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March 2014

Management Information Systems Staffing Analysis

State of North Dakota – Department of Public Instruction

Contents:

- Project Summary 2**
 - Project Goals & Objectives 2
 - Key Findings and Recommendations 2
 - Organizational Structure 4
 - High-Level Project Process Overview 7
- Current Environment Summary 8**
 - Introduction 8
 - Technology Support Resources for K-12 9
 - DPI Technology Resources and Services Provided 10
 - EduTech Technology Resources and Services Provided 11
 - ITD Technology Resources and Services Provided 12
- Research and Comparison Data 13**
 - Best Practices & Comparison Data 13
 - Organization Skills and Change 15
- Further Options and Recommendations Considered 16**
 - Option #1 – Move All DPI MIS Resources into ITD 16
 - Option #2 – Move DPI Programming Staff Into EduTech 17
 - Option #3 – Continue As-Is With Current DPI MIS Organization & Staffing 18
 - Benefits of Final Recommendations 19

Project Summary

Project Goals & Objectives

The North Dakota Department of Public Instruction (DPI) was asked by the legislature to review any overlap of duties and responsibilities between their Management Information Systems (MIS) unit and the State of North Dakota's Information Technology Department (ITD). The intent of the review was to look for efficiencies and any duplication of effort. ND House Bill 1013 Section 15 mandated the review and allotted dollars from the general fund for DPI to complete the project. Specifically, ND House Bill 1013 Section 15 states:

“The analysis must include a review of the department of public instruction information technology staffing duties, responsibilities, and staffing levels and must consider the feasibility and desirability of transferring additional information technology positions to the information technology department and must provide recommendations regarding the appropriate level of information technology staff for the department of public instruction.”

Eide Bailly worked with DPI's leadership and MIS staff to complete this analysis. The analysis also included a review of other organizations that share customers and data with DPI, such as EduTech and ITD, in an effort to identify any potential efficiency and / or quality of service improvements that may be achieved through a tighter working relationship amongst the organizations.

Key Findings and Recommendations

When reviewing the current DPI MIS staffing levels, several key points become immediately apparent for the analysis:

- Current DPI MIS staffing levels are not as high as they appear if one were to review the positions on the current organization chart. Traditional MIS staffing levels within DPI MIS are 7 FTEs, not the 12 positions that it appears to be under the current organization chart.
- While there are multiple organizations servicing the State of North Dakota's educational technology needs (DPI MIS, EduTech and ITD), each organization does play a distinctly separate role and there is only minimal overlap in the current organizations.
- Based on the current centralization of many key education technology services in the State of North Dakota (with ITD and EduTech) and compared to other states, true DPI MIS staffing levels are consistent with expectations and assigned duties.
- There is a need to increase the utilization levels of the current research team.
- The level of data collection requirements for the multiple education programs is the primary driving force for the number of DPI MIS staff (e.g., Federal reporting requirements are complex and require a significant technology investment to sustain).

Based on our analysis of the organizations reviewed as a part of this project, Eide Bailly recommends the following:

1. Establish a clear organizational separation between the “Research” and “MIS” functions within DPI.

- The current DPI MIS organization includes 4 FTEs that are performing various “research” functions for the department. Members of this team may appear to be “MIS” or “IT” staff; however, their day-to-day duties are not significantly related to those typically associated with an MIS function.
- Currently, the Researchers are largely focused on public, legislative and internal DPI requests for information. These duties are far more functional than technical in nature. Research staff need to be focused on how to effectively use and report on the information being collected by DPI, not on simply responding to requests for information.
- There is the potential to consider shared Research FTEs with the North Dakota University System (NDUS). Implementation of such a structure would allow for better analysis of data across the entire Pre-K through university education spectrum.

2. Maintain the current DPI “Programmer” organizational structure (4 FTEs).

- DPI’s current MIS “Programmer” staff is appropriate for their assigned responsibilities.
- While the DPI Programmer staff does spend a significant portion of their time designing, coding, testing and maintaining various DPI applications, they also provide significant “Business Analyst” skills to the department.
- In many cases, the DPI Programmer staff are more than just a software development team – they provide deep expertise in DPI’s data collection and reporting requirements. These skills could not easily be replicated by simply moving the software development responsibilities to another department (e.g., ITD).

