North Dakota University System

Core Technology Services
2016-2017 Annual Report

(Report generally covers the period from July 1, 2016 to June 30, 2017)

NORTH DAKOTA
UNIVERSITY SYSTEM
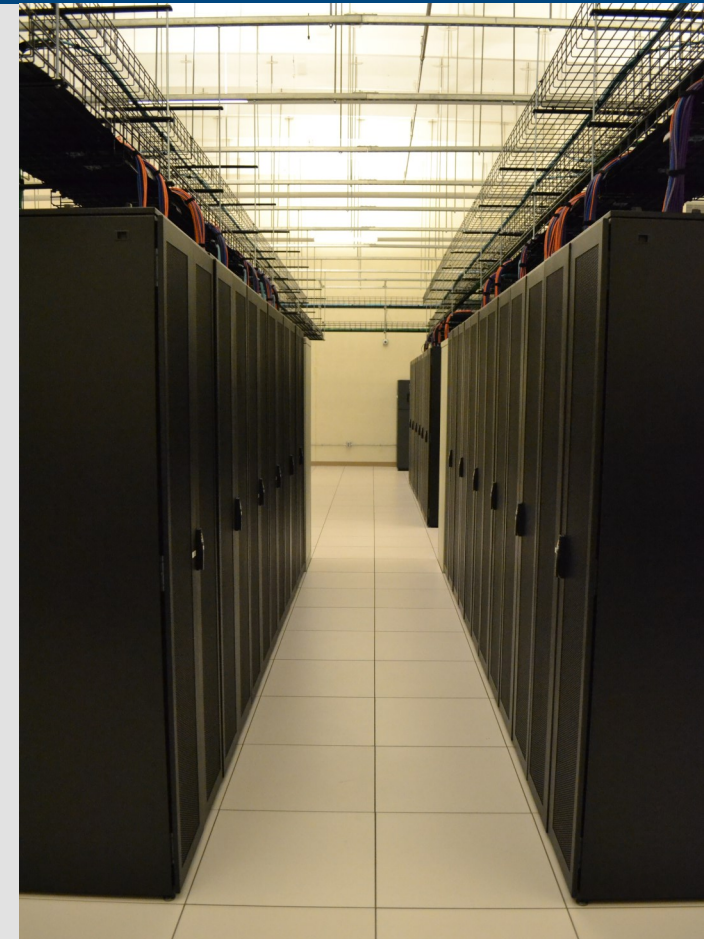**CORE TECHNOLOGY SERVICES**

Dr. Mark Haggerott
Chancellor

Dr. Lisa Feldner
Vice Chancellor for IT & Institutional Research

Darin King
CIO

Contents

The mission of Core Technology Services is to deliver technology-based resources, services, and solutions to NDUS institutions, students, faculty, staff, the System Office, and North Dakota residents.

CTS does this by leveraging current technologies, researching new technologies, and positioning the University System to innovate and use future technologies.

CTS provides secure information management and technology services to the North Dakota University System, linking academic and business services within the NDUS community, and by connecting users to the information and educational resources they need to accomplish their goals.

This report was developed in accordance with N.D.C.C. §15-10-44.1.c.

Integration of higher education information technology planning and reporting with the board's strategic planning process and annual performance and accountability report required by section 15-10-14.2.

NDUS Information Technology Goals:

Support North Dakota University System infrastructure needs.

Improve North Dakota University System information technology-enabled business processes and services while providing and managing resources to align with NDUS strategic goals.

Improve and enhance North Dakota University System student learning and user's focus.

Improve and enhance North Dakota University System collaborative efforts.

A Message from the CIO

Core Technology Services of the North Dakota University System continues to successfully complete important projects, react to opportunities and overcome challenges. This would not be possible without dedicated and skilled staff from both CTS and the NDUS institutions. CTS strives to collaborate with each NDUS institution to provide consistent, reliable and cost effective services across the NDUS.

Below is a summary of some of the many accomplishments of Core Technology Services. Each of these initiatives benefited greatly from the growing capabilities of the CTS project management and procurement team. Thanks to these foundational operational changes, CTS has consistently negotiated contracts that reduce costs and executed projects on time and on budget.

The CTS Information Security Department continues to update and execute the key pillars of the NDUS Strategic Security Plan in collaboration with the NDUS Information Security Council. They have successfully implemented many projects, including policy development, enterprise endpoint protection, multifactor authentication and centralized logging. They worked closely with the CTS PeopleSoft teams to successfully implement a specialized application firewall and multifactor authentication system to protect our Finance, Human Resources and Campus Solutions PeopleSoft systems.
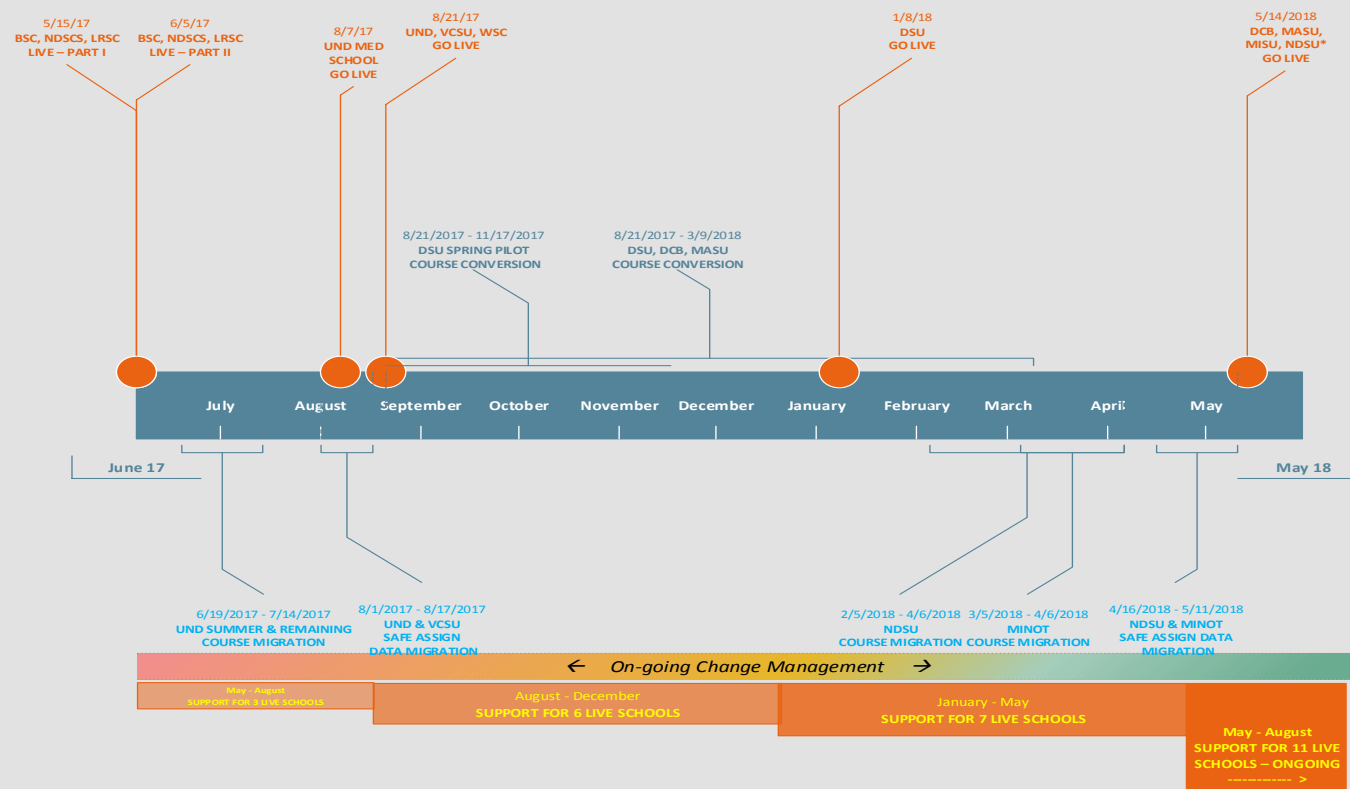
In May of 2016, the North Dakota State Board of Higher Education reaffirmed their directive to implement a single learning management system that will provide enhanced service levels and a more cohesive user experience to the students and faculty at all NDUS institutions. Blackboard was selected as the single system and a new, system-wide contract was developed that will save NDUS over $400,000 per year. The initial three institutions were implemented in May of 2017 with an additional three slated for implementation in August of 2017. The remaining five institutions will be fully implemented by August of 2018.

