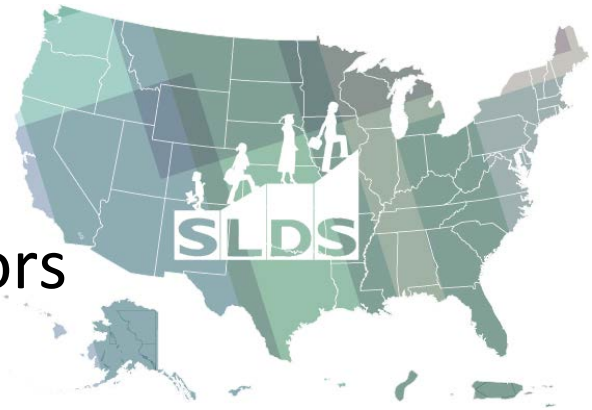
2017 SLDS Best Practices Conference
Pre-Conference Session

Dynamic Reporting Tools

Monday, February 13, 2017

Jeff Sellers & Kathy Gosa, SST Facilitators



Welcome and Session goals

- **Introductions**
  - Your name, state, role, and one thing you'd like to get out of this session
- **This session is driven by you!**
  - Pre-session survey results
  - Discussion questions
  - State demonstrations

Discussion Question

What is a dynamic reporting tool?

From Microsoft:

- **Dynamic reports**. Are created at runtime. Each time a dynamic report is run, it gathers the most recent data in the Data Warehouse. Only the report definition, which remains the same over time, is stored.
  Static reports. Are run immediately upon request, and then stored with the data in the Completed Reports module.

Discussion Question

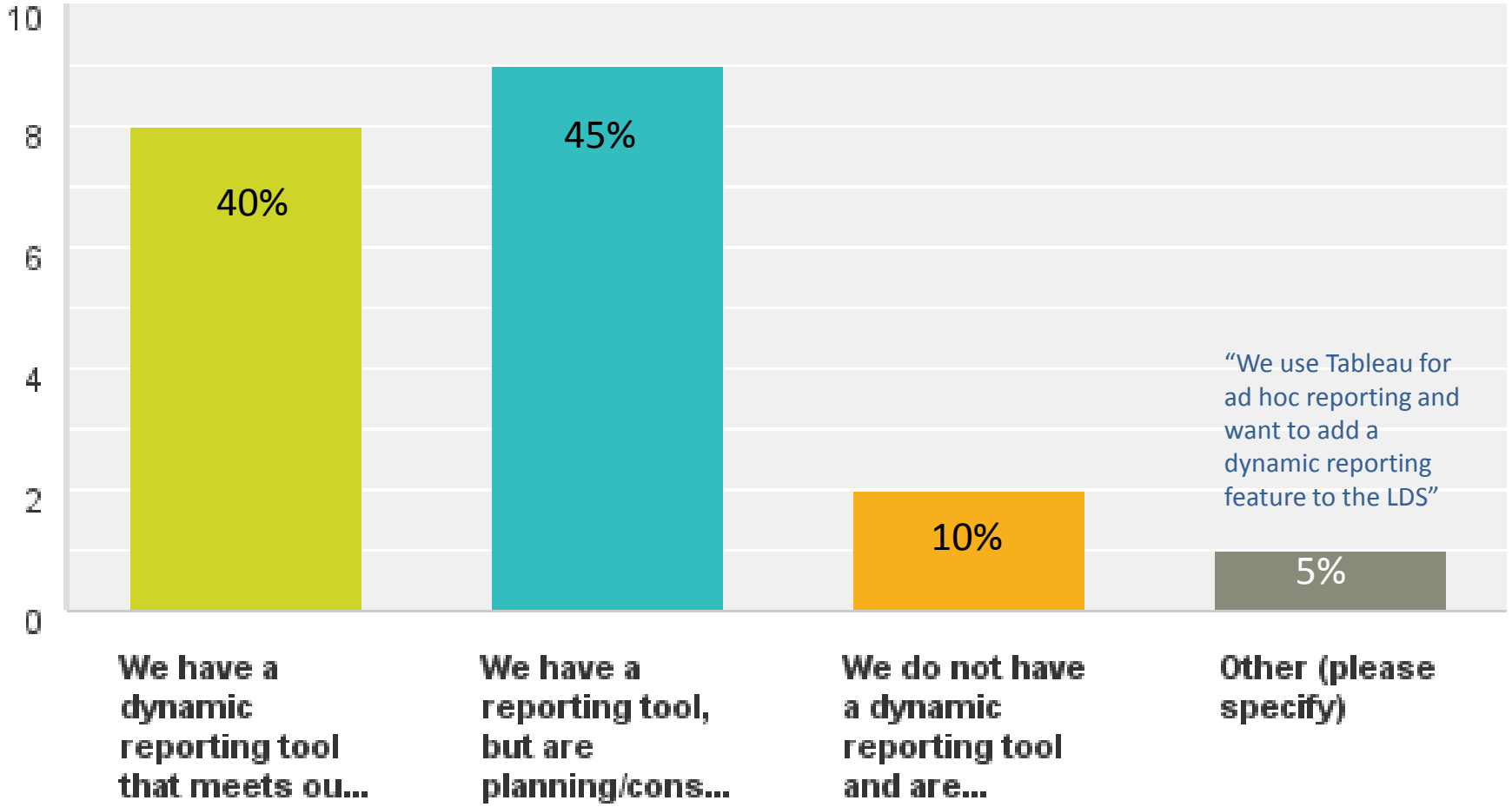
- **Why invest time and effort in a dynamic reporting tool?**

- **For states that are using them (or planning to), what motivated the acquisition?**

