

## **Minnesota Report Card**

A Mobile Friendly Platform for Disseminating School Performance Data

Digital Government: Government to Citizen

Matthew Porett  
Chief Information Officer  
MN.IT Services @ Education  
(651) 582-8804

Project Start: January 2013  
Project Completion: November 2013

## **Section I: Executive Summary**

*Minnesota Report Card* is the Minnesota Department of Education's (MDE) groundbreaking mobile research tool, allowing parents and policymakers alike to effortlessly view and analyze education performance data. *Report Card* is a public data reporting tool that enables users to access assessment, accountability, enrollment, graduation and staffing data for public schools, public charter schools and districts.

As Minnesotans embrace mobile technology, MDE has responded by creating an application that meets the needs of mobile users yet is still accessible to everyone. Schools have increasingly moved towards tablet and mobile devices for staff and the previous report card tool was not accessible by these devices. *Report Card* puts Minnesota at the cutting edge of mobile analytics and business intelligence.

*Report Card* supports browsers on all major desktop and mobile platforms. The web app features a touch friendly UI for small form-factor devices yet delivers the same intuitive interface from desktop computers to tablets and smartphones. *Report Card* is designed to exceed Minnesota State accessibility standards. Data is readable by screen readers, the UI is keyboard-navigable and ARIA roles enhance the assistive technology experience.

*Report Card's* major functionality has been extracted into a reusable presentation framework called Cardboard, enabling the rapid development of a new generation of mobile analytics applications for the State of Minnesota. Cardboard is adaptable to any backend that can serve up a JSON API, whether it's written in C# or Python. *Report Card* eliminates time spent running duplicate reports by providing parents, educators, and policymakers a dynamic report generation system.

*Minnesota Report Card* was designed and developed by MN.IT Services @ Education in partnership with the Minnesota Department of Education. MN.IT Services is the State of Minnesota's consolidated IT agency, providing IT services to over 60 executive branch agencies, boards and councils throughout Minnesota.

Report Card is accessible at <http://rc.education.state.mn.us>

## **Section II: Business Problem and Solution**

### **Business Problem: Previous version of *Minnesota Report Card* was completely non-functional on mobile devices**

Accessing accurate and up-to-date education performance data is critical for parents, educators and policymakers. Mobile devices, including tablets and smartphones, have experienced tremendous growth in popularity for both consumers and educational institutions. Being an Adobe Flash application, the previous version of *Minnesota Report Card* did not function on mobile devices. The Minnesota Department of Education worked in partnership with MN.IT @ Education to improve *Report Card*, redesigning it as an HTML5 web app with a “mobile first” philosophy.

Users need critical education performance data wherever they are – in a classroom, in a legislative hearing, or in their office. MDE and MN.IT @ Education were challenged by users to make our reporting system mobile-friendly, so that reports can be accessed from tablets and smartphones.

The new *Report Card* was designed to be not only mobile-friendly but mobile-first, optimized for a phone-sized platform but with a responsive design which scales naturally to the size of any device’s screen. *Report Card* was tested and validated on a minimum of ten separate web browser and device platform combinations to ensure that users will have a quality experience regardless of the device they choose.

### **Business Solution – Replace the existing *Data for Parents and Educators* application with a mobile friendly web app**

The improved *Report Card* web app update provides increased mobile operability, improves data quality and ensures information is accessible to people with disabilities. The app is designed to deliver the same high-quality and intuitive user experience, whether viewed on a traditional desktop computer, smartphone or tablet.

*Report Card* is an HTML5 single-page application. It loads and responds to user input instantly and with animation as appropriate, has no server-side dependencies, and consumes XML and JSON data sources with AJAX. Its layout is fully responsive and scales gracefully from phones up to high definition displays. The JavaScript foundation is built with jQuery, jQuery Mobile, Backbone + Underscore, Highcharts, RequireJS, Twitter Typeahead, RSVP, Hogan and more. Animation is a mixture of CSS3 and jQuery. Bower is the JS package manager, and the production build process is handled

by Grunt and RequireJS. Our present data source is a WebFOCUS XML API + MS SQL Server.

*Report Card* was developed following modifications to Agile SCRUM project methodology. Reports were created in two week sprints as MDE reused the existing backend. The developer mapped the data sources and designed new reports that combined the best of our former reports (previously, the app included separate data displays for parents and educators). These reports were combined into one compact, comprehensive report for each topic.

*Report Card* is designed to exceed all applicable Minnesota State accessibility standards. All data is readable by screen readers, the UI is keyboard-navigable, and ARIA roles enhance the assistive technology experience.

*Report Card* was featured in a press conference at MDE, and held as an example of Governor Dayton's Plain Language Initiative, which seeks to make government data more readily available to Minnesotans. MN.IT Services promoted the app on their social media feeds, as well as in the employee newsletter.

### **Scope & Projective Objectives:**

MDE and MN.IT were tasked with replacing the old report card, *Data for Parents and Educators*, with a new touch-friendly UI for small form factor touchscreen devices such as smartphones and tablets. Where possible, developers kept the existing user interface look-and-feel to match current website user interface, especially in regards design colors and standards.

MDE and MN.IT followed the following principals while designing *Report Card*

- Better performing than the previous application
- Touch-friendly
- HTML5-compliant
- Accessible
- Cross-platform, supporting browsers and screen sizes from smartphones to desktop computers

Additionally, the team worked to enhance UI & data model to support an unlimited number of questions, enhance data transfer to make performance acceptable to all modern target platformS, and use data mart best practices for backing data (including replacing obsolete data sources with current ones).