3. Re-align the current internal MIS support staff (2 FTEs) under the state of North Dakota’s Information Technology Department (ITD).

- As discussed in the prior Desktop Study analysis completed for the State of North Dakota Information Technology Department (ITD) and Office of Management and Budget (OMB), DPI’s internal support needs can be more effectively and efficiently met through a shared support team within ITD.
- The support needs of DPI staff are not sufficiently unique to require dedicated internal support staff, these functions can be effectively supported by centralized resources that support the needs of multiple agencies.

4. Establish a new “Measurement and Accountability” section (currently 4 FTEs) within DPI.

- This new section should serve as a re-cast version of the current Research function within DPI.

- The current Researchers will likely require additional leadership (e.g., A new department Manager / Director) to achieve DPI's goals associated with more effective use of information. In addition, new leadership of this function will allow for management and focus of the team's efforts on projects that are truly required and / or better-aligned efforts with DPI's goals.
- Note: This section is the area where there is the potential to share resources with NDUS.

5. Establish a shared technical support function with EduTech.

- Currently, DPI MIS and EduTech both support K-12 public schools. EduTech's focus is primarily on supporting core technology systems for many school districts and DPI MIS' focus is primarily on supporting their internally developed data collection applications.
- DPI currently provides their support to schools primarily through calls directly from school users to the MIS programming staff. EduTech has an established Help Desk for providing technical support to their K-12 users.
- The current structure is confusing and inconsistent for schools. DPI would benefit significantly in efficiency and quality of support by establishing a shared support / Help Desk system with EduTech. Such a system would require establishing formal escalation processes between the two organizations.

6. Complete the planned data mapping project to confirm how all collected data is being utilized by the department.

- DPI provides a common point of data collection for most data required for federally funded education programs. Data collection requirements frequently change over time and DPI's systems are frequently updated to reflect these changes. However, there is currently not a complete picture of what data is currently required and where it is used.
- Completion of the planned data mapping exercise will provide DPI with a clear baseline of what data is required and where it is utilized. This is important for the DPI MIS staffing analysis, as it would provide significant clarification on the scale and scope of DPI MIS data collection and reporting responsibilities.
- This effort would also help DPI establish a solid baseline for assessing the complexity and manageability of federal and state data collection requirements.

