Final Report - Capstone Project

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OUTLINE

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EXECUTIVE SUMMARY

- This project aims to use the dataset of Stack Overflow Developer survey in 2019 and the data collected from internet to analyze the following items:
  - Current technology usage
  - Future technology trends

- The technologies investigated in the project are programming languages, databases, platforms and web frames

- The stakeholders and business decision makers, based on the analysis,
  - allocate their budget, current human resources, future hiring strategy, and hardware & software resources
  - identify the future skill requirements and demand of the market, which can help keep a competitive edge.

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INTRODUCTION

- Technologies and skills are ever-changing, so keeping up with the industry trends is essential for businesses

- The analysis investigates changes in the IT industry trend

- Insights will be visualized as different charts for easy understanding

- Based on the insights, recommendations will be suggested

METHODOLOGY

- The dataset used is a subset of the Stack Overflow Developer Survey 2019

- The data was wrangled by removing duplicates, imputing missing values and normalizing

- Then, exploratory data analysis was performed to find the distribution, outliers and correlation, which helped to find insights

- Finally, the insights were visualized by Cognos Dashboard Embedded (CDE) through IBM Cloud

- Additional charts were rendered based on additional data, which was:
  - collected with web-scraping and API by Jupyter notebook
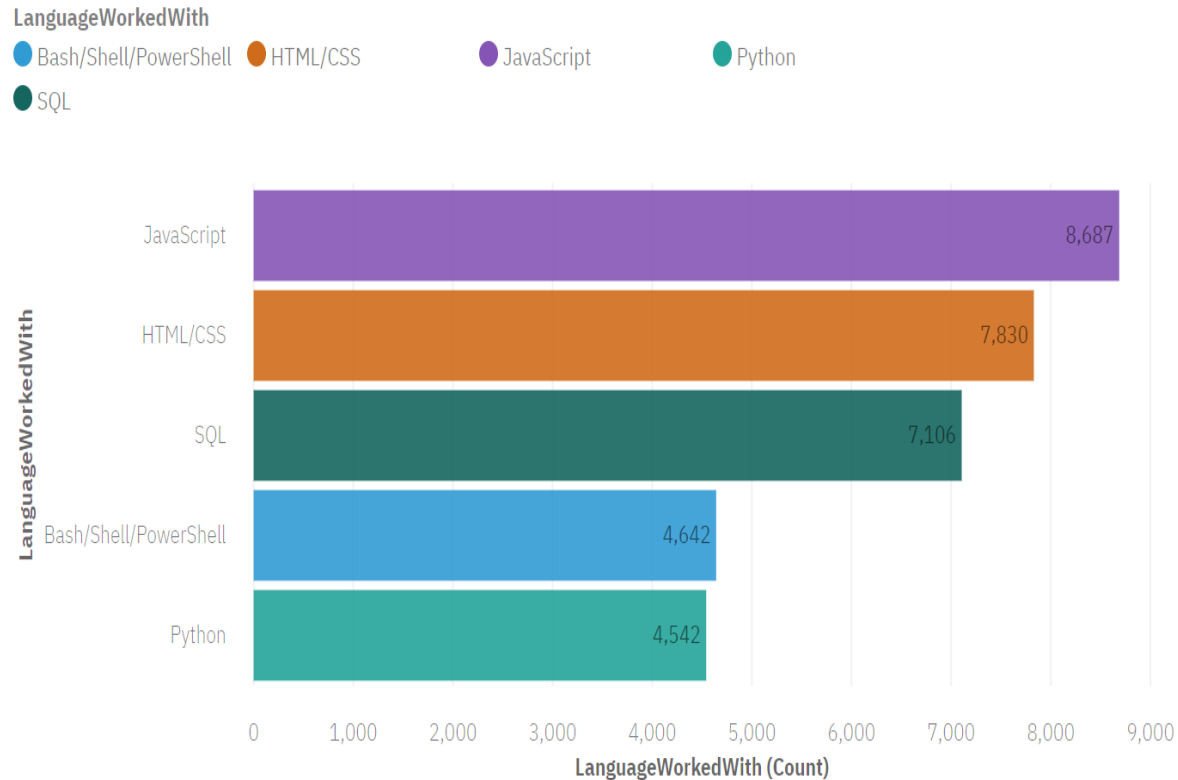 - And visualized by Excel and Jupyter notebook
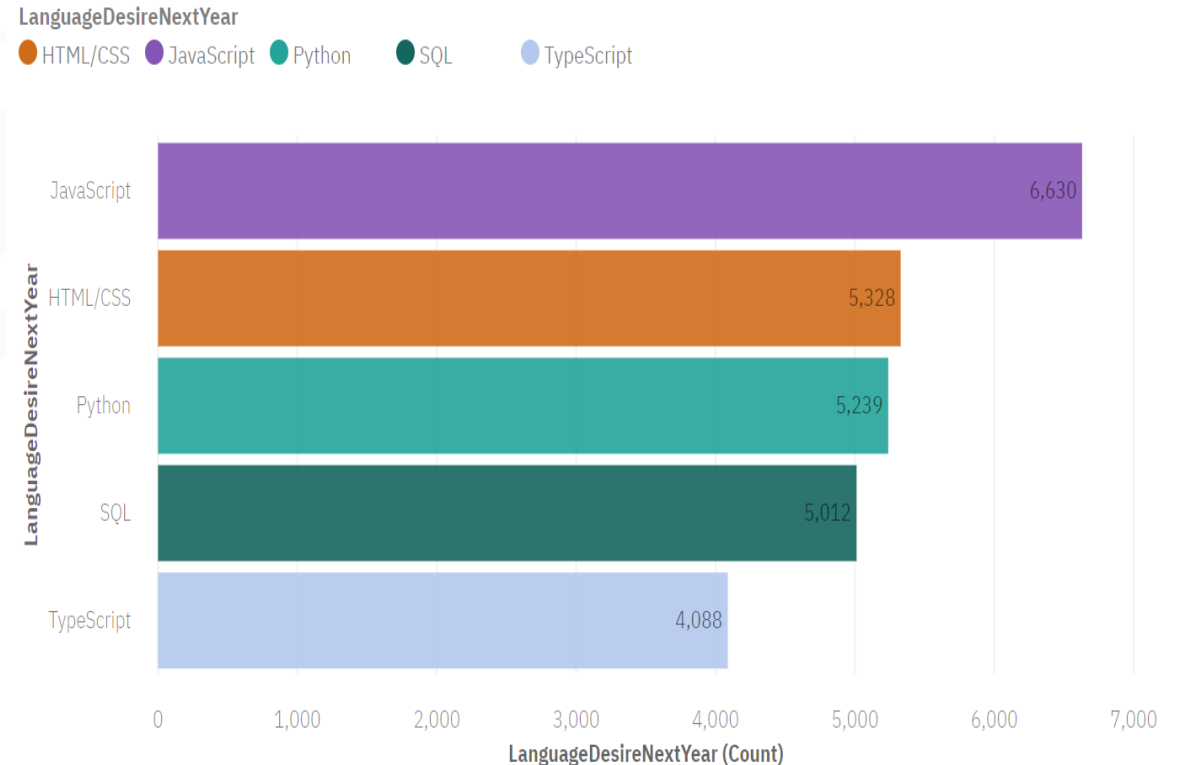
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RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year (2019)

Next Year (2020)

