

Power BI vs Tableau vs Cognos: A Data Analytics Research

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Overview

- Data Visualization and Tools
 - Data Visualization
 - Problem Statement
 - Introduction to Tools
 - Gartner Magic Quadrant
- Flow of Data
 - Power BI, Tableau, Cognos Analytics
- Tools In Action
 - Dataset
 - Dashboard in Power BI
 - Dashboard in Tableau and Cognos
- Qualitative Research and Conclusion
 - Qualtrics Questionnaire
 - Responses
 - Results
 - Feedback
 - Conclusion

Overview

❑ What is data visualization?

- ❑ Big Data (size and structure)
- ❑ Visual representation of information

❑ Why do we need data visualization?

- ❑ Organize and present the information
- ❑ Facilitates identification of trends and patterns
- ❑ To make data more understandable and support actions

❑ Data Visualization Tools

- ❑ Power BI (Version 2.78.5740.861)
- ❑ Tableau (Version 2019.1.8)
- ❑ Cognos Analytics (Version 11.0.10)

❑ Advances in AI and ML

- ❑ Leverage human's capability to deal with Big Data
- ❑ Mitigating gut feeling decision-making process

Data visualization helps to tell stories by curating data into a form easier to understand

Problem Statement

❑ Situation

- ❑ TTU IR department has long history and experience working with Tableau and Cognos Analytics
- ❑ High costs of Tableau and lack of features from Cognos

❑ Task

- ❑ We were tasked to research about Power BI
- ❑ Report findings

❑ Action

- ❑ We talked with other people within TTU to learn more about PBI
- ❑ We experimented with PBI and compared it with the other tools

❑ Results

- ❑ We find ourselves surprised of how PBI is very powerful
- ❑ We are implementing PBI reports

To find the proper visualization tool under a given set of circumstance

Power BI

❑ Characteristics

- ❑ Easy for Microsoft (Office 365) users
- ❑ Smooth learning curve
- ❑ Drag and drop interface
- ❑ Data cleaning/transformation

❑ Features

- ❑ Range of visualizations (Market Place)
- ❑ Data source
- ❑ Data/Drill
- ❑ Print Dashboard



Tableau

❑ Characteristics

- ❑ Facilitates data visualization
- ❑ It has a huge community with a “fanlike” attitude
- ❑ Free version available, but with limited capabilities
- ❑ Tableau Public – a platform where users can share their work

❑ Features

- ❑ Collaboration and Sharing
- ❑ Data source
- ❑ Great visualizations
- ❑ Mobile view



Tableau - Best practices in data visualization

Cognos Analytics

❑ Characteristics

- ❑ Incorporated visualizations/dashboards
- ❑ Strong in business intelligence
- ❑ Choice for IBM Cognos customers

❑ Features

- ❑ Web-based application
- ❑ Data scheduling
- ❑ Data protection



Cognos Analytics - Supports entire analytics life cycle

Gartner Magic Quadrant

❑ What is Gartner Inc.?

- ❑ Leader in IT research and advisory
- ❑ Magic quadrants demonstrate market research and trends
- ❑ Update results for technologies every 1-2 years

❑ Analysis of Magic Quadrant

- ❑ Don't always focus on the leader's quadrant
- ❑ Keep an eye on market challengers
- ❑ Niche players may align with your goals



Gartner is reference on evaluating IT products in many industries

Gartner Magic Quadrant (2020)



❑ For Analytics and Business Intelligence (from data preparation to visualization)

- ❑ Power BI: “viral spread”
- ❑ Tableau: uncertainty (Salesforce)
- ❑ Cognos Analytics: playing catch-up