5/15/17
BSC, NDSCS, LRSC
LIVE – PART I

6/5/17
BSC, NDSCS, LRSC
LIVE – PART II

8/7/17
UND MED
SCHOOL
GO LIVE

8/21/17
UND, VCSU, WSC
GO LIVE

1/8/18
DSU
GO LIVE

5/14/2018
DCB, MASU,
MISU, NDSU*
GO LIVE

8/21/2017 – 11/17/2017
DSU SPRING PILOT
COURSE CONVERSION

8/21/2017 – 3/9/2018
DSU, DCB, MASU
COURSE CONVERSION

July August September October November December January February March April May

June 17

May 18

6/19/2017 - 7/14/2017
UND SUMMER & REMAINING
COURSE MIGRATION

8/1/2017 - 8/17/2017
UND & VCSU
SAFE ASSIGN
DATA MIGRATION

2/5/2018 - 4/6/2018
NDSU
COURSE MIGRATION

3/5/2018 - 4/6/2018
MINOT
COURSE MIGRATION

4/16/2018 - 5/11/2018
NDSU & MINOT
SAFE ASSIGN DATA
MIGRATION

← On-going Change Management →

May - August
SUPPORT FOR 3 LIVE SCHOOLS

August – December
SUPPORT FOR 6 LIVE SCHOOLS

January - May
SUPPORT FOR 7 LIVE SCHOOLS

May - August
SUPPORT FOR 11 LIVE
SCHOOLS – ONGOING
------------- >

Email consolidation, required by N.D.C.C. 15-10-44-1, continues to make progress, with ten out of eleven NDUS institutions completed in 2017. Due to the Blackboard project, the final institution was delayed, and will be consolidated in November of 2017. This project will continue with some additional functional and technical enhancements during 2017 bringing even more value to the effort. This project also fulfills the requirements of N.D.C.C. 15-10-44-1.g. that requires all NDUS non-student email to be archived for 2 years.

The initial phase of the Identity and Access Management project was successfully completed in January of 2017 when the new environment was fully implemented. This system replaces an out-of-date system and will provide many new efficiencies and enhancements. The enhancements include improved user management, credential synchronization, and operational efficiency. In future phases, we expect to continue to develop the capabilities of the new system to bring more features that include enhanced federation of credentials and enhanced user self-service.

The Functional Consolidation project, directed by N.D.C.C 15-10-44.1, completed several milestones during 2017. The North Dakota State Board of Higher Education approved NDUS Policy 1200.1 directing the consolidation of IT services. The Functional Consolidation Study Report, which included a full institutional inventory of systems, was completed and submitted for legislative review in December of 2016 and work continues to identify systems for potential consolidation. The NDUS Data Center's capacity for enhanced consolidation continues to improve with the implementation of X nodes of hyper-converged infrastructure. This technology has increased our compute and storage density while providing potential improvements to the operational efficiency of the data center.

The State of North Dakota experienced a significant reduction in revenue that required CTS to reduce expenditures by 8% in FY17. Most of these reductions were accomplished by making strategic changes in CTS staffing levels by offering early retirement packages, not filling open positions, and restructuring in some areas. These changes allowed for the creation of the Enterprise Solutions Group, comprised our PeopleSoft, Document Imaging and Learning Management System teams under a single executive leader.
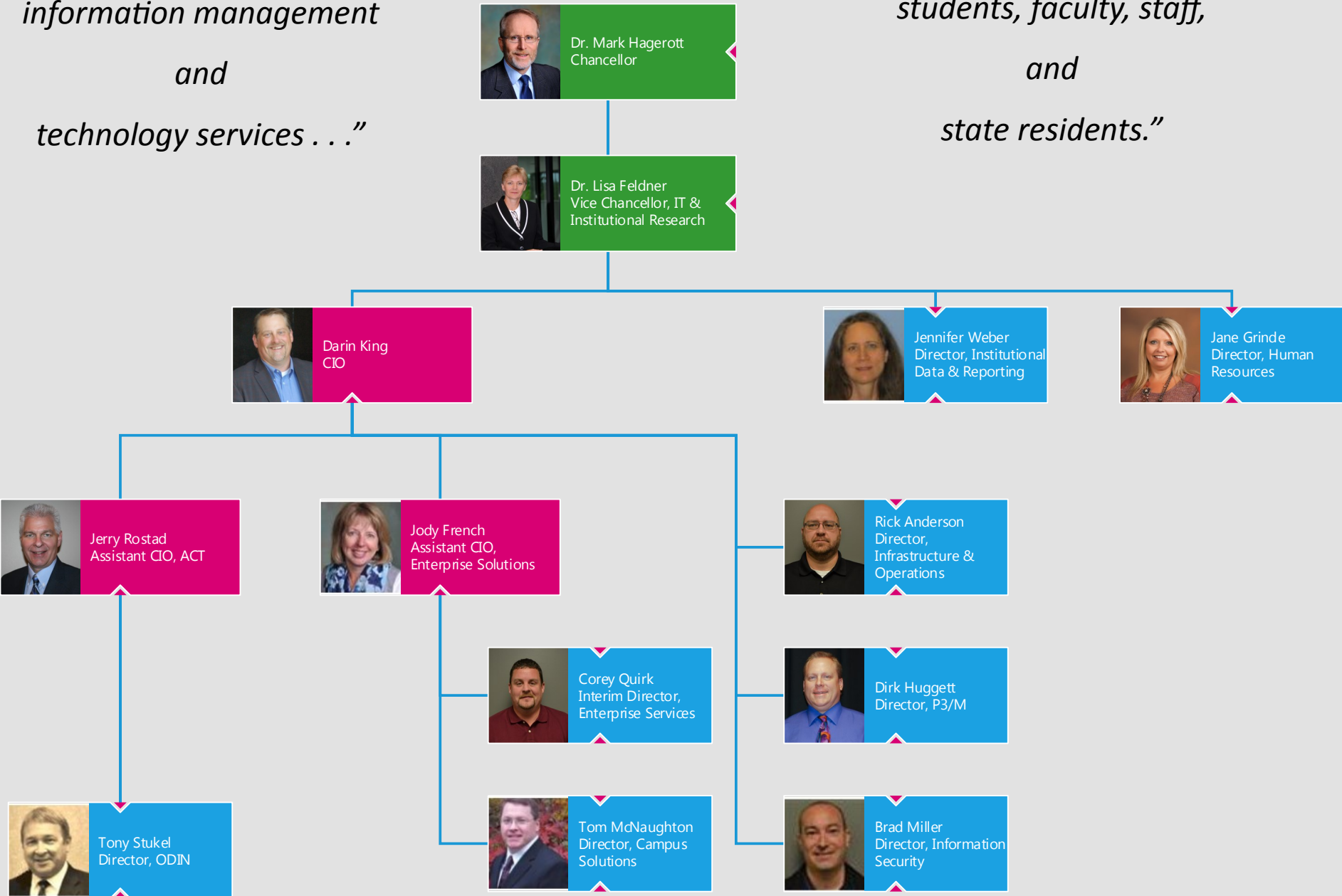
The Core Technology Services team is excited about the future and looks forward to continuing to provide effective solutions and services to the institutions we serve.

Sincerely,

"Providing secure information management and technology services . . ."

". . . to North Dakota University System students, faculty, staff, and state residents."

- Dr. Mark Hagerott — Chancellor
- Dr. Lisa Feldner — Vice Chancellor, IT & Institutional Research
  - Darin King — CIO
    - Jerry Rostad — Assistant CIO, ACT
      - Tony Stukel — Director, ODIN
    - Jody French — Assistant CIO, Enterprise Solutions
      - Corey Quirk — Interim Director, Enterprise Services
      - Tom McNaughton — Director, Campus Solutions
    - Rick Anderson — Director, Infrastructure & Operations
      - Dirk Huggett — Director, P3/M
      - Brad Miller — Director, Information Security
  - Jennifer Weber — Director, Institutional Data & Reporting
  - Jane Grinde — Director, Human Resources

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ACADEMIC COMMUNICATION AND TRAINING (ACT)

Academic Communication and Training provides leadership in current and emerging technologies that expand and enhance teaching and learning opportunities across the North Dakota University System. We work with the institutions of the NDUS to develop and deliver enterprise instructional systems, services, and technologies.

Our current services include two learning management systems. Blackboard Learn was launched in 2017 as a System-wide LMS while Moodle will be phased out in 2018. We support a lecture capture technology called Tegrity and two web conferencing solutions, Blackboard Collaborate and Skype for Business. In addition, ACT provides related communication services such as Office 365 management, the NDUS help desk and ticketing system, and coordination of ODIN (Online Dakota Information Network) library services.


ACADEMIC COMMUNICATION AND TRAINING

Blackboard Learn (Bb Learn)

The NDUS decided on Bb Learn as the learning management system (LMS) platform for the entire university system on June 30, 2016. Students are able to enroll in classes on any of the 11 NDUS institutions without having to become familiar with a new online course delivery system.

