Analyzing Emerging Skills Trends in the IT Industry

Rezwana Mamata

9 April, 2024

OUTLINE

- Executive Summary
- Introduction
- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix

EXECUTIVE SUMMARY

- Analyzed trends in IT skills demand using data analytics.
- Data sourced from Stack Overflow survey, IBM site, and GitHub job postings
- Conducted data cleansing, exploratory analysis, and visualization.
- Key Findings:
  - JavaScript identified as leading programming language.
  - MySQL dominates current database usage
  - Postgre SQL shows future potential.
  - Majority of respondents are male, from the USA, and average 28 years of age

INTRODUCTION

- Analyzing Emerging Skills Trends
- Objective: Identify future skill requirements in the IT sector.
- Scope: Collecting and analyzing data from various sources.
- Key Components: Data collection, analysis, visualization.
- Outcome: Providing actionable insights for talent development.

METHODOLOGY

Data Collection:

- Used GitHub Jobs API in Python to gather job posting data for various technologies and locations.
- Scraped IBM website for programming language names and yearly wages.
- Downloaded dataset from 2019 Stack Overflow developer survey.

Data Cleaning and Analysis:

- Conducted data cleaning and analysis using Python.
- Performed exploratory data analysis (EDA) to assess data distribution, identify outliers, and explore correlations.

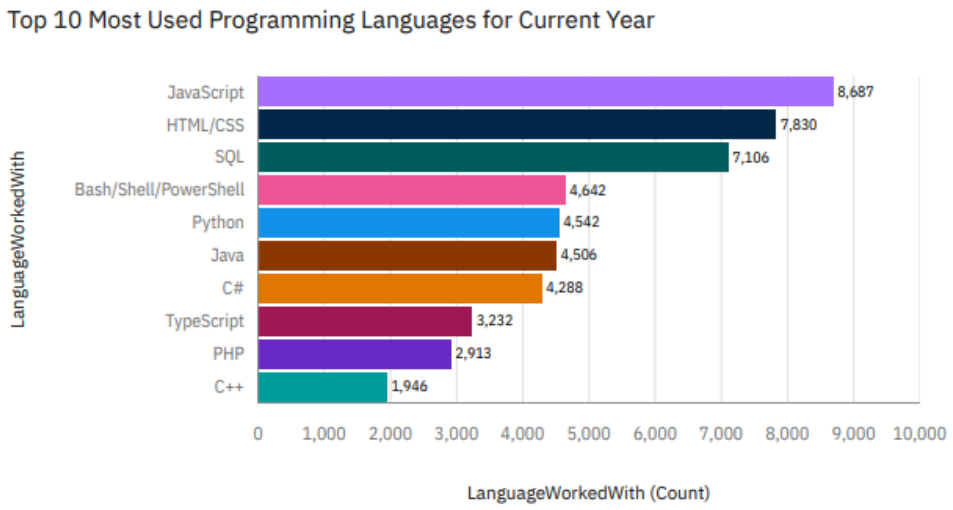
Visualization:

- Created charts, graphs, and dashboards with Python and Cognos Analytics.
- Utilized Jupyter Notebook in Visual Studio for Python analyses and visualization.