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS retain the top 2, but their counts will be dropped next year.
- Python and TypeScript have growing importance
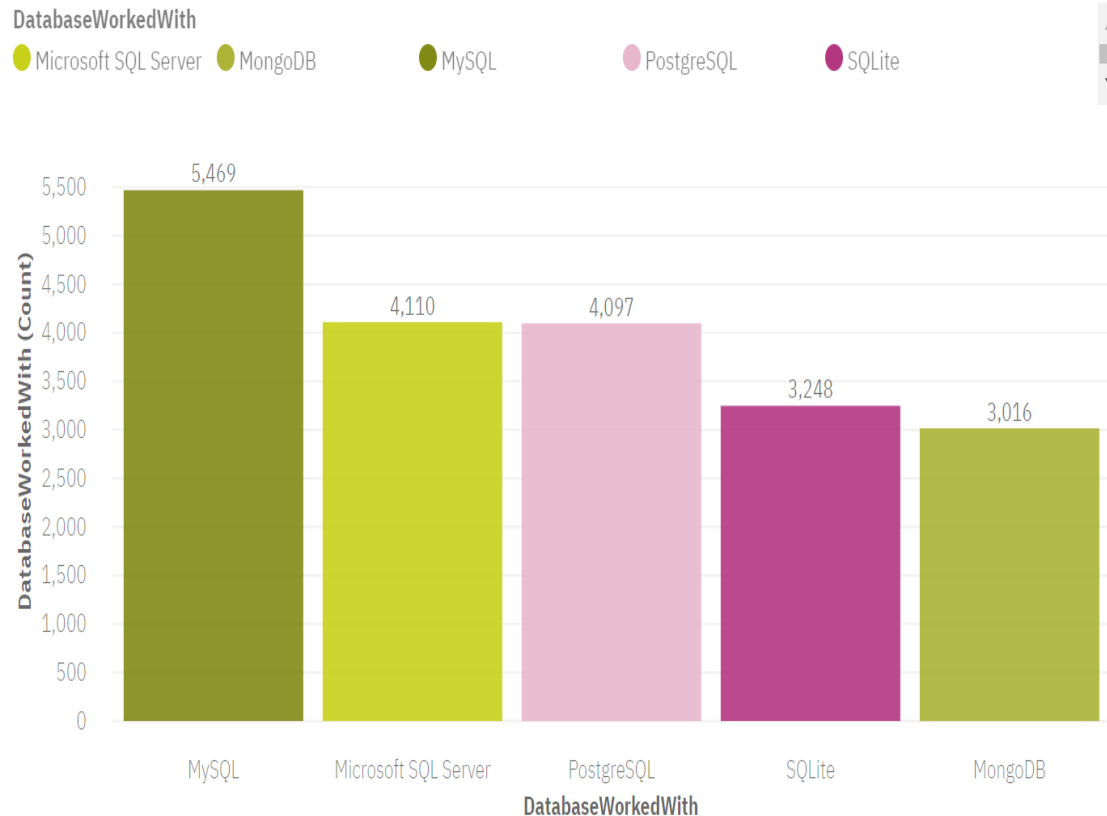- In contrast, SQL and Bash/Shell/PowerShell will be less desired next year

