Comprehensive IT Assessment
Future State Recommendations – Part 2
Executive Summary

August 2013
1 Background

1.1 Purpose
This Comprehensive IT Assessment was initiated by the Texas A&M University System (hereinafter referred to as either, “TAMUS,” or “the System”) to gain System-level insight into multiple facets of the IT environment across all Member Institutions and Agencies, and to develop a System-level set of recommendations designed to increase the effectiveness and efficiency of the System. While performing this assessment we have met with many talented, dedicated individuals, including many who regularly go “above and beyond” to ensure the best environment for those they serve. We have found organizations, or parts of organizations, that are doing many things very well, and who have developed strategic plans to guide their efforts. We have also found symptoms of challenges with IT operations, support and personnel throughout the System. This Future State Recommendations – Part 2 Executive Summary provides a set of recommendations for TAMUS intended to lay a solid foundation upon which to develop, grow and innovate in the process of becoming a “world class” Information Technology organization. Core to this foundation are the principles of improving IT service delivery, investing in new technologies, increasing IT efficiencies, creating System-wide visibility, and effectively acquiring needed skills and capabilities. Specifically, this foundation includes the establishment of an enterprise architecture framework and consolidation of duplicative functionality to streamline application management processes; a service desk model that will improve the effectiveness of IT service operations; a single framework for efficiently managing IT demand and in-flight projects across the System; and, a mature sourcing strategy and career path framework aimed efficiently and effectively acquiring the IT skills needed to maintain and improve the System’s IT environment going forward.

1.2 Purpose of This Document
The specific purpose of the Future State Recommendations – Part 2 Executive Summary is to provide a brief description of the set of recommendations that will improve the management of enterprise-level applications, increase the efficiency of IT operations, improve System-wide visibility into IT needs and projects, and enhance IT workforce management across all 22 in-scope System Member Institutions and Agencies (See Error! Reference source not found. for a complete listing).

- **Application Management** – Application Management includes assessing the processes used to develop, deploy, and manage applications
- **Information Technology Operations** – IT Operations includes reviewing how effectively IT service management and control processes and functions are utilized
- **Information Technology Demand and Project Management** – IT Demand and Project Management includes evaluating the alignment of IT projects with business objectives and the visibility of the IT project portfolio overall
- **Information Technology Staffing and Support** – IT Staffing and Support includes reviewing the alignment of the IT workforce and shared IT services in support of the needs of the TAMUS community
1.3 Basis for These Recommendations

These recommendations are based on the Data Gathering and Current State Analysis activities conducted by the Deloitte team, during which information was gathered and analyzed from each individual System Member. It is also based on Deloitte’s experience on projects of similar size, scope and complexity, and benchmarking data for comparable work done within higher education and other public sector and commercial industry segments. The TAMUS data gathered and analyzed gave us a critical understanding of how IT is delivered across the System today, identified a number of internal leading practices currently in place, and uncovered several potential improvement opportunities for the System. Deloitte experience and peer benchmarking was then used to apply leading practice examples to the TAMUS environment, resulting in the set of recommendations presented in this report.

The detailed data collection effort began in the second week of May 2013 and concluded in the fourth week of May 2013, with some additional follow-up continuing through the date of this report. This data collection effort spanned all 22 in-scope Member Institutions and Agencies, including the System Office itself. The data collection effort included:

- A tailored questionnaire distributed to all 22 in-scope Member Institutions and Agencies
- A set of interviews sessions with all 22 in-scope Member Institutions and Agencies, in which functional users and administrators of the applications in focus for Phase 4 of the assessment participated
- A set of application demos for the applications in focus for Phase 4 of the assessment

The data gathered through the use of each of these methods has been reviewed and analyzed by the Deloitte team. The intent of the initial analysis activities was to create a substantially complete view of Application Management, IT Operations, IT Demand and Project Management and IT Staffing and Support, identifying key themes in each of these four areas of focus.

An additional analysis effort was then conducted after the data gathering and synthesis period. The goal of this analysis was to identify specific, actionable recommendations to be made to TAMUS. The data and
information collected across the System served as a starting point for this analysis, in that it provided an understanding of the System as a whole, as well as for each individual System Member to some extent. This initial understanding of TAMUS was then compared with a proposed vision of what IT would look like at a “Top 10 Research, Teaching, and Outreach” System. Where there were gaps, recommendations were formed that would bridge those gaps. Both experience (in higher education, public sector, and the commercial sector) and comparable trends informed this analysis and, as such, underpin these recommendations.

1.4 Summary of Part 2 Future State Recommendations

The following is a list of the recommendations from Part 2 of the Comprehensive IT Assessment.

Application Management

- Recommendation 15: Financials (FAMIS) - Improve and streamline accounting/financial operations across the System by standardizing the Chart of Accounts, re-platforming the FAMIS functionality off the mainframe as part of formal, longer term strategic plan to replace FAMIS with an industry recognized, cloud-based software as a service (SaaS) solution, addressing immediate functionality needs of the System Members and integrating TEEX, TEES and WTAMU
- Recommendation 16: HR & Payroll (BPP) - Reduce costs and increase operational efficiency by replacing highly customized, legacy payroll application BPP with an industry recognized, cloud-based software-as-a-service (SaaS) solution, implementing SaaS-based HR functionality and retiring shadow payroll technologies at Member institutions
- Recommendation 17: Student Information Systems (Banner) - Reduce costs and increase reporting efficiency by centralizing Banner services across the System (i.e. Banner as a Shared Service)
- Recommendation 18: Grant Management (Maestro) - Continue to use Maestro as designed and complete rollout to entire System
- Recommendation 19: Enterprise Architecture - Establish an Enterprise Architecture team that will deliver a comprehensive enterprise architecture framework to support current and future business models, and supporting processes required to effectively define and deliver IT capabilities within the System in a cost effective manner

IT Operations

- Recommendation 20: Reduce cost and increase service quality by consolidating Service Desk operations across the System
- Recommendation 21: Reduce risk of unplanned outages and business disruption by implementing a single, enterprise-level, cloud-based Change Management tool, and standardizing Change Management policies, processes and procedures across the System
- Recommendation 22: Streamline incident resolution and increase customer satisfaction by implementing a single, enterprise-level, cloud-based Incident Management tool, supported by standard Incident Management policies, processes and procedures across the System
• Recommendation 23: Reduce costs, increase scalability, and eliminate duplicative applications and effort by implementing a single, enterprise-level, cloud-based Service Desk tool across the System

IT Demand and Project Management

• Recommendation 24: Improve visibility into IT projects and infrastructure needs System-wide by implementing demand management and project approval processes

• Recommendation 25: Reduce risk and increase consistency in IT project delivery by establishing a comprehensive, scalable IT project delivery framework to be used System-wide

• Recommendation 26: Reduce risk, improve System-wide visibility into IT projects and ensure oversight of key strategic projects by creating a PMO function within the ITSS model

IT Staffing and Support

• Recommendation 27: Improve productivity, innovation and IT effectiveness by establishing a strategy that will allow the System to appropriately source required IT skills

• Recommendation 28: Create alignment between IT staff and the IT skills and capabilities needed to deliver the future IT environment by establishing an IT career path framework for the System

• Recommendation 29: Ensure continued IT talent development through a formal training and mentoring program for all IT staff
2 Future State Recommendations

The Future State Guiding Principles described below constitute the basis for our Future State Vision and the specific recommendations made later in this section that will lead the System to this Vision. These Guiding Principles were developed based upon Deloitte’s understanding of TAMUS’ goals and objectives for this Comprehensive IT Assessment and for System IT overall. The Principles provided a framework for defining a Future State Vision of IT across the System, described below, and, as such, served to guide the development of specific, executable recommendations that will enable the System to achieve this Vision.

