North Dakota State Board of Higher Education Retreat Minutes

The State Board of Higher Education Retreat was held Monday, May 22 at 8:45 a.m., on the Bismarck State College Campus, National Energy Center of Excellence, Room 335, 1200 Schafer Street, Bismarck, ND. It was an open forum that was attended by Chancellor Hagerott, System Office staff, campus Presidents, campus representatives, Core Technology Staff (CTS), Ms. Larson, Assistant Attorney General.

SBHE Members present:

Dr. Casey Ryan, Chair
Ms. Danita Bye
Ms. Sadie Hanson
Mr. Kevin Black
Dr. Lisa Montplaisir, Faculty Advisor
Mr. Tim Mihalick, Vice Chair
Mr. Jeffry Volk
Mr. Nick Hacker
Dr. John Warford
Mr. Michael Linnell, Staff Advisor

Incoming Board Member: Mr. Curtis Biller

The SBHE held their annual retreat, and the following topics were informative and/or for training purposes:

Opening remarks
- SBHE President Casey Ryan
- NDUS Chancellor Mark Hagerott

Legislative Recap
- NDUS Vice Chancellors

Overview of Envision 2030
- NDUS Chancellor Mark Hagerott

Break

Presentation: How to orient NDUS in an uncertain future of digitization and changing student/workforce needs (John's Hopkins paper)
- Mark Hagerott, NDUS Chancellor

NDUS digital enterprise: orienting to an uncertain future at scale
- CTS Operations, Darin King, NDUS Vice Chancellor for Information Technology
- Digital Analytics/HPC and Cyber Programs, Dr. David Cook, NDSU President
- RIAS and Artificial Intelligence, Dr. Andy Armacost, UND President

Policy Board Governance and Role of the Board
- Meredith Larson, Assistant Attorney General\Office of Attorney General

Lunch

Campus updates
- Campus reports: research institutions; baccalaureate institutions; community colleges

Break

Envision 2035
- NDUS Vice Chancellor Jerry Rostad
- NDUS Chancellor Mark Hagerott

2035 suggested topics and 2030 topics

2035 suggested participants and 2030 participants by topic

At 4:45 p.m. CT, Chair Ryan stated the remaining two items will take place tomorrow morning (May 23rd), beginning at 8:00 a.m. CT.; the Board will take a short break, and start the Board meeting. Chair Ryan adjourned the retreat at 4:45 p.m. No additional action items were considered and no votes were taken during the retreat.

Approved September 28, 2023.

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Envision 2030 Overview

May Retreat

Envision 2030 Process

- One-day summit kickoff (May 2016)
  - Speakers and panelists
  - Breakout sessions
- 10 pillars/advisory teams to study through 2017
- Legislative roundtables during 2017 session
- Final report-out 2018

Envision 2035 Process

???

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Envision 2030 Drivers of Change

- Digitization of society, economy, and knowledge
- Massive, epic energy discoveries in Western N.D.
- Demographic changes in numbers/nature of state's population

Envision 2035 Drivers of Change

???

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Envision 2030 Co-Creators (approx. 100)

Agriculture
- Chris Boerboom
- Greg Lardy
- Khwaja Hossain
- Holly Rose Mawby
- Greg Stemen
- Dean Bresciani
- Mark Watne
- Dan Wogsland

Diversity
- Dina Petherbridge
- Carmen Wilson
- Annette Mennen
- Tom Mitzel

Energy
- Tom Erickson
- Paul Sukut
- Ron Ness
- Mark Nisbet
- Kathleen Neset
- John Miller
- Mark Watson

Health Care
- Julie Traynor
- Joshua Wynn
- Charles Peterson
- Craig Lambrecht
- Stacey Pfennig
- Kevin Melicher
- Doug Darling
- Aaron Johnson

Law
- Kathryn Rand
- Joel Fremstad
- Tony Weiler
- Troy Seibel
- Nick Hacker
- Mark Kennedy
- Robin Schmidt
- Robert Vallie

Liberal Arts & Humanities
- Tom Isern
- Mike Jacobs
- Josh Nichols
- Clay Jenkinson
- Richard Rothaus
- Tony Dutton
- Greg Vanney
- Casey Ryan
- Tisa Mason

Manufacturing
- Perry Lubbers
- Guy Moos
- Andy Peterson
- Tom Shorma
- Star-Ann Schank
- Kari Reichert
- Doug Darling
- John Miller
- John Richman
- Gaylon Baker

Technology
- Hesham El-Rewini
- Ken Nygard
- Tom Swoyer
- Deana Wiese
- Steve Burien
- Angela O'Leary
- Don Morton
- Larry Skogen
- Ken Nygard
- Prakash Ranganathan
- Dane Skow
- Steve Swiontek
- Justin Forde
- Jane Houda
- Kevin Kaeding
- Mark Kinzler
- John Nagel
- Jeremy Neuharth
- Troy Walker

Tomorrow's Student
- Tim Alvarez
- Larry Brooks
- Sol Jensen
- Tamara Uselman
- Levi Bachmeier
- Mike Ness
- Mark Kennedy
- Tammy Barstad
- Tom DiLorenzo
- Howard Dahl
- Kevin Iverson
- Andrew Laws
- Tabitha Lang
- Kay Meier

The Whole Student
- Laura Oster-Aaland
- Jane Vangsness Frisch
- Erin Klingenberg
- Kevin Harmon
- Andy Wakeford
- Steve Shirley
- Diane Hadden
- Dr. Jen Janecek-Hartman
- Ty Orton
- Mike Weber

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SBHE 2030 Charge: Respond with speed and scale to….

State and Student Needs

- Agriculture
- Energy
- Health care
- Manufacturing
- Law and legal systems
- Technology

Comprehensive Student Needs

- Diversity
- Liberal Arts & Humanities
- Tomorrow's Student
- The Whole Student

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Envision 2030 Framework

Commend

Endorse

Call to Action

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Commend:
Key current programs

- Dakota Nursing Program
- Elementary and secondary Education
- Cybersecurity

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Endorse:
Recent campus innovations

Higher Education Finances and Efficiencies

- Adapting higher education finances
- Strongly supports tuition flexibility based on individual campus market space
- Supports the review of N.D. residency policies
- Strongly supports eventual adoption of incentives for completion
- Supports establishment and maintenance of minimum class size to enhance campus financial resilience (Senate Bill 2003)
- Strongly endorses additional shared services in the NDUS business enterprise (S.B. 2003)

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Endorse:
Recent campus innovations

Diversity for a Changing State and Changing Workforce

- Endorse more campus collaboration programs and EPSCOR funding/undergraduate research with tribal colleges
- Endorse campuses to take steps to welcome men to nontraditional caring fields and women to STEM and computer science fields

SBHE commitment to our Faculty & Staff

- Commits to taking care of faculty and staff, with respect to pay and benefits
- Reaffirms the importance of tenure

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Call to action: SBHE provides leadership for emerging needs

Adapting Higher Education Finances

- NDUS is directed to study options to establish a financial mechanism for purpose of buffering higher education funding, and report to the SBHE by mid-2019
- Will work with the Governor and Legislature to explore pathways to restoration of student support and per-credit hour rates to 2015 levels

Higher Education Efficiencies

- Explore financing innovations for campuses

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Call to action: SBHE provides leadership for emerging needs

Access to Key Programs

- Western campuses, in response to anticipated surging workforce needs, will adopt the "Dual Mission" and "Polytechnic" models
- By 2025, campuses offering major one-of-a-kind academic degree programs will study and then provide options for online programs (e.g., Agriculture, Energy, Law)
- By 2019 SBHE retreat, the campuses offering these programs will study required steps needed to provide this option

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Call to action: SBHE provides leadership for emerging needs

Diversity for a Changing State and Changing Workforce

- Invite tribal presidents as honored guests at all meetings of the SBHE
- Invites NDUS and individual campuses to work to improve relations with and support of tribal colleges
- Work with presidents to explore ways to attract and retain highly talented individuals from underrepresented demographics to leadership positions within NDUS
- Invites tribal college presidents to attend SBHE meetings as guests
- Explore the possibility of In-STEM (like the successful IN-MED, RAIN, and INPSYDE programs works for tribal health programs)

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Call to action: SBHE provides leadership for emerging needs

Governance for 21st Century

- Continue to adapt and reform the SBHE, to include a study of subcommittee structures in the Board to better respond to tier-specific needs
- Establish an advisory group for Digital Privacy

SBHE commitment to our Faculty & Staff

- Engage Faculty and Staff throughout NDUS to improve collaboration and invite them in to help solve the issues facing higher education
- Utilize best practices from business to recruit and retain top talent

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Envision 2030 Topics

- Agriculture
- Energy
- Health care
- Manufacturing
- Law and legal systems
- Technology
- Diversity
- Liberal Arts & Humanities
- Tomorrow's Student
- The Whole Student

Envision 2035 Topics

???

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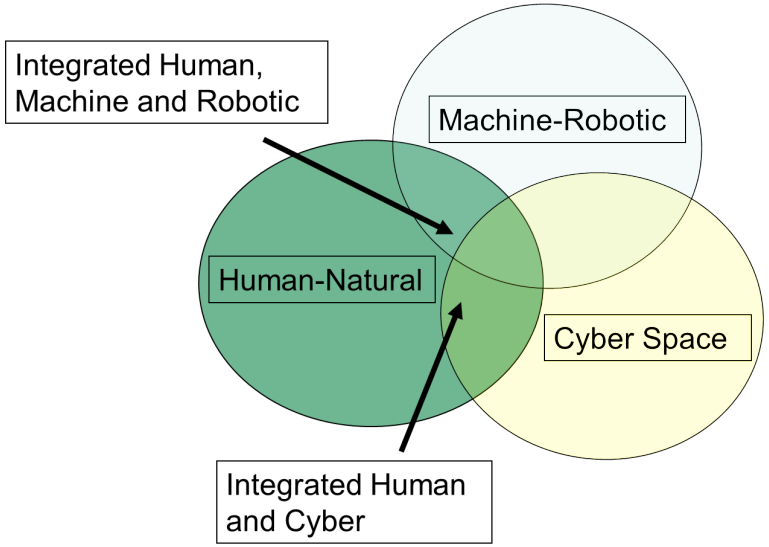
A Strategy of Resilience for NDUS/Campuses in an Uncertain Digital Age: How to Frame This Epic Challenge?

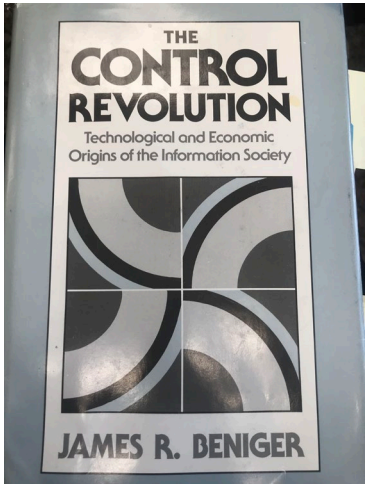
SBHE Retreat Bismarck, ND
May 22, 2023

Mark Hagerott Ph.D.
Chancellor, North Dakota University System
mark.hagerott@ndus.edu



❑Note: The views and opinions are the author's and do not necessarily state or reflect those of the U.S Government or the State of North Dakota

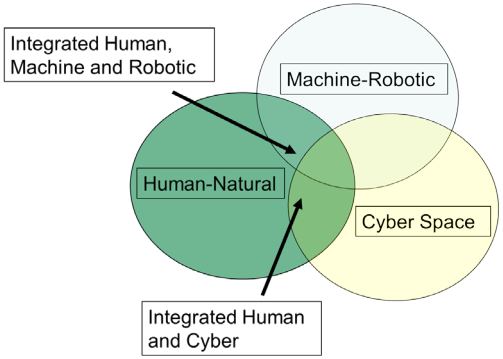
Resilience as a Strategic Framework for an Uncertain Future: Outline



- Ensure Resilience at 3 Levels:

1. Day-to-Day/Continuous **Reliability**,
2. **Adaptability**,
3. **Transformability**

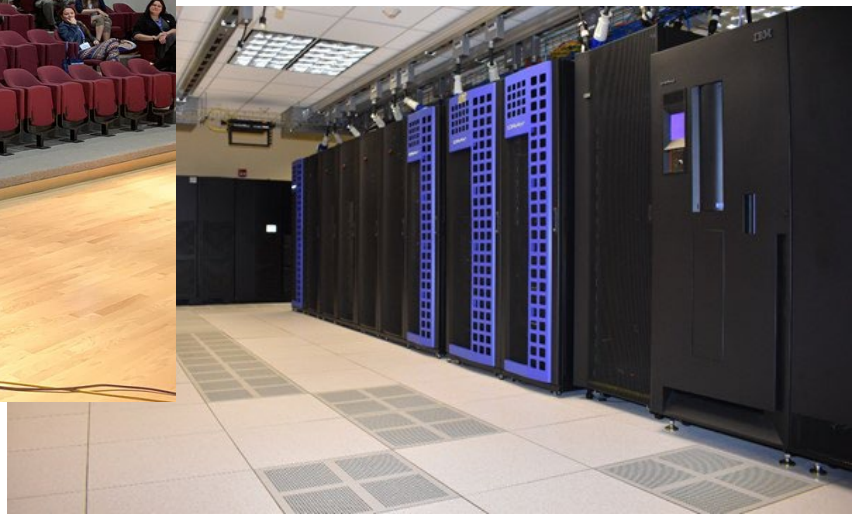
- Offer Framework Why Achieving Resilience is Different, How so?:
  - New "Realm" emerging
  - History shows how Chaotic, Dangerous, and Exciting achieving Resilience will be.



Today's Leaders are THE MOST IMPORTANT IN HISTORY… your early actions or inaction as Digitization unfolds will profoundly affect future generations…more on this later.

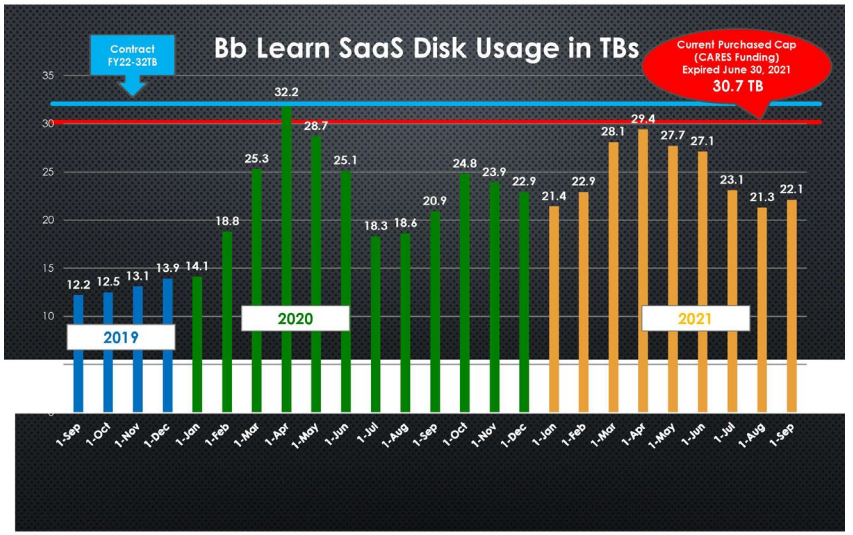
Level 1: Reliability in Day-to-Day Operation…

- Level One: Reliably care for and preserve knowledge (Data) in the human and machine systems, against the effects of thermodynamic and social entropy. Reliably pass knowledge to and prepare **the next generation (the students)…**



Level 2: Adaptability

- Level Two: adapt existing data/knowledge sets, organizations, processes, and systems etc., to changes in the external environment.

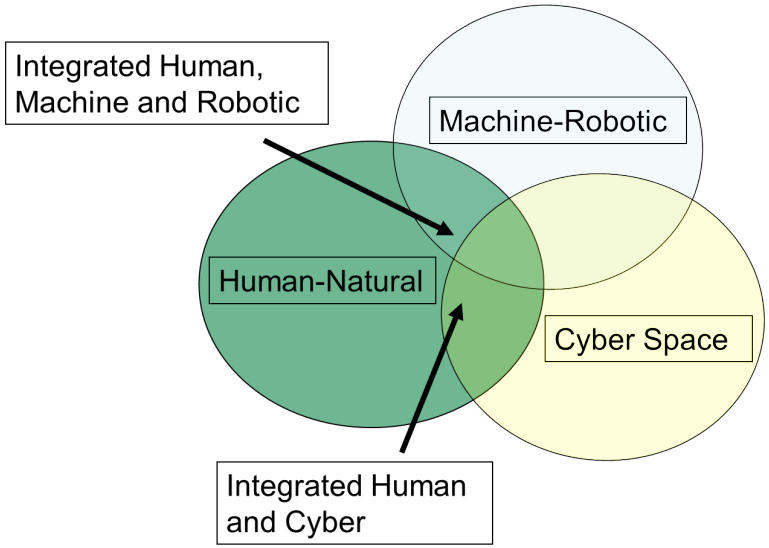


Level 3: Transformability

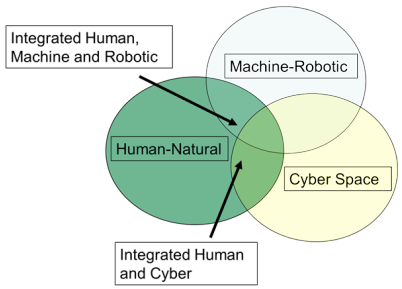
- Level Three: Transformability is the ability to create new processes, organization type, new fields of knowledge, scale-up to something new
- Innovation accelerating in past generation… … automobiles, planes, computers, chips, communications…

But when successive waves of Inventions combine… something bigger happens…

A Tool and Framework for Thinking about Radical, Macro Change…



Human Impulse to Better "Sense/Think/Act" their Environment, is both a life force and historical force of change…



- Sensing
  - Human senses (sight, hearing, taste, feel, smell)
  - Machine sensing: (glasses, telescope, radio, radar, at a distance)

(COMMUNICATION LINKS)

- Thinking
  - Human thinking (brain)… with values, ethics, morals
  - Machine thinking (early analog, now digital, AI/Cloud, thinking at a distance (combined with Machine Learning))… with encoded values, ethics, morals.

(COMMUNICATION LINKS)

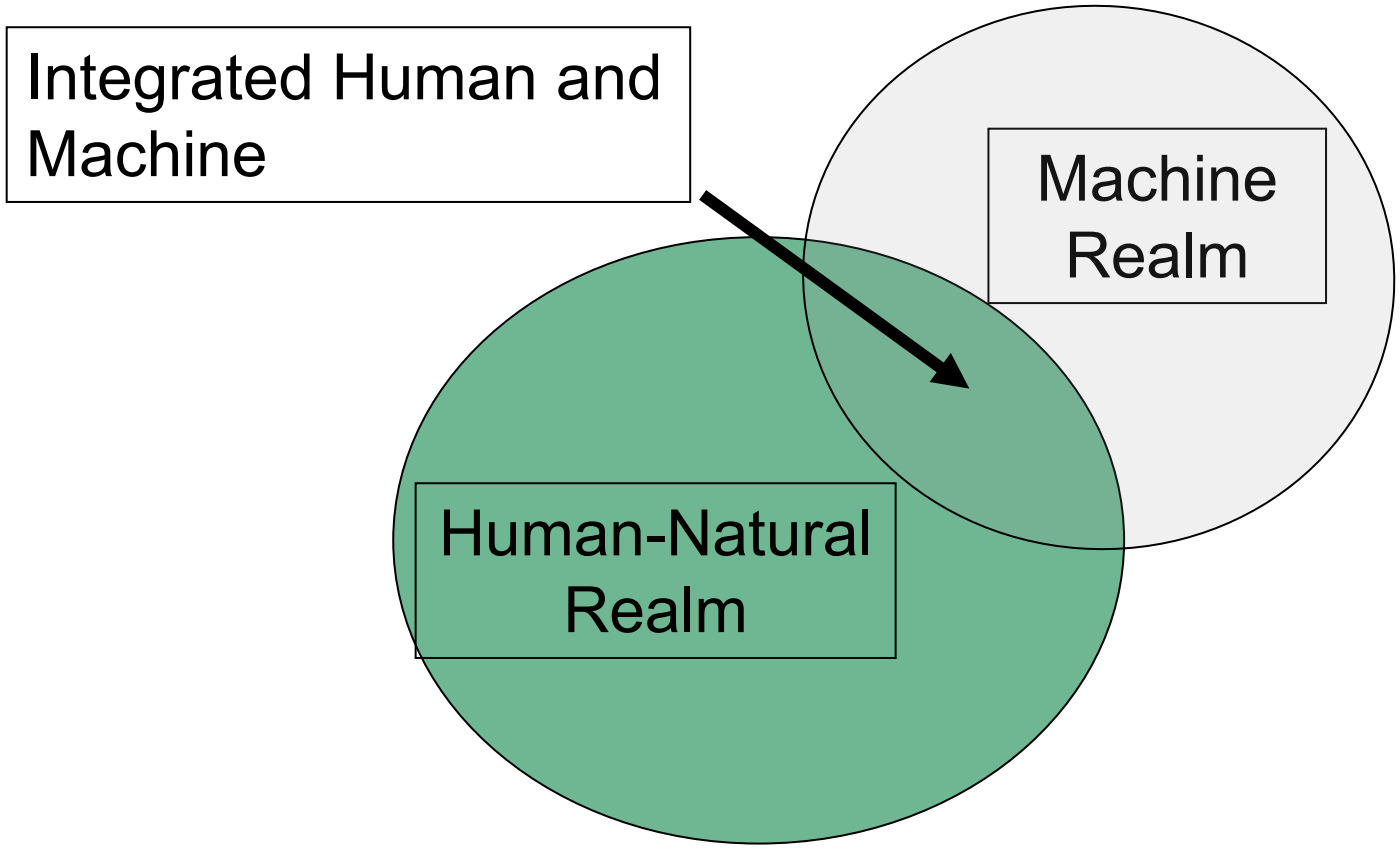
- Acting
  - Human acting (limbs…walking, holding, etc)
  - Machine acting (cars, planes, ships, unmanned systems, robots, acting in cyberspace, teaching at a distance)

We are seeing Macro-Level Change… what is that?

