



Report of the

TECHNOLOGY ADVISORY COUNCIL

January 9, 2023

Technology Advisory Council

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<https://mn.gov/mnit/about-mnit/committees/>

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Letter from the Chair

December 30, 2022

Governor Tim Walz
Lt. Governor Peggy Flanagan
Speaker of the House Melissa Hortman
House Minority Leader Lisa Demuth
Senate Majority Leader Kari Dziedzic

Senate Minority Leader Mark Johnson
MNIT Commissioner Tarek Tomes

Cc:
Members of the Technology Advisory Council

We are pleased to submit the 2022 report of the Technology Advisory Council (TAC).

TAC was created as a follow-on to the Blue Ribbon Council on Information Technology (BRC-IT). Like its predecessor, TAC engaged many of the key state agencies and state CIOs, county IT leaders, and the Minnesota Association of Professional Employees (MAPE). The council began monthly meetings in late-2021; four subcommittees also met each month and as needed: User Experience/Self Service, Project-to-Product/Agile, Sustainable Funding, and Cybersecurity. This report covers TAC's work to date.

TAC has been able to become much more influential and effective thanks to overall support from state agencies, the Governor's Office, and the Legislature. Three key items led to this enhanced collaboration and strengthened our recommendations:

- Having more CIOs from Minnesota's leading organizations on the council.
- Ongoing support from the state CIO and his staff at Minnesota IT Services (MNIT).
- Including four legislators on TAC contributed to a richer, more well-rounded discussion.

TAC's blend of private, public, county, union, and elected officials made for a perfect mix. Everyone agreed to listen to each other and to seek common ground. Council members agreed at the first meeting to reach consensus on each item that would appear in the report – rather than vote – wherever possible.

Happily, there were no votes. Members listened and worked to convince colleagues of their view. It was a bold gambit to achieve full consensus based on the TAC discussions, and it delivered.

You'll find 16 recommendations in this report; many follow the path of previous BRC-IT recommendations and move further forward. An overarching point is that agencies need to focus clearly on their customers when designing or enhancing technology products, and to maintain those relationships over the long term. To help do that, we recommend:

- Adoption of user experience practices that help agencies understand customer needs and improve their experiences.
- A shift in IT planning and thinking from projects to actual products, with teams that are funded to manage and improve them over the product lifetime.
- Methods to provide adequate funding for products that almost always live longer than the biennial budgets.
- Improvements in cybersecurity funding, training facilities and partnerships, and greater collaboration among state agencies and their partners.

It's important to note: Transforming how the state does IT does not just involve IT. This change starts from knowing the required business outcome and using technology to help deliver services for Minnesotans, with sharp focus on how customers want to receive state services. The process is not just a one-time investment in a new application, either. Ongoing funds for maintenance, operations, upgrades, and ultimate replacement are key to long-term planning and funding.

Our recommendations also highlight the importance of agency leadership in the success of IT, which is as important as an effective IT agency. To successfully lead and coordinate IT modernization, operations, and security, MNIT must take an expanded role as the centralized leader and coordinator of IT governance in collaboration with state agencies. Executive and legislative branch leaders need to prioritize investments needed to support this expanded role.

Minnesota policymakers and agencies must also consider two other important factors to ensure the success of IT in Minnesota. Counties often play a crucial role in the implementation of state practices and programs, which demands a strong partnership between the state and the counties. Similarly, IT workers are key to IT success in our state – now and in the future.

Minnesota is blessed with many hardworking and dedicated IT workers, some in the central IT function at MNIT, and others based in other agencies – such as MNIT partnering with MDOR (Minnesota Department of Revenue). Careful hiring, ongoing development, and retention of strong performers will help MNIT and other agencies fulfill their missions.

Finally, I want to call out the support that enabled this council to do its work efficiently and effectively.

When TAC membership was finalized, two additional team members from the agencies went above and beyond to act as writers for the subcommittees and this report. Integrating these two helped TAC focus on ideas and discussion versus writing and recording items for the report, saving council members many hours of work. This is a best practice for sure. Many thanks to Larry Mastbaum and Kendall Johnson for their countless hours and tireless work.

TAC also benefited from strong support within MNIT. Many thanks to Michael Hainlin, Brandon Hirsch, Jeff Smith, and Deputy Commissioner Jon Eichten.

Please let us know if any of you or your members have questions about the recommendations in this report. We look forward to seeing the recommendations adopted.



Respectfully submitted,

A handwritten signature in blue ink that reads "Rick King". The signature is stylized and fluid.

Rick King
Chair, Technology Advisory Council



Executive Summary

Technology can make Minnesota government more efficient and provide easier access to state and local services. However, IT systems and applications change fast, and frequently. To realize their full potential, government agencies must adapt quickly and continuously improve their technology and digital products to better meet the needs of Minnesotans.

The Technology Advisory Council (TAC) was established to help agencies meet that challenge. Since TAC began meeting in 2021, we've heard from a number of government and private-sector technology and security experts and consultants. We've explored how other states and organizations approach the many opportunities – and some challenges – presented by today's fast-moving technology landscape. (See Appendix D for a list of TAC meetings and presentations.)

Based on these presentations and research, TAC offers 16 recommendations in this report to improve IT services and processes for the State of Minnesota. All members of TAC agree that Minnesota agencies should move to implement these recommendations as soon as possible. Doing so will result in:

- Technology products and systems that better-meet customer needs and expectations
- More efficient and sustainable operation of state IT processes and systems
- Stronger security to protect state IT systems and sensitive data

Minnesota IT Services (MNIT) works closely with TAC, as it did with the council's predecessor, the Governor's Blue Ribbon Council on Information Technology. The council is an effective public-private partnership and great example of how we can work together to improve government services in Minnesota.¹

TAC subcommittees and the full council discussed, formulated, and refined these recommendations over the last 15 months. MNIT leaders and staff, including Commissioner Tarek Tomes, took part in these discussions, along with senior leaders and technology or program experts from other state agencies.

Together, these recommendations provide a framework to modernize Minnesota agency operating models and place state IT on a solid funding and security foundation. (See Page 6 for a complete list.)

- **Recommendations 1-4** focus on adopting **human-centered design thinking** to improve the user experience for customers served by Minnesota government.
- **Recommendations 5-7** emphasize moving from a project mindset to a **product model** to allow more efficient, customer-focused IT development that is managed for the long-term by joint business-technology teams.

1 See Appendix A for a brief history of TAC and its predecessor, the Blue Ribbon Council on Information Technology. Both councils' published reports are available on the Technology Advisory Council website (<https://mn.gov/mnit/about-mnit/committees/tac.jsp>).

- **Recommendation 8** embeds strong **change leadership** in a team of top agency leaders and commissioners to help drive this core shift in operations across state government.
- **Recommendations 9-12** move Minnesota toward more **sustainable IT funding** to develop, and maintain, technology assets and digital products that live well beyond the state's two-year budget cycle.
- **Recommendations 13-16** improve protection of technology assets through long-term planning that includes **cybersecurity funding**, and expanded partnerships to develop – and retain – a skilled, cyber-aware workforce.

We're confident these recommendations will make state agencies more efficient, serve citizens and agency staff or partners better, provide stable funding and resources, and protect our technology assets and private data.

We look forward to further discussions to help implement them.

List of Recommendations

The members of the Technology Advisory Council believe the following recommendations will help modernize how state government manages IT products and services for Minnesotans while moving toward more sustainable IT funding and cybersecurity protections. TAC views every recommendation as important. We encourage MNIT, other state agencies and partners, and elected policymakers to consider the recommendations during the 2023 and future legislative sessions.

Modern Operating Models

Focusing on the User Experience

1. State agencies should create – and maintain – internal and external user personas of core audiences to understand their needs, constraints, and expectations throughout a technology product or project lifecycle.
2. State agencies should research, create, and maintain user journey maps or experience maps for key audience personas to understand why, when, and how people interact with their services, and to identify friction points and opportunities to improve the customer and employee experiences.
3. State agencies should measure the outcomes of digital products and services – with measurement plans – to ensure they work well for all users, and to improve them over time.
4. State agencies should understand and meet the accessibility needs of all customers and staff when planning, developing, purchasing, and maintaining digital products and services.

Product Transformation

5. State agencies should migrate from a project-centered model for managing technology work to a product-centered, or product management, model that leverages persistent teams of business and technology resources and persistent funding to support the underlying technology assets.

6. State agencies should adopt new product management guidance that MNIT is adding to the Modernization Playbook for how to approach services, systems, roles, funding, team interaction, and governance.

7. MNIT should work with the Technology Advisory Council to identify a subset of agencies to serve as early adopters for the 2023-2025 budget years to test and refine customer-focused product management guidance and processes.

Change Leadership

8. The executive branch should adopt and drive strong change leadership – supported by the Governor’s cabinet and senior agency leaders – by creating a change board to help push adoption of customer-focused product management practices at all levels of state government.

Building a Solid and Safe Foundation

Sustainable Funding and Budgeting

9. State agencies, the Governor’s Office, and the Legislature should provide ongoing base funding to support sustainable IT budgets in appropriations.

10. MNIT should provide enterprise guidance on the development of sustainable IT budgets that will mitigate security and operational risks, maintain relevance, and support ongoing system operations and maintenance.

11. MNIT should update Minnesota’s Modernization Playbook to include more-detailed enterprise guidance on application portfolio management and a process for regular lifecycle review of application business value and technical condition.

12. MNIT should work with the Governor’s Office and the Legislature to enhance the Information Technology Account statute to support product-based funding and permit state agencies to set aside operating funds to mitigate business and cybersecurity risks.

Securing State Systems and Data

13. To provide safe, reliable, and secure environments for Minnesota government services, the Legislature should work with MNIT to ensure that cybersecurity is included and sustainably funded for all technology-related assets.