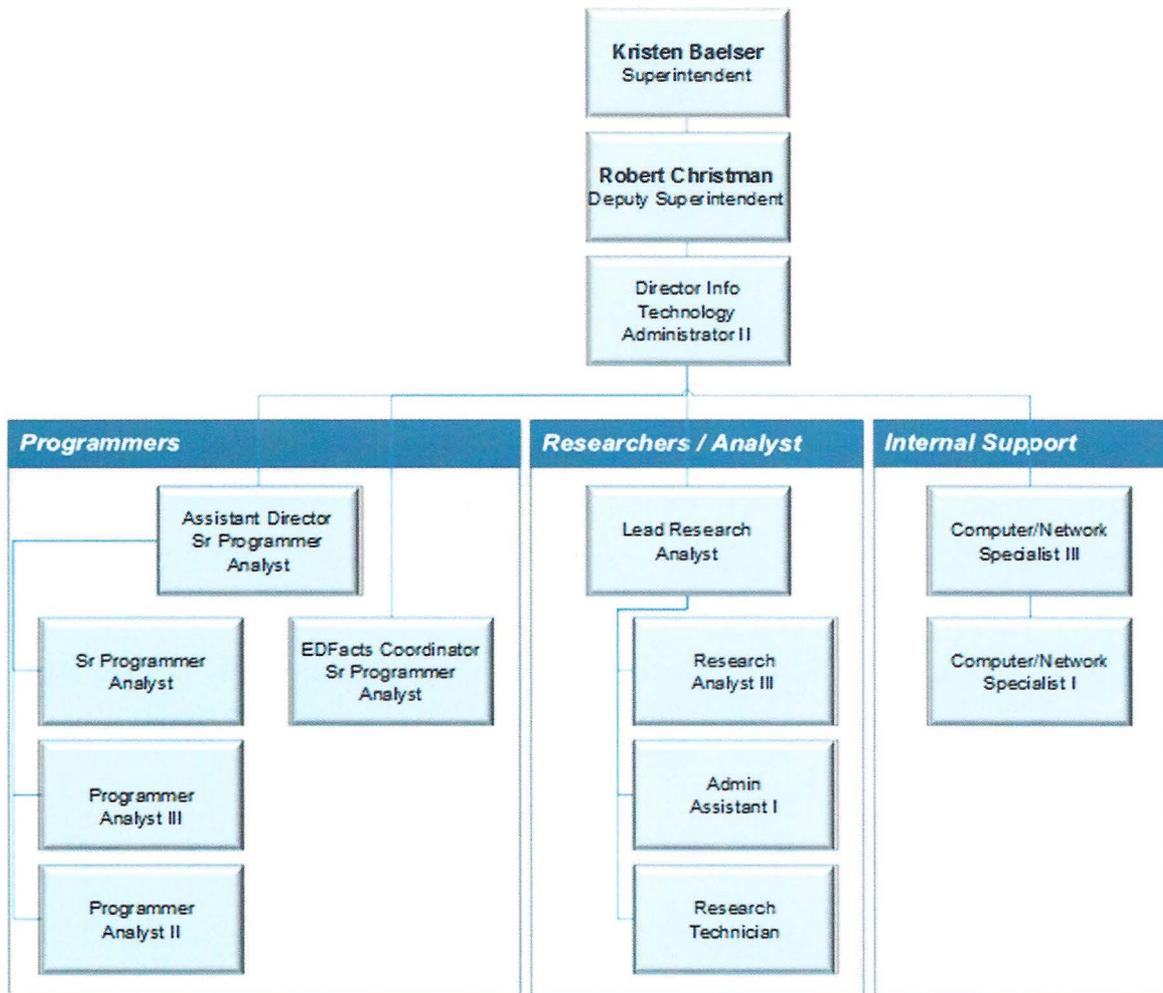
Organizational Structure

If fully implemented, the above recommendations would result in changes to the current DPI MIS organizational structure. Completing these recommended changes would provide the following benefits:

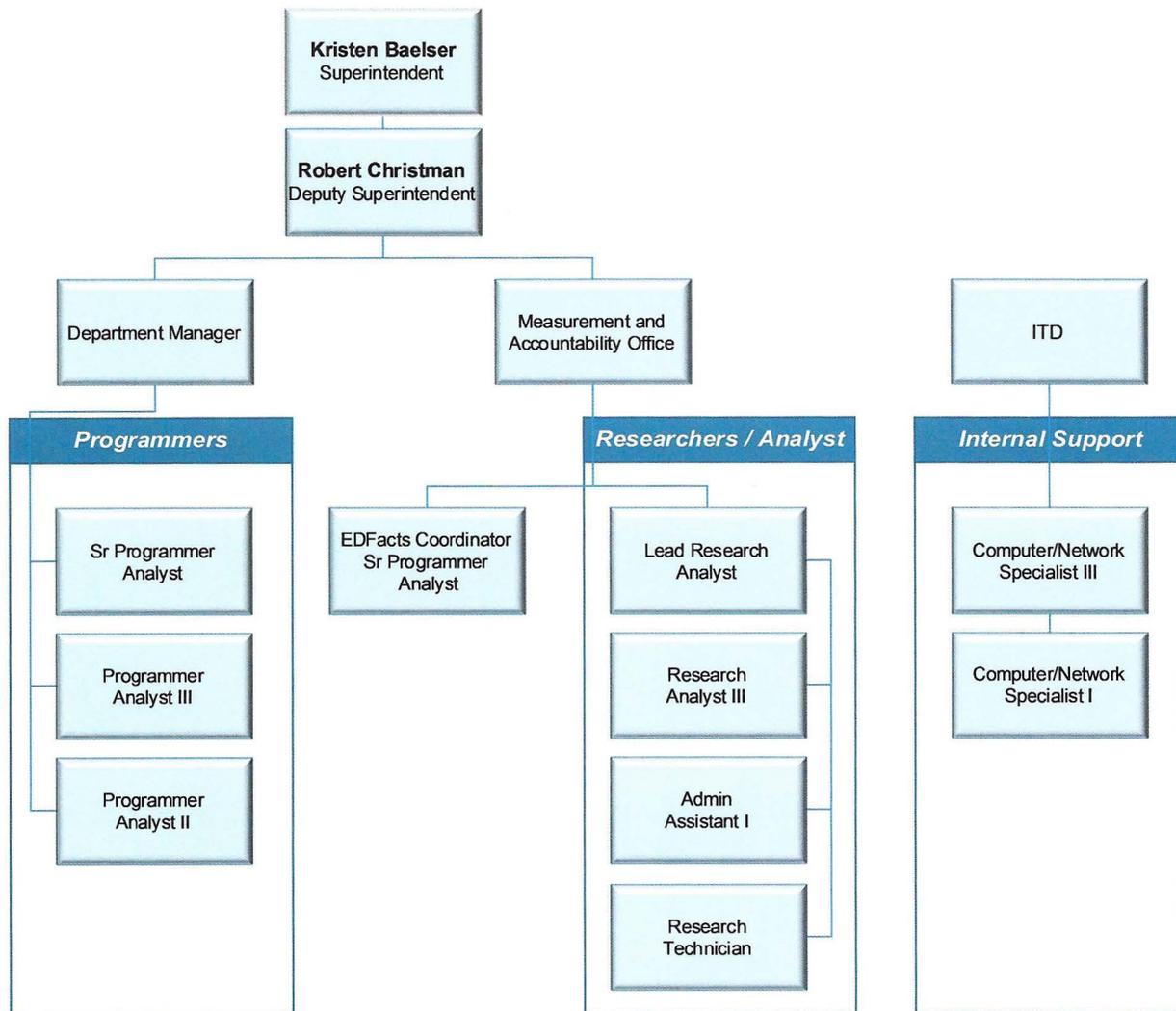
- **Clearly Defined Duties** – The current organizational structure creates the impression that DPI has 12 MIS / IT FTEs. In reality, based on staffs' assigned duties this is not the case. Approximately 7 FTEs on the current DPI MIS team are traditional MIS / IT resources.