- As distinct from multiple, preceding and coincident *micro*-techno revolutions… a **"Macro"** revolution is a combination of multiple technologies which create an entirely new, never before seen, **structure of global economic/social/military activity… what might be called, a new REALM of activity...**

…but when Macro change occurs, and new Realm emerges, this results in Massive Risk and Opportunity… lets look at some lessons from history…

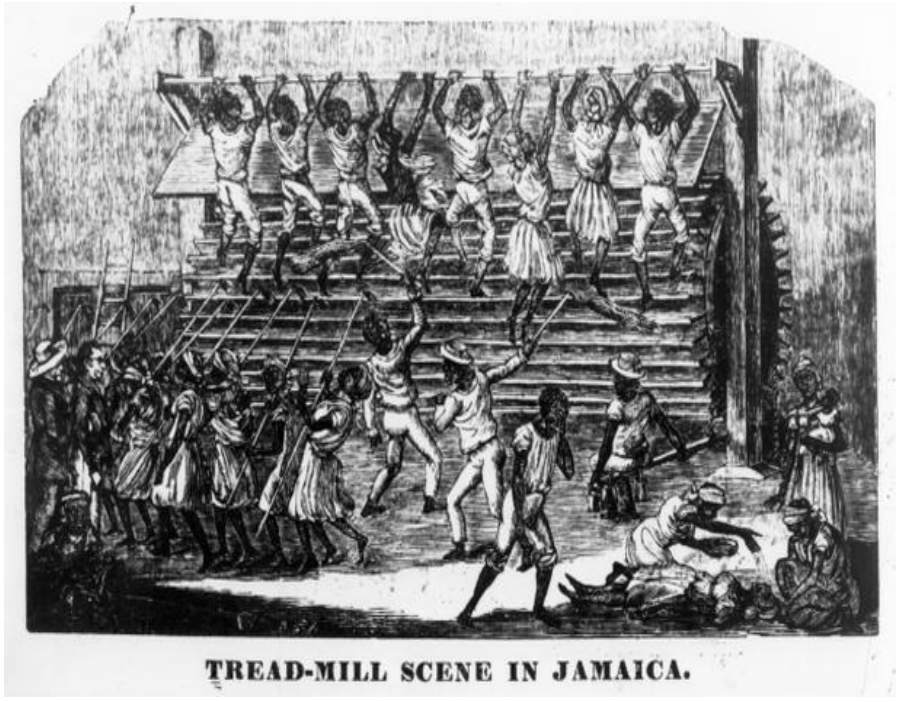
The Human-Natural, Machine-Robotic Framework…

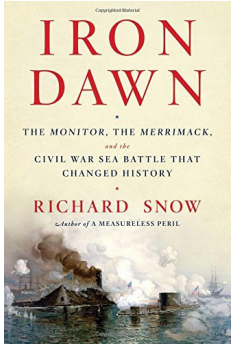


… machines proliferate, and become increasingly automated and result in massive disruption…

Second Realm with Machine economy emerge… the Industrial Revolution…much suffering but also liberation

- In pursuit of Sense-Think-Acting advantage and efficiency…
  - 1st: Natural-Human Realm
    - (apprx10,000 BC… (rise of cities, farming, **human slavery era**))
  - 2nd: Integrated Human-Machine Realm (the Industrial Revolution)
    - 1776 Watt steam engine & by1865 machine power helps to end slavery by overwhelming the Confederacy with mass production.



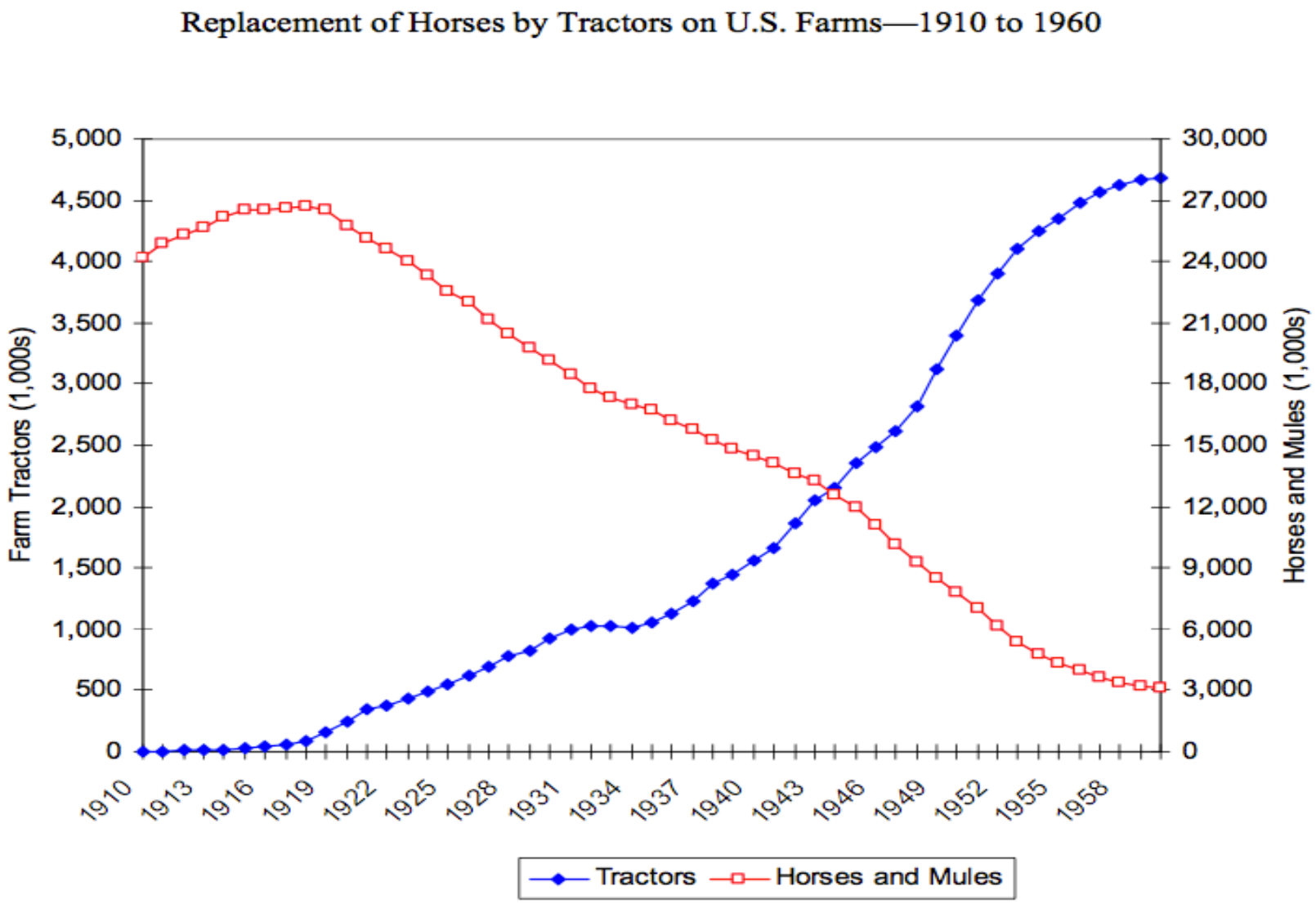


2nd Macro Revolution Deepens... human and natural (animal) agriculture workforce disrupted

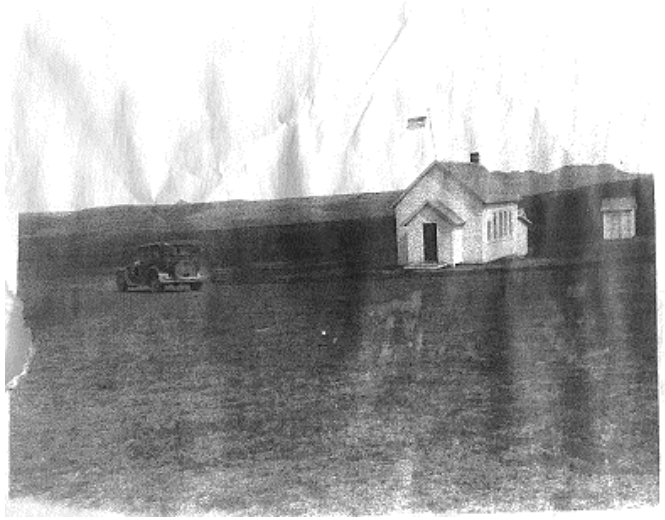
- Second Realm matures as machines replace people…
  - 1st: Natural-Human Realm
    - (apprx10,000 BC… rise of farming)
  - 2nd: Integrated Human-Machine Realm
    - Industrial Revolution on the farm continues.….the “Combine”

…life and work was never the same… where are the people…my grandfather adapted and kept his job…

Machine Realm expanded… horses replaced, crop prices collapse 1920s, Banks not Resilient...Crash of '29



Rural Education: Human-machine integration displaced small institutions, increasing SCALE was key to success



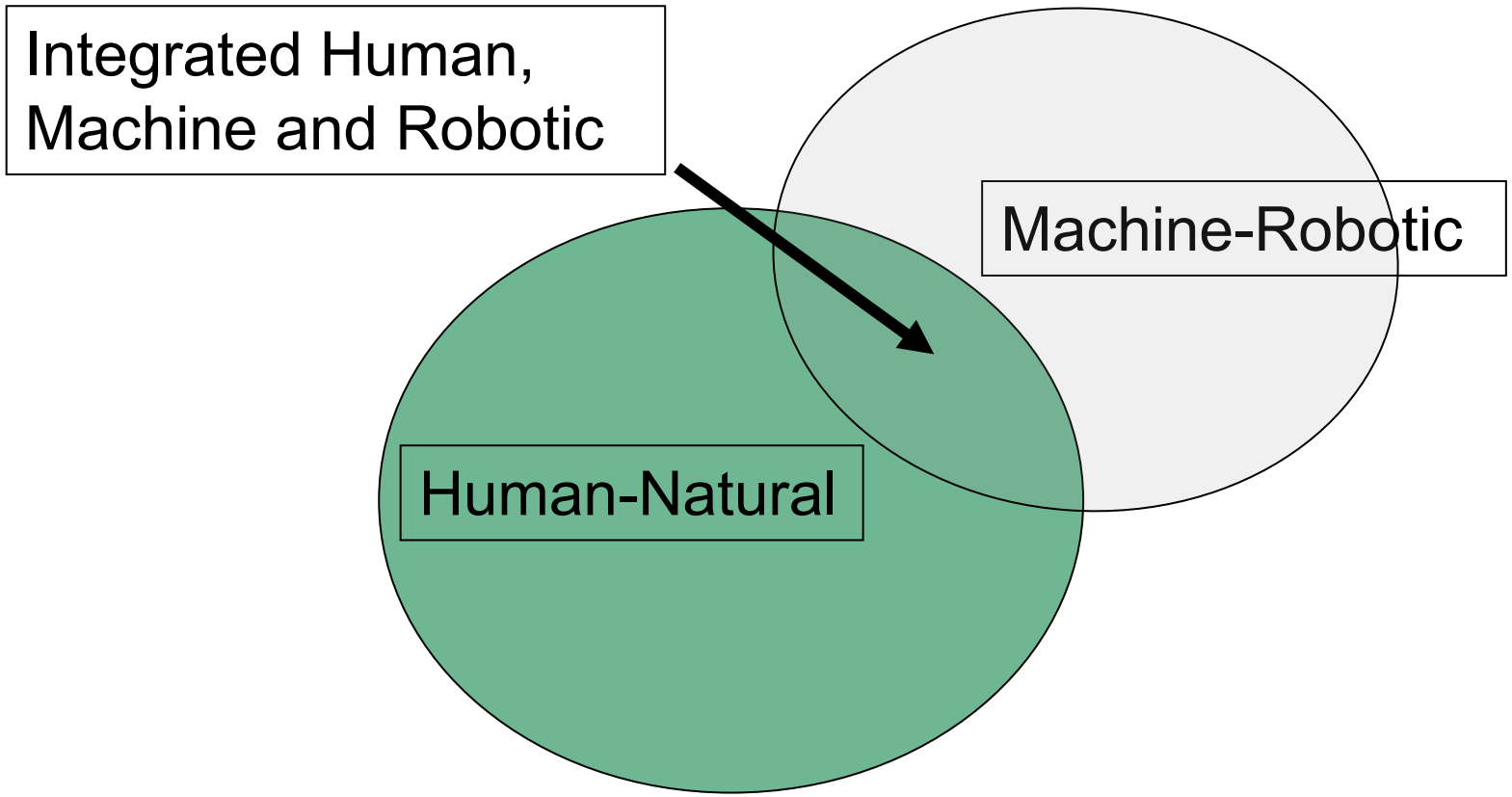
Increasing Scale

Crown Butte School: Great Grandpa Hagerott

Mandan Highschool: Grandma Hagerott

- Land Grant University, Morrill Act 1862
- Universities/colleges created in ND in 1880s… a medical school in 20th century
- Establishment of Tribal Colleges

The Human-Natural, Machine-Robotic Framework…

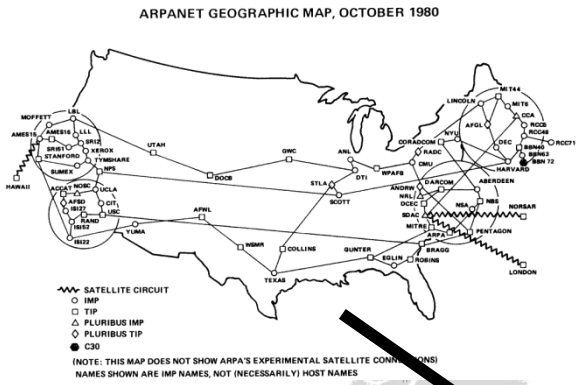


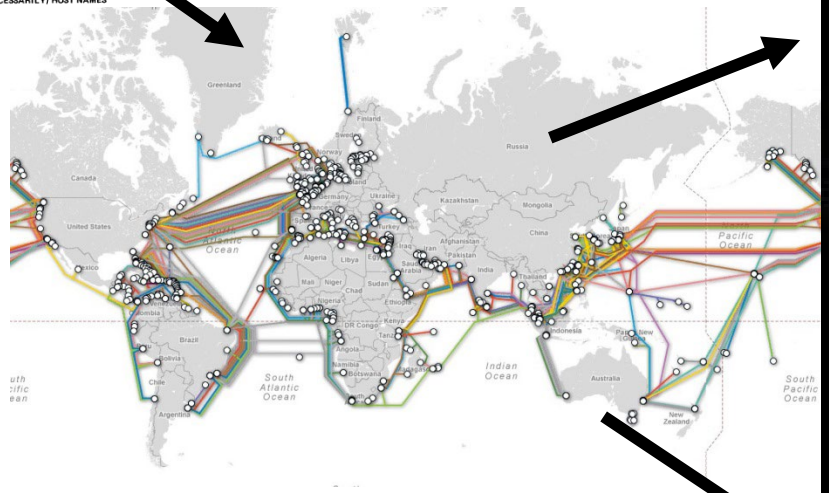
… and then came October 1969

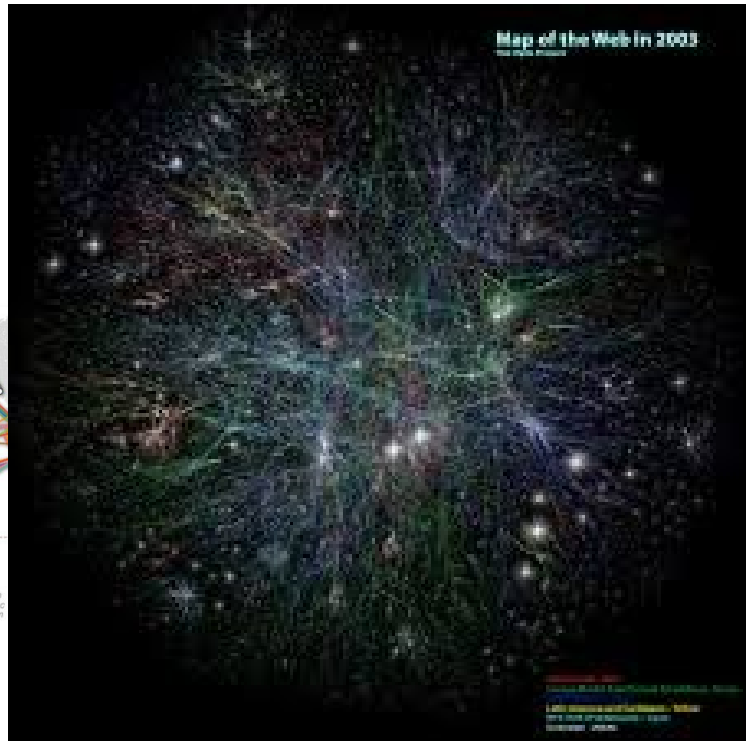
At a small collection of university computers… the Internet comes alive…

… the emergence of the weirdest surprise…. not fully anticipated until Gibson, and his sci-fi novel, *Neuromancer*… the place we call CYBERSPACE.