2.1 Future State Overview

2.1.1 Future State Guiding Principles

- **System-wide Focus.** The System Office should provide strong leadership across all System Members, through both executive roles and well-understood governance processes and structures. This leadership focus should recognize not only the mission of the System, but also of each System Member, whether Institution or Agency.

- **Cost Control Using a Balanced Value Focus.** Make better use of scarce resources to support teaching and research activities core to TAMUS’ mission. Decisions to adopt or defer new ideas, technologies, standards, or initiatives should be informed not only on the total cost of ownership (TCO), but also by reduction of risk (or improvement of ability to meet fiduciary responsibilities), added business value, improved operations and user experience, and standards compliance/harmony.

- **IT Security Focus.** IT should ensure that all System Members are properly equipped to provide appropriate levels of security to all faculty, staff, students, visitors and other users at all times.

- **Customer-driven Service Focus.** Services provided by the System Office or associated shared service-focused System Members should address the business needs and requirements of the customers they serve.

2.1.2 Future State Vision

The Texas A&M University System of the future will be included in the top tier of research, teaching and outreach systems globally. As such, the System will have the following IT attributes providing the continuing foundation on which that top tier global status was built and will be maintained.

- Strong leadership at the top and across all layers that enables the core mission of the System

- Effective governance across the System that promotes collaboration, innovation and System-wide visibility

- A System-wide information security strategy that ensures that people, process and technology will proactively and efficiently provide for the confidentiality, integrity and availability of information assets that significantly reduces risks and enables alignment with regulatory requirements

- Minimal System Member-hosted data and applications that are critical to the missions and unique business needs of individual Member Institutions/Agencies
A shared service framework that provides a foundation for common services

A staff and skills sourcing strategy to maintain an effective workforce in alignment with business requirements

### 2.2 Phase 4 – 7 Recommendations

The set of recommendations detailed in the remainder of this document provide a framework for establishing the vision described above and raising the level of IT at TAMUS.

#### 2.2.1 Application Management Recommendations

The Application Management recommendations, while discussed separately in different sections, are tied together to formulate an overall strategy to guide TAMUS towards an ideal end state. The foundation of the unified strategy starts with the creation of an Enterprise Architecture (EA) organization which will be instrumental in designing frameworks to support TAMUS IT capabilities and business processes in an efficient and cost effective manner. The EA organization will also guide strategic decision making for major IT architectural decisions and initiatives, such as the development of an IT shared services model, a consolidated data center, the development of a TAMUS-hosted private cloud environment, the replacement, retirement or enhancement of legacy applications, and any other significant IT-related effort.

The strategy is also supported by the idea that, eventually, most TAMUS services will be provisioned from cloud environments. The cloud environments may include purchasing services from a public cloud provider (e.g. SaaS, IaaS, etc.), leveraging and expanding the TAMUS private cloud environment, and/or a hybrid model which would include both types of environments. Based on successful deployments of (migrations to) SaaS platforms in a variety of environments with varying complexities, it has been demonstrated that SaaS platforms can support interfaces with legacy and open systems environments.

Moreover, the target environment for the re-platformed FAMIS core function will serve as a stepping stone towards ultimate migration to a SaaS platform that will either be the same as the BPP SaaS platform, or it will be a separate, but well-integrated, proven SaaS platform. The evolving SaaS market will influence which platform is chosen to eventually host the System’s ERP functions.

Since TAMUS is not currently in a position to immediately transition to an ideal future state, due to the magnitude of changes and the associated costs, there are interim steps that can be taken to achieve efficiencies in the meantime. These steps, while they may initially appear to be in conflict, will help TAMUS realize near term and long term gains, including:

- Lower operational IT costs
- Enhance customer service and alignment with business units
- Reduce the risk of unplanned outages and business disruption
- Allow TAMUS to gain experience with cloud-based enterprise class services, paving the way for hosting other enterprise services on a SaaS platform
- Allow broader cloud-based platforms to mature and gain wider adoption in Higher Education environments

The proposed strategy will also enable System Members to maintain control of particular IT and business services, where necessary, while centralizing services that are deemed appropriate for sharing across all, or many, System Members.
TAMUS has the opportunity to improve and streamline their accounting/financial operations across the System. Initiatives including standardizing the Chart of Accounts, executing a formal strategic plan for the future of FAMIS, addressing the immediate functionality needs of System Members and integrating TEEX, TEES and WTAMU onto the FAMIS platform will improve and streamline accounting/financial operations across the System. Many of these improvements were suggested in the FAMIS interviews conducted and questionnaires received.

Through the course of the FAMIS assessment, Deloitte considered the following alternatives before arriving at our final recommendation:

- **Do nothing:** This is not a real option if the System wants to move forward with improving efficiencies and reducing risk.

- **Rip and Replace:** The System could replace FAMIS by implementing a full ERP suite (whether on-premise or SaaS-based). Deloitte determined this alternative to be too expensive and too disruptive, considering the current state of the System. This determination is based on a very recent ERP implementation (go-live was early July 2013) that replaced an entrenched legacy financial accounting system in an organization that is very similar to TAMUS in size, geographic spread, and functional complexity. This program, from requirements analysis, to package selection, to design and implementation, and into production, was a multi-year effort and cost in excess of $100M.

- **Re-platform off of the mainframe:** This alternative, if executed in parallel with moving BPP off of the mainframe, will allow the System to avoid the extraordinary cost of a full Rip and Replace ERP transformation. This alternative also reduces the risk associated with the System’s aging platform and tools and significantly reduces platform maintenance costs.

We also believe that it is important to standardize the Chart of Accounts, addressing the immediate functionality needs of the System Members and integrating TEEX, TEES and WTAMU into the newly re-platformed and updated FAMIS, at a time when the benefits exceed the costs of doing so.

**Standardizing the Chart of Accounts**

In several of our interviews with FAMIS stakeholders, a common theme around the Chart of Accounts for the System emerged. Today, if there is a question of how much the System, across all System Members, is spending for a particular function, it takes a significant effort on the part of the System Budget Office to develop an answer. This is due to the lack of standardization across System Members. A single Chart of Accounts would help to alleviate this problem, would provide for straightforward and accurate consolidation of the System’s financials, and would assist System leadership in more accurate budgeting. No functional changes to FAMIS would be required for this effort short of making the updates to the data.

**Re-platforming the FAMIS functionality off the mainframe as part of formal, longer term strategic plan to replace FAMIS with an industry recognized, cloud-based software as a service (SaaS) solution**

The System should re-platform the core FAMIS functionality off of the mainframe (and legacy tools) onto an open system platform using a standard framework (e.g., .Net, Java, etc.). Tools exist that will efficiently translate existing Natural source code and ADABAS records and files to a standard framework and database that would be defined in
conjunction with the EA team (see Recommendation #19). This effort would need to be done in parallel with moving other legacy mainframe applications to new platforms, as well, in order to realize savings from end-of-life decommissioning of the mainframe platform and associated tools.

