

4th Digital Transformation in Government Conference Creating a Digital Vision for Federal Research

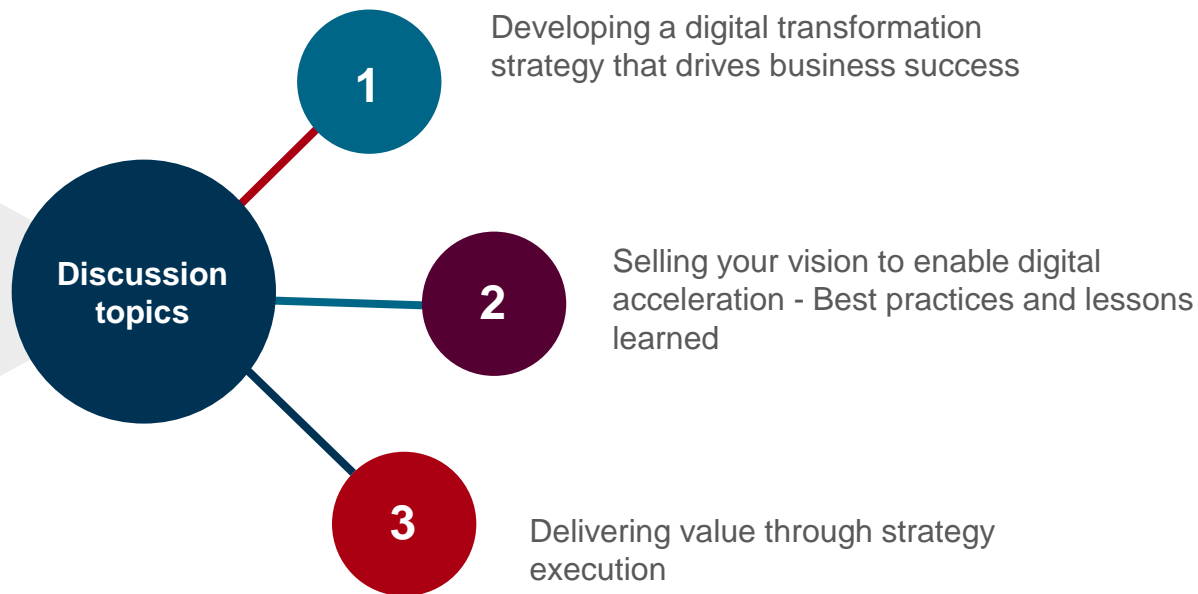
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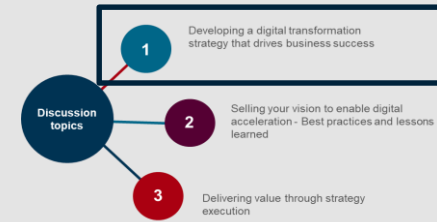
June 13 - 16, 2023



Driving IT innovation – Three discussion topics



1. Developing a digital transformation strategy that drives business success



Consult with key stakeholders
(e.g., users, other service providers, vendors, partners, potential partners)

Conduct environmental scan to identify leading practices and consult international comparator organizations

Align digital strategy with business objectives

An example - NRC's approach to create a digital strategy for federal science

- To develop a strategy, a significant amount of resources and time are required; the return on the investment materializes in your ability to communicate your vision, and receive the resources needed to drive business impacts.



Methods

- Consultations with key stakeholders (n = 44)
- Survey of researchers (n = 620)
- International comparison (n = 6)
- Economic impact study



Governance

- Three committees – Deputy Minister, Assistant Deputy Minister and Working Group
- Monthly meetings



Time and resources

- 8 months
- \$500K in professional services
- 1 dedicated FTE to over see project

A digital strategy for federal science

From Vision

To Operationalization

To provide a **dynamic, collaborative, and secure research environment** that empowers researchers through **automated and accelerated development**, adoption, and application of **cutting-edge digital tools** and services to emerging research and innovation areas in a way that is **scalable, sustainable and inclusive** for all researchers involved.

Solutions for data sharing and analysis

Data hub (collaborative platform, data repository, analytical tools)

Support for research data management

Cloud experimentation sandbox
On-demand
Cloud storage/compute

Improved access to current HPC services

Impact: Secure collaboration

Increased and easy to access technology

Self-service researcher portal with pre-approved services and applications

Electronic lab notebooks

Impact: Increased productivity

Automated research

Automation of tasks in the research life cycle

Cloud lab (remotely controlled automated lab)

Impact: Accelerated discovery

Access to leading-edge technology platforms

Access to quantum computing through partnerships

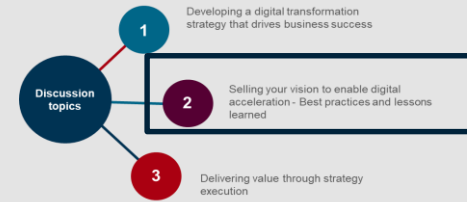
Preparations for use of emerging digital technologies (e.g., ability to use digital twins, IoT/sensors)

Impact: Leading-edge research

Risk-based security policy/practises for science

Cross SBDA Governance, policies/processes, and change management practices

Increased SBDA IM/IT capabilities and improved foundational IT



2. Selling your vision to enable digital acceleration

Best practices and lessons learned



Align vision and strategy with business objectives and benefits for the organization



