NORTH DAKOTA
UNIVERSITY SYSTEM

ACCESS. INNOVATION. EXCELLENCE.

Information Technology

Strategic Plan 2019-2021

Presented by

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Strategic Plan 2019-2021

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Executive Summary

Greetings,

As we continually work to improve our information technology processes, we decided to change the format of this biennium's IT Strategic Plan. Our goal is to clarify how all of the IT organizations throughout the North Dakota University System (NDUS) work to support their institution's mission as well as the mission of the State Board of Higher Education.

Previous iterations of this plan listed numerous projects from very large to very small. The rapid pace of technological change makes it difficult to predict whether or not a specific project will actually still be relevant a year or two in the future. This doesn't mean we can't be strategic in IT. It's just an admission that the rapidly evolving IT landscape does not cleanly fit inside a multiyear planning cycle. Therefore, our intent is to continue to develop strategies that support the ongoing goals of the NDUS Strategic Plan and also identify broad strategies that will help direct our work in rapidly changing technological landscape.

Later in this document, you will see the seven primary areas where we anticipate our IT projects to occur. We will continue to focus on and support the ongoing operational goals like infrastructure and business systems, while also establishing a strategic direction in IT security, mobility, cloud, and effective use of data.

I look forward to the continued collaboration with the institutions of the North Dakota University System and other strategic partners. These are exciting and challenging times to be in higher education and I am optimistic that we can work together to execute our strategies to expand and enhance the experiences of students across the NDUS.

Sincerely,

Darin King

Goals

N.D.C.C. 15-10-44.c requires the State Board of Higher Education to manage and regulate information technology plans and services including the integration of higher education information technology planning and reporting with the board's strategic planning process.

The North Dakota University System has published *The NDUS Edge 2015-2020 Strategic Plan*. The NDUS strategic goals listed in the document are as follows:

1. Deliver degrees that are the best value in the nation.
2. Provide programs people want, where and when they need them.
3. Equip students for success.
4. Maximize the strengths of the unified system.

This NDUS Information Technology (IT) Strategic Plan aligns with and supports the strategic plan brought forward by the Chancellor and approved by the State Board of Higher Education.

This section of the NDUS IT Strategic Plan lists the NDUS IT goals, their purpose, how they align to the NDUS Strategic Plan, and the strategy objectives to meet those goals.


GOAL ONE

To support North Dakota University System infrastructure needs.

Purpose

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 security and access control, requiring development and periodic updating of guidelines. Enterprise Architecture provides a blueprint for establishing information technology policies, procedures, and guidelines to promote effective use of information technology.

Alignment with NDUS Strategic Plan

This goal aligns with and supports the NDUS Strategic Plan Goal – Maximize the strengths of the unified system.

Strategy Objectives

1. Offer reliable, cost-effective and appropriate network services for NDUS institutions.
2. Provide tools and technologies to help people more easily use networked resources and services, while ensuring security and privacy of the information.
3. Provide tools and technology to enhance data and system security in order to reduce the impact of cyber threats.
4. Utilize the network infrastructure for the convergence of voice, data, and video, along with other collaboration tools.
5. Enable libraries to provide easy access to licensed electronic information.
6. Provide leadership for IT enterprise architecture, IT planning, project management, and service management.
7. Provide linkage through STAGEnet, Internet2, and other national and international research and development networks.
8. Provide a centralized IT infrastructure with maximized efficiencies that meet NDUS institutional needs.

GOAL TWO

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

Purpose

This goal is the essential core that supports business processes of the institutions and the North Dakota University System (NDUS). In order for institutions to remain competitive and offer information technology support for students, faculty and staff, including research and public service, the NDUS must provide and manage information technology resources aligned with NDUS strategic goals.

Alignment with NDUS Strategic Plan

This goal aligns with and supports the NDUS Strategic Plan Goal – Deliver degrees that are the best value in the nation.