**Addressing immediate functionality needs of the System Members**

Addressing the immediate functionality needs of the System Members such as Accounts Receivable, data warehouse dashboard, web-based audit reports, ACH approvals, re-allocation of payment cards, more frequent bank feeds and specific functionality for TEEX, TEES and WTAMU is necessary in order for FAMIS to continue to be the enterprise financial/accounting system for TAMUS. Functionality that does not currently exist in FAMIS or works poorly was identified during our interviews:

- Efficient routing/workflow functionality that is easy to maintain
- Robust and easy reporting
- Budget module
- Standard System-wide training module
- Automated allocation of funds from a central account to multiple accounts
- Data security
- Online bank reconciliation
- Data warehouse dashboard
- Web-based Audit reports
- Web-based ACH approvals
- Accounts Receivable (AR) module
- Re-allocation of payment/bank cards
- More frequent bank feeds than once a month
- Ability to overlay this year’s budget over next year’s budget
- Automated patterns by ABR rule
- Portability - web-based
- Electronic procurement process
Integrating TEEX, TEES and WTAMU into the newly re-platformed and updated FAMIS

Integrating TEEX, TEES and WTAMU into the newly re-platformed and updated FAMIS should be accomplished in order to realize the savings from decommissioning three additional financial/accounting systems that provide the same functionality as FAMIS. Ensuring that TEEX, TEES and WTAMU do not lose any existing functionality is a priority of this integration effort. WTAMU should be prioritized last because they are currently operating with a fully integrated suite of applications (Ellucian’s Colleague suite, formerly branded as DataTel). An appropriate inflection point, such as a major (and costly) upgrade mandated by the vendor, should be a factor in the decision to integrate WTAMU.

Recommendation 16: HR & Payroll (BPP) - Reduce costs and increase operational efficiency by replacing highly customized, legacy payroll application BPP with an industry recognized, cloud-based software-as-a-service (SaaS) solution, implementing SaaS-based HR functionality and retiring shadow payroll technologies at Member institutions

Implementing and maintaining a proper HR and payroll system is essential to any university institution. TAMUS currently lacks a robust HR application that meets the needs of its System Members, and the existing payroll application, BPP, has difficulty complying with regulations in a timely manner. BPP is a legacy mainframe system that has been in production since the late 1970s. Over the years, the BPP development team has worked with the System Members to define the business requirements for BPP and make the appropriate changes and upgrades, as budget and time would allow. While BPP sufficiently meets the payroll needs of the System and the BPP development team provides excellent support to the System Members, BPP does not meet the needs of the System for HRIS business requirements and struggles to comply with regulations in a timely manner. Functionality that does not currently exist in BPP or works poorly was identified during our interviews:

- Auto-adjust
- HRIS module
- Integration with third party vendors
- Retiree billing
- Timesheets
- Longevity of employees
- Routing for onboarding
- Portability - web-based
- Export control
- Accurate reporting
- International tax rules
- Universal Identifier to replace SSN for payroll processing
- Onboarding/Off-boarding module
- Electronic supplemental pay form
- Gross to net calculation on p2pay
- Applicant tracking
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- Ad hoc reports
- Monthly, daily, weekly reports online in a standard imaging system
- Employment application
- Template for prep salaries
- One-off encumbrances
- Ability to annualize 9 month payroll over 12 months
- Split dispersing
- Reporting requirements at the state level
- Prior state service
- Automated check printing
- Performance management
- Supplemental pay
- Role-based security/access

System Members are meeting the lack of HRIS/Payroll functionality in BPP with other bolt-on applications like the System Data Warehouse, TimeTraq, TrainTraq, LeaveTraq, HR Connect, iBenefits, Time and Effort, Monthly Payroll, and File Depot. These bolt-ons are supported by both the BPP and ESI development teams but do not provide seamless, enterprise-level functionality.

Implementing an enterprise-wide, industry recognized application that can perform core HR and payroll capabilities will reduce costs and enable Members to retire shadow technologies (e.g. home-grown, highly customized applications). The System can reduce costs and increase operational efficiency by:

- Replacing its highly customized, legacy payroll application BPP with an industry recognized, cloud-based Software-as-a-Service (SaaS) solution
- Implementing the SaaS-based HR functionality of the same SaaS-based solution
- Retiring shadow payroll technologies at Member institutions

**Recommendation 17: Student Information Systems (Banner) - Reduce costs and increase operational efficiency by centralizing and managing TAMUS Banner services in a private cloud environment (i.e. Banner as a Shared Service)**

Private cloud services enable organizations to reduce capital and operational IT costs, improve data accessibility, increase quality of service, and meet elastic demands in a timely manner. TAMUS has the opportunity to reap these benefits by standing up a centrally managed Banner shared service program.

The centralized Banner infrastructure would be hosted in the highly virtualized and scalable private cloud environment described in Recommendation #12, from Part 1. The program would support all Member instances of Banner, including testing and failover instances, and be managed by a System-level infrastructure organization. Centralizing Banner services across the System will achieve savings by managing and supporting the individual instances of Banner with a common pool of resources, all focused on level-appropriate tasks, sharing their knowledge across all Institutions for both infrastructure and application support.
The Banner shared services program would include a centralized resource support group to support various Banner functions. This should be done in concert with Recommendation #27, which recommends that the System develop a sourcing strategy that will allow TAMUS to determine how best to source the IT skills required to run the System's future IT environment. The functions supported by these resources should include (but are not limited to) the following:

- Banner production operations and maintenance
- Banner Data Analytics (e.g. Student trend analysis and forecasting, creating and customizing existing or new reports, developing processes to automate report processes, etc.)
- Application development and customization (e.g. customizing particular Banner modules to support Member business processes)
- Banner training (e.g. functional user training, administrative user training, business process training, etc.)
- A “Banner Users Group” or “Banner Center of Excellence” that stores and manages leading Banner practices easily accessible by other Members (e.g. source code repository, core business process methodologies, reliable infrastructure designs, etc.). These Banner groups may have sub-divisions or groups based on Banner modules or Member needs (e.g. a South Texas Users Group that has similar Banner needs). These can be implemented independently of the other parts of this recommendation.

These types of services would be especially beneficial for the smaller Members (e.g. TAMU-T, TAMU-SA, etc.) that may lack the budget and resource support to adequately support the Banner production environment, purchase comprehensive training services, and design and implement a cost efficient Banner environment.

The Banner private cloud environment should be architected to provide 24/7/365 uptime. As such, part of this infrastructure will include adopting a shared, System-wide MPLS network that seamlessly connects System Members to the centrally managed Banner infrastructure. Other benefits that the System may realize as a result of the MPLS network include efficient bandwidth usage, cost savings, increased reliability, and increased performance.

In order to minimize business disruption and reduce migration risk, TAMUS should consider implementing this recommendation in a phased approach:

- Phase I: Migrate to the shared infrastructure environment without other changes, and begin to leverage appropriate, foundational services across all instances
- Phase II: Consider regional rationalization of Banner instances where possible, reducing the number of instances by consolidating where appropriate
- Phase III: Continue monitoring not only Banner’s progress on maturing their multi-entity solution, but also the overall market offerings for Student Information Systems (SIS), with a goal of further reducing the number of SIS systems

A new offering from Ellucian is their multi-entity processing (MEP) environment, referenced above. Ellucian advertises that MEP enables large institution or systems to run a single instance of Banner with the ability to segregate data based on college, campus, or any category that supports business practices. (However, at this time, Ellucian has not provided references of large, complex institutions or university systems that are currently running on a single instance MEP system).

In all of the above phases, Member universities would maintain appropriate control of business functionality and reporting capability. This would be done in conjunction with centralizing the services, processes and functionality that are truly shared across all Members.
Recommendation 18: Grant Management (Maestro) - Continue to use Maestro as designed and complete rollout to entire System

Continue to use Maestro as designed and complete the rollout to the entire System.

While Maestro was developed using the Oracle Application Development Framework (ADF), and is meeting business requirements at this time, we believe that any future systems should be deployed on a framework to be determined by the System Enterprise Architecture group. Details around the Oracle ADF can be found in the “Oracle Application Development Framework: Past, Present and Future” article generated by Gartner (published on 8/24/12). Specifically, Gartner characterizes Oracle ADF as a highly integrated, proprietary Java development environment that must be tightly controlled by Oracle because it forms the foundation for the Oracle Fusion Applications. Gartner states that “Given its strong focus on the Oracle technology stack, IT leaders seeking to avoid long-term proprietary lock-in should look to other solutions in more generic Java Enterprise Edition (JEE) development efforts.” Deloitte is generally supportive of Gartner’s assessment in this article.