Power BI gets an edge over Tableau

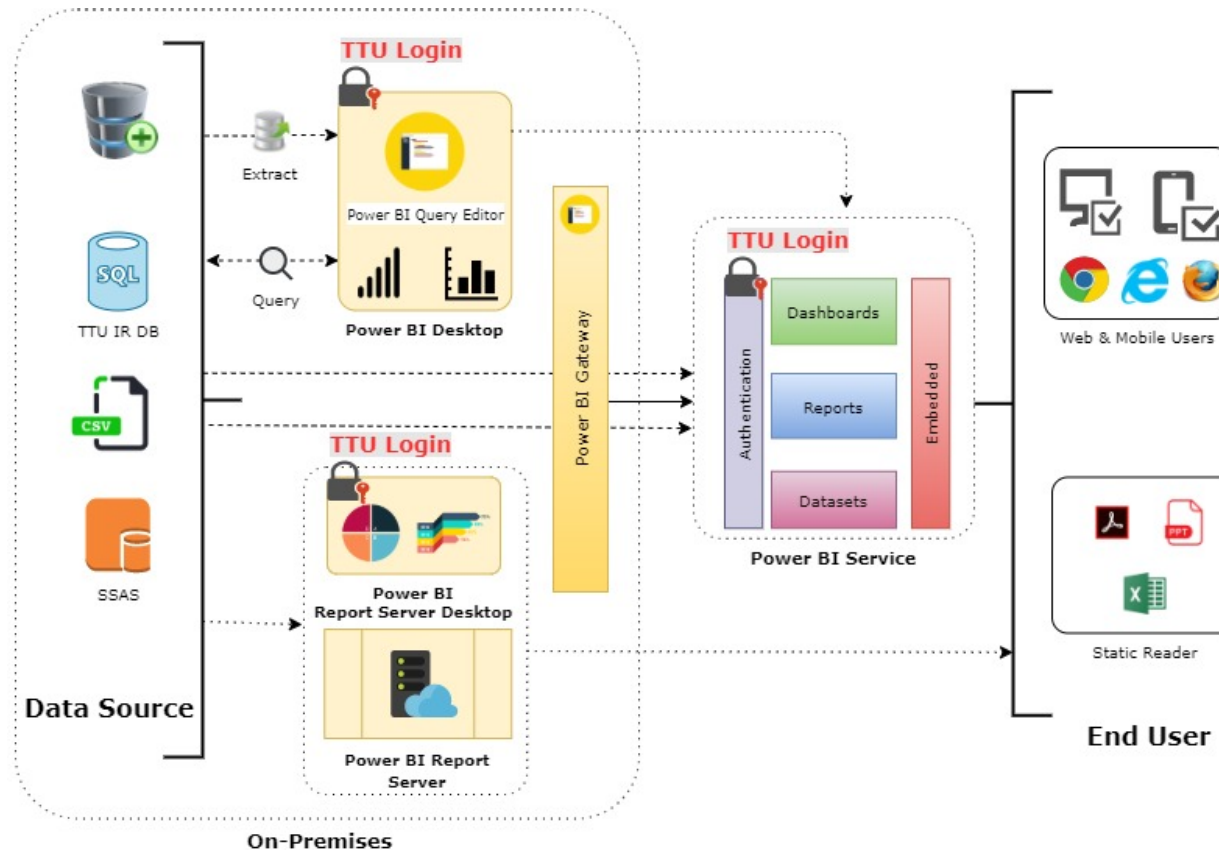
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Flow of Data in Power BI

❑ Power BI Report Server

- ❑ Cloud based service with light report editing.
- ❑ Data source connections with limited modelling.



Power BI is the authoring and publishing for shared views on Power BI Service.

Flow of Data in Tableau

Tableau Prep Builder and Conductor

- Tools for installing and administering the Desktop content
- Helping users to bring in and integrating data sources