14. To address a critical shortage of cybersecurity talent in Minnesota and build a cyber-aware workforce, MNIT should partner with higher education and K-12 institutions to ensure sustainable cyber training, develop existing and new training partnerships, and encourage cybersecurity education for all students.

15. The Legislative Commission on Cybersecurity should work closely with the Technology Advisory Council and the Minnesota Cybersecurity Task Force to promote cybersecurity threat information sharing and collaboration between state and local governments, state agencies, and tribal nations.

16. MNIT should engage with state agencies, constitutional offices, and other state entities to identify opportunities for collaborative procurement and implementation, and to drive adoption of advanced cybersecurity protections that meet or exceed the standard defenses currently provided by MNIT.



Modern Operating Models

Three years ago, Minnesota embarked on an ambitious effort to modernize how the state manages its technology assets, based largely on recommendations from TAC's predecessor (the Governor's Blue Ribbon Council on Information Technology, or BRC-IT).

To build on that foundation, MNIT and the state should embrace modern operating models to provide and continuously improve their technology and digital products to better meet the needs of Minnesotans by:

- Focusing on the experiences of customers and end users – both internal and external.
- Adopting a product management approach to deliver customer-focused technology products more quickly and continue to improve them after launch.
- Ensuring strong leadership support to drive and sustain these changes across state agencies and their partners.

Focusing on the User Experience

The ultimate value of technology lies in what people can do with it. To maximize that value, state agencies must:

- Forge a deep understanding and relationship with the Minnesotans they serve and those who provide the services.
- Place customers and end users at the center of their work – including how they define and measure success – to align business processes and services with the needs of all users.
- Ensure all customers can access and use the information and services they provide.

Focusing on customers and other stakeholders in this way – also known as human-centered design – plays a central role in product management, discussed in the next section. Some state agencies have used this approach on a small number of projects to simplify processes and technology tools for customers and users. Examples include:

- A revamped MNbenefits application for state social safety net benefits (Department of Human Services, or DHS).
- The MNDRIVE application that provides more self-service options for vehicle owners and drivers in Minnesota (Department of Public Safety/Driver Vehicle Services).

See Appendix B for examples of the user experience tools and processes discussed in this section.

Understanding The Experiences of Users

A user-focused approach requires state agencies to understand the people they serve – and the people who provide the services – to ensure their IT systems, tools, and digital products are accessible and easy to use. To do that, agencies must “meet people where they are.” They must lead with curiosity and empathy to gain a deep understanding of end users’ needs, knowledge, constraints, expectations, and experiences with agencies and their services.

1. State agencies should create – and maintain – internal and external user personas of core audiences to understand their needs, constraints, and expectations throughout a technology product or project lifecycle.

Minnesota agencies serve – and partner, employ, or contract with – individuals, families, and businesses with widely varying experiences and needs. These may include everyone from:

- People with reading or language issues to those with vision, hearing, or mobility challenges
- New or experienced parents and their children to aging residents and those who care for them
- Social program outreach workers and program staff or partners, to the many people they serve
- Recent immigrants to longtime citizens
- Business owners to first-time or mid-career jobseekers, who may be newly unemployed or simply changing their path
- Car or bicycle commuters to transit riders
- Hunters and anglers to recreational hikers, bike riders, and boaters
- Farmers or foresters to industrial, office, and construction workers

Meeting the needs of so many different people, with such a diversity of needs and experiences, requires agencies to understand who is using their systems, tools, and programs before starting the work to update or create them. Where are our customers and users when they need or provide government services? What are their written or spoken language needs? What technology do they have or need? Do they have accessibility needs for vision, hearing, physical, or neurodiversity accommodations?

To meet people where they are, we must first understand who they are. To do this, state agencies should develop personas – detailed, fictional profiles of their typical users or customers that can be tailored further for specific communities or use cases – based on qualitative and quantitative research.

This research can take the form of interviews and surveys, analyzing user metrics, community discussions, “ride-alongs,” or competitive analysis. For example, DHS and Code for America conducted site visits and focus groups to help revamp the online MNbenefits application, and DHS continues this work to refine and improve the application. (See Appendix B for examples of personas.)

State agencies should strive for this understanding before they choose a solution or platform, and even before they map out a process or user journey, or design a new (or updated) digital product. This requires agencies to be out in the communities they serve – even if the contact is virtual, not physical – seeking constant feedback and input.

State government serves millions of Minnesotans and is typically the only provider for a given service, digital product, or program – unlike most offerings in the private sector. Government faces, and should meet, similar consumer expectations to provide more online services and digital products that are efficient and easy to use. To meet those expectations, we must put ourselves in the end user’s shoes and improve the experience to be as seamless as possible.

Enabling state agencies and their partners to understand who we serve puts those customers and end users at the center of their work. This shift allows the unique needs of users to drive the development of digital solutions and products, rather than our personal biases or guesses. The result is greater equity and accessibility for the Minnesotan we serve.

2. State agencies should research, create, and maintain user journey maps or experience maps for key audience personas to understand why, when, and how people interact with their services, and to identify friction points and opportunities to improve the customer and employee experiences.

When state agencies know the people they serve, the next step is understanding what those Minnesotans experience – and how they feel – when using government digital products, tools, and processes. This also applies to government employees and the equipment, software, and processes they use to provide these services.

In a general sense, experience mapping helps agencies understand what it's like to interact with them as a customer or employee. Different types of maps focus on various aspects of the user experience to provide this insight, such as:

- **Journey mapping** – which focuses on a specific product, tool, or service
- **User experience mapping** – which takes a broader look at an agency or a related group of its products or services
- **Value-stream mapping** – which analyzes the internal agency resources and steps needed to complete a process or deliver a product or service

These maps, and other similar processes, provide a visual representation of user experience data and context about government services and products. They help teams visualize both the current state and a desired future state. (See Appendix B for examples of experience maps.)

This deeper understanding helps agencies make informed decisions to become more efficient and improve the user experience – for both the people they serve and the staff or partners who provide the services.

Mapping can pinpoint specific steps (or “touchpoints”) that cause frustration for users – and those that work well or delight them. It helps:

- Reduce bias and break down internal silos to create a shared, agency-wide understanding of their customer or end user's experience.
- Increase empathy and understanding for people who need accessibility accommodations by highlighting how their journey differs from other users.
- Identify opportunities to provide self-service options for Minnesotans who may need services outside normal business hours or when in-person, phone, or email help is not available.

Ultimately, experience mapping helps agencies design better digital products, tools, and services. It can also identify other improvements that may not even be technology solutions – such as simplifying a process or form, offering a new service, or using plain language that is easier for all users to understand and more readily translated into other languages.

For example, DHS simplified its internal process for social safety net applicants. The new online MNbenefits application simplified the process for customers from more than 80 steps to just 12, and the time to complete it from an hour or more to about 10 minutes – reducing frustration for customers at what's generally a difficult time in their lives. This streamlining effort also simplified life for agency staff and partners who assist applicants by reducing the number of contacts needed to receive and process applications.

State agencies need to dedicate time and resources to pursue a deeper understanding of the people they serve, and what it's like for those interacting with state government or working at an agency. Across the enterprise, expectations and development processes need to allow for sufficient discovery and research.

Planning for projects or products and agency programs must include experience mapping – and the time and resources to create and maintain the maps before, during, and after launch. These activities help establish and build long-term partnerships with customers and workers. They improve government services and products and show we are listening to the people we serve.

Defining and Measuring Success

State agencies – like the technology they use – exist to serve Minnesotans. To be successful, agencies must understand and meet the needs of their customers and end users. They must measure how well the user needs are being met. And they must make agency products and services accessible and usable for everyone.

3. State agencies should measure the outcomes of digital products or services – with measurement plans – to ensure they work well for all users, and to improve them over time.

Historically, most IT organizations have planned development and measured success based on execution of projects. (Did we deliver on time? Did we come in at or under budget? Were we good partners?) But these measures do not account for what success looks like for the people those agencies serve. (How well do the tools or systems work? How accessible are they to all users? Are they easy to use?)

As a result, organizations often neglect to put in place qualitative and quantitative measures to ensure their efforts meet the needs of customers, staff, and partners. This is especially true in project-oriented organizations where teams move from project to project without clear ownership, continuous improvement, or accountability for results from the users' point of view.

In Minnesota, this tendency may stem in part from how state law discusses the development of technology systems and other assets. Minnesota Statutes, Chapter 16E, which governs MNIT and IT development at state agencies, focuses on technology projects and internal success factors such as budgets, and timelines. The statute does not address customer or user needs beyond accessibility, however.

Defining how to create and measure success for end users is paramount, whether agencies focus on project management or – as recommended elsewhere in this report – product management.

User personas and experience maps (discussed above) help agencies understand and empathize with their customers and employees – and their diverse abilities, experiences, and needs. To fully meet those needs, agencies must consider them before launching a project or creating a new product or service. The discussion should answer:

- How will we determine if our solution meets our users' needs?
- What is a good level of end user adoption (knowing that no one solution will work best for all users)?
- What metrics or analytics should we use to make business decisions and measure our success moving forward?

The answers to these questions lie in shifting from project-based to people-based outcomes – such as accessibility, usability, and user satisfaction – rather than focusing only on internal factors like project execution and budgets. We cannot measure how well we're serving people unless we understand if and how they can access our product, how easily they can use it, and whether it meets their needs.

To gather meaningful data, agencies need to create measurement plans that detail what success looks like for the end user. Measurement plans should specifically address:

- **How we will measure:** Tools like surveys, user metrics, and interviews
- **What we will measure:** User satisfaction, efficiency, and effectiveness
- **When we will measure:** During development and after launch to compare against the desired outcomes defined at the beginning
- **What we will do with the data:** Inform our ongoing strategy and make improvements over time

To help ensure we are meeting user needs with a project, product, or service, this work (and measurement) should:

- Begin early in the process so it can inform planning, design, and development. (See Appendix B.)
- Continue up to and after launch to ensure the product or service is maintained and improved over time.
- Be part of the procurement process so that accessibility and usability criteria are included in vendor requirements and contracts for purchased software and services.

