

## STRATEGIC DIRECTION

### INTEGRATING ENTERPRISE TECHNOLOGY OPERATIONS

UNIVERSITY OF WISCONSIN COLLEGES  
UNIVERSITY OF WISCONSIN - EXTENSION  
2008

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#### EXECUTIVE SUMMARY

In January of 2005, Dr. David J. Ward completed his report for President Kevin Reilly, which examined opportunities for consolidation of administrative offices and functions within the University of Wisconsin-Extension and Colleges.

The objective put forth from President Reilly to Dr. Ward was to “*identify cost savings and efficiencies that could be achieved through merging the administrative operations of the central offices of the institutions.*”

An outcome from the findings and recommendations was the formation of the Administrative Integration Steering Committee (AISC). Members of this committee defined seven goals, with one being to “*identify, select and guide multiple work teams responsible for assessing specific Madison-based administrative functions/units and options for integration.*” From that, the Information Technology Subcommittee (ITS) was formed.

Of primary focus were the expected efficiencies that could be achieved through the integration of the central technical operational units for the Extension and Colleges. What followed was an extensive review of central information technology services and systems between the two institutions.

To integrate the technology departments of two institutions while staying mindful of their unique missions is a significant undertaking. It could not be achieved without the support from Chancellor Wilson and his leadership team. This new model is based on the theory and agreement that the outcomes will produce an improved technical infrastructure that shall be more effective, produce efficiencies through economies of scale, and create an environment that is flexible and responsive to the educational and program needs for the State of Wisconsin.

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## TARGETED AREAS FOR IMPROVEMENT

The layout of this document outlines each strategic initiative by providing a brief overview of the current systems and associated risks. That will be followed by the improvement strategy along with the expected benefits from its successful implementation. Areas targeted for improvements through the three initiatives outlined in this 2008 strategic directive are:

- ▶ Integrated data center
- ▶ Primary server operating system
- ▶ Enterprise Level Service Desk
- ▶ Improved access to critical systems
- ▶ Operational efficiencies
- ▶ Standards
- ▶ Security
- ▶ ITIL Information Technology Infrastructure Library
- ▶ COOP and DR Planning

The central organization that supports the technologies and infrastructure for the Extension and Colleges has finite people and capital resources. To maximize those resources in order to advance initiatives, it is critical that the philosophy and strategy is deliberate. This will ensure targeted areas for improvements complement one another and are achievable.

The successful implementation of these strategic initiatives is geared to result in comprehensive solutions that produce:

- ✓ Stable infrastructure on which to incorporate future technologies
- ✓ Single common network operating system for central operations
- ✓ Single sign-on to the primary network
- ✓ Improved access to electronic information
- ✓ Improved security to systems, applications and data
- ✓ Incorporate a Life Cycle approach for hardware and software
- ✓ Server consolidation for management and reduced licensing costs
- ✓ Scalable data storage solution
- ✓ Evaluation to in-source our data backup solution
- ✓ Reduce expenditures by volume purchases of systems and licensing
- ✓ Improved management of the remote technical environment
- ✓ Lower support costs
- ✓ Compliance
- ✓ Incorporate best practices
- ✓ Ensure 24/7 technical support for critical systems
- ✓ Identify and foster collaborative efforts
- ✓ Build and promote a Service Desk - single point of contact for all incidents and requests

By securing and improving the business tools and systems used by our institutions; employees and stakeholders will be able to focus on their customers, respective programs, and the educational areas they represent.

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## CHALLENGES OF INTEGRATION

There is another challenge just as difficult as building and promoting a new technical infrastructure. It is the recognition of cultural differences between and within each division of the Extension along with the culture of the UW Colleges. It is not two cultures to contend with, it is many. Central IT blends technologists from both institutions; therefore, the culture diversity and the strain it has exposed in Central's IT operations is heightened.

### Organizational Structure

Awareness and respect for the beliefs and practices has been a priority in the restructuring of Central's Information Technology workforce. A reorganization has taken place that has fashioned four core functional units, each with new leadership. Within the functional units are areas of specialties. This deliberate organizational makeup is designed to promote the technical initiatives that are outlined in this strategic direction. The Chief Information Officer for the UW Colleges and UW- Extension reports to Chancellor David Wilson.