- **Higher Quality External Customer Support** – Establishing a single support mechanism (through the EduTech Help Desk) would provide a clear support model for common customers of DPI and EduTech. In addition, a formal Help Desk model for support will provide customers with a more reliable and consistently available solution for support.
- **More Efficient Internal Support** – Internal DPI user support will be more efficient and cost effective through the planned ITD Desktop Support model.
- **Better Use of Data** – Effective use of all the data collected by DPI would be more easily achieved by having a portion of the organization dedicated to this function. In addition, focused leadership of the research team will provide DPI with an opportunity to increase the team’s utilization and productivity.

The following diagram illustrates the current DPI MIS organizational structure:



The following diagram illustrates how the DPI MIS organizational structure would look if full implementation of Eide Bailly's recommendations were completed:

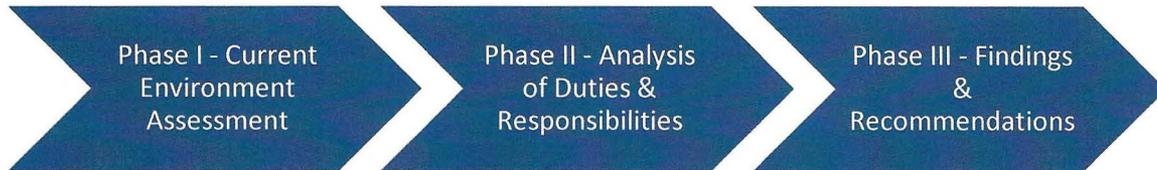


The final result of completing the recommended changes would change the reporting structure and departments that staff are located:

- DPI MIS organization staffing would go from the current 12 FTE count to 4 FTEs in the new MIS organization.
- The new Measurement and Accountability Office would have 6 FTEs and possibly be shared with NDUS.
- Overall staffing within DPI would be reduced by 2 FTEs; however, these FTEs would essentially become part of ITD (as recommended in the prior Desktop Study report).

High-Level Project Process Overview

The process completed for this project to develop the above recommendations included the following:



Phase I - Current Environment Assessment

- The project team completed interviews with DPI staff and contractors including leadership, programmers, research analysts and various program staff.
- Walk-throughs of key DPI processes were completed.
- An evaluation of tools, applications, and technology utilized in the current environment was completed.
- Discussions on current and future strategy and goals for the DPI MIS department were completed.
- A review existing documentation was completed, including: job descriptions, process flow diagrams and support and development processes.
- Current contractor spending was reviewed.