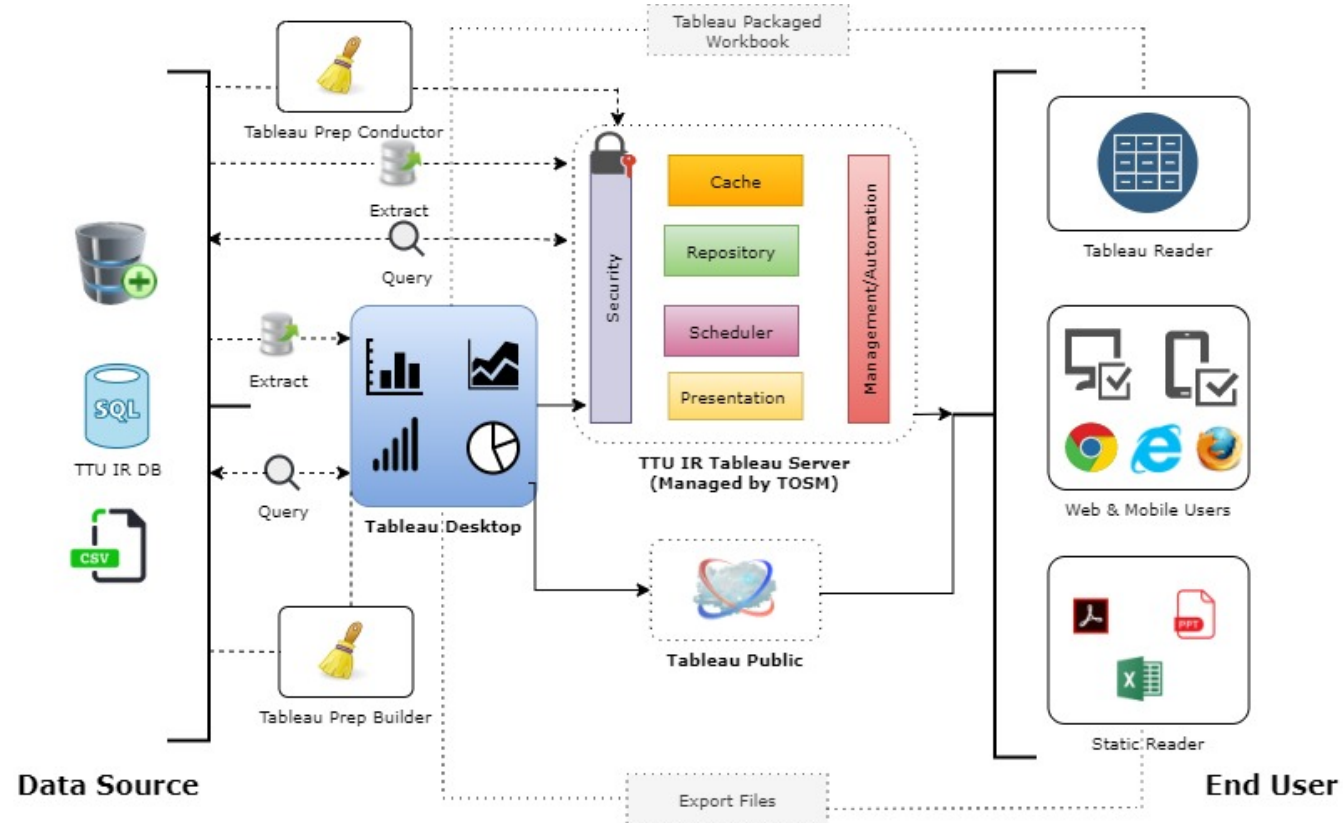


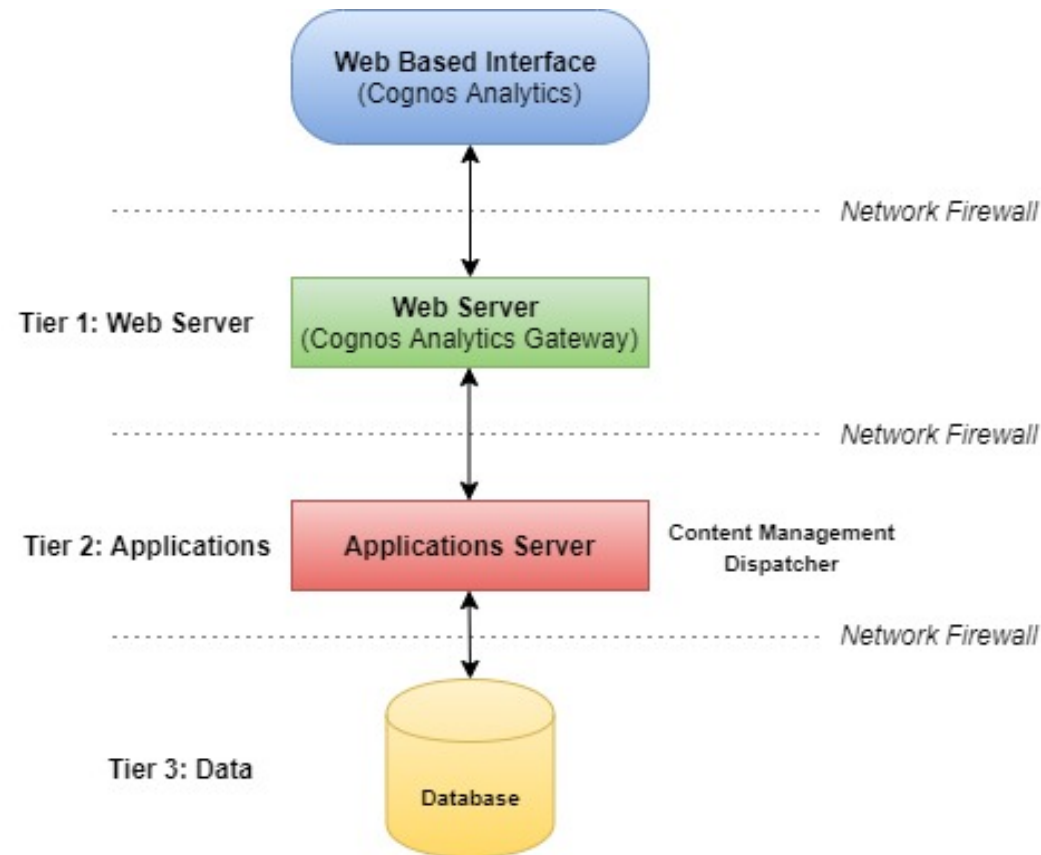
Tableau Desktop – Development

Tableau Server – Sharing and Collaboration

Flow of Data in Cognos Analytics

□ Cognos Analytics

- Cognos Architecture has a three-tiered architecture – web, application, data
