North Dakota University System

Core Technology Services

2021-2022 ANNUAL REPORT

Report generally covers the period from July 1, 2021 - June 30, 2022

NORTH DAKOTA
UNIVERSITY SYSTEM
CORE TECHNOLOGY SERVICES

Dr. Mark Hagerott
Chancellor

Darin King
Vice Chancellor IT/CIO

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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

1. **Support the North Dakota University System's infrastructure needs.**

2. **Facilitate digital transformation of systems and services.**

3. **Provide a user experience that is responsive to changing needs and expectations.**

4. **Improve and enhance the North Dakota University System's collaborative efforts.**

The mission of Core Technology Services (CTS) is to provide trusted technical and professional services to support the strategic goals of the North Dakota State Board of Higher Education.

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.

A Message from the Vice Chancellor

Greetings,

Core Technology Services (CTS) is the technical arm of the North Dakota University System (NDUS) with goals and objectives that align with and support the strategic vision of the NDUS. During these times of rapid digitization and enhanced customer expectations, it is critical that CTS continue to focus on strategic goals and operational effectiveness.

ServiceOne is our ongoing program in operational process improvement, focusing on enterprise service management. In partnership with the 11 institutions of the NDUS, CTS has implemented industry standard service frameworks and best practices to improve and enhance our operational effectiveness. As part of our progress, we have established several ServiceOne Practices, including Incident Management, Service Request Management, Problem Management, Relationship Management, and Organizational Change Management. We have also expanded the capabilities of the NDUS service desk by adding staff and creating a single point of contact for institutional personnel.
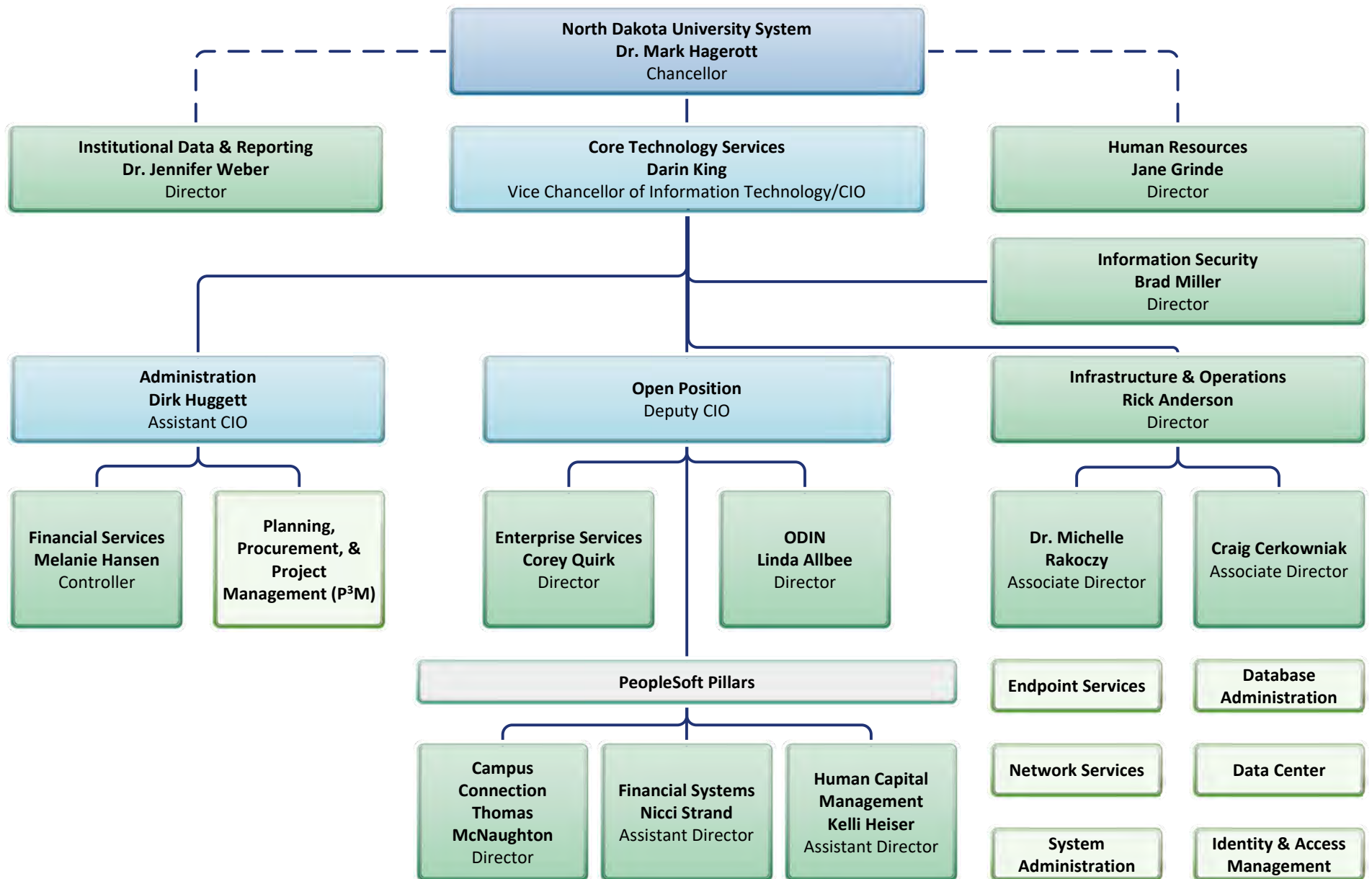
Information security continues to be a priority for NDUS. CTS has partnered with North Dakota Information Technology (NDIT) to implement behavioral-based endpoint protection at all NDUS institutions, safeguarding over 19,000 endpoints. The NDUS Security Operations Center (SOC) is actively monitoring alerts and responding to hundreds of security incidents every month. We continue to focus on improving our capacity to support all institutions and proactively detect and respond to security events.

The Enterprise Solutions team is at the center of the consolidated systems that CTS provides to institutions. These systems include Human Capital Management, Finance, Campus Connection, and Blackboard. This team, along with the Infrastructure and Operation team, represents most systems and services provided to the NDUS institutions.

The 2022 CTS Annual Report highlights the numerous accomplishments, current projects, and the roadmap for each CTS division. I encourage you to read on and learn more about the activities of the NDUS Core Technology Services team.

Core Technology Services Leadership Team

North Dakota University System
Dr. Mark Hagerott
Chancellor

Institutional Data & Reporting
Dr. Jennifer Weber
Director

Core Technology Services
Darin King
Vice Chancellor of Information Technology/CIO

Human Resources
Jane Grinde
Director

Information Security
Brad Miller
Director

Administration
Dirk Huggett
Assistant CIO

Open Position
Deputy CIO

Infrastructure & Operations
Rick Anderson
Director

Financial Services
Melanie Hansen
Controller

Planning, Procurement, & Project Management (P³M)

Enterprise Services
Corey Quirk
Director

ODIN
Linda Allbee
Director

Dr. Michelle Rakoczy
Associate Director

Craig Cerkowniak
Associate Director

PeopleSoft Pillars

Campus Connection Thomas McNaughton
Director

Financial Systems Nicci Strand
Assistant Director

Human Capital Management Kelli Heiser
Assistant Director

Endpoint Services

Network Services

System Administration

Database Administration

Data Center

Identity & Access Management

ServiceOne

In December 2012, Core Technology Services (CTS) was established to administer NDUS's IT enterprise systems and services. Shortly thereafter, CTS welcomed Darin King, as then-Deputy CIO, to oversee and manage the daily operations of the organization. One of Darin's top three goals for CTS was to implement the IT Infrastructure Library, commonly known as ITIL®, which is an IT service management framework that outlines the best practices for delivering IT services. This systematic approach to IT service management standardizes the selection, planning, delivery, maintenance, and overall lifecycle of IT services within the organization.

The ServiceOne Program

Maturing CTS's operational functions into an efficient, effective, relationship-based environment where *One* means:

✔ Importance placed on high-quality services.

✔ Priority given to best practices and processes.

✔ Partnering with NDUS institutions to deliver streamlined, customized services according to their unique needs.

Over the next several years, CTS took steps to build a solid operating foundation by implementing a formal project management department, incorporating change management and root-cause analysis practices into its Infrastructure and Operations business unit, introducing a work management system to the organization to manage projects, service request tickets, and time-tracking, and deploying Status.NDUS, the application used for communicating system outages to the NDUS community. In February 2020, CTS procured ITIL® Overview and Foundations trainings for a small group of staff members, resulting in 19 employees becoming ITIL® Foundations certified during this initial offering.

In March 2020, three CTS staff members presented to Senior Staff a business case to implement the ITIL® Change Management practice within the organization. This business case set the stage for the creation of CTS's first strategic plan which included a strong focus on service satisfaction, outreach services, process efficiencies, communication, and organizational culture. By incorporating ITIL® practices into its strategic objectives, CTS could work collaboratively and iteratively to help manage risk, strengthen relationships with campus users (Customers) and campus IT personnel (Technology Partners), establish cost-effective practices, and build a secure, stable IT environment to allow for growth, scale, and change. As part of this strategic effort, the Service Management Maturity (SMM) project was created in December 2020.

Within the first few months of 2021, a core project team of CTS staff began working with Watermark Learning through a series of discovery sessions and later engaged a consultant to guide the organization for the duration of the project. Also during this time, 14 additional CTS staff became ITIL® Foundations certified. Over the next few months, the project team conducted interviews, focus groups, and surveys with NDUS CIOs, Customers, Technology Partners, and CTS staff.

Upon completion of the final discovery phase in fall 2021, the following business needs were identified:
- CTS lacks standardization and consistency in processes, practices, and activities.
- There is a perceived lack of collaboration between CTS and Institutions.
- The CTS Service Desk practice is regarded as inefficient and ineffective.

Senior Staff was presented with findings and recommendations and approved to continue moving forward. Due to its scale, the SMM project evolved into a multiyear program, focusing on the implementation of nine ITIL® practices to improve the delivery and support of CTS's products, systems, and services to the institutions' staff, faculty, and ultimately, the students. This program is now known as ServiceOne.

ServiceOne
Partnering For Progress
North Dakota University System

Practice (Workstreams)	Purpose	Forecasted Benefits
Organizational Change Management (OCM)	To help CTS and NDUS personnel transition through the changes introduced by the other eight Practices.	• Ready adoption and sustainment of introduced changes by impacted personnel. • Faster benefit realization; optimized investment.
Relationship Management	To manage the relationships and communication between CTS and its stakeholders and strengthen working relationships with institutional personnel.	• Strengthened working relationships through increased responsiveness to concerns and open, structured communication channels. • Alignment between CTS and Institutions' goals and objectives.
Problem Management	To identify the root cause of one or more incidents (unplanned outages) and facilitate the identification of a permanent, cost-effective solution.	• Increased availability of CTS' products, systems, and services. • Increased productivity of CTS personnel. • Strengthened technology infrastructure.
Service Desk	To provide: • A single point of contact for institutional personnel to report incidents or service requests. • Status notifications to impacted stakeholders. • First-call incident resolution and service request fulfillment, when possible.	• Streamlined communication with CTS for institutional users. • Ultimately, faster resolution of simpler unplanned outages (incidents) and fulfillment of service requests (e.g., access, reports, etc.) • Standardized and timely communication regarding unplanned outages.
Incident Management	To minimize the impact of unplanned outages on business operations by restoring normal operation as quickly as possible.	• Increased availability of CTS' products, systems, and services. • Increased user satisfaction.
Service Request Management	To support the agreed quality of a service by fulfilling all predefined, user-initiated service requests in an effective and user-friendly manner.	• Increased user productivity. • Increased user satisfaction.
Service Level Management	To set clear business-based targets for service performance, and to ensure that delivery and support of services is properly assessed, monitored, and reported against these targets.	• Increased accountability to institutional personnel regarding incident resolution and service request fulfillment within defined and agreed timeframes.
Change Enablement	To maximize the number of successful service and product changes by ensuring risks have been properly assessed, authorizing the implementation of changes, and managing the change schedule.	• Increased availability of CTS' products, systems, and services. • Minimal impact to business operations from planned outages.
Service Design	To design new solutions and implement changes to existing products and services to fulfill customer requirements and ensure successful delivery and support by CTS personnel.	• Holistic design of products and services. • Streamlined product/service delivery and support.

Governance

Due to the breadth and depth of the ServiceOne program, a governance structure was established which includes CTS and institutional representatives. The purpose of the ServiceOne Governance is to provide inclusive and timely oversight and guidance for workstreams within the program, ensuring cost-effective business value. This is realized through appropriate levels of resource allocation, organizational focus, and alignment with complementary and strategic initiatives.
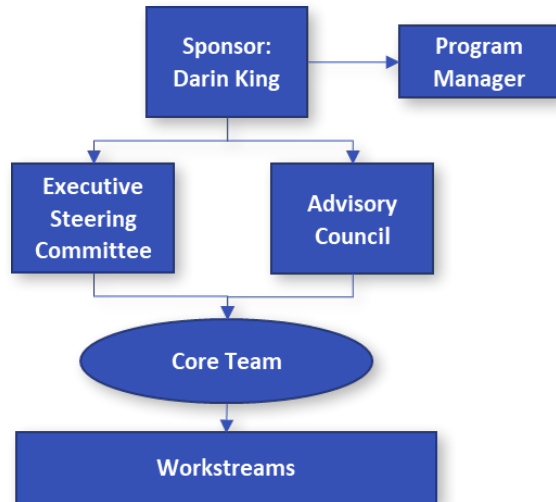
The **Sponsor** has overall accountability for the ServiceOne Program.

The **Program Manager** provides facilitation, coordination, overall management, and reporting for all Program components.

The **Executive Steering Committee** (ESC) is comprised of four CTS Senior Leaders and four Institutional CIOs who provide oversight to all program activities, ensure organizational focus, and approve Practice Standards and Processes.

The **Advisory Council** (AC) is comprised of 11 CTS and four Institutional Managers who provide oversight to workstream activities and approve Work Instructions.

The **Core Team**, led by the Program Manager, consists of CTS resource representatives. All members of this team are considered to be the pioneers of the ServiceOne Program and provide workstream leadership.

The **Workstreams** are Project Teams comprised of CTS personnel who plan and implement the Practice.