4. State agencies should understand and meet the accessibility needs of all customers and staff when planning, developing, purchasing, and maintaining digital products and services.

Minnesota agencies serve, and employ, a wide range of people with varying experiences and needs. State and federal laws require their IT systems, information, websites, and other digital products to be accessible to everyone.² Agencies should invest time and resources to ensure they understand accessibility needs and ensure their digital products and services meet the relevant standards.

MNIT's Office of Accessibility sets accessibility and usability standards for state agencies and provides resources and guidance to meet those standards.³ Minnesota's standard is based on the federal standard, Section 508, and the Web Content Accessibility Guidelines set by the W3C Web Accessibility Initiative.⁴ True accessibility also embraces inclusive design – creating products, services, and user experiences that everyone can access and use regardless of age, abilities, identity, language, or culture.

Beyond legal requirements, there are compelling practical reasons to ensure accessibility in state government websites and other online or digital products and documents: Accessible design is good design. And designing for accessibility results in a more usable system, website, or digital product – more usable for everyone, not only for people with disabilities or other accommodation needs.

2 See Minnesota Statute 16E.03, subdivision 9 (<https://www.revisor.mn.gov/statutes/cite/16E.03#stat.16E.03.9>). Viewed Dec. 17, 2022.

3 More information about the Office of Accessibility, including accessibility resources and guidance, is available online at <https://mn.gov/mnit/about-mnit/accessibility/>. Viewed Dec. 17, 2022.

4 Minnesota IT Services, MNIT Accessibility and Usability of Information Technology standard. Viewed Dec. 17, 2022 (https://mn.gov/mnit/assets/Stnd_State_Accessibility_tcm38-61585.pdf).

Accessibility must be considered from the start of a project or product so that it's incorporated into the design, testing, development or procurement, and follow-up phases. At the same time, agencies should do what they can to improve the accessibility of existing or legacy systems and tools.

To meet these commitments, state agencies should invest the necessary time and resources to:

- Work with MNIT to assess the accessibility of their current IT systems, tools, and digital products.
- Improve the accessibility of their current offerings where possible.
- Follow and adopt accessibility recommendations from MNIT's Office of Accessibility and the state Chief Information Accessibility Officer for ongoing and future development or purchases.
- Include accessibility requirements in requests for proposals and vendor contracts to ensure purchased products, solutions, or services meet state accessibility standards.⁵

Product Transformation

Technology today advances at a breathtaking pace, challenging information technology teams to keep up with the constant flow of new hardware and software. Multi-year IT projects focused on a static set of requirements, gathered early in the process, run the risk of becoming obsolete before they even launch.

State agencies need a more flexible, agile approach – one focused on the customer needs that are (or will be) met by a technology asset or digital product, rather than on a specific project or timeline. Product management provides that focus, with a customer-centered design approach that

embraces ongoing feedback, satisfaction measures, and continued development to improve over time.

5. State agencies should migrate from a project-centered model for managing technology work to a product-centered, or product management, model that leverages persistent teams of business and technology resources and persistent funding to support the underlying technology assets.

The nature of software and information technology development is changing. Organizations and their IT teams have traditionally organized development into distinct sets of work known as projects, where a team is formed to complete work that begins and ends at specific times with operational teams accountable for managing the asset ongoing.

This decades-old approach is evolving into a modern method of organizing IT development – **products** – where a persistent product team manages technology assets to allow continuous improvement as customer and business needs, technology, and programs evolve.

Project versus Product

In the traditional project model, IT development is organized and funded around projects:

- Technology teams are organized into sub-teams based on the activities they perform such as system or software design, coding, or testing.
- Team members are assigned to projects and accountable to complete specific tasks. When a project is done, team members get assigned to the next one.

⁵ Minnesota IT Services, Procurement for Accessible IT Products and Services. Viewed Dec. 17, 2022 (<https://mn.gov/mnit/about-mnit/accessibility/it-procurement.jsp>).

- Technology funding is based on these projects and aligns with their start- and endpoints. Once created, a technology asset remains static unless another project is funded to update or replace it.
- The results of the project are typically not reviewed or implemented until the project is fully completed.

By contrast, the product model takes a more flexible approach that supports ongoing IT development:

- Product teams, comprising business and technology resources, are deployed to meet specific business or customer needs.
- Team members are assigned to one or more products managed by a persistent team; together, the team is accountable for sustainable success and continuous improvement of their product.
- Technology funding aligns with products over the long term to support continuous improvement, with adjustments over time to meet the needs and mission of both the organization and its customers.

Projects may be around for years to come. But shifting to product management for high-demand services or solutions that must adapt to fluid customer and business needs will help state agencies be more agile and meet their customers where they are. This agility will improve government services for Minnesotans.

Defining a Product

A product is a specific business capability or service that combines technology assets and business processes—such as software, online tools, or services – to create value for customers. For state agencies, customers can be internal or external end users – and ultimately Minnesotans.

Product teams include people from both the business and IT sides of an agency. For example, Minnesotans can buy hunting and fishing licenses directly from the Department of Natural Resources (DNR) through its website; they can also buy licenses by phone or in person at designated vendors across the state.

All the software, technologies, and processes used to meet this DNR business and customer need can be thought of as one product group. To manage these licensing products:

- DNR product owners or managers work closely with technology staff on the product team to analyze how well each piece of the system is working for customers.
- Based on this data – and customer or stakeholder feedback – they identify a roadmap for continuous improvement of these products.
- Each year, MNIT and the DNR allocate funding for this roadmap, based on its value – compared with other products – to the overall organization.

How the Product Model Works

The product model recognizes that the ongoing evolution of technology assets is critical to meet current and future needs. It differs from the project model that MNIT and other agencies use to own, fund, and do the work.

- **How We Own Work:** In the product model, persistent teams own the work of developing an IT product and are accountable for its overall success. Team members may specialize in a particular task, but they work together and share ownership of the results. Their work is ultimately measured by the consistent improvements that are regularly implemented to support and continuously enhance the product.

- **How We Fund Work:** The product model, by itself, does not affect the amount of funding available to develop, maintain, and improve technology assets. But it does change how technology resources (people and dollars) are allocated. Rather than funding transient projects to various business areas throughout the year, the product model allocates the same total resources upfront to dedicated and persistent product teams.
- **How We Do Work:** Product teams use Agile development, which emphasizes narrowly focused “sprints” of work to move through requirements, design, coding, and testing on a specific piece of work then quickly move to the next. Sprints are typically two to six weeks in length and focused on continuous product improvement and enhancement.

The product model delivers results sooner – throughout the process rather than waiting months to complete all the work at the same time. It provides better quality because teams get results, or feedback, along the way. The team can adjust requirements or scope mid-stream because they’re testing and learning as they go.

Migrating from a project-centered model to a product-centered model is not limited to MNIT or any specific agency. It’s a fundamental change in operations that requires a shift in thinking and leadership behaviors across all agencies and the Legislature. But for the State of Minnesota – like thousands of companies who have made this leap already – the benefits of this change will be very positive, very quickly. They include:

- Faster IT delivery times
- More agile response to new or shifting needs
- More efficient software development
- Higher quality services
- **Better outcomes for Minnesotans who are the customers of these products**

This change – in concert with the user experience, self-service options, and accessibility recommendations elsewhere in this report – will drive dramatic improvements in customer satisfaction for state agencies and the people they serve.

6. State agencies should adopt new product management guidance that MNIT is adding to the Modernization Playbook for how to approach services, systems, roles, funding, team interaction, and governance.

Minnesota government comprises more than 70 state agencies, boards, and commissions, plus hundreds of local and tribal governments, K-12 school districts and higher education institutions, and nonprofit or other organizations. The Modernization Playbook provides a shared set of approaches and standards to help build, maintain, and improve digital services and technology assets for Minnesotans. (See Appendix C for more information about the playbook.)

MNIT’s Office of Transformation and Strategy Delivery is working with TAC to create new guidance for the Modernization Playbook on how to run the product model in state agencies. The updates will align closely with the federal Digital Services Playbook, used successfully by thousands of private sector and government IT organizations around the world.⁶

Agencies should adopt this new guidance as they shift toward a customer-focused product model to develop and manage their technology assets and other processes to deliver services to Minnesotans.

⁶ U.S. Digital Service, Digital Services Playbook. Viewed Dec. 17, 2022 (<https://playbook.cio.gov/>),

The new guidance will cover:

- **Product Adoption:** How to do journey mapping; value stream mapping; and streamline and improve delivery processes for digital and other services.
- **Agile Development:** Values and principles of Agile development; how to start using Agile team techniques with projects and products; and how Agile works with services for both internal (government) and external (public) customers.
- **Funding and Procurement:** How to apply current funding sources to the product model; how procurement is affected; and how contracts need to change.
- **Change Management:** Organizational change management for state agencies; how to lead change; and cultivating a change leadership mindset.
- **Human Resources:** Clarifying future roles, responsibilities, titles, and position descriptions; supporting Agile and product teams within the state’s collectively bargained framework; and creating a plan to select, train, manage, and reward staff who are product-focused.

Early adopters, outlined in the next recommendation, will use the expanded Modernization Playbook. However, all agencies should adopt this common approach to help them move forward together – efficiently and effectively – with sufficient flexibility for their unique roles, customers, and needs.

7. MNIT should work with the Technology Advisory Council to identify a subset of agencies to serve as early adopters for the 2023-2025 budget years to test and refine customer-focused product management guidance and processes.

MNIT’s professional product and Agile coaches and the TAC will work closely together to identify agencies to partner with as early adopters of the product model for the 2023-2025 budget years. MNIT will collect submissions for the early adopter program in early 2023.