Transition and governance teams have been working on implementing the Bb Learn throughout the past year. The following institutions have migrated to Bb Learn as of spring/summer 2017:

- Bismarck State College
- North Dakota State College of Science
- Lake Region State College
- Williston State College

Valley City State University and University of North Dakota will transition from their current institutional version to Bb Learn in August 2017. The remaining institutions will transition in 2018, with the process completion date of summer 2018.
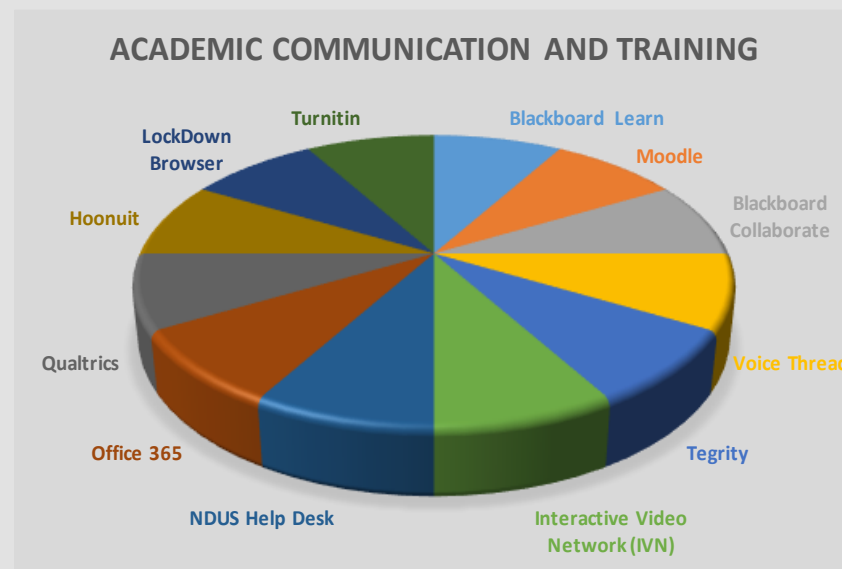
Moodle

Moodle is an open-source learning management system (LMS) that has been used by Dakota College-Bottineau, Dickinson State University, Mayville State University and Williston State University.

Moodle Academic Year 2016-17

870 Courses → **5,393 Enrollments**
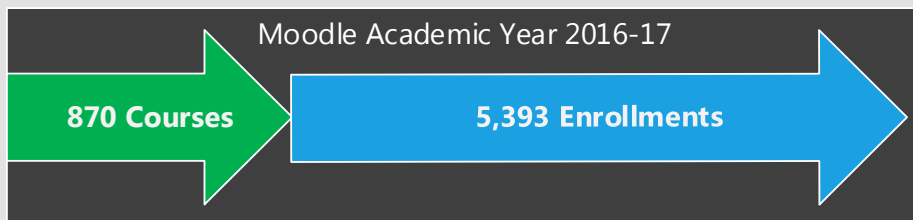
Blackboard Collaborate (Bb Collaborate)

Bb Collaborate is a desktop web conferencing platform. It can be used in a standalone environment for meetings or it can be accessed from within an LMS. Blackboard Collaborate recently released Ultra RTC, providing users with a much simpler interface. NDUS staff and NDSU Extension personnel have used it frequently for meetings and training webinars.

VoiceThread

VoiceThread is a web-based application which allows participants to share conversations and make comments to presentations using a mix of text and voice. While VoiceThread is available system-wide. It is a brand-new product and usage statistics are not available. Training is being held in August for administrators and institutions.

Interactive Video Network (IVN)

CTS provides technical and training support for the NDUS Interactive Video Network. Institutions took ownership of the IVN Public rooms in August 2016. Institutions utilize the service of audio and video conferencing for classes and meetings. During the spring 2017 semester, institutions delivered 36 dual credit classes, 133 undergraduate courses, and 29 graduate courses reaching a total of 2,293 students. IVN replicates the traditional face to face classroom while extending its reach to geographically remote students.
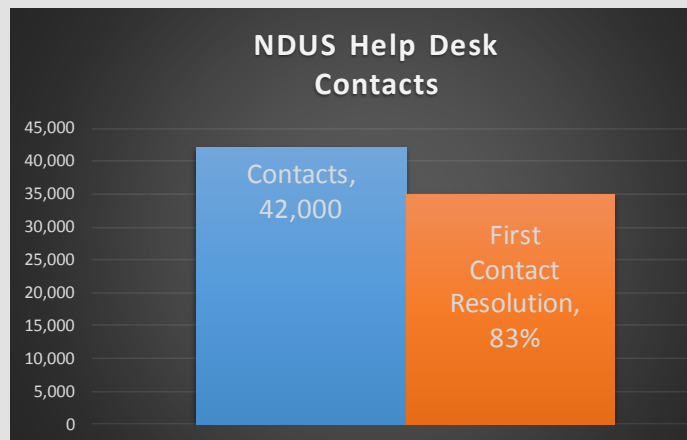
MeetMe Rooms allow ad-hoc scheduling for meeting through the Microsoft Outlook calendar to connect either by a videoconference unit, telephone, web-browser or any combination.

Tegrity

Tegrity is a lecture and content capture software that enables faculty, students, and staff to record presentations, lessons, training, lectures, and more. Institutions have amassed more than 40,000 hours of lecture records.

Tegrity Usage (RECORDED HOURS): 14713 (FY14), 23115, 28855, 34650, 42077 (FY18)
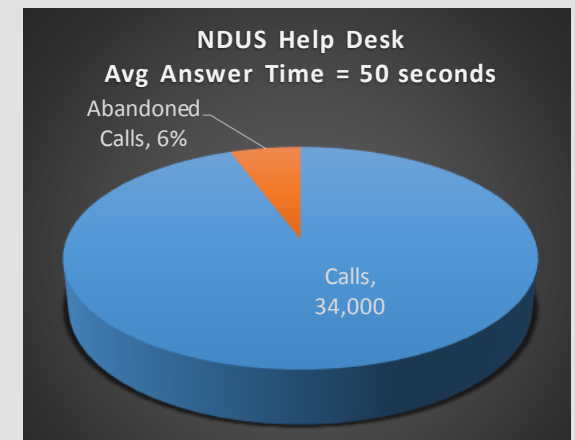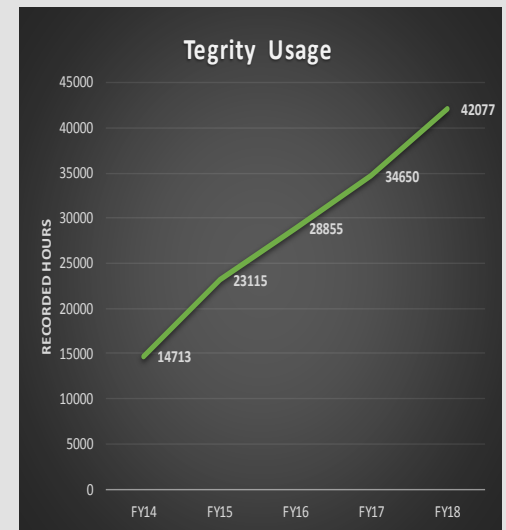
NDUS Help Desk

The North Dakota University System Help Desk is open 24 hours, 7 days a week and provides technical support for the following systems and applications:

- NDUS Account IDs and passwords
- ConnectND applications, including Campus Solution/Campus Connection, Financials, and HRMS
- Moodle, Bb Learn, and Bb Collaborate
- Skype for Business
- Support for SharePoint
- Office 365 support
- Password changes
- 'How To' support for Exchange Email and Calendar

NDUS Help Desk Contacts: Contacts, 42,000; First Contact Resolution, 83%

NDUS Help Desk Avg Answer Time = 50 seconds: Abandoned Calls, 6%; Calls, 34,000

Office 365

Office 365 refers to access to Office applications plus other productivity services that are enabled over the Internet (cloud services). CTS hosts bimonthly meetings with the institutions to discuss new features and functionality. VCSU is schedule to migrate to the NDUS Office 365 tenant in November.

New Features:
- Yammer
- Groups
- Teams
- PowerBI

Migrated 3 campuses and UND Aerospace to NDUS Office 365 Tenant

160,000
Office 364 Mailboxes

10
NDUS Campuses on Single Tenant

HOONUIT (ATOMIC LEARNING)

Hoonuit (formerly Atomic Learning provides online professional training for institution staff personnel and faculty. In the report from January 1 through August 7, 2017, a total of 1012 series titles were accessed.

TURNITIN

Turnitin is plagiarism software that can be used outside of, or within the NDUS integrated Moodle environment. Instructors can check for potential plagiarism, use drag and drop comments, record voice comments, and grade directly or by Rubric. Students can use it to precheck their assignments, improve their writing skills, or to obtain peer reviewed feedback.

LOCKDOWN BROWSER

LockDown Browser is a custom browser that locks down the testing environment within a learning management system. CTS is currently supporting integrations with Bb Learn for VCSU, MiSU, NDSU, UND, NDUS Bb SaaS, and with NDUS Moodle.
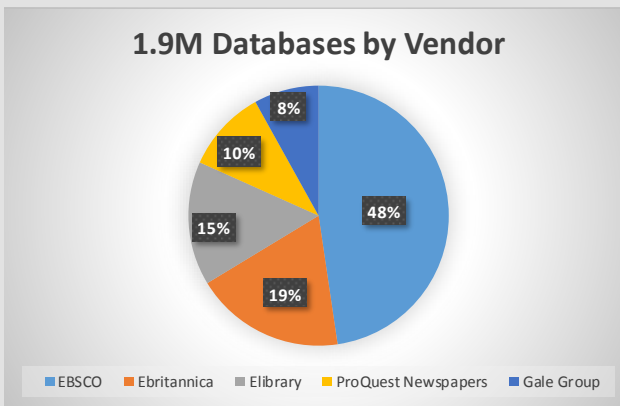
QUALTRICS

Qualtrics is survey software available to those institutions that wish to participate. Currently there are 65 active accounts. Training provided on demand.

ODIN

ODIN provides library management services, including a search interface to find library materials both physical and electronic, circulation control, course reserves, acquisitions and serials control and an interlibrary loan function.