Strategy Objectives

1. Maintain critical core functions and implement upgrades and enhancements to the student management, financial/human resources management, data warehouse, library, administrative, and academic technology systems.
2. Identify and integrate appropriate NDUS CTS systems to create operational effectiveness and efficiencies.
3. Provide cybersecurity training and materials to faculty, staff and students to assist in the protection of critical systems and data.
4. Provide enterprise architecture administration, enterprise IT planning, procurement, and project management expertise.
5. Enhance educational experiences with new or repurposed resources that expand user services, technologies, and initiatives.
6. Maximize IT infrastructure to improve services to students, faculty, staff, and the citizens of the state.
7. Hire, train, and retain highly competent professional staff to meet the needs of NDUS services.
8. Provide centralized IT procurement services that allows multiple institutions to easily acquire software that meets their business needs.


GOAL THREE

To improve and enhance North Dakota University System student learning and users' focus.

Purpose

Empower student learning and development through the use of technology by providing a near seamless environment with boundless access to information, educational, and research resources – both inside and outside the classroom, for all types of students from undergraduates to lifelong learners.

NDUS encourages and supports an operational environment where the characteristics of its users – student, faculty, staff, North Dakota residents, and affiliates worldwide – are identified, their needs are understood, their relationships and expectations are effectively managed, and to foster quality delivery of their services and support.

Alignment with NDUS Strategic Plan

This goal aligns with and supports the NDUS Strategic Plan Goal – Equip students for success.

Strategy Objectives

1. Leverage the IT infrastructure to create an environment for enhancing learning.
2. Evaluate enhancements to the Online Dakota Information Network's (ODIN) library systems and services to improve functionality that supports the evolving needs of users.
3. Continually improve standards, policies, procedures, and services that facilitate seamless, integrated learning.
4. Collaborate with NDUS institutions to identify business needs and respond to their expectations in a timely manner.
5. Continue to gather feedback from the NDUS user community on services provided by NDUS CTS.
6. Provide effective, efficient, and highly available IT help desk capabilities, while ensuring self-help resources extend support services

GOAL FOUR

To improve and enhance North Dakota University System collaborative efforts.

Purpose

Provide a seamless experience for students taking classes at multiple NDUS institutions. By working together and with the State, K-12, and other constituents, the NDUS is able to bring new technologies to North Dakota and find efficiencies in supporting existing ones.

Alignment with NDUS Strategic Plan

This goal aligns with and supports the NDUS Strategic Plan Goal – Provide programs people want, where and when they need them.

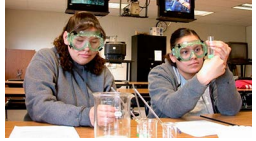
Strategy Objectives

1. Optimize helpdesk services within the NDUS community.
2. Continually improve communications with all stakeholders.
3. Collaborate with NDUS institutions, K-12, state/local governments, and libraries to identify and deploy appropriate administrative, learning, and research support systems.
4. Identify where converged services are appropriate and work with the NDUS institutions to deploy the services to enhance collaboration.
5. Enable collaboration among learners by providing easy, efficient, and reliable access to learning resources anytime and anywhere.
6. Leverage educational resources and IT systems to minimize barriers between institutions, libraries, and other sources of learning.
7. Expand virtual and digital holdings available within the Online Dakota Information Network (ODIN) libraries.
8. Promote Internet2 and research-level infrastructure.
9. Continue the integration of video, audio, and data collaborations in cross-platform environments.
10. Collaborate with business and industry to identify opportunities for innovations that enhance NDUS CTS systems and services.

Strategic Plan

The North Dakota University System CIO council identified four areas of concentration during the next biennium. They include IT Security, Retention, Mobility and Access/Use of Data.

Strategic Plan

IT Security

Security is obviously a key concern. A data breach involving personal or financial information could significantly impact faculty, staff, students, and alumni by exposing them to financial loss or identity theft. Data breaches involving intellectual property or research data could put an institution's research grants at risk and have serious economic consequences. A data breach can also significantly impact an institution's reputation, not to mention costing the institution millions of dollars in mitigation and direct cost. An article in EdTech magazine noted a report by Gemalto that found "the number of lost, stolen or compromised data records went up 164% in the first six months of 2017." Researchers from the Ponemon Institute found that it costs, on average, $245 per compromised record for U.S. education entities. According to Privacy Rights Clearinghouse, there have been 12 known data breaches on educational entities during the first five months of 2018. One breach, at Broward College, affected 44,000 records including name, date of birth, address, social security number, financial account numbers, credit/debit card numbers, and/or driver's license or state identification card number. There were 16 identified breaches for the year of 2017, including Stanford University with 10,000 records affected and UCLA with 30,000 records affected. The NDUS IT organizations are committed to the security of our information systems while balancing funding limitations and operational needs.

