ANALYSIS ON EMERGING TECHNOLOGY SKILLS AND TRENDS:STACK OVERFLOW DEVELOPER SURVEY

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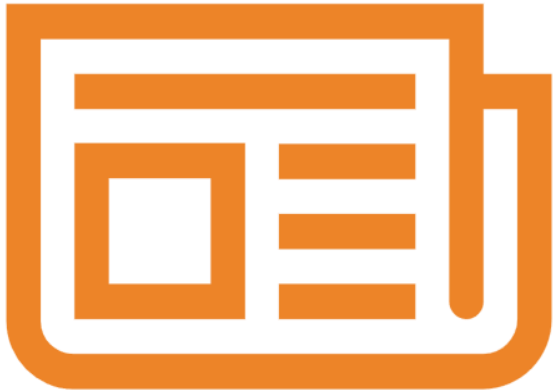
EXECUTIVE SUMMARY

- This report uses data analytics to highlight current and projected trends in the need for skills related to programming languages, databases and other technologies. It also studies the demographics of professionals in the technology sector. Therefore, to be competitive in global IT sector, it's essential to keep up with the ever-changing technologies.
- Data was gathered and collected from a Stack Overflow Survey, IBM site, and Github job postings. It was cleaned, subjected to exploratory analysis and visualized on dashboards.
- The findings showed that JavaScript is the most used/popular programming language. MySQL has the highest database usage but Postgre SQL is projected to have more demand in the future.
- Majority of the survey respondents are males from USA and they are 28 years of age.

INTRODUCTION

- In the field of programming and technology, key trends have emerged in recent years.
- **Stack Overflow** conducts an inclusive survey of individuals engaged in coding globally.
- Covering a wide array of topics from preferred technologies to career aspirations.
- The insights shows the evolving landscape of programming languages, web frameworks, and demographics of professional developers.

METHODOLOGY

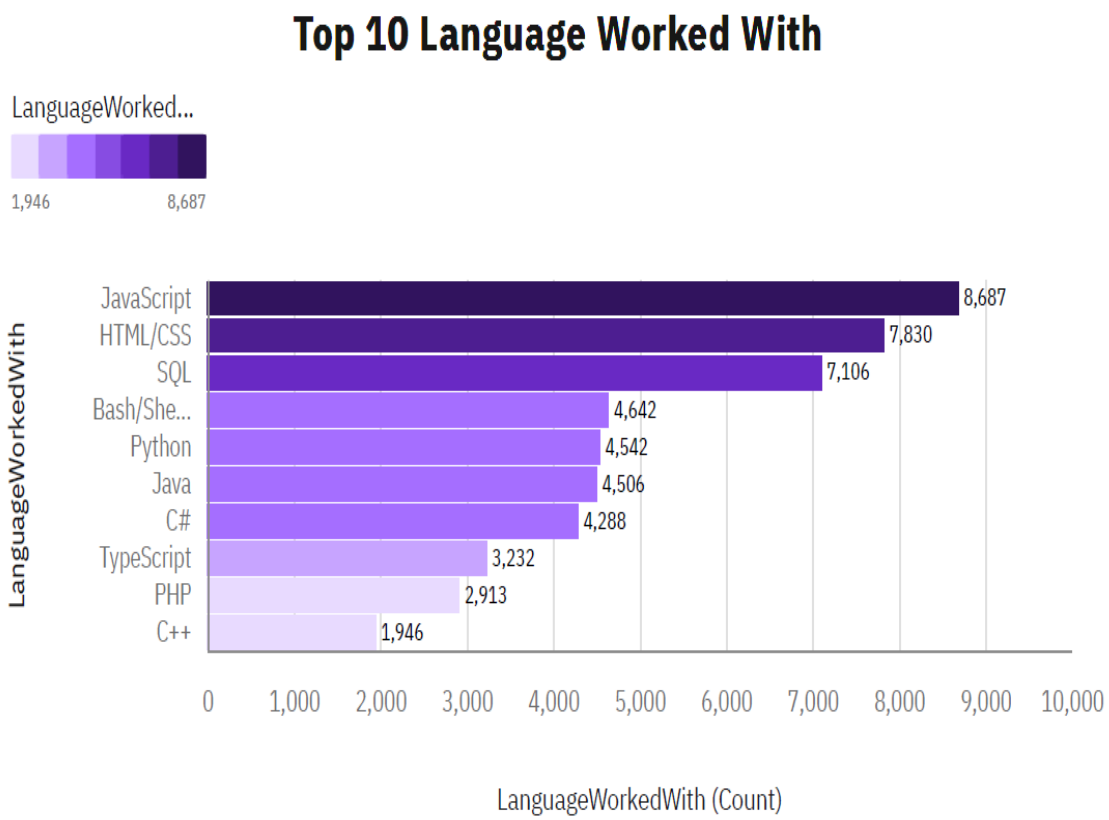


- Data in several formats, such as the number of jobs available for different technologies and for different regions were gathered using the Job API on Python.
- To obtain the names of the programming languages and their yearly salaries, the IBM website was scraped.
  The dataset from Stack Overflow developer survey was downloaded and saved.
- Python was used to clean and analyze the data. An Exploratory data analysis was carried out, assessing the distribution of the data, identifying the outliers and the correlation between various columns in the dataset.
- Charts, graphs and dashboards were created using Python and Cognos Analytics to visualize the data. All Python analyses were carried out on Jupyter Notebooks.