The System should continue to monitor SaaS market offerings addressing grants management and research administration. As SaaS offerings in this space continue to mature, and as costs for these SaaS offerings continue to decline (on a per feature basis), there will come a time when it may be less expensive, on an ongoing basis to migrate to a SaaS platform. The System should take this into consideration at inflection points in the continued evolution of the Maestro platform, such as a major update or transition of the Oracle ADF that might be costly to deploy.

Recommendation 19: Enterprise Architecture - Establish an Enterprise Architecture team that will deliver a comprehensive enterprise architecture framework to support current and future business models, and supporting processes required to effectively define and deliver IT capabilities within the System in a cost effective manner

Organizations often find the highest hurdle to clear is communications across many organizational units (often significantly fewer than the 22 members that comprise TAMUS). Making decisions at the strategic level and then communicating them to IT and the business (including institutions, agencies, and service providers) so they can be tactically achieved can be even more difficult to accomplish. This is also true for cost rationalization decisions, technology simplification choices, and in general architectural decisions that affect the alignment of business and technology. Getting everyone to understand what this means to them is a key to success.

In order to address these communication challenges, and measure benefits like greater cost reduction though a migration to SOA or SaaS, organizations are turning to Enterprise Architecture to help understand the important decisions that need to be made.

Enterprise Architecture (EA) is the practice of applying a comprehensive and rigorous method for describing a current or future structure for an organization's processes, information systems, personnel and organizational subunits so that they align with the organization's core goals and strategic direction.

Although often associated strictly with information technology, it actually relates more broadly to the practice of business optimization in that it addresses business architecture, performance management, and process architecture as well.

- EA is multidisciplinary — it helps link, analyze, and enable three primary stakeholder groups within an organization: business managers, technology managers, and technology implementers.
- EA is broad in coverage as well by helping to address business strategy (goals and objectives, operational models, organizational structures), business operations (functions, processes, systems), business information (data, metadata), and technology (software, hardware, networks, communications, etc.).
- EA enables organizations to achieve this comprehensive approach by helping them leverage a selected framework, incorporating specific products, or artifacts, under the guidance and instruction of an overarching methodology. This also enables better EA construction results as well as more flexibility to accommodate business change.

Much of the challenge of unlocking EA value is in the execution. Selection of an appropriate framework, completion of a consistent set of integrated EA products, and employment of comprehensive governance policies and procedures will enable proper design and deployment of the EA. The result can be substantial business value created, with better business strategic and operational plans, better alignment of business functions, processes, systems and data, and traceability throughout.

Key activities of the EA team would include:

- Selection of an appropriate EA framework on which to model the TAMUS EA framework and processes, choosing from The Open Group Architecture Forum's TOGAFv9.1, the Federal Enterprise Architecture Framework (FEAF), the DoD Architecture Framework (DoDAF), etc.
- Collect architecture best practices/guides that are aligned with evolving standards being adopted for standing up and maintaining particular applications and infrastructure across the System (e.g. Exchange, Banner, classroom technologies, firewalls, etc.). This would be particularly useful to newer and/or smaller schools that lack the experience, expertise, resources and budget to develop architecture from scratch. These leading practices would be published so that they are easily accessible by every System Member.
- Define hardware, software, and compliance/audit standards across the System
- Create defined policies, processes and procedures for IT projects moving forward including SDLC (reference governance recommendation provided in Part 1)

2.2.2 IT Operations Recommendations

IT Operations encompasses the processes, procedures, and services that are supported and delivered by a technology organization to its clients and customers. The role of IT operations in an organization consists of maintaining and delivering IT services that meet or exceed the established service agreements in a consistent and reliable manner. This may include fulfilling user requests, resolving service failures, troubleshooting Incidents and carrying out routine operational tasks. Implementing industry leading service management tools and adopting proper IT service management frameworks are cornerstones of any mature IT organization, and lays the foundation to sustain high levels of customer satisfaction, improve operational efficiency, and reduce costs.

Recommendation 20: Reduce cost and increase service quality by consolidating Service Desk operations across the System

Moving to a consolidated Service Desk model enables organizations to reduce operational and resource costs and increase customer satisfaction by providing a single point of contact for all service needs and requests. The large number of functional Service Desks located across TAMUS has restricted its ability to realize these types of benefits. The inability to consolidate Service Desk operations lends itself to an organization with fragmented information where one Service Desk may spend a large amount of time attempting to fix an issue/problem that another Service Desk has already created a workaround for. Customer service suffers as a result. A centralized Service Desk model
enables Service Desk staff to have access to all data (e.g. known incidents/problems and associated workarounds, IT assets, network topologies, SLAs, open Changes, etc.) to deliver high quality support.

TAMUS has the opportunity to consolidate Service Desk operations, policies, processes and procedures. This consolidation should be done in a phased approach, starting initially at the individual Member level (unless a consolidation has already taken place) and then eventually at a regional and/or System level. This effort would include defining and standardizing the following:

- Incident/problem types, categories and resolutions (e.g. known errors, common workarounds, etc.)
- Incident, Problem and Change priority and urgency levels (e.g. defining low, medium, high and critical incidents and the proper processes to address them)
- Ticket escalation processes and procedures (e.g. how and when to engage tier 2 and tier 3 support resolve incidents) through a common ticketing queue
- Service level agreement (SLA) standards for services offered and supported

The processes and procedures should also be tightly and seamlessly integrated with other IT Service management processes like Change Management, Asset Management and Configuration Management. This will increase efficiency by integrating workflows across these different disciplines, and tracking the lifecycle Incidents, Problems and Changes.

The implementation of an enterprise, industry-recognized Service Desk tool is a parallel effort that will supplement and support this Service Desk consolidation effort (Refer Recommendation #23 for more information). The tool should be selected based on business and technical requirements identified by System Members, have the ability to integrate with other Service Management processes, capture basic Service Desk metrics (e.g. call abandonment rates, first call resolution rates, etc.) and support the overall mission of the System.

**Recommendation 21: Reduce risk of unplanned outages and business disruption by implementing a single, enterprise-level, cloud-based Change Management tool, and standardizing Change Management policies, processes and procedures across the System**

Designing and implementing a standardized and repeatable Change Management process that meets business needs and service level agreements (SLAs) is a vital component of any mature IT organization. It enables and supports the delivery of controlled Changes in the production environment, while minimizing (or eliminating) the impact of Change-related Incidents.

While some pockets of mature Change management capabilities were evident, the interview process and Questionnaires revealed systemic weakness for Change Control across the Texas A&M University System. Absence of basic Change infrastructure suggests capabilities that are at the lower end of the process maturity scale. TAMUS has the opportunity to design and implement a standardized Change Management process across the System to improve its IT process posture, and minimize risk exposure and business disruption.