Implications

- To allocate the most resources to JavaScript and HTML/CSS, but be careful of their importance continuing to drop in the future
- To increase the resources of Python and TypeScript
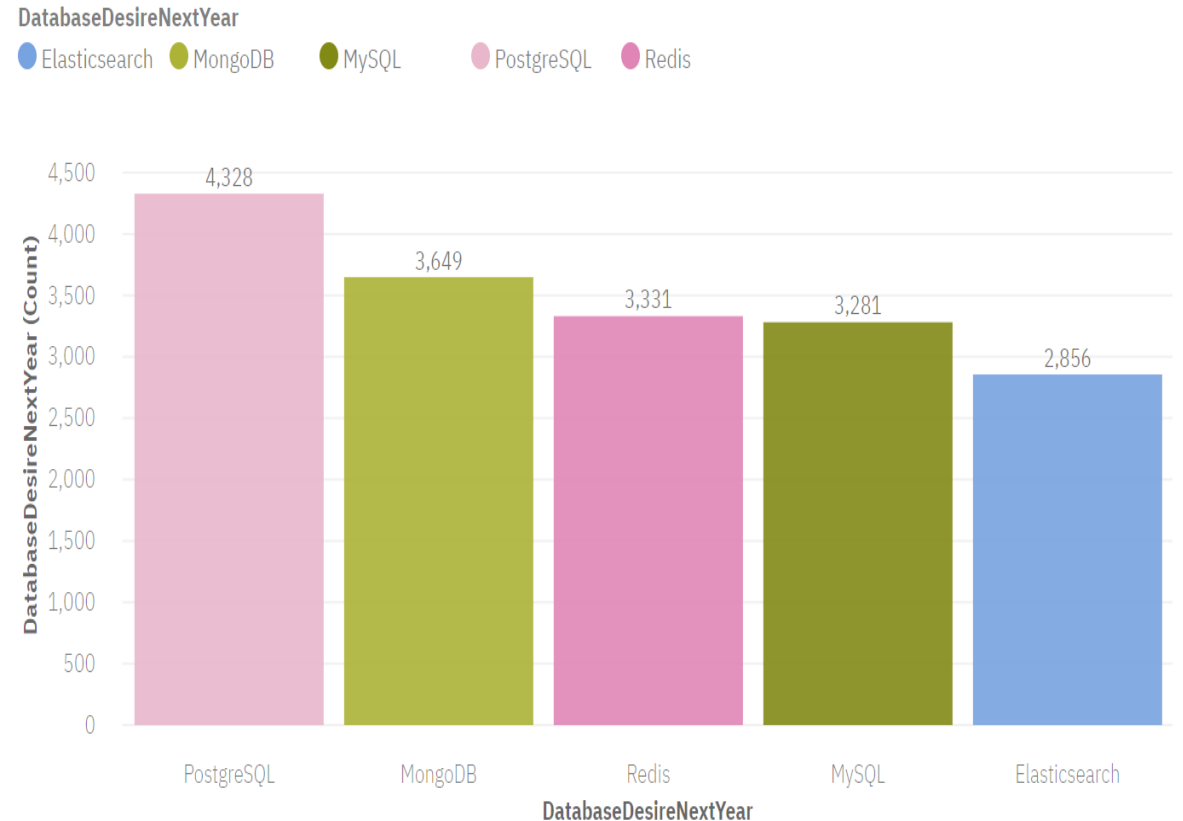- To reduce the resources of SQL and Bash/Shell/PowerShell

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DATABASE TRENDS

Current Year (2019)

Next Year (2020)

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL, Microsoft SQL Server and SQLite will be less desired vastly