Measures of Success

The following ServiceOne Measures of Success were developed after thoughtful consideration of the problem/situation statements, documented CTS strategy (2021-2023), and ideas submitted by members of the program's Executive Steering Committee. To determine the impact of the ServiceOne program, Customers, Technology Partners, and CTS staff will be surveyed early next year to reveal their thoughts regarding the changes made by CTS. These statements indicate the desired responses from these populations, which will validate the success of the program based on the business needs identified during the project's discovery phase:

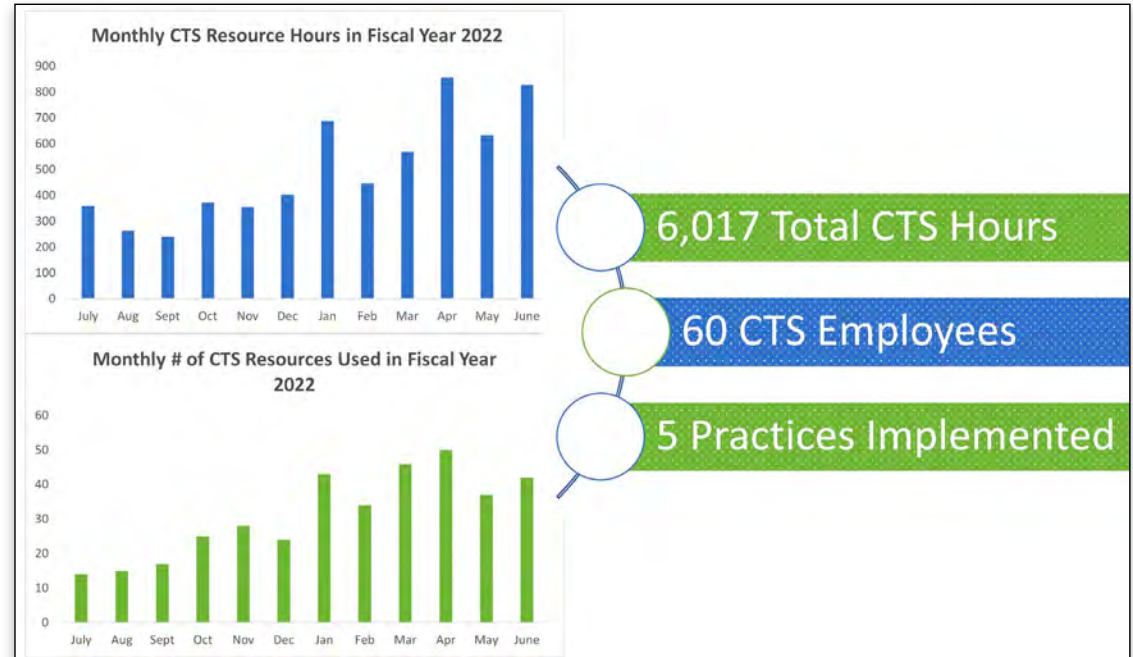| Customers and Technology Partners	CTS Employees
Most of CTS' Customers and Technology Partners, when surveyed in January 2023, will report that the ServiceOne program has: • Improved service availability (uptime). • Improved customer service. • Simplified end-user-facing processes. • Strengthened relationships with CTS. • Resulted in better alignment between CTS and Campus goals.	**Most of CTS' employees, when surveyed in January 2023, will report that the ServiceOne program has:** • Improved their ability to support customers. • Enabled them to perform their jobs more efficiently through modernized processes. • Improved interdepartmental communication and relationships. • Increased their overall job satisfaction.

Fiscal Year 2022 Highlights

Additional ServiceOne accomplishments during fiscal year 2022 include:

- ITIL® overview workshops were delivered to all CTS personnel and offered to all NDUS institutions' IT personnel.
- Delivery of Organizational Change Management (OCM) workshops:
  - Three-hour workshops were offered to ServiceOne governance personnel and CTS senior leadership to educate on OCM key concepts and how to effectively communicate and lead change initiatives.
  - Two-day workshops were offered to select CTS personnel to educate on OCM key concepts and how to effectively assess change readiness, develop relevant change plans, and evaluate the effectiveness of those plans. These personnel were given the opportunity to opt into a Change Practitioner role or to actively assist Change Practitioners in the facilitation of organizational change efforts associated with CTS projects.
- Full implementation of five of the nine ServiceOne Practices:
  - Organizational Change Management
  - Relationship Management
  - Service Desk Management
  - Incident Management
  - Problem Management

Monthly CTS Resource Hours in Fiscal Year 2022

Monthly # of CTS Resources Used in Fiscal Year 2022

6,017 Total CTS Hours

60 CTS Employees

5 Practices Implemented

Roadmap

- Focus on full implementation of the remaining ServiceOne Practices:
  - Service Request Management
  - Service Level Management
  - Change Enablement
  - Service Design
- Develop continual improvement roadmaps for implemented practices.
- Survey Customers, Technology Partners, and CTS employees to ascertain progress toward fulfillment of identified measures of success.

ServiceOne ITIL® Practices included in the program's roadmap

Practice	3rd Q 2021	4th Q 2021	1st Q 2022	2nd Q 2022	3rd Q 2022	4th Q 2022	1st Q 2023	2nd Q 2023
Org Change Management								
Relationship Management								
Problem Management								
Service Desk								
Incident Management								
Service Request Management								
Service Level Management								
Change Enablement								
Service Design								

Institutional Research (IR)

The Office of Institutional Research is responsible for systemwide institutional research for State Board of Higher Education reporting, legislative requests, Chancellor studies, required federal and state reporting, and other ad-hoc data requests. IR conducts studies, maintains datasets, and reports information on topics such as enrollment, retention, degree completion, productivity, and other areas of interest. The four main areas of work for Institutional Data & Reporting are outlined below.

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. Staff also contribute to statewide committees relating to workforce needs, K-12 education, and the state data warehouse. Ongoing responsibilities include:

- Annual enrollment reporting (fall, spring, annual), program enrollment, and completions.
- Integrated Postsecondary Educational Data System (IPEDS) keyholder services for NDUS institutions as well as eight 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.

- Development and maintenance of the State Board of Higher Education Strategic Planning dashboards.
- Provision of requested data and/or reporting for legislature, governor's office, workforce, media, and other ad-hoc requests.
- Representing NDUS for the interagency North Dakota State Longitudinal Data System (SLDS).
- Provide a lead role in establishment of systemwide data governance through Information and Data Executive Governance (IDEG).

Data and Reporting Services

As of July 1, 2017, the ND Department of Public Instruction (NDDPI) contracts IR services through the North Dakota University System. NDUS-IR works collaboratively with NDDPI and NDIT to provide services that include development and implementation of the federally required K-12 district profiles, accountability reporting, and state/school district public dashboards - Insights.ND.Gov.

NDUS Systemwide IR Collaboration

The Office of Institutional Research team leads the collaboration effort of the IR staff among all NDUS institutions and the 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 to validate data and methods are consistent, and to ensure IR staff are supported in their work and professional development needs. The IRUG meets annually for an extended face-to-face meeting and communicates daily on the IRUG listserv.

NDUS Shared IR Services

The shared services provide contracted data and reporting services to NDUS institutions, focusing primarily on mandated federal and state reporting, including IPEDS and Student Achievement Measures (SAM).

Fiscal Year 2022 Highlights

This year, IR staff:

- Presented at several conferences including the DPI Back to School Conference, the NDCEL Administrators Conference, the Cognia Fall Conference, and the North Dakota Teacher Shortage Summit. Additionally, staff have served on the Governor's K-12 Coordinating Council, the CCSSO EIMAC Collaborative, the McRel Advisory board, and as HLC Peer Reviewer.

- Participated in a variety of PD programs including the Bismarck Mandan Leadership Program and Strategic Change Management.

- Collaborated with NDDPI and NDIT to create deidentified public datasets that are download accessible on Insights.nd.gov.

- Conducted a series of studies on COVID-19-related learning loss in K-12 students in response to House Bill 1003.

- Worked with CTS staff to create a new and updated version of the SBHE Strategic Plan dashboard.

- Partnered with other NDUS staff on continued implementation of systemwide data governance through the Information & Data Executive Governance committee.

Figure 1: Findings on COVID-Related Learning Loss

Current Projects

IR staff are presently:

- Focusing on the standardization of automation tools and processes for data analysis to improve efficiency.

- Reporting the findings on covid-related learning loss to a variety of stakeholders as required for HB1003. Initial data suggests there are differences in student proficiency based on COVID-19-era disruptions and reliance on distance education, as noted in Figure 1.

- Preparing for the upcoming 2023 legislative session by modernizing processes for accessing and analyzing datasets, resulting in decreased response time to legislative, governor, and system office data requests.
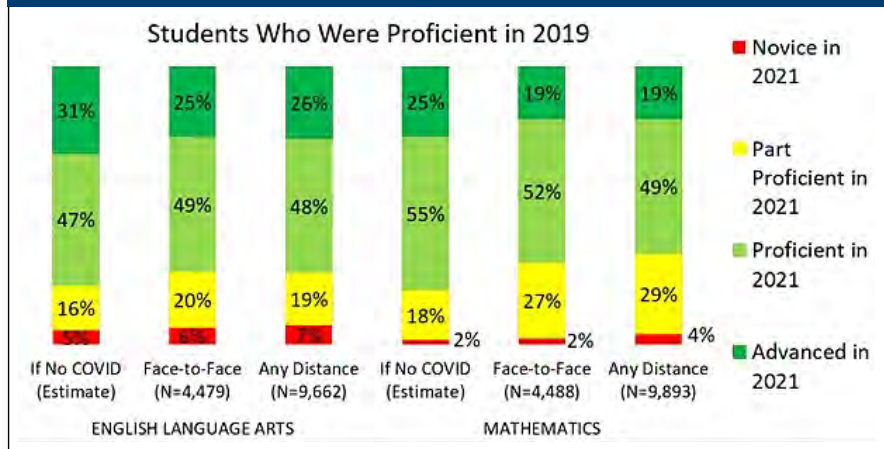
Figure 1 shows students proficient in English and mathematics in 2019 had lower levels of proficiency in 2021 than they otherwise would have, had the pandemic not occurred (labeled if No COVID.) Pre-pandemic trends were used to provide estimates of student proficiency levels for 2021 if COVID had not occurred. To illustrate, 20% of these students would be expected to lose proficiency (receiving "novice" or "partially proficient" scores) in math in a COVID-free world. In reality, COVID disruptions led more students to be non-proficient in math than expected; 29% of students who swiftly returned to face-to-face education fell to non-proficiency. However, 33% of students who continued to rely on distance education received non-proficient scores. Thus, COVID disruptions had considerable negative impacts on math proficiency among these students. The impact was similar for students who were previously proficient in English language arts.
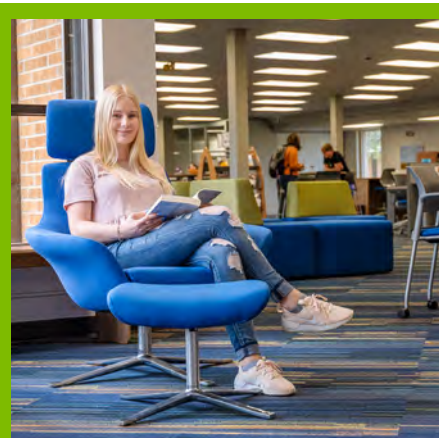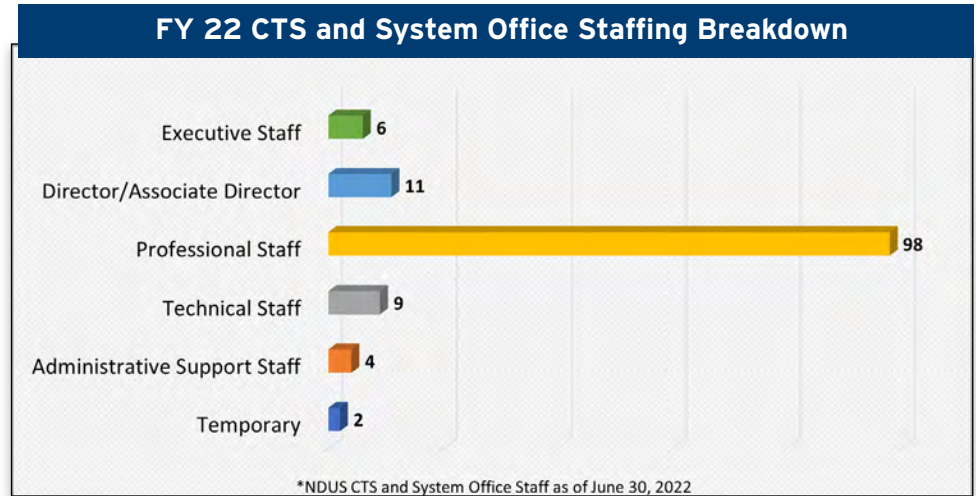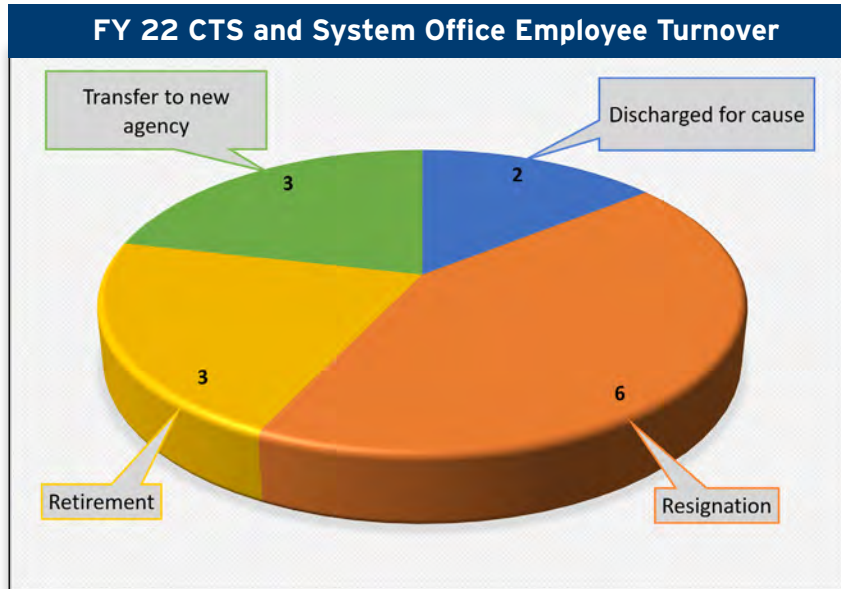
Fiscal Year 2023 Roadmap

Goals and objectives for the Office of Institutional Research include:

- Increasing collaboration among NDUS IR staff to share new data tools and processes, including use of regular IR User Group Q&A working sessions, participation in NDHEUG, and providing on-time TEAMS peer training opportunities.

- Transitioning general maintenance of SBHE Strategic Plan dashboards from IR to the department of the Vice Chancellor for Strategic Planning, while maintaining responsibility of dashboard data updates.

- Collaborating with IDEG to explore the creation of a Business Intelligence Competency Center and proof of concept for a NDUS data lake.

Office of Human Resources (OHR)

The Office of Human Resources (OHR) provides human resource (HR) services and support to CTS and System Office staff of approximately 156 employees. Fifteen new staff members were recruited in fiscal year 2022 at CTS and five new staff members at the System Office. OHR supports the mission of the NDUS and CTS by providing services that attract, develop, and retain a highly qualified and diverse workforce. Services include recruitment, employee relations, learning and development, performance management, OHR information management, policy implementation, policy compliance, and employee engagement/recognition. The OHR team consists of one director and one part-time administrative support position.

FY 22 CTS and System Office Employee Turnover

- Transfer to new agency: 3
- Discharged for cause: 2
- Resignation: 6
- Retirement: 3

FY 22 CTS and System Office Staffing Breakdown

- Executive Staff: 6
- Director/Associate Director: 11
- Professional Staff: 98
- Technical Staff: 9
- Administrative Support Staff: 4
- Temporary: 2

*NDUS CTS and System Office Staff as of June 30, 2022

Learning and Developing

CTS provides employee professional development opportunities using both formal and informal delivery methods. CTS offers formal onsite training to staff at least once per year by collaborating with the organization's employee assistance provider, Village Business Institute. Additionally, CTS uses various online systems to deliver training courses in several areas. Employees participate in mandatory compliance training on an annual basis with a focus on fraud, security, and internal controls. In addition, employees have access to an online system called Infobase, which offers a range of training courses from Microsoft tutorials to workplace environment and behavior topics. CTS allotted a budget to each division, allowing prioritization of professional development requests within each department. OHR offers supervisor training quarterly. The OHR Director works with the CTSSO Staff Senate Professional Development Committee to provide additional professional development opportunities, including book discussion groups and special topic presentations delivered by CTS staff.

