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**August 15, 2015**

**Departmental Review**

**Information Technology Services**

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 **CIO**

**Departmental Assessment**

**1. Provide a brief overview of departmental activities throughout the reporting period including goals and progress to achievement:**

Prometric Training Company’s website states “Information Technology (IT) is the single, most rapidly changing and growing industry in the world. Every day, new technology is developed while old technologies are retired or improved.” This constant state of change has kept ITS very busy over the last five years. Below is a brief overview of the major activities.

1. ITS entered into a 3 year contract with Adobe starting in 2015 for their Adobe Creative Cloud products. This contract allows Adobe Acrobat to be installed on all UNA owned machines. In the past, Acrobat was typically purchased by individual departments, but will now be provided free of charge to all departments. This contract also allows departments to purchase the full Adobe Creative Cloud suite of products at a discounted price over previous years. Providing great service to the campus is always one of our goals and this should benefit many of the departmental budgets.
2. ITS has increased the campus Internet bandwidth from 55 megabit to 250 megabit since 2010. ITS is currently in discussions to move our Internet bandwidth to 1 gigabit, which would be four times faster than what we have today. As part of this move, ITS hopes to gain redundancy in our Internet connectivity, so that a fiber cut between Florence and Huntsville will not create an outage for the campus. If ITS can make this move, it will help us achieve our goal of providing up-to-date technology to the campus as we are lagging behind many others in the amount of bandwidth available to the campus. This move would not only provide a faster Internet experience for the campus, but would also provide a faster connection to UNA-hosted sites and services via the Internet.
3. ITS has worked with Housing and Residence Life to increase the residence halls Internet bandwidth from 20 megabit in 2010 to 500 megabit today. ITS has also assisted in outsourcing the wireless Internet connectivity in the halls, which has provided the residents with a much improved experience. The Residence Halls have always been problematic for ITS to manage appropriately due to our small staff size and the funding required to do so. Sometimes the best way to make progress and to reach goals is to acknowledge your weaknesses and find alternative solutions. This is one of those instances. ITS is currently best serving the Residence Halls by letting someone provide the services and acting as the technical liaisons.
4. In late 2008, Gateway, Inc. went out of business and left the University with a campus full of out-of-warranty desktops, laptops, and several servers. Until this time, ITS had been able to keep computers on a three year warranty replacement cycle. ITS struggled for the next several years, but today has managed to get back to being able to keep computers across campus up to date. Recently, ITS has started adding additional memory and solid-state hard drives (SSD) to computers in order to improve their performance and gain a longer life span. In many cases, this change has allowed computers to go from a powered off state to a useable state in just 10 to 20 seconds. Prior to this change, many computers took a minute to a minute and a half to be useable. These hardware additions have also greatly improved the responsive of the computers once booted. These changes will hopefully allow us to extend the life cycle of several computers from three years to four or five years. This is one of the many ways ITS has improved technology on campus while saving funds to be used in other areas.
5. In 2010, ITS used 1-gigabit multi-mode fiber to connect each building to the campus network backbone and provided a 100-megabit connection to each desktop. Today, ITS has 10-gigabit single-mode fiber to the majority of buildings on campus and provides a 1-gigabit connection to each desktop. This has improved the campus network speeds ten-fold and provides users a much better network experience while at the same time allowing ITS to carry voice and video traffic across the same infrastructure without negatively impacting network performance. All new buildings on campus now get single-mode fiber with 10-gigabit connectivity added during the construction phase and ITS plans to have all existing buildings moved to the new faster infrastructure during the next two years.
6. Five years ago, the campus had wireless in the majority of the buildings with the goal of covering common areas. Today, ITS provides wireless throughout all buildings and are adding access points as needed to cover areas with weak signal or in need of additional capacity. ITS’ current goal is to provide total wireless coverage indoors and outdoors on both University campuses. ITS currently has several outdoor access points on order for the Parking Deck and will continue to add additional outdoor access points until all outdoor areas are covered. This goal has been complicated and slowed by the steady change in wireless technology. These changes sometimes require funds to be spent to replace current access points with newer technology, therefore prevent spending those funds on additional access points, and take a toll on limited staff. The newest wireless standard is 802.11 AC. We currently have a mixture of 802.11 N and AC, but are working to move everything to 802.11 AC over the next few years. All new wireless access points bought for the next few years will be 802.11 AC capable.