### **Section III: Significance of Project**

MN.IT and MDE were tasked with replacing the Flex-based *Data for Parents & Educators* app (version 1.0) with a new HTML5 implementation to support browsers on all major desktop platforms and mobile devices. The project goal included enhancing underlying data model to improve maintainability, improving mobile and desktop performance, and adhering to best practice data standards.

*Report Card* uses HTML5 technology and a new touch-friendly user interface to ensure compatibility across most types of devices and web browsers. Interested stakeholders can view or compare education performance data (such as assessment, enrollment, accountability and other measures of education performance) from any location or device. The new app is designed to be accessible to users with disabilities.

By developing *Report Card* as a mobile application, MN.IT @ MDE can ensure that it functions in the internet of tomorrow, in which desktop computers are just one of a wide variety of connected devices. By choosing HTML5 rather than native application development, MN.IT @ MDE developed just one application that supports all platforms without requiring a download, rather than developing and maintaining one for Android, one for iOS, one for Windows, etc.

This approach to application development is new to the State of Minnesota, and all these technologies are cutting edge. MN.IT @ Education is not aware of any web-based analytics system that can match our commitment to both desktop and mobile/touchscreen UX. MN.IT @ Education and MDE have delivered a single codebase that works on all platforms.

### **Section IV: Benefits of Project**

MN.IT @ Education and MDE have created a statewide report card that is clear, concise and presents data in an understandable and uniform format accessible to persons with disabilities. Data is provided in a format that parents can understand, free of jargon and edu-speak, as required by the Federal government. The HTML5 format is available on all platforms and devices, and is accessible to the public, school staff, legislative staff and internal users.

All stakeholders in public education benefit from this project – parents, teachers, school administrators and policy-makers will all find *Minnesota Report Card* a useful tool for viewing and comparing education performance data for public and charter schools and school districts. Portable, always-available education metrics have an immeasurable

impact on families' quality of life through better-informed school choices, and on the quality of policymakers' research and decisions.

### Ensuring accountability for Minnesota schools

A report card is a critical tool both for promoting state and school accountability, and for engaging parents and communities in meaningful discussions about the academic challenges and opportunities facing their schools. Accurate and timely information brings transparency to education policies, uncovers academic challenges and deficits, and highlights areas in which the State and schools have made gains.

### Enabling and supporting school choices and parental involvement

A well-informed public is important to improving schools. In the same way that data enables educators to make better decisions about teaching and learning, data can also help parents and other community members work more effectively with educators and local school officials. Additionally, the more parents and community members know about the academic achievement of their children and their schools, the more likely they are to be involved in their local schools. Equipped with information on academic results and teacher quality, parents and community members can make better decisions concerning their children's educational pathways and become more effective advocates for their children's schools.

### Addressing the needs of mobile users

The *Minnesota Report Card* app is available to all Minnesotans. MDE reports an average of 5,000 users per month. 945 of the last 6932 sessions were phone or tablet users. Mobile sessions are up 32% since January.

July 2013			January 2014		
Platform	User Hit Count	User Percent	Platform	User Hit Count	User Percent
iOS	14,051	7.93%	iOS	22,960	15.45%
Android	4,047	2.28%	Android *	2,689	1.81%

*\* Note: Android users are moving from the Android browser to the Chrome browser. Chrome browser usage is way up (now #2 behind Internet Explorer) but is not broken out from desktop Chrome usage in our statistics*

MDE website browser statistics demonstrate how rapidly users are moving to mobile devices. Prior to 2013, mobile device usage of the website was very low, between 1% - 2%. The *Report Card* application was deployed for external user testing in July 2013

and official production release in December 2013. Clearly there is high level of interest in mobile device usage. As MDE's primary mobile-first web application, MN.IT @ Education believes that *Report Card* is driving a large amount of this usage.

### **Meeting and exceeding accessibility and readability standards**

The US Department of Education requires state and local education organizations must release performance data annually, in a format that is:

- Easy to read and balances text with graphs and charts to help users visualize the data;
- Accessible to the target audiences both physically and linguistically;
- Accompanied by adequate interpretive information that includes short narrative explanations of the data in order that the public will be better able to put the information in context; and
- Supported by evidence that the indicators, other information, and suggested interpretations are valid

In addition to meeting or exceeding these federal standards, *Report Card* is designed to exceed Minnesota state accessibility standards. Data is readable by screen readers, the UI is keyboard-navigable and ARIA roles enhance the assistive technology experience.

### **Cardboard: An application framework for analyzing and displaying Minnesota data**

MN.IT and MDE continue to benefit from *Cardboard*, an application framework developed for *Report Card* as it extractable to other applications. Cardboard is an in-house, mobile-first HTML5 application framework that's used to rapidly develop user interfaces for data analytics and business intelligence applications. It's designed to consume JSON or legacy XML data sources and visualize them as interactive charts and data tables. Cardboard is built by and for MN.IT Services @ Education, so its user interface and style of analysis is focused on comparing educational institutions and organizational units. In addition to *Report Card*, Cardboard was abstracted to form the basis of the user interface for another reporting app, Minnesota SLEDS (Statewide Longitudinal Educational Data System). This saved months of development time, resulting in tens of thousands of dollars in cost avoidance.

Cardboard enables the rapid development of a new generation of mobile analytics applications for the State of Minnesota. By abstracting *Report Card's* major functionality into a reusable presentation framework, MN.IT @ Education and MDE have made a single investment in reporting infrastructure that will pay dividends to the State down the road.