Recruiting

The OHR team assists CTS and System Office leaders in fulfilling recruitment requests with well-qualified candidates within a minimal turnaround time. The OHR department also advises the System Office on presidential searches.

Performance Management

The OHR provides advisement and facilitation for employee performance management. A consistent process is in place for both CTS and the System Office to conduct annual employee performance reviews, which has contributed to a successful completion rate over the past three years.

Employee Engagement and Recognition

Employee engagement is a priority at both CTS and the System Office. Both organizations hold annual staff recognition gatherings and several informal employee events throughout the year. In addition to events, employees are encouraged to participate in anonymous surveys that aim to gather feedback to improve morale. NDUS/CTS Staff Senate and the NDUS compliance office support the surveys with OHR oversight.

HUMAN RESOURCES

- POTENTIAL
- EMPLOYEE
- SKILL
- RESEARCH
- TRAINING
- RECRUITING
- PERFORMANCE
- LEADERSHIP

Human Resource Council (HRC)

The Office of Human Resources is part of a larger system council called the Human Resource Council (HRC). The HRC advises the Chancellor, institution presidents, and University System councils on human resource issues. The HRC also facilitates collaboration between institution HR staff to reduce inconsistencies in business processes, data entry, reporting, and policy and procedure implementation. The OHR Director serves as the System Office liaison to the HRC. HRC council membership includes human resource directors from each institution and three employee designees: one from a two-year institution, one from a four-year institution and one from a research institution.

Work-Based Learning

As part of the CTS Strategic Plan, CTS continues to promote a culture that supports the North Dakota community IT workspace. CTS staff development is needed on an ongoing basis to ensure consistent training in areas such as professionalism, security, service, and culture. To help develop IT talent across North Dakota, CTS works with institutions and local high schools by providing internship and apprenticeship positions. Interns and apprentices assist CTS by filling positions that have been difficult to recruit and hire, increasing job satisfaction for departmental staff who help mentor these new IT professionals.

Apprentice Program

CTS continues to partner with Lake Region State College (LRSC) for their Apprenticeship Program. Modern apprenticeships build a highly skilled and customized flow of talent, preparing workers who often remain in the region for the long term. This program allows the apprentice to work full-time while attending classes online with LRSC. Two apprentices have completed the program successfully at CTS: one in Information Security and one in Network Services. Both have moved into regular, full-time positions within the organization. Currently, CTS has one apprentice who is working with Endpoint Services. CTS also serves on the State Apprenticeship Expansion Executive Board and Advisory Committee, which provides opportunities to share experiences and learn from others in the area.

Internships

CTS hired four students from the University of North Dakota (UND) as part-time employees; two worked in Network Services and two worked in System Administration. These students gained valuable work experience in their field while attending classes. Due to employee turnover, CTS hired one Network Services intern into a full-time position following graduation. One System Administration intern was also hired into a full-time position and will continue to work toward their degree; the second System Administration intern left CTS upon graduation. Network Services has replaced an open part-time position with a UND student.

To help promote the ServiceOne initiative, CTS hired two part-time employees to provide marketing and communication services. These students are supervised by CTS staff and provided mentorship through the NDUS System Office Director of Communications and Media Relations. One of these students worked until graduation while the other continues to work at CTS.

Fiscal Year 2022 Highlights and Roadmap

The Office of Human Resources actively participated in the ePerformance project by serving on the executive steering and advisory committees, defining application requirements, and participating in user acceptance testing for the July 2022 rollout. OHR will help provide ongoing support for this electronic performance evaluation tool within the PeopleSoft HCM system.

The CTS Professional Development Committee, in conjunction with OHR, offered seven professional development events for staff in 2022, resulting in 436 cumulative participants. New professional development opportunities for CTS and System Office staff will continue to be provided with a specific focus on ServiceOne coaching and training.

The OHR supported CTS leadership through quarterly meetings, which included training topics along with discussion on current workforce needs and challenges.

Information Security (InfoSec)

The Information Security department (InfoSec) is composed of three teams: Security Operations, Security Engineering, and Applications Security. These teams provide security services, policy and planning, incident response, and applications access security to CTS and NDUS Institutions. The InfoSec department leads the NDUS Information Security Council (ISC), which includes representatives from CTS and each NDUS institution. The ISC identified 10 strategic initiative areas aimed at protecting NDUS systems and data from known cyberattack vectors. The ISC met in 2022 for an Information Security Strategic Planning Summit to specifically identify FY 2023 roadmap initiatives that fit within the 10 strategic areas.

Fiscal Year 2022 Highlights
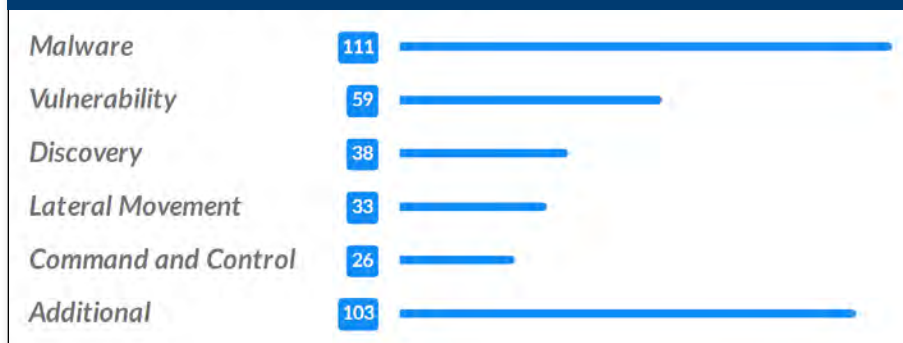
Security Operations

The NDUS Security Operations Center (SOC) has ramped up operations by adding a Senior Security Analyst to the team. The SOC has begun using a Detection and Response platform, Palo Alto Cortex XDR, to detect and respond to security incidents across all 11 NDUS Institutions.

Figure 2. FY 22 Security Incidents by Status

531 INCIDENTS
- New (7)
- Under Investigation (4)
- Resolved (520)

During the last 30 days of the fiscal year, the team responded to more than 500 security incidents (see Figure 2), primarily in the categories of malware, vulnerability exploitation, discovery, lateral movement, and command and control (see Figure 3).

Figure 3. FY 22 Security Incidents by Category

Category	Count
Malware	111
Vulnerability	59
Discovery	38
Lateral Movement	33
Command and Control	26
Additional	103

Endpoint Security

The InfoSec Security Operations team completed a major project to deploy an Endpoint Security Detection and Response platform called Palo Alto Cortex XDR. The Cortex XDR agent was deployed to over 19,000 computers and servers across all 11 NDUS Institutions (See Figure 4). This yearlong project has provided the NDUS SOC and institutions with an increased capability to prevent, detect, and respond to security incidents. Over the past year, Cortex XDR agents have generated over 194,000 security alerts (see Figure 5).
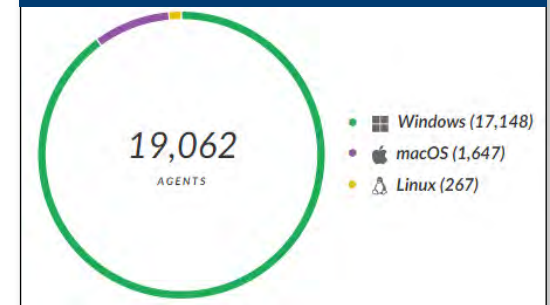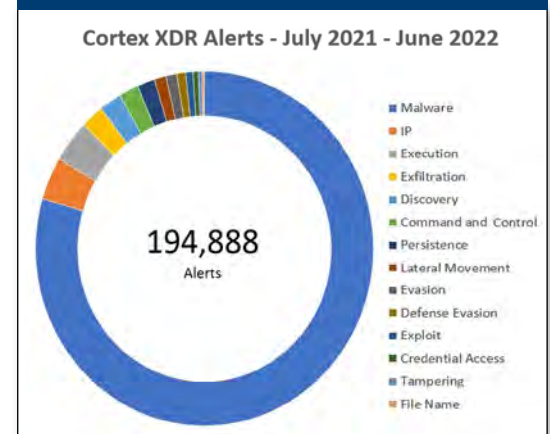

Figure 4. Cortex XDR Agents by OS

19,062 AGENTS
- Windows (17,148)
- macOS (1,647)
- Linux (267)

Figure 5. FY 22 Cortex XDR Alerts

Cortex XDR Alerts - July 2021 - June 2022

194,888 Alerts
- Malware
- IP
- Execution
- Exfiltration
- Discovery
- Command and Control
- Persistence
- Lateral Movement
- Evasion
- Defense Evasion
- Exploit
- Credential Access
- Tampering
- File Name

Current Projects

Identity and Access Management

CTS has a project underway to procure and implement a Privileged Access Management (PAM) solution for CTS. A PAM product will allow CTS to secure administrative access and privileged accounts on CTS computers, systems, and infrastructure. Implementing a PAM solution is an important security initiative; compromise or misuse of a privileged account used to access CTS systems and applications poses a significant risk to the organization. Using a PAM solution to manage these accounts will allow CTS to adhere to least privilege principles and reduce the likelihood and impact of a credential attack. The use of a PAM solution will also provide visibility to risky privileged account behavior. The 2021 security assessment, coordinated by the State Auditor's Office and conducted by Secure Yeti, identified the category of Access Control for privileged accounts as a significant high-risk issue for CTS and the NDUS.

Security Operations

The Security Operations team is currently implementing Cortex XSOAR, a security orchestration, automation, and response platform. This platform will allow the SOC to better manage the response to security incidents and alerts, streamline security processes, connect various security tools and systems, and enable automated responses for repetitive security tasks that often do not require human intervention. In the coming year, work will continue to create automated playbooks and workflows within the platform. These efforts will provide security operations analysts greater efficiency in handling the many security incidents and alerts occurring daily across the NDUS, resulting in the ability to focus on more urgent and critical incidents.

Security Training and Awareness

The InfoSec department procured the InfoSec Institute's InfoSec IQ Security Awareness platform for all NDUS Institutions. This platform provides security awareness training videos and resources, phishing simulations, and phishing reporting capabilities. The Security Engineering team is working with institutions to implement and expand the use of this valuable platform to educate faculty, staff, and students so they can effectively identify and prevent security threats.

Fiscal Year 2023 Roadmap

Systems and Software Management

The top initiative identified during the 2022 Information Security Strategic Planning Summit was to address increased threats from email-based attacks. During the next year, the InfoSec department will be implementing an Advanced Email Security platform within the Office 365 email environment. This platform will use behavioral AI (Artificial Intelligence) to block malicious and unwanted emails, such as phishing, business email compromise, ransomware, and more. It will also prevent and remediate compromised email accounts and automate phish reporting and response, streamlining workflows to save time and effort for the NDUS SOC.

Data Loss Prevention

The Security Engineering team will be exploring and testing Microsoft's Data Classification and Information Protection solutions within Office 365. These solutions will allow CTS and NDUS institutions to identify sensitive data within Office 365 and on endpoint computers and protect it from unauthorized access.

Identity and Access Management

CTS and the InfoSec department, in cooperation with NDUS institutions, will explore streamlining and implementing account deprovisioning processes for critical CTS systems and services. Defining and applying these processes will help protect systems by reducing the risk of accounts being abused or taken over by attackers.

Centralized Logging

InfoSec and a CTS functional team implemented Splunk centralized logging to assist in identifying security risks and conducting incident response for CTS systems and applications. Future efforts include providing centralized logging capabilities for NDUS institutions.
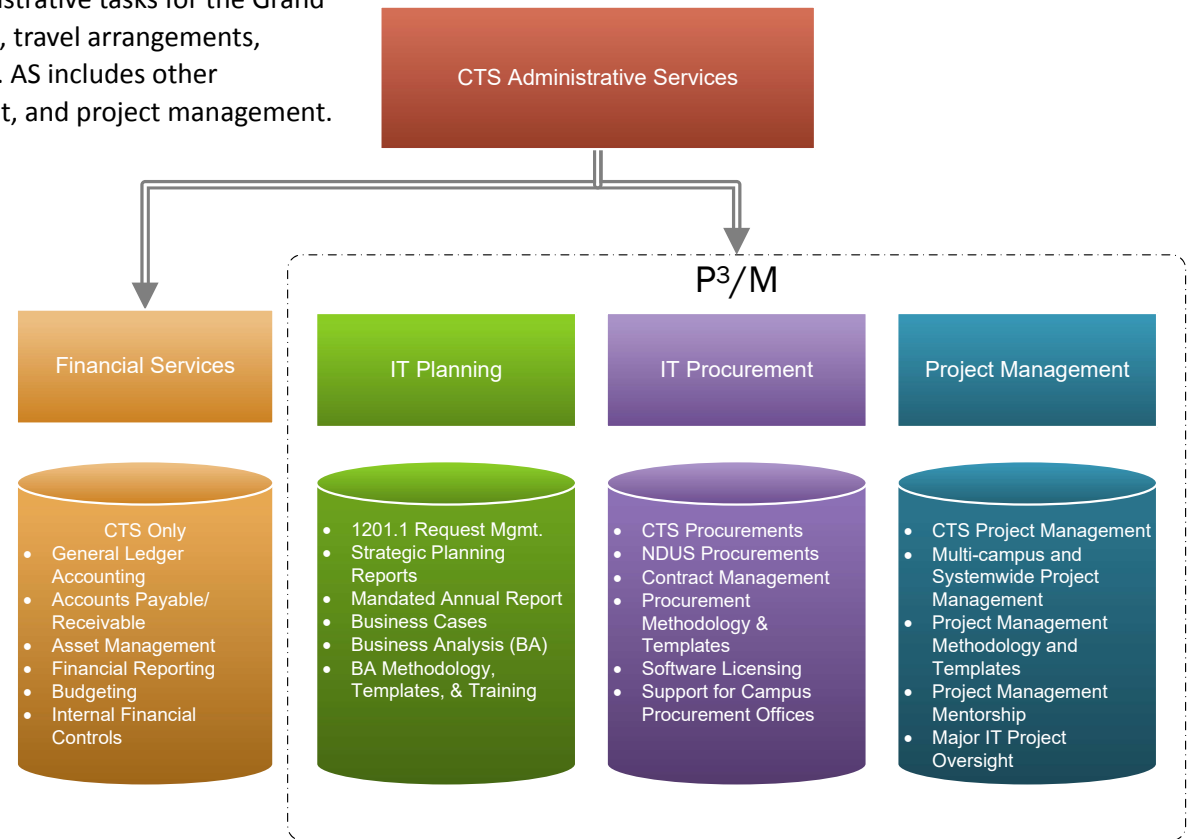
Administrative Services (AS)

The Administrative Services (AS) team handles the general administrative tasks for the Grand Forks site including the reception desk, meeting room setup, mail, travel arrangements, facility issues, and departmental data entry and file management. AS includes other administrative services such as financial, IT planning, procurement, and project management.

Work Management System

CTS implemented the TeamDynamix Work Management System (WMS) in March 2015 as a method to track time spent performing operational tasks and project work. The WMS provides additional features including a service catalog and an Incident and Service Request ticketing system. AS leads a cross-functional team which provides support for the tool.

The team spent much of the year focused on deploying ServiceOne processes via the system, which culminated in the launch of a new service portal and incident form as part of the Incident Management, Service Request Management, and Service Desk practices. Other ServiceOne practices have also expanded use of the system. As CTS continues to build upon the ServiceOne practices and shift into continual improvement mode, additional system changes are anticipated, including expansion of the existing knowledgebase and revitalizing the service catalog.