7. Malware (Viruses, Spyware, Adware, Ransomware, etc.) is a much greater threat today than in the past. Microsoft stated in 2011 that one in every 14 downloads from the Internet contained malware code. This growing trend is a constant battle for ITS as a single malware-related event can have a great impact on all. ITS has implemented several layers of technology over the last five years from the desktop level to the campus Internet gateway level in order to combat this problem. These implementations have cost in the six-figure range. Due to this review being posted to unknown readers, we will not go into our methods, so that we do not benefit an attacker. However, ITS can state that we have seen our malware-related work orders decline over the past five years even though the threats have grown. ITS will continue these efforts and add to them as needed in order to protect the University.
8. ITS has a goal to continually improve customer service. One of the best things we have done to meet this goal from a technology standpoint was the addition of a product called KACE by Dell. KACE gives us features such as inventory and asset management, computer systems deployment, patch management, software distribution, helpdesk, and much more. KACE allows ITS to respond faster to campus technical issues and software needs, which allows ITS and the rest of campus to be more efficient. With KACE we have the ability to report on inventory and assets, software usage, helpdesk tickets, etc., which we did not have in the past, thus giving ITS data to make better decisions and assign resources more wisely.
9. ITS implemented a NetApp Storage Area Network (SAN) in the mid-2000s as part of the Banner project. While this SAN had redundancy built-in, the only unit was in the Main Campus datacenter and therefore the data was at risk if the datacenter was destroyed. In January 2015, ITS replaced our NetApp SAN with a Tegile SAN. ITS was able to purchase two Tegile SANs for approximately the same cost spent on NetApp in the past. This purchase allowed ITS to not only house a SAN at the Main Campus, but also at the East Campus. Now, the data is replicated hourly between the two campuses, which gives us a greater level of protection against a disaster. In 2012, ITS purchased a new backup appliance solution and updated this solution to multiple appliances in 2015. Our data backups are written to these appliances, which are stored at a location on campus outside of the datacenter. These two implementations give the University three locations for its data and greatly decrease data loss risk.
10. In 2015, with the assistance of the Facilities and University Police departments, ITS began installing IP-based security surveillance cameras and NVRs on campus. At this time, all dorms, Collier Library, the Science Technology and Engineering building, Parking Deck, and a few other select locations have been completed. Other buildings are being evaluated for installations. This implementation will provide greater security for the campus and aid the Police in solving cases.
11. In 2015, ITS and Human Resources worked together to implement a campus-wide Information Security Awareness Training Program. This training consists of a series of informational videos designed to provide insight and instruction regarding information security. All new employees must complete the training within two weeks of their initial hire date. Training may vary year-to-year based on current trends. Training completion and results will be maintained in each employee’s personnel file. Any employee who fails to complete the required training will be subject to removal of access to University systems until such requirements have been met. In addition, new employees will be denied access to University systems until such requirements have been met. It is the intent of this program to help users be aware of actions they can take to better protect the University's information as well as their personal information. These actions include, but are not limited to proper password usage, data backup, proper antivirus protection, reporting any suspected incidents or violations of security policy, and following rules established to avoid social engineering attacks.
12. In 2010, ITS migrated the University to Microsoft’s Live@Edu offering and since that time has moved to Microsoft’s Office 365 solution. Office 365 for Education provides the University with email, calendaring, contacts/directory, instant messaging, video and voice chat, and online document storage. With Office 365, students, faculty, and staff can access the same great Office 365 tools that businesses around the world use every day at no charge to the University. Office 365 offers cloud-based email, calendars, and contacts powered by Microsoft Exchange Online with 25 GB storage per user. Using OneDrive for Business, the University receives file storage and sharing with one TB of storage per user. Users have the ability to create and edit Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Microsoft OneNote documents using their favorite web browser when they do not have Office installed on the device they are using. Users also have the ability to install the latest version of Office free on up to five of their personal devices.