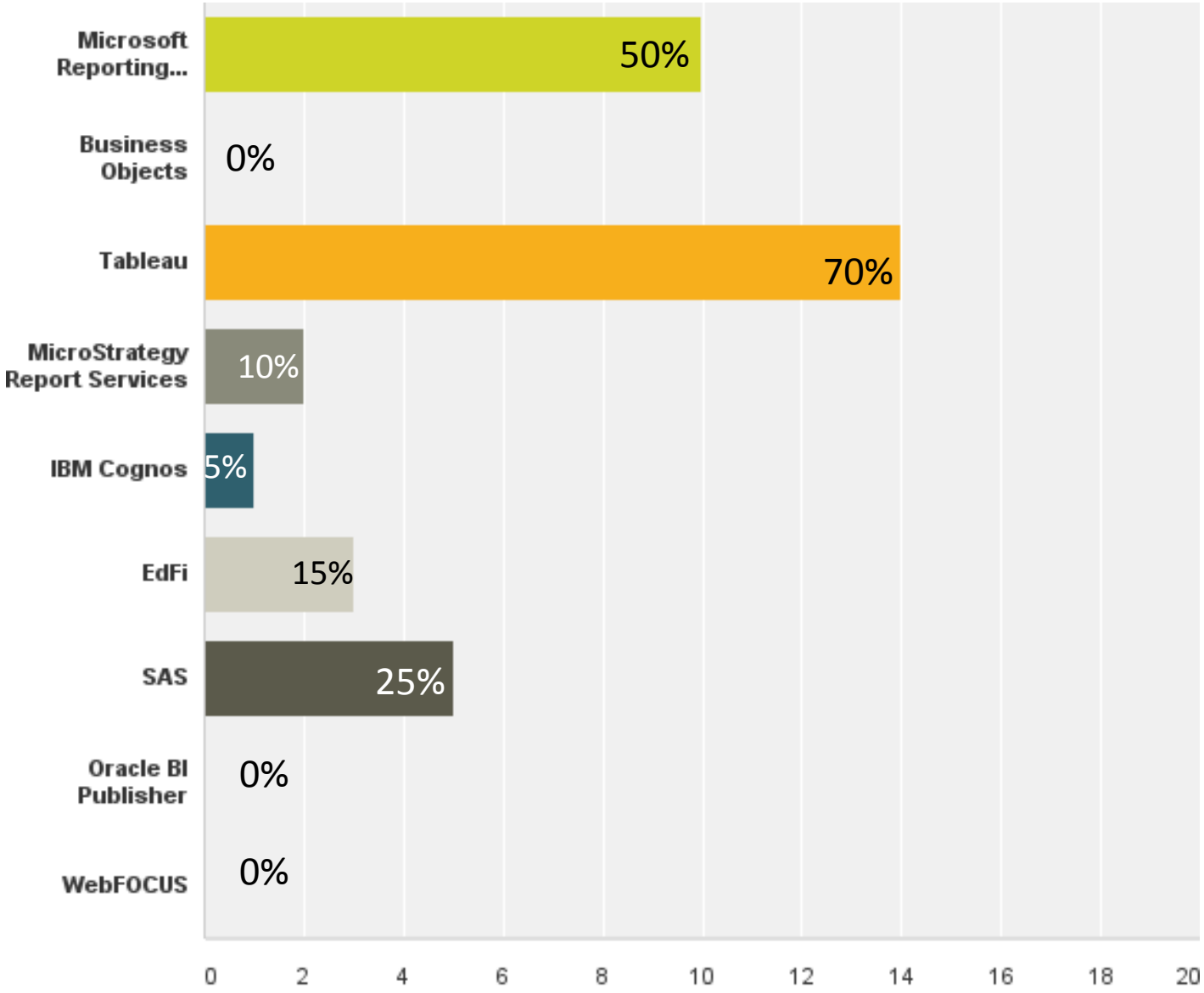
Survey Results

- Survey was sent to 29 session registrants on 2/1/2017, and re-sent to 40 registrants on 2/8/2017
- 5 questions
- 20 responses

Q1: Select the response that most accurately describes your interest in this session



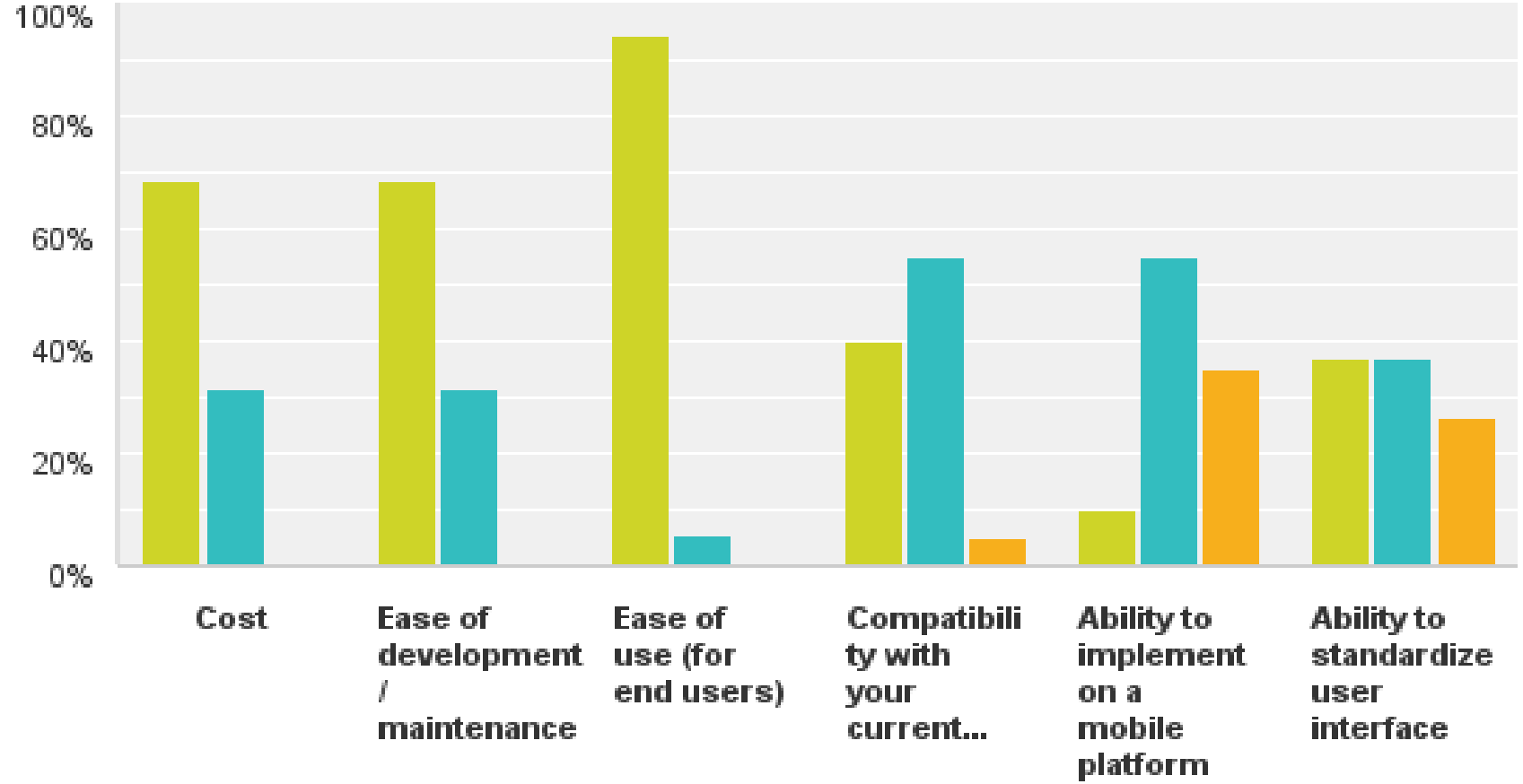
Q2: Which dynamic reporting tool/environment do you currently have or are considering? (select all that apply)