Macro Digital Revolution and new Realm: …Cyberspace …







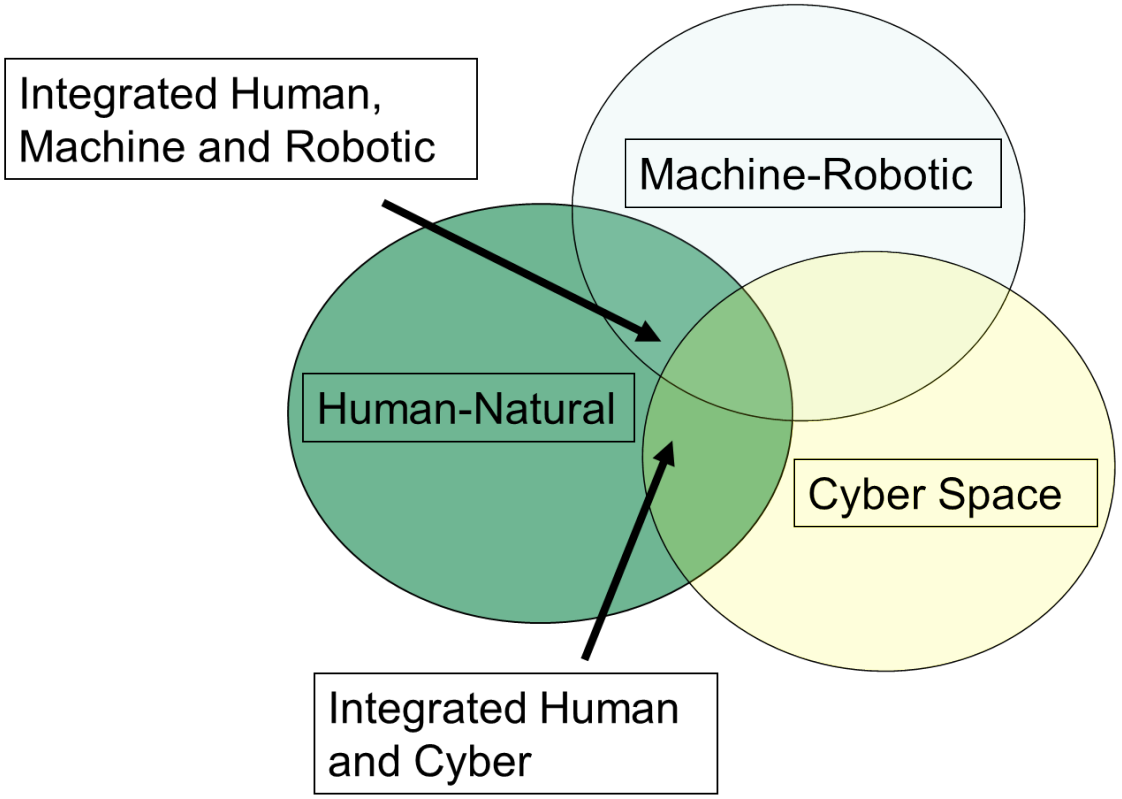
Rapid A.I. advance with access to massive internet/IoT data...

Emergence of the Cyber Realm, increasingly powered by advanced A.I.…

- What this will mean ultimately for humanity…. politics… economy….society… war…. medicine…EDUCATION.
- But be positive, YOU are alive, now, to help create this emerging Realm of intelligent machines and cyberspace.

…and META (3billion users) announced their "Metaverse" as top priority project. And, multiple-campus Meta-Universities rolling out… UMD/KU +100 others joining to achieve SCALE.

Our World today…multiple Realms with different needs, possibilities, laws, norms…



…Covid increased Speed of Digital Change …yet, what we do will still massively affect FUTURE GENERATIONS…why?

Observed Phenomenon of Socio-Tech "Lock In" or "Momentum"… "QWERTY" in your hand!

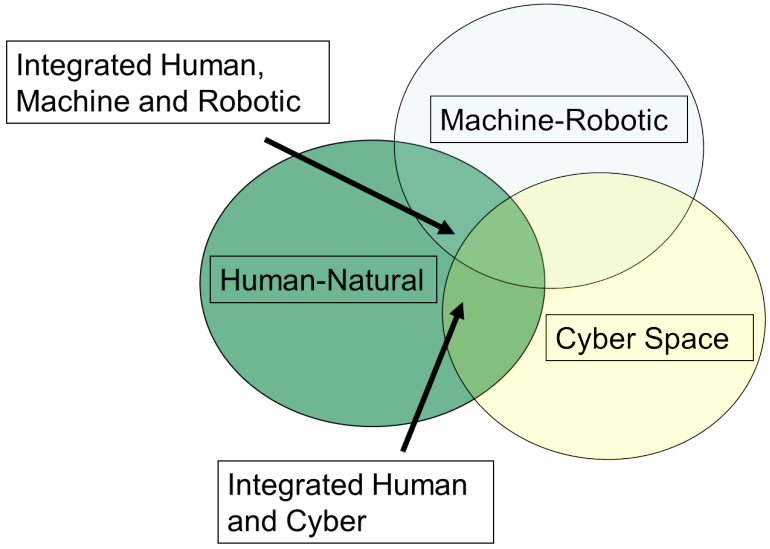
- **Early Stages of Technology Innovation**: leaders and society exerts most influence. Redirecting technological change is relatively easy.

- **Middle Stage**: momentum accumulates around the innovation (e.g., capital, labor, political)… redirecting change is harder but doable at moderate cost.

- **Late Stage**: technological innovation is now "Locked In" or beyond social redirection. (e.g., UM/Minneapolis computer industry 1958 versus Stanford/Silicon Valley in 2021; Kodak and emergence of digital photography; Placement of freeways in communities of color). To remedy past mistakes, comes with high cost or is precluded entirely.

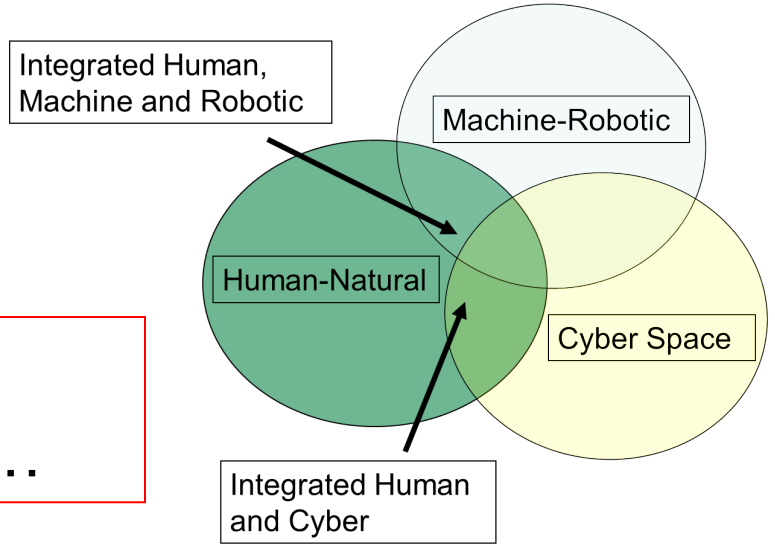
Using the Framework to Think about Reliability, Adaptability, Transformability

Resilience by Realms and Intersections between Realms:
-the Human/Natural Realm,
-Integrated (intersections),
-Intelligent Robotics (distanced from direct human contact),
-CyberSpace (distanced from direct human contact).



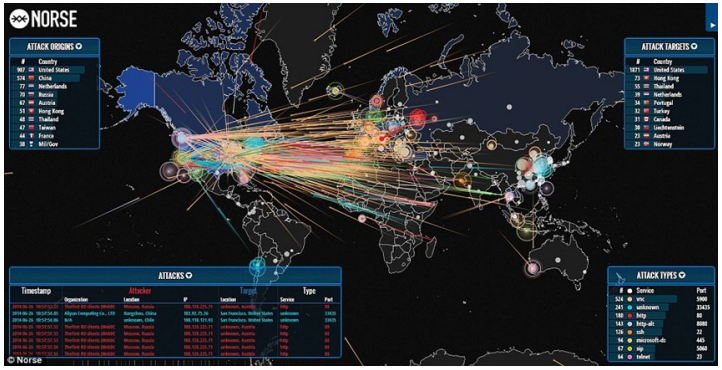
On the Road to Greater Resilience…

1. Reliable and Adaptive Security (Human & Machine)… this is the showstopper… must do this, all else moot.
2. As new Realms emerge, ensure you bring along everyone… geographical, class, ethnicity, gender.
3. AI: where to go fast, where to go slower?
4. IT Work Force: need champions at each level, for Day-to-Day Reliability; Adaptability; and Transformability.

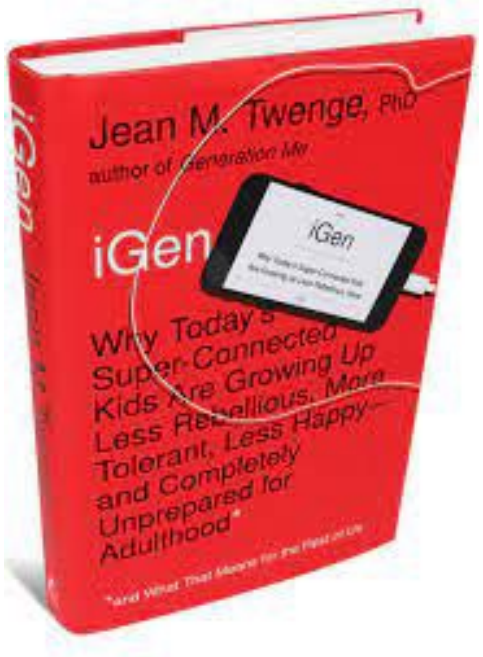


Different approaches based on where you are in the Framework…

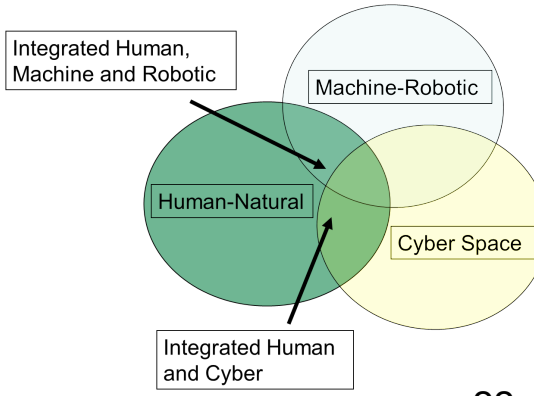
1. Guard your Machines and People…Cyber Attack can be an Existential Showstopper…



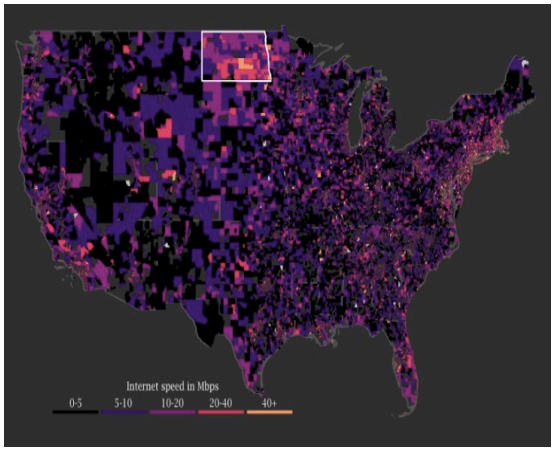
Ready Tool: AGB Cyber Handbook



NDUS critical economic driver, vital center of community… SBHE/Presidents have Public Trust of digital property, and a Sacred Trust of our Children as they interact with the machines… *think SPORTS GAMBLING BILL, Students vs Vegas AI/Big Data!*



2. Students Enrollment: As new Realms emerge, ensure you bring along everyone… geographical, class, ethnicity, gender



…use all tools, On Premise, Hybrid, HyFlex to reach the student…but Diversity will require a human and systematic helping hand...not for the faint of heart.

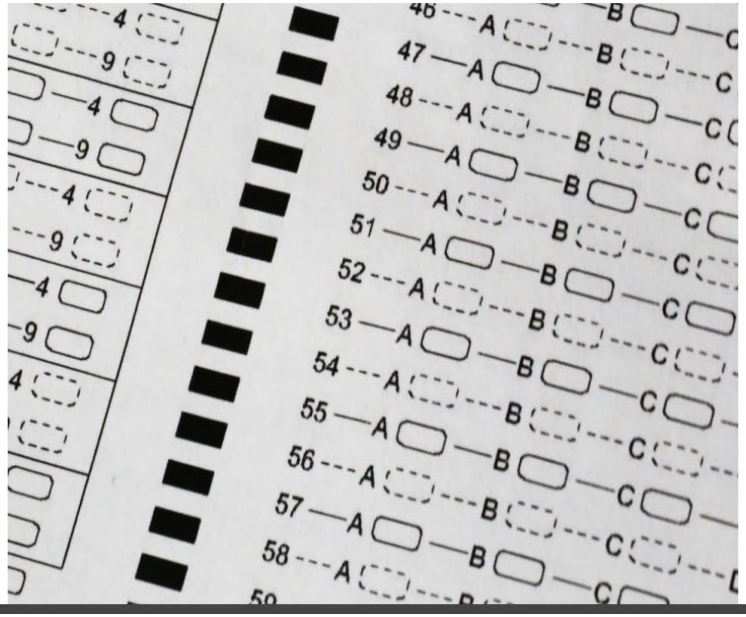
3. Artificial Intelligence (AI) or Intelligent Assistant (IA): Use the Framework to locate Policies/Laws/Ethics/Norms Implications….

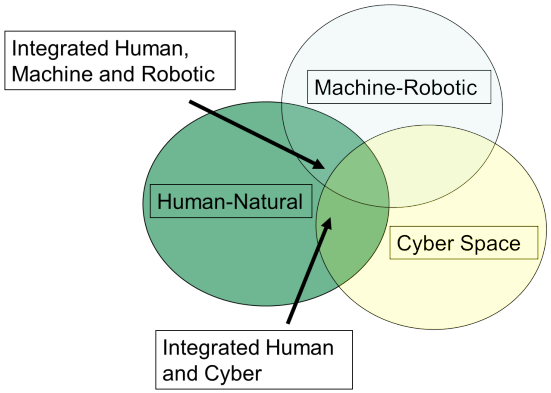
WIRED BACKCHANNEL BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY

BUSINESS 07.10.2020 07:00 AM

Meet the Secret Algorithm That's Keeping Students Out of College

The International Baccalaureate program canceled its high-stakes exam because of Covid-19. The formula it used to "predict" scores puzzles students and teachers.





AI Policy, Law, Ethics in Proximity to Humans will be Complex… Proceed with Caution… for example…


FirstNet LTE
6:44 AM
94%
AA
google.com
wired.com
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ERIC LANDER , ALONDRA NELSON
10.08.21 8:00 AM OPINION
Americans Need a Bill of Rights for an AI-Powered World
The White House Office of Science and Technology Policy is developing principles to guard against powerful technologies—with input from the public.

4. Take care of your digital-skilled Staff/faculty…mentor and accelerate promotion of these transformative people

BOOKSHELF | By George Melloan

When Assets Are Intangible

Capitalism Without Capital

By Jonathan Haskel and Stian Westlake
(Princeton, 278 pages, $29.95)

Why is an airliner like a song? Both can be capital assets, according to Jonathan Haskel and Stian Westlake. An airliner is tangible capital, a song intangible. The two British authors argue that the growing importance of intangible capital requires us to change the way we think about business in postindustrial economies.

Intangible capital, as defined by the authors, is not new. One could argue that the Phoenician alphabet, invented three millennia ago, was software, the capital base for the spread of knowledge throughout the ancient world. Today management gurus write about "human capital" and the "knowledge industry." We all know that most people in the developed world make their living delivering services, some of which could be regarded as intangible capital, rather than producing goods.

Intellectual property is a big concern in global trade negotiations.

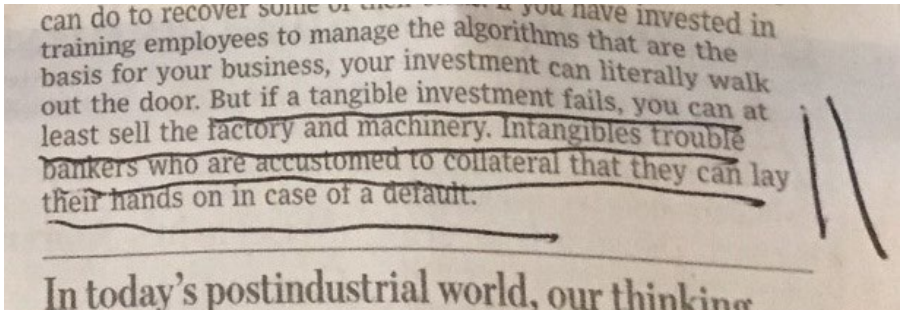
But the historical view of "capital" as something tangible persists and limits our thinking, the authors argue. To be sure, exactly which intangible assets qualify as capital can be debated endlessly. In "Capitalism Without Capital," the authors choose a broad definition and explore its implications.

In so doing, they provide insights into some puzzling questions. For example, why is Uber, a company with few assets and huge losses, so popular with investors? Why are stock-market prices soaring at a time when capital investment, as typically measured, is creeping upward at only a 4% annual rate? Why are banks losing their role as business lenders to other forms of finance, such as private equity? Why haven't rock-bottom interest rates spurred more economic growth? Why is income inequality suddenly a political issue again?

There are lots of possible answers to these questions, but the authors start by offering two broad responses: "We are now trying to measure capitalism without counting all the capital"; and "the basic economic properties of intangibles makes an intangible-rich economy behave differently from a tangible-rich one." To explain the difference, they cite what they see as the four distinctive "S's" of intangible capital that set it apart from the tangible kind: sunk costs, scalability, spillovers and synergies.

By sunk costs, they mean that if an intangible investment fails to produce a salable product, there is little that investors can do to recover some of their stake. If you have invested in training employees to manage the algorithms that are the basis for your business, your investment can literally walk out the door. But if a tangible investment fails, you can at least sell the factory and machinery. Intangibles trouble bankers who are accustomed to collateral that they can lay their hands on in case of a default.

In today's postindustrial world, our thinking about capital—how it should be measured, h…



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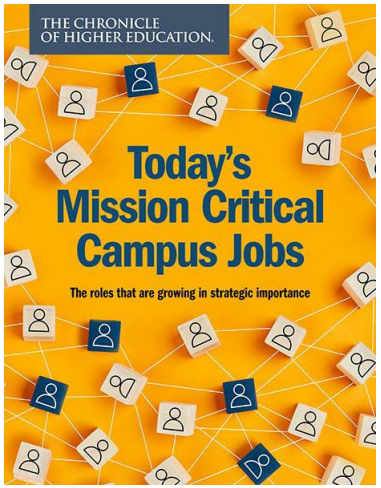
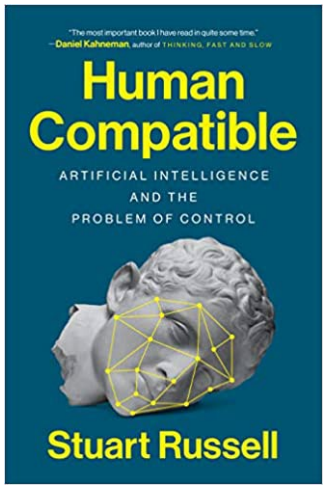
In today's postindustrial world, our thinking





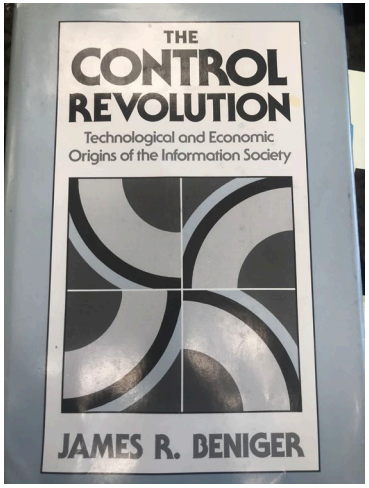
Digital Skilled Staff/Faculty are key Translators between the Human and Machine… our students and businesses and communities need them to stay in North Dakota!

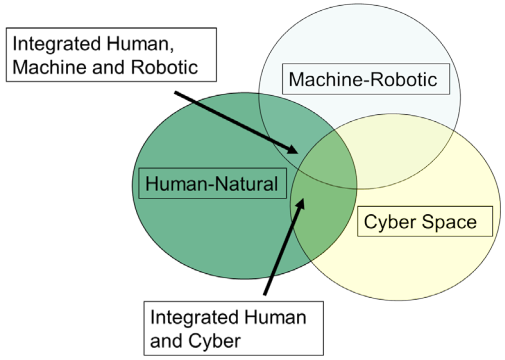
Resilience as a Strategic Framework for an Uncertain Future: Outline

- Ensure Resilience at 3 Levels:

1. Day-to-Day/Continuous **Reliability**,
2. **Adaptability**,
3. **Transformability**

- Offer Framework Why Achieving Resilience is Different, How so?:
  - New "Realm" emerging
  - History shows how Chaotic, Dangerous, and Exciting achieving Resilience will be.





Today's Leaders are THE MOST IMPORTANT IN HISTORY… your early actions or inaction as Digitization unfolds will profoundly affect future generations…the reality of Momentum or historical "Lock In" of technical systems.

Questions

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Core Technology Services

Darin King

Vice Chancellor of IT/CIO

CTS Vision and Mission

The vision of CTS is to foster an organizational culture that delivers exceptional service, secure infrastructure, and access to information.