13. In 2014, ITS worked with ETS to migrate the University Online Learning Management System (LMS) from Angel to Canvas. This migration has been well received by faculty and students and is viewed as a more robust and easier to use system than past ones. This change to Canvas allowed the University to save money on a yearly basis also. Once again, as with several changes, performance was increased while cost was decreased.
14. In 2011, ITS moved the University from a PBX-based telephone system to a Voice over IP (VoIP) system made by Adtran. VoIP provides several benefits to the University. VoIP combines many communication methods such as telephone, voicemail, fax, and instant messaging into a single system. Inbound fax to email, outbound faxing from a computer, voicemail to email, click-to-call functionality from a computer, and presence information are other benefits it gives to users. VoIP reduces infrastructure cost by consolidating data and voice onto a common IP network. This saves the University money by not having to double wire buildings with one wire for voice and another for data as in the past. Now, one wire can be run to supply both voice and data.
15. Since 2008, ITS has continued to grow our use of virtualization. Over the past five years, ITS has migrated the Banner system, which comprises over twenty servers, from physical to virtual. We have seen up to ten times qualifiable performance increases over the physical systems. ITS is in the process of virtualizing UNAPortal. When UNAPortal is complete, all systems that we desire to virtualize will be virtualized. All campus-hosted systems going forward will be virtualized, if possible. Virtualization has saved the University hundreds of thousands of dollars over the past seven years in hardware, personnel, cooling, and electrical costs and will continue to save more in the future. Once again, ITS has been able to improve performance and efficiency, while cutting costs.
16. ITS has made much progress with Disaster Recovery (DR) and Business Continuity (BC) at East Campus over the last five years. With the help of the Facilities department, we now have a room there with a new diesel generator, backup battery system (UPS), and HVAC. ITS has approximately five servers located there currently, which provide redundancy of essential services also provided by servers at Main Campus. In the event the servers providing these essential services at Main Campus go offline, East Campus servers should be able to provide services to both campuses. As mentioned earlier in the report, we now have a storage unit at East Campus and are replicating to it hourly. We are in the process of replacing our current hardware, which runs our virtual server farm at Main Campus, and are investigating the feasibility of moving the old hardware to East Campus. This would move us one step closer to being able to bring the datacenter active at East Campus in the event of a disaster at Main Campus, but carries a sizeable licensing cost from various vendors. Therefore, we are evaluating funding to determine if we think we can sustain the ongoing cost at this time. With the help of the Facilities department, we have also replaced our aged diesel generator and UPS at Main Campus during the past year. As mentioned earlier, we are now replicating our storage between the two campuses and have our backups at a third location. While we do not have a full DR/BC architecture in place, we are much improved in this area over five years ago.
17. In 2012, ITS changed the department’s name from Computer and Telecommunications Services (CTS) to Information Technology Services (ITS) in order to become more in line with the industry and other higher education institutions. ITS also went through a departmental reorganization, which created five basic areas that we refer to as teams. ITS has a Systems Services Team, which has three areas of interest – Desktop Systems, Server Systems, and Labs/Classrooms. The Systems Team is led by the Systems Services Manager. The Network Services Team manages the campus wired and wireless networks, VoIP, cable TV infrastructure, security cameras, and assists with security. The Network Services Team is led by the Network Services Manager. The ERP Services Team manages Banner and related products and security. The ERP Services Manager leads the ERP Services Team. The DBA Team manages the Oracle databases for the University, and the databases’ related security, reporting, and integrations. The DBAs answer to the Assistant Director/Systems Architect. The Team Managers, Assistant Director/Systems Architect, Phone Operators, and Executive Assistant answer to the CIO. This reorganization has allowed ITS to become more efficient and better managed. From campus feedback concerning ITS, this reorganization has been a success.
18. In June of 2015, Lab/Classroom audio and video services moved from ETS to ITS. ITS received one employee from ETS as part of the services move. The employee was added to the Systems Services Team Lab/Classroom area. This move should be of great benefit to the University. Previously, it was not always clear as to what department Labs/Classrooms problems should be routed. Now, ITS is responsible for all technology needs within Labs/Classrooms. This should also help to alleviate any confusion and miscommunication that was sometimes present in the past concerning Labs/Classrooms between the two departments.