Phase II - Analysis of Duties and Responsibilities

- Comparisons were made between DPI MIS staffing and other state education department MIS / IT staffing models.
- An evaluation of staffing levels based on work type, resources, and department structure was completed.
- Options for future staffing options for DPI MIS were considered.

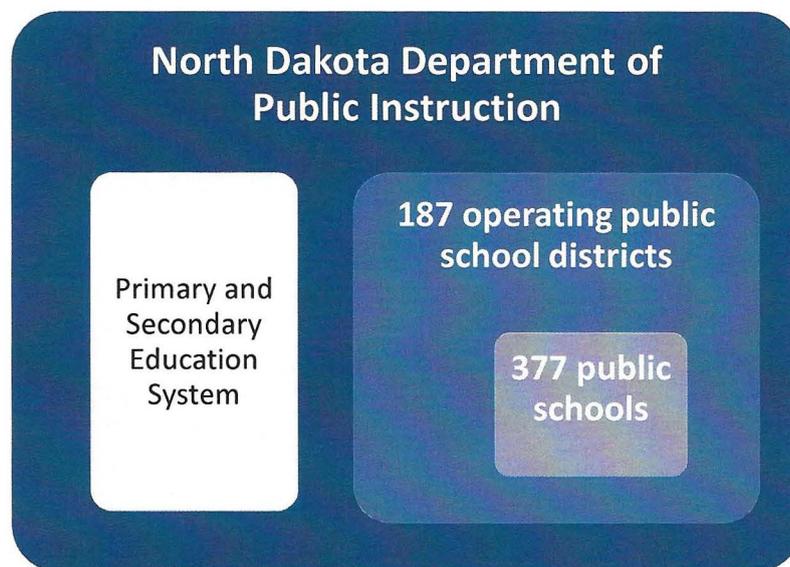
Phase III – Findings & Recommendations

- Recommendations for the following at DPI MIS were developed:
 - MIS team organization
 - Internal IT resource needs and structure
 - MIS management recommendations

Current Environment Summary

Introduction

DPI administers the state’s primary and secondary education system encompassing 187 public school districts and 377 public schools. DPI provides a system of programs (federal and state) and data collection efforts that provide significant funding to local school districts.

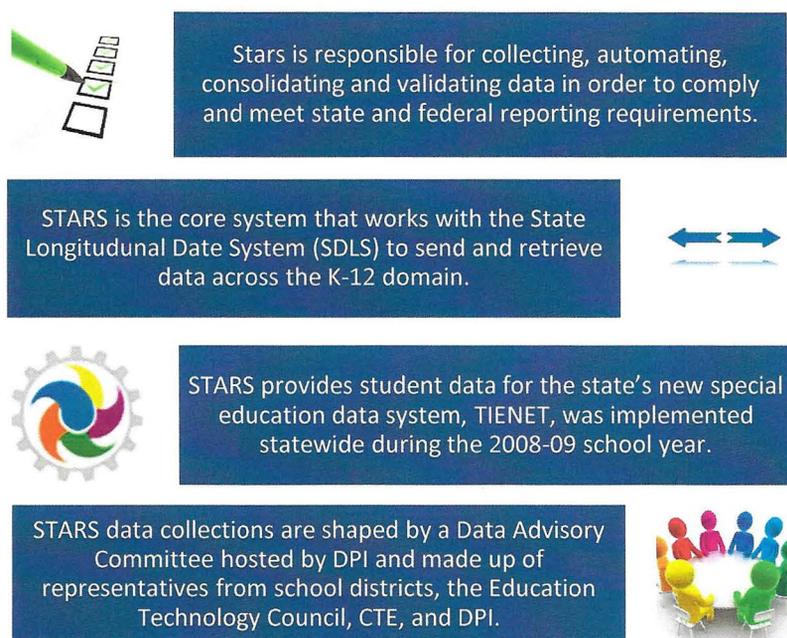


In addition, some technology needs of schools such as virus protection, email service, and PowerSchool are provided by EduTech, a separately funded service under the Information Technology Department and governed by the North Dakota Education Technology Council.

DPI’s mission and goals center on providing a uniform statewide system of effective learning that yields student academic success, and employs a system of accountability to foster continued improvement driven by data. DPI’s MIS department provides a variety of support and services to internal and external customers.

The MIS department has developed and continues to maintain STARS, which is a data collection tool that assists with providing performance information, evaluating and accrediting schools. STARS is the primary data collection tool for all statewide data collection required for most federally funded programs.