ODIN also provides access control for 45 licensed full-text databases and similar on-line material for more than 300 North Dakota libraries of all types. ODIN posts monthly use statistics for these databases monthly at http://www.odin.nodak.edu/stats.

Titles Owned By Library Type

Academic 2,869,300
Public 658,408
Schools 239,668
State Agencys 220,380
Hospitals 22,739

1.9M Databases by Vendor

48%
19%
15%
10%
8%

EBSCO ■ Ebritannica ■ Elibrary ■ ProQuest Newspapers ■ Gale Group

Training

ODIN provides library system use functional training for library staff. This past year training included:

36 site visits to ODIN libraries. 60+ online training sessions via online meeting/support software. 91 training documents and videos were created, updated or modified.

New training manuals were created and distributed to all ODIN member libraries for public service functionality (circulation, ILL, general – downloading client, printing, etc.).
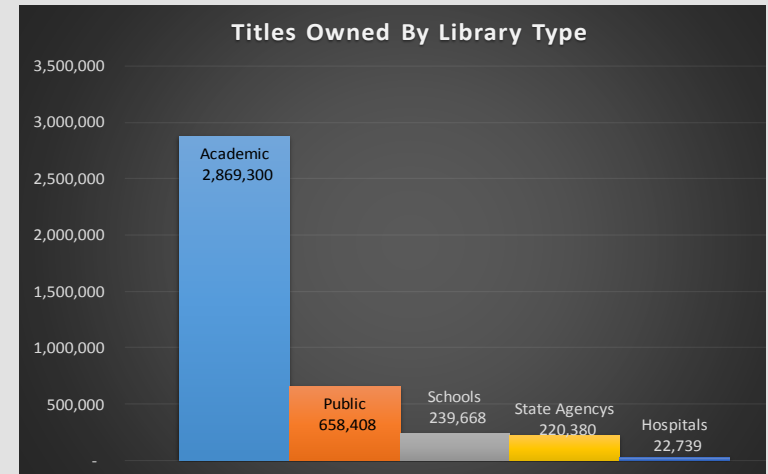
Support

Developed and implemented a daily library system patron record update process for NDUS student, faculty and staff records. Record updates for all institutions are done in a single daily process replacing a manual update process that was institution by institution.

Performed intensive review of the public web interface (the Primo Discovery Tool). Significantly improved results and the user experience by implementing configuration changes indicated by the review.

Configuration of an improved version of the new user interface for the Primo Discovery Tool is in progress. Implementation in the live system expected in the later part of FY18.

Numerous custom reports and services were created, modified or enhanced per library requests.

300
North Dakota Libraries

The Enterprise Solutions department includes ConnectND and Enterprise Services.

ConnectND is North Dakota's implementation of Oracle/PeopleSoft. Core Technology Services supports Human Capital Management, Financial Management and Campus Solutions along with dozens of ancillary systems for the eleven institutions in the North Dakota University System.

Enterprise Services is responsible for administration of enterprise class information technology solutions including a Service Level Agreement for applications administration with the University of North Dakota.

ConnectND, Blackboard and document imaging services are each supported by a governance committee and multiple user groups. The division hosts the ND Higher Education User Group (NDHEUG) conference each year to provide professional learning for institutional participants.

Enterprise Services

Enterprise Services is the business unit responsible for design, development, implementation, maintenance, and administration of enterprise-class information technology solutions while providing IT leadership, vision, and planning for the University System. The unit supports enterprise-level software applications including a document imaging system, dashboard software, learning management systems, student information systems, Web solutions and mobile applications. Enterprise Services is comprised of teams that are highly integrated to provide complete solutions to serve the needs of NDUS constituents.

Implementing the NDUS System-Wide Learning Management System (LMS), Blackboard delivers a single instance LMS to create a unified user experience across the 11 institutions and the System Office. Included in this implementation is the Blackboard (Bb) Learning Essentials SaaS Advantage and the Blackboard SIS Integration Framework. The project deployed Blackboard in Summer 2017 to the three eCollege institutions initially (BSC, LRSC, NDSCS) then migrated the four Blackboard institutions (MiSU, NDSU, UND, VCSU) in Fall 2017, the four Moodle institutions (DCB, DSU, MaSU, WSC) and the System Office will join during second semester 2018. Academic Technology Planning (ATP) meetings were held at each institution at project kick-off ensuring clear communication on goals, needs, participant availability and timelines for each institution. Risks, mitigations, drivers/outcomes and success criteria were also shared. A custom-building block was created to notify users how many days they have left on the NDUS password expiration policy. Three institutions were added to the NDUS Blackboard Connect system which provides users a Web–based interface for mass notifications via multiple communication channels.

Secure File Transfer System

ES is set-up to provide configuration and administrative services for LiquidFiles (sendfiles) and MoveIt MFT Solution offering secure exchange of critical business data and sensitive files both internally and externally. It ensures delivery to the intended recipients and document transfer activities with an audit trail. Also deployed Splunk, a tool for searching, monitoring, and analyzing machine-generated data.

UND SLA

CTS provides application administration for nearly fifty software applications hosted in the data center (On-Premise OP) and in a cloud service (Software as a Services SaaS). Software Application Administration Services include:

- Architectural design (OP)
- Installation and implementation (OP)
- Administration (OP/SaaS)
- Upgrades and patching (OP)
- Server replacements (OP)
- Security (OP/SaaS)
- Integration and Middleware (OP/SaaS)
- Backup (OP)
- Data recovery (OP)
- Tuning (OP)
- Support/Troubleshooting (OP/SaaS)
- Vendor relations (OP/SaaS)
- Budget (OP/SaaS)
- Contract renewal (OP/SaaS)

Document Imaging

The Document Imaging service went live with the Transform system that develops online forms. The state-wide service offers efficiency, data consistency and an improved user experience. The team is transitioning institutions from student records storage to workflows. They continue to help institutions document their business processes and develop electronic workflows with retention built in to meet those needs. Work was started on storage historical financial documents across the eleven institutions which is expected to be completed in Spring/Summer 2018. Implementation of the retention module within Perceptive content to provide more efficient identification of documents for retention review and purge.

The document Imaging initiative was awarded the Kofax Inspire Higher Education Best Practice leader award in June at the Inspire Awards luncheon during the Kofax annual conference in Nashville, TN. Along with award acceptance, the team provided multiple presentations at the conference.

The NDUS document imaging initiative was featured as a Higher Education success story published by Lexmark.

Campus Solutions

Campus Solutions is the system of record for over 46,000 active students of the North Dakota University System. The system supports all 11 institutions with day-to-day operational data and functionality for every aspect of the student learning cycle, including Financial Aid, Admissions, Student Records, Academic Advisement, and Student Financials. In addition, Campus Solutions feeds the majority of other University System data systems, e.g. the Housing, Parking, Facilities Management, and scheduling (Astra) systems to name a few. Lastly, Campus Solutions supports such initiatives as the Blackboard Learning Management System and the Predictive Analytics Systems (PAR) initiatives. Each "module" supports a different functionality, however, and seamlessly tracks the student's progress, registration, graduation, and overall success; allowing them to become lifelong learners.

> Bank of North Dakota Application Fee Waiver Event
> **2,601**
> students took advantage of free applications to University System

> **Two statewide Financial Aid initiatives**
> FAFSA Completion Project
> ND Scholarship Management Solution

TouchNet

TouchNet is the Vendor utilized for all payments within the University System. It includes Single Sign On capabilities with easy access for parents and students to make electronic payments. The "Marketplace" or storefront functionality has ability to connect to our 3rd party vendors such as Hobsons and the Parking systems. There were 108,000 student online transactions totaling over $130 million dollars that were processed last year alone.

Predictive Analytics Reporting (PAR)/Starfish

PAR combined with student data creates a holistic approach to student support and success. These systems gather data from a number of sources in order to provide a better insight into student academic progress. In turn, institutions can use the data to make better-informed decisions. Starfish retention software is a direct, follow on project to PAR. Integrating PAR and Starfish has effectively identified retention gaps while proactively assisting the institutions in taking corrective measures. Currently all 11 institutions are utilizing the Predictive Analytic Reporting system, and Starfish is now deployed to 10 of 11 Institutions.

Statewide Longitudinal Data System (SLDS)

This effort is a collaboration between The North Dakota University System, Department of Public Instruction, Department of Commerce, Job Service North Dakota and the State's Information Technology Department to meet the demands of K-20 longitudinal reporting. The higher education project is on track and reports are currently under development in the Data Warehouse environment using data from four Campus Solutions modules: Admission, Student Records, Financial Aid and Student Financials. The SLDS will allow near real-time data reporting potential, also supporting the P20 project for the state of North Dakota.

Data and Research results located at
https://slds.ndcloud.gov/public/SitePages/Research%20Home.aspx

Other Campus Solutions Initiatives / Project Overview:

- Implementation of new FAFSA requirements for the 2016-17 Academic Year related to prior year tax reporting.
- Evaluated, removed and reduce customizations across Campus Solutions to support efficient, effective and reliable data accuracy, and decrease maintenance efforts.
- Implemented delivered functional enhancements including Activity Guides for Gainful Employment Disclosures.
- Coordinated face-to-face site visits to all institutions fostering relationships, included were training and troubleshooting issues, including receiving feedback on our current processes, reports, and queries.
- Enhancement of the State Grant program, which provided an improved aggregate page to show history of the State Grant recipient's awards.
- Supported enhancement to TouchNet, the University Systems payment vendor including integrations with High Point, the University Systems mobile solution for students.
- Expanded and implemented delivered functionality including Communications, Student Center and Veterans Benefits.
- Enhancements to required IPEDS reporting to streamline and automate processes, also building consistency in reporting efforts.
- Developed and supported the Reverse Transfer development through the delivered Academic Advisement functionality to engage students that have not attained a degree.