Others (1 each):

- Pentaho
- Weave
- Unknown
- Logi
- PerformancePlus

Q3: Please indicate the level of importance for each tool feature:



Answer Options	High	Medium	Low	Count
Cost	13	6	0	19
Ease of development / maintenance	13	6	0	19
Ease of use (for end users)	18	1	0	19
Compatibility with your current technical environment	8	11	1	20
Ability to implement on a mobile platform	2	11	7	20
Ability to standardize user interface	7	7	5	19
Other (please specify): * Ability to accommodate large data sets and ability to present data in multiple graphical formats * Skillset needed for ongoing maintenance				2

Discussion Question

- **Other considerations when choosing a dynamic reporting tool?**

- **Any specific considerations in the set up and roll out?**

Q5: Is there anything you'd like to add in order to shape this session?

1. An overview of functionality and especially costs across the different platforms listed above would be helpful.
2. The next part of our SLDS project will be focused on secure reporting for districts and schools. We are interested in the ability to create dashboards that highlight student data peculiar to a district or school, e.g., an early warning dashboard.
3. Would like to see how others are using the tool to present data.
4. I believe in only exposing aggregate data to a reporting tool—so no issues with data breach. Also struggle with masking—would love to discuss how others are doing that.
5. Look forward to seeing what other states are doing. Demos of other states would be very valuable.
6. We're interested in data branding across our SEA, integration with current custom applications. We're publishing reports designed in Tableau this year and are considering making this our standard and are hoping to move the department in this direction. Any pointers about this would be great!
7. We are evaluating both an internal self-service analytics tool as well as a mechanism for publishing reports and data visualizations to the public.
8. I would be interested in hearing from other states who have multiple stakeholders with the ability to create reports and what challenges/suggestions they have for us as we consider expanding report writers. Our concern is that we will quickly lose control over the look/feel of reports and that the user experience with these reports will suffer or the data won't be accurate to the purpose of the report.
9. Can you define in the session what a "dynamic reporting tool/environment" mean? What are some qualities that makes for a good reporting tool/environment? If we could rubric characteristics of a good reporting tool/environment and score ourselves, that may help us identify people who are doing well and those who could do better. Maybe then we can talk to those who score high on different areas or have them showcase. They can then highlight that characteristics within their reporting software.

BREAK

Dynamic Reporting Tools
State Demonstrations

State Example—Dynamic Reporting Tools

Kentucky Example

Linda Borkosky

https://kcews.ky.gov/

KCEWS

Dynamic Reporting Requirements and Tool Comparison

Collected from users who attended demonstrations of all tools

Requirement/Functionality	Tableau (OnSite)	Power BI (Cloud)	Lumira (Cloud)
1. The ability for the tool to allow narrative to be imbedded into the reports that are created • To accommodate text along with numbers and metrics	✓		
2. The ability to make large data sets available to users to easily create comparisons, visualizations and customized reports	✓	Only within an organization & all data stored in the cloud	Need Business Objects Account
3. The ability for users to access the tool through the KCEWS website • Without login credentials • Without a cost to or for the user • Without requiring proprietary software to be acquired	✓	Limited	NO
4. The ability to have the tool reside on KCEWS' server • To access data from KCEWS' environment	✓	NO	NO
5. The ability to share queries and reports with other users • Internal (State employees) and external stakeholders (Universities, researchers, public, etc.)	✓	Diff. Report needed for each audience	✓
6. The ability to run what-if scenarios/forecasting with the data	✓	✓	✓
7. The ability to display data graphically • Bar charts • Pie Charts • Heat Maps	✓	✓	✓
8. The ability for users to create customized dashboards • Using the data that is important to them	✓	Somewhat-can only share with folks with same email	Somewhat
9. The ability for the user to create ad-hoc analysis and apply typical research techniques • i.e., Predictive modeling	✓	✓	✓
10. The ability for the tool to be accessed via desktop/laptop computers and mobile devices	✓	✓	✓
11. The ability to schedule reports	✓	Can schedule Refresh	NO
12. The ability to provide ADA compliance	✓	Not sure	Not sure

Quick Overview:

- **Tableau** – Connects directly to over 45 connections and does not require an account/ license to view published reports.
- **Power BI** – Doesn't connect well to large databases—focuses on Microsoft stack with cloud-based data storage, hard to share outside the organization. Microsoft tools needed to fully use the tool.
- **SAP Business Objects Lumira** – Lumira server sits on SAP HANA Database—all data has to be imported into HANA then to the application.