The following diagram provides a high-level overview of STARS:



Technology Support Resources for K-12

Under the current and future structure, state-level technology services across North Dakota school districts are delivered via multiple organizations. While each of these organizations has an important role in providing services required by districts and for the collection of data required to support federal program reporting requirements, each organization does have a distinct and separate role. Our prior recommendations and findings are intended to provide customers with the best possible experience, while accounting for the separate purpose for each organization.

- **DPI** – The MIS department develops, maintains and supports all statewide data collections tools. The data collected by these tools is required to support the funding process for multiple federally funded programs. These data collection tools are utilized by both public and private schools. DPI's MIS department is focused on state and federal-level data collection and reporting requirements.
- **EduTech** – EduTech provides multiple core technology services to districts throughout North Dakota. The most relevant service, for this analysis, that EduTech administers and supports is PowerSchool for all public schools within the state. For the purpose of this analysis, EduTech's primary role is to support district-level technology needs.

- **ITD** – Statewide network services are provided to schools by ITD. In addition, PowerSchool is physically hosted for EduTech at ITD facilities. For the State of North Dakota’s educational technology needs, ITD services primarily state-level services for the districts (e.g., use of STAGEnet).

K-12 Technology Services



DPI Technology Resources and Services Provided

The current DPI MIS department provides the following specific services:

Programmers

The primary responsibility for the Programmer staff at DPI includes:

- Gathering and defining business requirements
- Providing support on DPI applications
- Development of new functionality and / or changes to new or existing DPI applications

There are five programmers within the MIS department at DPI. These programmers are responsible for supporting and enhancing custom applications. This team works very closely with the programs at DPI to determine their technology requirements, answer questions on data within the software, and to deliver technology solutions. Nexus Innovations is often contracted to supplement this staff and performs development and support within DPI’s technology environment. One of the programmers is titled a programmer but she is the EDFacts coordinator who facilitates federal reporting.

Research Analysts

The primary responsibilities of the Research/Analyst staff include:

- Handling data requests
- Delivering data / reports to DPI customers

The four research analysts at DPI receive requests for information from internal and external parties. The information consists of data that is collected and stored within DPI applications. These resources rely on the programmers to create views for them to access a particular kind of data.

Internal Support

The primary responsibilities of the Internal Support staff at DPI is Desktop Support to all DPI staff. Support activities include:

- Desktop PC / Laptop support
- Printer support
- General application support

There are two desktop support technicians at DPI. Their primary responsibilities include providing desktop support to approximately 100 end users at DPI.

Nexus Innovations

Nexus Innovations is frequently contracted for development work that supplements DPI's MIS programming staff. Nexus Innovations primarily supports ancillary applications at DPI, all STARS development and support are handled internally.

EduTech Technology Resources and Services Provided

EduTech provides multiple IT-related services to districts throughout the state. These services include the following:

Technical Services

EduTech provides a wide array of technical services to school districts, including:

- Email
- Anti-Virus Software
- Web Hosting
- Internet Content Filtering
- On-Line Surveys
- Purchasing Agreements

Because EduTech provides this wide array of services, they have also have an established Help Desk that provides technical support to school districts.

PowerSchool

PowerSchool is a web based statewide information system that provides grade and attendance management for teachers and students. EduTech provides PowerSchool for all public and select private school districts in North Dakota. PowerSchool is physically hosted in ITD facilities and administered by EduTech staff. In addition, EduTech provides training and technical support for PowerSchool.

Training

EduTech provides onsite training for tools and technology, such as Virtual experiences in the classroom, SMARTBoards, iPads, Geographic Information Systems, etc. They also provide workshops, conferences and school assessments.

ITD Technology Resources and Services Provided

ITD provides Hosting, Business Intelligence, and other necessary services in support of the Statewide Longitudinal Data System (SLDS) Committee. The SLDS committee is responsible for governing a system for sharing longitudinal data.

The following are a relevant services provided by ITD for school districts:

Hosting

ITD provides hosting platforms, web servers, databases, disk storage and backup, file and print services, and datacenter space rentals for the majority of the services they provide and to statewide alliances.