CTS Administrative Services

P³/M

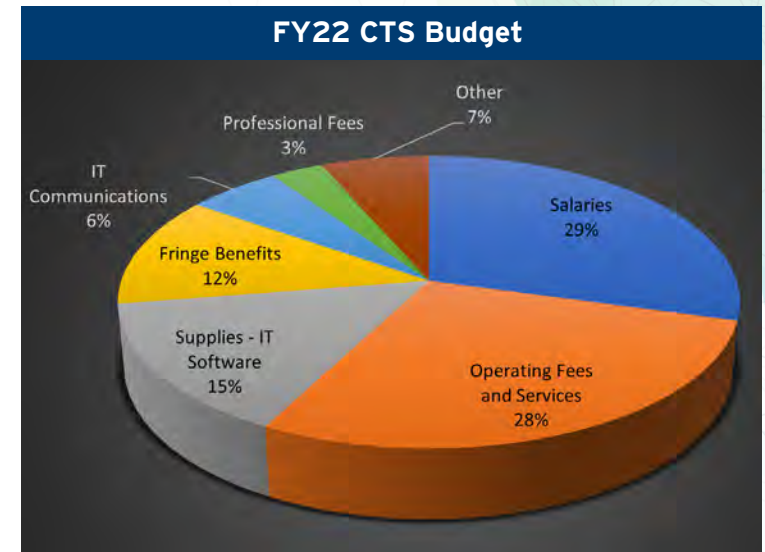| Financial Services	IT Planning	IT Procurement	Project Management
CTS Only • General Ledger Accounting • Accounts Payable/Receivable • Asset Management • Financial Reporting • Budgeting • Internal Financial Controls	• 1201.1 Request Mgmt. • Strategic Planning Reports • Mandated Annual Report • Business Cases • Business Analysis (BA) • BA Methodology, Templates, & Training	• CTS Procurements • NDUS Procurements • Contract Management • Procurement Methodology & Templates • Software Licensing • Support for Campus Procurement Offices	• CTS Project Management • Multi-campus and Systemwide Project Management • Project Management Methodology and Templates • Project Management Mentorship • Major IT Project Oversight

Financial Services

Financial Services provides financial oversight for CTS in the following areas: accounts payable, accounts receivable, asset management, budgeting, financial reporting, general ledger, and internal controls. Overall, this team prepares and manages an annual budget in excess of $36 million.

Fiscal Year 2022 Highlights

Financial Services continued to review and revamp internal processes to provide more effective and efficient workflows. CTS deployed a new inventory process to streamline asset additions and retirements, identify major and minor equipment thresholds, and expedite the annual physical inventory reconciliation. Departmental training sessions outlined asset management concepts, staff responsibilities, and the financial implications of asset transactions. The overall impact of the new process has been more accurate inventory and financial records as well as greater interdepartmental communication.

Members of the financial services, procurement, and project management staff collaborated to understand the interconnectivity of each department's activities on the other departments. The team developed flowchart diagrams of processes to visualize process life cycles, identify departmental impacts for each process, and relay expectations and efforts needed to accurately report the financial transactions resulting from each departmental process.

FY22 CTS Budget

- Salaries 29%
- Operating Fees and Services 28%
- Supplies - IT Software 15%
- Fringe Benefits 12%
- Other 7%
- IT Communications 6%
- Professional Fees 3%

Current Projects

The team is collaborating on a new initiative which involves developing a tracking system where both financial services and human resource personnel can easily access pertinent payroll changes such as new hires, terminations, and salary adjustments. This system will bridge the gap between the human resource activities and the financial services payroll activities by providing up-to-date details and progress updates for both departments. An added benefit will be better access to data for analysis as well as budget preparation.

Fiscal Year 2023 Roadmap

Automation of financial processes continues to be an area of focus. In the coming year, the team will evaluate improving the accounts payable process through automation. To address the need for additional centralized services within the NDUS, the Financial Services team will explore opportunities to provide entity-wide solutions such as multi-state payroll tax processing. The team is also looking to expand by adding an additional staff member to assist with fiscal services that are currently outsourced.

IT Planning, Procurement, & Project Management (P³M)

P³M is responsible for issuing the mandated IT strategic plans and CTS annual report, overseeing all CTS procurement, and performing all Level 3 & 4 procurements for the organization. This team also manages some of the most complex projects and performs Major IT Project Oversight.

IT Planning

The IT Planning team is responsible for assisting CTS and NDUS institutions with developing biennial IT strategic plans and publishing required reports. This area utilizes business analysis practices and supports the rest of the organization with templates and training. Key reports that are published to the CTS website include:

- The CTS Annual Report
- The biennial CTS Strategic Plan
- The biennial NDUS IT Strategic Plan

A new biennial Statewide IT Strategic Planning dashboard, developed by the ND Information Technology (NDIT) department, will include NDUS IT goals and objectives for the 2023-2025 biennium. CTS and institution-specific accomplishments from the previous biennium will also be featured. This dashboard is expected to be live in December 2022.

FY 22 1201.1 Requests

The IT Planning team also monitors and supports the NDUS Procedure 1201.1 reporting process. A live dashboard was created to inform the NDUS CIO Council of all IT purchase notices, system integration requests, and major IT projects submitted by other institutions.
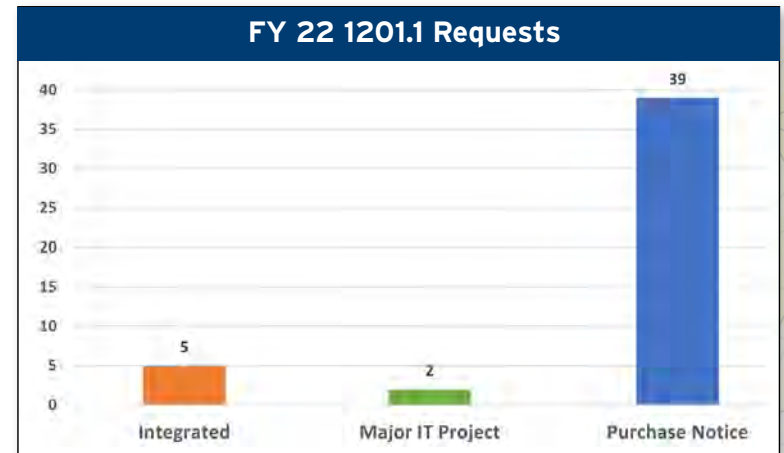
Business Analysis

The P³M department offers Business Analysis (BA) professional services to the CTS organization, including facilitating meetings, identifying key stakeholders to assist in defining a problem/need, eliciting requirements for possible solutions, diagramming the current state of a process and, with the assistance of stakeholders, diagramming the desired state by working through challenges and requirements. BA services also include managing projects and writing strategic planning reports.

Business analysis initiatives that were completed in the past year include:

- Performing a requirements fit/gap analysis for Recruiting Solutions.
- Eliciting requirements for use in a Request for Proposal (RFP) for a replacement Customer Relationship Management (CRM) system.
- Eliciting requirements for use in a Request for Proposal (RFP) for a Scholarship Management System.

Current Projects

The IT Planning team is preparing for the creation and release of the CTS Annual Report and collaborating with CTS leadership and NDUS CIOs for biennial IT strategic plans. The team is also working with NDIT staff to ensure NDUS IT goals, accomplishments, and objectives will display properly on the new Statewide IT Planning dashboard. Reporting process changes for Statewide IT Planning are being documented and communicated to institutions.

Procurement

The Procurement team supports both CTS and the institutions with IT purchases and software research. This area manages over 160 active contracts, including centralized contracts that can be utilized by any NDUS institution. Further responsibilities for this team include ensuring CTS remains in compliance with all software licensing agreements, providing support for the System Office's procurement processes, and advising on institutional procurements. Additionally, the procurement team participates in state and national procurements by collaborating with the State Procurement Office (SPO) and the Midwest Higher Education Compact (MHEC).

Fiscal Year 2022 Highlights

In FY 2022, both of CTS's full-time procurement officers received their Certified Public Procurement Buyer (CPPB) certification. This team also:

- Participated in a proof-of-concept for the deployment of PeopleSoft Contract Management, a supporting component to the statewide Procurement Automation Program.
- Performed oversight of NDUS institutions' procurements over $10,000.
- Increased the amount of P-Card rebates returned to CTS.

FY 22 Completed Solicitations

- An RFP for a systemwide payment application to replace or re-award the current TouchNet payment application. The contract was awarded to Nelnet.

- An RFP for search firms to provide interim staffing for temporary presidential placement.

- An RFP to replace or re-award the current customer relationship management (CRM) system and admissions application for nine NDUS institutions.

- An RFP to replace the current online college prep curriculum. This RFP was not awarded; all proposed solutions were not as evolved as the current solution.

- An RFI for solutions to manage Family Medical Leave Act (FMLA) within the Human Capital Management (HCM) system.

- An RFI for a Title IV course auditing solution to ensure a student's coursework counts toward their program of study; this is a federal regulation to receive Title IV funding. There is currently not a solution available.

- A procurement to replace the systemwide tool which enabled automated forms. The contract was awarded to GT eForms.

- A bid to provide systemwide multi-state payroll tax software/services.

- A bid for systemwide software for virtual classroom lab work.

- Assisted the State Board of Higher Education in its efforts to award an evaluation of presidential salaries and compensation.

Current Initiatives and Projects

- Working with the SPO to deploy and support updated procurement system(s) to NDUS. Efforts include Contract Management, Sourcing Management, and eMarketplace.

- Performing evaluations for SPO RFPs, including:
  - A statewide Microsoft Large Account Reseller solicitation.
  - IT and business training services for Business Analysis, Project Management, Desktop Support, and Database Design.

- Issuing RFPs for:
  - A secure browser solution for online test-taking.
  - An interactive collaboration and sharing tool that allows students and faculty to comment at any level within threaded discussions and presentations utilizing pictures, text, audio, and video.
  - A scholarship management system for the NDUS Financial Aid Office to administer multiple North Dakota resident scholarship programs.

Fiscal Year 2023 Roadmap

Over the next year, the Procurement team will explore options to provide additional centralized procurement services for NDUS. This team will also be facilitating sessions with the State Procurement Office to re-initiate policy and procedure updates with NDUS.

Project Management

The Project Management team manages some of the most complex projects in the organization, many of which affect multiple institutions. This team is also responsible for performing Major IT Project Oversight as mandated by North Dakota Century Code (N.D.C.C.) and maintains the methodology and templates for the CTS Project Management Office. As part of the ServiceOne program, all CTS project managers were trained in Organizational Change Management (OCM) with the intent to serve as organizational change management practitioners on future projects.

FY22 CTS Projects

Pending 1
On Hold 3
In Process 19
Cancelled 9
Completed 118

Fiscal Year 2022 Highlights

During the past year, the Project Management team assisted in the completion of eight projects involving CTS departments and NDUS institutions, all of which are highlighted throughout this report. Completed projects include: replacing the systemwide payment application from TouchNet to Nelnet, transitioning NDUS's student housing application from on-premises hosting to the cloud, updating the NDUS learning management system's navigation menu, deploying the Cortex XDR endpoint security platform, re-architecting the High Performance Computing data center network to be a stand-alone research network, exploring and implementing enhancements for Identity Management, automating application testing for PeopleSoft, and implementing two modules of the Novelution research management system for UND and NDSU.
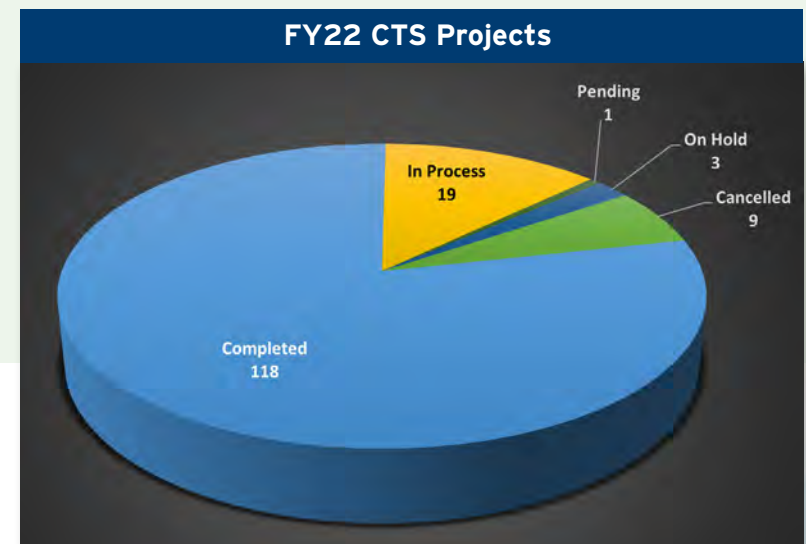
Current Initiatives and Projects

The team is currently providing project management services for the ServiceOne program, the upgrade of Oracle Exadata Cloud@Customer (ExaCC) database to its second generation (Gen 2), performing discovery for the next generation data center, synchronizing user accounts in the NDUS active directory with those at institutions and with NDUS's Microsoft Azure AD, Information and Data Governance, redesign of the customer service portal and creating a single incident ticket form, securing a privileged access management solution, and discovery and implementation work for two additional modules for NDSU's electronic system for the administration and compliance of research grants.

Fiscal Year 2023 Roadmap

Over the next year, the CTS Project Management team will focus on updating its current Project Management methodology to align with the recent changes made to the Project Management Body of Knowledge (PMBOK), which is the foundation for how the NDUS manages projects. The new PMBOK incorporates both waterfall and Agile methodologies, with the former consisting of a single start to finish plan, while the latter emphasizes a phased approach to planning. The team will also continue its collaboration with the NDIT Project Management Office to ensure methodologies remain consistent and meet the mandated requirements for Major IT Project Oversight.

Infrastructure & Operations (I/O)

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

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

I/O strives to provide, sustain, and enhance a robust, secure, reliable, and relevant technological foundation used across the NDUS. The team's successes are directly attributable to staff who are action and detail-oriented, committed, and passionate subject-matter experts of many technologies. Managing service requests is a significant portion of the I/O workload. The department handled almost 2,700 service tickets this past year (Figure 6), which resulted in 241 completed survey requests. Figure 7 shows the average rating on a five-point scale for technician competency, resolution timeliness, and customer service.
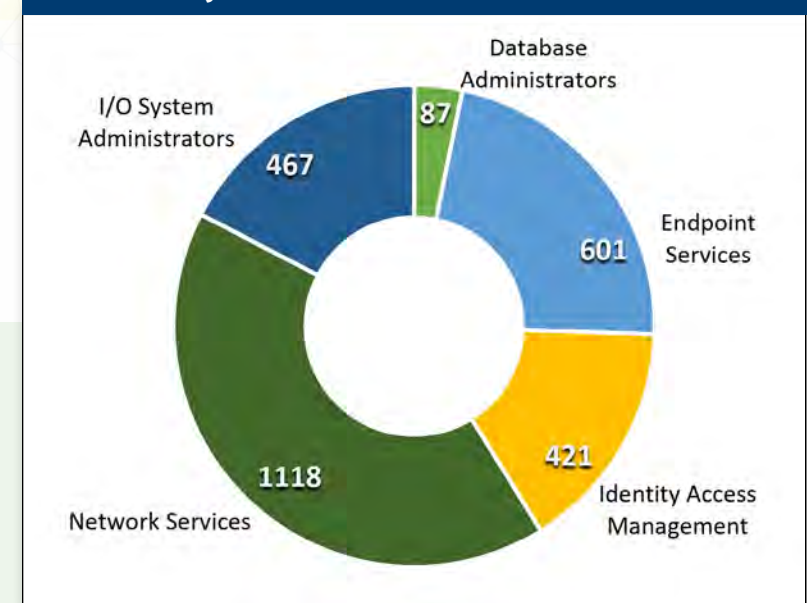

Figure 6. FY 22 I/O Service Tickets

Figure 7. FY 22 I/O Service Survey Ratings

Technician Competency

4.92

Average Rating

14 (5.74%)

Tech Competency
- Very satisfied
- Satisfied
- Neutral

227 (93.03%)

Resolution Timeliness

4.85

Average Rating

19 (7.79%)

Resolution Timeliness
- Very satisfied
- Satisfied
- Neutral
- Dissatisfied

217 (88.93%)

Customer Service

4.90

Average Rating

16 (6.56%)

Customer Service
- Very satisfied
- Satisfied
- Neutral

224 (91.8%)

Service Agreement

As part of a service agreement with UND, CTS provides support and maintenance on a variety of application and infrastructure needs as noted in Figure 8. Specific services provided by I/O departments for UND are shown in Figure 9.

