The State of North Dakota

North Dakota K-12 Identity Management Services Project

Category: Enterprise IT Management Initiatives

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Executive Summary

EduTech, a division of the North Dakota Information Technology Department, provides technology services to the state's K12 community. Before this project, one of those services was state-hosted email for roughly 60,000 K12 users.

Over time, the email system became increasingly incompatible with new technologies, such as advanced calendaring, collaboration tools, and document storage. Stagnation of services led schools to attempt to meet their own needs, causing fragmentation of school IT platforms. Additionally, the user accounts were built and authenticated using a custom identity management system. The workflow to add/remove users to the system was fraught with potential for security and data errors and redundant data entry.

These problems could only be solved with an enterprise approach. The state decided to automate identity management for students, teachers, and staff in all 200 school districts, and modernize both the authentication systems and technology services.

Active Directory was implemented as a single, unique, authoritative authentication system for services delivered by the State of North Dakota for K12 Schools. The Microsoft Forefront Identity Management (FIM) system was implemented to manage ND K12 identity records, and automatically provision and de-provision K12 Active Directory accounts based on data already being entered for essential business functions. Finally, Office 365 was launched not only as a replacement for the legacy email system but as a powerful collaboration tool for all K12 schools.

The overall project concept was to allow schools to put their efforts into educating students and not into user management, while providing them with tools to transform education and reach the state's goals of providing 21st-century learning skills to students. It was completed 8.2% under budget ($395, 802) and on schedule (six months).

The transformation of North Dakota K12 educational technology due to this project is extraordinary. Namely, the new identity management and authentication solution improves data fidelity, increases security, and reduces the burden on school IT staff, while Office 365 has provided powerful email, calendaring, storage, and collaboration tools.

Concept

[EduTech](), the State of North Dakota's K12 educational technology agency and a division of the [Information Technology Department]() (ITD), provides educational technology services to North Dakota's approximately 200 K12 independent school districts and educational organizations.

Before this project, one of those services was email hosted for roughly 60,000 North Dakota K12 users. The accounts were built and authenticated using a custom identity and service management system, which over time became increasingly incompatible with newly developing technologies. For example, schools would often request new services such as student portfolios, document storage, collaboration systems, calendaring, more advanced Web-based email, etc., and more often than not, the custom system would prevent us from accommodating those requests.

At the same time, we needed to increase email quotas from a paltry 100 MB per user, but that was too expensive to implement when accounting for records retention and eDiscovery requirements.

Additionally, the workflow to add users to the system put responsibility for security outside of the control of the state and into the hands of school staff. Because that process was not tied to any other educational activity within the school, it was an extra burden and as such often not given adequate diligence. Stagnation of services led schools to attempt to meet their own needs, causing fragmentation of school IT platforms. This added to overall state IT expenses, increased technology burden on school district staff, many of whose primary job function is not IT related; limited collaboration, hindered the state's ability to provide efficient and centralized IT services in the future, and adversely affected security and adherence to data privacy standards.

These problems could only be solved with an enterprise approach. The state decided to automate identity management for all students, teachers, and staff in all 200 school districts, and modernize both the authentication systems and technology services.

The overall project concept was to allow schools to put their efforts into educating students and not into user management while providing them with tools to transform education and reach the state's goals of providing 21st-century learning skills to students.

A series of small exploratory initiatives sponsored by the state's CIO and the Director of the [Educational Technology Counsel]() were organized to determine what data structures existed and how they could be used to build or configure an identity management solution. This resulted in a discovery document that was a template for building identity management.

As part of these exploratory initiatives, we also compared available cloud productivity solutions such as Microsoft Office 365, Google Apps for Education and Blackboard. We chose to implement Office 365 primarily because it allowed for true state-wide management and licensing, meaning as individuals moved among school districts they

could retain their email address and files. It also allowed for flexible district level controls to meet the varying needs of each district.