## Collaborative Financial and Human Capital Management Projects

1. Deployed DUO multifactor authentication for all Financial & HCM users providing a second layer of secure access to protected data.
2. Provided integration development for the implementation of Novelution, a modular based electronic Grants Administration application, at the research institutions.

Financial Management

Financial Management is the PeopleSoft solution that reduces costs by automating, centralizing and standardizing global transactional processes.

- Deployed Travel & Expense management solution that streamlines and automates travel spend management and establishes policy driven controls for expense reimbursement. The system is deployed at all institutions and significantly reduces the amount of time and effort required to submit, approve, process, and pay expense reports.

- Financial Associate Director represents the NDUS as the Chair for the Oracle Higher Education Product Advisory Group, which is a global organization working closely with users and key Oracle strategists to improve the Academic Advising functionality for all institutions.

- Implemented Positive Pay for all institutions enabling fraud protection for NDUS payments.

- IBARS is the Higher Education interface to the State budgeting system. This deployment allows more visibility for the Legislature.

- Successfully patched Financials which enables the application to be current with changes to regulations and government mandated reporting. The next patching cycle will begin Fall 2017.


Fin Unique Users by Year
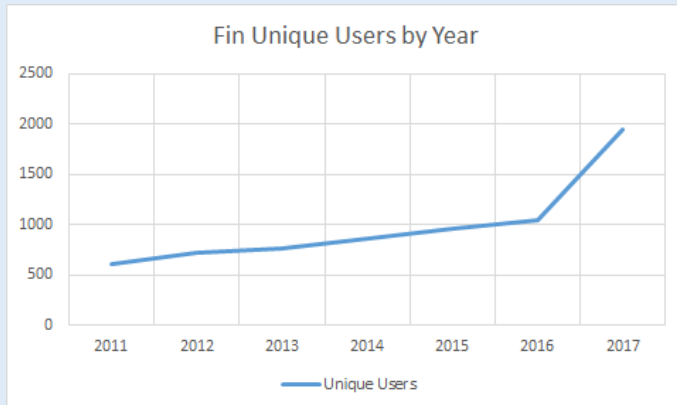
Significant growth in Financials users due to deployment of Travel and Expense module.

Human Capital Management (HCM)

Human Capital Management is the PeopleSoft solution that serves as a global foundation for HR data and improved business processes.

- Deployed the Time and Labor & Absence Management (TLAB) modules for all institutions. Time and Labor is a flexible, integrated solution designed to support the time reporting needs of a wide range of business functions, including payroll, financial and cost accounting, project management, employee benefits, and organizational administration. Absence management combines employee and manager self-service absence management functionality in one configurable, flexible, and scalable Web-based product to track and analyze consolidated absence and leave accrual information.

- HCM Interim Director and Lead Programmer Analyst represent the NDUS on the Oracle Academic Advising Product Advisory Group at the national level working closely with users and with Oracle to improve the Academic Advising functionality for all institutions.

- Successfully patched HRMS which enables the application to be current with changes to regulations and government mandated reporting. The next patching cycle will begin Fall 2017.

- The 9.2 upgrade is in process as the current version application will be unsupported in early 2018. The target go-live date is late summer 2018. The new version will offer an improved user experience including an improved mobility interface.

HR Unique Users by Year
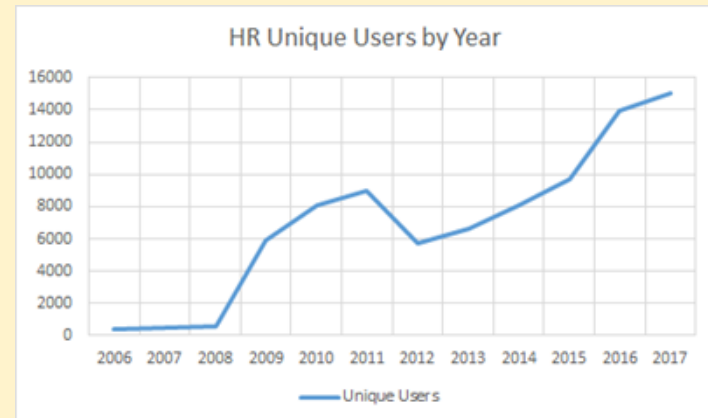
Significant growth in HCM users due to deployment of TLAB

HUMAN RESOURCES

The Office of Human Resources at CTS provides HR services and support to CTS staff. CTS HR supports the mission of the NDUS and CTS by providing services that attract develop and retain a highly qualified and diverse workforce. HR services provided include; recruitment, employee relations, learning and development, performance management, HR information management, policy implementation, policy compliance and employee engagement/recognition. The HR team consists of one director and a part-time HR assistant.

Staffing Breakdown

Technical Staff:
7

Administrative Staff:
5

Executive staff:
7

Director/Associate Director:
11

Professional Staff:
91

FTE* as of 6/30/2016: **132**
FTE* current: **121**
*full-time benefited constitutes employees working more than 20 hours per week

FY17 turnover rate
10.9%

Total Years of Service—All Employees
1,980

Infrastructure and Operations (I/O) is a business unit of Core Technology Services (CTS) and is comprised of the following sub-units.

- Database Administration
- Data Center/Production Control
- Endpoint Services
- Identity and Access Management
- Network Services
- System Administration

We strive to not only provide, but also sustain and enhance, a robust, reliable, and relevant technological foundation that is used across the NDUS. Our successes are directly attributable to staff. They are action and detailed oriented, committed and passionate subject matter experts of a great many technologies.

Identity & Access Management (IAM)

The IAM team is responsible for managing the identity life cycle for all students, staff, and faculty within the NDUS. The team maintains the complex administration and processing of NDUS people, processes, and products to govern identities and access to resources of an enterprise environment. The team ensures that users have quick and secure access to the resources they need, affords users strong authentication without restricting productivity, and simplifies the process by which users gain access to IT resources.

Total Number of Accounts	Accounts Used Regularly	Accounts Created	Records Processed
346,900	**71,769**	**25,950/Year**	**100,000/Day** **36.5 Million Annually**

NetIQ Recap

Since the implementation of NetIQ on January 30, NDUS has deployed Office 365 synchronization projects at several institutions (NDSU, Board Office, CTS, LRSC, and DSU). NDUS is now provisioning and managing the local directory service for VCSU. Without the NetIQ project being completed, all of these projects would have had significant risks and additional labor costs because the previous Identity Management System was end-of-life and offered limited support for projects and development for projects as described above.

NetIQ's features and abilities are superior to previous system. After several months of operational use, the IAM Staff has a higher level of competency with NetIQ than was achieved after a year of use with the previous identity system. The amount of NetIQ documentation, vendor support, and user community forums enables the IAM Staff to be considerably more self-sufficient in supporting this product as well as enabling the team to offer more enhancements and service offerings for the NDUS.

Consolidation Efforts

BSC, DCB, MaSU and DSU use the NDUS directory service as their local directory service

MiSU, VCSU and UND provision and manage accounts in their local directory service using the NDUS IAM system.

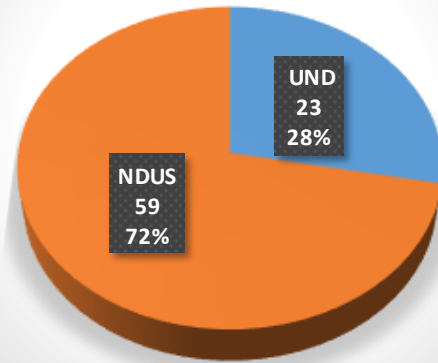LRSC, NDSCS, NDSU, and WSC have not yet been consolidated into the NDUS IAM system.