Early adopters will focus on a single product or service offering within an agency, such as a program or license application. Submissions will be evaluated based on agency culture and leadership, the customers of the product or service, its technical footprint or complexity, and the potential benefits for Minnesotans.

MNIT will review early adopter submissions with TAC to determine the appropriate level of support for each agency and product. Selected agencies will participate in kick-off sessions later in 2023.

These early adopters will test out the expanded Modernization Playbook, resources, and tools that will change how they own, fund, and do work. Based on their experiences and any lessons learned, MNIT will refine the playbook to ensure all agencies can move to a product model. We recommend that even agencies that do not participate in the early adopter program should start learning the product model and applying its principles.

Change Leadership

Shifting to a customer-focused, product-based approach to technology is monumental work that never truly ends. MNIT and other state agencies must continuously anticipate and meet ever-evolving customer needs, legal requirements, agency programs, and IT capabilities and risks.

Wherever possible, agencies should adopt consistent user experience and product management methods for technology assets. Strong leadership is needed to drive and sustain changes in how the State of Minnesota manages its technology processes and development.

- 8. The executive branch should adopt and drive strong change leadership – supported by the Governor’s cabinet and senior agency leaders – by creating a change board to help push adoption of customer-focused product management practices at all levels of state government.**

The changes outlined in this report go beyond any one agency – adopting a product model alongside data – and research-driven user experience methods across state government. Far more than a change to MNIT operations, these changes represent a core shift in how the State of Minnesota owns, funds, develops, and manages its technology assets to deliver services to Minnesotans.

A shift of this magnitude requires different thinking and behaviors across all agencies and all disciplines. It extends from IT and financial management to human resources, communications, and program administration – among others.

Change on this scale requires strong – and sustained – leadership and advocacy from the highest levels of management. We recommend formalizing this change leadership within a change board supported by the Governor’s cabinet and senior agency leaders to push adoption of these changes throughout state government.

Leadership is the most critical piece of this change and its success. The stronger the leadership at the top of the enterprise and its agencies, the faster this change will take hold, and the sooner Minnesota will start seeing the benefits.

Solid and Safe Foundation

Ongoing modernization of IT operations in Minnesota government – as recommended elsewhere in this report – represents more than a one-time investment or new application. To make, and sustain, those changes the state must also explore funding government technology assets differently than before.

Agencies need ongoing funds for operations, enhancements, maintenance, and security updates for the complete lifecycle of IT systems and products. Securing those systems and products against future attacks also requires ongoing thoughtful investment and more collaboration in cybersecurity training and operations across our state.

Sustainable Funding and Budgets

The lifespan of technology assets and digital products goes far beyond their initial planning, design, and launch. Current funding mechanisms and budgets are built around the state’s two-year budget cycle and often do not account for post-launch needs.

Agencies need adequate funding – and sometimes, flexibility – to operate, secure, and improve their systems over the long-term for the Minnesotans who use them.

9. State agencies, the Governor’s Office, and the Legislature should provide ongoing base funding to support sustainable IT budgets in appropriations.

Base funding is meant to ensure state government IT systems and tools continue to work well and remain secure for Minnesotans and the state agencies that serve them. Base funding needs to

cover the ongoing costs for system operations and maintenance to protect against degraded system performance and security risks.

Millions of Minnesota residents and businesses rely on these systems and tools to access government services, do business with the state, and meet tax, licensing, or other obligations. State agencies use the same systems to provide government services, monitor compliance with state laws, and securely store customer information and other records. Ensuring these systems and tools perform effectively plays a critical role in building trust and confidence in state government.

Everyone using state IT systems and tools needs them to work reliably and efficiently while protecting non-public customer data and state information from bad actors or inadvertent release. Doing this in a sustainable way requires consistent funding to keep up with system, software, and security updates.

MNIT is working with state agencies to develop processes and training to conduct regular IT system risk assessments and identify base funding needed to address high-priority risks. MNIT should also develop training and education for agency staff and agency, enterprise, and legislative leaders to understand – and avoid – the customer service and security risks posed by inadequate or inconsistent base funding.

For systems to perform effectively during their whole lifecycle, these base funding costs should be included within the initial costs of the system acquisition or development and then monitored and adjusted as conditions change. This is a collaborative effort that requires attention by agency leaders, the Governor’s Office, and the Legislature.

10. MNIT should provide enterprise guidance on the development of sustainable IT budgets that will mitigate security and operational risks, maintain relevance, and support ongoing system operations and maintenance.

Consistent budgeting across the state enterprise is crucial to ensure MNIT and agencies have the funds necessary to support operations and maintenance for the life of an IT system in a sustainable way. Ongoing support is crucial to maintain the performance and security of the systems Minnesota residents and businesses use to access state government services while protecting their private data.

Sustained system operation requires the state to keep up with software upgrades and maintenance releases, and to proactively plan for ending or changing an application when it's no longer needed or when manufacturer support for a product or version ends.

Providing enterprise-level guidance and tools to agencies will provide greater consistency in IT budgeting across state government and help ensure proper budget planning and accounting for new and ongoing digital projects or products. Over time, enterprise guidance and tools will also provide more consistent:

- Tracking and metrics to improve budget planning and cost projections across – and within – state agencies.
- Communications and discussions – across the enterprise and with the Legislature – about the funding needed to sustainably support IT projects and products.

To reach and maintain this consistency, MNIT needs to develop guidance, training, and tools based on a set of best practices to help agencies develop consistent budgets that meet their IT project and product needs over time.

Agencies need to adopt common approaches to these budgeting practices to ensure consistency across the enterprise and improve budget communications. Enterprise and legislative policymakers need to understand and use these guidelines when planning and considering IT budgets, so they understand how these budgets are developed and the decisions that have been – or need to be – made.

11. MNIT should update Minnesota's Modernization Playbook to include more-detailed enterprise guidance on application portfolio management and a process for regular lifecycle review of application business value and technical condition.

In 2020, MNIT worked with the Governor's Blue Ribbon Council on Information Technology to create a Modernization Playbook. The playbook:

- Gives a high-level view of the principles and general steps to follow for successful IT modernization in Minnesota government.
- Outlines a common framework and consistent roles, language, and processes to help state agencies streamline and improve IT systems and tools.
- Guides MNIT and its agency partners as they upgrade, replace, and expand digital services for Minnesotans.

MNIT's Office of Transformation and Strategy Delivery continues to refine the playbook in response to stakeholder feedback, real world experience, and evolving needs and best practices. Similarly, agencies must do the same with their software applications to keep them operating, relevant, and useful to the customers and staff who use them.

The playbook outlines how agencies should manage their applications as a portfolio, with ongoing analysis and measurement. These activities provide data to help agencies prioritize their needs to guide technology decisions and planning – for both current and future needs.

Reviewing applications regularly across their whole lifecycle will ensure they are properly maintained, receive timely security updates, and continue to work well for customers and other end users in- and outside government. This ongoing review also helps agencies identify if there are alternatives that can do a better job as they use, maintain, and update their current applications, or develop plans when systems begin to lose their business value due to obsolescence or changing business needs.

For example, MnDOT reviews application portfolios quarterly with each office to identify each application and its fitness. The meetings allow offices to budget for enhancements or replacement well in advance of obsolescence. Through the meetings, MnDOT identified a number of legacy systems that required security enhancements, and a commonality among them. This agency-wide visualization allowed MnDOT to tap security funds and begin a process to update the legacy systems across the agency, with minimal disruption for end users and the business.

By updating the Modernization Playbook with more-detailed guidance and processes, MNIT will help agency business leaders adopt these principles in a more consistent way. Though each agency is different, with its own strategic plan and needs, the use of common processes and standards will promote greater uniformity – and efficiency – in how we measure, plan, and budget for applications across state government.

12. MNIT should work with the Governor’s Office and the Legislature to enhance the Information Technology Account statute to support product-based funding and permit state agencies to set aside operating funds to mitigate business and cybersecurity risks.

The state Information and Telecommunications Account (or “Odyssey Fund”) was created in 2006 to help agencies invest in efficiency-focused IT projects by providing more funding flexibility. Agencies may transfer unspent operating funds to the Odyssey Fund and carry them forward to the next budget biennium. MNIT manages the account and works with agencies to identify appropriate uses for the funds.

Odyssey Fund dollars can only be used to pay the IT cost of certain projects that increase government efficiency for agencies and the people they serve. Eligible projects may be specific to one agency or shared across multiple agencies at the enterprise level. Once transferred to the Odyssey account, the funds must be used within four years.⁷

In its current form, the Odyssey Fund provides some flexibility for agencies to use unspent operating funds for IT expenses in future budget years. But the statute requires these funds to be used for projects that emphasize new things over better management of existing systems.

This focus on specific projects means agencies cannot use Odyssey funds to manage fluctuating IT operating costs, performance issues, or cybersecurity risks. Nor can they use the funds for incremental product-focused improvements to IT systems, tools, and processes that improve government services for Minnesotans.

⁷ To receive Odyssey funding, a project must be approved by MNIT, Minnesota Management & Budget (MMB), and the Legislative Advisory Commission (LAC). Agencies apply to MNIT, which oversees the account. MNIT forwards eligible requests to MMB, which reviews and shares them with the LAC. Minnesota Statute 16E.21, subdivisions 1 to 4, viewed Dec. 17, 2022 (<https://www.revisor.mn.gov/statutes/cite/16E.21>).

Allowing agencies to use Odyssey dollars for product-based funding, cybersecurity, and other system enhancements will:

- Give agencies an important funding tool to help reduce IT-related business and security risks that can impact their customers, staff, and the non-public data stored in those systems.
- Let agencies invest in IT product management – recommended elsewhere in this report – to continuously improve the systems and digital products that Minnesotans rely on.

