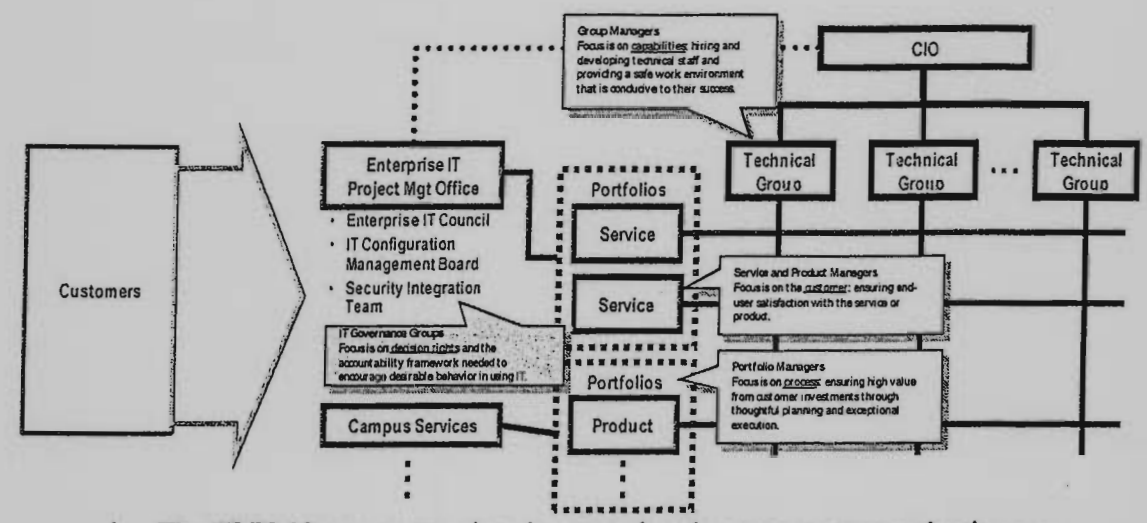
Recommendations

There is no quick or one-time fix. UT IT has broken too many things that were already broken. A strong CIO must be put in place and given the support and latitude to effect the necessary changes. The next CIO must be allowed to focus most of his or her attention on core governance and long-term strategy issues. It is critical to note that if the next CIO does focus on the core strategic issues, then they may be strongly criticized by the faculty for not delivering newer/fancier end-user services. If the next CIO is forced to focus on delivering the newer/fancier end-user services, then the foundation will continue to deteriorate and the system will demand another leadership change and the major negative impacts will continue. Everyone at both the system and campus levels must recognize that the governance and structure need to be in place and supported for an order of five years for the open wounds to heal.

Keeping in mind that stability is the most important objective; the following are recommendations for improvement. Whatever direction is selected, it is imperative to stay the course.

1. Empower a system-wide CIO for an IT turnaround:
    a. Commit to a 3-year "say only good things about IT" and hire a single system-wide CIO on a white horse. The CIO should have full public support of both System and all campuses. No end-arounds permitted to either system or campuses.
    b. The CIO should be given assurance of support so that they can make necessary decisions without fearing loss of employment.
    c. All IT decisions must be approved by the CIO. Create a governance process for buy-in, but UT IT needs an empowered turnaround leader and not leadership by committee.
2. Implement an IT Project Management Office (IT PMO) and an IT framework:
    a. Establish a UT IT PMO. IT services and projects should be led by a service or project level manager who can demand and expect integration. Technical group leaders should not lead major IT projects as they tend to favor their organization and skill base. A strong PMO, where all projects run through project managers, will alleviate some of the concern about where the IT organization reports. With a strong PMO, the customers will view their project manager or liaison as a strategic business partner and run projects horizontally through an integrated IT organization rather than from top down.



b. The IT PMO must commit to improved and constant communications to stakeholders. Let people know priorities and schedules. Pass along both good and bad news.

c. Deploy an IT framework such as ITIL to standardize service delivery and expectations. A consistent theme in our interviews was that UT staff did not know who to contact with their problems. Following an implementation of ITIL, the answer becomes consistent across all the technical organizations and projects. People who fund projects are called customers. Customers contact their service level manager. Everybody else is an end-user who contacts the service desk. End-user requests are categorized as either: 1) incidents, 2) problems, or 3) service requests. The service desk cannot close a ticket without the end-user's concurrence (something that is happening now).

3. Make IT staffing a priority:
   a. Find a way to increase salaries for key IT staff. IT is only as good as its people. UT is paying ~30-40% less than UT-Battelle for comparable IT staff.
   b. Assess the willingness of the incumbent IT staff to perform the 3-5 year turnaround. A true turnaround is a lot of work and requires all staff to dedicate 100% effort.
   c. Hire a strong SIS project manager and fund the project appropriately. Chattanooga is headed for an imminent train wreck. Other campuses (except possibly Martin) are not far behind.
4. Include EVERYONE doing IT at UT:
   a. IT organizations in non-Knoxville campuses must conform to standard IT Portfolio project management and utilize the core IT services. IT staff remaining at non-Knoxville campuses must have a matrixed role to single System CIO via their associate CIO. The campuses and system need to agree on a common mission and priorities and demonstrate unified support for the CIO and the structure.
   b. Many problems exist with rogue IT. Roughly half of the Knoxville IT is rogue. Most of it is at the department level but some of it is in the administration (e.g., some of the IRIS IT staff report to the treasurer and most of the UTK Student Affairs staff we met with were more IT than line of

business). These rogue IT staff will work against a unified OIT due to fear for their job as a technologist. Manage them or remove them.

5. Adjust the IT budget to support a turnaround (reorganize or increase):
    a. The SIS development and implementation budget is short about $20M.
    b. The IT salary adjustment will have a cost.