Statewide alliances include the following:

• ConnectND	• FirstNet	• PowerSchool
• Criminal Justice Information Sharing (CJIS)	• GIS Hub	• State IT Advisory Committee (SITAC)
• Education Technology Council	• Health Information Technology	• STAGEnet
• Enterprise Architecture	• ND.GOV portal	• Statewide Longitudinal Data System

WAN and LAN Access

ITD manages and supports the statewide WAN for state government, higher education, K-12 education and political subdivisions. WAN components include Internet Protocol Addressing, Domain Name Services (DNS), Internet Access, VPN, Firewalls, Intrusion Detection Systems, Monitoring and Content Filtering. ITD also provides Local Area Network (LAN) for buildings and campuses.

Research and Comparison Data

Best Practices & Comparison Data

As part of completing the DPI MIS Staffing Analysis project, comparisons of DPI MIS' current staffing level and structure were made to several industry and best practices data sources, including:

- Other States (using widely available public information)
- Desktop and User Support Metrics

Other States

A review of neighboring states was completed to determine their approach for Department of Education / Public Instruction MIS / IT staffing. The follow is a summary of key findings and observations in this area:

- **Montana** – The Montana Office of Public Instruction has a full internal IT team, including Systems Analysts, Database Administrators, Network Staff and a Project Manager.
- **Minnesota** – The Minnesota Department of Education has a full internal IT team, including Application Development, Business Analysts, Project Management and IT Operations. Overall, the Minnesota Department of Education is much larger than the North Dakota DPI in all areas, not just IT / MIS.
- **Iowa** – The Iowa Department of Education has an internal “Bureau of Information Technology Services”. This team is comprised of 11 “Information Technology Specialists”.
- **Wyoming** – The Wyoming Department of Education includes a designated “Public Information Officer” that does not appear to be part of an MIS / IT organization.
- **Wisconsin** – The Wisconsin Department of Public Instruction includes IT staff that is under the “Libraries and Technology” heading.

Based on our research of other state Departments of Education / Public Instruction MIS / IT staffing models, there is no clear staffing model to refer to as a best practice amongst peer states. However, best practices can be developed based on North Dakota's current delivery model for IT services. Key facts about the IT service delivery in North Dakota that had an impact on the development of our recommendations include the following:

- Most “enterprise” level IT services for State of North Dakota are currently delivered via ITD. (Examples: Data Center Management, Active Directory, Network Services, Security Services, etc.)
- ITD currently does limited custom development for agency-specific software applications.

- ITD is currently in the planning and design process for developing a “Desktop Support” offering for most small / mid-sized agencies.
- The current MIS (traditional MIS staff, not including the Researchers) at the North Dakota Department of Public Instruction is consistent (e.g., not higher or lower) with other states (when the current delivery of IT services from ITD and EduTech are considered).
- Frequently, other states do not have an MIS / IT function similar to the DPI research team. When a similar team exists, it is common to see the team outside of the MIS / IT organization and a title that is more “data” or “accountability” focused.

Desktop and User Support Metrics

As recommended in the prior Desktop Study project, our recommendations for the current Internal Support function at DPI is to have these services delivered via ITD’s planned “Desktop Support” offering. Based on industry standard metrics for user support (includes desktops, laptops, mobile devices, printers, etc.), DPI’s current Internal Support function would be more efficiently delivered under this model.

Specifically, DPI’s currently ratio of users to support staff is approximately 50:1. Under the planned ITD Desktop Support model this ratio would increase to approximately 250:1, with service being delivered to multiple agencies. For reference, the recommended support staff to user ratio in the desktop study is supported by the following study:

Number of End Users per Support Technician (Agency)		
Small Sized Organizations (Less than 2,000 Users)	Medium Sized Organization (2,000 - 10,000 Users)	North Dakota Agency
Median Ratio 150:1	Median Ratio 375:1	Average Ratio 128:1

(Source: HDI – Staffing Desktop Support – March 2013)

Organization Skills and Change

One of the primary challenges with any organizational change assessment is determining optimal roles for the current staff within the new / proposed organization. Within the scope of this project there were two teams assessed where there was a potential need for skills changes to meet DPI needs:

1. Programming Staff
2. Research Staff

Programming Staff

The current DPI programming staff has the appropriate skills required to support the internal and external reporting needs of the department.

Key strengths of the current programming staff include:

- Deep knowledge of DPI's data collection processes and requirements
- Functional knowledge of multiple DPI programs
- Business analysis skills
- Software design and development skills

Making significant reporting changes to this department would not provide DPI with any significant benefit. Our analysis does not indicate that realigning the current DPI programming staff is desirable.