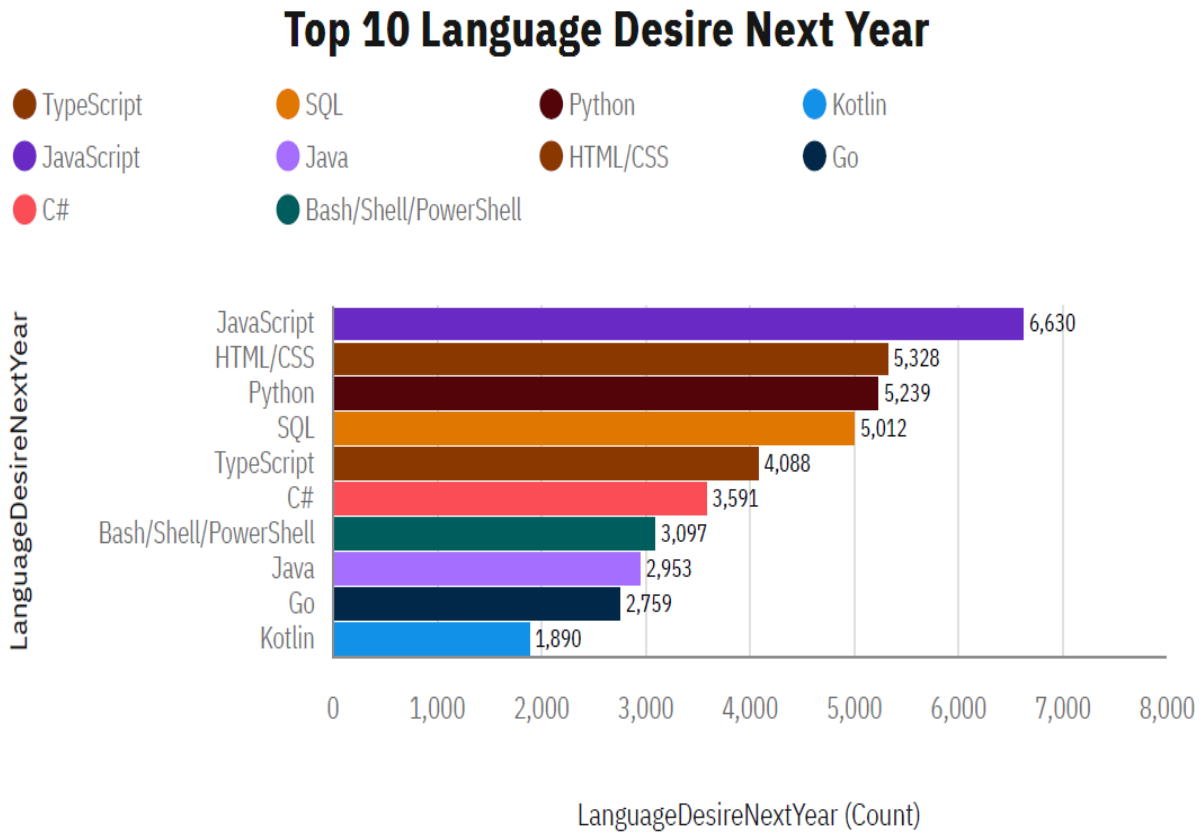
RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