At this point, we developed a large multistage project to implement identity management, statewide active directory, and cloud services for North Dakota K12 schools. We outlined a statement of work and opened an RFP to find a vendor to assist us in implementing the solution. We had an aggressive budget of $451,000, which included all personnel, licensing, hardware, vendor, operational and management costs. To complete the project in a timeframe compatible with the K12 school calendar, we had a timeline of six months. It was completed 8.2% under budget ($395, 802) and on schedule.

Requirements were developed based on input from vendors, consultants, stakeholders, subject matter experts, and other state agencies. Microsoft's Forefront Identity Management (FIM) system was selected to automatically provision and de-provision Active Directory (AD) accounts based on daily student enrollment data.

The core project team involved six state staff and two vendor staff, with additional personnel serving on an advisory panel. The project was managed and implemented by ITD through EduTech and its oversight organization, the Educational Technology Counsel. Even though the project had a small budget, it was of such high visibility that it came under additional oversight by our Large Project Oversight Committee.

The project manager and business lead worked as a team to coordinate activity and communication among the vendor, Office of Management and Budget, ITD, 200+ K12 schools and education organizations, Department of Public Instruction, and the Educational Technology Counsel.

Significance

From the beginning of this project, we did not want technology for technology's sake. Rob Kaspari, EduTech Director, said it well, stating "This project is really about education and providing North Dakota K12 schools with the right technology tools for the job." To that end, this project has been and will continue to be transformational for the K12 community and state government.

The major goals of this project were to:
- Universally manage identities for every K12 public school student and teacher
- Maximize efficiency and reduce data redundancy. We wanted to leverage existing data reporting to the greatest amount possible in building identity information.
- Improve security
- Modernize educational technology tools provided to North Dakota K12 schools (Office 365)
- Reduce the IT burden on K12 schools
- Reduce state cost by retiring servers and reducing backup costs. Reduce school

cost through elimination of local file servers and lessening IT staff burden.

Unlike similar projects, participation in ours was not part of a mandate. We could not assume or require the use of a specific human resource or enterprise management system, could not set a single cutover date for every participating school, and could not force people to use the solution we delivered. Our goal was to make participation voluntary but so desirable that it would be the solution of choice across North Dakota K12 schools.

Thus, EduTech convened a taskforce of stakeholders, including users of our services and subject matter experts. Regular meetings were conducted via phone and video conference in addition to broader face-to-face input at statewide educational summits. Ongoing communication with the K12 technology community via email lists and meetings were valuable in providing updates, answering questions, as well as allowing us to understand their challenges and build a plan to help them meet those challenges. This communication generated much excitement in the project, as well as helped the schools feel that they were truly involved in the design of the system, making adoption of the system much easier. The goodwill and trust this generated among the community was essential.

Key to making this project valuable for stakeholders was coming up with innovative ways to reduce redundancy of data entry. We wanted to drive the identity management system based on essential data that schools were already entering.

This was particularly difficult because identity management comes down to having unique and permanent numbers identifying and tracking each person as they enter, exit, update and migrate within the system. This is relatively easy when the organization uses the same human resource or enterprise management system. However, within North Dakota, each school district and educational entity is autonomous, with many not having any HR or ERP system. Therefore, no unique numbering system existed, no automated data flow identified when a student leaves one school for another, or left the state entirely, and the state could not mandate that schools adopt a common HR or ERP solution.

Fortunately, North Dakota had already built a [Statewide Longitudinal Data System](#) (SLDS) that necessitated adoption of a statewide student identification number as well as collation of student data from each of the state's public schools on a nightly basis. We combined data from the SLDS with existing unique teacher license numbers and developed a system to generate unique keys for non-licensed staff. This laid a foundation on which we could build our statewide identity management system using Microsoft's Forefront Identity Management (FIM) system Active Directory (AD) accounts.

Once this foundation of FIM and AD was in place, Office 365 was launched not only as a replacement for the legacy email system but as a powerful collaboration tool for all K12 schools.