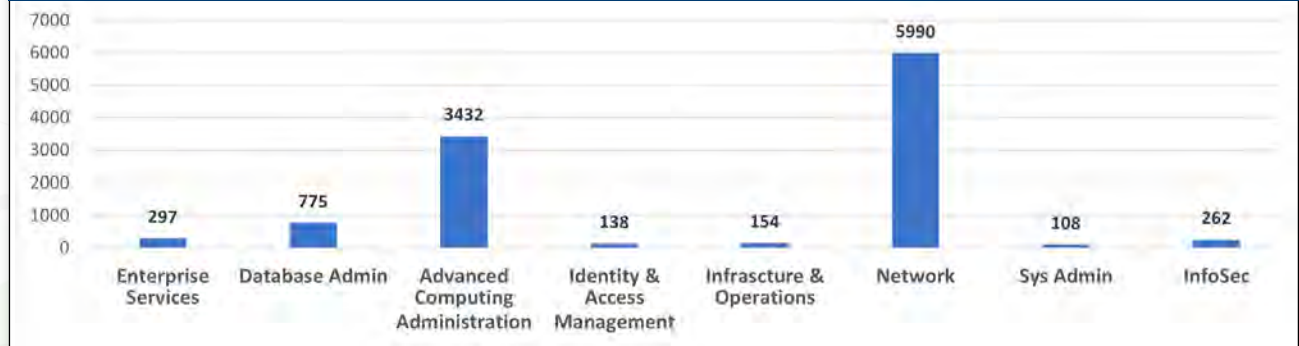**Figure 8. FY22 Service Hours Provided by CTS Through UND Service Agreement**

| Figure 9. Services Provided by I/O Departments Through UND Service Agreement			
Data Center/System Administration	**Database Administration**	**Identity & Access Management**	**Network Services**
Data center facility management	Database hosting and administration	Identity system administration	Campus LAN/WAN management; including high performance computing
Server hosting (physical & virtual) and administration – IaaS, PaaS and SaaS	Capacity planning	Account provisioning	Data Center network
Information Security – vulnerability management, backup/recovery, data encryption	Software installation	User account services	Monitoring and analysis
Monitoring and analysis	Install patches and upgrades	One-off account creation	IP address management, including DNS and DHCP
High Performance Computing	Monitoring and analysis	Auditing	VPN Management
	Backup and recovery		Campus wireless management
			Network Security

Notification System

To provide timely information to users, Status.NDUS is utilized for all planned and unplanned outage notifications. This system allows users to opt-in to notifications via text message or email. This system is managed by a functional team with members across CTS.

Database Administration (DBA)

The Database Administration (DBA) team provides enterprise-level software systems administration. Additionally, 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 DBA team also ensures operational stability, integrity, and security of database management software and their respective interfaces. The team supports standalone and clustered databases on multiple database platforms and performs technical functions in support of database-driven applications.

Total Instances and Databases by Platform
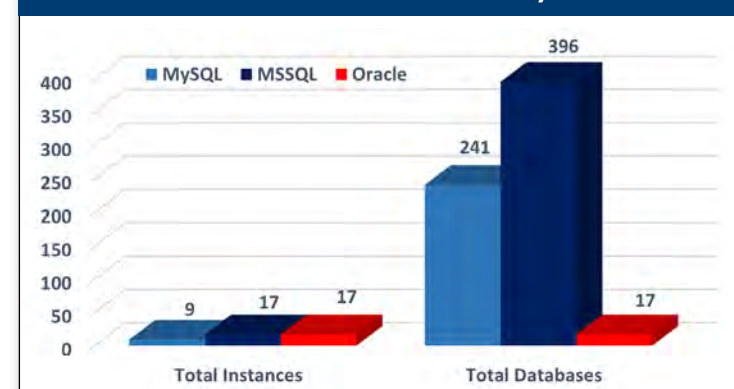
Fiscal Year 2022 Highlights

- Performed technical work to maintain the integrity of the ExaCC architecture.
- Applied ongoing security-related and critical patch updates to all database platforms.
- Performed significant technical work to upgrade Oracle databases to 19c, the current long term release, in preparation for migration to the ExaCC Gen 2 appliance.
- Performed significant technical work to train for and implement Zero Data Migration software.
- Migrated Oracle databases for multiple enterprise-level, mission critical applications to ExaCC Gen 2 appliance.
- Assisted with upgrades for mission critical applications, including Campus Connection, IAM software, and document imaging software.
- Performed data refreshes throughout the year across multiple platforms and applications.
- Worked cross-functionally with other teams to enhance existing application software, such as Phire.
- Performed analysis and tuned the Campus Connection system to improve overall performance during peak activity periods.

Fiscal Year 2023 Roadmap

In the coming year, the DBA team will wrap up the migration to ExaCC Gen 2 architecture and explore opportunities to utilize new functionalities to further enhance performance and management of Oracle databases. Additionally, the team will be working with Microsoft on a risk assessment program for hosted MSSQL platform servers and participate in an expected Campus Connection PeopleTools upgrade.

Endpoint Services

Endpoint Services provides technical support to the NDUS System Office and Core Technology Services. The team also provides assistance and consultation to institutions.

Fiscal Year 2022 Highlights

Desktop Support

This year, CTS employees transitioned into new work agreements - either fully remote, hybrid, or onsite. Endpoint Services worked with departments and staff to ensure all personnel had the necessary equipment to be productive in their chosen work arrangement. At CTS building locations, hoteling spaces were set up to be used by remote employees who need to work temporarily onsite. Several workspaces for onsite and hybrid staff have been relocated or reconfigured, and due to limited space, equipment was reduced.

Standard desktop support services continued with approximately 40 users receiving new laptops this year. Security is imperative to all technology and endpoint equipment is no exception. Security benchmarks were reviewed to ensure both on-premises and cloud-based endpoints have the appropriate level of security.

To better facilitate meetings with both in-person and remote attendees, Endpoint Services worked to ensure onsite audio-visual equipment could accommodate the needs of both audiences. Meeting rooms and equipment were reviewed and evaluated. The large training and education space in Grand Forks was converted to work in a Microsoft Teams environment; other meeting spaces may include two-monitor setups or additional changes as needed.

Institution Partnerships

Endpoint Services works with the staff at institutions to provide support and technology solutions relevant to their needs. Support continues this year for Dickinson State University (DSU) and Williston State College (WSC) for their integration into the NDUS System Center Configuration Manager (SCCM) environment (Figure 10). Endpoint Services has worked to expand the utility of the NDUS SCCM environment to DSU and made it easier for WSC to deploy, manage, and update user and lab computers.

The Endpoint Services team is working with institutions to begin leveraging cloud device management using Microsoft Intune and other technologies. CTS has also implemented a shared JAMF environment which allows campuses to manage Mac computers. In addition to CTS, this service is currently in use by BSC, MiSU, VCSU, and WSC.

Endpoint Services implemented and tested strategies for using Intune, Azure Active Directory, and other cloud-based endpoint management tools that will benefit CTS, the System Office, and all institutions. These systems allow conformation to the new Microsoft licensing and updates. Because this is the direction that Microsoft is moving, it is imperative that the NDUS also moves in this direction.

To enhance communication and partnerships between CTS and institutions, the NDUS CIO Endpoint Sub-Council meets monthly to research and recommend operational procedures to ensure the continued effectiveness of shared services. These meetings allow Endpoint Services to participate in the planning for future improvements and upgrades.

Figure 10. SCCM Managed Clients by Institution

146
247
547

■ CTS ■ DSU ■ WSC
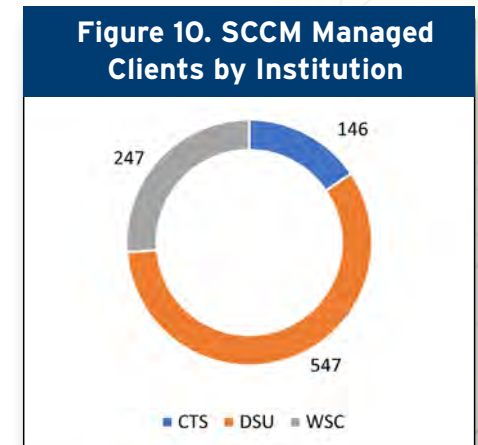
System Office Support

Support for NDUS System Office staff, including their work-from-home hardware needs, was moved to CTS Endpoint Services. To assist with providing onsite support, CTS entered into an agreement with BSC staff to provide a weekly support window for end-users in Bismarck. Endpoint Services continues to work with the NDUS Financial Aid Office to support scholarship applications.

Fiscal Year 2023 Roadmap

Endpoint Services will continue to strengthen the Microsoft Teams environment through interaction and troubleshooting with Poly and Microsoft when issues arise. To assist institutions, Endpoint Services will expand use of JAMF environmental tools and monitoring for Mac computer support.

To support CTS staff, Endpoint Services will begin Phase 2 of the PC cycle upgrade for remaining users. Endpoint Services will also work with departments to relocate equipment and desks in the Grand Forks IT building for staff moving to the first floor once space consolidation plans are finalized.
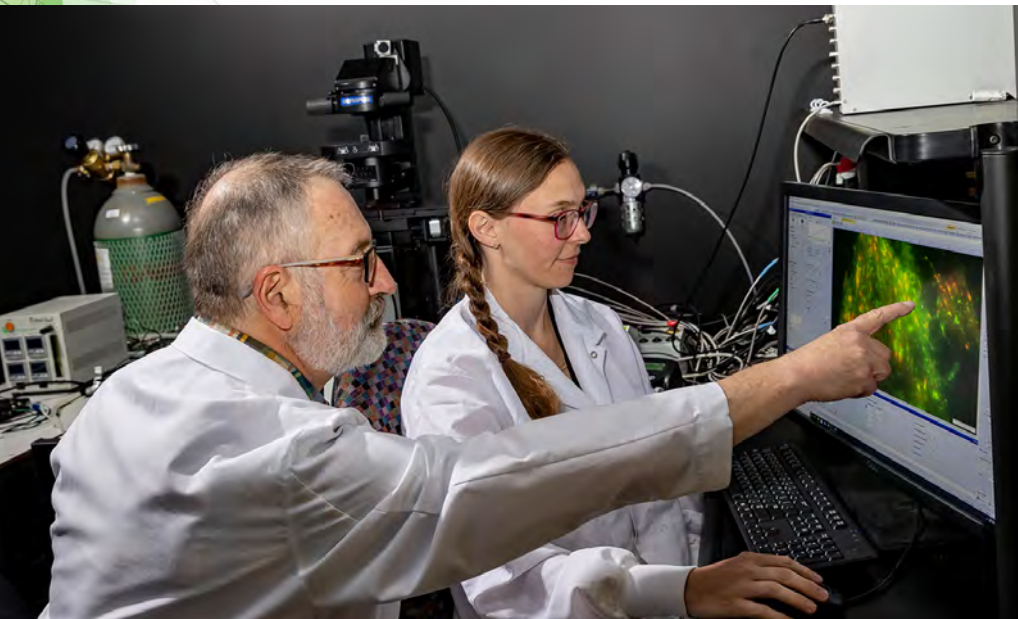
Network Services

The Network Services team is responsible for enterprise-level network administration, as well as the physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of the UND Network. Additionally, the team works closely with NDIT in providing network services via North Dakota's Statewide Technology Access for Government and Education Network (STAGEnet) to institutions.

Fiscal Year 2022 Highlights

Partnership with NDIT

CTS resumed installation of redundant fiber paths to Lake Region State College (LRSC), Minot State University (MiSU), and Bismarck State College (BSC) to ensure reliability of STAGEnet. As NDIT completed the procurement process for new fiber contracts for the state network, CTS worked with campuses and NDIT to explore options for additional redundancy utilizing these contracts. Internet capacity is monitored to ensure campuses have the capacity needed.

Network Services has completed the installation of a network-monitoring tool called ThousandEyes. This tool gathers measurements from multiple locations across the enterprise network to help identify, analyze, and resolve performance issues such as latency and loss. This data will assist in understanding the usability of applications from a customer point of view. The ThousandEyes tool will be shared with NDIT to help identify and resolve issues on the STAGEnet network.
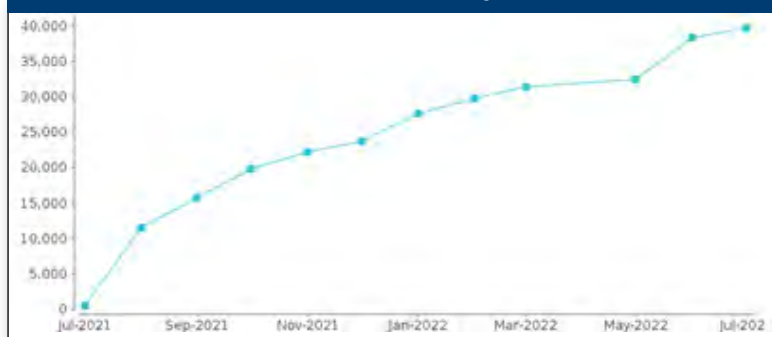
Institutional Partners

Network Services continued to centralize services with the NDUS institutions. This year, the team added DNS/DCHP and IP address management appliances to BSC, DSU, and VCSU. DNS is a critical service that the internet relies on to translate domain names to IP addresses across the internet. These new services will provide better failovers, redundancy, and more efficient management, while allowing the ability to leverage new technologies and security features.

Network Services has continued working on a project to centralize authentication services. These centralized services consist of authentication for wired and wireless devices, including Internet of Things (IOT) such as TVs and gaming consoles, a portal for guest access, and onboarding assistance for users and devices for institutions. Eight campuses are participating in these centralized services: DSU, DCB, and MaSU are complete; work is being finalized at WSC, NDSCS, LRSC, VSCU, and UND.

