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TO: Dr. Joel Boyd, Superintendent of Schools  
FROM: Linus J. Guillory Jr., PhD, Chief Schools Officer  
DATE: April 16, 2021  
RE: *Data Visualization Report*

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The following report is in response to a motion made by Committee Member Hilary Clark:

**Data Visualization Tool & Dashboards**

*Request the superintendent explore the cost and benefits of a data visualization tool, where data from various source systems can be pulled into developed dashboards to provide useful information that can be rolled up, sliced, and filtered based on user access and need.*

**Background:**

The need for readily accessible, standardized data began at the beginning of the 2019-20 school year when asked “what was our attendance rate for the first day of school” and an answer was not readily available, nor was it a “click away” i.e. easily discernible. School leaders alike expressed the need to have “data/information” at their fingertips, that doesn’t require hours upon hours of their time and multiple steps to extract data from various sources.

In early 2020, the district underwent a Request For Proposals (RFP) process to identify a data visualization vendor to assist the District with the development and implementation of a comprehensive data visualization solution and document such process as a future training tool. The RFP was released March 16, 2020 and was open for two-weeks. Within that two-week span, 11 responses were submitted for review.

A committee made up of seven district staff, ranging from central office staff to building level staff, came together to review and rate the proposals using a rubric-based rating scale. Based on the rating scale, three vendors met the criteria and the District selection committee invited all three vendors to demonstrate their product. Of the three vendors, two presented to the committee on April 16, 2020.

The District selection committee presented the School Committee with a recommended vendor to move this project forward in April 2020.

As the COVID-19 Pandemic continued throughout the spring, the RFP was placed on hold and the district did not move forward with the recommended vendor at that time.

### **Current State:**

The District currently uses various tools in order to analyze data - either for visual purposes or to provide simple statistics in order to meet the data request needs.

#### **Tableau:**

Tableau, a data visualization tool, has been utilized by the District for roughly four years beginning in the 2015-2016 school year. The District further enhanced its use of Tableau in the 2016-2017 school year, by having the ability to publicly link the created dashboards to the District's website. Currently, there are five creator licenses that have been purchased, and will expire on July 28, 2021.

Since the District purchased Tableau, two staff members at Central Office were sent to one training session. From that training, the former Assessment and Research Coordinator gathered his knowledge from other districts utilizing Tableau and self-discovery to develop dashboards that he thought were useful/beneficial. From this, numerous dashboards/visualizations were created relating to Assessments, Attendance, Discipline, and Academics that were seldom used. These dashboards needed to be manually updated in order for the dashboards to display the most current data. Since the Assessment and Research Coordinator left the District, these dashboards have not been updated as current staff are not familiar with how to use or maintain them; nor have there been requests from the intended users to access those dashboards.

#### **Google Data Studio:**

Google Data Studio is a free tool that takes data and turns it into informative, easy to read, easy to share, and fully customizable dashboards and reports using a "drag and drop" editor. The data can come from a wide variety of sources without the need to program and is easily shareable with others.

The use of Data Studio was in response to the need for administrators and teachers to visualize various pieces of data in one place. While the DataStudio dashboards have the ability to filter down to student level data, are easy to understand and build, the performance of the dashboards when you add additional schools is very slow, the dashboards require a manual download from the data source in order for the data to be refreshed, and have a tendency to "break" if the updated data source is not formatted in the same way. This system also requires frequent manual touchpoints as well as begs the question of District confidential data being stored outside District safeguards.

#### **Microsoft Office/Google Suite:**

Microsoft Office products - Word, Excel, and PowerPoint and Google Suite products - Docs, Sheets, Slides and Forms are being used across the district as a way to house data, communicate out about data and analyze data using simple statistics. These products are easy to use and readily available to everyone across the District, but rely on copy/paste functionalities, manual updates, and require a tremendous amount of staff time to compile.

Due to the various tools being utilized as mentioned above, and in response to the District's need of a data visualization tool, district staff in the Office of Performance Management, began using Structured Query Language (SQL) Server Reporting Services as a platform, and created internal dashboards around key performance indicators such as attendance, student assessments, and course grades.

The benefits of these in-house created dashboards is that it allows District and school staff to visualize their data in "real-time" so that more time can be spent on analyzing/interpreting actions, rather than extracting, sorting, and building the data. In addition, the attendance dashboards are "interactive" in which graphs are clickable to drill down to the student level so that staff can easily identify those students.

While these newly developed dashboards are being used at the District and school level, and gaining much traction as well as generating excitement, the non-attendance dashboards do have limitations to what information is displayed in that there are currently no filtering options; they are not completely dynamic and do not drill down to the student level. The dashboards also lack the robust capabilities that a vendor created tool would have, specifically the predictive analytics capabilities that the District is interested in utilizing.

#### **Future State:**

The District has been using Aspen (X2) as the student management system (SMS) database; this system does not have a visualization package. To this end, users frequently download information from X2 and "analyze" it in another system, typically one of those mentioned above.

While Aspen is a comprehensive SMS, users have varying degrees of comfort and skill across the organization extracting relevant information. As such, becoming an expert in how to successfully navigate the system is limited to very few within the organization. A data visualization infrastructure becomes more critical in instances where large amounts of data are stored in a system like Aspen and is difficult to retrieve, analyze and assess. The need for a data visualization package, analogous to the dashboard of a car, becomes more critical for our organization.

Due to the limitations that our current, internally developed dashboards possess, the need still exists to explore a vendor created data visualization tool. The vendor created tool will alleviate the need to spend hours at the District and school level manually compiling data from different systems and producing reports that are primarily focused on compliance rather than supporting instructional improvement, and allow for student level data visualized all in one place so that District and school leaders and teachers can see how students, schools and the District are doing in order to respond in ways that improve student outcomes. **A comprehensive datavisualization package will allow "real-time" data from multiple sources to be readily available and in one location for District and school personnel.**

Due to the pandemic and the RFP process being put on hold, the District will have to undergo another issuance of the Data Visualization RFP. Work is currently being done to investigate other companies as we have now solidified what types of dashboards we are interested in and will request the re-issuance of a refined, more comprehensive RFP in the coming months.

This investment will help our students in that staff will have real-time information readily available to put supports in place for our highest risk students in order for them to be successful in their academic journey.