NDUS is utilizing the National Institute of Standards and Technology (NIST) Cybersecurity Framework (NCF) as the foundation of our security planning. The NCF has identified five primary areas of cybersecurity: Identify, Protect, Detect, Respond, and Recover. The Information Security Office, in collaboration with the NDUS Information Security Council (ISC), identified 52 initiatives across these five areas to focus on over the next five years. Below is a quick look at the top 10.

Systems and Software Management

NCF Areas
Identify
Protect
Respond

In order to protect our environment and keep it functioning properly and securely, we need to first identify the systems and software we are using and then actively manage and keep them up-to-date. Projects in this area could include software and hardware inventory systems, software deployment and configuration management, and patch management systems.

Data Loss Prevention

NCF Areas
Identify
Protect
Respond

Avoiding loss of data is paramount to security. Projects in this area could include sensitive information discovery tools that could scan endpoints and network systems for restricted and private information. This area could also include projects to implement data loss controls in systems where sensitive information might be exposed, such as email and cloud services, and projects to implement endpoint and data encryption.

Endpoint Security

NCF Areas
Identify
Protect
Respond

Endpoint security is about protecting the devices accessing our systems and networks from malware, exploits, ransomware, data loss, and other threats that may compromise our data and systems. Projects in this area could include endpoint security (antivirus) software, advanced endpoint protection software, and host-based intrusion prevention systems.

Penetration Testing

NCF Areas
Identify
Detect

A successful defensive posture requires us to periodically test our defenses to identify gaps in security. We want to identify these gaps before an adversary does. We also need to assess our readiness to respond to these attackers if they do discover and attempt to take advantage of these weaknesses. Projects in this area might involve implementing internal tools and capabilities to conduct penetration testing, as well as engaging third parties to conduct penetration testing.

ID and Access Management

NCF Areas
Identify
Protect
Respond

One of the most common attack vectors involved in data breaches and system compromise is stolen and misused credentials. NDUS must continually improve access management by implementing security controls such as multi-factor authentication and working on improving and expanding identity and access management sytems.

Vulnerability Management

NCF Areas
Identify
Protect
Detect
Respond

Vulnerability management is about identifying, classifying, prioritizing, and either remediating or mitigating vulnerabilities in systems and software. Projects in this area would include expanding and adding to existing vulnerability management systems and capabilities.

Centralized Logging

NCF Areas
Detect
Respond

All of our information systems, applications, software, endpoints, and network devices across the NDUS generate huge and valuable amounts of log data. In order to use this log data to proactively generate security alerts, provide intelligence for potential security incidents, and facilitate the quick response to and analysis of these incidents, logs from these disparate systems must be centrally aggregated, stored, and protected.

NIPS/Firewall

NCF Areas
Protect
Detect

NIPS are network devices or software applications that monitor networks to detect and prevent malicious activity. Network firewalls are devices that limit access to networks and systems by monitoring and controlling incoming and outgoing traffic based on predetermined security rules. Projects in this area will be to add and expand firewalls and intrusion prevention systems and capabilities on NDUS networks.


Security Awareness

NCF Areas
Protect
Detect

Helping faculty, staff, and students understand security risks and how to better protect themselves and NDUS data and resources is a key to improving the overall security posture of the NDUS. Projects in this area will be the development and expansion of security awareness and security training initiatives.

Security Operations

NCF Areas
Detect
Respond
Recover

Security operations is about the day-to-day response to cybersecurity threats. Projects in this area will be acquiring and developing the capabilities and resources to monitor, assess, prevent, detect, respond, and recover from cybersecurity threats and incidents across the NDUS.

Retention

Student retention is a major focus for NDUS institutions. The IT organizations help support this effort by deploying and supporting data driven applications that key on specific metrics linked to failure or drop out. The applications provide student advisors with important data on key factors that could indicate student progress is at risk. It also allows campuses to track their retention programs to see what level of impact they are having or if adjustments need to be made. Using data analytics tools, institutions are able to develop and react to indicators before the student arrives on campus. Other analytic tools provide real time information to determine the appropriate need for student success interventions.