DBA

The Database Administration (DBA) team is responsible for enterprise-level software systems administration. The team is responsible for physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of software to support local and enterprise-wide applications. The team ensures operational stability, integrity, and security of database management software and interfaces to that software. The team supports standalone and clustered databases on multiple database platforms. The team performs technical functions in support of database-driven applications.
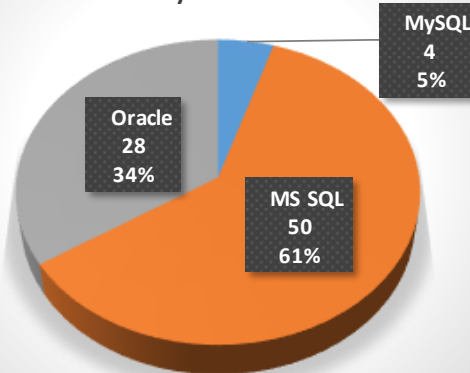
DBA Team Major Accomplishments:

- Managed and performed significant technical work to complete a successful upgrade to PeopleTools 8.54 on schedule
- Successfully moved all Campus Solutions databases to new virtualized architecture allowing for more efficiencies through consolidation
- Completed upgrade of all Campus Solutions databases to Oracle 12 successfully on schedule
- Successfully applied ongoing security-related and critical patch updates to all database platforms in a timely manner
- Worked on a team to successfully implement Grey Heller multifactor authentication in Campus Solutions environments
- Successfully applied multiple application upgrades to mission critical applications such as Campus Solutions, Ad Astra, and FAMIS
- Performed analysis and successfully tuned Campus Solutions application to improve overall performance in conjunction with institutional users, vendors, and NDUS staff
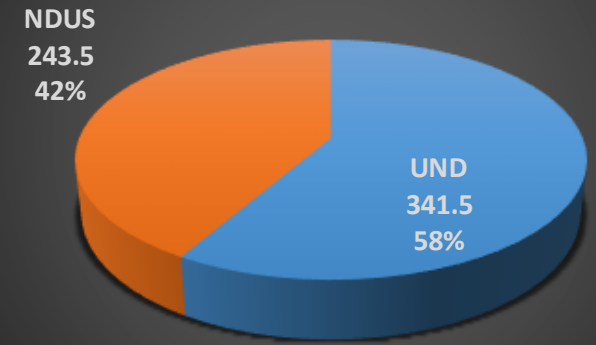
Database Instances
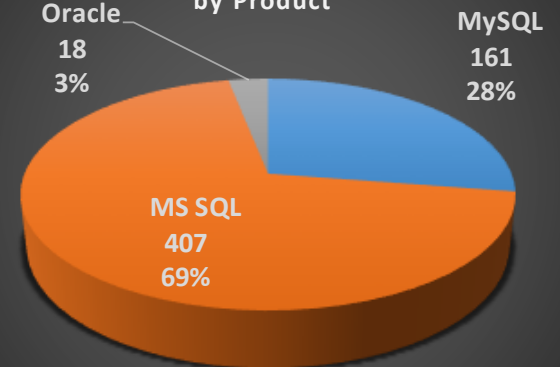by Business Unit

UND 23 28%
NDUS 59 72%

Databases
by Business Unit

NDUS 243.5 42%
UND 341.5 58%

Database Instances
by Product

MySQL 4 5%
Oracle 28 34%
MS SQL 50 61%

Databases
by Product

Oracle 18 3%
MySQL 161 28%
MS SQL 407 69%

Endpoint

Endpoint Services provides technical support to the NDUS System Office and Core Technology Services. In addition, the team provides assistance and consultation to institutions, as needed.

- Updated most NDUS CTS users to the Windows 10 OS
- Upgraded IVN hardware and software at the institutions
- Participated in the TeamDynamix planning and rollout project
- Led the process of enhancing our reporting capabilities using PowerBI
- Worked with institutions and within CTS to enhance the capabilities and utilization of System Center Configuration Manager (SCCM)

Network Services

The Network Services team is responsible for enterprise-level network administration. The team is responsible for physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of the UND Network. Network Services works closely with ITD in providing network to institutions.

- Institution-level access to edge network and information security devices
- Network support includes a cooperative arrangement between ITD and NDUS Network Services to support the common communications systems required for secure and reliable access to both NDUS hosted and outsourced applications, along with network interconnectivity between institutions, and to the Internet.
- CTS supports the UND campus network, consisting of approximately 25,000 wired connections and over 11,000 connected wireless devices during the semester.
- CTS is working with UND to upgrade the campus network
  - Relocate the fiber point-of-presence from Merrifield to the UND/ NDUS Data Center. Procure and provision network core equipment within a survivable design, with redundant 10Gbps connections to approximately 30 campus buildings. Procure equipment to enhance wireless service in a limited number of buildings. Procure and deploy management tools and applications to support upgrade.
  - Wireless will be upgraded to provide full coverage within 15-25 buildings, and designed to meet capacity requirements in identified high use areas, such as classrooms and lecture bowls.

Client Count on Wireless Network - UND
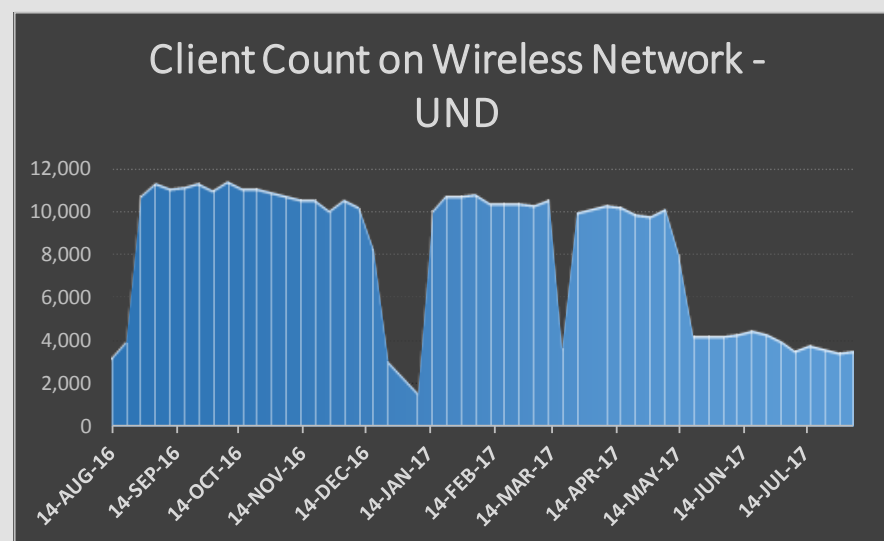
System Administration

The System Administration team is responsible for enterprise-level hardware and operating system administration. The team is responsible for physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of server, backup and storage hardware and software to support local and enterprise-wide applications. The team ensures operational stability, integrity, and security of servers and storage hardware and software to enable CTS departments and institutions to provide services to staff, faculty and students.

Next Generation Data Center: CTS continually researches new products and services to determine which will assist CTS with meeting the needs of the institutions, the strategic plan, and the mission of the organization. Products researched must be efficient, adaptable, based upon industry best practices, help provide data protection, have high availability, and be cost-effective.

This year hyperconverged infrastructure was found to be beneficial to the organization in meeting these needs and Nutanix was selected to begin replacing aging equipment in the data center.

Research on a new backup system has also been completed and Rubrix will be implemented in FY18.

The System Administration department has implemented many efficiencies over the past years with virtualization and automation, these efficiencies have allowed CTS to leave position unfilled in this area. The department has been reduced from 14 positions to 9 positions over the past two years.

700 Servers/Systems

1 Petabyte of Storage

589 Virtual Machines
- 470 Vmware
- 119 Hyper V

Data Center

The NDUS-CTS Data Center provides power, cooling, space, and Remote Hands support staff for the technology needs of higher education stakeholders and partners throughout the region. Skilled staff work 20/7 with established processes and approved operational governance practices to ensure safe and secure data processing in a Tier 3, mission critical facility.

The secure facility provides a prestaging burn-in room, a dedicated loading dock and lift, network distribution POP/IDF rooms, and electrical/mechanical system rooms for the following support infrastructure:

- Caterpillar 400kW Diesel Emergency Backup Generators with 800 gallon tanks
- Eaton 375KVA Uninterruptable Power Systems (UPS)
- Liebert Computer Room Air Handlers (CRAH)
- Simplex Grinnell Pre-Action Fire Alarm and Suppression Systems
- Very Early Warning Smoke Detection (VESDA) System
- Trace Tek Water Detection Rope Sensors
- 24/7 Building Management Environmental System monitoring
- Advanced Physical Door Access Control System
- Extensive CCTV Monitoring and Surveillance

Building infrastructure remained uninterrupted during this year's maintenance cycle.

INSTITUTIONAL DATA & REPORTING

The Office of Institutional Research is responsible for system-wide institutional research for State Board of Higher Education reporting, legislative requests, Chancellor studies, required federal and state reporting, and other ad-hoc data requests. The Office conducts studies, maintains datasets, and reports information on topics such as enrollment, retention, degree completion, productivity, and other areas of interest.

NDUS System Office Data and Reporting

System Office IR staff serve to fulfill data needs of the State Board of Higher Education, Chancellor's Office, legislature, and governor's office. They also contribute to statewide committees relating to workforce needs, K-12 education, and the state data warehouse. Accomplishments include:

- NDUS Fall, Spring, and Annual Enrollment, Programs Enrolled and Programs Completed Reports
- Maintenance of data and overall development and publishing of the SBHE Strategic Plan dashboard
- IPEDS keyholder services for NDUS institutions as well as 8 additional ND private and tribal schools
- Support of system office and institutional staff for Strategic Planning Online (SPOL) software used for documenting strategic planning at all levels of the system
- Provide requested data and/or reporting for legislature, governor's office, workforce, media, and other ad hoc requests
- Work closely with NDITD for the state longitudinal data warehouse (NDSLDS)
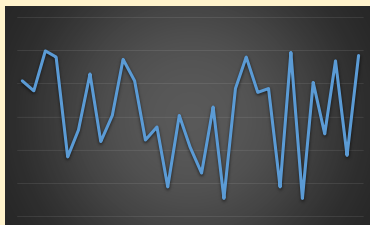
ND Department of Public Instruction Data and Reporting Services

A new division of the NDUS-IR team, as of July 1, 2017, IR services for the ND Department of Public Instruction are contracted through the North Dakota University System. NDUS-IR works collaboratively with NDDPI and NDITD to provide services that include development and implementation of the federally required K-12 district profiles, accountability reporting, and state/school district public dashboards. Current accomplishments include:

- Establishment of data sharing agreement between NDUS and NDDPI
- hiring of NDUS-IR staff who will be dedicated to providing NDDPI data services,
- and working closely with NDDPI and NDITD to plan and implement a sustainable plan for NDDPI required federal reporting and departmental data service needs.