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

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CTS - 2015

- High Operational Effort to "Keep the lights on" (92%+)
  - Strategy: Work Management System, Automation, Consolidation, Realignment, Project Management
- Administratively "Top Heavy"
  - Strategy: Right Size with normal attrition, Early Retirement, Realignment
- No Security Practice or Strategy
  - Strategy: Establish NDUS Information Security Office
    - Build team with FTE's created through normal attrition and Operational efficiencies.
    - Develop Policy, Procedure, Standards. Regular external risk assessments.
- Administrative Issues
  - Strategy: Outsource some business function for separation of duties, etc.
    - Update and communicate CTS expectations and procedures.

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CTS - 2017

- The Budget Crisis
  - 18% Budget Reduction
- 2019 – Hold Even Budget
- 2021 – Hold Even Budget

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CTS - 2023

- Operational Effort below 80% and falling (Run-Grow-Transform)
  - How: WMS, strategic investments in data center, automation, realignment
  - How: Planning, Procurement and Project Management. (118 projects in FY22)
  - How: Enterprise Service Management (ITIL) program called ServiceOne.
- Reduced Senior Management from 7 FTE to 3 FTE
  - How: Attrition, Early Retirements, Realignment
- NDUS Information Security Team
  - How: Used FTE's available because of efficiencies in other parts of CTS
  - How: Strategic investments to reduce risks
- Administrative Effectiveness
  - How: Gradually built capacity to effectively run our business using available FTE's.

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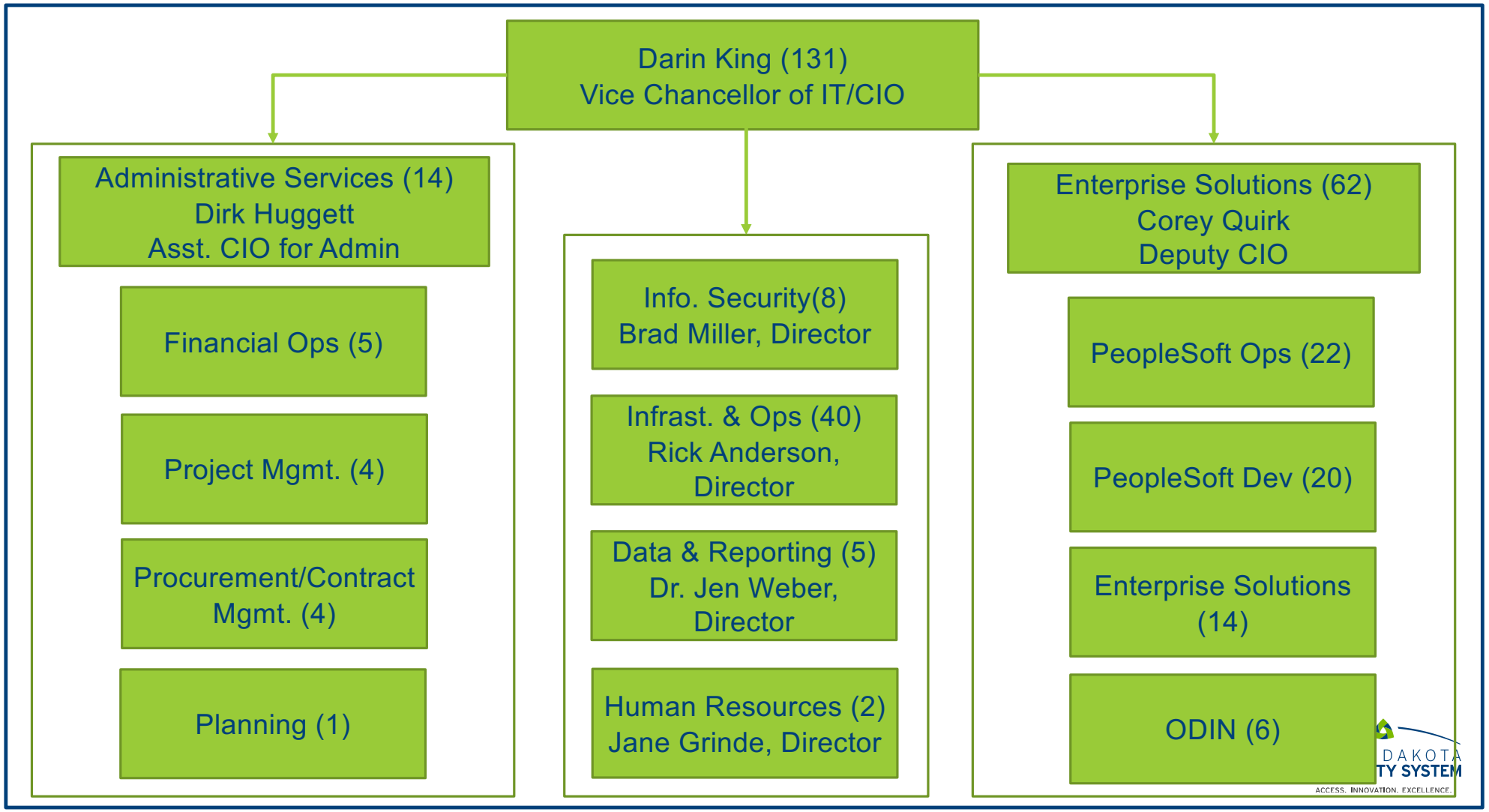
Darin King (131)
Vice Chancellor of IT/CIO
Administrative Services (14)
Dirk Huggett
Asst. CIO for Admin
Financial Ops (5)
Project Mgmt. (4)
Procurement/Contract Mgmt. (4)
Planning (1)
Info. Security(8)
Brad Miller, Director
Infrast. & Ops (40)
Rick Anderson, Director
Data & Reporting (5)
Dr. Jen Weber, Director
Human Resources (2)
Jane Grinde, Director
Enterprise Solutions (62)
Corey Quirk
Deputy CIO
PeopleSoft Ops (22)
PeopleSoft Dev (20)
Enterprise Solutions (14)
ODIN (6)
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ServiceOne

- International IT Enterprise Service Management Framework
  - Used by over 80% of IT shops worldwide
- Detailed standards and work instructions
- 8 Practices Implemented
- Data for continual improvement

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Practice	Purpose	Forecasted Benefits
Organizational Change Management (OCM)	To help CTS and NDUS personnel transition through the changes introduced by the other 8 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 Desk

First Call Resolution/Fulfillment

ServiceOne
Partnering For Progress
North Dakota University System

Metric	Total	%	Priority 1	Priority 2	Priority 3	Priority 4
Total Incidents – First Call Resolved	**54***	**31%**	**7**	**5**	**13**	**29**
Incidents - First Call Resolved by Other	32*	59%	2	2	6	21
Incidents - First Call Resolved by Service Desk	22*	41%	5	3	7	8
Total Service Requests – First Call Resolved	**623**	**60%**	**n/a**	**4**	**179**	**440**
Service Requests - First Call Fulfilled by Other	554	89%	n/a	4	122	428
Service Requests - First Call Fulfilled by Service Desk	69	11%	n/a	0	57	12

*Includes both Parent and Children tickets.

Analysis – Incidents

32 Incidents – First Call Incidents Resolved by Other

- 69% Incidents were submitted and resolved by CTS staff
  - ✓ 68% of the 22 Incidents were for Endpoint Services, 35% were for Enterprise Service Operations

22 Incidents - First Call Resolved by Service Desk

* Volume includes three Parent Incidents with 7 children

- 69% of the remaining 12 incident tickets were for Enterprise Service Operations

Analysis – Service Requests

554 Service Requests - First Call Fulfilled by Other

- 32% (179) Campus Solutions
- 21% (114) HCM
- 14% (79) I/O
- 11% (61) FIN
- 11% (60) Security Applications

69 Service Requests - First Call Fulfilled by Service Desk

- 42% Blackboard
- 35% Document Imaging
- 14% ES Applications

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PeopleSoft

PeopleSoft ERP

- Human Capital Management
  - 16 Bi-directional integrations
  - 25+ Data Pushes
- Financial Management
  - 18 Bi-directional integrations
  - 12+ Data Pushes
- Campus Connection
  - 15 Ancillary Systems (integrations)
  - 15+ Data Push/Pulls

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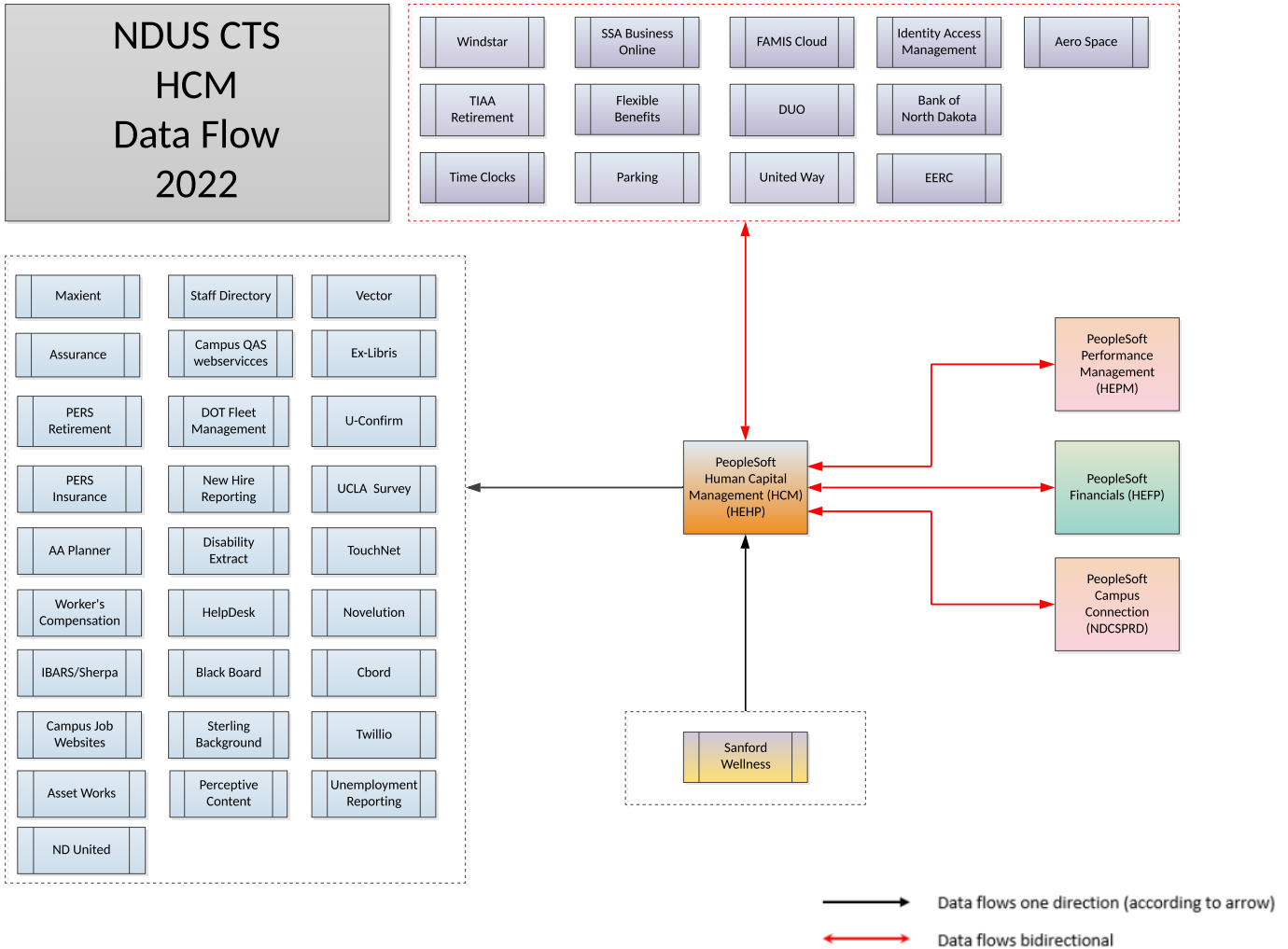
NDUS CTS HCM Data Flow 2022



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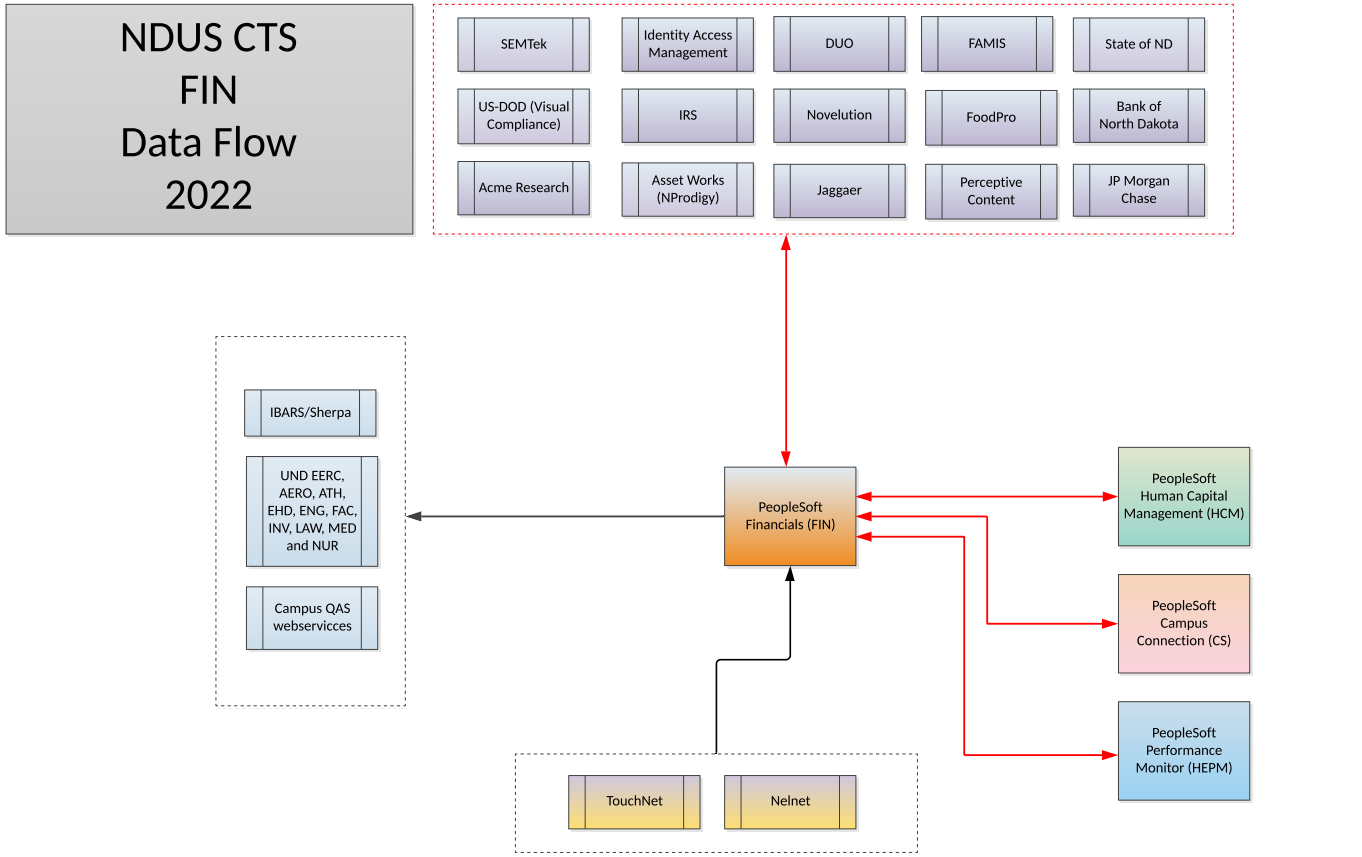
NDUS CTS FIN Data Flow 2022



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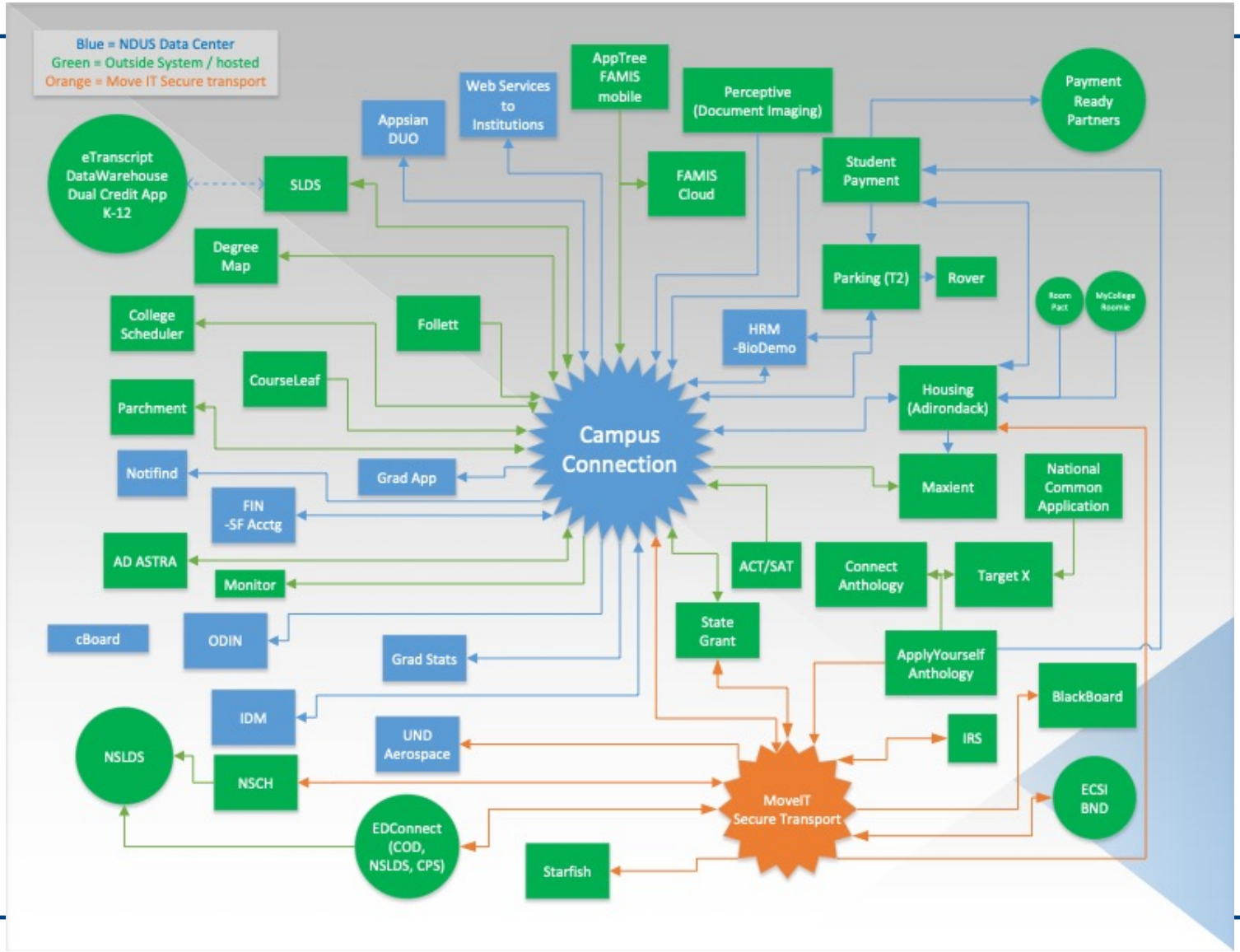

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CORE TECHNOLOGY SERVICES

NDUS ERP (PeopleSoft) Market Analysis

Corey Quirk
Deputy CIO
NDUS Core Technology Services

ERP (PeopleSoft)
Market Analysis Objectives'

- Explore ERP Trends & Developments
- Evaluate Options in the Marketplace
- Assess Risk & Opportunities
- Review Implementation & Operating Costs
- Identify Requirements for RFP