From a planning and development standpoint, the decisions made in this project have

laid a strong foundation for the future of educational technology in North Dakota. Choosing to implement a single Office 365 tenant and domain simplified management and ensured longevity and stability of the system vs using multi-domain and multi-tenant structures. Creating a new domain and identity structure as well as a new email system instead of migrating or updating the old system gave us increased flexibility and let schools transition to the new services on their own timeline, even down to the user level. The capabilities and manner in which we implemented them through FIM, AD and Office 365 were excitedly received and described by the K12 community as "the greatest advancement in educational technology in the last 20 years!"

Impact

The transformation of North Dakota K12 educational technology due to this project is extraordinary. We are now able to provide new and better services at a lower cost both for the state and K12 schools.

Some of the most impactful advancements from the project are:

Account Management: Instead of 60,000 accounts generated through manual vetting and updating, we now have 150,000 accounts, managed by an automated identity management system. Students and educators move seamlessly between schools. Provisioning, deprovisioning, and directory information are all updated automatically without any burden on school staff.

Data accuracy and security: What used to be a manual process fraught with the potential for security and data errors is now automatic and based upon business-critical data that schools ensure is entered accurately.

Automatic Group Creation: Nearly eliminated the need for teachers and administrators to build and update their own staff or classroom mailing lists. 90,000 mail-enabled security groups covering every school district, grade level, course enrollment, and user type are automatically created, populated, and updated to reflect enrollments in schools.

Open Records and eDiscovery Searches: Day-long recovery operations that would encumber administrator time have been literally cut to minutes!

Self-Service: The ability for users to restore deleted files and retrieve forgotten passwords has opened up new areas for self-service without straining support and administrative personnel.

Modern Email and Calendaring: Office 365 and all of its features have been provided under a single managed tenant for all ND K12 schools. Mail quota concerns have disappeared, move from 100 MB to 50 GB (increase of 500x). Backup restrictions have evaporated as well. Calendars can be shared and meetings scheduled among administrators, teachers, students, activities directors, athletic teams, etc., regardless of what school they attend within the state.

Personal and Collaborative Productivity: The Office 365 suite includes powerful collaboration tools, such as OneNote for Classroom. These tools are transforming how teachers interact with their students. Even if a student misses a day of class, the notes, assignments, and examples are available in OneNote or OneDrive. OneDrive provides all users with essentially limitless online storage (1TB with option of increasing), letting them keep their projects and assignments for years to come, creating a comprehensive student portfolio that assists them as they do advanced coursework, and apply for internships and college.

We even allow extended service for two full years post-graduation to allow students to fulfill military service or otherwise make the transition to higher education without risk of losing data.

Single Sign On: Our centralized AD authentication grants role-based access to numerous state systems, something that never would have been possible otherwise. Even the EduTech systems that were not retired or transitioned to Office 365 have SAML integration so users may use their new K12 credentials for legacy applications, such as Web hosting and training, without losing legacy account data.

Cost Savings: Because of the project, EduTech is retiring or repurposing eight servers and eliminating more than $20,000 annually in licensing and server costs. Many schools are also retiring their local file servers thanks to OneDrive storage, saving tens of thousands of dollars each.

Enterprise Optimization: We have halted the fragmentation of school IT platforms and have brought many schools back to centralized services.

Home Use Program: As part the Office 365 licensing agreement, users can install Microsoft Office on their personal computers and tablets for free. As of submitting this nomination, 10,000 users have installed Office on their personal devices without having to spend a penny.

The benefits of this project are further reflected in satisfaction surveys. Customer satisfaction with the capabilities, ease of use, and reliability of the new services was 97%. Since the launch of the new services, EduTech's annual survey has also shown dramatic increases in overall customer satisfaction, customer trust, customer experience, technology leadership, and meeting customer needs services (average increase of 5.5%).

Customers stated that "everything is much more reliable," that the services are "transforming professional workflows and the student experience," and that EduTech works to "be innovative … [and does] stuff my colleagues in other states can't even dream of."

We set out to automate our identity management and authentication solution to improve data fidelity, increase security, modernize our application services, reduce costs and the burden on school IT staff, and transform educational technology. On each of these points we were successful and based upon customer satisfaction the project has earned a solid "A."