Updating the Odyssey Fund statute in this way cannot, by itself, solve every potential security or performance risk that can affect agencies and customers who rely on state government IT systems. But it will give agencies more options to invest unspent operating funds to reduce those risks. It will reduce – though not eliminate – the need for additional base funding to support sustainable operations and maintenance of IT systems.

Securing State Systems and Data

Government agencies rely on an increasing array of digital products and online tools to improve service and streamline programs for Minnesotans. Meanwhile, cyber exploits and related risks continue to proliferate and grow more sophisticated. Securing government IT systems and data requires long-term planning and execution – backed by appropriate funding, a sustainable pool of cyber talent, and expanded collaboration across all levels of government.

Sustainable Security

Though cyber attacks can be launched with the click of a mouse, protecting against them requires constant vigilance, sustained planning and resources, and strong academic and technology partnerships to provide the necessary people, tools, and capabilities.

13. To provide safe, reliable, and secure environments for Minnesota government services, the Legislature should work with MNIT to ensure that cybersecurity is included and sustainably funded for all technology-related assets.

To protect government IT systems, digital products, and sensitive data, Minnesota must approach cybersecurity in a more holistic and sustainable way. Cybersecurity should be considered from the earliest stages. Planning and designing must include controls to protect systems and data – while also supporting usability and functionality for end users.

But cybersecurity needs are not static. Planning, and funding, must also account for updates, maintenance, and improvements after launch. Anything less represents a substantial and unacceptable business risk that may jeopardize

the state’s ability to deliver critical government services.

To that end, some other states build cybersecurity costs into the rates that agencies pay for IT services and equipment, or they include full cybersecurity costs as part of project planning and implementation.

Historically, Minnesota has funded cybersecurity in a less sustainable way. It’s often treated as a one-time expense that is limited to the startup stage, which must be renegotiated or identified in subsequent years, or is not included in budgets at all for various technology implementations across the state.

Large-scale agency products or IT solutions may be funded for initial development, but without any long-term, sustainable funding to maintain cybersecurity funding after launch. In addition, including separate line items for security operations in funding requests can lead to unexpected cuts during political budget negotiations.

Instead, the state should identify and provide consistent funding to cover the added costs for security, support, monitoring, and cyber defenses – for the whole lifecycle of a system. These items should be built into MNIT’s required service rates– or use a similar mechanism – to distribute the collective cost among all the agencies MNIT serves. Agencies will need adequate and sustainable funding in their base budgets to ensure they can cover these costs.

14. To address a critical shortage of cybersecurity talent in Minnesota and build a cyber-aware workforce, MNIT should partner with higher education and K-12 institutions to ensure sustainable cyber training, develop existing and new training partnerships, and encourage cybersecurity education for all students.

Our state faces significant challenges in recruiting and retaining highly skilled cybersecurity workers. A chronic shortage of cyber staff has resulted in a critical talent gap that undercuts the ability of entities throughout Minnesota to address their cybersecurity vulnerabilities. To secure our state now and in the future, we must take action to address these shortages and develop a sustainable cybersecurity workforce while building broad awareness of cyber issues.

Minnesota is not the only state facing these challenges. In fact, half of all states say the lack of available cybersecurity professionals and staff rank among their top five IT security challenges. And over 60% of them say their existing cybersecurity staff need to improve their skills to handle cybersecurity threats that grow more sophisticated each year.⁸

Fortunately, Minnesota has a long history of government, education systems, and the private-sector working together on workforce development. Building on this foundation, MNIT should work with educators and institutions, and other partners, to:

8 2022 Deloitte-NASCIO Cybersecurity Study: State Cybersecurity in a Heightened Risk Environment. Inadequate availability of cybersecurity professionals is among top five barriers that CISOs cite (p. 3). Most CISOs report that staff has a gap in competencies (p. 23). Viewed Dec. 17, 2022 (<https://www.nascio.org/wp-content/uploads/2022/10/2022-Deloitte-NASCIO-Cyber-Study.pdf>).

- Identify and sustainably fund a main access point for cybersecurity training to ensure Minnesota maintains a world-class facility and the opportunities it provides.
- Build existing and new opportunities for training partnerships, and incentives to attract more cybersecurity graduates to Minnesota government.
- Encourage additional cybersecurity for all K-12 and higher education students in the state.

Cybersecurity Training Center

Minnesota boasts a strong lineup of higher education institutions, several of them identified as cybersecurity centers of excellence by the National Security Agency. Examples include the MN Cyber Institute and Cyber Range at Metro State University, and Center for Information Assurance Studies at St. Cloud State University.

We must maintain a robust training presence to increase and maintain cybersecurity efforts in Minnesota. Identifying and funding a central training access point will support higher education, workforce development, and public and private entities. This facility would complement existing efforts and expertise to:

- Make cybersecurity training available to more students across Minnesota.
- Build and diversify the economy as cybersecurity demand grows in the future.
- Position the state for long-term leadership in the cybersecurity sector.

Training Partnerships

Facilities like Metro State University’s MN Cyber Institute and Cyber Range also provide a foundation on which to build more, and stronger relationships to increase collaboration among the state, its higher education institutions, and

many other organizations. Regional opportunities include:

- Partnering with existing cybersecurity programs and centers of excellence at Minnesota State University campuses.
- Coordinating with higher education institutions to expand internship and potential apprentice programs with the state or other organizations.
- Establishing new centers of excellence – or focusing current centers – to support specific sectors or entities such as local government, K-12 or higher education, nonprofits, and small business.
- Building relationships with mature organizations to create apprentice, internship, or student worker programs that can lead to advanced opportunities to move into full-time positions.
- Working with the Minnesota Department of Education, K-12 and higher education officials, and other partners to ensure all students learn about cybersecurity and raise awareness of cyber issues.

Graduate Incentives

With cybersecurity talent scarce nationally, Minnesota agencies often must compete for these skilled workers with other levels of government, other states, and the private sector.

Though state jobs often cannot match the salaries and flexibility offered by the private sector, they typically offer greater job security and a sense of purpose – which helps attract younger skilled workers who can be trained in cybersecurity roles. Many also seek a diverse and inclusive workplace, areas where Minnesota is placing greater emphasis than in the past.

Reaching out to students before they graduate – and positioning them to experience the workplace

culture and opportunities in state government – is an important recruiting tool.

As higher education costs continue to climb, finding ways to help defray the cost of a degree can provide an additional incentive for students and recent graduates to consider state employment.

Minnesota has several existing loan forgiveness programs for medical professionals, teachers, and others who work in the public sector, specific jobs, or certain geographic areas. The state could provide similar incentives for cybersecurity workers who work for state or local governments. Examples include:

- Scholarship for Service programs that help pay for a cybersecurity-related degree in exchange for working in the public sector for a specific amount of time after graduation.
- Student loan forgiveness or similar programs to support cybersecurity students or graduates who work for a government agency in Minnesota.

Expanding Collaboration

State agencies partner with other organizations to serve Minnesotans, including local, city, and county governments, public K-12 and higher education institutions, and health care agencies and systems. Maintaining cybersecurity across the state requires extensive collaboration and sharing information – and sometimes resources – among all these stakeholders. This level of collaboration will require a higher degree of communication and coordination than has existed up to now.

15. The Legislative Commission on Cybersecurity should work closely with the Technology Advisory Council and the Minnesota Cybersecurity Task Force to promote cybersecurity threat information sharing and collaboration between state and local governments, state agencies, and tribal nations.

The Legislative Commission on Cybersecurity (LCCS), TAC, and Minnesota Cybersecurity Task Force (MCTF) are well-positioned to promote deeper collaboration that increases information and resource sharing at all levels of government in Minnesota.

- LCCS provides broad oversight of cybersecurity practices of state agencies.⁹ The commission reviews state cybersecurity efforts and may recommend policy or law changes to help protect the state’s technology from current and emerging cyber threats.
- TAC – through its Cybersecurity Subcommittee – provides guidance and collaborates with MNIT on protecting the state from cyber threats.
- MCTF, with MNIT, is developing a statewide cybersecurity plan and coordinating Minnesota’s participation in the State and Local Cybersecurity Grant Program.¹⁰ The program provides federal grant funding to enhance the cyber defense posture and help secure state, local, and tribal government IT systems across Minnesota.

⁹ LCCS was established in 2021, in response to a recommendation from the Governor’s Blue Ribbon Council on Information Technology. Report of Minnesota BRC-IT, June 2020, p. 17. Viewed Dec. 17, 2022 (https://mn.gov/mnit/assets/blue-ribbon-council-report-june-2020_tcm38-438716.pdf).

¹⁰ MCTF began meeting in November 2022 and was formed for this specific purpose. To receive funds under this program, states must have a cybersecurity plan that meets specific requirements spelled out in the Infrastructure Investment and Jobs Act of 2021. Public Law 117-58, Title VI, Subtitle B, State and Local Cybersecurity Improvement Act. Viewed Dec. 17, 2022 (<https://www.congress.gov/bill/117th-congress/house-bill/3684/text>).

Working together, LCCS, TAC, and MCTF can:

- Identify opportunities to share resources between state, tribal, and local governments, and other organizations in Minnesota, including potential funding to support them.
- Work to remove barriers to and encourage sharing of information and resources in this way between government entities to improve efficiency and cybersecurity capabilities throughout state, local, and tribal government.
- Help ensure stakeholders seek out and take advantage of opportunities to collaborate earlier in the process for new projects, products, or programs to coordinate their resources and capabilities in the most efficient and effective way.

This work would build on existing collaboration efforts such as the Cyber Navigator program to increase cybersecurity across all levels of government.

In current form, a Cyber Navigator coordinates between MNIT, counties, and the Minnesota Fusion Center (through which federal, state, and local law enforcement can share information about security threats in Minnesota). Expanding this program will:

- Provide more focus on cities, towns, K-12 and higher education systems, and critical infrastructure with targeted resources.
- Continue building threat awareness and intelligence sharing between state and local governments and private-sector partners.
- Build and support a statewide incident sharing network.
- Help identify resources available to local governments from federal and state programs, Information Sharing and Analysis

Centers, and other programs, especially free or low-cost opportunities that improve cybersecurity.