UND Network Support

CTS supports the University of North Dakota's network, which consists of 15,000 wired connections and close to 40,000 unique wireless devices connected per semester for various operating systems. This year, Network Services worked closely with UND's University Information Technology support unit to refresh over 300 access points to support new Wi-Fi technologies, including Wi-Fi 6, and increase wireless connectivity on campus. In addition, CTS deployed new core wireless controllers and upgraded access switches to eliminate end of life devices and modernize the network. UND completed several building network projects, including the new Memorial Union and remodel of O'Kelly Hall. Both buildings required state-of-the-art wired and wireless solutions to support the campus community.
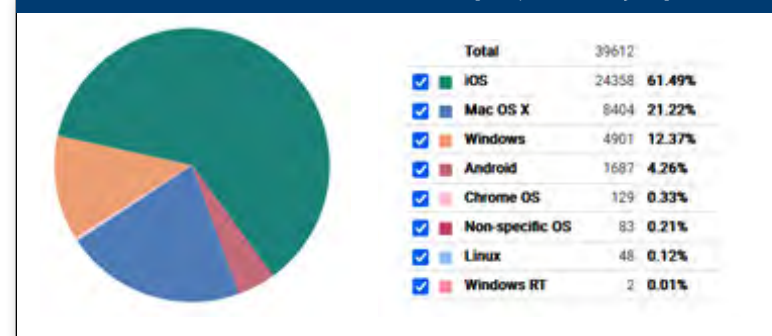
Cloud Infrastructure

Network Services, in conjunction with the System Administration team, built a cloud environment in Azure to support current and future cloud initiatives. This infrastructure is a hybrid cloud environment that works with on-premises systems to provide a robust and resilient cloud option for systems and services. The team's Cloud Architect/ Network engineer helps design and maintain standards for this new cloud architecture.

Wireless Connections by Semester

Wireless Devices Connected by Operating System

		Total	39612	
☑	■ iOS	24358	61.49%
☑	■ Mac OS X	8404	21.22%
☑	■ Windows	4901	12.37%
☑	■ Android	1687	4.26%
☑	■ Chrome OS	129	0.33%
☑	■ Non-specific OS	83	0.21%
☑	■ Linux	48	0.12%
☑	■ Windows RT	2	0.01%

Current Projects

Network Services is replacing the core hardware at UND to allow 100G backbone capacity between buildings and provide 100G connectivity to researchers on campus. To provide a better user experience and support for learning environments, the team is completing upgrades to wireless and refresh access switches and adding state-of-the-art equipment and latest technologies for campus construction projects, which includes the new Nistler College of Business and Public Administration and two replacement residence halls.

Fiscal Year 2023 Roadmap

Partnership with NDIT

CTS Network Services and NDIT will leverage new contracts for last mile and backbone services to continue to bring diversity of network paths and high speeds to all institutions on STAGEnet.

Institutional Partners

Network Services has positioned the UND campus to allow for new technologies, including software-defined access. This technology will tie network services to individuals rather than locations, enabling customers to move around campus while carrying their access and network parameters with them. This effort will offer increased security and better automation.

Also on Network Services' roadmap is the next generation data center, an initiative to increase security, improve automation, and allow for disaster recovery and continuity of business operations.

Data Center Operations

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. While the pandemic created challenges for everyone, skilled CTS staff were onsite working 20 hours a day, 7 days a week to ensure safe and secure data, uninterrupted processing, and physical security while continuing to monitor the mission-critical facility.

Fiscal Year 2022 Highlights

- Achieved an uptime of 100% through standard maintenance and proactive monitoring.
- Oversaw the physical move of ExaCC Gen 1 and Gen 2 equipment.
- Renewed vendor support contract to maintain the data center.

Fiscal Year 2023 Roadmap

- Replace all uninterrupted power supply batteries.
- Continue assessment of data center Power/Cooling/Capacity.
- Explore adding a third generator to the data center.

Identity & Access Management (IAM)

The IAM team is responsible for managing the identity lifecycle for all students, staff, and faculty within the NDUS. The team also maintains the complex administration and oversite of NDUS people, processes, and products, and governs identities and access to resources of enterprise environments. The IAM team continues to simplify the process for users to gain quick and secure access to the IT resources they need, while providing strong authentication without restricting productivity.

Single Sign-On (SSO) Portal

Over the last year, 30 new NDUS SSO contracts have been added to Access Manager. Since the NDUS Portal has been officially rolled out, the IAM team anticipates new SSO configurations will be added to take advantage of the new service.

Fiscal Year 2022 Highlights

- 522,733 total IAM accounts
- 100,946 active accounts in the NDUS Identity System
- 39,161 new accounts added last year
- 69.7 million accounts are processed annually/190,946 daily

Current Projects

- Moving O365 account creation from its current platform to Azure Connect.
- Working with the CTS InfoSec team to add security features to self-service password reset (SSPR) and O365 Federation.
- Assisting VCSU in provisioning accounts into their local directory.

Fiscal Year 2023 Roadmap

The IAM team will continue working with vendors to integrate various IAM components to form a unified structure for IAM governance. The goal of implementing IAM governance is to provide administrators and managers with tools to easily collect relevant user and access information, ensure that users have focused access, and provide access request and approval. Over the next year, the IAM team will be performing system upgrades for our IDM and NAM services.

System Administration

The System Administration team is responsible for enterprise-level hardware and operating system administration. The team is also 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. These responsibilities ensure the operational stability, integrity, and security of these systems, enabling CTS departments and institutions to provide services to staff, faculty, and students.

Current Projects

The System Administration team is working on replacing UND and NDUS domain controllers to modernize the operating systems, which will result in increased security and functionality of the environment. This work can be accomplished with little-to-no downtime for users of the system. Additionally, the team is reviewing results of an annual Microsoft Risk Assessment for active directory and creating a plan to enhance security hardening changes to the system. This experience will help in supporting the Database Administration team through similar risk assessments. System Administration is also supporting other teams in a migration of the Oracle ExaCC platform to new hardware.

The System Administration team has also started the process of replacing the original 11 node hyper-converged infrastructure (HCI) cluster with new HCI hardware, allowing the team to streamline the systems and support. This change positions CTS to reduce its cluster hardware size from 11 to 8 compute nodes, but still increase capacity.

Fiscal Year 2023 Roadmap

System Administration will complete the new HCI cluster that began this past year and migrate off the previous cluster. After the new year, the team will assist in supporting a Campus Connection upgrade and modernizing elements of the systems. Security will continue to be a driving force as the team looks to support and implement new practices as the systems evolve.

In conjunction with Network Services, System Administration will be involved in the research and planning for the next generation data center. This work includes determining the tools needed to ensure system security while allowing for disaster recovery and continuity of business operations.

The team will be working to modernize server operating systems over the next year. Moving forward, modernization will be prioritized to ensure systems are continuously meeting security benchmarks.

UND Advanced Computing Administration (ACA)

The System Administration and Network Services teams worked with UND on the advanced computational systems needed for research computing at the institution. This project included moving these systems to different networks while maintaining their presence within the NDUS Data Center. CTS rearchitected the existing network to include a separate research network with no direct communication with the current enterprise production environment. This improves the performance of the ACA while maintaining secure access for its users. Another benefit to completing this project was a reduction of risk to the NDUS enterprise systems within the Data Center network and the ability to accommodate future needs of the ACA.

Enterprise Solutions (ES)

The Enterprise Solutions department includes ConnectND, Enterprise Services, and the Online Dakota Information Network (ODIN).

Enterprise Solutions supports the three pillars of ConnectND, North Dakota's implementation of Oracle's PeopleSoft, which includes PeopleSoft HCM, PeopleSoft Finance, and Campus Connection, along with dozens of ancillary systems for the eleven institutions in the NDUS. The three systems use similar technical and functional tools and processes to ensure business continuity. Additionally, institutions have an opportunity to participate in PeopleSoft query training throughout the year, hosted monthly by CTS for each of the three systems on a rotational basis. Over the past year, all three pillars deployed PeopleSoft Test Framework (PTF), which allows the use of automated test scripts to greatly reduce the amount of effort it takes when testing patches and fixes.

Enterprise Services is responsible for the administration of enterprise-class information technology solutions including Blackboard, Document Imaging, and a Help Desk that provides 24/7 support. Enterprise Services also maintains an agreement with the University of North Dakota to administer and support several institution-specific applications.

Three Pillars of ConnectND		
Human Capital Management	**Financial Systems**	**Campus Connection**
Core HR	Banking	Student Finance
Payroll for NA	Budgeting	Financial Aid
Benefits Administration	Grants	Campus Community
Time & Labor	Supplier Management	Admissions
Absence Management	Travel & Expense	Student Records
Recruiting Solutions	Purchasing	Student Academic Advisement
- Candidate Gateway	General Ledger	
- Talent Acquisition Management	Asset Management	**3rd Party Systems of Campus Connection**
Budgeting	Pcard/SUA	Ad Astra Class Scheduling
Onboarding	Accounts Payable	Anthology Application Support
Commitment Accounting	Commitment Control	College Scheduler - Student Scheduling
Contract Pay	Cash Management	Degree Map Planning
Savings Management	Project Costing	Facilities Management
Flexible Spending Accounts	Billing	Follett Bookstore Software
Company Directory/Org Chart	Proposal Management	Maxient Student Conduct Software
ePerformance	Accounts Receivable	National Common Application
Employee Self Service	Treasury	National Student Clearing House
Manager Self Service	Lease Administration	National Student Loan Data System
	Contract Management	Parchment Transcript Services
		Parking (T2)
		Scholarship Management
		Starfish Student Success
		TargetX CRM & Admission Application
		The Housing Director for Student Housing
		Nelnet Payment System

ODIN supports a consortium of libraries serving academic, public, school, and special libraries across North Dakota with two shared library management systems (Alma and Polaris).

A governance committee and/or multiple user groups support each of the ConnectND pillars, Blackboard, Document Imaging, ODIN, and the NDUS Help Desk. These groups are integral for communication and collaborative decision-making.

PeopleSoft HCM

Human Capital Management (HCM) is the single integrated system for managing a wide range of functions including employee benefits, time & labor, absence management, performance, and recruiting. This system supports all institutions with operational data and functionality for nearly every aspect of NDUS's 8,600+ employees.

The HCM team administers the NDUS's semi-monthly payroll for all 11 institutions, the System Office, and Core Technology Services. This team also applies system patching, provides Workforce Safety and Insurance (WSI) annual workers' compensation reports, processes W-2s and 1095Cs, and assists institutions with troubleshooting HR and Payroll transactions.

HCM uses Manager Self-Service (MSS) and Employee Self-Service (ESS) to ensure workflows for transactions process efficiently. The HCM team provides leadership in application management by offering training to institutions and serves as active participants in the HR User Group and Human Resource Council.

Fiscal Year 2022 Highlights

ePerformance

ePerformance is a self-service performance evaluation management system for managers, employees, and HR Administrators to facilitate collaboration on performance evaluations and goal setting, review performance history, and monitor the overall performance process. Figure 9 shows a supervisor's dashboard view of their employees' Goal Setting step in the Performance Review process, including the due date to complete this step, the number of employees who have started, and the team's completion status. The software became available in May 2022 following a period of user testing and training.

eForms

The HCM team developed and delivered five electronic forms this year including one for additional pay, two mobile phone stipends, a telework agreement, and an employee tuition waiver. The additional pay form enables institutions to automatically adjust employee pay in the system using a built-in workflow, effectively creating efficiencies for departments and payroll offices by eliminating the transfer of paper forms.

Figure 9. ePerformance - Supervisor Dashboard View

Current Projects

Summer and Year-End Patching

A major HCM upgrade performed over the summer consisted of four image updates and a PeopleTools version upgrade. Enhancement features included Kibana Analytics, alphabetized navigations and breadcrumbs, and elastic search indexing. Year-end patching will bring in new tax updates and legislative changes from federal and state governments.

FMLA

Representatives from NDUS institutions and CTS have established an advisory committee to research effective management of Family and Medical Leave Act (FMLA) data. This effort will result in software that will deliver processing efficiencies for employees, supervisors, and Human Resources departments.

Time Clocks

HCM is completing an upgrade to the physical time clock software, referred to as Kaba or B-COMM; testing of the biometric feature is underway. For campuses using fingerprint recognition for employees clocking in and out, this upgrade provides the ability to delete the biometric files of terminated employees directly from the software.

Fiscal Year 2023 Roadmap

New eForms

The HCM team and the HCM User Group will work together to identify HR business processes where eForms could create more efficiencies. A vetting procedure will be used to evaluate whether each form would be best developed in PeopleSoft HCM or GT eForms.

Shift Differential Pay

Requirements will soon be gathered in preparation for developing the functionality needed to offer shift differential pay. Once implemented, institutions have the option to pay employees at differing rates for shifts that are difficult to fill.

Position Management Modernization

Modernizing Position Management will provide enhanced capabilities including the ability to add effective sequence rows, a fluid dashboard, a configurable and improved search, and a fluid-based, guided process for creating and updating positions. Optimizing data entry through configuration settings will help minimize errors, resulting in increased efficiency for administrators when managing positions. Approvals can also be configured when a new position is created, or an existing position is updated.

Job Data Modernization

Improvements to the Job Data component will bring a new look and feel with an activity guide-based redesign to make it easier to use, which will minimize data entry errors and facilitate new user adoption. This update includes configurable approval processes, pages, and fields by action/action reason, masking for Personally Identifiable Information (PII) data, and replacement or extension of customizations. The ability to attach documents and improved search functionality is also delivered.
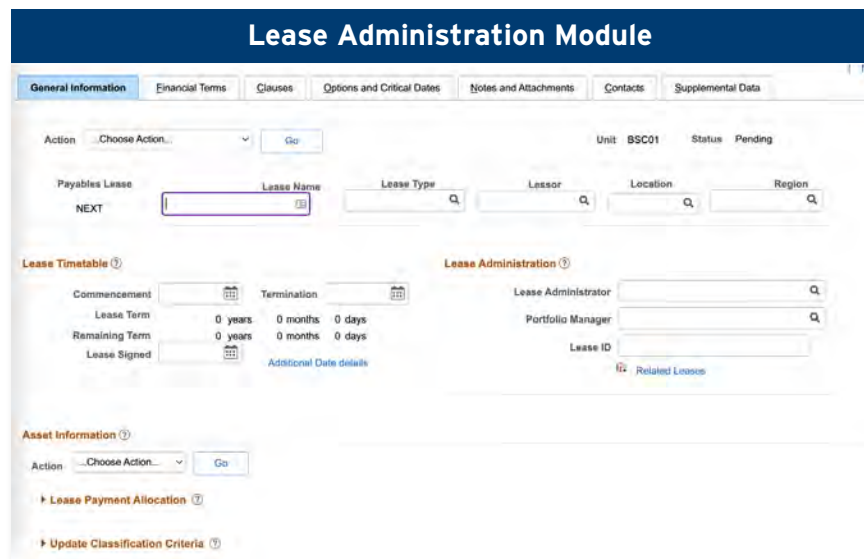
PeopleSoft Finance

PeopleSoft Financial Management (FIN) is the system of record for NDUS business operations. FIN is comprised of several modules including General Ledger, Commitment Control, Accounts Payable, Grants, Supplier Management, and Travel and Expense.

The FIN team conducts central processing for the NDUS. These activities include generating 1099s, performing fiscal year-end processes, extracting and uploading monthly PCard and bank statements, applying system patches to remain current with regulation changes and government-mandated reporting, and troubleshooting financial transactions. The FIN functional team actively partners with the Controller and Financials User Group.

Fiscal Year 2022 Highlights

Lease Administration Module

A team of NDUS, CTS, and State of ND staff collaborated to implement Lease Administration as required by the Government Accounting Standards Board (GASB) Statement 87. This module streamlines lease administration for ND state agencies and the NDUS to effectively manage lease terms and costs. The project also included the installation of a custom solution to meet the requirements for GASB 87 Revenue Lease Accounting. This solution includes the calculation of deferred inflow/lease receivable as net present value (NPV) of lease revenue, and books monthly lease and interest revenue using delivered journal generation processes.

Supplier Portal Change Request

The Supplier Portal, deployed in 2020, has recently been enhanced with new functionality allowing online registration for new suppliers. By the end of fiscal year 2022, a Supplier Change Request process was implemented, which consists of a workflow for the review and approval of new supplier registrations and change requests.