Research Staff

The current DPI research staff is focused primarily on responding to internal and external requests for information. While this service is required, DPI leadership has expressed a desire to have a team that is more focused on utilizing DPI collected data to improve educational results. Transforming the current research staff into this future / higher-value role will require focused leadership. (e.g., simply making the reporting changes outlined in this report will not be enough to accomplish this transition.) This approach is intended to increase the overall utilization and value delivered by the members of this team.

Key skills that need to be developed with the current research team to achieve DPI's desired results include the following:

- Statistics and Analysis of Statistical Measures
- Educational Outcomes Research
- Data Analysis (e.g., "What does the data tell us?, not just What is the data?")

Further Options and Recommendations Considered

When reviewing the findings and recommendations developed as part of this project, it is important to consider what other possible options were considered, understand the pros and cons of these options as well as why these options were not recommended.

Option #1 – Move All DPI MIS Resources into ITD

There are several pros and cons associated with this approach, including the following:

Pros	Cons
<ul style="list-style-type: none">• Most significant <u>potential</u> savings• Broader resources available knowledgeable on K-12 needs of DPI• Potential for tighter integration with other state-wide, ITD led initiatives (Example: SLDS)	<ul style="list-style-type: none">• Limited IT resources <u>focused</u> on K-12 needs of DPI (e.g., Resources would be shared)• Scheduling and prioritization challenges with shared resources• Significant transition cost and effort, with minimal benefit

Final Rationale for Not Recommending: Based on our analysis, implementation of this option would not achieve significant benefit to the State of North Dakota and would introduce significant transition risk and cost.

Option #2 – Move DPI Programming Staff Into EduTech

Implementation of a model where EduTech and DPI share development staff also has several pros and cons, including:

Pros	Cons
<ul style="list-style-type: none">• Consolidates all K-12 data collection within a single state-wide organization• Simplified customer support (e.g., One place to call)• <u>Potential</u> cost savings (Specific EduTech integration TBD)	<ul style="list-style-type: none">• Distances (organizationally) DPI data collection resources from programs at DPI• One-time implementation costs (Significant change)• Potential budgeting and legislative challenges

Final Rationale for Not Recommending: Moving DPI's current programming staff further away from the programs they primarily support would not be beneficial. DPI's current programming staff size is appropriate for their assigned responsibilities; therefore, this option would not likely achieve any significant cost savings.

Option #3 – Continue As-Is With Current DPI MIS Organization & Staffing

As with any organizational analysis, continuing with the current structure is an option to consider. For the DPI MIS Staffing Study, this would result in the following pros and cons:

Pros	Cons
<ul style="list-style-type: none">• Minimal change	<ul style="list-style-type: none">• Continued confusion of who the true “MIS” resources are within DPI.• No solution for increasing the usefulness of data would be established within DPI.• Customer support would continue to be confusing and informal for DPI applications.

Final Rationale for Not Recommending: Continuing with the current MIS organization does not provide the type of focus on educational data utilization desired by DPI and their constituents. In addition, the current MIS organizational structure does not clearly delineate between traditional MIS and other data analysis services.

Benefits of Final Recommendations

After considering the pros and cons of the above options, the “Key Findings & Recommendations” listed at the beginning of this report were developed. The recommendations achieve the best possible results in the following areas:

- DPI remains in full control of the critical data collection process that is required to support many of the department’s programs and federally funded initiatives.
- DPI programming staff remain organizationally close to the program staff that they serve.
- The DPI organization is positioned to develop a more focused set of resources on making the data collected by the department more useful in analyzing state and local district education needs. (Note: This would be accomplished through the newly created Measurement and Accountability Office)
- Dedicated leadership will provide DPI with an opportunity to increase the value and utilization of the current research (future Measurement and Accountability Office) team.
- Completing the planned data mapping project will provide DPI with valuable insight into how and where the data currently being collected by department applications is used today. This will be a critical foundational step in DPI’s transition of the current research function into one that is more focused on utilizing the collected data to improve educational results.
- The findings and recommendations are consistent with current IT operations and practices of other agencies within North Dakota state government.
- Improved customer support for school technology is achieved through the collaborative IT Help Desk model recommended with EduTech and DPI.