State Example—Dynamic Reporting Tools

Montana Example

Daniel Bruce

http://gems.opi.mt.gov/Pages/HomePage.aspx

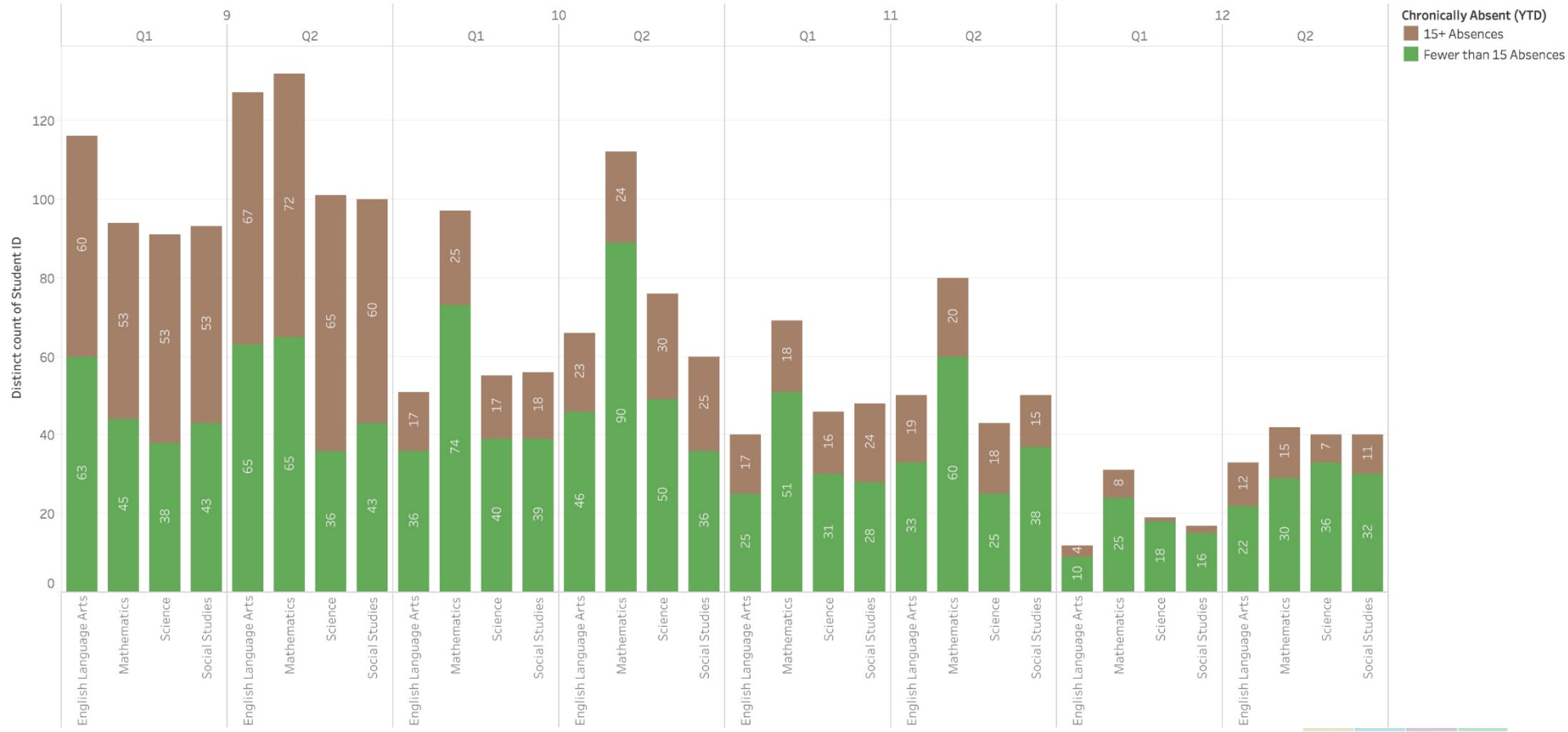
State Example—Dynamic Reporting Tools

Hawaii Example

Jana Chang & Shane Hedani

Students with Core Subject F by Teacher

as of January 8, 2017
Source: LDS Admin/Grades
CONFIDENTIAL - ADMINISTRATION USE ONLY



Connecticut Example

Richard Cloud, Angela Gambaccini-May, Ajit Gopalakrishnan, Chitralekha Macherla, Charles Martie, Stephanie O'Day, John Watson

http://edsight.ct.gov

Arizona Dynamic Reporting

Henry Williams

1/27/2017

Rev. 1.0.0

Previous State of Reporting

- Majority of Reporting Are Operational
- Numerous Reporting Tools
  - Reporting Services (SSRS)
  - Crystal Reports/Business Object
  - Excel
- Silo-Based Reporting
- Lack of Enterprise Reporting Strategy
  - Internal vs. External
- No Self-Service Reporting Options
- Custom .NET Dashboards Development

Why Tableau ?

- Enterprise-class business analytics platform that can scale up to hundreds of thousands of users
- Supports your choice of data architecture
- Create operational and analytical reporting
- Self-service reporting
  - Natural path from report consumer to report developer
- Offers a fast, in-memory Data Engine that is optimized for analytics

Tableau Software was founded on the idea that data analysis and subsequent reports should not be isolated activities but should be integrated into a single visual analysis process—one that lets users quickly see patterns in their data and shift views on the fly to follow their train of thought. Tableau combines data exploration and data visualization in an easy-to-use application

Tableau Product Suite

Creating/Authoring

Desktop

Data Visualization software that allow you to created Tableau Dashboards and reports for consumption

Public	Professional
Data Connections	
File based data sources (Excel, Access, CSV) only	Relational DB,OLAP, Cloud based data, File base data sources
Sharing	
Tableau Public Only	Export Package workbook Publish to Server/Online

Share in the Enterprise

Server	Online
Browser based mobile enabled tool to interact with dashboards/reports created with Tableau Desktop. Can refresh data sources and supports live or data extracts	
Deployment	
On premise or Cloud	Cloud (Tableau Host)
Data Connections	
Live data connections Data Extracts	**Live** data connections (Cloud Only) Data Extracts
Authentication	
Local Authentication Single Sign-on Active Directory	Local Authentication Single Sign-on Active Directory

Share outside the Enterprise

Small Team	Public
Reader	Public
Free desktop application to interact with data visualization built in Tableau Desktop. Can filter, drill down and discover data. Does not support mobile, data extract only (static data). No security (underlying data goes with report)	Public site to interact with data interact with data visualization built in Tableau Desktop. Can filter, drill down and discover data. dashboards/reports available for public consumption. Data security for extracts. Supports mobile and browser devices.
Data Connections	
No Live Connections Data Extracts saved to .twbx file extensions	No Live Connections Data Extracts

Tableau Pros

- Support Operational and Analytical Reporting
- Stunning Data Visualizations Options
- Interactive Discovery Solution
  - Can drill down from summarized view to detail and underlying data source
- Data Source Integration
  - Can blend data from multiple sources
  - Can connect to your data no matter where it lives
- Supports Mobile Devices
- Drag-and-Drop Report Design Interface

Tableau Cons

- Cost Prohibitive
  - Core licensing model for Tableau Server
- Initial Data Preparation
  - Requires strong technical skills to build initial structure
- Complexity of Advanced Dashboard Design
  - High-level or technical expertise required
  - Will require IT intervention
- Data Management
  - Works best with Tableau Data Extracts vs. live connections
  - IT management of another redundant data repository
- Security for External Users
  - No one-stop authentication mechanism for external and internal users
- Change Management
  - No concept of report version