Coming Summer 2023

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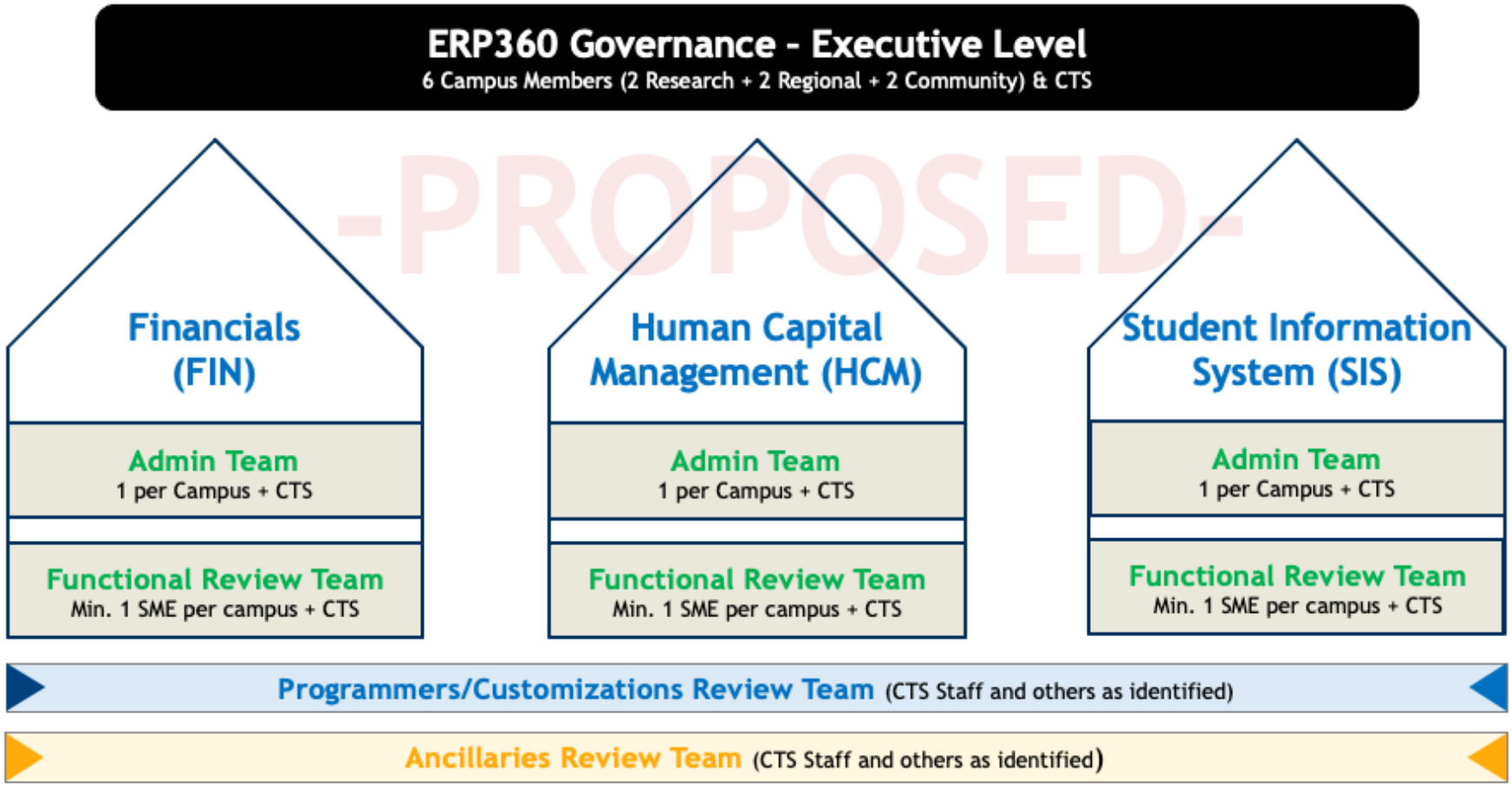
CORE TECHNOLOGY SERVICES

ERP (PeopleSoft) Market Analysis - Process



PeopleSoft Governance Membership

Name	Council	Campus	Term
Larry Brooks	Academic Affairs	VCSU	1st term Expires 9/12/25
Sharon Loiland	Administrative Affairs	UND	1st term Expires 6/11/23
Dr. Steven Shirley	Chancellor's Cabinet	MiSU	1st term Expires 3/9/23
Gary Haugland	CIO	LRSC	2nd term Expires 3/7/24
Sarah Gasevic	Human Resources	MaSU	1st term Expires 6/13/25
Laura Oster Aaland	Student Affairs	NDSU	1st term Expires 9/12/25
Chris Erickson	Public Affairs	NDUSSO	1st term Expires 6/11/23

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CORE TECHNOLOGY SERVICES

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IT Consolidation

IT Consolidation

- Why?
  - Late 1990's
  - Small State, volatile economy
  - Economy of Scale
  - Human Resource Efficiencies
  - Fiscal Efficiencies
- What?
  - State Government IT
    - IT Unification in 2019
  - State Network
    - State Government, K12 & Higher Ed
  - PeopleSoft
    - State Government and Higher Ed
  - PowerSchool SIS
    - K12

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NDUS IT Consolidation

- N.D.C.C 15-10-44
  - Provides for a waiver
- Policy 1200
  - Provides for a waiver
- Procedure 1200.1
  - Process for approval and/or waiver

- What?
  - ERP (PeopleSoft)
  - Learning Management System (Blackboard)
  - Email and Collaboration (Microsoft 365)
  - Identity and Access Management
  - Document Imaging
  - NDUS Data Center
  - Information Security
  - Secure File Transfer
  - Training

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

Existing Solution - Hobsons		
	Annual $	$ Unit of Service*
All NDUS	$ 396,495.40	$ 9.11
Remove NDSU/UND	$ 396,495.40	$ 22.75

*Note: Unit of Service using Fall 22 FTE count

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Case Study of IT Consolidation

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Approved UND and NDSU to go To RFP for a new solution in 2018.

They selected a solution called TargetX.

*Note: Unit of Service using Fall 22 FTE count

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

As the Hobsons solution neared 10 years of use in 2021, CTS facilitated a systemwide RFP.

The RFP selection committee also selected TargetX.

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

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The RFP selection committee also selected TargetX.

Target X – Systemwide Response		
NDUS RFP Response		
	Annual $	$ Unit of Service*
All NDUS	$ 537,350.00	$ 12.34
NDSU	$ 68,100.00	$ 5.56
UND	$ 68,100.00	$ 4.91
Remaining 9	$ 401,150.00	$ 23.02

*Note: Unit of Service using Fall 22 FTE count

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

TargetX had existing contracts with UND and NDSU. Thus, the system contract we signed was for the 9 remaining institutions.

The actual costs for FY23

*Note: Unit of Service using Fall 22 FTE count
**Note: UND has purchased additional modules to support their specific needs.

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Case Study of IT Consolidation

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The actual costs for FY23

Actuals FY23		
	Annual $	$ Unit of Service*
NDSU	$ 169,238.00	$ 13.82
UND**	$ 236,575.00	$ 17.05
NDUS	$ 395,487.00	$ 22.69
Total	$ 801,300.00	$ 18.40

*Note: Unit of Service using Fall 22 FTE count
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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

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vs.

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Governance and Collaboration

CTS Governance & Collaboration

- **Governance**
  - Chief Information Officer Council
  - Information Security Council
  - Endpoint Council
  - Network Council
  - Blackboard Governance
  - PeopleSoft Governance
  - Information and Data Governance
  - Document Imaging Steering Committee
  - ODIN Advisory Council
- **User Groups**
  - HCM User Group
  - FIN/Controllers User Group
  - Supplier Workgroup
  - Grants User Group
  - Institutional Research Users Group
  - Microsoft 365 User Group

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CTS Governance & Collaboration

- **Campus Connection User Groups**
  - Campus Community
  - Student Finance
  - Financial Aid
  - Admissions
  - Student Records
  - Ad Astra
  - Parking
  - FAMIS
  - Housing Director
  - Starfish
- **State Affiliations**
  - NDIT CIO
  - Distance Ed Directors
  - Video and Audio Coordinators
  - NDIT SLDS Governance
  - NDIT SLDS Research
  - K12 Coordinating Council

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Question and Answer

NDSU NORTH DAKOTA STATE UNIVERSITY

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY

Academics

Instruction

1. B.S. in cybersecurity to start in Fall 2023, available online and on-campus
2. Launching new MS degree in Data Science
3. $1.5 million from DoD VICEROY program to support course development and provide student scholarships will support this program
    - NDSU Led, participation from BSC, MiSU, City University of Seattle, and Dakota Digital Academy.

External Facing Activities

1. Summery cybersecurity camp
2. Several strong competition finishes for students, including third place in 'experienced' team category for the National Cyber League
3. The Challey Institute recently sponsored a day-long seminar on the ChatGPT AI technology

Infrastructure

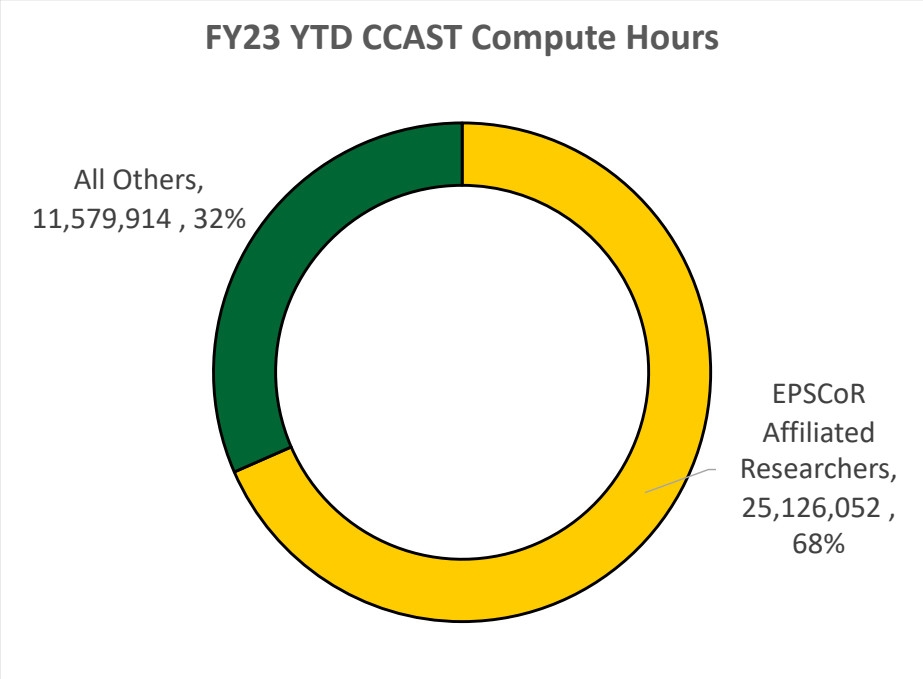
CCAST Resources for Computational Research

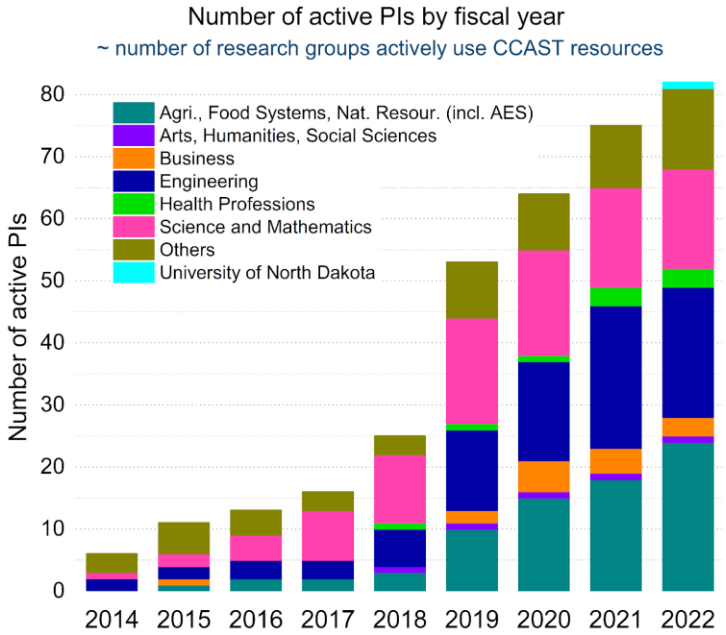
Item	Size
Compute Cores	12,000+
Graphical Processing Cores	70
Storage	10 petabytes (10,000,000 Gb)
Current FTE	5

In 2021 NDSU received **$1.6M** in federal money for computational research. This allowed us to approximately **double our compute and storage** capacity.

CCAST: Center for Computational Assisted Science and Technology

Serving the State and the University





Training & Workforce Development

1. **Trained over 600** faculty, staff, and students in the past 5 years
2. More than **40 student interns**.
3. Learning **high demand skills** in IT system administration, scientific computing, and computational research

Preparing for the Future

1. Anticipate 3 additional FTE due to new money from legislature.
2. Working on needs assessment for these FTE
3. Engaging with Ag on synergistic activates beyond the base needs assessment

Research

1. RESEARCH 1 (R1) DESIGNATION
2. RESEARCH SUCCESS IN KEY AREAS
3. INNOVATION AND THE NDSU RESEARCH FOUNDATION
4. ENTREPRENEURSHIP
5. THE NDSU RESEARCH AND TECHNOLOGY PARK
6. NDSU'S LAND GRANT MISSION

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY NDSU

Research Activities Involving Cyber and CCAST

- NDSU researcher earns NSF grant to study computer system efficiency (**Sumitha George**, Electrical and Computer Engineering) https://www.ndsu.edu/news/view/detail/72595/
- Faculty member receives NSF CAREER Award to investigate interactions occurring at the interface of nanoscale materials and an enzyme (**Mohi Quadir**, Coatings and Polymeric Materials) https://www.ndsu.edu/news/view/detail/71783/
- Understanding ice-covered rivers and finding new ways to prevent river ice disasters in North Dakota (**Trung Le**, Civil Engineering; a recent recipient of the prestigious NSF CAREER Award): https://www.ndsu.edu/news/view/detail/71472/
- Developing new cultivars of pea, chickpea, and lentil for the Northern Great Plains region (**Nonoy Bandillo**, Plant Sciences): https://kb.ndsu.edu/109500
- Computational design of materials for energy, optical, optoelectronic, and quantum information applications (**Khang Hoang**, Physics and CCAST); his recent research work made front-page news in The Forum (https://www.inforum.com/news/north-dakota/30-years-after-discovery-ndsu-researcher-finds-how-the-material-in-products-keeps-glowing) and was featured by other news outlets in the U.S. and abroad.

Sensors

Agricultural Sensors

- **Electrical and Computer Engineering, Agricultural and Biosystems Engineering and Plant Sciences)**
  This group is focused on the development and design of electromagnetic sensors (microwave, images, RADAR, LIDAR, etc.) for the agricultural industry, which are capable of detecting soil moisture, temperature, etc. Their research covers fabrication, device design and modeling, various sensing techniques and platforms for the field.

- **Mechanical Engineering**
  This group is focused on the development and design of environmentally-friendly materials for sensor applications in the field. Their research covers fabrication, material design and modeling, and various manufacturing techniques.

Biomedical Sensors

- **Electrical and Computer Engineering**
  This group is focused on the development and design of electronic devices and sensors based on nanomaterials, which are capable of detecting trace chemical gases with broad application of medicines, food safety and toxic gases in society and industry. Their research covers nanomaterial fabrication, device design and modeling, and variable sensing techniques.

Recent Awards

PI Name	Area	Project Title	PTE Sponsor/Direct Sponsor/Agency	Total Budget
Jeremy A Straub	Cyber	Support for Cybersecurity Training for High School Educators	City University of Seattle / National Security Agency	$22,982
Jeremy A Straub	Cyber	Study of Advanced Cybersecurity Techniques to Advance the Security of Power Generation SCADA Systems Supporting MDA Capabilities	Office of the Secretary of Defense	$999,652
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Ying Huang	AI	RII Track-2 FEC: Artificial Intelligence on Sustainable Energy Infrastructure Network (AI SUSTEIN) and Beyond towards Industries of the Future	National Science Foundation	$2,999,179
Bakhtiyor Rasulev	HPC	MRI: Acquisition of a High Performance Computing System for Scientific Research and Education at NDSU	National Science Foundation	$884,596
Total				**$5,206,763**

NDSU NORTH DAKOTA STATE UNIVERSITY

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY

Academics

Instruction

1. B.S. in cybersecurity to start in Fall 2023, available online and on-campus
2. Launching new MS degree in Data Science
3. $1.5 million from DoD VICEROY program to support course development and provide student scholarships will support this program
    - NDSU Led, participation from BSC, MiSU, City University of Seattle, and Dakota Digital Academy.

External Facing Activities

1. Summery cybersecurity camp
2. Several strong competition finishes for students, including third place in 'experienced' team category for the National Cyber League
3. The Challey Institute recently sponsored a day-long seminar on the ChatGPT AI technology

Infrastructure

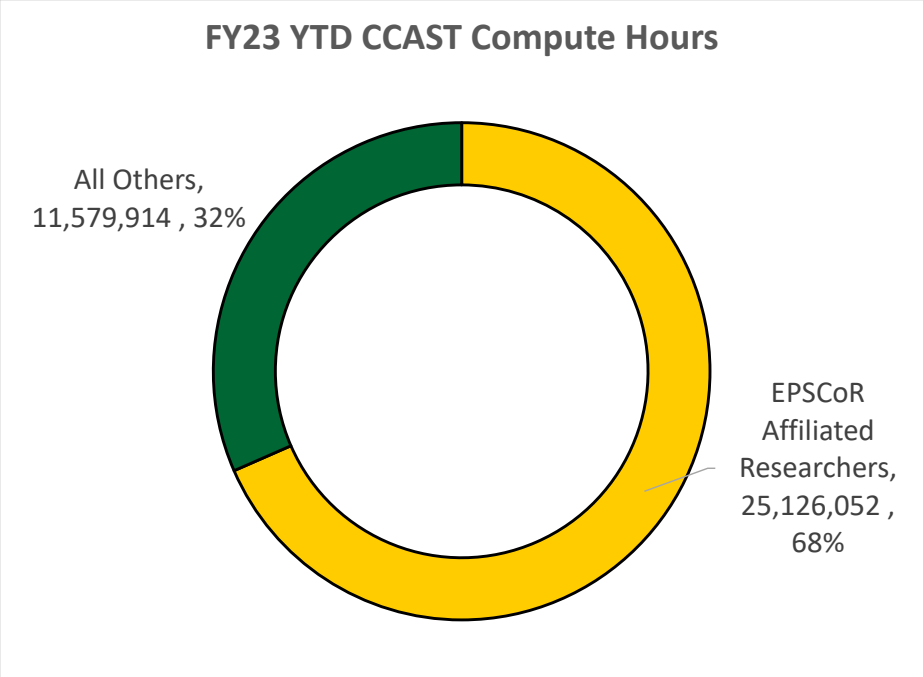
CCAST Resources for Computational Research

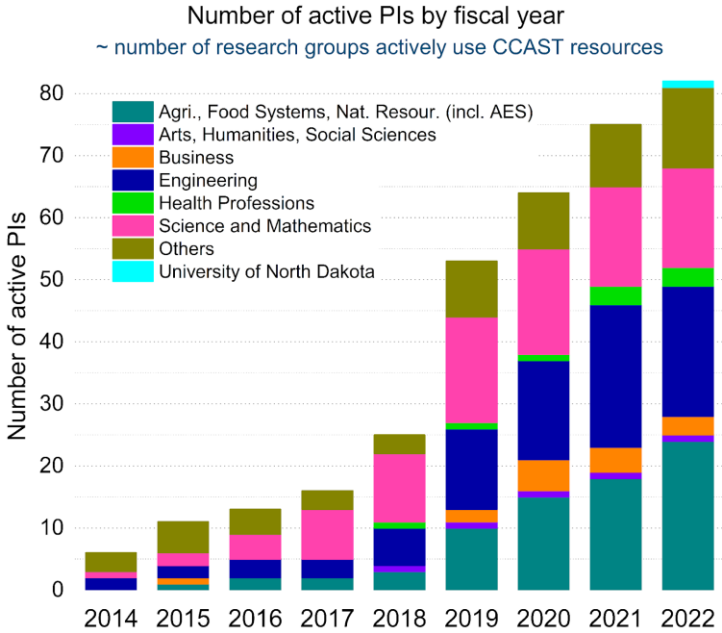
Item	Size
Compute Cores	12,000+
Graphical Processing Cores	70
Storage	10 petabytes (10,000,000 Gb)
Current FTE	5

In 2021 NDSU received **$1.6M** in federal money for computational research. This allowed us to approximately **double our compute and storage** capacity.