The TAMUS Change Management process should include processes and infrastructure that are customary in an advanced and mature IT organization. For example, the process should ensure that all Changes to configuration items (CIs) are carried out in a planned and authorized manner. This includes the following:

- Identifying necessary Changes to the production environment to support agreed upon service levels and requirements
- Identifying the specific configuration items, end users and IT services impacted by each Change
• Standing up an official Change Approval Board which reviews the status, priority, schedule and impact of open and upcoming Changes in the pipeline. It should also include business and technical representation from each functional group to foster alignment across organizations.
• Obtaining approval from the Change Approval Board (including the implementation schedule, owners, and cost of each Change) prior to implementing any Changes in the production environment
• Developing detailed plans and test cases for each Change
• Developing a comprehensive communication strategy to notify other organizations (e.g. Service Desk) that may be impacted by upcoming Changes (e.g. automated notifications/emails to faculty regarding planned outages, maintenance windows, etc.)
• Producing recurring reports which track the lifecycle of Changes and various Change key performance indicators (e.g. number of successful Changes per month, number of emergencyChanges executed, percentage of Change requests in the queue, etc.)
• Defining a rollback plan should the Change result in an unexpected state of the configuration

In addition to defining and adopting a Change Management process, TAMUS should consider selecting a single, cloud-based, SaaS Change Management tool to manage the Change policies, processes and procedures across the System. It should also have the ability to seamlessly integrate with other ITSM processes like Incident Management, Problem Management and Service Request Management (Refer Recommendation #23). The tool should have the ability to log, track and measure the effectiveness (or disruptiveness) of Changes made to the production environment. This will enable IT organizations across the System to view the progress and impacts of Changes. System Members will also be able to report and compare similar Change and Incident metrics. Without a mature enterprise tool, monitoring, maintaining and troubleshooting the health of IT network, infrastructure, and application services is extremely difficult. Simple logging systems are insufficient as they often lack reporting capabilities and require a manual reconciliation against ticketing systems in order to determine the success of various changes.

The Change Management tool that TAMUS selects should also have the ability to automatically route Change requests to various business and technology stakeholders across the System. This type of feature allows organizations to replace manual processes with automated workflow capabilities. TAMUS will need to work with key stakeholders to identify the official Change approvers (i.e. Change Advisory Board (CAB)), and associated escalation processes and procedure for each type of Change request. Two tiers of CABs should be stood-up across the System and engaged in the approval workflow based on the category of the Change. These CAB tiers include the following:

• Member-Tier CAB: Each System Member should establish one CAB that receives and manages Change requests related to its particular Member institution (e.g. a Code change to a home-grown TAMU classroom application that only impacts TAMU faculty). The CAB processes, policies and procedures (including Emergency Change procedures) should be standardized and adhered to by all System Members (with room for individual Member customization as needed). Business and technical stakeholders from each Member should participate in the design and finalization of these processes to support consistency and sharing of leading Change Control practices
• System-Tier CAB: One CAB should be established at the Texas A&M System-level. This workflow will only be triggered if the Change request is categorized as having the potential of impacting more than one System Member (e.g. a TAMU network outage that impacts Agencies located in College Station, or a code Change to an application that is shared by 3 Members). Moreover, the System-tier should have a defined process for both normal Changes and Emergency Changes
Executive sign-off for these detailed, tiered processes and workflow steps should be mandatory prior to being built into the ITSM tool.

While a substantial portion of Change Control can be managed remotely using the tool, it is still strongly encouraged that CABs still conduct recurring Change Control meetings to discuss the progress and status of open and upcoming Changes (in-person, conference call, etc.). The tool simply provides an option where Change requests can be managed virtually through the use of automated workflow.

**Recommendation 22: Streamline incident resolution and increase customer satisfaction by implementing a single, enterprise-level, cloud-based Incident Management tool, and standardized Incident Management policies, processes and procedures across the System**

Adopting a standardized and repeatable Incident Management process that meets business needs is an essential component of any mature IT organization. It supports the management and timely resolution of reported incidents while minimizing adverse impact on normal service operations.

While some pockets of mature Incident Management processes were evident, the interview process and questionnaires revealed systemic weakness for Incident Management across the System. Absence of basic incident infrastructure suggests capabilities that are at the lower end of the process maturity scale. TAMUS has the opportunity to design and implement a standardized Incident Management process across the System to improve its IT process posture and ensure the best possible levels of service quality are achieved and maintained.

The TAMUS Incident Management process should include processes and infrastructure that are customary in a mature IT organization. For example, the process should ensure that all incidents are addressed in a planned, timely and authorized manner: This includes the following:

- Managing and resolving priority incidents in the production environment to support agreed upon service levels and requirements
- Identifying the specific configuration items, end users and IT services impacted by each incident
- Assigning owners for each incident, conducting root cause analysis and restoring normal operations as soon as possible with minimal business disruption
- Developing a comprehensive communication strategy to notify key stakeholders and organizations (e.g. Service Desk) that may be impacted by existing incidents (e.g. automated notifications/emails to faculty regarding known incidents or performance issues)
- Producing recurring reports that track the lifecycle of incidents and various incident key performance indicators (e.g. average time to close a ticket, number of tickets opened per month, number of open tickets, number of tickets unassigned, etc.)
- Categorizing incidents by type and priority, and defining escalation paths and impacted stakeholders of open and existing incidents in the pipeline

In addition to defining and adopting an Incident Management process, TAMUS should consider selecting a single, cloud-based, SaaS Incident Management tool to manage the incident policies, processes and procedures across the System. It should also have the ability to seamlessly integrate with other ITSM processes like Change Management, Problem Management and Service Request Management (Refer Recommendation #23). The tool should have the ability to log and track the lifecycle of reported incidents and measure the level of disruption to the business. This will enable IT organizations across the System to view the progress and impacts of incidents. System Members will also be able to report and compare similar incident metrics. This type of feature allows organizations to replace manual
processes with automated workflow capabilities. TAMUS will need to work with key stakeholders to identify the official incident categories, priority, escalation processes and procedures for each type of incident.

The Incident Management tool that TAMUS selects should also have the ability to automatically route incident information to various business and technology stakeholders across the System. Similar to Recommendation #21, there will be two tiers of processes:

- System Member-Tier Incident Management Process: Each System Member should establish a process that manages the lifecycle of an incident related to its particular Member institution/agency (e.g. network outage only impacts TAMU-K’s campus). The incident processes, policies and procedures should be standardized and adhered to by all System Members (with room for individual System Member customization as needed). Business and technical stakeholders from each System Member should participate in the design and finalization of these processes to support consistency and sharing of leading Incident Management Control practices.

- System-Tier Incident Management Process: This workflow will only be triggered if the incident is categorized as having the potential of impacting more than one System Member (e.g. a TAMU network outage that impacts Agencies located in College Station).

Executive sign-off for these detailed, tiered processes and workflow steps should be mandatory prior to being built into the ITSM tool.

Recommendation 23: Reduce costs, increase scalability, and eliminate duplicative applications and effort by implementing a single, enterprise-level, cloud-based Service Desk tool across the System

Investing in an enterprise ITSM/Service Desk application is an important organizational decision. The Service Desk is at the front line of the organization and is uniquely positioned to answer basic questions about the health and effectiveness of the services IT offers and supports. Selection of outdated and/or freeware tools that lack enterprise ITSM features directly impacts the organization’s ability to monitor and manage its IT operations. Inadequate tools impede the ability to develop a true service orientation and introduce numerous integration hurdles for other key processes like Incident and Change Management. These in turn ultimately impact both costs and customer satisfaction.

The majority of System Members have not selected enterprise-quality Service Desk support tools. Organizations that lack such tools are at a major disadvantage. Without these tools, it is difficult to gauge the effectiveness and speed of service delivery, or to answer basic questions about the health and stability of IT infrastructure. These features include (but are not limited to) the following:

- Automated tracking of key performance metrics like first call resolution, call abandonment rates, time to resolution, cost per incident, etc.
- Advanced reporting/dashboard capabilities to measure and improve support (e.g. weekly trend analysis, common incident types, open tickets by agent, etc.)
- Automated workflow, escalation, notification and approval features
- Integration with other ITSM applications and processes like Change Management, Incident Management and Problem Management
- A variety of customer interfaces that integrate into the Incident Management process, including self-service web portals and chat/IM capabilities
• Comprehensive knowledge bases that provide Agents and customers with known incident, change and outage information, and answers to basic technical support questions

TAMUS has the opportunity to acquire these features, improve its ITSM operations and reduce costs by implementing an enterprise-level, cloud based Service Desk solution. TAMUS should first collect and finalize the business, technical and security requirements of all System Members. This should be closely followed by a business case, and a comprehensive vendor selection process to ensure the selected solution meets the flexible and distributed IT needs of TAMUS faculty, staff and students. A detailed strategy should also be planned in parallel to retire legacy and “bolt-on” Service Desk applications currently in use across the System (38 total Service Desk applications reported in the Questionnaire). Retiring these ancillary systems will reduce associated maintenance costs and resource support needs, and eliminate redundant data entry and manual reconciliation between numerous Service Desk systems.