**2. Assess the department as it relates to staff activities throughout the previous reporting period including research, service, and staff development:**

1. Beginning in 2013, ITS worked with Procurement to implement a donation of retired technology policy. Since this time, ITS has donated several hundred computers to needy organizations. This policy has aided ITS in disposing of old equipment while at the same time spreading the name and good will of the University. Each donated computer is laser engraved with the name of the University and is a great no-cost marketing tool for the University while benefiting others.
2. Since 2013, ITS has purchased an annual subscription to online technical training for ITS staff. While ITS has not replaced classroom-based training that takes us out of the office, we have augmented our annual training with an option that allows us to train when it’s convenient and at a greatly decreased cost over classroom-based training.
3. ITS staff attends many conferences annually in order to stay up to date on technology. Some of the conferences attend by ITS staff on a regular basis are:

Ellucian Live (annual conference for Banner and other Ellucian products)

THEITS – Tennessee Higher Education IT Symposium

EDUCAUSE - the largest conference focused on technology in higher education

VMworld – the largest conference dedicated to virtualization in the U.S.

ALBUG - Alabama Banner Users Group conference (This conference moved to Florence in 2014 and ITS played a major role in setting up and providing technology resources for the attendees)

Dell World – conference covering all Dell products including KACE, which we use

Microsoft Ignite (TechEd) - the largest annual Microsoft technology event

1. Training events vary annually depending on need. Over the past five years, ITS staff have attended week-long classroom-based training on topics such as Oracle, Microsoft products, Dell KACE, RedHat, Cisco, Unified Communications, Ellucian products, Wired and Wireless Networking, Voice over IP, Security, and many more. ITS staff also attends several Lunch and Learn events, one to two day seminars and webinars annually.
2. ITS staff takes a part in University life and is seen regularly at University-sponsored events and community-sponsored events.

**3. Are facilities and resources adequate to address the goals and objectives of the department? Explain why or why not:**

Are facilities and resources adequate is a hard question to answer and depends upon your definition of adequate. ITS has had some improvements made to the Computer Center over the past five years, which have been much needed and appreciated. These improvements have ranged from new carpet and paint in some areas, to repairing our leaking roof, to a new battery backup (UPS) and diesel generator for the datacenter. Some of these improvements have been funded by ITS and others by the University. ITS still has facility-related issues with HVAC. Some areas do not cool properly in the summer months, while others cool too well. In the winter months, personal heaters are a common item in ITS. The heat tends to be similar to the cooling in that either it does not heat properly or it overheats and has to be turned off. This coupled with the air entering around the aged windows can make for some chilly days. We also have an air conditioning unit in a downstairs office area of the Computer Center that is putting out noise at a level exceeding 80 decibels. This is not only a non-conducive work environment, but also a hazard as prolonged exposure to high noise levels such as this can lead to some level of hearing loss. ITS is also in need of more space for offices and storage. Different options for gaining more space have been discussed, but a solution has not been found at this time. As ITS is getting by with the facilities we have, I would have to say they are adequate per my definition, but I would say the facilities are far from optimum for a 2015 datacenter.

Since ITS has equipment in every building on campus, we are affected by the condition of facilities other than the Computer Center. Our biggest issue in other facilities is the lack of backup electrical power via a UPS and/or a generator for our equipment. This means that during a power outage these facilities do not have data, video surveillance, or desk phone capabilities. We also have cooling issues in a few areas, but these are very limited.