Supplier Audit Functionality

The Supplier Audit functionality was implemented in April 2022. With this implementation, reports can be generated to identify what changes have been made to supplier records. Those with access to the Supplier Audit Inquiry and Supplier Audit Log will be able to see what fields were changed, when it was changed and by who, the content before and after the change, and any comments regarding the change.

Spring Patching

The Spring FIN upgrade provided enhancements to the user interface, including pivot grids, real-time elastic search indexing, breadcrumbs in the NavBar, alphabetical sorting of the NavBar menu, and the addition of Kibana Analytics.

Current Projects

PCard Data Encryption

NDUS staff is developing PCard data encryption to secure credit card numbers. The system will modify the display to show only the last four digits of credit card numbers, including credit card numbers that are display-only and editable.

Expense Report Entry for Employees at Other Institutions

Development is in process to enable institutions to enter expense reports for employees at other institutions. This enhancement will permit the System Office to reimburse employees through the Travel and Expense module when the employee is employed at another institution.

Fiscal Year 2023 Roadmap

Kibana Data Analytics

Kibana Data Analytics provides rich analytics and visualization to enable better decision-making and improved understanding of data. PeopleSoft security is applied to the application data, allowing only authorized users to access Kibana and see the data for which they have permission. An anticipated highlight of this future integration is a financial dashboard that will display budget activity including budget and spending amounts.

Travel and Expense Enhancements

The Travel and Expense module will be transitioning to Fluid data entry. PeopleSoft Fluid pages are designed for smartphones, tablets, and desktops. When accessing a PeopleSoft Fluid page, the system detects the device you are using and renders the appropriate display size.

PCard Transactions in Travel and Expense

This functionality will load an employee's PCard transactions into the My Wallet feature within the Expenses module. Employees will be able to create an expense report and pull in the credit card transactions associated with the reimbursement.

eForms

The Financials team is awaiting approval to begin building two new eForms - one for campus users to request PCards, and the other is the Personnel Activity Confirmation (PAC) form for use in Grants. Each of these forms would replace existing paper processes with automated, electronic solutions.

Campus Connection

Campus Connection is the system of record for more than 46,000 active students within the NDUS. The Campus Connection team supports all 11 institutions with day-to-day operational data and functionality for all aspects of the student learning cycle, including Financial Aid, Admissions, Student Records, Academic Advisement, and Student Financials. In addition, the Campus Connection system integrates with 40 university data systems, including Housing, Parking, Facilities Management, and scheduling (Ad Astra). Lastly, the Campus Connection team supports Blackboard Learn, Starfish, and other systems related to student success and intervention initiatives. While each module supports its functionality, the total environment seamlessly tracks student progress, registration, graduation, and overall success.

This past year, CTS hired two full-time associate programmers for Campus Connection, which has allowed the team to expand their capabilities and extend their skill sets into Power BI and the related query training. In addition to the highlights listed below, the entire Campus Connection team was immersed in the completion of two major projects this last year - Gideon Taylor Electronic Forms and the implementation of Nelnet.

## Gideon Taylor Electronic Forms (GT eForms)

Perceptive Content discontinued its digital forms software, Transform, prompting CTS to issue an RFP and enable a new solution before the current product's end of life. GT eForms, a PeopleTools-based and Oracle-certified form application, was selected and implemented over the past year, resulting in the redevelopment of over 100 electronic forms for the NDUS.

TouchNet Transition to Nelnet

CTS changed student payment vendors from TouchNet to Nelnet. This major project resulted in significant cost savings across the NDUS, increased processing speeds, and institutional branding.

Statewide Longitudinal Data System (SLDS)

The SLDS provides K-20 longitudinal data reporting. It is a collaborative effort involving the NDUS, the Department of Public Instruction, the Department of Commerce, Job Service North Dakota, and the North Dakota Information Technology Department. Current projects through the SLDS are the Financial Aid Scholarship Management System and the Reverse Transfer initiative, which provide avenues for degree completion and students' graduation rates. Additional data, overview, and research are located at: www.slds.nd.gov
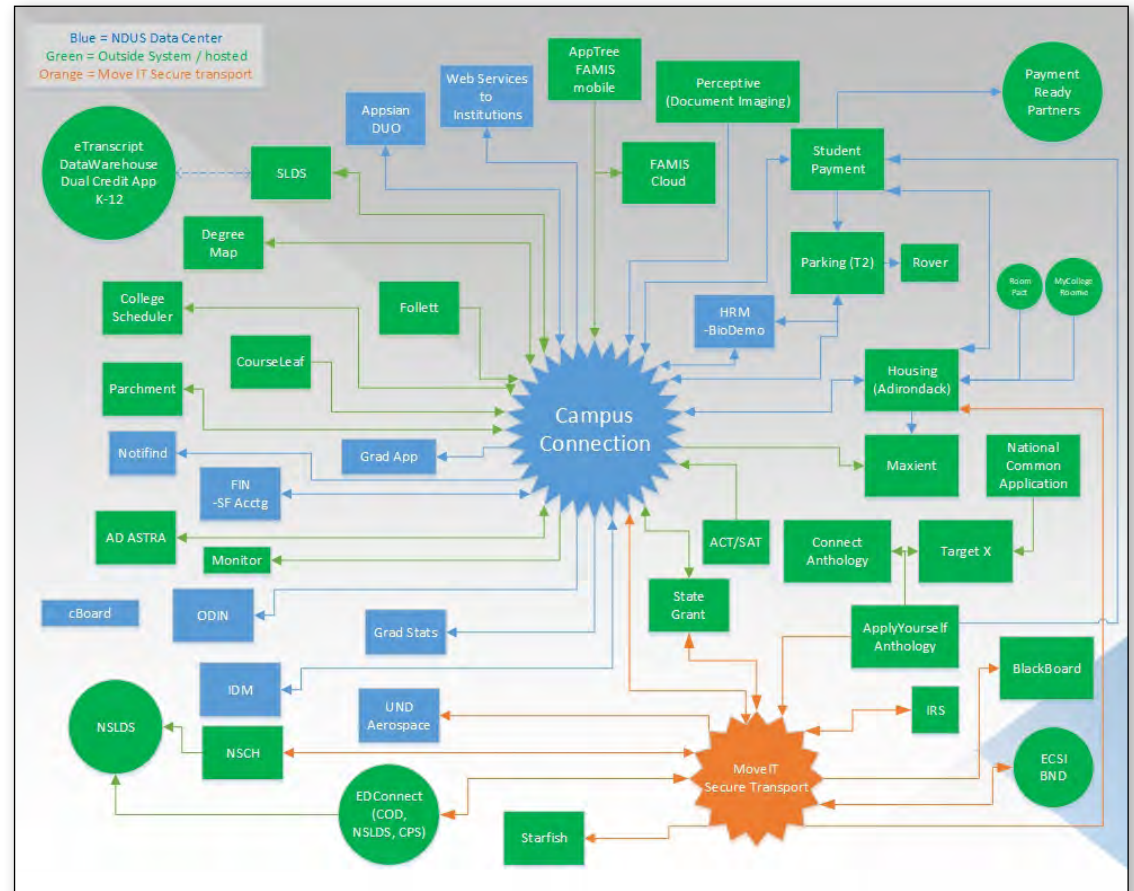
Fiscal Year 2022 Highlights

- With the decline of COVID infections, the Campus Connection team was able to resume in-person campus visits to facilitate introductions for new staff, provide training, and continue to foster working relationships with institutions.

- A new process was implemented to avoid shutting down Campus Connection to back up necessary data for reporting census figures and earned degrees. In the past, this could occur up to ten times a year, up to four hours at a time. This change enhances the availability of the system for students, faculty, & staff.

- The Campus Connection team participated in the annual free Admission Application program supported by the Bank of North Dakota, which waives over 2,500 application fees for high school students who apply to one of the state institutions.

- The Housing Director (THD) system was migrated from on-premises to hosted services, allowing customizations and branding by institutions.

- The use of T2, the University System's hosted parking service, was expanded by adding Dickinson State University.

- A revised aid year prep process was implemented, which breaks down the functions of preparing for the new financial aid year by aligning with common financial aid processes.

- CTS Financial Aid business analysts provided design support for the new ND Dual Credit Scholarship in the ND Scholarship Management System.

- A new custom process was designed and developed to automate updates to the Financial Aid module for collaboratively enrolled students, replacing a previously manual process.

- A financial aid data security training was created and presented at the North Dakota Association of Financial Aid Administrator's annual conference in Williston in spring of 2022.

- Campus Connection business analysts and programmers worked together with campus representatives to gather requirements and complete a data model proof of concept for the NDUS Information and Data Governance (IDEG). This effort resulted in the creation of an Enrollment History Data Model in Power BI for campuses to access and generate a variety of reports using historical enrollment data. Additionally, the IDEG created the NDUS Data Information Hub which provides NDUS data stewards a one-stop information and resource site pertaining to NDUS data. This site includes information on the NDUS data governance operations, a data catalog of Power BI datasets available to NDUS users, data access request forms, and Power BI training information - ndusbpos.sharepoint.com/sites/NDUSInfoandData.

Current Projects

- TargetX and Salesforce were recently awarded a contract to replace the existing NDUS admission application and CRM system for nine institutions. Both UND and NDSU have managed their student recruitment operations within TargetX and Salesforce for several years. Members of the Campus Connection team have started working alongside the campuses and the vendor to develop an implementation plan; this system is expected to go live by the end of FY 23.

- Planning is underway for the biannual North Dakota Higher Education User Group (NDHEUG) conference, which will be held in Bismarck in fall 2022. This event brings together staff from all eleven institutions for networking, training, and collaboration.

- In conjunction with the National Student Clearing House, CTS is implementing Myhub to provide a centralized and secure online location where NDUS students can access all their academic records from multiple institutions from a single site.

- CTS supported the State Attorney General's request by providing students with a document from Campus Connection easing the ability for students to vote in their correct voting location.

- Work is underway to replace the manual process of sending data to the Department of Education with an automated solution by December 2022.

Fiscal Year 2023 Roadmap

During the upcoming year, the Campus Connection team will implement the next series of PeopleTools, the underlying programming that provides expanded data tools for the Campus Connection system. Additionally, the team will continue to install quarterly Oracle product updates to Campus Connection, increasing new functionality and security for students and staff.

The Department of Education is mandating changes to the Free Application for Federal Student Aid (FAFSA) program to increase its effectiveness and ease of use for students and parents. CTS will implement these required changes during the 2022-2023 financial aid year to support the FAFSA Simplification Act and FUTURE Act.

Enterprise Services

Enterprise Services (ES) is the department responsible for the design, development, implementation, training, course development, support, maintenance, and administration of enterprise-class information technology solutions. This team also provides IT leadership and vision while planning current and emerging technologies that expand and enhance teaching, learning, and business operations across the North Dakota University System. Supported applications include a document imaging system, eSignature platform, secure managed file transfer, learning management systems (LMS), O365, video conferencing, Web solutions, mobile applications, and numerous integrations. Enterprise Services is comprised of teams that are highly integrated, including the CTS Service Desk, to provide complete solutions to serve the needs of NDUS constituents.

Fiscal Year 2022 Highlights

Blackboard (Bb)

Over the past year, the core Blackboard Learn system was upgraded to Ultra-Based Navigation (UBN), which provides a modern, intuitive learning experience for faculty, students, and staff. UBN is more responsive on mobile devices and provides a simplified and accessible interface. With this new design, course information is consolidated; users can go to one place to check email or grades for all their courses rather than navigate to each course individually. Users' ability to learn anytime, anywhere is markedly improved with UBN.

Additional Blackboard updates and highlights from this year:

- *Blackboard Learn*
  - Launched a new login interface with multifactor authentication for elevated system accounts.
  - Implemented student pronoun and pronunciation features.
  - Lead a concerted effort with NDUS institutions to improve the management of YuJa video storage by implementing retention policies to reduce the footprint of total storage over the 2021-2022 academic year. YuJa is an enterprise video platform that integrates with Bb Learn and includes lecture capture, file streaming, live streaming, quizzing, and video exam proctoring.
  - Conducted Bb Day 2021 at Bismarck State College. This annual event brings together CTS and NDUS campus Blackboard support staff and users for a day of product demonstrations, discussions, and vendor one-on-ones.

- *Blackboard Collaborate*
  - Implemented new retention policies to manage the storage footprint, reducing storage by 59%.

Reduction in Yuja Video Storage
YuJa Storage (TB)

- July 2020: 42.5
- July 2021: 74.2
- July 2022: 56.1
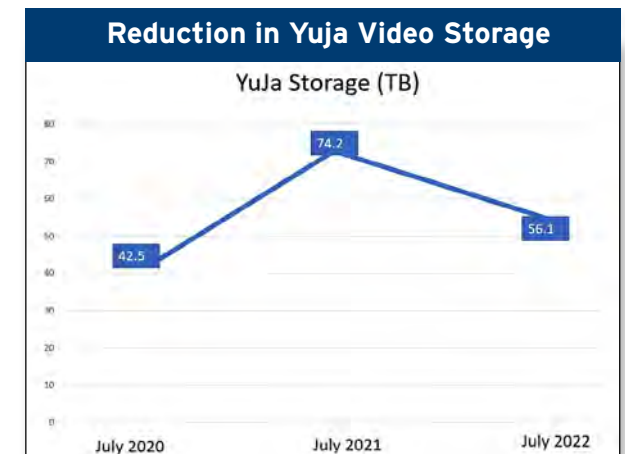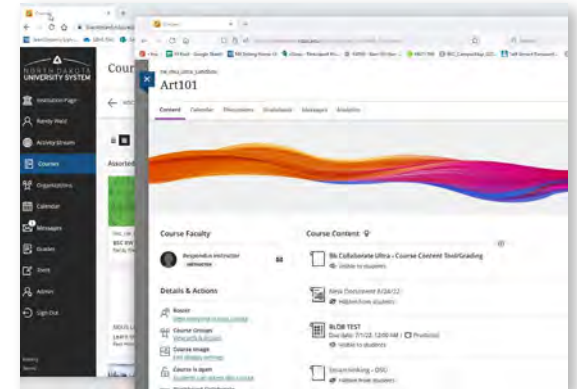
Secure File Transfer System

Enterprise Services continues to provide configuration and administrative services for LiquidFiles (sendfiles) and MOVEit MFT (Managed File Transfer) Solution, offering secure exchange of critical business data and sensitive files both internally and externally. These systems ensure delivery to the intended recipients, document transfer activities with an audit trail, and enforce file retention policies. The MOVEit system facilitates data transfers from server to server, server to person, and person to server. On average, the MOVEit system automates the moves of approximately 100,000 files a day with users/systems averaging uploads of over 23,000 files and downloads of over 16,000 files. The sendfiles system is available to all faculty and staff and is used to send hundreds of secure messages every month.

Mass Communication Delivery Systems

The ES staff administers and maintains the day-to-day operations of three statewide communication systems: Assurance, Listserv, and Blackboard Connect. Message delivery methods include targeted emails, phone calls, SMS (texting), as well as other message types. These systems are essential for providing emergency notifications for individual institutions as well as the state system. One campus also utilizes these services in conjunction with the National Oceanic and Atmospheric Administration (NOAA) for severe weather alerts.