Leverage the expertise of non-technical team members (e.g., communication specialists, policy analysts) to strengthen message and garner support



Use non-technical language to describe the future state, and the benefits for the client



Enable a mindset and internal culture of innovation both within your IT teams and across the broader organization to increase buy-in for digital transformation

An example – Aligning vision and strategy with business objectives and benefits for the organization

Short term

Solutions for data sharing and analysis facilitate secure collaboration

Improved access to digital research tools and services increases researchers' productivity

Collaborative governance and enterprise service delivery results in efficiency gains for SBDAs

Medium term

Access to leading-edge technology platforms enhances quantum and other emerging research fields

Science focused security policies and practices enable efficient and secure innovation

Tools for automated research accelerate scientific discovery

Long term

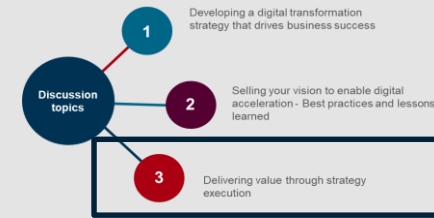
Position as a research partner and scientific employer of choice is strengthened

Research has an increased impact in diverse areas of science

Canada's economic growth increases through knowledge generation and technology development



Results from the economic impact study suggest that increased R&D productivity as a result of investments in IT could increase GDP by \$164M - \$657M and increase the number of jobs by 1,473 – 5,909 per year.



3. Delivering value through strategy execution



Get buy in and support on strategic plan


Ensure all decision makers support and agree on the strategic plan

Communicate with employees the strategic goals as successful strategy execution depends on them



Align jobs to the strategy

Align job tasks and responsibilities with organizational strategy to facilitate high performance



Measure and monitor performance

Successful execution requires awareness of progress to course correct, identify unintended outcomes, and identify evolving needs of the business

By the numbers: 95 % of employees don't understand or are unaware of their company's strategy, underscoring the need for improved communication (HRB, Nov 17, 2020)

Tip: Know your business outcomes and build your Key Performance Indicators (KPIs) from there



An example – Monitoring progress

Short term

Solutions for data sharing and analysis facilitate secure collaboration

- % of researchers who agree IT infrastructure enable them to collaborate in an efficient manner

Improved access to digital research tools and services increases researchers' productivity

- % of researchers who reported that increased access to advanced research computing and storage services has improved their productivity

Medium term

Access to leading-edge technology platforms enhances quantum and other emerging research fields

- % of researchers that agree they can leverage emerging technologies with the current IT infrastructure to support their research

Science focused security policies and practices enable efficient and secure innovation

- # of cyber incidents
- % of researchers that agree that security practices don't impede research activities

Tools for automated research and Cloud lab accelerate scientific discovery

- # of invention disclosures
- # of peer-reviewed publications

Long term

SBDA position as a research partner and scientific employer of choice is strengthened

- # of unique external research clients and collaborators
- % of researchers leaving who sight IT infrastructure as a reason for departure

Research has an increased impact in diverse areas of science

- Citation score publications relative to the world average
- % of publications amongst the 5% most cited worldwide

Canada's economic growth increases through knowledge generation and technology development

- Economic growth (jobs & GDP)



An example – Using survey results to inform strategy development and monitor progress

Why did we an online survey?

1. To understand what matters most to researchers, their current reality, and what they need (including baseline)
2. To measure progress on improvements made through the digital transformation
3. To provide an opportunity to reflect on direction and take action to recalibrate and adjust as needed.

What did we find?

Opportunities were identified for the NRC to better meet the digital needs of researcher - Overall, only 20% of research and technical staff that responded to the questionnaire felt that the current IT infrastructure supports their research.

Solutions needed for increasingly large volumes of data



- **14%** indicated they could use their big data efficiently
- **18%** indicated they could access Cloud compute/storage as needed
- **28%** indicated they have been able to access advanced research computing services as needed

IT infrastructure needed to support collaborative research



- **21%** indicated the current IT infrastructure supports efficient collaboration
- **11%** indicated that current IT infrastructure and tools decrease barriers to the attraction of clients/collaborators who wish to partner with the NRC

Improved infrastructure needed for emerging digital technologies



- **14%** indicted they had the infrastructure needed to leverage emerging digital technologies (e.g., sensors, AI)
- **16%** felt they could enter into new research fields within their discipline with the current IT infrastructure and services they have access to

Greater efficiencies can be gained while ensuring secure research



- **28%** indicated that the secure network enables collaboration, access to the infrastructure/tools/services needed for research and supports efficient research
- **5%** agree that security practices do not impede their research activities

Opportunities for IT to support enhanced productivity



- **40%** felt they can access IT support and services in a timely manner
- **20%** indicated that efficient processes are in place to procure hardware and software
- **55%** estimated improvements to IT would enhance productivity by an average of 29%



Summary

In order to drive IT innovation, you must:



- ✓ Develop a digital transformation strategy that is aligned with business needs
- ✓ Sell your vision to enable digital acceleration
- ✓ Deliver value through strategy execution



Questions



Thank you