Tableau Report Samples

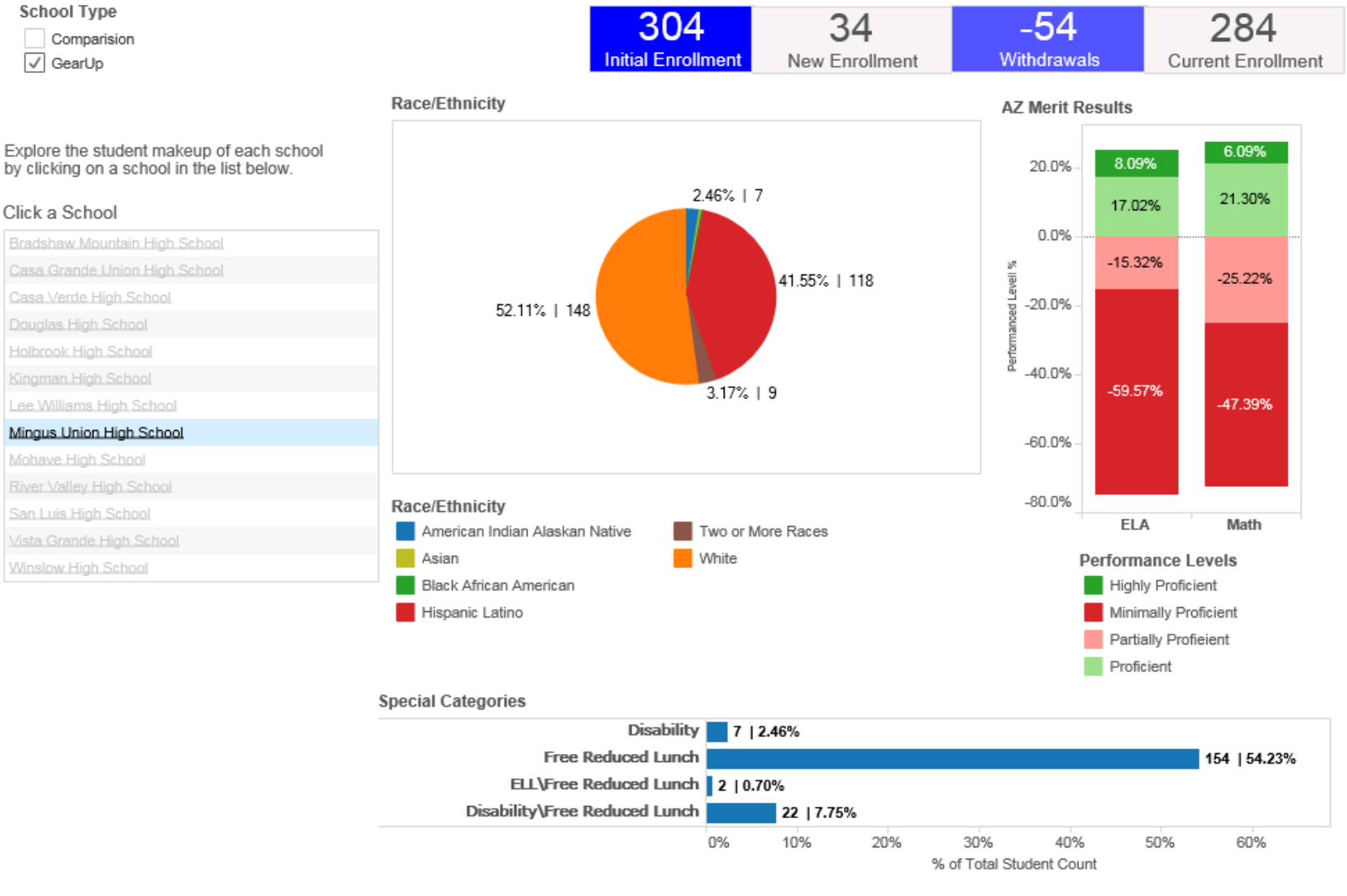
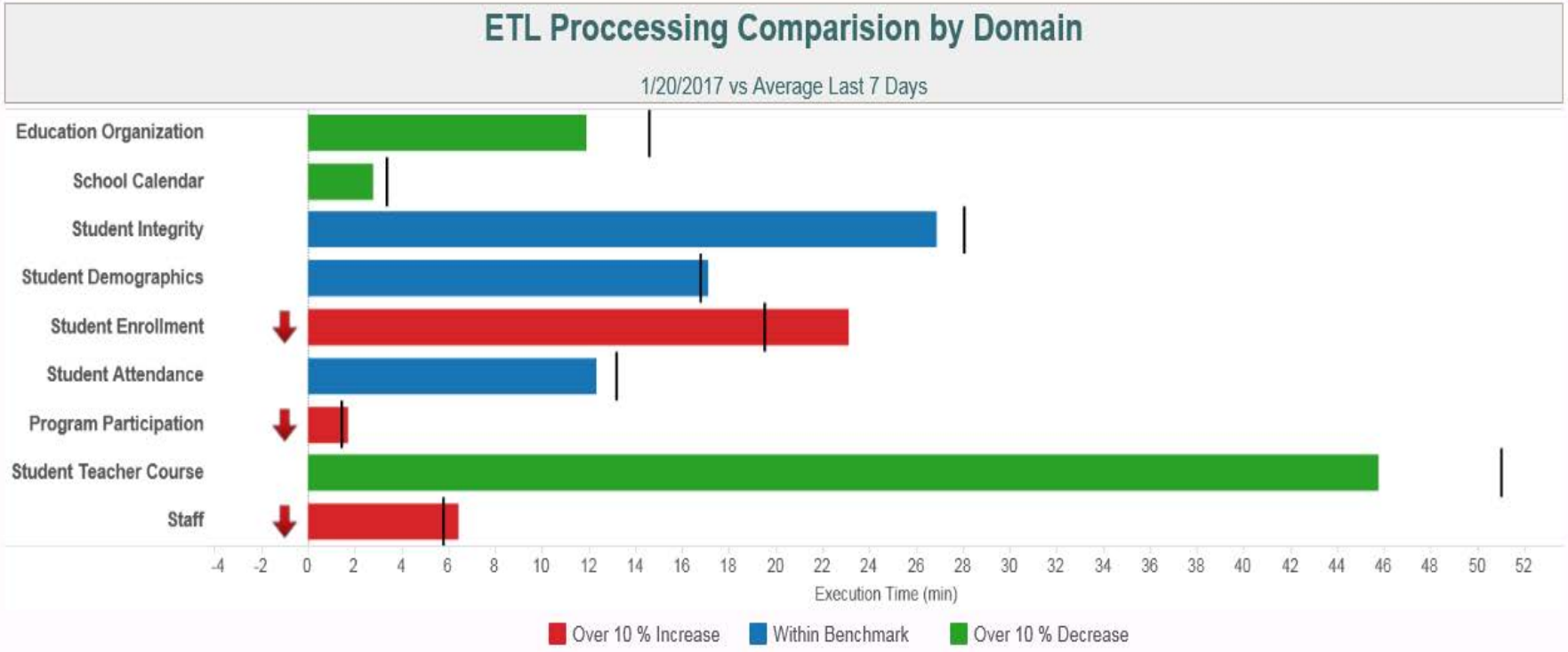