NDUS System-wide IR Collaboration

The Office of Institutional Research team leads the collaboration effort of the IR staff among all NDUS institutions and system office. Known as the Institutional Research Users Group (IRUG), members meet monthly to discuss, critique, and plan for data reporting and processes across the university system so that data and methods are consistent, and so that IR staff are supported in their work and professional development needs. The IRUG also gathers twice per year for an extended face to face meeting, and communicates daily on the IRUG listserv. Collaboration has allowed the IRUG to:

- Validate NDUS-IR development opportunities to IR staff
- Collaborate on a vasystem level reporting
- Validate Cognos reports created by CTS analysts
- Provide professional riety of IR projects

NDUS Shared IR Services

An expanding division of NDUS-IR team, the shared services provided contracted data and reporting services to NDUS institutions, focusing primarily on federally and state mandated reporting.

- Data reporting for Integrated Postsecondary Education Data System (IPEDS)
- Data reporting for Student Achievement Measures (SAM)
- Provision of additional data services to institutions

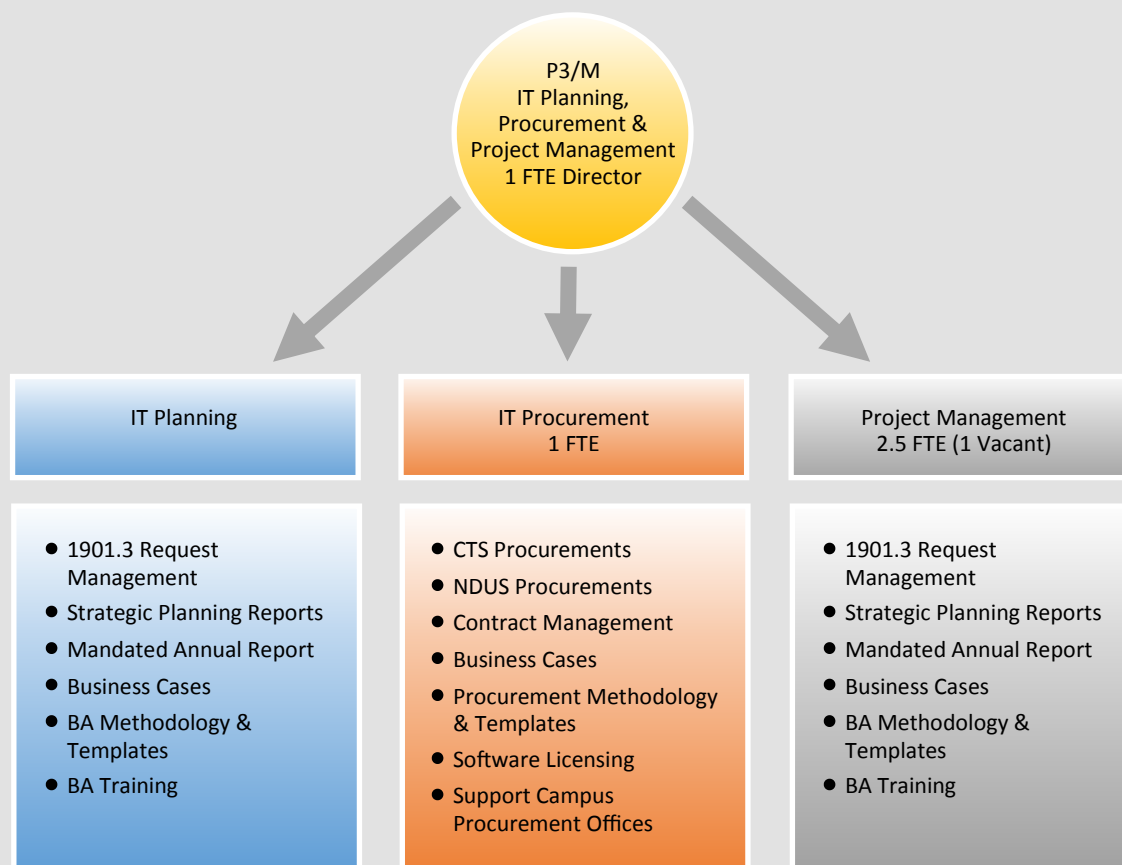# IT PLANNING, PROCUREMENT & PROJECT MANAGEMENT (P3/M)

While CTS has had these responsibilities for years, P3/M is a relatively new business unit. It currently consists of five FTEs and is responsible for issuing the mandated IT strategic planning and annual reports, overseeing all CTS procurement and performing all Level 3 procurements for the organization. We also manage some of the most complex projects and perform Large Project Oversight as mandated in NDCC.

IT Planning

The focus of this team is assist NDUS and all campuses with developing a strategic IT plan and publishing required reports. We utilize good business analyst practices and support the rest of the organization with templates and training. In 2016 we published:

- The 2016 Annual Report
- The Update to the 2015-17 IT Strategic Plan
- The 2017-19 IT Strategic Plan
- We also worked in cooperation with the State of ND's Information Technology Department on the mandated Statewide IT Strategic Plan.

Another responsibility of this team is to coordinate the review and approval process for Campus IT requests known as 1901.3 according to the corresponding policy number.

P3/M
IT Planning, Procurement & Project Management
1 FTE Director

IT Planning

- 1901.3 Request Management
- Strategic Planning Reports
- Mandated Annual Report
- Business Cases
- BA Methodology & Templates
- BA Training

IT Procurement
1 FTE

- CTS Procurements
- NDUS Procurements
- Contract Management
- Business Cases
- Procurement Methodology & Templates
- Software Licensing
- Support Campus Procurement Offices

Project Management
2.5 FTE (1 Vacant)

- 1901.3 Request Management
- Strategic Planning Reports
- Mandated Annual Report
- Business Cases
- BA Methodology & Templates
- BA Training

Participated in 2 statewide procurements
- Microsoft LAR RFP
- Vendor Pool

168 Active Managed Contracts

Procurement

The procurement team supports both CTS and the campuses with their IT purchases. We provide several centralized contracts that any institution can use. We also help research software and participate in state and national procurements partnering with the State Procurement Office and the Midwest Higher Education Compact. This area is also responsible for ensuring CTS maintains compliance with all of our software licensing agreements.

Project Management

The project management team leads by example. They manage many of the most complex projects in the organization, many of them impacting multiple campuses. They also serve as mentors for others in the organization who are managing the multitude of projects going on in the organization. This area is also responsible for performing Large Project Oversight as mandated by NDCC.

UND Project Management Mentorship

UND is actively working on a new campus-wide strategic plan and has embraced project management to help get it accomplished. CTS is helping by mentoring over 11 project managers at UND. The CTS project management team meets weekly with each assigned project manager to provide guidance and assistance with tools, techniques, and general advice.

Active Projects

Blackboard: The P^3/M team is managing the System-wide deployment of Blackboard LMS.

Novelution: Novelution Electronic Research Administration and Compliance software solution began implementation at both NDSU and UND this year. Novelution will provide a central repository for researchers to track their projects and help foster consistency, accuracy, completeness, and compliance using the software's forms, workflows and accessibility.

O365: Ten of the 11 institutions have migrated to the NDUS email tenant. VCSU is scheduled to migrate in November. In addition the team has been working on synchronizing the passwords between Office 365 and the ND Active Directory system.

Electronic Health Records system (EHR): Coordinating with MiSU, NDSU & UND on a common Medicat consolidated system contract, along with other updates to that service. MiSU is a new EHR deployment, and UND is migrating to the same cloud-based service that NDSU has used.

Completed Projects

Data Inconsistencies: This initiative sought to correct the data inconsistencies identified and detailed in House Bill 1003 Section 4.2. The types of inconsistencies that this project focused on are: personal and demographic information, lack of standardized chart of accounts, absence of standard financial business processes, inconsistent methods of recording/tracking student data, inconsistencies in tuition related expenses, fees, etc., inconsistent account coding and naming, improper use of 'shadow account' systems, and varied 'student' definitions. The project formed teams of Subject Matter Experts (SMEs) to help drive project goals and it was successfully completed by December 2016.

TLAB: This project deployed the Time & Labor and Absence Management modules in PeopleSoft HR. It included deploying an new time clock system that interfaces with PeopleSoft. This brings significant new functionality including electronic approval of leave requests and the ability to clock in via a web based time clock.

Other Completed Projects

Semtek—Assisted LRSC with deploying a new tool for the TrainND program to manage program enrollments.

Consolidation—New NDCC mandated functional consolidation of IT across NDUS. Phase 1 was discovery and planning.

ImageNow—NDUS deployed a document imaging system across all of NDUS. The team managed the migration portion of this project.

Endpoint Security, Multifactor Authentication, and Centralized Logging —the procurement and deployment of several security projects with CTS and System-wide.