- Each of the tiers can be separated by a firewall



Cognos Analytics, a web-based integrated BI tool, for reporting and analytics

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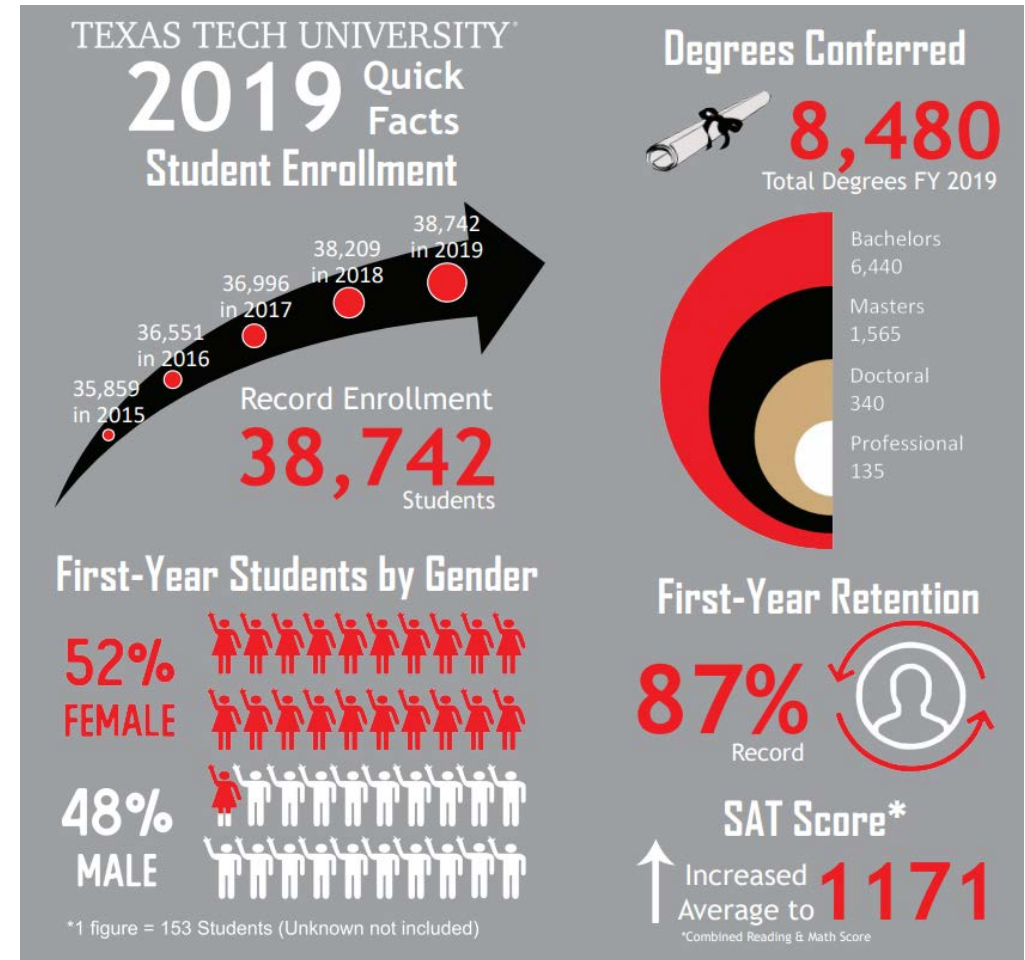
Dataset