2.2.3 IT Demand and Project Management Recommendations

To achieve effective IT demand and project management across the System, TAMUS should undertake a series of initiatives that will:

• Improve visibility into the demand for IT improvements and innovation and into in-flight IT projects across the System
• Ensure the consistent delivery of and provide tools to support IT projects of all sizes across the System
• Provide enhanced focus on the successful delivery of enterprise-wide and other large, complex initiatives

Recommendation 24: Improve visibility into IT projects and infrastructure needs System-wide by implementing demand management and project approval processes

Develop processes within the System-level IT governance structure (Refer Recommendation #2, Part 1) that will allow for visibility into IT demands across the System. By implementing processes that require System Members to present annual IT plans and requests for project approvals to the IT Governance Board, the System as a whole will gain a better understanding of, and will be better equipped to enable the success of IT projects across the System – whether they be enterprise-level initiatives, complex initiatives that involve multiple System Members, or single-Member initiatives that further the missions of particular System Members. Additionally, as the System moves toward a shared ITSS model, with the more central delivery of core IT services and infrastructure, these processes will allow the System to effectively plan for and provide the IT services needed to support the System Members and their business needs.

Establish Demand Management and Project Approval Processes

As the System develops and implements its IT Governance Board (Refer Recommendation #2, Part 1), it should build processes into this structure by which System Member IT needs and projects are presented to, reviewed, and approved by the IT Governance Board. A first step in developing these processes will be for the System to determine what will be reviewed centrally by the IT Governance Board and what will remain within the purview of the individual System Members. In order to achieve the true benefits of System-wide demand management without creating undue bureaucracy on System Members or burden on the IT Governance Board, the System should develop a consistent definition of what constitutes an IT program, project and sub-project and then determine what levels of this structure
would require IT Governance Board review and approval, and to what extent. As part of setting these definitions, the
System should review Policy, 29.01.01 – Information Resources Governance that sets the SCIO approval threshold
for all System Member “information resources procurements” at $250k and consider if this definition and/or threshold
needs to be refined in order to further enable System-wide visibility into planned and in-flight projects.
Also as part of defining these processes, the System should define standard criteria for what constitutes an
“enterprise-level” initiative, create a standard charge-back mechanism and process, and a process for maintaining the
initiative/service once implemented.
The System should develop templates to enable the processes developed above – these templates would include a
brief IT annual plan that each System Member would be required to complete indicating its key IT objectives for the
year, as well as templates for submitting project concepts, budgets and requests to the IT Governance Board. These
standard templates will provide visibility into and comparison between emerging IT demands, current in-flight efforts,
and the results of comparable completed or closed efforts. They will also assist the System in identifying common IT
needs across System Members and enable increased collaboration and the more efficient use of resources to
respond to these needs.
The System will also require a set of criteria for approving and prioritizing the requests received by the IT Governance
Board. These criteria should link clearly to System and System Member strategic goals, objectives and missions. A
process should also be developed through which the IT the IT Governance Board periodically reviews, refines and
communicates the prioritization criteria.

Roll-out Demand Management and Project Approval Processes
As System-wide demand management and IT project approval will be a relatively new concept for System Members,
it is recommended that the System take a phased approach to implementing the processes and procedures defined
above. Begin with those new or in-flight initiatives categorized as “enterprise-level” initiatives, where there is a clear
tie to System-level goals and benefits. Next, as the ITSS model is stood up around specific shared services, include
the review and approval of IT projects dependent upon these shared services (i.e., projects that require use of ITSS-
managed infrastructure, or centrally managed specialist resources, such as a “Banner database analyst”). Next, the
System should identify criteria, including the number of System Member affected or project size/budget thresholds,
and roll these processes out to these initiatives. In determining this phased approach, the System should consider
that the more quickly and more broadly it rolls out these processes, the better visibility into IT demand, in-flight
projects and upcoming IT needs the System will have, allowing it to drive more efficient use of System-wide IT
resources for project delivery, greater collaboration among System Members, and reduced duplication of efforts.

Recommendation 25: Reduce risk and increase consistency in IT project delivery by establishing a
comprehensive, scalable IT project delivery framework to be used System-wide
Using the same definition of what constitutes an “IT program, project and sub-project” established in
Recommendation #24, it is recommended that the System develop a standard IT project delivery framework,
including reporting requirements, that will be used System-wide to deliver on these initiatives. Depending on the level
of the initiative within the project structure and other determining criteria, such as project size/budget and/or number
of System Members affected by the initiative, the IT project delivery framework can be scalable to provide the
appropriate level of documentation, reporting, guidance and oversight. Each level within the project structure will have
corresponding project management documentation to complete and specific metrics that will be tracked consistently
for all comparable initiatives across the System.

Define IT Project Delivery Framework
The IT project delivery framework that is created should be comprehensive and comply with Title 1, Part 10, Chapter 216, Subchapter C of the Texas Administrative Code (TAC 216): Project Management Practices for Institutions of Higher Education and the Texas Department of Information Resources’ (DIR) Project Delivery Framework, but should also be scalable to suit the needs of smaller initiatives – allowing for proper management, enabling System-wide visibility, but not creating undue burden on System Members.

The framework should consist of project management processes for project initiation, project planning, project execution, monitor and control, and project close, and should include basic templates such as project charter, project plan/schedule, budget, risk log, issue log, and decision log. These processes and templates should be scalable to suit smaller projects, but use should be enforced across all System Members in order to drive consistency in project management and visibility into project status System-wide.

**Define Processes for Reporting at the Project, Program and Portfolio Levels**

Consistent reporting will be a key element of the IT project delivery framework. The System should define specific metrics to be tracked on all initiatives across the System. While metrics may vary depending on the level of the project within the defined project structure, reporting should be consistent at each level within the project structure to allow for comparison across similar initiatives. Standard reporting templates should be developed and used by all System Members to allow for the roll-up of metrics to the program- and portfolio-levels for use by senior leadership. When used consistently by all System Members, such reporting will allow for greater visibility into the effectiveness of project delivery and use of resources at the individual System Member level, and will also allow for the further roll-up of project metrics to the System-level.

The System should define processes for rolling up these reporting requirements at both the program (or System Member) level and portfolio (or System) level. This will entail defining project management roles and responsibilities at the project, program and portfolio levels that tie into the defined “IT program, project and sub-project” definitions and into the governance structures defined as part of Recommendation #2 and Recommendation #4.