Another issue we have with the Computer Center and our IT spaces (network closets) around campus is the lack of security. The Computer Center nor our network closets have video surveillance or swipe card locks, so there is no record of anyone coming or going from them. We do lock the rear doors to the Computer Center, therefore preventing entry without a key, but the front doors stay unlocked during business hours and are not monitored. Many of our network closets are shared with janitorial staff, which means we have chemicals, water, etc. around several thousand dollars of equipment. Even in our areas controlled by supposedly limited keys, we have been surprised at the number of non-ITS employees whom have used a key to enter. While this has not caused major issue in the past, it is not a best practice for a datacenter and network infrastructure in today’s world.

Other resources such as personnel and funding are a similar story to facilities. ITS gets our job done with the personnel and funding we have. This does not mean that it is not a struggle sometimes. The biggest issue with our current resources is that ITS desires to do more than stay status quo. Today, it is hard for ITS to dedicate staff to become technical experts on a particular subject or subjects due to our small staff size. ITS staff members tend to be in many cases "Jacks of all trades”. This can be good and bad. It is useful sometimes to have a vast skill set, but it makes it hard to be great at any one. If ITS had more staff, we would be able to offer faster service, improve many of the services and products we offer today, and offer additional services and products.

Of course, more staff, more products and services, and better facilities all require more funding. ITS funding is based on a combination of University budget line and technology fees, with fees being the majority. With the decline in enrollment over the past few years, ITS funding has decreased due to our funding being fee based. Funding is starting to improve hopefully as a possible record enrollment is projected for this fall, an additional dollar has been added to the technology fee starting this fall, and several cost-cutting measures have been implemented by ITS over the last five years.

As stated at the beginning of this report, “Information Technology (IT) is the single, most rapidly changing, and growing industry in the world. Every day, new technology is developed while old technologies are retired or improved.” This constant state of change creates what I refer to as a “TMP” problem – time, money, and people, and if we get the money, we can get the people, which will make the time. While facilities and resources may not be to the level ITS would desire, they have improved over the last ten years. If ITS can improve as much or more in the facilities and resources area in the next five years as the last ten, hopefully we can move from being a good department to a great department.

**4. Notable achievements by the department (students, faculty, staff):**

 A. ITS had two staff members complete their first Bachelor degree in the last five years and another staff member completed their second Bachelor degree. One of the staff members graduated Summa Cum Laude and is a member of Phi Kappa Phi and another of the graduates was chosen as a Promising Alumni. Each of the graduates was able to graduate while maintaining a high work performance level and balance work, school, and personal life. ITS is very proud of these staff members.

 B. In the last five years, ITS has had staff members obtain industry certifications including: Adtran Technical Solutions Professional for Unified Communications

 Adtran Technical Solutions Professional for vWLAN

 Adtran Technical Solutions Expert for Unified Communications

 Brocade Certified Network Engineer

 Brocade Certified Networking Professional – test pending

 Certified Wireless Network Administrator – test pending

 Corning Certified Fiber Optic Hardware Technician

 ITS has had multiple staff go through the Leadership Certificate program with UNA Continuing Education.

 C. ITS staff members have presented at conferences/events such as ALBUG, Connecting Alabama, and Adtran Connect Press and Analyst Event over the past five years.

 D. ITS staff members have worked with vendors to do multiple case studies on our use of their products and in one instance a webinar.

**5. Briefly describe the department’s vision and how it aligns with the University’s strategic plan:**

ITS understands that technology increasingly affects every aspect of the University. Therefore, ITS envisions that our role as a department is to provide technology leadership, expertise, and cost-effective solutions along with customer service excellence to support the University while doing our best to secure and protect the University’s information resources. With the importance of security growing more crucial each day, ITS will strive to balance the needs of an open academic environment against the increasing demands to keep the University’s information resources secure.