Document Imaging and Form Solutions

The Document Imaging team completed the conversion and transition of 124 electronic forms utilized by NDUS institutions from the current form solution, TransForm, to either GT eForms or DocuSign. Each form was analyzed for usage, specific requirements, and attachment and/or storage needs to determine the best solution. For NDUS forms needing to integrate with the Perceptive Content document imaging system, DocuSign was the preferred third-party solution for those impacted processes. This same integration is also utilized by NDSU and UND, as both institutions operate their own DocuSign instance. Due to increased DocuSign volume, the team enabled the document retention feature in the NDUS instance of DocuSign, which completed all the identified security enhancements for the application. Over fiscal year 2022, 2,958 DocuSign forms were submitted, which is an increase of 638 submissions over fiscal year 2021.

Full Stack Team

This new Enterprise Services team was created to unify software development and management of web-related applications and systems. This team also:

- Focuses on interfaces, integrations, workflows, WordPress, and website debugging/performance/security.
- Collaborates with users on specifications and requirements to incorporate into existing NDUS/CTS applications.
- Develops working relationships with other teams that may benefit from these services.

Training

Enterprise Services offered supplemental training sessions for Microsoft applications, including Word, Excel, PowerPoint, OneNote, OneDrive, Teams, and Outlook. In fall 2021, 314 NDUS employees signed up for training; by spring 2022, registrations spiked to 1,377 employees, totaling 1,691 registrations. Training registrations were highest for Excel, OneDrive, and OneNote applications. ES team members also administered the final cohort training to several Power BI users from across NDUS.

Service Agreement

CTS provided application administration under a service agreement with UND for nearly 35 software applications hosted on-premises (OP) in the data center and/or hosted in a cloud service, also known as Software as a Service (SaaS).

Software Application Administration Services

- Architectural design (OP)
- Application and Desktop Virtualization (OP)
- Installation and implementation (OP)
- Domain Management (OP/SaaS)
- 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)

Other Completed Projects and Achievements

- Designed infrastructure for a multi-institution instance of the counseling application, Titanium.
- Configured and deployed a tiny URL service for System Office and CTS, which shortens lengthy webpage addresses.
- Evaluated and re-assigned all NDUS O365 licenses to accommodate new features and the CTS move to Teams Voice.
- Revised State Board of Higher Education Dashboards with new designs and dashboards to go with current SBHE initiatives.
- Created searchable Policies and Procedures documents on the NDUS website to allow a better user experience and eliminate confusion.
- Lead and implemented CTS's move from landline phone services to Microsoft Teams Voice.
- Coordinated a Microsoft Symposium online conference featuring Microsoft experts who presented on a variety of topics and applications.
- Nominated for a 2022 Blackboard Catalyst Award in the Leading Change category; this nomination was for effectively leading a complex implementation of the Bb Analytics for Learn product across multiple campuses and successfully balancing the campus autonomy with systemwide consistency.
- Presented at the 2022 Alliance national conference – Pardon our Dust: Radically eForming PeopleSoft at NDUS, a session which shared the NDUS's time-sensitive evaluation and transition process from one eForm product to two other solutions.

Current Projects

- Re-integrating LMS third-party tools to adopt updated LTI and API integrations to replace the deprecated technology of Building Blocks within Bb Learn.
- Assisting in the development of systemwide vaccine information courses.
- Conducting an RFP for an asynchronous, interactive collaboration and sharing tool. Such tools help engage online learners, provide alternative platforms for faculty lectures and instruction, student presentations, and engage collaborative groups.
- Supporting Dickinson State University and Valley City State University as they implement a more modern course design, Ultra Course View, within the Blackboard Ultra-based Navigation environment. The outcome of this project will reveal best practices and become the impetus for other institutions to follow suit.
- Working with NDUS institutions to develop best practices and policies for the adoption of Himalayas, a new YuJa cold storage product for NDUS institutions that will continue to reduce the overall footprint of data with YuJa.
- Deploying Blackboard Data, a unified data source for all Blackboard products and services, for all NDUS institutions.
- Enabling single sign-on for the document imaging application, Perceptive Content, and its web-based version.
- Assisting with TDx CTS Portal redesign.
- Designing and developing a custom, self-service device registration portal for students to register personal devices, including smart TVs and gaming consoles, that are not able to authenticate to gain access to the campus network. This service will be launched for a few campuses this fall.

Fiscal Year 2023 Roadmap

- Support and facilitate the implementation and adoption of Bb's Ultra Course View for all institutions.
- Continue to address campus needs for Blackboard Data and Analytic reporting.
- Expand Microsoft training opportunities for NDUS staff to improve productivity.
- Further evaluate where Enterprise Services can reduce the data footprint created by the use of educational tools.
- Increase the use and capabilities of GT eForms by applying new functionality, creating process improvements and enhancements through automation and integrations, and expanding the use of reporting and analytics.
- Rollout of new Service Desk under the CTS ServiceOne initiative that is built around the ITIL framework.
- Assist and consult with campuses that decide to transfer phone service from landlines to Microsoft Teams Voice.
- Work with campus administrators on policy and procedures to automate the deprovisioning of Office365 user accounts in a timely manner.
- Implement additional data privacy and security features within O365 to identify and classify confidential information, which will control how information is shared and improve protection from malware and phishing attempts.
- Implement a personalized secure file drop using LiquidFiles for all faculty and staff; this practice will become the preferred, safer method for sending sensitive documents, such as those containing PII, rather than through standard email.
- Enhance the infrastructure, policies, and procedures of the current tiny URL service to prepare for systemwide usage.

Online Dakota Information Network (ODIN)

The ODIN system provides library management services for 60+ libraries across North Dakota. This includes all 11 institutions of the North Dakota University System and two private higher education institutions who use the Alma library platform by Ex Libris. The remaining ODIN libraries are comprised of K-12 schools, public libraries, and special libraries who use the Polaris library management system by Innovative Interfaces.

ODIN continues to evolve by partnering with member libraries to explore and evaluate products that will best meet the needs of ODIN libraries and their users. ODIN strives to identify technologies which will enhance the missions and strategic plans of ODIN and member libraries, while keeping an eye toward efficient, secure, and cost-effective solutions.

Fiscal Year 2022 Highlights

ODIN Website

An ODIN website redesign was launched in July 2021 www.odin.nodak.edu. The new layout offers a more streamlined experience for users, targeting access to specific databases as well as information and training for the library software supported by ODIN.

Ex Libris Alma

The Ex Libris Alma platform is used by ODIN's academic libraries to manage physical and electronic material for their institution (including access, loan of material, and inventory maintenance). As Alma has matured, users have gained valuable experience and become savvier in their usage of the platform. Librarians and ODIN staff participated in several training and informational opportunities provided by the vendor, and virtually attended the annual online user group conference (ELUNA).

Polaris

ODIN continues to support Innovative Interface's Polaris software, which is utilized by public, K-12, and special libraries in our consortium. Library members have increasingly implemented additional aspects of the software, such as outreach services and inventory management. Staff worked through two upgrades to the software, enhancing current functionality and moving many purchasing and inventory tasks from their legacy client software to the newer web-based interface. Librarians and ODIN staff participated in several training opportunities provided by the vendor to learn about the web-based features and how to improve workflows to become more efficient. Staff also virtually attended the annual online user group conference (IUG).

ODIN Workday

ODIN developed and participated in the annual ODIN Workday where librarians and ODIN staff presented on various software-related topics, including optimizing workflows to handle overdue and lost material, and using analytics to improve reporting mechanisms. Also included on the agenda were programs for Leganto, a course resource management tool which enables faculty to easily deliver materials to students, and Primo, the user discovery interface for physical and electronic material. This conference yielded ten presentations on Alma, Polaris, Leganto, Primo, and the ODIN website.

Emerging Technologies Committee

To stay abreast of new technologies in the library field, ODIN created the Emerging Technologies Committee to review new products (and current product updates) on the market. Additionally, ODIN has implemented a series called Tech Talks where ODIN staff lead the member community through a deeper discussion of technologies available to librarians. The inaugural Tech Talk discussed opportunities for creating an interlibrary loan bridge to share material between the Alma Academic library platform and the Polaris Public/K-12/Special library system. A more recent Tech Talk provided instruction to libraries on using Counter Reporting/Sushi harvesting for electronic database statistical usage. Recordings of the sessions are available on the ODIN website.

Current Projects

Polaris is currently being upgraded from version 7.1 to 7.2. In addition to workflow enhancements, this upgrade involves a server move from the currently hosted environment to another. ODIN is coordinating the details of the upgrade and move to ensure the transition is seamless for member library users.

ODIN participates in and provides authentication services for a shared electronic resources package negotiated by Minitex and customized for North Dakota www.minitex.umn.edu. These E-Resources continue to enhance the education, economic development, and overall quality of life for citizens of North Dakota.

Preparation work and migration details are being coordinated between ODIN and three new member libraries that are slated to join the ODIN organization this year: Elgin Public Library, Kidder County Library, and Maddock Community Library. ODIN will configure, migrate, train, and launch all three libraries before Fall 2022.

Fiscal Year 2023 Roadmap

In conjunction with the North Dakota State Library, access to E-Resource databases will be provided to all North Dakota libraries through funding from Federal American Rescue Plan dollars. ODIN has updated authentication processes to allow for every library to access these databases free of charge for the upcoming fiscal year. This will result in significant monetary savings for member libraries and offer non-member libraries an opportunity to preview the databases and potentially subscribe in the future.

In January 2023, a product called the Vega Starter Kit will be made available to Polaris customers with the goal of making the configuration of email notifications for both overdue and requested material to patrons easier. Currently, ODIN office staff must create and maintain configurations for formatting and verbiage of patron notifications for each individual library. The starter kit will allow libraries to control their own configuration with minimal ODIN intervention. The ODIN office will provide initial configuration and testing of the product before rolling it out to member libraries.

ODIN will continue to partner with member libraries to research emerging technologies.

NDUS System Service Cost Evaluation

NDUS Support for System Services

- CTS/SO Payment $10,930,292.05 — 74%
- Campus Payment $1,335,973.87 — 9%
- Special Funds $2,495,313.29 — 17%
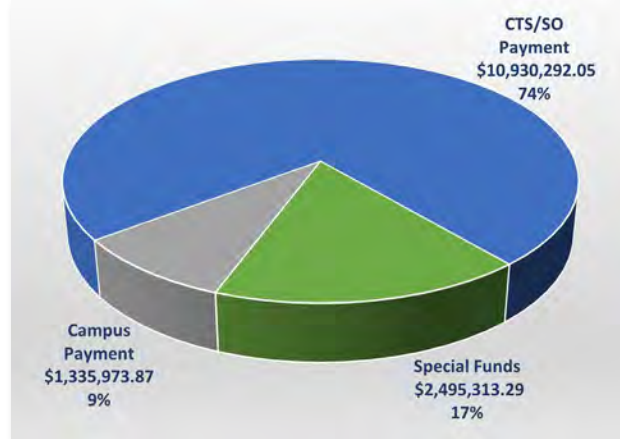
NDUS System Services Spend by Institution (Student FTE)

Institution	Spend
BSC	$1,008,962
DCB	$227,843
DSU	$468,753
LRSC	$341,765
MASU	$316,857
MISU	$890,141
NDSCS	$812,559
NDSU	$4,363,730
UND	$4,277,983
VCSU	$451,195
WSC	$265,817

Cost by System Service (Over $100,000)

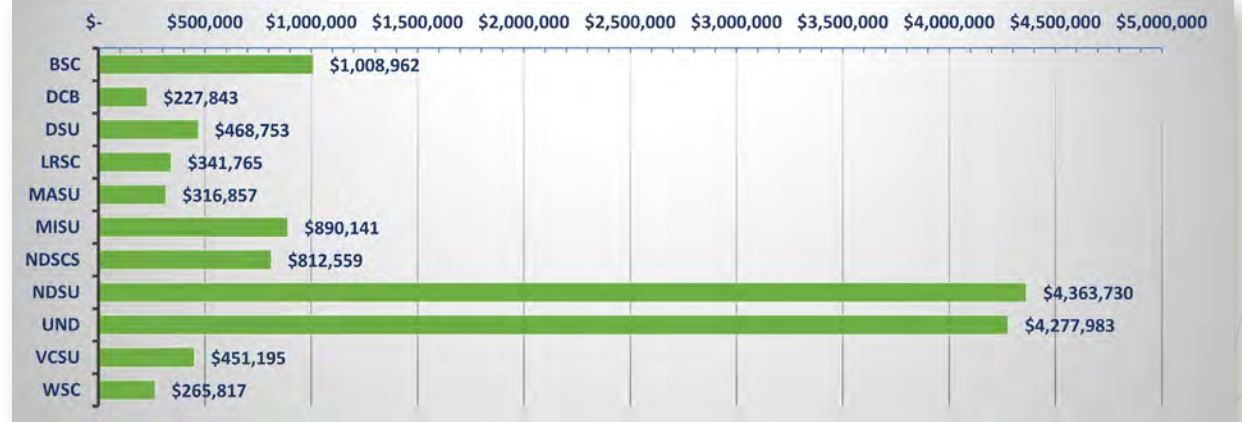| System Service	Cost
WIDE AREA NETWORK - STAGENET	$2,044,263
PEOPLESOFT - ENTERPRISE FINANCIAL & HR SYSTEMS	$1,761,341
ENTERPRISE LEARNING MANAGEMENT SYSTEM	$1,733,108
PEOPLESOFT - STUDENT INFORMATION SYSTEM	$1,434,362
ODIN ACEDEMIC LIBRARY SYSTEM *	$770,844
MICROSOFT SOFTWARE	$712,303
IDENTITY MANAGEMENT SYSTEM	$628,344
CREDIT CARD PAYMENT PROCESSING SERVICE	$619,634
DOCUMENT IMAGING	$557,104
NDUS HELP DESK & TICKETING SYSTEM (SNOW)	$514,771
ENDPOINT SECURITY SOFTWARE	$423,500
CAMPUS APPLICATION SYSTEM AND CUSTOMER RELATIONS...	$396,495
STUDENT RETENTION APPLICATION	$372,041
FACILITIES MANAGEMENT SYSTEM	$216,731
STUDENT SCHEDULING SYSTEM	$215,320
PEOPLESOFT TESTING SERVICE	$195,469
LECTURE CAPTURE SYSTEM	$195,023
NEW PAYMENT PROCESSING SERVICE	$161,985
CTS DATA ANALYSIS SYSTEM	$154,973
SURVEY TOOL	$118,256
SECURITY VULNERABILITY MANAGEMENT	$117,502
PARKING SYSTEM	$114,547
MICROSOFT O365 SUPPORT	$112,250
MULTI-FACTOR AUTHENTICATION	$100,184
OTHERS	$1,091,229

* ODIN costs do not reflect costs related to the K12/Public/Special Library System

NDUS System Services Spend – per Student per Year

$408.32

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 the North Dakota University System's infrastructure needs.

This goal provides the foundation for Information Technology (IT) in support of NDUS business processes. Infrastructure integrates and links information technology systems and allows those systems to communicate with each other over a network. Infrastructure 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 — Facilitate digital transformation of systems and services.

Digital transformation enables reduced cost and improved productivity, customer service, governance, and compliance. To remain competitive, the NDUS will facilitate and provide opportunities for digital transformation.

Goal 3 — Provide a user experience that is responsive to changing needs and expectations.

In the rapidly evolving world, the needs and expectations of our users - students, faculty, staff, North Dakota residents, and affiliates worldwide - are changing. The NDUS systems and services must be responsive to meet their needs and address their expectations.

Goal 4 — Improve and enhance the North Dakota University System's collaborative efforts.

By working together and with the State, K-12, and other constituents, the NDUS is able to implement, integrate, and support systems and services that further the missions of NDUS institutions.

This concludes the 2021-2022 NDUS Core Technology Services Annual Report