### Technical

The technical challenges to a successful integration for Central IT services and systems are many and of great magnitude. The UW-Extension and UW Colleges have disparate networks. The technologies used by each institution tie back to Central IT servers, security, applications, and data storage. Since they are dissimilar networks, few efficiencies have been achieved as of yet. When a primary network is constructed for authentication and access, along with standard best practices implemented, Central IT will be positioned to accomplish and then benefit from the targeted areas outlined earlier.

### Current Network Design

The technology services and systems provided through the central Extension network serves approximately 1,000 employees and an undetermined number of end customers. This network provides the backend solutions to General Educational Administrative Services (GEA) and the four expansive Extension divisions of: Cooperative Extension, Broadcast and Media Innovations, Entrepreneurship and Economic Development, and Continuing Education and Outreach E-Learning. The network thereby acts as the mechanism for the delivery of services for employees, customers, and stakeholders throughout the State of Wisconsin. The primary point of authentication and backend server systems for the Extension is Novell Netware.

For the UW Colleges, central operations supports the 13 two year campuses, the Online program, and central administrative employees. Customers and backend dependencies for this network include roughly 13,000 students, along with 3,200 faculty and staff members. The primary point of authentication and server system of the Colleges is Microsoft Windows Server.

The two physical networks reside in separate buildings and neither have the required environmental controls. Both networks have multiple points of failure and are poorly documented.

The above inefficiencies and criticalities will be corrected through the strategic initiatives outlined in this writing.

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## STRATEGIC INITIATIVES

There are three extensive strategic initiatives identified to begin in 2008 that are specifically targeted to improve overall computing resources, services and efficiencies, and align Enterprise Operations with the business goals and objectives of the University of Wisconsin-Extension and Colleges.

This strategic direction includes a rebuild of the server and network infrastructure, an evaluation of and correction to single points of failure, increased support services, ease of access to electronic information, standard practices, and expanded collaborative efforts. The objective is to establish an environment that provides a solid foundation for current needs and will be flexible and scalable to embrace future service requirements.

Successful implementations of these initiatives are interdependent and vary in scale. They will result in exponential benefits as each initiative is accomplished.

### Initiative #1: Improved Infrastructure

A new data center facility was built in the lower level of the Pyle Conferencing Center. It will be ready for occupancy in the spring of 2008. A state of the art APC chilled water racking system was purchased and has been installed. This initiative is to move to the next phase, which plans and builds the integrated network while consolidating the number of servers and disk for data storage.

Today, Central IT for the Extension and Colleges has a number of high risk areas between its two server farms in the Regent and Lake Street buildings. There are over 150 servers that require technical management and each system requires licensing. Additionally, Central IT has responsibility for 26 servers located at the 13 UW Colleges. There is minimal redundancy in the current design, which has led to service outages and frustrations. The current design is not positioned to provide 24/7 access or to support growth agendas.

To correct these deficiencies this initiative targets the build out of an infrastructure at the Pyle Data Center that is fault tolerant; meaning that if one system fails, service is still delivered to the customer. The design will provide physical security to the systems and data. Blade servers and virtualization will be part of the strategy along with 64-bit architecture that is a requirement for next generation applications.

Currently, most of the 150 servers have their data stored locally on each box. This approach creates tremendous overhead for staff and requires additional hardware to be purchased when more storage space is required. The future solution will include a Storage Area Network (SAN), which is a system that stores data on one primary, yet fault tolerant device. A SAN is designed to store the data from all servers on one redundant device that can readily be expanded to meet increasing data storage needs.

Backup solutions will be examined to determine if it is cost effective to bring that service back under the control of Central IT operations. It has been outsourced to DoIT for an annual cost of approximately \$50K.

The infrastructure build out will give consideration to Continuity of Operations Planning and Disaster Recovery requirements for both the Extension and Colleges.