**Recommendation 26: Reduce risk, improve System-wide visibility into IT projects and ensure oversight of key strategic projects by creating a PMO function within the ITSS model**

In addition to implementing the System-wide demand management and project approval processes (Refer Recommendation #24) and establishing a System-wide project delivery framework (Refer Recommendation #25), the System should establish a small Project Management Office (PMO) of 1-2 FTE to be run centrally through the ITSS model. This PMO would not be responsible for running System Member IT projects on a day-to-day basis, or for maintaining an army of project managers that would be deployed to do so, but rather this organization’s primary responsibilities would be to:

- Track the project and program-level metrics reported as a result of implementing Recommendation #25
- Develop System-wide portfolio-level reporting for use at the executive level (with the IT Governance Board)
- Organize training, support and guidance on the use of the IT project management framework, processes and templates
- Organize general project management training for all System Members to enable more effective management of IT projects carried out at the local level
- Maintain the System-wide IT project management framework, process documentation and templates established as part of Recommendation #25
- Assist in identifying and appointing Project Managers for those projects that require a dedicated Project Manager resource (as defined below, these Project Managers will not be full-time staff within the PMO, but rather staff from a System Member or ITSS)

Develop PMO Structure and Responsibilities

The System should first define the organizational structure and reporting relationships for the added 1 to 2 FTEs that will constitute the System-level PMO. As a shared resource for the System, the PMO should fall within the ITSS model, as recommended in Recommendation #3. The System should establish position descriptions, roles and responsibilities for the PMO staff. In conjunction with Recommendation #28, the System should define the specific qualifications required for PMO staff, in line with the System's Human Resources policies and procedures, and finalize job postings for the new positions.

Additionally, the System should develop a model for how the PMO will interact with the different types/levels of projects as defined in Recommendation #24. Staff within the PMO will not be responsible for running projects on a day-to-day basis, but instead will interact with projects across the System to collect and analyze the reporting metrics defined in Recommendation #25 and to ensure that IT staff managing projects across the System have access to and a thorough understanding of the IT project delivery framework and associated templates, and have adequate project management training.

Define Key Strategic Initiatives

It is also recommended that the System take a more active role in defining key strategic projects and ensuring the proper oversight of these initiatives. The System should first determine the criteria that must be met in order for a project to be considered a key strategic initiative (for examples, those projects that are classified as “enterprise-level” initiatives, projects that affect a certain number of System Members, and/or those that meet a specific project size/budget threshold). For these projects, the System should define a process through which the PMO is tasked with assisting ITSS leadership identify and assign Project Managers to these initiatives. These Project Managers will not be full-time PMO staff, but rather will be existing staff from System Members or the ITSS organization that will be assigned, in a full- or part-time capacity depending on the project, to projects that meet the defined criteria. The PMO will be responsible for vetting potential Project Managers and ensuring that those selected have the training, tools, skills and capabilities to properly manage the initiatives for which they are responsible.

2.2.4 IT Staffing and Support Recommendations

To achieve the proper IT staffing and support structure for the System, TAMUS should undertake a series of initiatives that will:

- Provide a strategy for the System to use in determining how best to source the IT skills that will be needed to support the System’s future IT environment
- Strengthen the manner in which IT staff across the System build and progress through their careers
- Lay the foundation for the more focused training and development of IT staff across the System

**Recommendation 27: Improve productivity, innovation and IT effectiveness by establishing a strategy that will allow the System to appropriately source required IT skills**
Develop a sourcing strategy that will allow the System to determine how best to source the IT skills required to run the System’s future IT environment. As the System formalizes its future vision for IT, it will require specific IT skill sets and capabilities, some of which are currently present in the System’s IT workforce and some of which are not. In addition, as the System moves forward, new technologies will be developed and adopted by the System, requiring new and different IT skills and capabilities. In order to adequately maintain its IT environment, the System needs to establish a strategy that it can consistently use to determine how these needed skills and capabilities will be sourced, whether in-house, through temporary contractors, or completely outsourced to third party vendors.

Assess the Current and Future Environment

To start, the System needs to understand in detail the IT roles required to deliver the future IT environment and the skills and capabilities associated with each of these roles. These future state IT roles should then be compared against the skills and capabilities that exist within the current IT workforce. To achieve this baseline, it is recommended that the System conduct a comprehensive skills inventory of current IT staff, including technical, functional and management responsibilities, titles, salaries, education, experience and current technical capabilities. The results of the inventory would then be validated with IT managers across the System for accuracy. From the results, skill gaps between the future IT needs of the System and the existing IT workforce will be identified.

As the inventory is being compiled, it is also recommended that the System conduct a comprehensive labor market study to determine market rates and supply of IT professionals with the required IT skills and capabilities by geography around the State. Having an understanding of this data will assist the System in making decisions about how and where to staff particular skills.

Develop and Employ Sourcing Strategy

The System should then develop a strategy that can be employed consistently across all IT roles to determine how to source the IT skills and capabilities needed to fulfill the role. The sourcing strategy should consist of a decision process flow, used to decide how to source a role, and a sourcing framework, which provides specific tactics to use in executing the sourcing. Factors that should be considered in creating these tools include cost, existing resources, geography, specialized IT requirements, and specialized System knowledge, among other factors.

Once the sourcing strategy has been developed, it will guide the System in determining which skills and job functions to grow in-house (either at the System Member-level or within an ITSS model) and which to acquire through third party vendor support. To begin, the System will prioritize the IT roles identified for the future IT environment based on those most critical to the System – roles that require a high degree of TAMUS or System Member knowledge and those in urgent need should be prioritized highest. For each role, the System will then ensure an understanding of the future role, responsibilities, and skills required and use the sourcing decision process flow to determine how to fill the role. Error! Reference source not found. below provides a sample sourcing decision process flow, though specifics for what the System’s flow will entail will be determined during implementation.
Figure 1: Sample Sourcing Decision Process Flow

Once the decision process flow has been followed, the System will reference the appropriate section of the sourcing framework to determine how the role should be sourced and the specific sourcing activities to conduct. **Error! Reference source not found.** below provides a sample sourcing framework, though specifics on what the System’s framework will consist of will be determined during implementation.

Figure 2: Sample Sourcing Framework
Based on the guidance provided by the framework, the System will then develop a detailed course of action for transitioning, training, or acquiring the resources to fill the role. This strategy would be followed for each of the IT roles identified in the System’s future IT environment.

It is recommended that the System also define a process by which the IT Governance Board (Recommendation #2, Part 1) will review the IT skill requirements of the System on an ongoing basis as new technologies evolve and as new shared services are considered for the ITSS model in order to determine the best method for staffing each service based on the defined sourcing strategy.

**Recommendation 28: Create alignment between IT staff and the IT skills and capabilities needed to deliver the future IT environment by establishing an IT career path framework for the System**

As part of Recommendation #27, the System will identify the IT roles required to deliver the future state IT environment, and through use of the sourcing strategy will determine which IT roles will be staffed in-house, either by individual System Members or more centrally through the ITSS model. It is recommended that the System then group these IT roles that will be delivered in-house into industry-standard job titles and career paths that will be adopted by all System Members and within the ITSS model. This IT career path framework should include parallel technical and management paths, so that IT professionals can grow their careers by developing specialized technical skills and capabilities as well as by demonstrating increased proficiency with supervisory and management skills. Each job title within the IT career path framework should have a salary band associated with it, so as to allow for equitable compensation of similar skills and capabilities across the System.

The career path framework will provide distinct paths employees can follow to progress from one job title to the next as they demonstrate increased proficiency with the requisite skills and job responsibilities. By linking job titles together as predecessors/successors of each other, the System will minimize the risk associated with an IT organization depending on a single individual for a specific set of IT skills and will lay the foundation for succession planning within individual IT organizations.

**IT Career Path Framework**

The IT career path framework will consist of industry-standard job families (or groupings of similar job titles based on requisite skills and capabilities) and job titles. For each job title within the framework, standard job descriptions, responsibilities, required skills, minimum education and qualifications, performance metrics and promotion criteria should be established along with the appropriate salary bands for the title.

In developing the IT career path framework, the System should consider high-level job families such as those represented below in Error! Reference source not found.. The System should keep in mind that, depending on the results of applying the sourcing strategy to the required IT roles, it may not need job titles and career paths associated with each job family represented below. For example, if the System chooses to use a third party vendor for all application development and support, it would not need to develop job titles and career paths associated with these IT functions.