- Coordinate needs and resources to address cybersecurity needs at all levels of government as efficiently as possible.

16. MNIT should engage with state agencies, constitutional offices, and other state entities to increase opportunities for collaborative procurement and implementation, and to drive adoption of advanced cybersecurity protections that meet or exceed the standard defenses currently provided by MNIT.

Cybersecurity is a collective need and responsibility shared by all government organizations in Minnesota. Cyber threats can affect any of them, separately or as part of a wider coordinated attack. It's critical they work together to achieve, maintain, and improve stringent cybersecurity across the state to protect IT systems, applications, and products.

As the state's centralized IT agency, MNIT should continue to drive the needed long-term improvements in cybersecurity awareness, practices, and procurement across Minnesota government. This includes full-service executive branch agencies and constitutional offices, as well as non-executive branch partners that contract with MNIT for conferencing, voice, and network services.¹¹

To increase Minnesota's overall cybersecurity, MNIT should engage the full range of state government agencies, offices, and partners to:

- Provide cybersecurity guidance, playbooks, and other information for use by any government agency or organization.

11 Constitutional offices include the Governor, Lt. Governor, Attorney General, Secretary of State, and State Auditor. Non-executive partners include the Legislature and court system, tribal nations, K-12 and higher education systems, public libraries, cities, and counties, and other government organizations in Minnesota.

- Share statistics about cybersecurity vulnerabilities and incidents reported each year to raise awareness, mark progress, and guide future efforts.
- Drive greater use of MNIT cybersecurity tools, or other common tools that meet the same standards, across state government.
- Extend shared cybersecurity capabilities that cover local and tribal government partners to include state entities not covered by MNIT enterprise security.¹²
- Coordinate the use of shared procurement or rate-based MNIT security services, with appropriate cost sharing, to help ensure cybersecurity efforts are backed by sufficient funding and staff.
- Work with agencies to identify flexible or one-time funds – such as Odyssey Fund dollars, discussed elsewhere in this report – that are available and appropriate for cybersecurity efforts.

12 MNIT currently provides cybersecurity protection to county government, port city, and tribal nation partners through the grant-funded Statewide Security Monitoring Initiative.

Conclusion

The TAC recommendations in this report build on previous reports from the Blue Ribbon Council on Information Technology and identify new ways for business and technology leaders to work closely together on behalf of the Minnesotans they serve. The recommendations continue the ambitious modernization effort Minnesota began three years ago with additional guidance to position our state for the future.

Advancing these recommendations will require continued collaboration and partnerships among the state's Executive Branch, Legislature, and our partners, experts, and contributors throughout the private and public sectors.

Appendices

Appendix A | History of the Technology Advisory Council

The current Technology Advisory Council (TAC) dates to 2011, when the Minnesota Legislature created a Technology Advisory Committee to advise the state’s chief information officer (CIO) on technology strategy and management. In 2019, Gov. Tim Walz established Blue Ribbon Council on Information Technology (BRC-IT) under Executive Order 19-02.

The executive order added private sector and legislative members to the committee and broadened its mandate to focus more directly on the needs of state residents and businesses. “Minnesotans expect reliable, secure, and accurate information technology services when they interact with the State,” the order notes, and the BRC-IT “was created to ensure the people of Minnesota have access to high-quality, dependable services.”

The BRC-IT published two major reports, in June 2020 and February 2021, with 30 recommendations focusing on IT modernization, funding, cybersecurity, and data management and privacy. The council worked closely with Minnesota IT Services (MNIT) under the leadership of state CIO Tarek Tomes, appointed in 2019. MNIT, alongside many other state agencies, has implemented – or started to implement – many of the BRC-IT recommendations through agency strategic planning efforts.

The BRC-IT also recommended updating the Technology Advisory Committee statute to align with the BRC-IT’s broader mandate and membership. The Legislature passed a bill doing so, which Gov. Walz signed into law on May 25, 2021 (HF1952). That update renamed the committee as the Technology Advisory Council (TAC), keeping the BRC-IT structure – 15 members that include state agency IT staff and leaders, private sector experts, and legislative members from Minnesota’s major political parties.

The reconstituted TAC has met monthly since late 2021. The council has four subcommittees that meet monthly or as needed: Sustainable Funding, Cybersecurity, User Experience/Self-Service, and Project-to-Product/Agile. For more information, including published reports, visit the Technology Advisory Council page on the MNIT website (<https://mn.gov/mnit/about-mnit/committees/tac.jsp>).

Appendix B | User Experience Tools

Customer/User Personas

Personas help agencies better-understand their customers' situations and needs. Personas create composite, fictional representations of different types of customer based on statistical research and in-person interviews or experiences.

Example: Minnesota Department of Human Services – Single, Adoptive Parent

Single adoptive parent

Page 1 of 2

Children and Families focused persona

My story

Can I just tell you... It's hard being a single parent!¹ I knew it was going to be, but wow, this is tough. Sometimes I wish I could just give them back to my sister.² I won't of course. It doesn't look like she's ever going to get her life on track, and, they don't deserve to be in foster care. Besides, the adoption just got finalized. These are my boys now—it's on me to take care of them! I do love my little angels but I don't know how I'm going to make it all work. Between rent, food, daycare (if I could find it!), and the rest of our bills, it's getting to be too much.³ ⁴ Winter is cold and I don't want to have to decide between food and heat. I feel lucky to get insurance through work⁵ and have my boys on my policy but by the time all that money gets taken out of my check, there's not enough. I don't even feel like I can take them to the doctor because of my big copay and high deductible.⁶ ⁷ And, I'm worried about my youngest. He's 18 months now and when I took him for his well-baby checkup (thank god that's free) the doctor said he was behind on his development. I know his mama drank while she was pregnant with him⁸, and she might've been doing other drugs too.⁹ I just don't know, how to take care of him right on my budget. His brother is developing great though. He's five now and learned to ride a bike the other day. I'm so proud of him and the way he can learn new skills. But, he does lash out at me sometimes. He can go from sweet to scary mean and back again just like that. I guess that's because of something that he's seen through...

Behaviors

- Asks for help
- Advocates for children
- Asks questions

Attitudes

- Fretful
- Lost
- Distressed
- Open
- Hopeful

Goals

- Get support for her children
- Get financial or food help
- Get help with childcare
- Build a support network

Fears

- Hurting my kids
- Making mistakes
- Losing my job
- Unexpected expenses

Pain Points and Accessibility

Social Needs Tool responses

Demographics

How many people live in your household?
3

Do you have a High School Diploma?
Yes

Do you have a disability?
No

Unmet Needs

BASED ON SOCIAL DETERMINANTS OF HEALTH

- Financial resource strain
- Food insecurity
- Housing insecurity
- Utility assistance
- Child care
- Physical health
- Employment
- Transportation

Mental Health Considerations

- Depression

Example: Minnesota Department of Agriculture – Small Farmer

Small Farmer

(Small farmer trying to get a MN state required license)

👉 As a small farmer, I want to be able to hit a single MN state website that tells me everything I need to know or do.

What licenses do have?
When do they expire?
When do I need to renew?
What Grants do I have?
When do I need to reapply? What Grants are avail. to me

🧠 Skills

They will learn a tech IF it will help them run the farm, make more \$

✅ Persona Main Job (Main goals)

My main job/goal is to grown my crops and sell them at a fair and profitable price so I can both provide for my family and continue my farming and even grow. I don't want to stay in the same place every year. I want to see that our lives are improving over time and we're contributing to our community.

😊 Personality

Proud / Independent
Strong (physically and mental)

👁️ Interests

📱 Tech savviness

- Wide Diversity
- Amish (none)
- Some very highly skilled
- Good AT? - Tech that improves their bottom line (100 dairy farms that robotic milk - they monitor systems)
- Grain farmer - GPS systems for planting and fertilizing (higher/lower amounts)
- Login to Land-o-Lakes to see how much I'm getting paid

😊 Gains

Being in nature!
Being around animals
Pride of Ownership
Sustainability - Farming
Cont. to society
Job Sat / Fulfillment
Immigrant Farmers?
Living Cultural Values

😞 Pains Financial - ?