CCAST: Center for Computational Assisted Science and Technology

Serving the State and the University





Training & Workforce Development

1. **Trained over 600** faculty, staff, and students in the past 5 years
2. More than **40 student interns**.
3. Learning **high demand skills** in IT system administration, scientific computing, and computational research

Preparing for the Future

1. Anticipate 3 additional FTE due to new money from legislature.
2. Working on needs assessment for these FTE
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STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY NDSU

Research Activities Involving Cyber and CCAST

- NDSU researcher earns NSF grant to study computer system efficiency (**Sumitha George**, Electrical and Computer Engineering) https://www.ndsu.edu/news/view/detail/72595/
- Faculty member receives NSF CAREER Award to investigate interactions occurring at the interface of nanoscale materials and an enzyme (**Mohi Quadir**, Coatings and Polymeric Materials) https://www.ndsu.edu/news/view/detail/71783/
- Understanding ice-covered rivers and finding new ways to prevent river ice disasters in North Dakota (**Trung Le**, Civil Engineering; a recent recipient of the prestigious NSF CAREER Award): https://www.ndsu.edu/news/view/detail/71472/
- Developing new cultivars of pea, chickpea, and lentil for the Northern Great Plains region (**Nonoy Bandillo**, Plant Sciences): https://kb.ndsu.edu/109500
- Computational design of materials for energy, optical, optoelectronic, and quantum information applications (**Khang Hoang**, Physics and CCAST); his recent research work made front-page news in The Forum (https://www.inforum.com/news/north-dakota/30-years-after-discovery-ndsu-researcher-finds-how-the-material-in-products-keeps-glowing) and was featured by other news outlets in the U.S. and abroad.

Sensors

Agricultural Sensors

- **Electrical and Computer Engineering, Agricultural and Biosystems Engineering and Plant Sciences)**
  This group is focused on the development and design of electromagnetic sensors (microwave, images, RADAR, LIDAR, etc.) for the agricultural industry, which are capable of detecting soil moisture, temperature, etc. Their research covers fabrication, device design and modeling, various sensing techniques and platforms for the field.

- **Mechanical Engineering**
  This group is focused on the development and design of environmentally-friendly materials for sensor applications in the field. Their research covers fabrication, material design and modeling, and various manufacturing techniques.

Biomedical Sensors

- **Electrical and Computer Engineering**
  This group is focused on the development and design of electronic devices and sensors based on nanomaterials, which are capable of detecting trace chemical gases with broad application of medicines, food safety and toxic gases in society and industry. Their research covers nanomaterial fabrication, device design and modeling, and variable sensing techniques.

Recent Awards

PI Name	Area	Project Title	PTE Sponsor/Direct Sponsor/Agency	Total Budget
Jeremy A Straub	Cyber	Support for Cybersecurity Training for High School Educators	City University of Seattle / National Security Agency	$22,982
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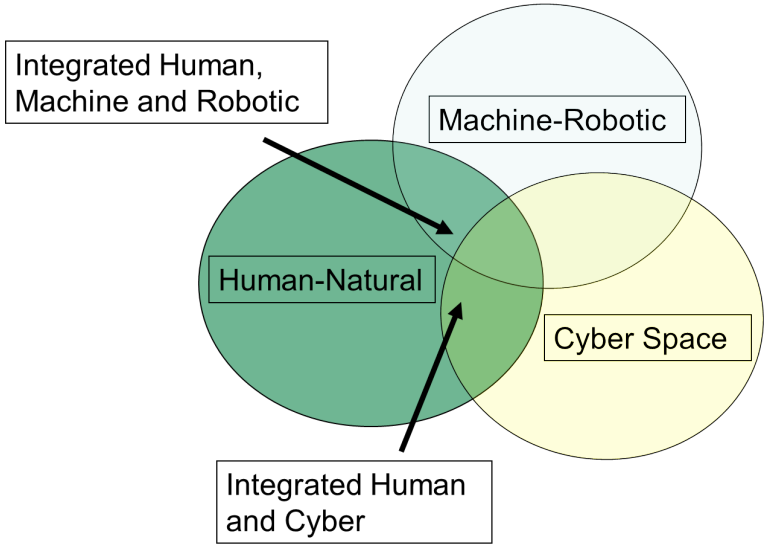
Total				**$5,206,763**

A Strategy of Resilience for NDUS/Campuses in an Uncertain Digital Age: How to Frame This Epic Challenge?

SBHE Retreat Bismarck, ND
May 22, 2023

Mark Hagerott Ph.D.
Chancellor, North Dakota University System
mark.hagerott@ndus.edu



❑Note: The views and opinions are the author's and do not necessarily state or reflect those of the U.S Government or the State of North Dakota

NORTH DAKOTA
UNIVERSITY SYSTEM

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Core Technology Services

Darin King

Vice Chancellor of IT/CIO

CTS Vision and Mission

The vision of CTS is to foster an organizational culture that delivers exceptional service, secure infrastructure, and access to information.

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

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CTS - 2015

- High Operational Effort to "Keep the lights on" (92%+)
  - Strategy: Work Management System, Automation, Consolidation, Realignment, Project Management
- Administratively "Top Heavy"
  - Strategy: Right Size with normal attrition, Early Retirement, Realignment
- No Security Practice or Strategy
  - Strategy: Establish NDUS Information Security Office
    - Build team with FTE's created through normal attrition and Operational efficiencies.
    - Develop Policy, Procedure, Standards. Regular external risk assessments.
- Administrative Issues
  - Strategy: Outsource some business function for separation of duties, etc.
    - Update and communicate CTS expectations and procedures.

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CTS - 2017

- The Budget Crisis
  - 18% Budget Reduction
- 2019 – Hold Even Budget
- 2021 – Hold Even Budget

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CTS - 2023

- Operational Effort below 80% and falling (Run-Grow-Transform)
  - How: WMS, strategic investments in data center, automation, realignment
  - How: Planning, Procurement and Project Management. (118 projects in FY22)
  - How: Enterprise Service Management (ITIL) program called ServiceOne.
- Reduced Senior Management from 7 FTE to 3 FTE
  - How: Attrition, Early Retirements, Realignment
- NDUS Information Security Team
  - How: Used FTE's available because of efficiencies in other parts of CTS
  - How: Strategic investments to reduce risks
- Administrative Effectiveness
  - How: Gradually built capacity to effectively run our business using available FTE's.

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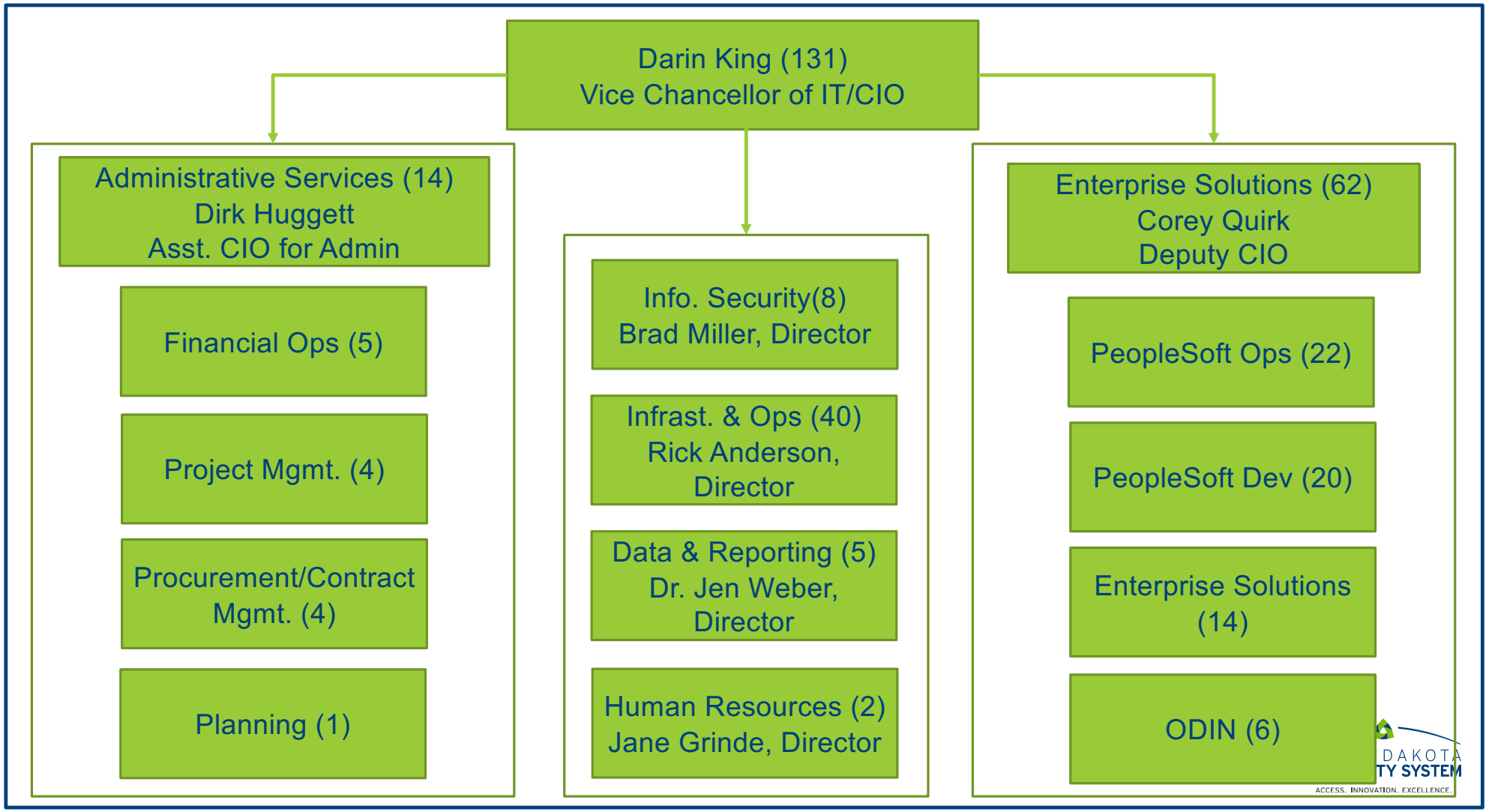
Darin King (131)
Vice Chancellor of IT/CIO
Administrative Services (14)
Dirk Huggett
Asst. CIO for Admin
Financial Ops (5)
Project Mgmt. (4)
Procurement/Contract Mgmt. (4)
Planning (1)
Info. Security(8)
Brad Miller, Director
Infrast. & Ops (40)
Rick Anderson, Director
Data & Reporting (5)
Dr. Jen Weber, Director
Human Resources (2)
Jane Grinde, Director
Enterprise Solutions (62)
Corey Quirk
Deputy CIO
PeopleSoft Ops (22)
PeopleSoft Dev (20)
Enterprise Solutions (14)
ODIN (6)
DAKOTA
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ServiceOne

- International IT Enterprise Service Management Framework
  - Used by over 80% of IT shops worldwide
- Detailed standards and work instructions
- 8 Practices Implemented
- Data for continual improvement

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Practice	Purpose	Forecasted Benefits
Organizational Change Management (OCM)	To help CTS and NDUS personnel transition through the changes introduced by the other 8 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 Desk

First Call Resolution/Fulfillment

ServiceOne
Partnering For Progress
North Dakota University System

Metric	Total	%	Priority 1	Priority 2	Priority 3	Priority 4
Total Incidents – First Call Resolved	**54***	**31%**	**7**	**5**	**13**	**29**
Incidents - First Call Resolved by Other	32*	59%	2	2	6	21
Incidents - First Call Resolved by Service Desk	22*	41%	5	3	7	8
Total Service Requests – First Call Resolved	**623**	**60%**	**n/a**	**4**	**179**	**440**
Service Requests - First Call Fulfilled by Other	554	89%	n/a	4	122	428
Service Requests - First Call Fulfilled by Service Desk	69	11%	n/a	0	57	12

*Includes both Parent and Children tickets.

Analysis – Incidents

32 Incidents – First Call Incidents Resolved by Other

- 69% Incidents were submitted and resolved by CTS staff
  - ✓ 68% of the 22 Incidents were for Endpoint Services, 35% were for Enterprise Service Operations

22 Incidents - First Call Resolved by Service Desk

* Volume includes three Parent Incidents with 7 children

- 69% of the remaining 12 incident tickets were for Enterprise Service Operations

Analysis – Service Requests

554 Service Requests - First Call Fulfilled by Other

- 32% (179) Campus Solutions
- 21% (114) HCM
- 14% (79) I/O
- 11% (61) FIN
- 11% (60) Security Applications

69 Service Requests - First Call Fulfilled by Service Desk

- 42% Blackboard
- 35% Document Imaging
- 14% ES Applications

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PeopleSoft

PeopleSoft ERP

- Human Capital Management
  - 16 Bi-directional integrations
  - 25+ Data Pushes
- Financial Management
  - 18 Bi-directional integrations
  - 12+ Data Pushes
- Campus Connection
  - 15 Ancillary Systems (integrations)
  - 15+ Data Push/Pulls

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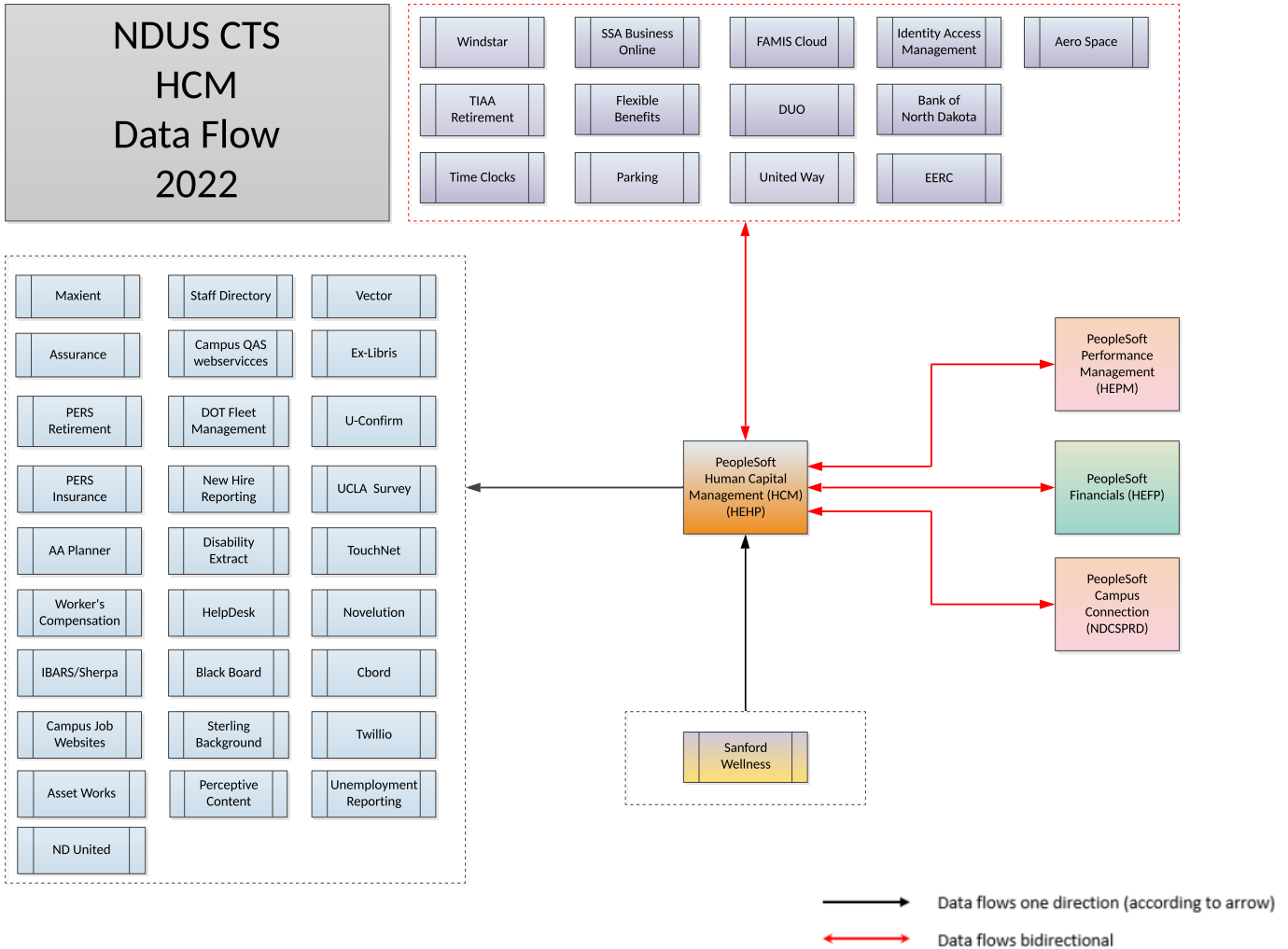
NDUS CTS HCM Data Flow 2022



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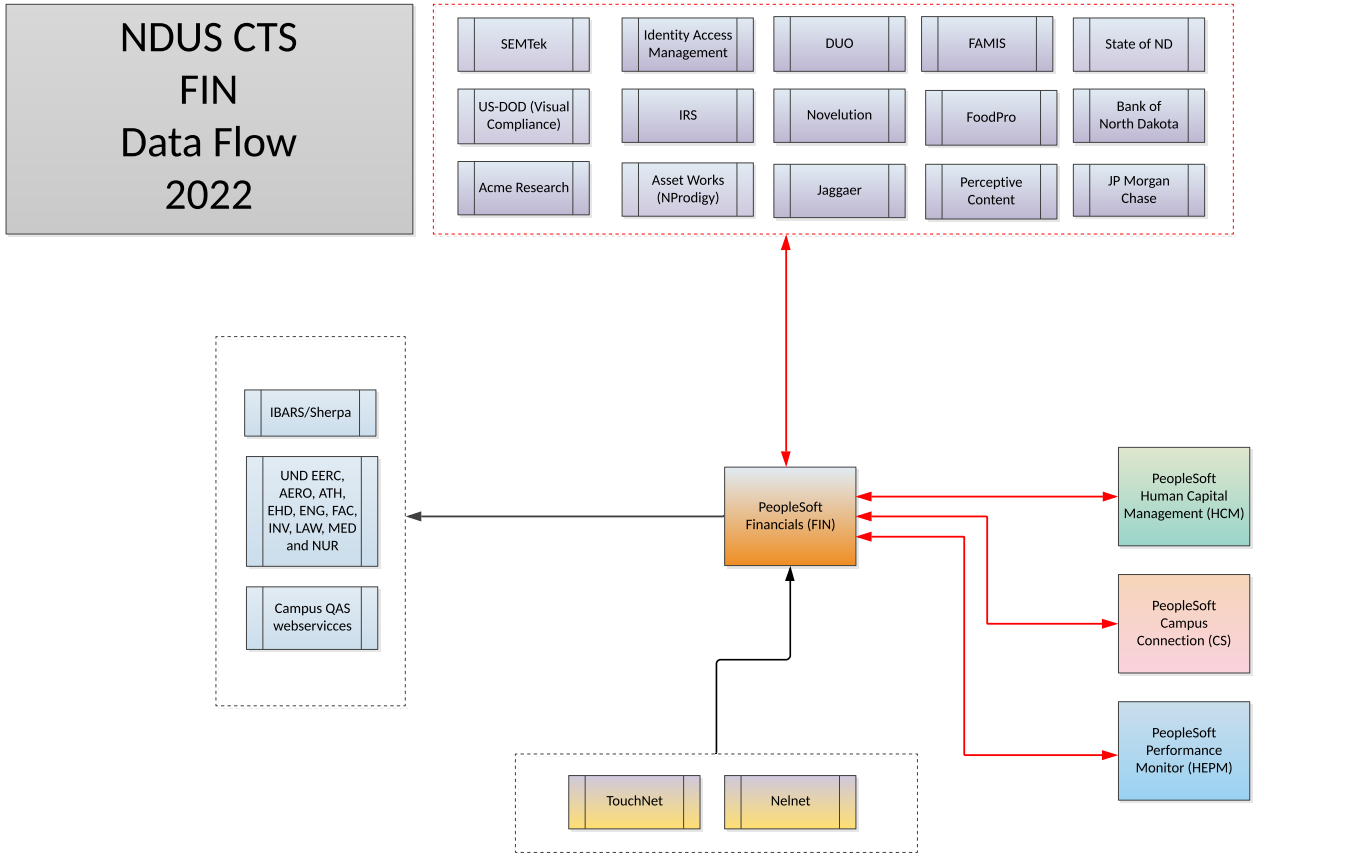
NDUS CTS FIN Data Flow 2022