Factbook Data

- Derived from our Factbook
- <http://techdata.irs.ttu.edu/FactBook/>

Attributes in Dataset

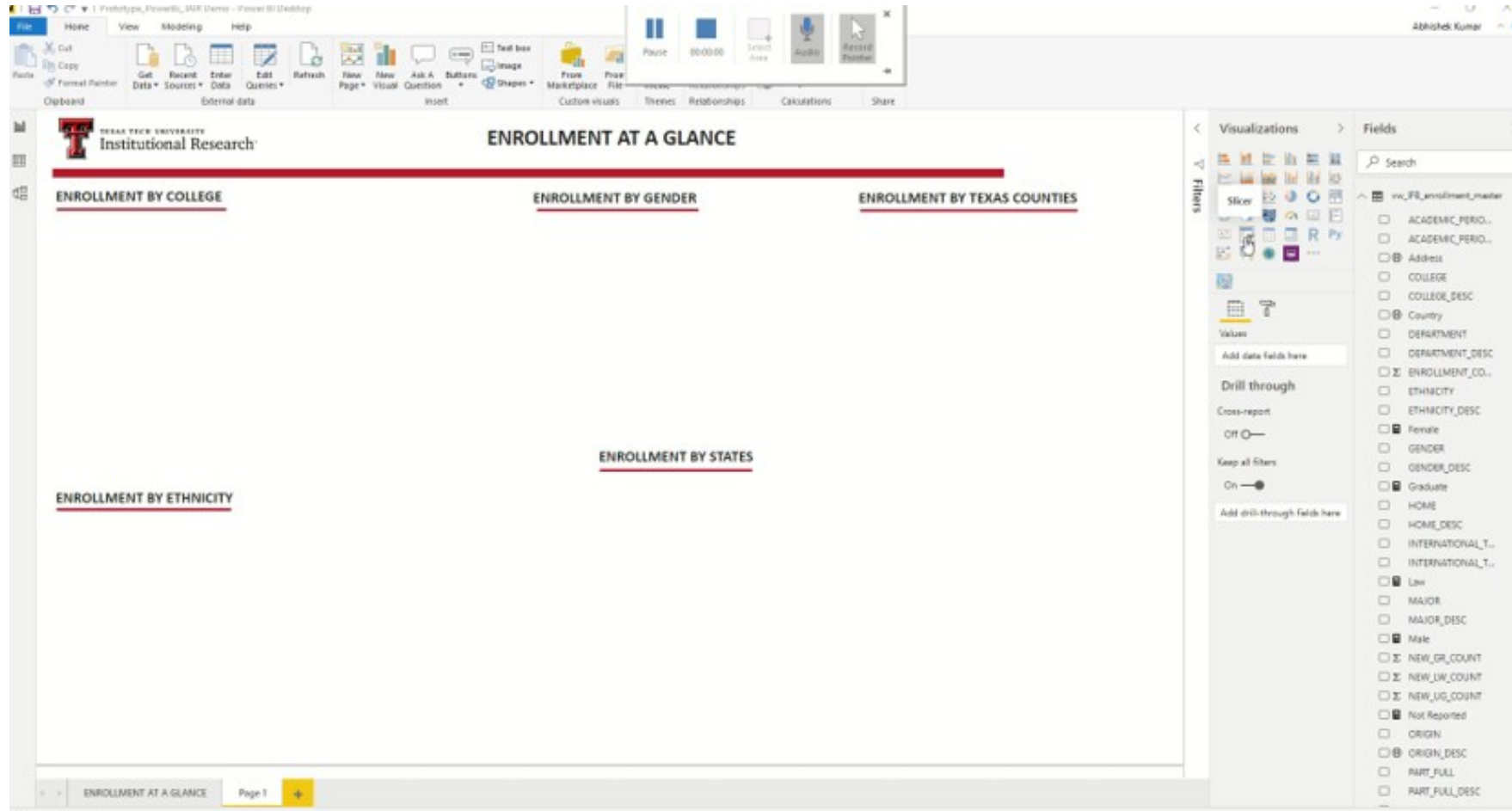
- College
- Gender
- Ethnicity
- Home Origin
- Undergraduate Enrollment Count
- Graduate Enrollment Count
- Law Enrollment Count