Tableau Report Samples

Agency ODS ETL Summary Report

Summarized view of ETL metrics for nightly extract of data from numerours source systems to Agency Operational Data Store for the specified period. Allows business stakeholders and Agency ODS team members and to monitor ETL activities and identify potential issues/outliners during processing

SUCCESS	4	148.1 Min	156	115.1M	5.1M	345	2,830
ETL Status	Days Since Last Failure	Package Execution Time	Number of packages	Records Processed	New Records	New Students	New Enrollments



Questions

State Example—Dynamic Reporting Tools

Michigan Example

Michael McGroarty

http://www.mischooldata.org

State Example—Dynamic Reporting Tools

Utah Example

Aaron Brough

State Example—Dynamic Reporting Tools

South Dakota Example

Sara Kock

http://doe.sd.gov/data/tables/

Public Reporting

- Pull data from the SLDS or source systems into Excel and suppress when appropriate (ex: subgroups of < 10 students)
- Tableau
  - Desktop Professional License
    $1,599/user with $458 annually for maintenance
  - Publish using Tableau Public – Free
  - Use embedded link to post on DOE website
- Pros/Cons
  + Affordable
  + DOE can develop our own reports
  + User friendly
  – Have to manually pull data

Internal STARS Reports

- OtisEd iMart Data Warehouse – SQL 2014
- Blender Portal Solution
  - DOE users – see students in the state
  - District/school users – see students in their district/school
  - Teachers – see students in their courses or caseload
- Utilized SQL Server Report Services
- Pros/Cons
  - \+ It is free
  - \+ It is user friendly
  - – It require programmers to develop reports, so DOE and districts cannot write our own reports

Websites

- Tableau - http://doe.sd.gov/data/tables/
- Internal STARS Reports – https://doestars.sd.gov

Is this “dynamic”?

Internal Accountability Reports

- OtisEd iMart Data Warehouse – SQL 2014
- Blender Portal Solution
  - Purchased a product/module of the Blender portal
  - Supports state, district, and school users
  - Provides aggregated results down to student rosters
- OtisEd runs calculations, Blender does the visual
- Pros/Cons
  - \+ It is user friendly
  - \+ We tripled the amount of data districts get
  - – It require programmers to develop reports
  - – Any changes costs money
  - – Requires lots of validation time

Websites

- PDF of 4-Year Cohort Graduation Page and Roster in TRAINING CENTER - https://doestars.sd.gov/

Is this “dynamic”?

- To see Public Report Card PDF http://doe.sd.gov/reportcard/listnew/

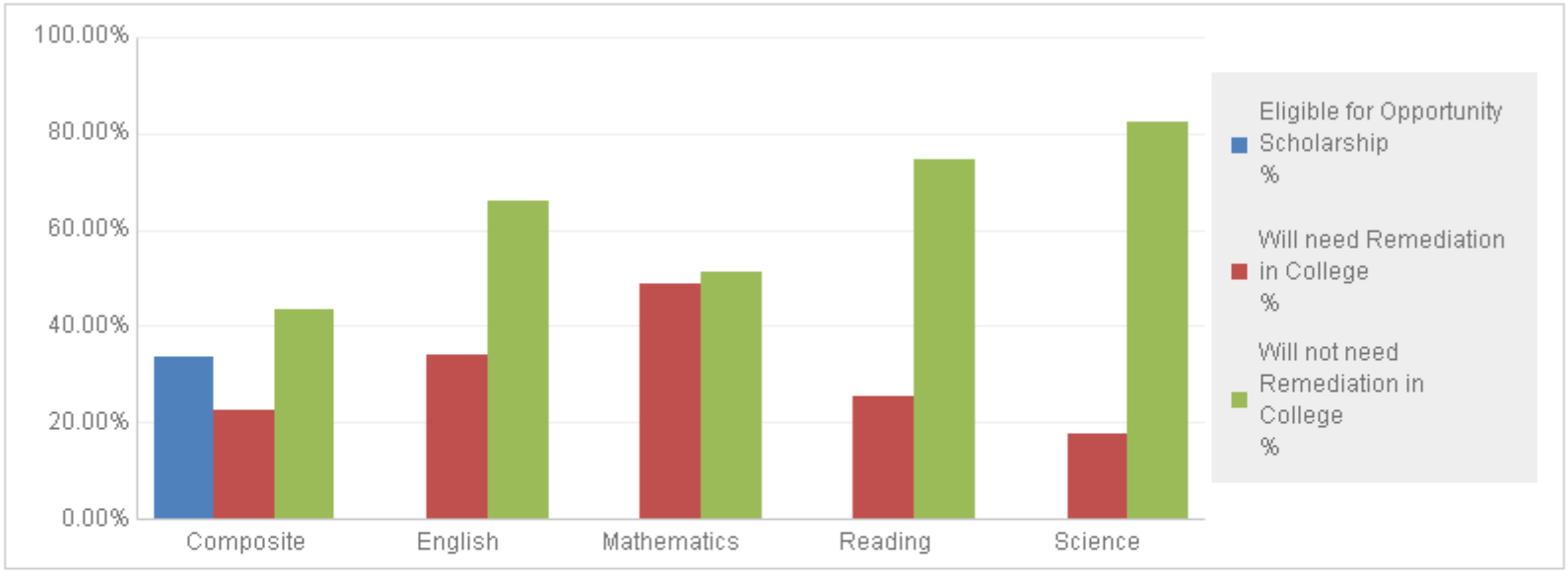
Working on…

- MicroStrategy
  - OtisEd partnered with them to get a reduced rate on their reporting services. The price is contingent on a OtisEd Data Warehouse.
- Foreseen Pros/Cons
  - + Allows for trained DOE staff to create and publish reports to users
  - + Allows for trained district staff to create and publish reports to district/school users
  - + Can write SQL code to pull the data
  - + Lots of options
  - – We were one of the first, so it has taken a lot of time to implement (Aug 2014-March 2017)
  - – Cannot publish on website without purchasing MicroStrategy public license (expensive)
  - – Lots of options
  - – Training!!!