- Interest in PostgreSQL and MongoDB will be increased and become the top 2

- Redis and Elasticsearch will make it to top 5 next year

Implications

- To reduce a lot of resources of MySQL, Microsoft SQL Server and SQLite

- To allocate the most resources to PostgreSQL and MongoDB

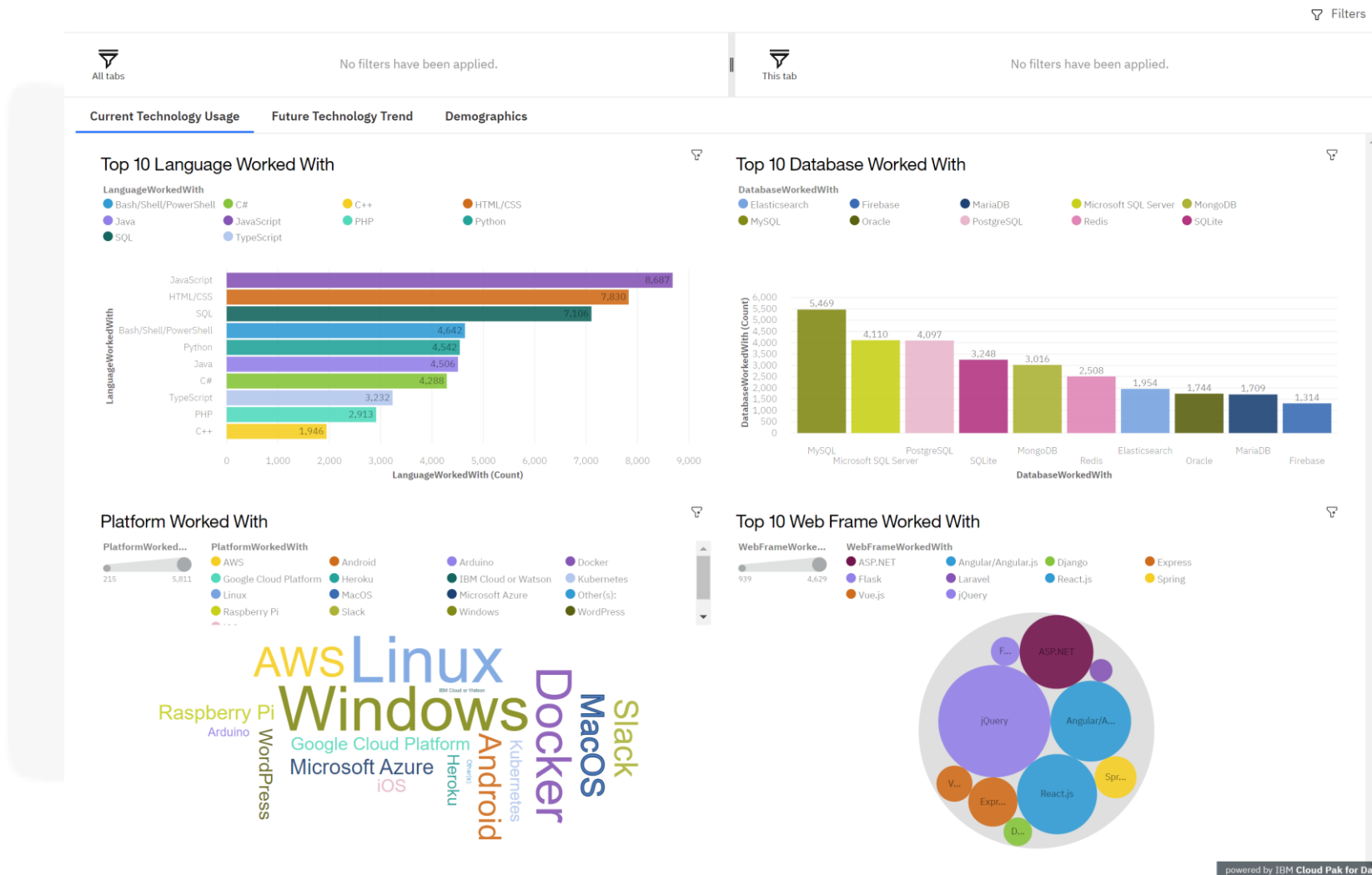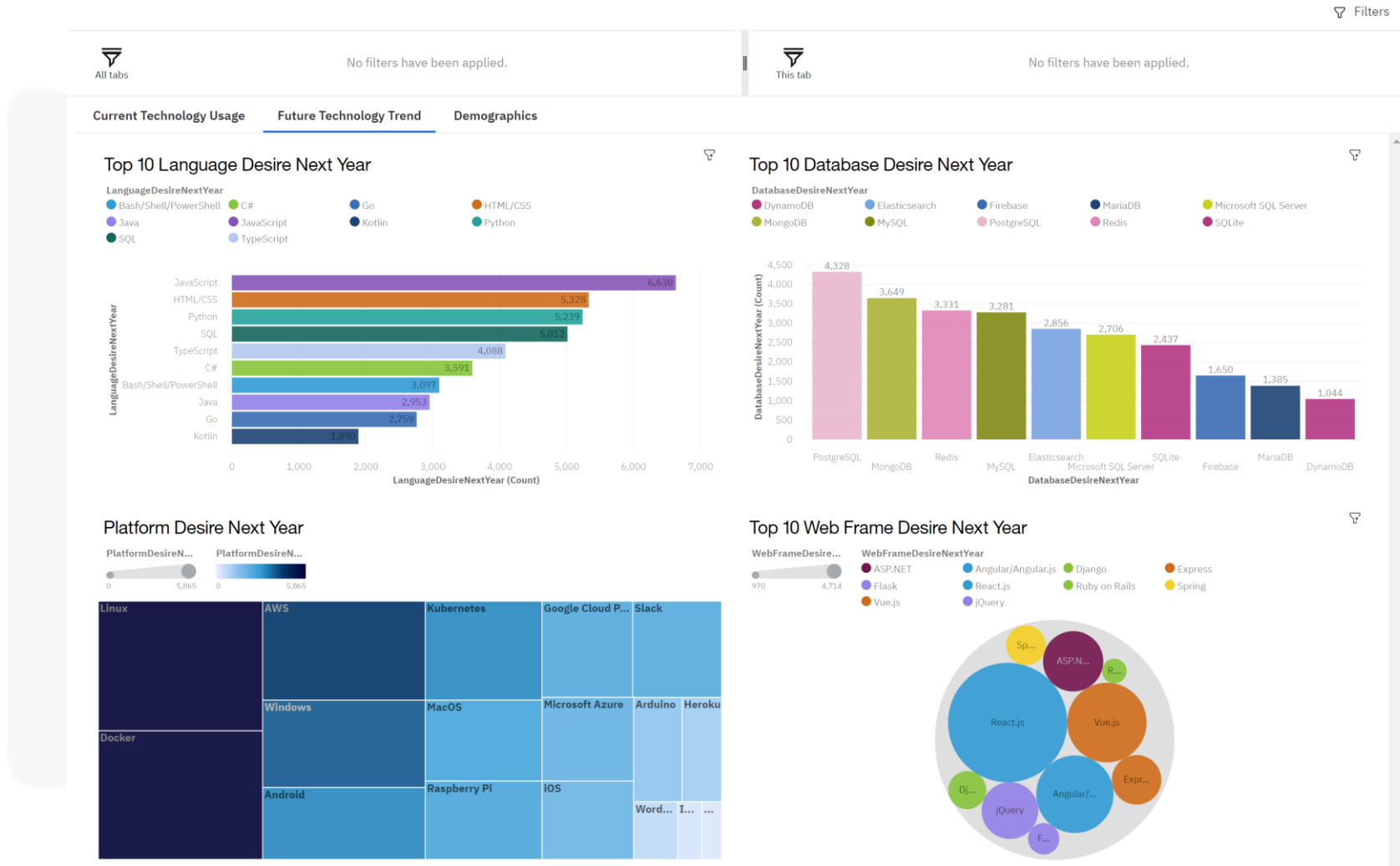- To add or increase the resources of Redis and Elasticsearch
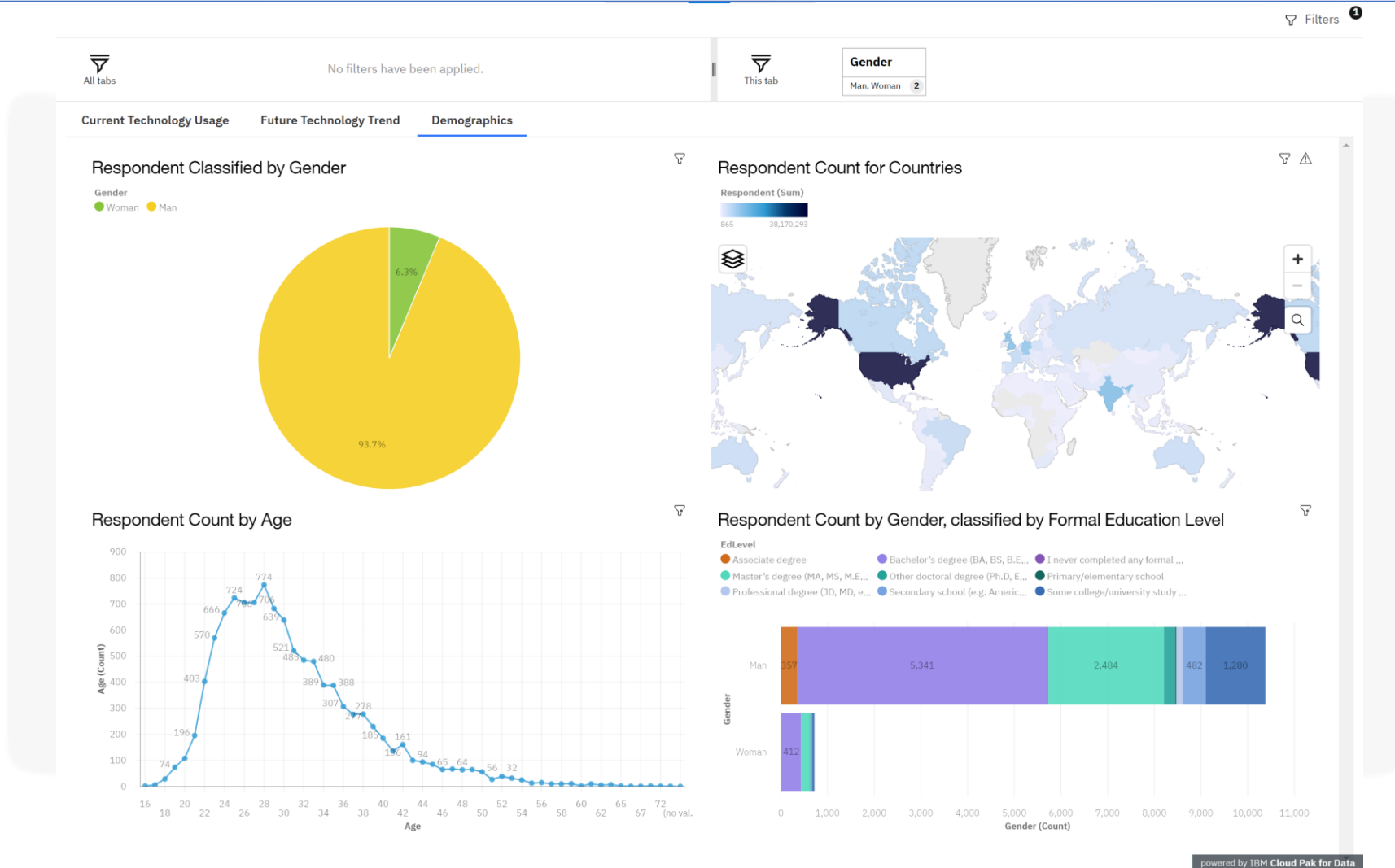
DASHBOARD

Click here to view the Cognos dashboard

DASHBOARD - CURRENT TECHNOLOGY USAGE

DASHBOARD - FUTURE TECHNOLOGY TREND

DASHBOARD - DEMOGRAPHICS

DISCUSSION

OVERALL FINDINGS & IMPLICATIONS

Findings

- Programming Languages – Python and TypeScript will gain more desire significantly
- Databases – PostgreSQL, MongoDB, Redis and Elasticsearch continue to increase in desire
- Platforms – Windows and Slack will be less desired
- Web Frames – React.js and Vue.js will be more desired

Implications

- To increase more resources to Python and TypeScript
- To increase the resources to PostgreSQL, MongoDB, Redis and Elasticsearch
- To allocate the resources from Windows and Slack to Linux and Docker
- To allocate resources from JQuery to React.js and Vue.js

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CONCLUSION

- Allocation of resources is essential to keep up the industry trend.

- The analysis provided insights on different technologies trend.

- The stakeholders and business decision makers can plan the strategy based on the insights.

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APPENDIX

RESOURCES

1. https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/

2. m5_survey_data_demographics.csv and m5_survey_data_technologies_normalised.csv

3. https://www.kaggle.com/promptcloud/jobs-on-naukricom

4. json

5. https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html