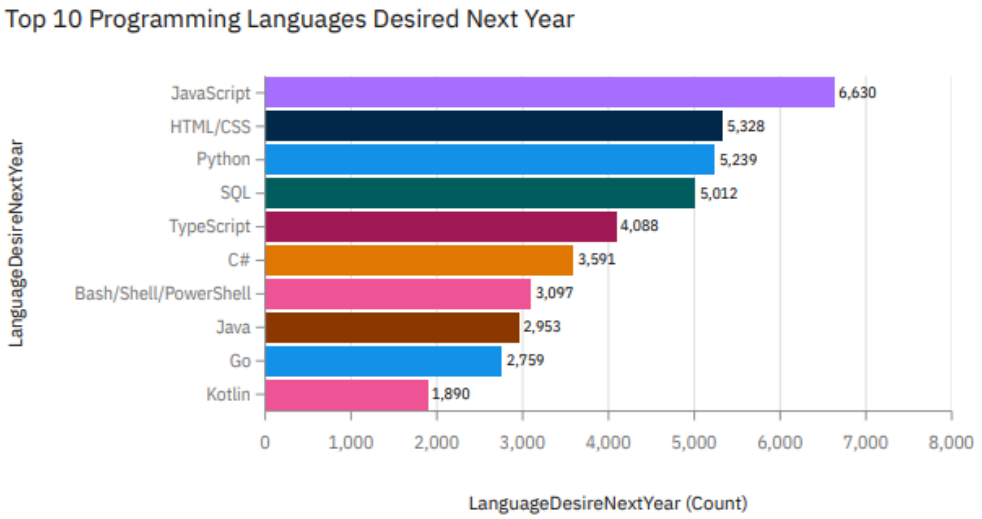
RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

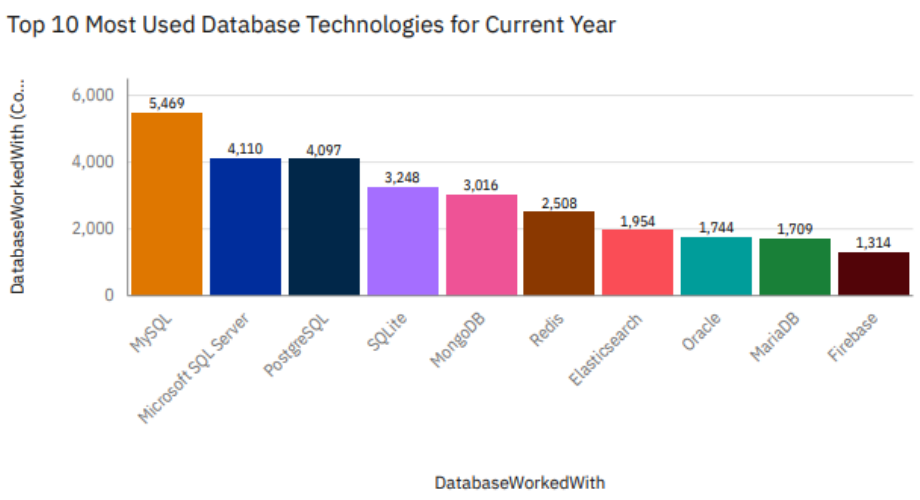
- Currently, the most utilized languages include JavaScript, HTML/CSS, SQL, Shell languages, and Python.
- In the upcoming years, JavaScript, HTML/CSS, Python, SQL, and Typescript are forecasted to maintain their dominance as the most used languages.
- Python is projected to surpass SQL in demand next year.

Implications

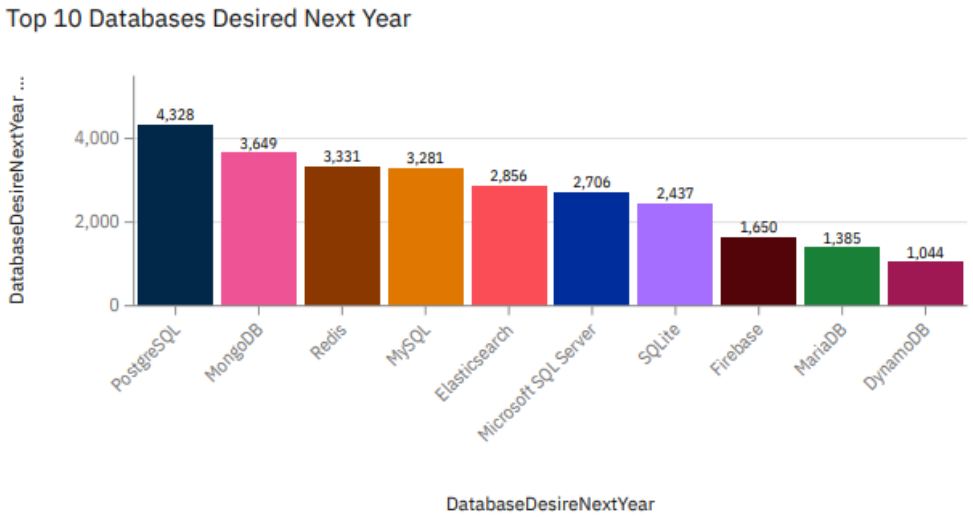
- Web development remains in high demand with JavaScript and HTML leading the way, particularly with the rising popularity of Typescript.
- Python is becoming increasingly important due to the rising demand for AI and ML expertise.
- SQL remains essential for data professionals, emphasizing the need for proficiency in SQL for those pursuing careers in data analysis, science, and business analysis.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL, Microsoft SQL Server, PostgreSQL, SQLite, and MongoDB are currently the top 5 most used databases.
- However, PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch are expected to gain more popularity in the future.
- Redis and Elasticsearch, being relatively new tools, are anticipated to gain significant traction in the IT industry.