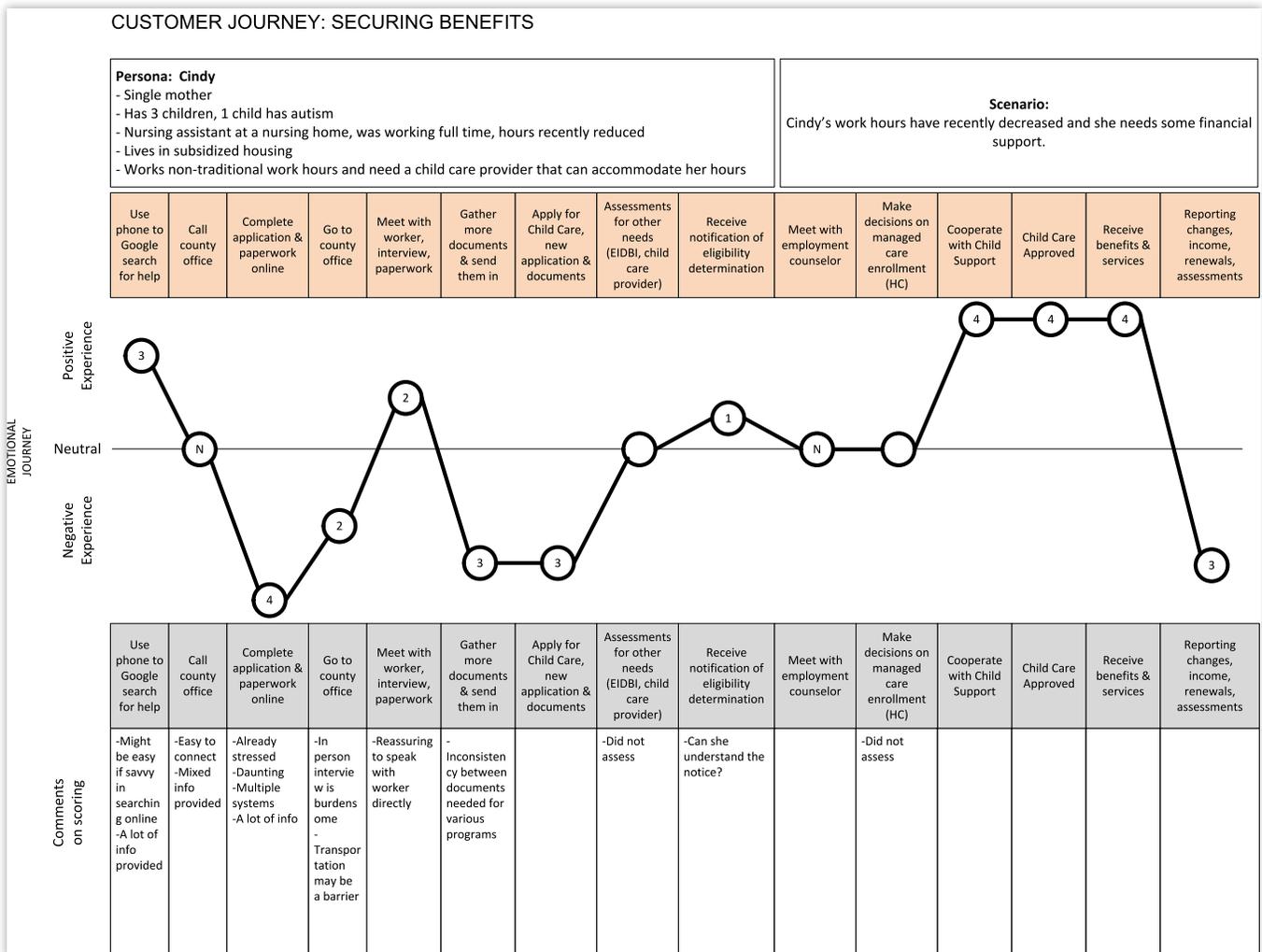
Drought and Floods
Petroleum
Debt - Loan Sharks
Experience
Big Farms
Mental Health
Family Stress
Cost of Supplies
Limited English
Limited Access to Tech

MDA! - Regulations

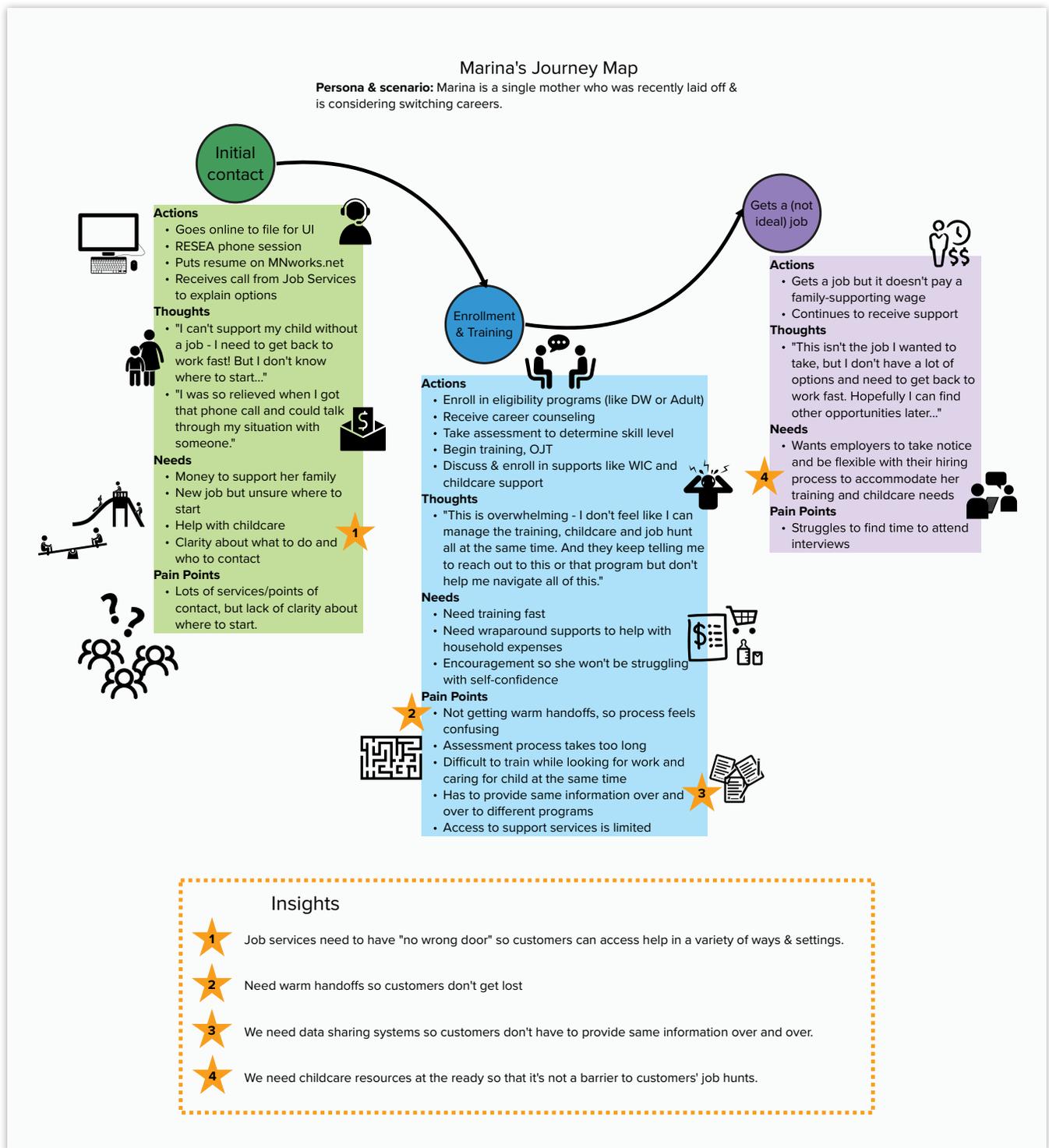
Customer Journey/Experience Maps

Journey or experience maps help capture what it's like – and how it feels – for customers when they interact with an agency, such as to apply for benefits or change careers.

Example: Minnesota Department of Human Services – Single Parent Applying for Benefits



Example: Minnesota Department of Employment and Economic Development – Marina, Single Mother UI Benefits, Career Counseling, Employment



Value-Stream Map

Value-Stream Maps examine the resources – for both customer and agency – needed to complete a process or deliver a product or service.

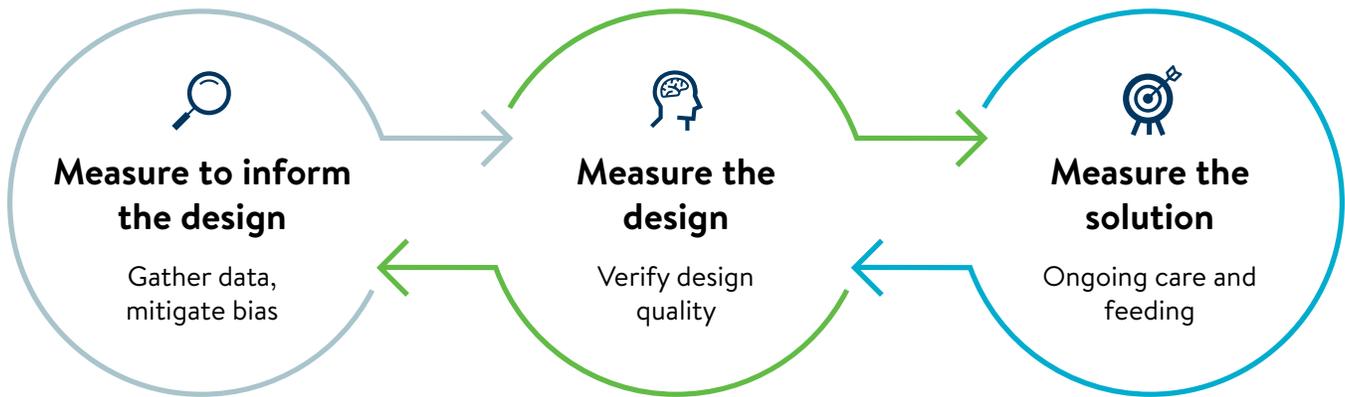
Example: Minnesota Department of Human Services – Getting Access to Benefits

DHS Value Stream: Get Access to Benefits



Measuring for Success

Measurement plans are an integral part of human-centered design before, during, and after the launch of technology or digital products. Measuring how easily people can access and use a product – and how well it satisfied them – helps ensure the product meets customer and user needs, and helps improve it over time.