Asset Management—Deployed a tool to assist CTS with managing software licensing, ensuring compliance with licensing requirements.
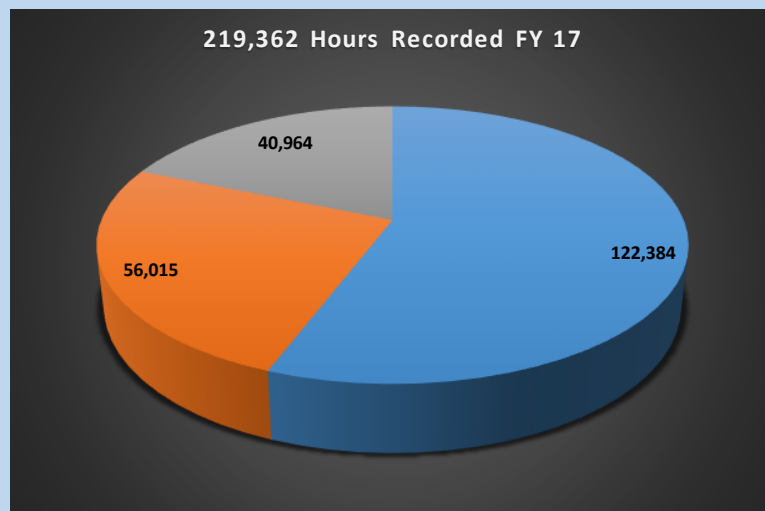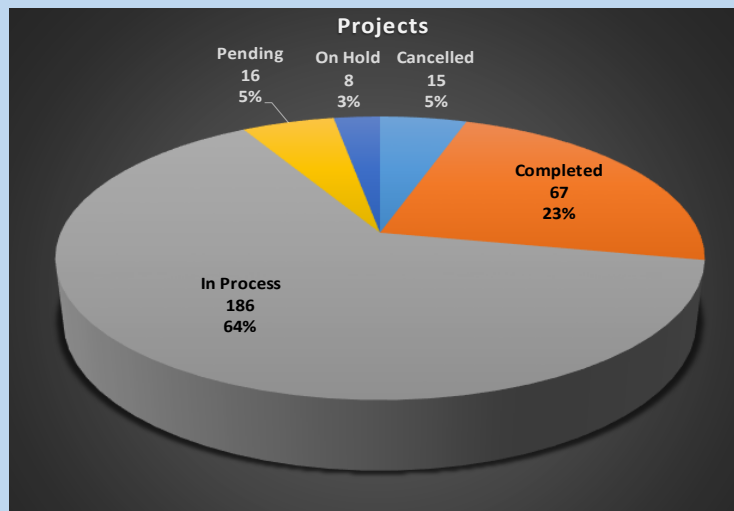
Change Management—This was an internal project to improve our process for how we implement technical changes within our organization.

Identity & Access Management—The department managed the NDUS side of the successful IAM deployment utilizing an contracted PM resource.

Work Management System (WMS)

The TeamDynamix Work Management System was implemented for CTS in March 2015. CTS staff use the system for time and project tracking. WMS also provides other capabilities. The department maintained and supported the system through February of 2017. At that time a cross-functional team was identified to review our deployment and update the system to let CTS improve and expand their usage of the tool. This cross functional team now provides the support for the tool with P3/M providing overall guidance and support.

Projects

Pending 16 5%
On Hold 8 3%
Cancelled 15 5%
Completed 67 23%
In Process 186 64%

219,362 Hours Recorded FY 17

40,964
56,015
122,384

SECURITY

The Information Security Department is responsible for NDUS security policies, standards, and procedures, security planning, risk management, compliance, governance, security education and awareness, security technology architecture planning, security systems administration and management, access control, and incident response.

Security Policies Standards and Procedures

The Information Security Department in collaboration with the NDUS Information Security Council (ISC) and CIO Council developed and approved the following policies and standards: 1202.3 Data Privacy Policy, 1203.3 Physical Security Standard, 1203.4 Endpoint Security Standard, and 1203.5 Disaster Recovery Standard.
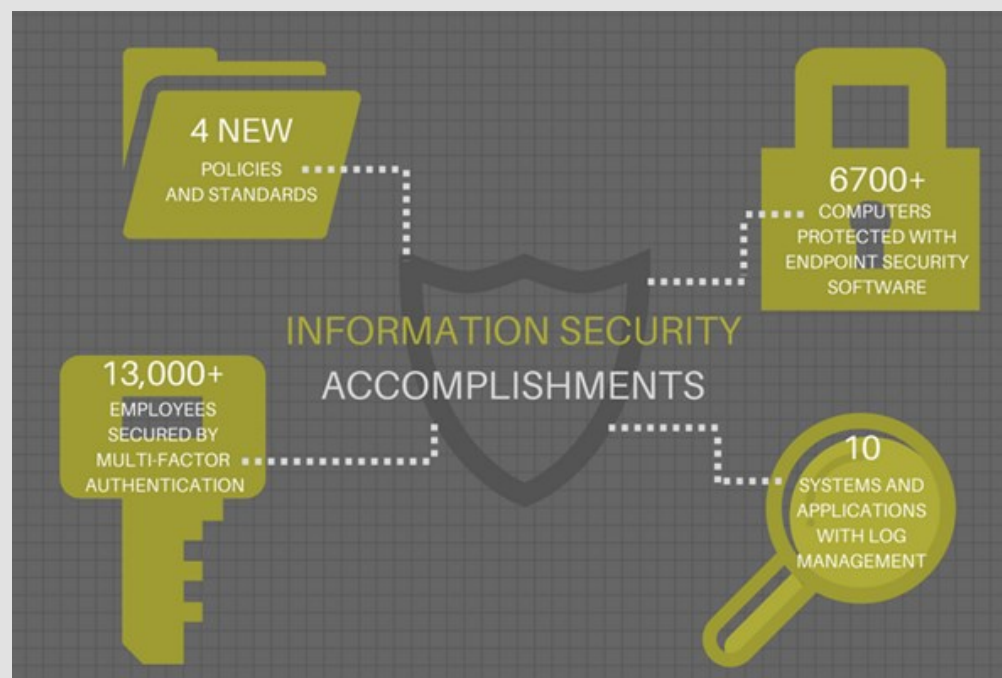
Endpoint Security

The Information Security Department procured and deployed an Endpoint Security product which was purchased by CTS and 10 institutions and is currently protecting over 6700 computers across the University System.

Multifactor Authentication

Multifactor authentication was integrated into Campus Solutions, Human Resources, and Financial systems to protect against stolen credentials that otherwise could be used to compromise sensitive University System and personal data. Over 13,000 faculty and staff members were enrolled in the Multifactor authentication system to make this protection possible.

Log Management

CTS Implemented a centralized log management system to assist in collecting, analyzing, and storing critical server, network, and application logs. Among other benefits, this log management system improves security by providing a mechanism to prevent, detect, and respond to security incidents and breaches. This system is currently collecting and managing logs for 10 systems and applications, and the number continues to grow.

4 NEW POLICIES AND STANDARDS

6700+ COMPUTERS PROTECTED WITH ENDPOINT SECURITY SOFTWARE

INFORMATION SECURITY ACCOMPLISHMENTS

13,000+ EMPLOYEES SECURED BY MULTI-FACTOR AUTHENTICATION

10 SYSTEMS AND APPLICATIONS WITH LOG MANAGEMENT

Core Technology Services—Goals

Four goals provide Core Technology Services (CTS) with the guiding principles for information technology planning and system implementations. This framework allows for the information technology goals at the eleven institutions to roll into the goals of CTS and ultimately make their way into the strategic plan of the State Board of Higher Education.

Goal 1 – Support North Dakota University System infrastructure needs.

Infrastructure holds information technology systems together and allows systems to communicate with each other over a network. It includes such things as security and access control for which guidelines must be developed and updated as needed. Enterprise Architecture provides a blueprint for establishing information technology policies, procedures, and guidelines to promote effective use of information technology.

Goal 2 – Improve North Dakota University System information technology-enabled business processes and services while providing and managing resources to align with NDUS strategic goals.

In order for the NDUS institutions to remain competitive and offer information technology support for students, faculty, and staff, including research and public service, the NDUS must provide and manage information technology resources aligned with NDUS strategic goals.

Goal 3 – Improve and enhance North Dakota University System student learning and users' focus.

The focus of this goal is to empower student learning and development through the use of technology by providing a near seamless environment for learning through boundless access to informational, educational and research resources, both inside and outside the classroom, for all types of students from undergraduates to the life-long learners. The NDUS encourages and supports an operational environment where characteristics of its users – student, faculty, staff, North Dakota residents, and affiliates worldwide – are identified, their needs are understood, relationships and expectations are effectively managed, and quality assurance is fostered for high-quality services and support.

Goal 4 – Improve and enhance North Dakota University System collaborative efforts.

By working together with the State, K-12, and other constituents, the NDUS is able to bring new technologies to North Dakota and support existing ones. Communicating with stakeholders is an important factor and everyone must work together in making necessary information available to every administrator, faculty, staff, and student across the North Dakota University System institutions.

This concludes the 2016-2017 NDUS Core Technology Services Annual Report.