Implications

- SQL remains a key tool for data specialists, emphasizing its continued relevance in the industry.
- Open-source databases continue to be favored by companies.
- The absence of Oracle SQL from the top 10 suggests a decline in its relevance over time.

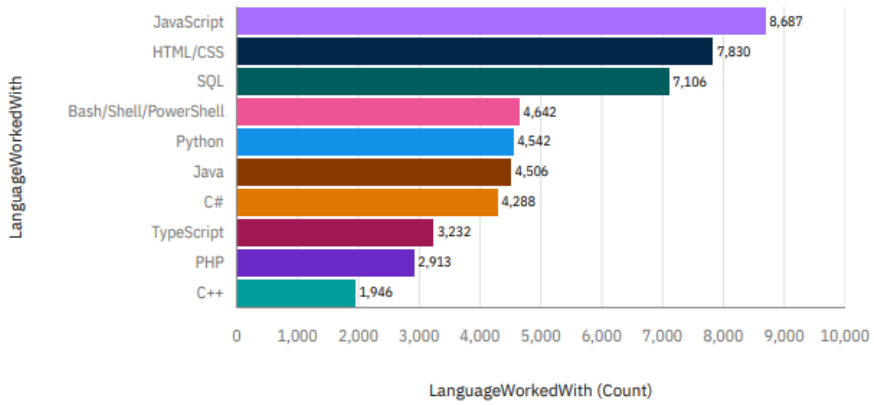
DASHBOARD

<Dashboard GitHub Link>

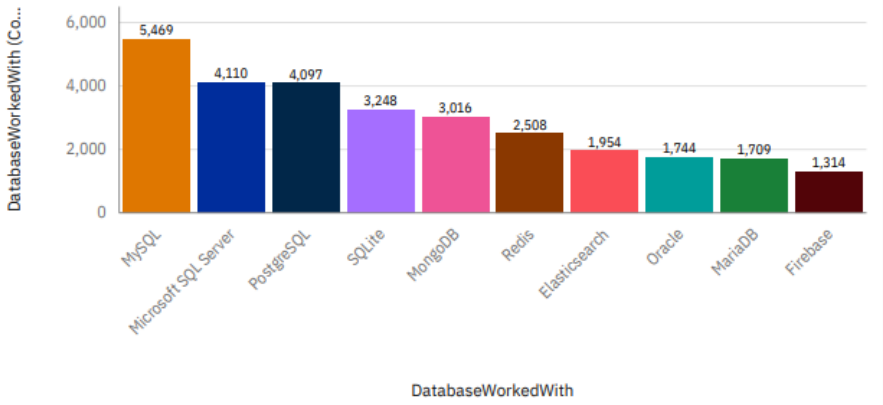
DASHBOARD TAB 1

Current Technology Usage

Top 10 Most Used Programming Languages for Current Year

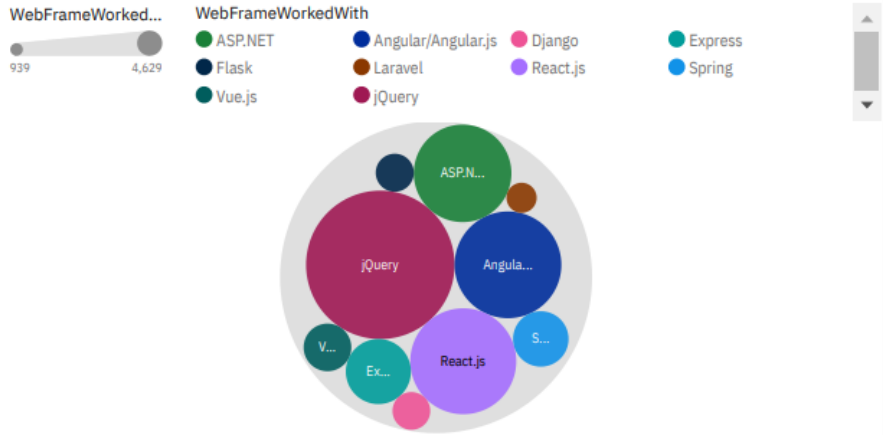


Top 10 Most Used Database Technologies for Current Year



Most Popular Platforms for Current Year

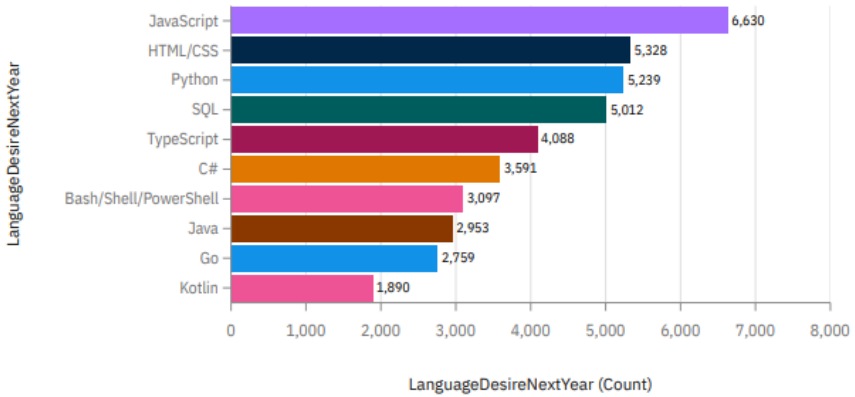
Top 10 Most Used Web Development Framework for Current Year