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To minimize the risk of this undertaking, a parallel environment will be built and applications and services will be systematically migrated to the new server operating systems and hardware environment. This is further detailed on under the Common Network initiative.

## CURRENT RISKS

- ✘ Failure rates with critical components are increasing
- ✘ Server systems or applications unsupported by the vendor
- ✘ Inadequate security
- ✘ Little or no fault tolerance for applications
- ✘ Lack of standard set-up procedures
- ✘ Enterprise applications run on inadequate hardware
- ✘ Poor protection from power failure
  
- ✘ No automated fire retardant
- ✘ Lack of documentation
- ✘ Underutilized management and monitoring tools
- ✘ Physically separate environments
- ✘ Poor depth in staff knowledge
- ✘ Disparate networks
- ✘ Lack of best practices

## STRATEGY

The design and implementation of the new service infrastructure for Enterprise Operations will increase reliability and availability of critical services, consolidate of number of server systems, and instill operational procedures utilizing best practices for data center management. Hardware will be installed that supports a 64-bit architecture.

Employing current server and data storage technologies will use less physical space while providing Enterprise Operations with increased computing and storage capacity. The design will examine backup strategies towards a more resilient and responsive on-line system that provides faster backups and restores without impacting business services.

Software that controls server and critical infrastructure components will be upgraded, and enhanced security measures will be installed to protect the Enterprise network from threats such as viruses, worms, and hackers. The building of the new Enterprise service infrastructure will be advanced while maintaining support of the existing infrastructure. All services and applications will be thoroughly tested before they are migrated and released into the new environment to mitigate any service outage.

## BENEFITS and OUTCOMES

- ✓ Server Consolidation
    - Hardware to support 64-bit architecture required for SharePoint, Exchange 2007, SQL and next generation applications
    - Decreased long term hardware and software licensing costs
  - ✓ Dedicated data center space
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- Higher capacity servers reduces the amount of physical space required
- High capacity servers require special environments that were designed into the Pyle Data Center and APC chilled water rack enclosures
- ✓ Disk/Data Consolidation
  - Data from disparate servers will be consolidated into a highly available and secure enterprise data storage system
  - Multiple servers point to one shared storage location for greater efficiency and increased availability
  - Easily scaled to meet changing needs
- ✓ Fault tolerant design to reduce network outages
  - Hardware and software solutions will be utilized
- ✓ Improved network response time
- ✓ Standardization of systems
  - Stabilized infrastructure provides the foundation to advance future technologies
    - Adult Student Initiative
    - Growth Agenda for Wisconsin
- ✓ Improved security and management
- ✓ Reduction in complexity
- ✓ Comprehensive data backup solution
- ✓ Disaster recovery planning
- ✓ Management tools and monitoring

## Initiative #2: Common Network and Standards

The UW Colleges and the UW-Extension use dissimilar server operating systems. They have built their respective networks and have chosen hardware and applications based on different philosophies. The server operating system is the initial point of authentication when you log into the computing network, and it determines what files, printers, group memberships, and applications you have access to. The server operating software is a security barrier. It allows network access to persons based on their roles and responsibilities in the organization, and protects the environment from intrusion and malicious attempts to gain access to confidential data.

Integrating the services and systems in Central IT to become an Enterprise Service Organization that will be built with common standards, and structured to support the mission of the Colleges and Extension requires a new direction. The rebuild of our infrastructure will include a design that employs Microsoft Windows 2003 Active Directory (AD) as the principle server operating system for both institutions.

Many Extension employees along with the multiple divisions within Broadcast and Media Innovations (BAMI), and Entrepreneurship and Economic Development authenticate through Novell's NetWare. The primary operating system used by the 13 colleges and central college employees is Microsoft Windows 2003 Active Directory.

The new Active Directory will be designed based on a best practice approach and with consideration for all stakeholders. Active Directory is an extremely powerful tool and operating system. The design must be flexible in its crafting, and able to accommodate other entities if and when they opt for Enterprise Operations to manage their servers and systems. Upon successful completion of this initiative all students, faculty, and staff accounts along with

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applications and services from both systems will be meticulously migrated into the new secure architecture.