south dakota STARS | Student Teacher Accountability and Reporting System

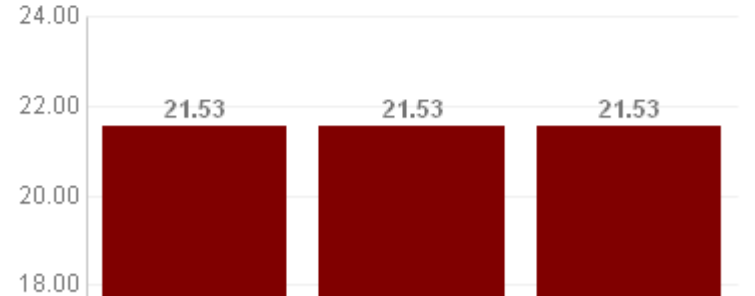
ACT Summary

School Year 2015 | **District** Aberdeen 06-1 | **School** Central High School - 01 | Show Student Scores

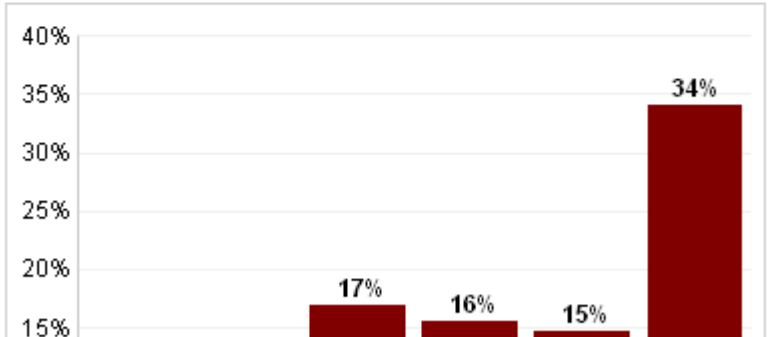


Average Scores

Composite | English | Mathematics | Reading | Science



Subjects At/Above

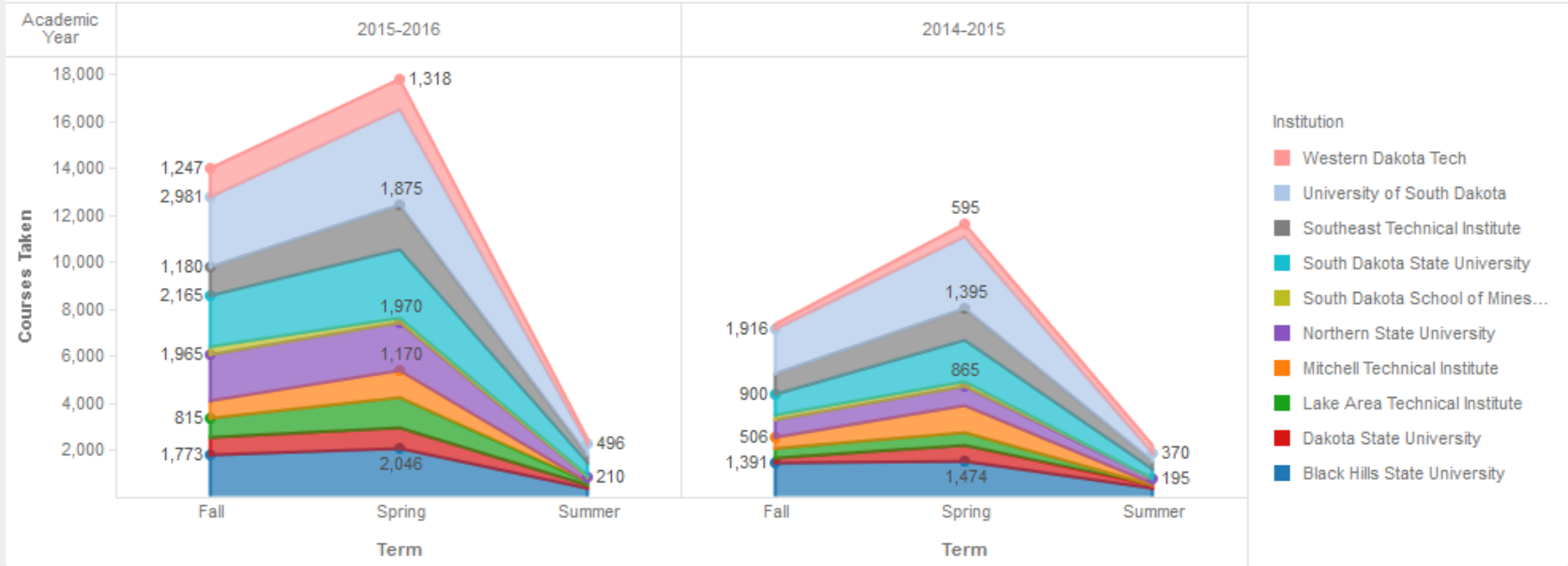


Dual Credits Analysis

Number of course enrollments

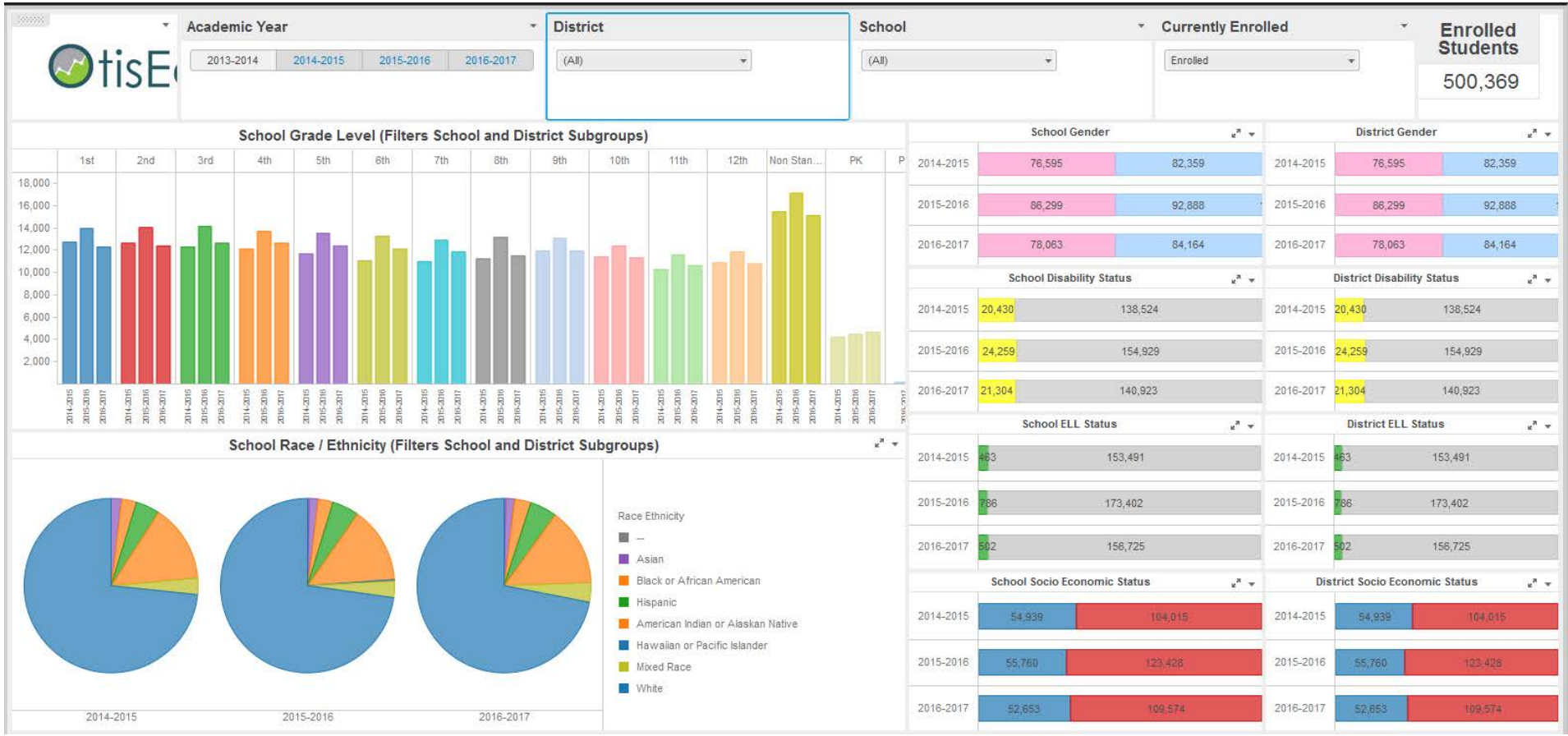
Metrics								Courses Taken
Academic Year	2015-2016	2015-2016	2015-2016	2015-2016	2014-2015	2014-2015	2014-2015	2014-2015
Institution	Fall	Spring	Summer	Total	Fall	Spring	Summer	Total
Black Hills State University	1,773	2,046	317	**4,136**	1,391	1,474	352	**3,217**
Dakota State University	720	855	155	**1,730**	245	680	105	**1,030**
Lake Area Technical Institute	815	1,305	135	**2,255**	375	575	40	**990**
Mitchell Technical Institute	740	1,170	20	**1,930**	506	1,103	30	**1,639**
Northern State University	1,965	1,970	210	**4,145**	735	865	195	**1,795**
South Dakota School of Mines and Technology	355	255	15	**625**	205	180	10	**395**
South Dakota State University	2,165	2,921	560	**5,646**	900	1,745	415	**3,060**
Southeast Technical Institute	1,180	1,875	350	**3,405**	832	1,395	336	**2,563**
University of South Dakota	2,981	4,047	496	**7,524**	1,916	2,990	370	**5,276**
Western Dakota Tech	1,247	1,318	185	**2,750**	232	595	305	**1,132**
Total	**13,941**	**17,762**	**2,443**	**34,146**	**7,337**	**11,602**	**2,158**	**21,097**

Number of course enrollments by institute (full year)



Course Enrollment | Student Participation | Pass Rate | Average Credits | Course Grade | Security Check | +

Enrollment Analysis



District Reports

Aberdeen 06-1

Student Enrollment List Document v3
ACT Stoplight Document
Student Demographics Dashboard v2

Andes Central 11-1

Student Enrollment List Document v3

Belle Fourche 09-1

Post Secondary Course Grades for Dual Credit Students from Cube Report
Post Secondary Grades for Dual Credit Students from Object Model Report
ACT Overview Document

Freeman 33-1

Student Enrollment List Document v3

Harrisburg 41-2

ACT Stoplight Document

Yankton 63-3

Student Demographics Dashboard v2

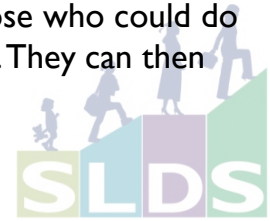
© Copyright 2017, South Dakota Department of Education powered by Blender. All Rights Reserved.