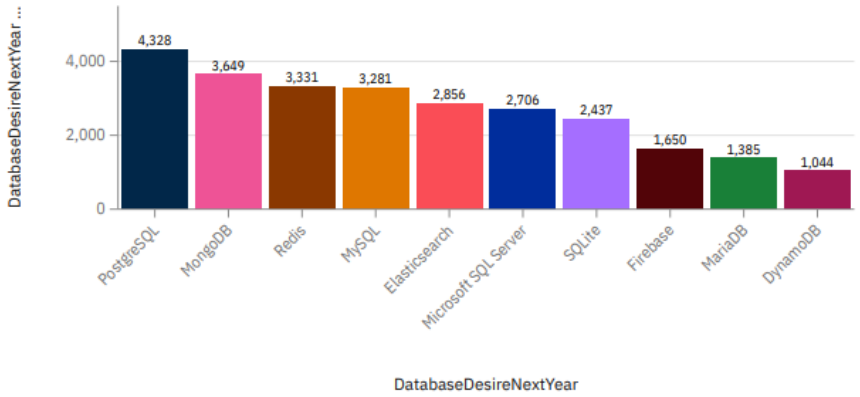
DASHBOARD TAB 2

Future Technology Trend

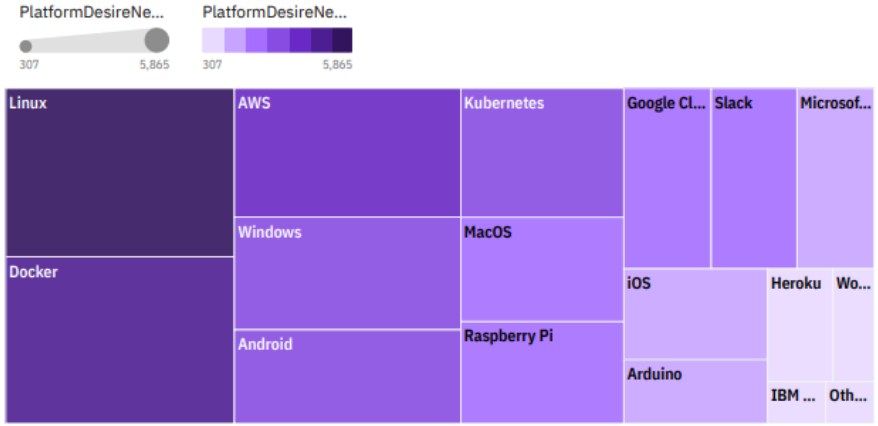
Top 10 Programming Languages Desired Next Year