An additional complication of having multiple server operating systems and clients is for central personnel to provide desktop support. The more non-standard and disparate the technology is directly relates to higher operational costs and reduced efficiencies.

The future design and direction will reduce inefficiencies and administrative overhead. This will position Enterprise Operations to enhance and expand services. This new model creates an environment that allows technical staff to focus on fewer technologies, but with greater depth. In turn, knowledge levels increase, personnel can focus on and research improved solutions, and a proactive approach to service support and service delivery is fostered.

## CURRENT RISKS

- ✘ High security risks exist in the Microsoft Active Directory design that currently supports the Colleges
- ✘ High security risks exist in the current Novell Netware design that supports the Extension
- ✘ Lack of fault tolerance which is required to support mission critical applications
- ✘ Inability to respond to a user request in a timely fashion
- ✘ No common point of authentication
- ✘ Current design does not support integration efforts
- ✘ Best practices were not used resulting in a poorly defined structure
- ✘ High failure rate for delivered services
- ✘ Inability for personnel to share data between the two server systems
- ✘ Lack of standard configuration and operating procedures
- ✘ There are vulnerabilities could be exploited to gain unauthorized access to confidential data

## STRATEGY

The Active Directory design and migration will follow best practices taking into consideration our customers of today and requirements for tomorrow. The planning and design sessions to craft a secure, scalable and effective solution will be a large undertaking involving input from many stakeholders.

The Active Directory implementation in use today services over 13,000 students, along with faculty and staff throughout the Colleges and Extension. Microsoft Windows Server 2003 is an enterprise solution and is the foundation for our Exchange 2003 mail environment. Other Microsoft technologies already requested from our customers include SharePoint Server 2007 and Exchange 2007. These server applications require 64-bit architecture. The new design will include hardware and server operating system installs that will enable Central IT to meet these business requirements.

Desktops that are supported by central operations are split between the Novell and Microsoft networks adding overhead for technicians and requiring users of the systems to log in multiple times to access all of their resources. As the network is rebuilt so will be the desktops. All end computers under central IT's support will receive a new standard image. The end result

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will be a single sign on and the ability to have common shared file storage on the Microsoft network.

The redesign of Active Directory will be done in conjunction with strategic initiative #1, an improved infrastructure. Design and planning sessions will begin in early spring and take several months. July of 2008 will be a target date to begin the build out of the new Windows Active Directory server system on the hardware defined in a RFP. As the new infrastructure is built, older systems at Regent and Lake will be decommissioned. Servers that have not outgrown their useful life cycle will be relocated to Pyle. As they age they will be replaced with newer technologies. The entire rebuild and decommissioning could be completed by the spring of 2009; however, efficiencies will be recognized long before that date.

#### BENEFITS and OUTCOMES

- ✓ Utilize fault tolerant technologies to improve service delivery by reducing outages to the customer
- ✓ Establish a primary point for authentication
- ✓ One common network for central administrative employees to easily share and store data files
- ✓ Promotes integration
- ✓ Ability to respond to ever changing business environments
- ✓ Meet the customers' expectations and deliver applications for business requirements
- ✓ Improved messaging and collaboration tools such as SharePoint and Exchange 2007
- ✓ Implement delegation and appropriate permission levels to the 13 College Network Administrators allowing them to be successful in the support of their respective campuses while maintaining required security levels
- ✓ Service layering of applications
- ✓ Proactively manage the network
- ✓ Establish architecture capable of providing service to other Extension Divisions and administrative units

#### Initiative #3: Service Desk, ITIL Framework and Process Improvements:

The UW Colleges and the UW-Extension both use a web based product called Footprints for their Help Desk solution. It is a power product; however, for both institutions the current installation and how the product is being utilized provides minimal benefit.

Footprints is the tool used when a customer has an issue or is requesting a new service. It can categorize and prioritize the event and attach it to the person reporting the problem. The ticket generated from the call can be assigned to technicians and escalated accordingly. This product is only as valuable as how it is designed and implemented. Similar to the current Active Directory installation, the current implementations of Footprints is providing little return on investment, has exacerbated issues, and is a strong point of contention between and among units of the Colleges and Extension.