 ITS aligns with the University’s strategic plan by playing a vital part in several of the Foundations of Excellence, of which the plan is comprised. ITS has worked with the Enrollment Management area to implement Ellucian Recruiter, a customer relationship management system. Recruiter will allow the University to manage its relationship with students from the time they become a prospect to the point they become an alumni. ITS has worked with other areas around campus to implement technology solutions to aid with tutoring, student success tracking, and other systems in order to improve student retention. ITS works with Facilities during new construction and modernization of older facilities to implement technology such as Voice over IP, video surveillance, wireless and wired data connectivity, and other technology solutions. ITS assist University Advancement with technology required in their fund raising campaigns. ITS is working with the Director of the Quality Enhancement Program to outfit an area with technology for faculty, staff, and students to use for collaborative purposes. ITS often provides technology assistance and consultation to businesses and schools. These are just some of the ways ITS aligns with the University’s strategic plan. In summary, ITS’ mission is to provide excellence in all we do and to be a trusted and respected partner within the campus community in order to advance the University’s strategic plan.

**6. How has the department addressed recommendations from the previous program review?**

1. Previous Recommendation #1 - Implement the UNA ITS Disaster Recovery Plan at UNA’s East Campus. ITS has made much progress at East Campus over the last five years and has more planned. We now have a room there with a new diesel generator, backup battery system (UPS), and HVAC. ITS has approximately five servers located there currently, which provide redundancy for essential services also provided by servers at Main Campus. In the event the servers providing these essential services at Main Campus go offline, the East Campus servers should be able to provide services to both campuses. As mentioned earlier in the report, we now have a storage unit at East Campus and are replicating to it hourly. We are in the process of replacing our current hardware, which runs our virtual server farm at Main Campus, and are contemplating moving the old hardware to East Campus. This would move us one step closer to being able to bring the datacenter active at East Campus in the event of a disaster at Main Campus, but carries a sizeable licensing cost from various vendors. Therefore, we are evaluating funding to determine if ITS can sustain the on-going cost at this time.
2. Previous Recommendation #2 - Increase the LAN backbone speed from 1 gigabit per second to 10 gigabits per second to every major building on campus and increase the LAN bandwidth to each desktop computer from 100 megabits per second (MB) to 1 gigabit per second (GB). ITS has completed this to over 75% of campus and is moving toward 100% completion. The main obstacle that has prevented this from being completed already is lack of staff. ITS should have this completed during the next year.
3. Previous Recommendation #3: Purchase or lease dark optical fiber between Main Campus and East Campus. This recommendation has proved to be unobtainable financially. ITS is currently connecting the two campuses using AT&T MetroE services with a 1 GB link. With the new State of Alabama contract pricing released in 2015, we are able to upgrade this link to 5 GB for a small savings over what we are paying for 1 GB. For a modest additional sum, we can upgrade this link to 10 GB. Currently, ITS is evaluating funding and will most certainly be upgrading to the 5 GB and possibly to 10 GB during the next year. The upgraded link will be using AT&T ASE services, which provides redundancy not offered with the MetroE.
4. Previous Recommendation #4: Diversification/redundancy of UNA bandwidth and ISPs. While ITS has increased bandwidth drastically since the last review, we still have a single link to our Internet Service Provider (ISP), Alabama Supercomputer Network (ASN). With the new State of Alabama contract pricing released in 2015, we can upgrade our Internet bandwidth from 250 MB to 1 GB with AT&T and save money. We could also continue to keep the 150 MB provided free by the State through ASN today. While this seems like an easy decision, the switch to AT&T would cause some re-architecture of the University network, which can be somewhat complex and require downtime to complete. ITS is evaluating the work and time required to meet this recommendation and will be making a decision on how to move forward during the next year. Again, lack of staff is an obstacle to obtaining this goal currently.
5. Previous Recommendation #5: Implement a Voice over IP (VoIP) system to phase out the existing telephone switching system. This goal was achieved totally in 2012 with the finalization of the Adtran VoIP system project completion. This project was a success and allowed the University to overcome the shortcomings of the previous PBX telephone system. ITS has recently been informed that Adtran is getting out of the VoIP market and we are now evaluating our vendor options and will begin planning a migration. Adtran will continue to support our current system through 2018 without any feature updates. This is a prime example of the constantly changing technology industry.