**Figure 3: Representative High-Level IT Job Families**
Additionally, as part of developing the IT career path framework, the System should establish a process for reviewing and refreshing the framework and the IT job titles. This process should be carried out following any new sourcing decisions made by the IT Governance Board, as well as on a periodic basis as the overall IT needs of the System evolve. This process should include participation from both IT and business stakeholders across the System to ensure that all IT needs sourced internally are captured and provided for through the framework.

**Roll-out IT Career Paths**

Once the IT career path framework has been established, the System can then rationalize the current IT job titles and salaries across the System. Based on the results of the skills inventory conducted in Recommendation #27, current IT staff can be matched to new titles and career paths as appropriate. Individual transition plans, including plans for any immediate training needs (see Recommendation #29, should be developed and carried out, ensuring that IT staff transitioning into new IT roles and career paths, even if their day-to-day responsibilities do not change significantly, understand the new career path framework and the expectations of them in their new roles.

**Compensation and Performance Management**

As part of developing the job descriptions, it is recommended that the System undertake a compensation study to assess possible compensation and reward strategies that can be implemented along with the new IT career paths. While the System has some compensation restrictions associated with being a State entity, there are a number of different culture, work environment and career opportunity rewards that the System could look to institute in order to encourage innovation and motivate employees in the new career path structure. Based on the results of this study, the System should create a compensation strategy framework built upon cost-effective, performance-driven rewards linked to the IT career paths that can be implemented consistently across System Members and centrally in the ITSS model. Decisions will need to be made by the System regarding how to fund the rewards.

In order to ensure that rewards and progression through the IT career paths are linked to high performance and increasing proficiency in requisite IT skills and capabilities, the performance management process should be reviewed and a consistent, System-wide method for reviewing and assessing performance within the new career path framework should be established. While performance management will continue to be handled at the System Member level, a clear process for measuring performance against defined metrics, job requirements and level-appropriate expectations tied to each IT job title will allow for consistent leveling of performance across the System.

**Recommendation 29: Ensure continued IT talent development through a formal training and mentoring program for all IT staff**

With the rapid nature in which technology changes and advances today, the System needs to formalize a process for continually developing and training its IT professionals. Once an IT career path framework (Recommendation #28) has been established, the System must create training requirements that align with each path and require the completion of these requirements for advancement. These requirements should target the essential technology skills needed to perform the job functions of the current position and to prepare the employee for next level job responsibilities. Implementing such a program will ensure that IT employees are equipped with the requisite skill sets and capabilities to support the System's IT environment. Such a training program will ensure that progression through a career path is then linked not only to performance and experience, but also to completion of the training requirements and acquisition of the skill sets and capabilities associated with the employee’s current position and those at the next level.

Likewise, developing and implementing a mentoring program across the System will enhance on-the-job training, provide junior IT staff the opportunity to benefit from the experience of others more senior to them, and provide senior IT staff the opportunity to develop critical coaching and mentoring skills as they assist junior staff acclimate to their
roles. Formal mentoring is a proven way to provide professional development support and deliver specific messages through pairing staff in one-on-one professional relationships with staff that can provide a seasoned perspective. Mentoring expands career development beyond traditional classroom and online learning in a way that is focused on individual needs and is relevant to job responsibilities.

Implementing such a program will keep the IT workforce productive, relevant and effective, and also serve the dual-purpose of creating a retention and incentive tool for IT staff, demonstrating that the System is vested in their continued development.

Develop Training Program

To begin the development of a comprehensive training program linked to the IT skill and capability needs of the System’s future state IT environment, the System will need to inventory available training courses, materials, and programs in use by System Members, including in-person offerings, on-line courses, vendor-taught programs, etc. For each offering identified, the relevant skills and capabilities tied to each course should be determined and cataloged. At the same time, a catalog should be built defining the skills and capabilities required for each newly defined IT career path and job title (Recommendation #28). The skills and capabilities required for specific positions can then be matched with those covered in existing trainings and gaps identified. The System should develop a plan for closing these gaps, identifying existing training courses offered by outside vendors, identifying courses offered by System Member Universities, partnering with schools/colleges/professors to develop new materials, etc.

Based on the analysis of existing courses and the plans to develop new materials, training requirements tied to each job title can be determined. These requirements and timeframes by which they should be completed should be formalized within the guidelines of the training program and communicated out to System Members. The System should also develop a process by which to periodically review and refresh the training courses offered and the requirements tied to each IT title. As the IT career path framework evolves, so too will the training program have to. Decisions will need to be made by the System regarding how to fund the training program on an ongoing basis.

Develop Mentoring Program

To roll-out the mentoring program, the System should first develop the structure for the program, then test the structure with a pilot group of mentors and mentees, ensure adequate input and feedback is gathered, adjust the program as needed and then roll-out to a broader audience.

Prior to launching the pilot program, the System will need to identify a program administrator, develop an orientation program for mentors and mentees and have in place processes and administrative procedures to define such things as how mentors and mentees will be selected and paired, the duration of the pairing engagement, reporting requirements for the program, and issue management. The System will need to define guidelines for mentors and mentees and develop a program evaluation structure to evaluate effectiveness and obtain feedback. Once these elements have been defined, the System can move forward with enlisting mentors, enrolling mentees, conducting orientation and kicking off the pilot.

While many of these items will evolve over the duration of the pilot, it is important that these program elements be well thought out and that program administrators have a baseline of information from which to work. Program feedback and experience will dictate changes in the administration and communication of the program as it is rolled out beyond the pilot.

2.3 Where To Go Next

This Future State Recommendations – Part 2 Executive Summary focuses on recommendations that put in place the foundation on which TAMUS can build a “world class” IT environment. The recommendations presented were chosen because they were identified as the ones which provide the
most value to TAMUS. The value these recommendations bring is measured in several ways, including risk reduction, cost savings, and/or research enablement. In addition to these initial recommendations, there are several other areas in which opportunities may be found. As an ongoing process, the System should continually identify potential recommendations for analysis and implementation as additional avenues to differentiate itself as a Top 10 research, teaching and outreach System. As a starting point, once the foundational aspects of TAMUS’ IT environment recommended here and in Part 1 of the Assessment are in place, there are several additional areas of focus that the System should consider as methods of differentiating itself. In addition to those provided in Part 1, below are several focus areas the System should consider.

- TAMUS could significantly increase Member collaboration and reduce overall security risks by consolidating Active Directories across the System as a further step on the path to implementing a System-wide federated enterprise identity and access management strategy.
- Member collaboration could also be increased by consolidating content management applications into a single solution across the System. Initially, this would be focused on administrative content, but it could be extended to support academic content as a part of a larger learning management system strategy.
- As a part of the content management solution consolidation, the System could improve website performance by implementing an integrated website analytics capability across the System for both internal and external websites. This would improve reporting capabilities and enable more active management of all TAMUS web properties.
- To extend the capabilities put in place as a part of implementing the IT Demand and Project Management recommendations, TAMUS should consider additional tools that would facilitate data collection and analysis allowing it to start managing IT demand and collecting project and program metrics centrally.
- In the longer term, the System should evaluate employee retention within the new IT career path framework and determine if there is a need to develop more formalized succession planning. Succession planning can be vital to an organization’s success and can create an effective process for recognizing, developing, and retaining top talent. As a public sector entity, TAMUS is limited by the fact that it cannot designate “successors” for future vacancies. However, by linking jobs through the IT career paths and then enhancing knowledge transfer from one employee to another through job rotation programs, shadow roles, and building communities of practice, the System can still do much to ensure that it is not left at a critical disadvantage as a result of employee turnover.