An enterprise approach to improve service support and service delivery will be taken with initiative #3. This will focus on a complete revamp of the help desk solutions in place today and implement a Service Desk center. A Service Desk is much broader than a Help Desk in that it will track and manage IT incidents and problems vertically and horizontally throughout

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both institutions. The Service Desk will provide a single point of contact for the customer needing assistance.

Currently there are at least seven separate installations of the older version of Footprints. Problems are reported and managed differently. There are no common practices, and information between the multiple installs does not allow for sharing of information, because each has its own database.

Best practices will be incorporated throughout the design and ongoing care of the network. The Information Technology Infrastructure Library (ITIL) is a framework for best practices used in the management and delivery of IT services. It focuses on critical business processes and disciplines needed to deliver service, and is a widely accepted approach to IT service management. The ITIL framework will provide the principles on which the design and implementation for the Service Desk Center as an enterprise solution will be built.

## RISKS

- ✘ Customers experience substantial down time because service issues are not being addressed
- ✘ Technicians have no way to proactively manage issues
- ✘ Multiple installs create separate databases; therefore there is no sharing information on problem or resolution
- ✘ No systematic escalation of service requests
- ✘ First level technical support is being done at multiple levels throughout the two institution wasting valuable people resources
- ✘ Multiple licensing costs
- ✘ No release or configuration management in place
- ✘ No problem or change management in place
- ✘ No standard procedures established
- ✘ Lack of follow through with requests resulting in poor service support
- ✘ No metrics in place to identify trends and look for improvement
- ✘ Lack of asset management

## STRATEGY

The newest version of Footprints was evaluated and is able to provide an enterprise wide solution that supports the ITIL framework. Central operations is currently holding conversations with the other units from Extension and Colleges to explain the benefits of a redesign of Footprints, built on a best practice framework and sharing a single database. The units with the two largest installs of Footprints have agreed that an enterprise approach managed by central IT is the best solution.

A new design of Footprints will move forward with input from the current users of Footprints, which will be led by managers from central IT that are certified in ITIL and versed in Information Technology Service Management. The rollout will contain modules supporting the five service support processes of incident, problem, change, release and configuration management.

All users of the new system will receive training so that accurate and consistent information will be entered in a singular database. When the rollout of the new enterprise

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solution is stable, then an informational launch will take place informing customers from the Colleges and Extension of the Enterprise Service Desk. The Service Desk will be the first point of contact for all customers requiring technical assistance.

## BENEFITS and OUTCOMES

- ✓ A single point of contact for Information Technology requests and incidents
- ✓ An improved customer experience
- ✓ A managed approach to request changes to the live environment
- ✓ Improved time to resolution for reported problem
- ✓ A thorough test, release, and communications plan for changes scheduled into the live computing environment
- ✓ Connecting processes throughout Enterprise IT and as well as to the Extension and College technology units
- ✓ Web based program that will allow technologists at the 13 campuses and throughout the Extension divisions to report on and manage their areas of responsibility
- ✓ Improve the communication gaps between technologists operating in multiple units
- ✓ Ability to use metrics and view reports
- ✓ Process improvements
- ✓ Release management for control over production environment
- ✓ Asset management

## THE NEW DIRECTION

The initiatives outlined in this writing support and promote the administrative integration efforts for the UW-Extension and the UW Colleges. Its outcomes create a solid model on which to support and manage technologies and provide leadership for the two institutions.

The evolving organization generates a structure that will deliver enterprise solutions, promote best practices, and foster collaborative relationships throughout the program and technology units for Extension and Colleges. Success will be achieved through these combined efforts.

Central operations will champion partnerships and strive for excellence to recognize the full benefits from integrating. From this our institutions shall be positioned to embrace new technologies that better serve all our customers and leverage emerging strategies that advance the missions and initiatives of the Extension and Colleges.

This is a living document and will be reviewed so that the initiatives and approaches outlined within continue to be aligned with institutional principles and strategic directions.