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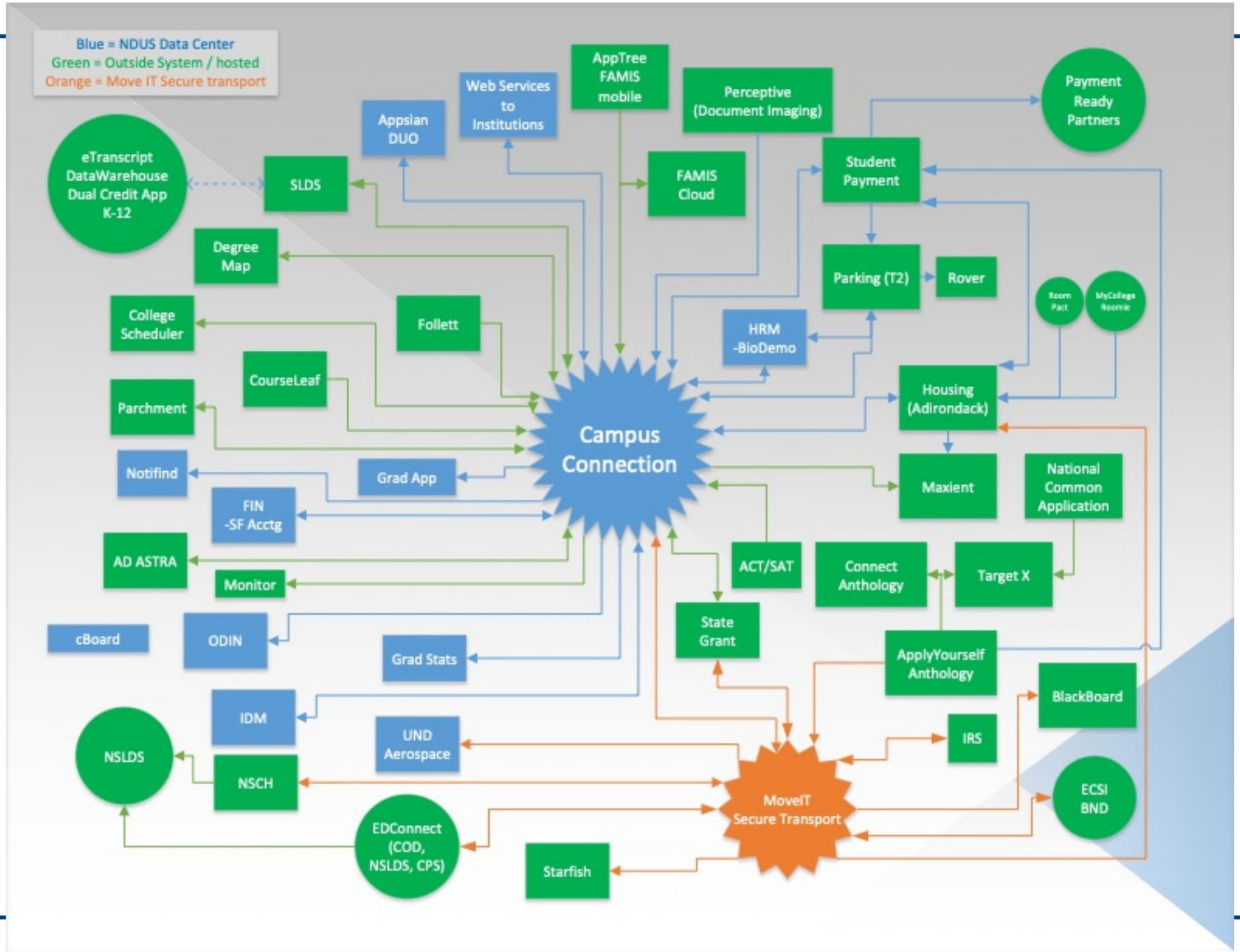

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NORTH DAKOTA
UNIVERSITY SYSTEM
CORE TECHNOLOGY SERVICES

NDUS ERP (PeopleSoft) Market Analysis

Corey Quirk
Deputy CIO
NDUS Core Technology Services

ERP (PeopleSoft)
Market Analysis Objectives'

- Explore ERP Trends & Developments
- Evaluate Options in the Marketplace
- Assess Risk & Opportunities
- Review Implementation & Operating Costs
- Identify Requirements for RFP

Coming Summer 2023

NORTH DAKOTA
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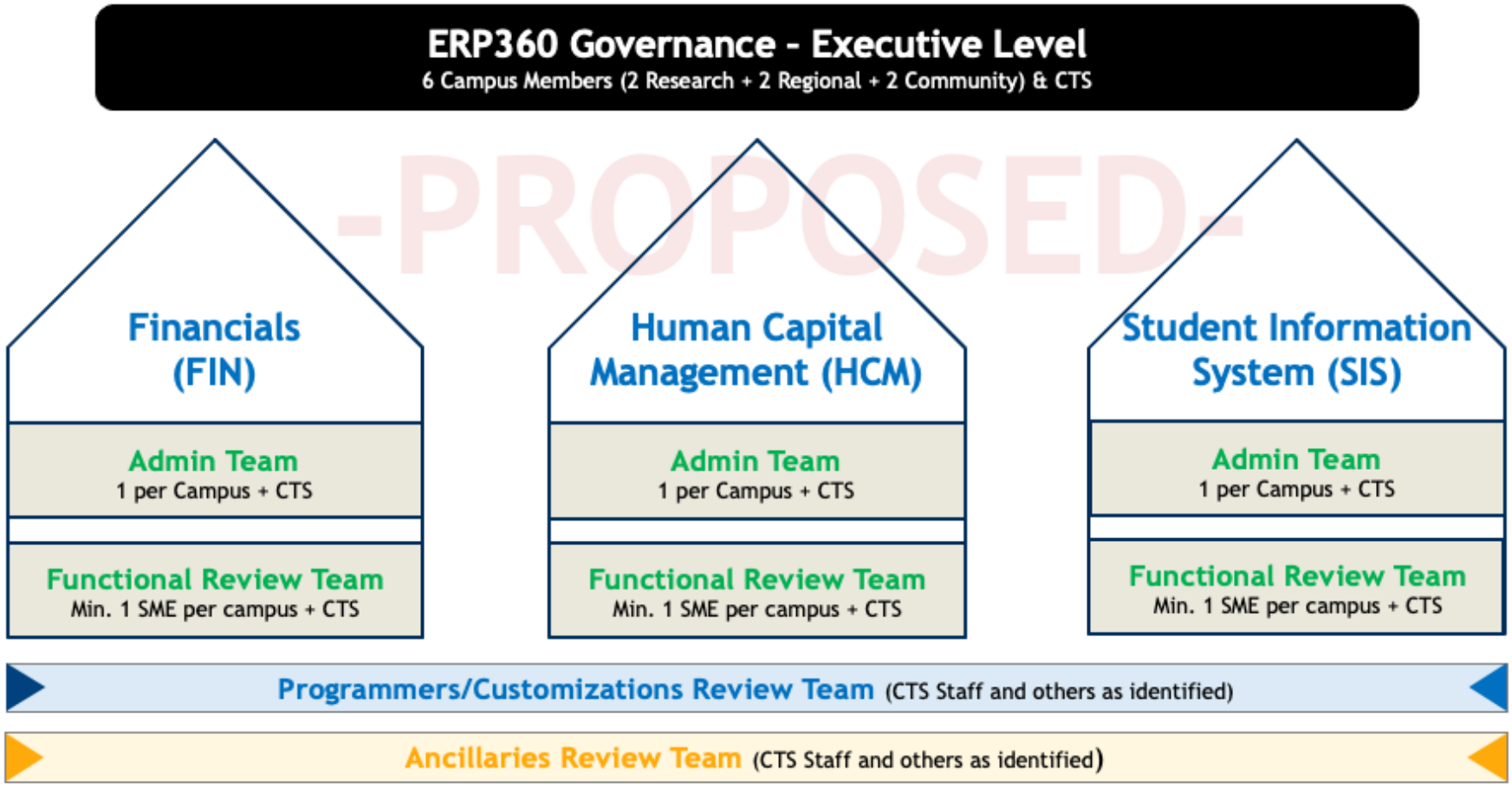
CORE TECHNOLOGY SERVICES

ERP (PeopleSoft) Market Analysis - Process



PeopleSoft Governance Membership

Name	Council	Campus	Term
Larry Brooks	Academic Affairs	VCSU	1st term Expires 9/12/25
Sharon Loiland	Administrative Affairs	UND	1st term Expires 6/11/23
Dr. Steven Shirley	Chancellor's Cabinet	MiSU	1st term Expires 3/9/23
Gary Haugland	CIO	LRSC	2nd term Expires 3/7/24
Sarah Gasevic	Human Resources	MaSU	1st term Expires 6/13/25
Laura Oster Aaland	Student Affairs	NDSU	1st term Expires 9/12/25
Chris Erickson	Public Affairs	NDUSSO	1st term Expires 6/11/23

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CORE TECHNOLOGY SERVICES

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IT Consolidation

IT Consolidation

- Why?
  - Late 1990's
  - Small State, volatile economy
  - Economy of Scale
  - Human Resource Efficiencies
  - Fiscal Efficiencies
- What?
  - State Government IT
    - IT Unification in 2019
  - State Network
    - State Government, K12 & Higher Ed
  - PeopleSoft
    - State Government and Higher Ed
  - PowerSchool SIS
    - K12

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NDUS IT Consolidation

- N.D.C.C 15-10-44
  - Provides for a waiver
- Policy 1200
  - Provides for a waiver
- Procedure 1200.1
  - Process for approval and/or waiver

- What?
  - ERP (PeopleSoft)
  - Learning Management System (Blackboard)
  - Email and Collaboration (Microsoft 365)
  - Identity and Access Management
  - Document Imaging
  - NDUS Data Center
  - Information Security
  - Secure File Transfer
  - Training

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

Existing Solution - Hobsons		
	Annual $	$ Unit of Service*
All NDUS	$ 396,495.40	$ 9.11
Remove NDSU/UND	$ 396,495.40	$ 22.75

*Note: Unit of Service using Fall 22 FTE count

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Approved UND and NDSU to go To RFP for a new solution in 2018.

They selected a solution called TargetX.

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As the Hobsons solution neared 10 years of use in 2021, CTS facilitated a systemwide RFP.

The RFP selection committee also selected TargetX.

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Target X – Systemwide Response		
NDUS RFP Response		
	Annual $	$ Unit of Service*
All NDUS	$ 537,350.00	$ 12.34
NDSU	$ 68,100.00	$ 5.56
UND	$ 68,100.00	$ 4.91
Remaining 9	$ 401,150.00	$ 23.02

*Note: Unit of Service using Fall 22 FTE count

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Case Study of IT Consolidation

Customer Relationship Management (CRM) Solution for Recruit/Retain

TargetX had existing contracts with UND and NDSU. Thus, the system contract we signed was for the 9 remaining institutions.

The actual costs for FY23

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**Note: UND has purchased additional modules to support their specific needs.

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Actuals FY23		
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NDSU	$ 169,238.00	$ 13.82
UND**	$ 236,575.00	$ 17.05
NDUS	$ 395,487.00	$ 22.69
Total	$ 801,300.00	$ 18.40

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Governance and Collaboration

CTS Governance & Collaboration

- **Governance**
  - Chief Information Officer Council
  - Information Security Council
  - Endpoint Council
  - Network Council
  - Blackboard Governance
  - PeopleSoft Governance
  - Information and Data Governance
  - Document Imaging Steering Committee
  - ODIN Advisory Council
- **User Groups**
  - HCM User Group
  - FIN/Controllers User Group
  - Supplier Workgroup
  - Grants User Group
  - Institutional Research Users Group
  - Microsoft 365 User Group

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CTS Governance & Collaboration

- **Campus Connection User Groups**
  - Campus Community
  - Student Finance
  - Financial Aid
  - Admissions
  - Student Records
  - Ad Astra
  - Parking
  - FAMIS
  - Housing Director
  - Starfish
- **State Affiliations**
  - NDIT CIO
  - Distance Ed Directors
  - Video and Audio Coordinators
  - NDIT SLDS Governance
  - NDIT SLDS Research
  - K12 Coordinating Council

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Question and Answer

NDSU NORTH DAKOTA STATE UNIVERSITY

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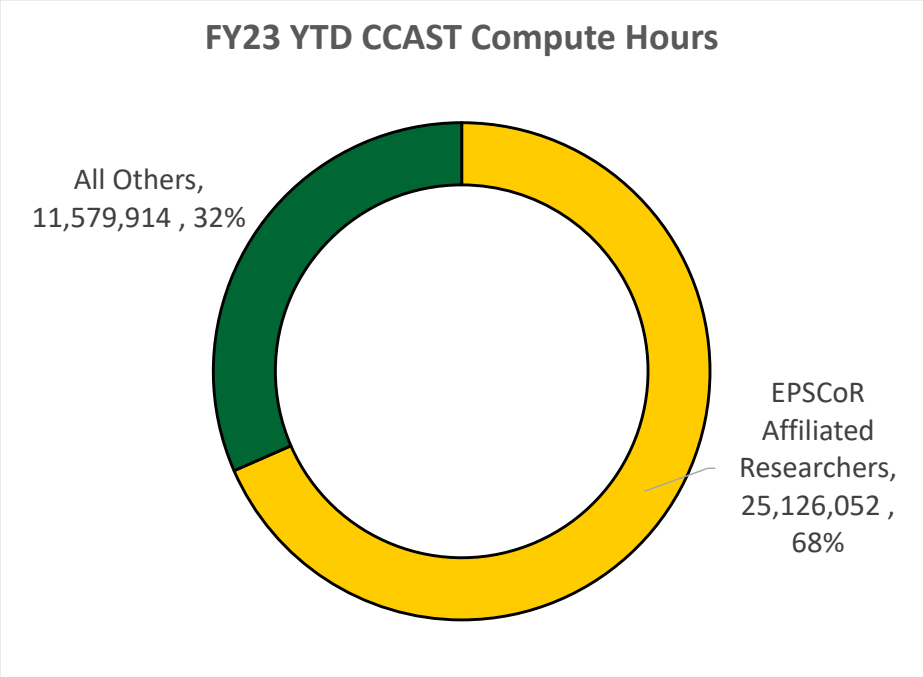
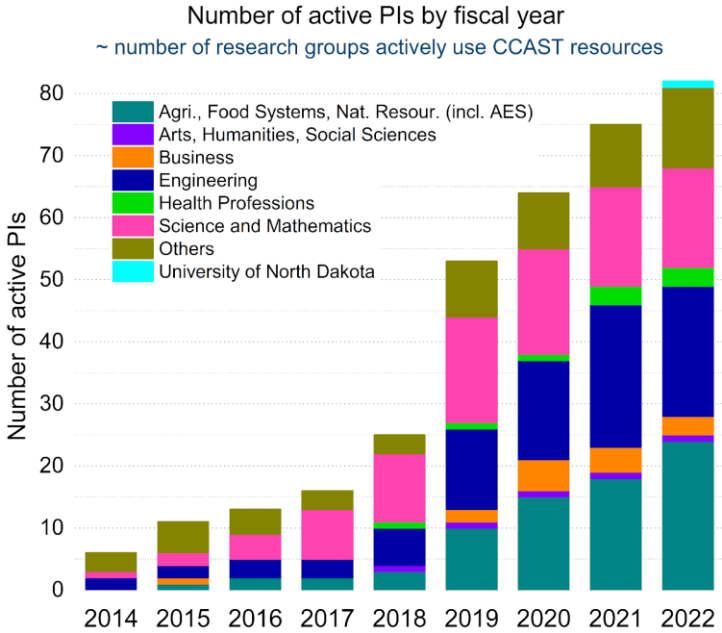
Serving the State and the University





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2. RESEARCH SUCCESS IN KEY AREAS
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6. NDSU'S LAND GRANT MISSION

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY NDSU

Research Activities Involving Cyber and CCAST

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- Faculty member receives NSF CAREER Award to investigate interactions occurring at the interface of nanoscale materials and an enzyme (**Mohi Quadir**, Coatings and Polymeric Materials) https://www.ndsu.edu/news/view/detail/71783/
- Understanding ice-covered rivers and finding new ways to prevent river ice disasters in North Dakota (**Trung Le**, Civil Engineering; a recent recipient of the prestigious NSF CAREER Award): https://www.ndsu.edu/news/view/detail/71472/
- Developing new cultivars of pea, chickpea, and lentil for the Northern Great Plains region (**Nonoy Bandillo**, Plant Sciences): https://kb.ndsu.edu/109500
- Computational design of materials for energy, optical, optoelectronic, and quantum information applications (**Khang Hoang**, Physics and CCAST); his recent research work made front-page news in The Forum (https://www.inforum.com/news/north-dakota/30-years-after-discovery-ndsu-researcher-finds-how-the-material-in-products-keeps-glowing) and was featured by other news outlets in the U.S. and abroad.

Sensors

Agricultural Sensors

- **Electrical and Computer Engineering, Agricultural and Biosystems Engineering and Plant Sciences)**
  This group is focused on the development and design of electromagnetic sensors (microwave, images, RADAR, LIDAR, etc.) for the agricultural industry, which are capable of detecting soil moisture, temperature, etc. Their research covers fabrication, device design and modeling, various sensing techniques and platforms for the field.

- **Mechanical Engineering**
  This group is focused on the development and design of environmentally-friendly materials for sensor applications in the field. Their research covers fabrication, material design and modeling, and various manufacturing techniques.

Biomedical Sensors

- **Electrical and Computer Engineering**
  This group is focused on the development and design of electronic devices and sensors based on nanomaterials, which are capable of detecting trace chemical gases with broad application of medicines, food safety and toxic gases in society and industry. Their research covers nanomaterial fabrication, device design and modeling, and variable sensing techniques.

Recent Awards

PI Name	Area	Project Title	PTE Sponsor/Direct Sponsor/Agency	Total Budget
Jeremy A Straub	Cyber	Support for Cybersecurity Training for High School Educators	City University of Seattle / National Security Agency	$22,982
Jeremy A Straub	Cyber	Study of Advanced Cybersecurity Techniques to Advance the Security of Power Generation SCADA Systems Supporting MDA Capabilities	Office of the Secretary of Defense	$999,652
Jeremy A Straub	Cyber	Support for Cybersecurity Outreach Center for Native American Community	National Security Agency	$293,838
Jeremy A Straub	Cyber	Support for the Development of K-12 School Cybersecurity Education in North Dakota	University Of Washington / National Security Agency	$6,516
Ying Huang	AI	RII Track-2 FEC: Artificial Intelligence on Sustainable Energy Infrastructure Network (AI SUSTEIN) and Beyond towards Industries of the Future	National Science Foundation	$2,999,179
Bakhtiyor Rasulev	HPC	MRI: Acquisition of a High Performance Computing System for Scientific Research and Education at NDSU	National Science Foundation	$884,596
Total				**$5,206,763**

Envision 2030 and Digitization

Presentation to the State Board of Higher Education

Andy Armacost
President, University of North Dakota

May 22, 2023

Growth in Programs

- **New academic programs**
  - Cybersecurity – on campus and online
  - Data Science – on campus and online
- **Research units**
  - Research Institute for Autonomous Systems – Mark Askelson
  - Center for AI Research – Naima Kaabouch
  - Center of Cybersecurity Research – Prakash Ranganathan
  - High-Performance Computing Center – Aaron Bergstrom
    - Digital Realism in Engineering and the Applied Metaverse – DREAM Lab
  - Committee for the Strategic Enhancement of Autonomous Systems Research (CSEASR)

Digitization and Faculty

- **AI/Machine Learning/Autonomy expertise across campus**
  - Electrical Engineering & Computer Science, Petroleum Engineering, Mechanical Engineering, Geography, Biology, Atmospheric Science, Mathematics, Physics & Astrophysics, Chemistry, Biomedical Science, Law
- **Hiring actions in last two years**
  - Three national security faculty members hired (one with AI background)
  - Two new cybersecurity/AI faculty members
  - Two new data science/AI faculty members
  - Four additional cybersecurity/data science/AI hires next year

Artificial Intelligence and ChatGPT

- On-going forums on AI and teaching
- Addressing academic honesty
  - Routine policy change (July 1) to *Code of Student Life* to clarify that each faculty members sets expectations in their course
  - Promoting active conversations across the faculty through multiple forums
  - Writing Center-led discussions about AI detectors
- Expanding role of CSEASR

Digital Literacy Policy

- Prepared to implement learning outcomes by fall 2024
- Embedding lessons and modules within existing courses
- Development work began prior to the pandemic
- Strong support from across disciplines

Digitization in Envision 2035

- Endorse the expansion of this focus area
- Should help us answer questions such as:
  - What do we research?
  - What do we teach?
  - How do we teach?
  - How do we run the universities?
  - How do we emphasize what it is to be human?