Mobile

The world of mobile computing continues to grow. According to February 2018 Pew Research data, 94% of 18-29 year olds have smartphones. For 28% of them, it is their only internet connection. Students are coming on to campuses demanding to use their mobile devices for all of their transactions. IT companies recognize the trend and are developing apps that let you do everything from interactively polling a classroom to apps that allow a student to connect to their campus public safety office when walking home late at night. According to Dr. David Odom in his paper "*Teaching with Smartphones in the Higher Education Classroom*," there is a new field of study called mobile learning that is focused on using mobile devices as part of the learning experience.

Deploying mobile friendly apps and making existing applications more mobile friendly will be a focus of the NDUS CIO Council during the next few years. The student information system, the finance system, and the human resource system have become or are in the process of becoming mobile friendly. These updated mobile-centric interfaces utilize newer web-based technologies that recognize the device that's being used and auto-adjusts the page layout and formatting—from large screen devices, such as laptops and desktops, to the reduced viewing space of tablets and smartphones.

The migration to the new Learning Management System also provides students with better access to their classroom materials via mobile devices. Blackboard also has a new interface that campuses are beginning to look at. It is completely designed around the mobile experience.


Access and Use of Data

As we compile more data and information about our institutions and students, we need to be able to get that information to the staff and faculty in a usable format so they can continue to improve our service to students. One way the IT team can do this is with data visualization. This could include developing dashboards for institution strategic plans, completion rates, and enrollment goals – providing institution leadership an at-a-glance view of their priorities. This could also include mapping where students attended high school to see where there might be additional recruitment opportunities.

Another developing approach is to provide and support powerful tools that allow users to customize data sets and create individualized reports. These easy-to-use tools pull data from multiple sources to create unique reports and dashboards, such as the *2015-2020 NDUS Strategic Plan* developed by the NDUS Office of Institutional Research. The same tool is being used to pull essential reports from the facilities management software.

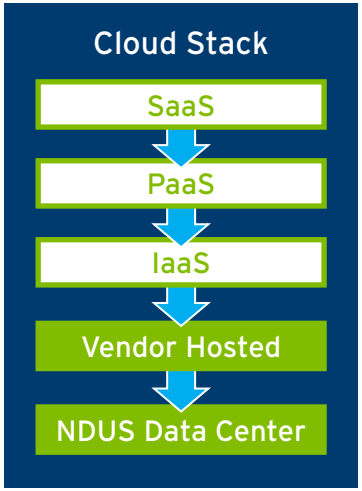
IT teams are also investigating how to make it easier to provide increased access to data sets in a secure environment.

CTS is participating in a pilot project that will provide NDSU with real-time data from the human resource system and the student information system, in order to more efficiently support multiple business processes unique to the campus. For example, this project will seamlessly provide ACT and/or SAT scores to NDSU, so the students can be enrolled in the correct math placement course in the Learning Management System.

Cloud?

The NDUS strategic perspective of "Cloud?" represents our intent to evaluate cloud solutions when making changes to existing on premises solutions or investigating new solutions. It doesn't mean cloud only. NDUS will continue to evaluate and select enterprise solutions that support strategic objectives, are cost effective and resource efficient.

The 2018 Software-as-a-Service (SaaS) Industry Market Report by *FinancesOnline*, states that nearly 73% of organizations will have the majority of their applications delivered as SaaS by 2020. Part of the NDUS strategy is to evaluate opportunities to move solutions to the cloud stack from the top down. Our preferred solution is SaaS, but if there are impediments to effective SaaS implementation, Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS), or Vendor Hosted will be considered. Depending on the specific solution, use case, and necessary resources, the NDUS Data Center will continue to host enterprise solutions that serve all institutions of the North Dakota University System.



Summary

Priorities can change quickly at our institutions. The IT teams at the campuses and Core Technology Services are dedicated to provide information technology solutions that can meet that changing demand. They continue to work to improve the services they offer and deploy new solutions that improve the student experience. Working together with institutional and NDUS leadership, we can continue to provide high quality education to the citizens of North Dakota.