Factsheet 2019, TTU

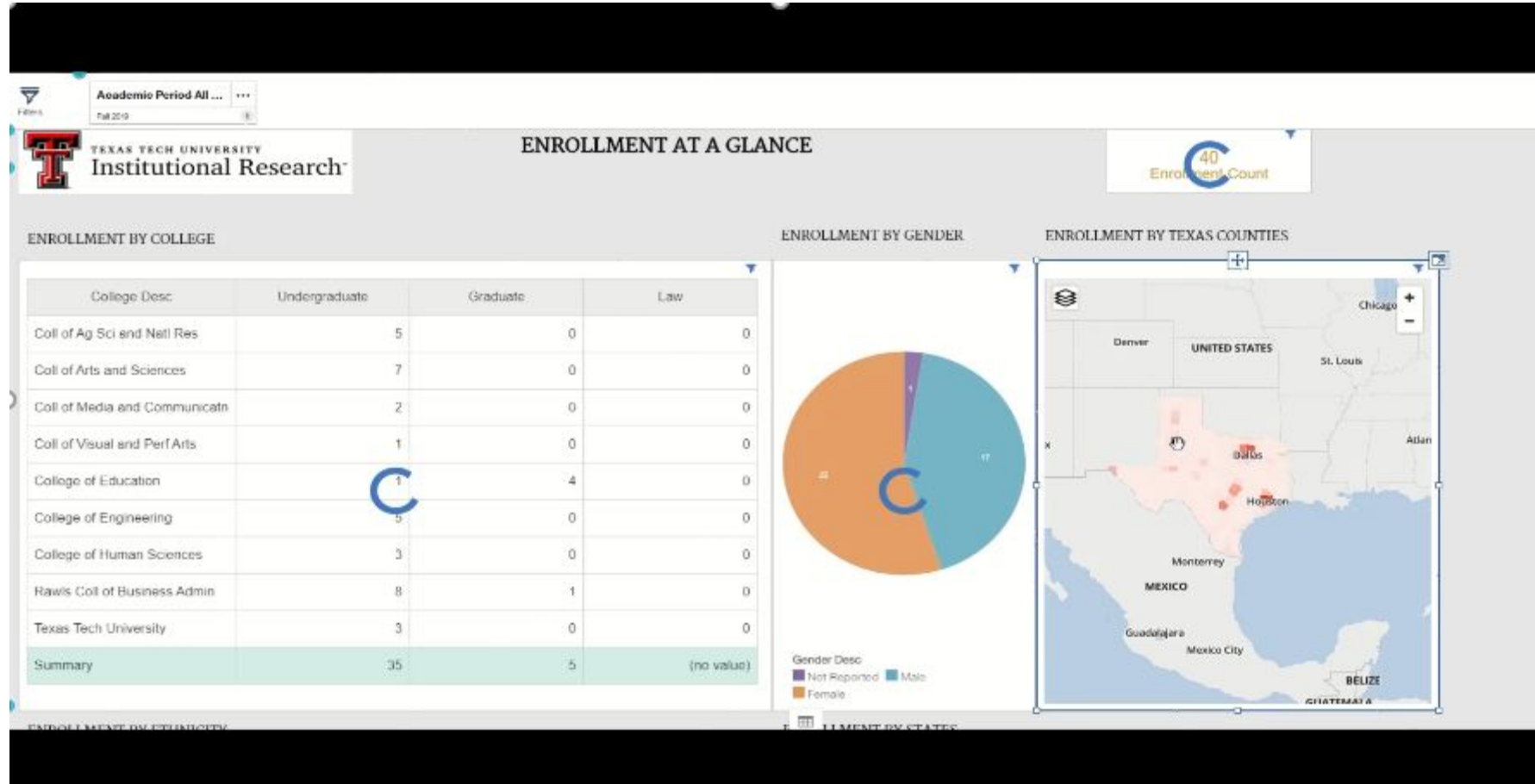
Data from our Factbook was extracted to build our dataset