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Board Governance and Role of the Board

May 22, 2023

Outcomes

- Connect with the Mission/Vision and the Principles and Core Values of the SBHE and NDUS
- Understand roles and responsibilities of SBHE
- Learn best practices for high functioning board members

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Mission and Vision of the SBHE

- **Our Mission**: "To enhance economic growth, social vitality, and quality of life for North Dakota through the discovery, sharing, and application of knowledge."

- **Our Vision**: "To lead the nation in educational attainment through access, innovation and excellence.

Policy 100.4

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Overview

- The State Board of Higher Education is the **policy-setting** and **advocacy body** for the North Dakota University System and the governing body for North Dakota's 11 publicly supported colleges and universities.
- The SBHE also oversees the NDSU Extension Service and Agricultural Research Stations, Northern Crops Institute, State Forest Service and the Upper Great Plans Transportation Institute.

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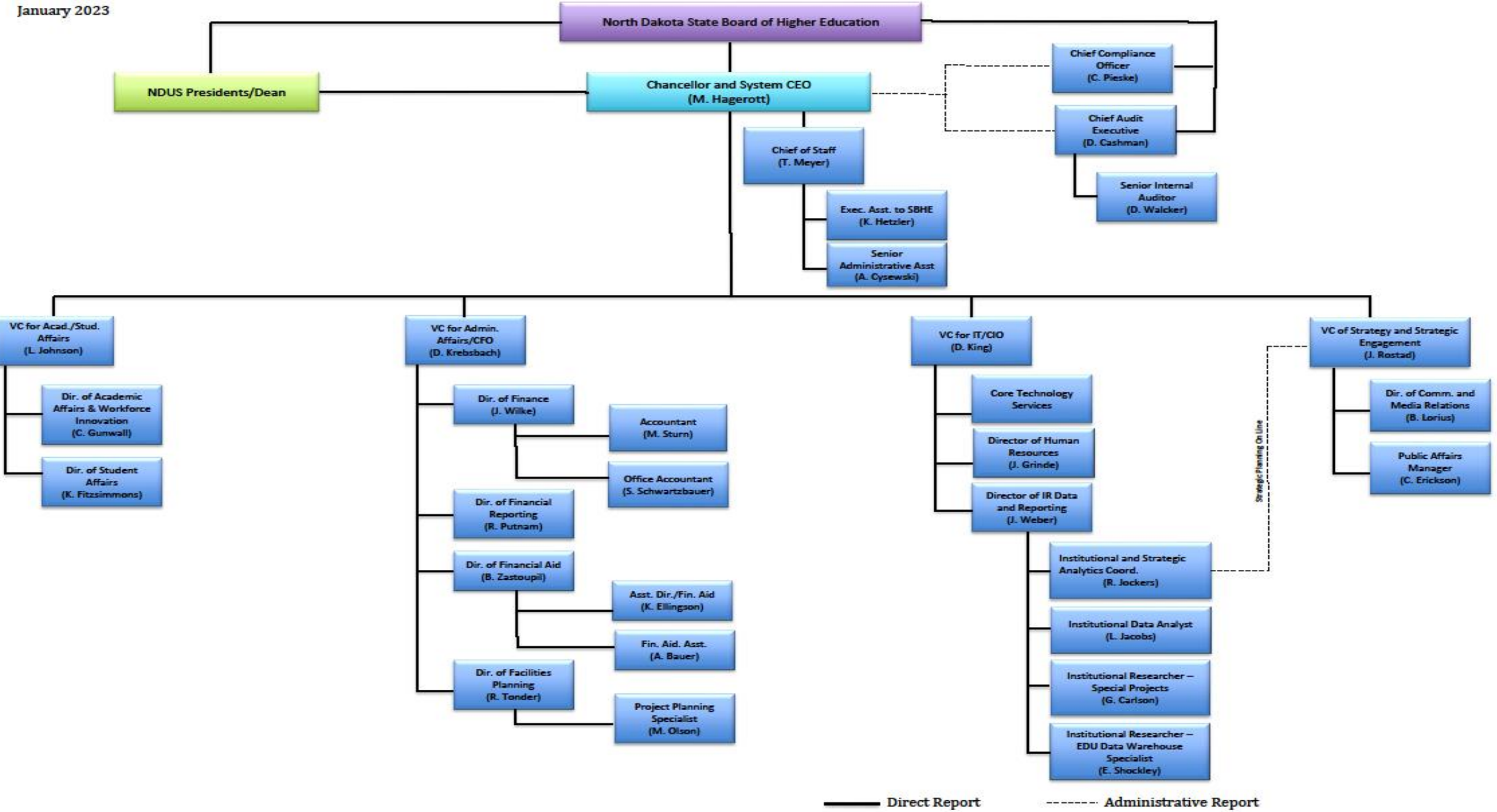
January 2023



Principles of SBHE (100.5)

- **The SBHE believes**:
- a. **The most valuable asset of any state is its human capital**: educated and highly skilled citizens, employees, business owners, community leaders, and contributing members of society.
- b. **A stable future for North Dakota is directly linked to and dependent upon its University System**. Likewise, a stable future for the NDUS is linked to the economy of North Dakota.
- c. **The NDUS, in collaboration with the elected and private sector leadership across the state, in North Dakota, can and should take positive steps to enhance and diversify the economy of North Dakota**.
- d. **Recruitment and retention of students who graduate from NDUS and move into the North Dakota workforce is a priority focus**.
- e. **The students, faculty, and staff are the foundation of the NDUS**.
- f. **Performance of the NDUS will be enhanced in an environment which is conducive to innovation, creativity, and flexibility – coupled with appropriate quality assurance and accountability.**
- g. **Our educational programs should provide access and inclusion to a widely diverse student population and prepare all students to succeed in an increasingly pluralistic society.**
- h. **The citizens and the legislature created and expect the NDUS to function as a system;** i.e., to collaborate, whenever appropriate and feasible, in offering programs, serving students and citizens, and in providing administrative services.
- i. **The benefits of the NDUS can and should be available and accessible to all of North Dakota residents**.
- j. **It is important for all the key stakeholders of the NDUS to adopt and apply** the same set of expectations and accountability measures which are identified and agreed to in the **SBHE Strategic Plan**.
- k. **Student success encompasses the whole student, to include discovery and academic performance, intervention strategies designed to support at-risk students, tele-health and mental health services, and timely progression toward completion and graduation.**

Core Values of SBHE (100.5)

Built on the vision that education serves as a keystone to strengthening the state's economy, improving the quality of life for its citizens, and building better futures for all, the SBHE and all personnel of the NDUS commit to the following **core values**:

a.**Excellence and Scholarship**: We strive for excellence in all our pursuits. We are committed to innovation in the discovery, sharing and application of knowledge. We commit to continuous self-improvement to achieve excellence in all our endeavors.

b. **Ethics and Dignity**: We are committed to the highest standards of honesty, fairness, accountability, respect and professional and scholarly ethics. We value the dignity and worth of all people. We expect all of our conduct, in discussions and actions, to be based on integrity, mutual respect and civility, and that conduct is driven by the highest ethical standards. We are cognizant of the state's vast investments in the NDUS and remain stalwartly committed, responsible stewards of the state's investments.

c. **Diversity**: We value diversity of thought and of people and believing that diversity is a necessity to a vibrant learning community that pursues excellence in scholarship and research. We are committed to providing a university system that is trustworthy, supportive, safe and welcoming. We are committed to ensuring intercultural and international diversity in our curriculum and our people.

d. **Student Success**: We are committed to fostering the professional and personal growth of all students, staff and faculty by promoting lifelong learning and leadership development. These interests are the primary focus of our decisions and activities.

e. **Collaboration and Public Engagement**: We commit to working collegially and cooperatively in establishing productive partnerships with our colleagues in pre K – 12 education, higher education and all state agencies as well as corporate, nonprofit and public communities. Through these partnerships, we strive to improve education and the quality of life to ensure a better future for all.

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Types Of Board Structures

- **Governing board:** follows organization's best interests and provides high level strategy and direction to organizational management
- **Managing or executive board:** manages day-to-day operations of organization; makes organizational decisions
- **Working board:** members both board members and the workforce of the org (small/new companies)
- **Advisory board:** provides advice and expertise to organization's leadership and main board
- **Policy board:** creates organizational policies and practices to be followed; delegates responsibility for implementation to the Chief Executive Officer and executive management

Board Responsibilities

1. Decision-making and supervisory
2. Advisory
3. Employment
4. Trustee function
5. Symbolic function

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Board Member Responsibilities (310.1)

- Be a link between the SBHE and the public which it serves.
- Conform to and advocate SBHE Beliefs and Core Values
- Build and sustain: Respect, Openness, Civility, Partnership with fellow SBHE, Chancellor, NDUSO and NDUS Presidents/faculty/staff
- Be knowledgeable about higher ed in NDUS, institutional missions, governance of institutions, etc.
- Be an advocate for NDUS by developing a SBHE strategic plan, monitor and assess achievement of goals
- Monitor Chancellor performance
- Participate in Board Meetings
- Carry a fair share of SBHE leadership responsibilities
- Establish effective governance policies
- Participate in reasonable amounts of professional development
- Advocate for the system as a whole without special regard to a particular institution, interest, political affiliation or position, community, or constituency.

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1. Decision Making/Supervisory

- Strategic planning and setting purpose and direction
- Setting major policies for the organization *(e.g., investment, fundraising, ethics, conflicts of interest, etc.)*
- Monitoring major policy compliance
- Approving material transactions and actions
- Hiring Executive Leadership and monitor performance
- Determine standards /monitor Board performance

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2. Advisory Function

- Advise Executive Leadership
- Day to day management of NDUS- delegated to the Chancellor
- Provide input in the application of and compliance with major policies
- Direct Executive Leadership on tasks to be carried out with major policies

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Understanding Supervisory/Advisory Function

Board Responsibility

- Approve policies
- Make high-level strategic decisions
- Ensure legal, ethical, financial duties are met
- Hire and oversee performance of Executive Leadership
- Serve as external advocate
- Stay out of the weeds- avoid second guessing
- More of: what NOT to do…less of: what TO do

Executive Leadership Responsibility

- Make operational decisions
- Make operational procedures
- Keep board educated and informed
- Provide documented recommendations and information to the Board

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3. Employment

Board Function:

- Hiring and review performance of Executive Leadership
- Determine Chancellor compensation
- Ensure continuing education for Executive Leadership
- Ensure open communication with Executive Leadership
- Ensure sound overall legal & ethical performance

Executive Leadership Function:

- Hire employees
- Evaluate, monitor, discipline employees
- Ensure policy compliance
- Resolve employee issues with policy
- Maintain adequate records
- Report financial conditions & significant issues to Board
- Represent organization to the community

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Delegation to Executive Leadership

- Administration of facilities and all activities and departments
- Carry out all policies established by Board
- Select, employ, control & discharge employees
- Create organizational procedures
- Prepare regular & annual reports and assist with budgets / attend all meetings
- Oversee physical property, business affairs, staff, clients
- Serve as liaison officer and channel of communication between Board and committees or staff
- Delegate duties to subordinates
- Other management-related duties

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4. Board Trustee Function

- Safeguard assets
- Ensure fiscal responsibility
- Review fundamental operating and financial plans/monitoring effectiveness

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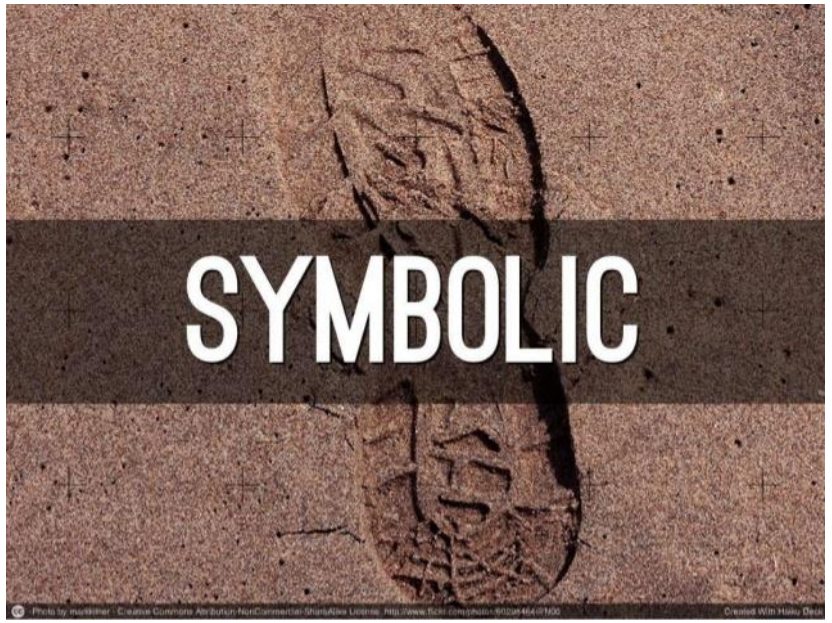
5. Board Symbolic Function

- Face of the organization to:
  - Community
  - Business Partners/ Affiliates
  - Employees



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Required Fiduciary Duties of Board

1. Duty of Care
2. Duty of Loyalty
3. Duty of Obedience

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1. Duty of Care

- Give the same care and concern to your board responsibilities as you would your personal matters.
- Prudent and informed decisions, including with respect to financial oversight
- Use good process for decision-making
- Be honest
- Ensure adequate records

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2. Duty of Loyalty

- Place interests of organization ahead of your own interests at all time
- Avoid (and/or disclose) conflicts of interest, self-dealing, and other breaches of loyalty is especially important
- Avoid political influences and act in best interest of NDUS

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3. Duty of Obedience

- Attend meetings, participate effectively and assertively in discussions, be prepared
- KNOW what's going on
- Comply with SBHE policies and applicable law.
- Review SBHE Mission/Vision, Core Values/Principles, and Board Member Responsibilties. Act in accordance with such provisions.

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Conclusion: Good Board Members…

- Active, engaged, knowledgeable
- Understand organization's missions and objectives
- Respect all points of view
- Unite behind majority decisions even when disagree/vote against decision
- Do not re-hash old decisions
- Minimize politicking and posturing
- Maintain a united Board image
- Safeguard confidential information
- Intercept and correct rumors
- Remember first responsibility to is to the organization itself

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Dakota College at Bottineau
NDSCS
North Dakota State College of Science
NDSU North Dakota State University
Mayville State University
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Lake Region State College
Williston State College
Valley City State University
Minot State University
BSC
Bismarck State College
UND
Dickinson State University

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ENVISION 2035

May Retreat

Envision 2030 Process

- One-day summit kickoff (May 2016)
  - Speakers and panelists
  - Breakout sessions
- 10 pillars/advisory teams to study through 2017
- Legislative roundtables during 2017 session
- Final report-out 2018

Envision 2035 Process

- Kickoff; identify study topics (May 2023)
- President/topic leadership identified (June 2023)
- Formation of first meetings of advisory teams (Jun-Sep 2023)
- Presidential/Cabinet scoping of topics (July 12, 2023)
- Advisory team meetings (summer/fall/winter 2023-24)
- Fall/winter summit: advisory teams brief main drivers, emerging sub-topic issues to SBHE (Nov 1, 2023)
- Initial findings/early draft of Envision 2035 (Q2 of 2024)
- Final report of Envision 2035 (Q4 of 2024)
- Written document (Jan 2025)

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Envision 2030 Drivers of Change

- Digitization of society, economy, and knowledge
- Massive, epic energy discoveries in Western N.D.
- Demographic changes in numbers/nature of state's population

Envision 2035 Drivers of Change

- AI and digitization
- Inflation
- Workforce (Energy? Healthcare? Others?)
- Behavioral health
- Changing student needs/preferences?
- Cultural tensions?
- Other?

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Envision 2030 Topics

- Agriculture
- Energy
- Health care
- Manufacturing
- Law and legal systems
- Technology
- Diversity
- Liberal Arts & Humanities
- Tomorrow's Student
- The Whole Student

Envision 2035 Topics
Draft Compendium of Multiple Inputs

- Human capital: sustainable productivity; livable wages
- Physical and IT infrastructure
- Specialized institutions: ag, health care, legal/law
- Digital programs/AI
- Student of the future
- Classroom of the future
- Humanities
- Wellness and behavioral health
- Energy: workforce and economic development
- Other?

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Envision 2030 Topics

- Agriculture
- Energy
- Health care
- Manufacturing
- Law and legal systems
- Technology
- Diversity
- Liberal Arts & Humanities
- Tomorrow's Student
- The Whole Student

Envision 2035 Participants

Brainstorm your networks

- Federal and state leadership
- Legislative leadership
- Business/industry
- NDUS: leadership and subject matter experts

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Next Steps: breakout in groups to…

- Review topics: add/change/provide focus
- Rank order topics with 1 being most important
- Review participant list; identify the topic they would best fit
- Table report outs to conclude this session

ENVISION 2035

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Back Up Slides as needed

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Example of how Input was aligned to broader topic areas:

- **CTS & Enterprise Resource Planning (People Soft):** Need to reform the governance of CTS to expand campus input to improve current ERP technology and service level to campuses. (physical and IT infrastructure)
- **Dual Credit:** This is a powerful tool, and we need to understand the SWOT. Additionally, how can campuses's expand its effectiveness while ensuring quality. (student of the future)
- **Tenure Reform:** Must be a priority to reform post-tenure review and applicability across the system to provide confidence to taxpayers. (human capital)
- **Legislative Priorities:** Several, large capital projects were included in this biennium. Conversely, critical projects were removed. This requires a review of how our legislative priorities are determined and managed. (physical infrastructure/classroom of the future)
- **Emergent Technology (AI):** How do we create a framework of ethics and policies to manage and leverage the power of this technology in higher ed. (digital programs)
- **Enrollment Retention, & Graduation Rates:** The board must be engaged on how to best support enrollment, retention, and graduation rate growth strategies. Furthermore, the funding of operational costs and capital expenditure spending associated with online programs must be scrutinized. (student of the future/classroom of the future/physical and IT infrastructure)
- **Program Evaluations:** Great work has been done by the campuses. Continuous evaluation of the relevancy and effectiveness, with regard to workforce development, must be continued. (human capital/classroom of the future)
- **Affordability:** A major driver in enrollment trends, NDUS stakeholders must craft a grand strategy on maintaining one of its historically strongest strategic advantages – affordability. (classroom of the future)
- **Presidents & Board Interaction:** I, personally, would like to hear more directly and regularly from presidents at SBHE meetings. (Board practice, can be changed without ENV2035 study group)

Example of how Input was aligned to broader topic areas:

- Tenure (Human capital)
- dual credit (student of the future)
- funding formula (classroom of the future)
- capital project prioritization (physical and IT infrastructure)
- facilities and infrastructure maintenance and repairs (physical and IT infrastructure)
- program duplication (classroom of the future)
- enrollment trends (student of the future)
- neighboring state funding changes (classroom of the future)
- NDUS workforce challenges…. (human capital)
-
-

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Example of how Input was aligned to broader topic areas:

- Promote Ag programming...rise of hobby/boutique farming (specialized institutions: ag).
- Expand research efforts for agriculture. I'm thinking that this is part of Precision Agriculture. But, it may be separate (specialized institutions: ag).
- AI/Big-Data. We're endorsing initiative like DDA and Digital Literacy. AND.....it feels to me like we need even more focus to get ND out of the Digital Desert (digital programs).
- One more item – may already be there - UAS/Drones/Space Force (digital programs).
-