Need help or technical support? Contact Support.

blender

south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

Q5: Is there anything you'd like to add in order to shape this session?

1. An overview of functionality and especially costs across the different platforms listed above would be helpful.
2. The next part of our SLDS project will be focused on secure reporting for districts and schools. We are interested in the ability to create dashboards that highlight student data peculiar to a district or school, e.g., an early warning dashboard.
3. Would like to see how others are using the tool to present data.
4. I believe in only exposing aggregate data to a reporting tool—so no issues with data breach. Also struggle with masking—would love to discuss how others are doing that.
5. Look forward to seeing what other states are doing. Demos of other states would be very valuable.
6. We're interested in data branding across our SEA, integration with current custom applications. We're publishing reports designed in Tableau this year and are considering making this our standard and are hoping to move the department in this direction. Any pointers about this would be great!
7. We are evaluating both an internal self-service analytics tool as well as a mechanism for publishing reports and data visualizations to the public.
8. I would be interested in hearing from other states who have multiple stakeholders with the ability to create reports and what challenges/suggestions they have for us as we consider expanding report writers. Our concern is that we will quickly lose control over the look/feel of reports and that the user experience with these reports will suffer or the data won't be accurate to the purpose of the report.
9. Can you define in the session what a "dynamic reporting tool/environment" mean? What are some qualities that makes for a good reporting tool/environment? If we could rubric characteristics of a good reporting tool/environment and score ourselves, that may help us identify people who are doing well and those who could do better. Maybe then we can talk to those who score high on different areas or have them showcase. They can then highlight that characteristics within their reporting software.



Anything else that we should cover?

Next Steps?

What follow-up to this session would you like to see?

Thank you!