Dashboard in Power BI



[Click Here: Power BI Demo](#)

Dashboard in Tableau and Cognos



[Click Here: Tableau and Cognos Analytics Demo](#)

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Qualtrics Questionnaire

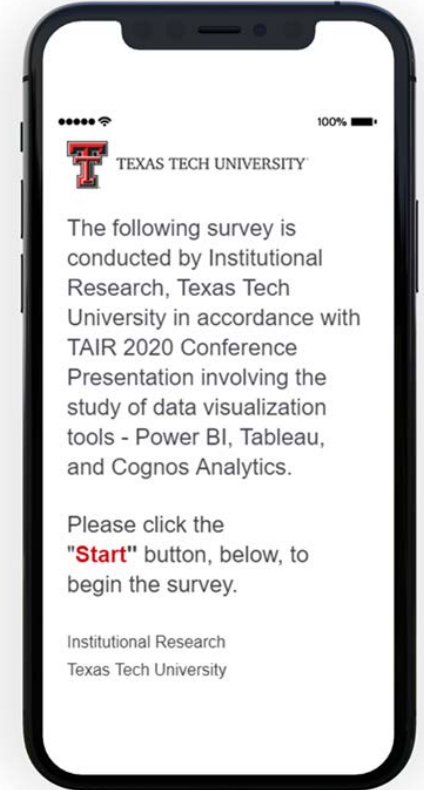
Areas of interest

Subjective Questions:

- Accessibility (Ease of usage)
- Connecting to Data
- Data preparation/Data cleaning
- Security
- General Feedback

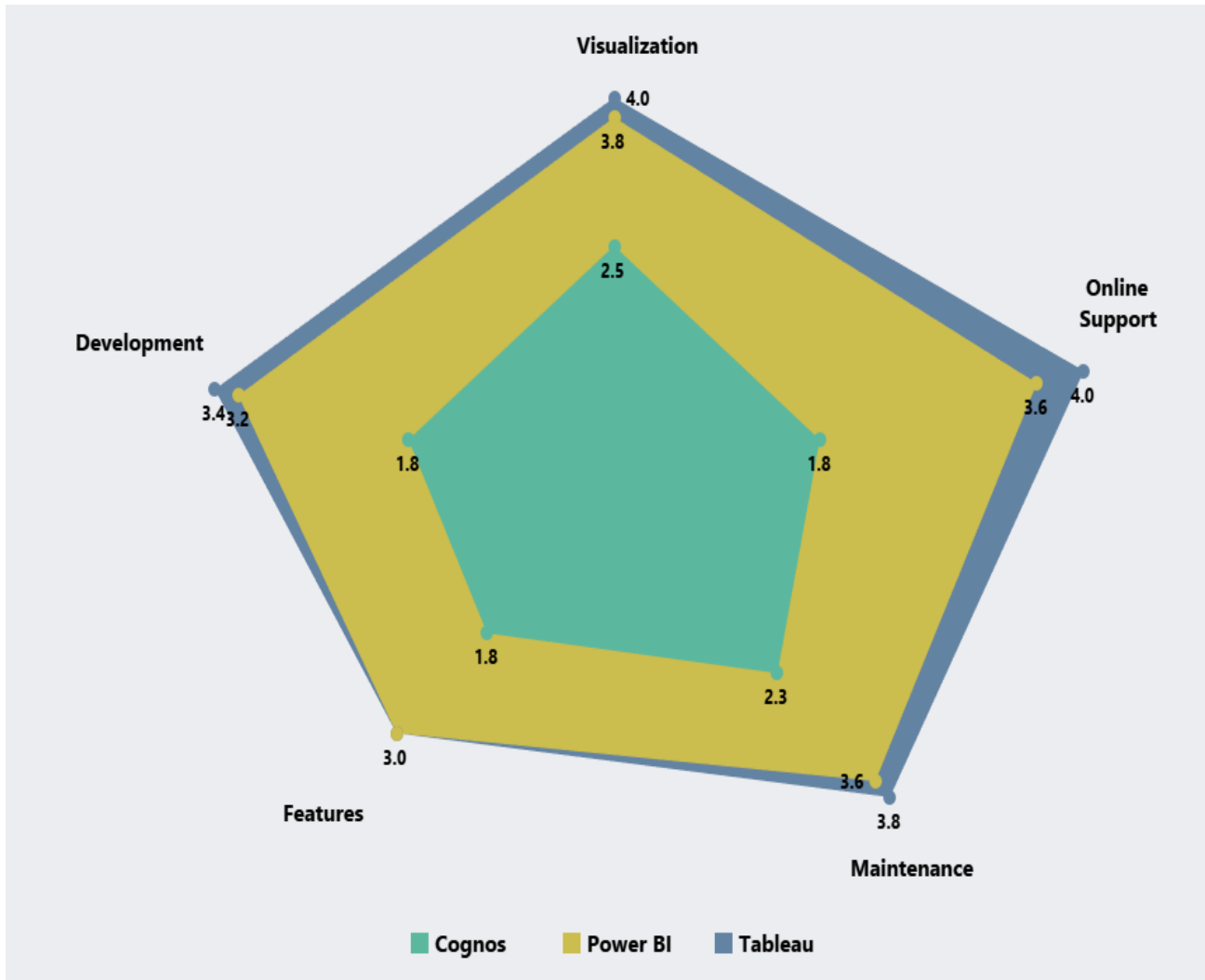
Coded Questions:

- Visualization
- Use of in-built features
- Ease of development
- Community Support
- Project maintenance



Questionnaire was sent to specific departments within TTU campus

Questionnaire Results (Coded Questions)



☐ User Satisfaction Scale

Code	Category
4	Excellent
3	Good
2	Average
1	Poor

Results suggested that Power BI and Tableau are close in our areas of interest while Cognos trails behind.

Responses for Power BI (Subjective Questions)

☐ Accessibility (Ease of usage)

- ☐ *“The **tool is intuitive**, and the online service has the same user-friendly permission management as other **Office365 apps.**”*

☐ Connecting to Data

- ☐ *“Power BI was able to **connect to the various data sources** I work on so far.”*

☐ Data Preparation and Data Cleaning

- ☐ *“Power Bi itself provide **data cleaning/prep tools via Power Query.**”*

☐ Security

- ☐ *“The tools **security is good**. We can **mask the data** which we want to present as well so I find it secured.”*



Responses for Tableau (Subjective Questions)

☐ Accessibility (Ease of usage)

- ☐ *“Tableau has a **learning curve**. Once you understand how the software works, it is easy to use, has a **large community** to help with questions and a powerful tool for data visualizations.”*

☐ Connecting to Data

- ☐ *“I **love the connectivity** of this tool to various data sources. I use Excel, Data Extracts and MySQL.”*

☐ Data Preparation and Data Cleaning

- ☐ *“I've been using **Tableau Prep** more and more and I find it's a **pretty intuitive tool**.”*

☐ Security

- ☐ *“Tableau has **good security** and so far, have not faced any issues with respect to security concerns.”*



Power BI



Tableau



Cognos

Responses for Cognos (Subjective Questions)

❑ Accessibility (Ease of usage)

- ❑ *“The UI of the tool feels outdated and have a steeper learning curve than more modern tools, such as Power BI and Tableau.”*

❑ Connecting to Data

- ❑ *“I would say it was fairly easy to connect the report to the database.”*

❑ Data Preparation and Data Cleaning

- ❑ *“Cognos does not offer much flexibility in preparation/Cleaning. All the work done before saves us huge time.”*

❑ Security

- ❑ *“Cognos should be secured as I have accessed it both in network and outside network .”*



Power BI



Tableau



Cognos

Feedback Summary

☐ Power BI

- ☐ Potential to grow since there are **regular updates** every month
- ☐ **Smooth integration** with other Microsoft tools
- ☐ **Run script** directly and import the resulting dataset
- ☐ **Cost-effective** and easy to obtain a license

☐ Tableau

- ☐ Ease of creating **Calculated fields** and **Parameters**
- ☐ Tableau Server and Tableau Online provides **easy web access**
- ☐ **Higher Cost** as compared to alternatives
- ☐ **Time consuming** as **data preparation** required before usage

☐ Cognos Analytics

- ☐ Good for **running Excel Reports**
- ☐ Development is **time consuming**
- ☐ Tool is **not intuitive**
- ☐ Lack of **Online Community**



Power BI



Tableau



Cognos



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Thank You!