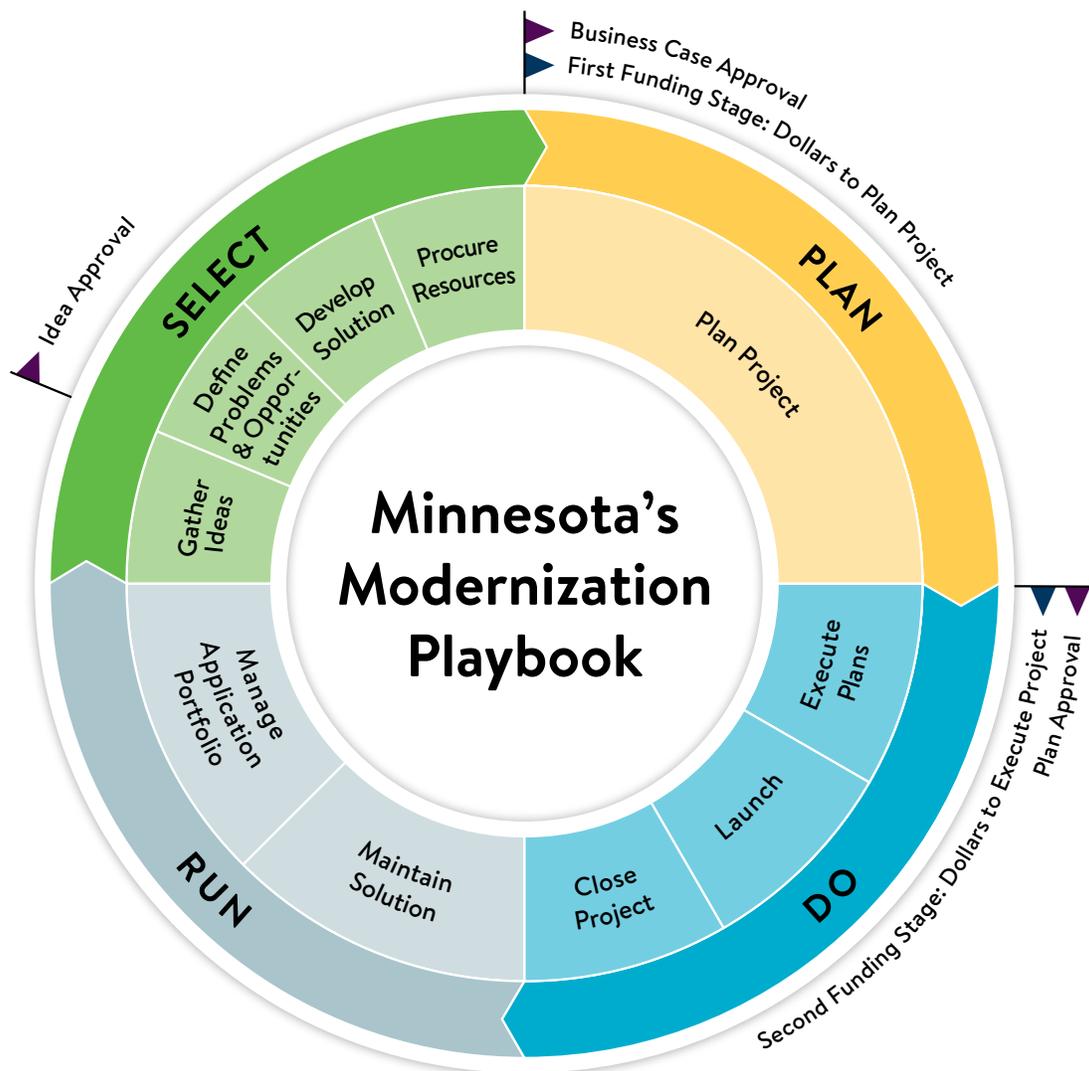


For example, we might measure the effectiveness of an online application for a benefits program by considering:

- **Accessibility:** Can people read and use the application form on mobile devices? Does it work equally well for people who use a screen reader or other assistive technology?
- **Usability:** Can people understand the text as they read it? Can they easily understand and navigate with design elements such as icons or buttons?
- **Satisfaction:** Can people complete the form without the need for assistance? How long does it take them to complete and submit the form? Is the agency getting all the information it needs to process the application without the need for follow-up?

Appendix C | Modernization Playbook

The Modernization Playbook outlines a common framework and consistent roles, language, and processes to help Minnesota agencies streamline and improve IT systems and tools.



MNIT's Office of Transformation and Strategy Delivery continues to refine the playbook in response to stakeholder feedback, real world experience, and evolving needs and best practices. The current version is available online at <https://mn.gov/modernization/>

Appendix D | TAC Speaker List 2021-2022

Month	Type	Speaker
October - November 2021		Council updates and sub-committee discussions – no guest speaker(s)
December 2021	Discussion	Cybersecurity Chris Ingles, National Cyber Director
January 2022	Presentation	MNbenefits Overview Chuck Johnson, Deputy Commissioner, Minnesota Department of Human Services (DHS)
February 2022	Discussion	Computer Science Education Representative Jim Davnie Amy Roberts, code.org
March 2022		Council updates and sub-committee discussions – no guest speaker(s)
April 2022	Presentation	Strategic Cybersecurity in Government Jim Boehm, McKinsey & Company
May 2022	Presentation	Minnesota Department of Natural Resources (DNR) Technology Strategy Overview Barb Naramore, Deputy Commissioner, DNR Katie Smith, Director of Ecological and Water Resources, DNR Dave Olfelt, Director of Fish and Wildlife, DNR Ann Pierce, Parks and Trails Director, DNR Jenna Covey, Chief Business Technology Officer, Minnesota IT Services (MNIT) partnering with DNR

Month	Type	Speaker
June 2022	Presentation	<p>Minnesota Department of Health (MDH) Technology Strategy Overview</p> <p>Robert Maki, Chief Business Technology Officer, Minnesota IT Services (MNIT) partnering with MDH</p>
July 2022		Council updates and sub-committee discussions – no guest speaker(s)
August 2022	Presentation/ Discussion	<p>Massachusetts Bay Transportation Authority (MBTA)</p> <p>David Gerstle, Chief Digital Officer, MBTA</p>
September 2022	Presentation	<p>Project to Product</p> <p>John Kost, Gartner</p> <p>Minnesota Department of Transportation (MnDOT) Application Preservation Program</p> <p>Bob Bennett, Application Operations, MNIT partnering with MnDOT</p> <p>Bill Leifheit, Line of Business Security Manager, MNIT partnering with MnDOT, Minnesota Department of Commerce (COMM), and Minnesota Public Utilities Commission (PUC)</p>
October 2022	Presentation	<p>Minnesota Department of Employment and Economic Development (DEED) Technology Delivery Overview</p> <p>Evan Rowe, Assistant Commissioner, DEED</p> <p>Annie Tietema, Director of Performance and Technical Management, DEED</p>
November - December 2022		Report writing – no guest speaker(s)

Appendix E | Members of the Technology Advisory Council

Name	Organization
Rick King, Chair	Formerly Thomson Reuters
Representative Kristin Bahner	Minnesota House of Representatives
Tom Butterfield	Formerly TCF Bank
Vincent Cabansag	Clockwork
Kassie Church	Minnesota Association of Professional Employees
Ed Clark	Formerly University of St. Thomas
Deputy Commissioner Shireen Gandhi	Minnesota Department of Human Services
Commissioner Steve Grove	Minnesota Department of Employment and Economic Development
Deputy Commissioner Lee Ho	Minnesota Department of Revenue
Senator Mark Koran	Minnesota Senate
Jason Lenz	Minnesota Association of Counties
Assistant Commissioner Timothy Lynaugh	Minnesota Department of Public Safety
Representative Jim Nash	Minnesota House of Representatives
Susan Ramlet	Medtronic
Melissa Reeder	League of Minnesota Cities
Deputy Commissioner Britta Reitan	Minnesota Management & Budget
Katie Smith	Minnesota Department of Natural Resources
Senator Melissa Wiklund	Minnesota Senate
Theresa Wise	Formerly Delta Air Lines

Letter from Commissioner Tomes

December 30, 2022

Governor Tim Walz
Lt. Governor Peggy Flanagan
Speaker of the House Melissa Hortman
House Minority Leader Lisa Demuth
Senate Majority Leader Kari Dziedzic
Senate Minority Leader Mark Johnson

Cc:

Members of the Technology Advisory Council

Minnesota IT Services (MNIT) thanks Chairman Rick King and the members of the Technology Advisory Council (TAC) for their continued support and collaboration to make technology the best it could be for Minnesotans. The discussions between council members, private sector leaders, public servants, and industry experts and guest contributors have helped to guide continuous improvements in government technology, cybersecurity, and modernization. They help MNIT to achieve our vision of an innovative digital government that works for all.

We recognize the significant time commitment and contributions from TAC members and guests over the past year, including the new members who joined us along the way. The efforts of all involved and the resulting recommendations will improve the way that state government can serve the people of Minnesota. Over the past year, MNIT has advanced recommendations from previous Blue Ribbon Council of Information Technology (BRC-IT) reports, including launching Minnesota's Modernization Playbook – a BRC-IT recommendation and a common, end-to-end outline for consistent roles, language, and activities to streamline and improve access to modern executive branch services. MNIT has worked with every agency to focus on areas of improvement commonly reported as gaps for technology modernization and projects and created measurable maturity targets within individual agencies.

The TAC recommendations continue to encourage user-centered design, Agile processes, and a focus on delivering value. When we focus on the people of our state and their needs, we can return agility to them and give them time. It will enable us to take care of more families and children, create thriving communities, protect Minnesota's environment, embed equity and inclusion, and deliver measurable results – improving outcomes in month one of an effort, rather than month 12. We are meeting the needs of the people we serve in a way that works for their family and their schedules.

In order to fully realize that continued progress, many recommendations require initial and ongoing investment. We look forward to working with TAC and our legislative partners on determining those needs and paths forward.

MNIT's existing strategic goals continue to complement these recommendations, especially as we focus on promoting people-centered digital government services. MNIT is ready to lead and share our work in this space with all of our partners across state government. TAC truly seeks to improve the way that government provides services for Minnesotans. Minnesota IT Services is eager to move this work forward with our state agency business partners, our partners in the Minnesota Legislature, and our partners in private industry so that together, we can all deliver with agility and return time, and ease of mind back to the people of Minnesota.



Sincerely,

A handwritten signature in blue ink that reads "Tarek Tames".

Tarek Tames

Commissioner, Minnesota IT Services and Minnesota State CIO