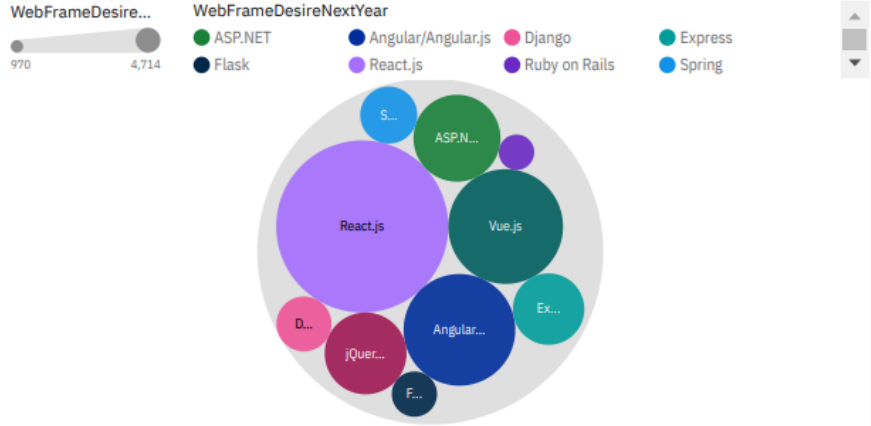
Top 10 Databases Desired Next Year



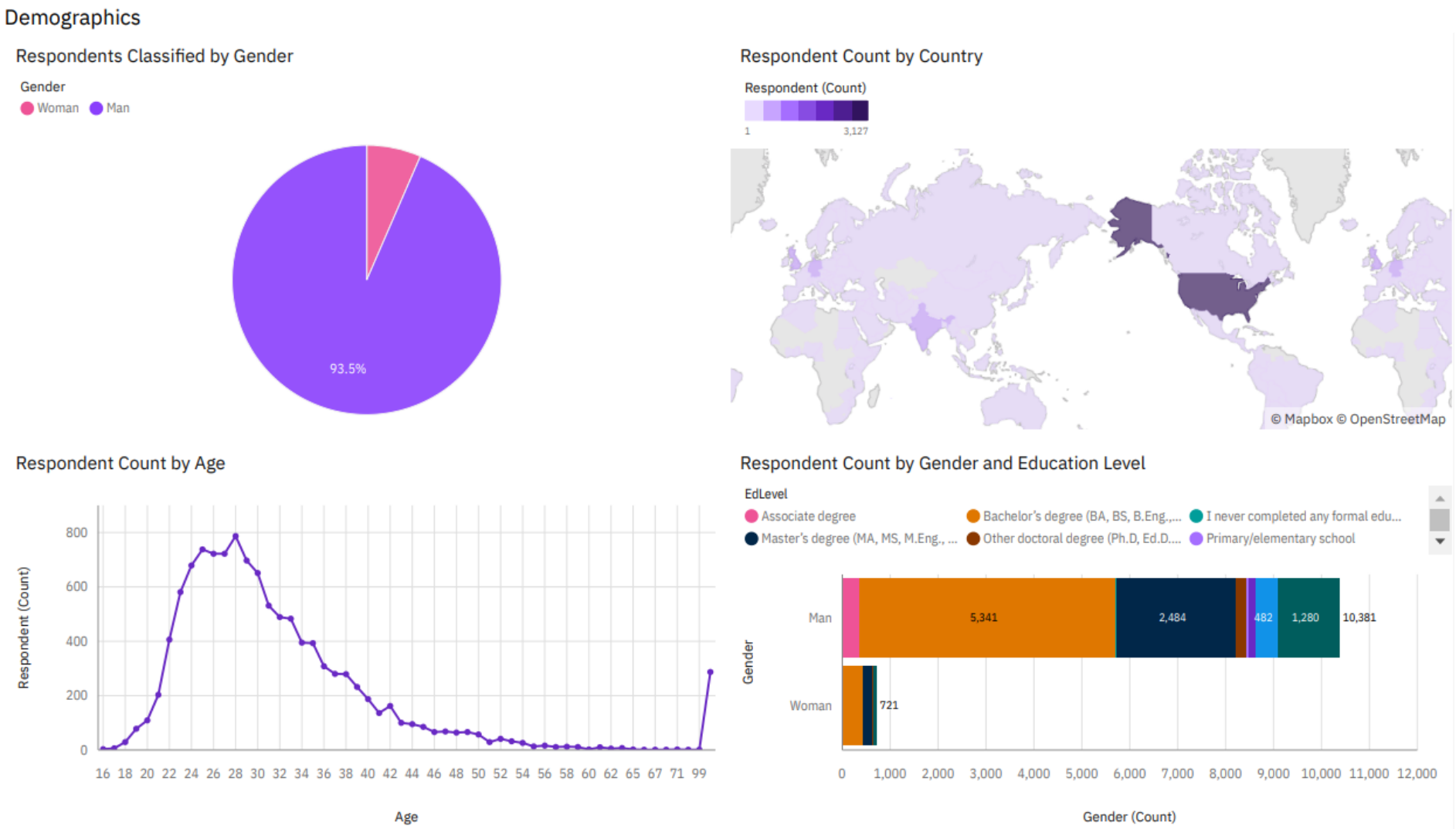
Platform Preferences for Next Year



Top 10 Web Frameworks Desired Next Year



DASHBOARD TAB 3



DISCUSSION

- **Tech Upskilling**: How can professionals effectively upskill to stay competitive in the technology sector?
- **Bridging Gender Gaps**: What strategies can close the gender gap in the technology sector?
- **Advanced Degrees**: Is an advanced degree necessary for success in the technology industry?
- **Mobile Development**: How is the rising popularity of Kotlin shaping the future of mobile development?
- **Tech in Developing Regions**: How can we improve access to technology education in less developed regions of South East Asia, South America, Africa, and parts of Europe?
- **Oracle SQL's Future**: Will Oracle SQL maintain its relevance in the future of database technology?

OVERALL FINDINGS & IMPLICATIONS

Findings

- **Dominance of Web Technologies**: JavaScript, HTML/CSS, and SQL are the most used programming languages, reflecting the importance of web development skills.
- **Relational Database Preference**: MySQL, Microsoft SQL Server, and PostgreSQL are top database technologies, indicating a strong preference for relational databases.
- **Cloud Computing and Linux**: High usage of cloud platforms (AWS, Google Cloud) and preference for Linux suggest a shift towards cloud computing and open-source operating systems.
- **Popularity of React.js**: React.js is among the top web development frameworks and also highly desired for the next year, highlighting its importance in building dynamic web applications.
- **Gender Disparity**: The technology sector shows a significant gender gap, with 93.5% of respondents identifying as men.

Implications

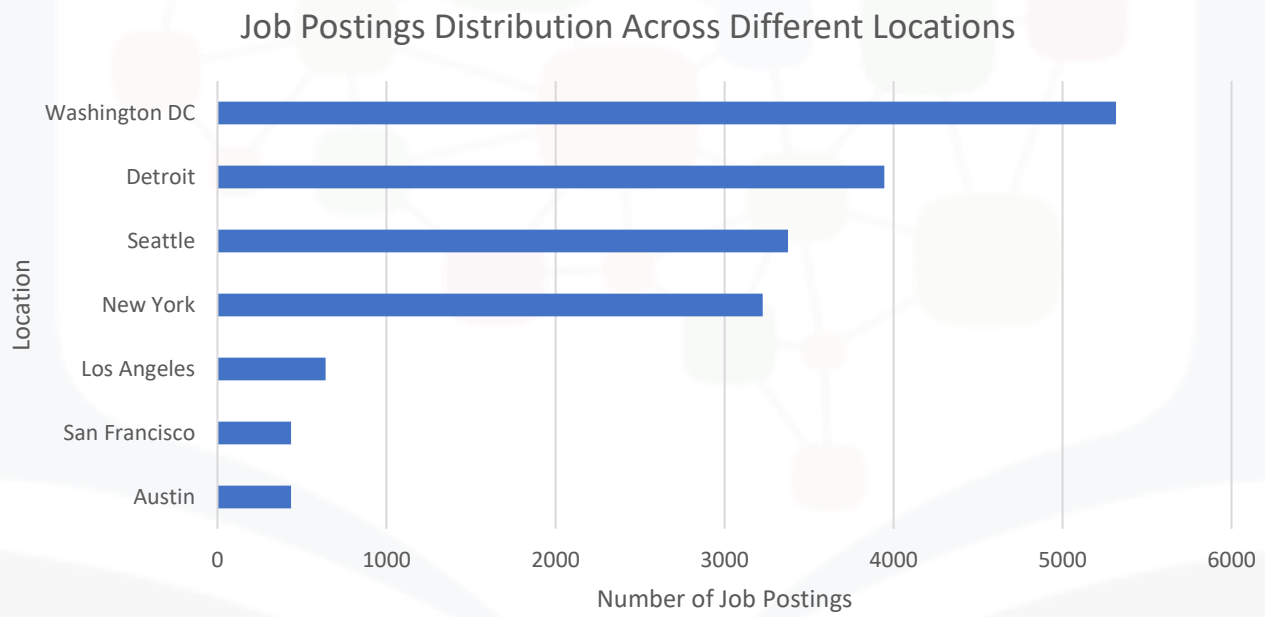
- **Need for Web Development Skills**: Individuals should focus on enhancing their web development skills, especially in JavaScript, HTML/CSS, and Python, to remain competitive.
- **Investment in Cloud and Docker**: Businesses and professionals should invest in understanding and leveraging cloud platforms and containerization technologies.
- **Adoption of React.js**: Organizations and developers should consider adopting React.js for developing user-friendly and dynamic web applications.
- **Emphasis on Diversity**: There's a critical need for initiatives aimed at increasing gender diversity within the tech industry.
- **Versatility in Database Skills**: Professionals should develop skills in both relational and NoSQL databases to meet the versatile data handling needs of future projects.

CONCLUSION

- Web development skills, especially in JavaScript and SQL, are critical.
- Interest in PostgreSQL and NoSQL databases is rising alongside traditional SQL databases.
- The tech industry is trending towards open-source and cloud platforms like Linux and AWS.
- Addressing the gender gap in tech remains a significant challenge.

JOB POSTINGS

In Module 1 you have collected the job posting data using Job API in a file named “job-postings.xlsx”. Present that data using a bar chart here. Order the bar chart in the descending order of the number of job postings.



POPULAR LANGUAGES

In Module 1 you have collected the job postings data using web scraping in a file named “popular-languages.csv”. Present that data using a bar chart here. Order the bar chart in the descending order of salary.