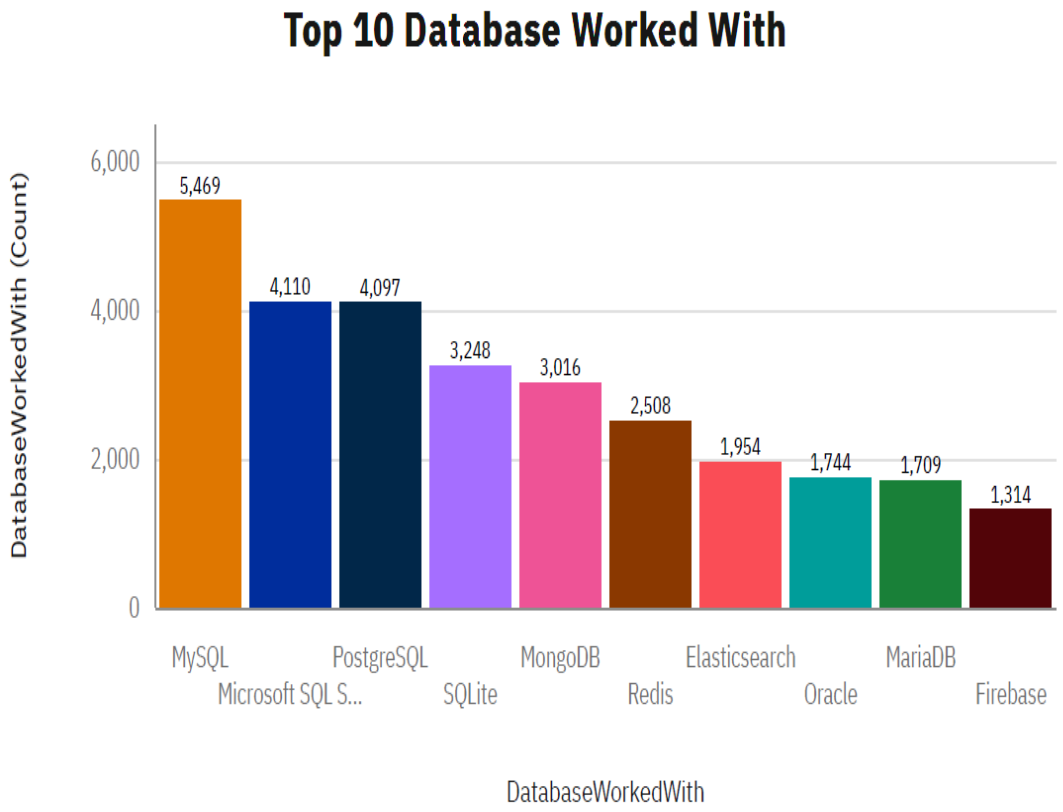
- The findings indicate that **JavaScript, HTML/CSS, and SQL dominate as core skills**, while **Python** and **Java** remain highly relevant across multiple fields in the current year.
- **JavaScript** remains the most desired language for the future, indicating its continued dominance in web development.
- **SQL** remains critical, showing consistent demand in data-driven fields
- **TypeScript**, **Go**, and **Kotlin** are gaining traction, while **PHP** and **C++** are losing developer interest.

Implications

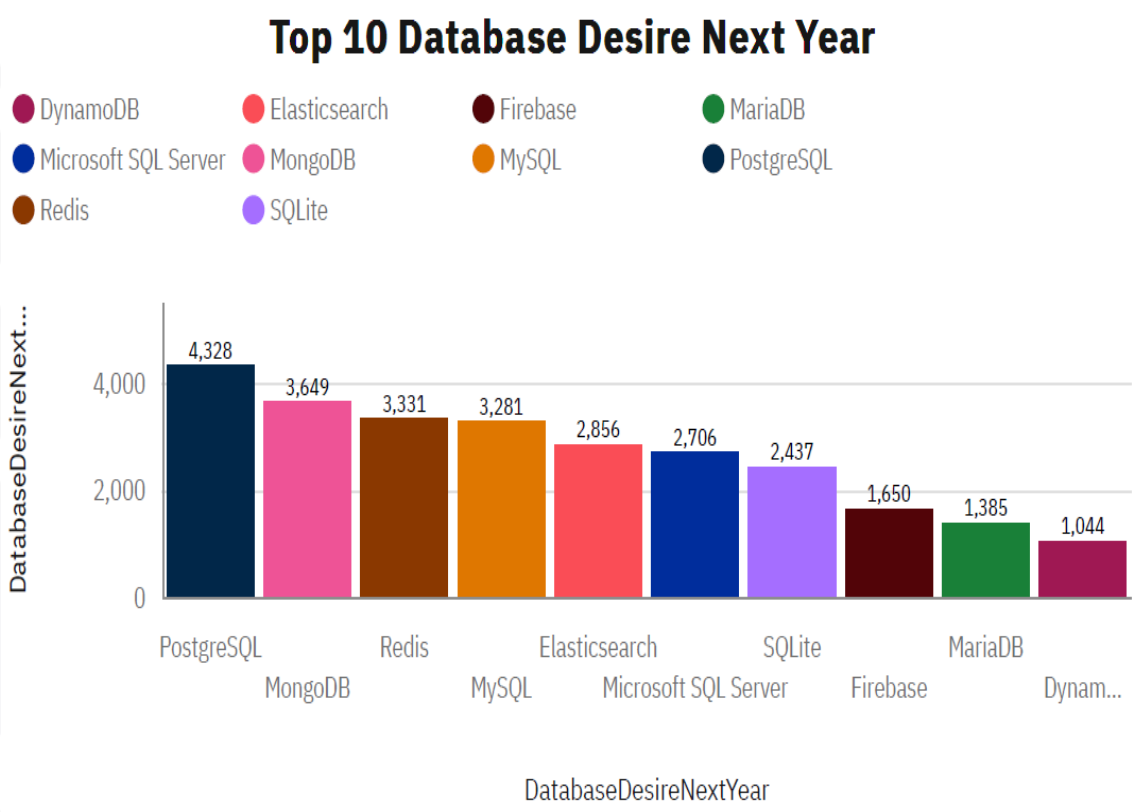
- **JavaScript and HTML/CSS** dominance implies strong demand for web development skills remains, so front-end roles continue to be highly relevant.
- **Python** moving higher popularity signals growth in data science, AI, and machine learning jobs. Demand for Python developers will expand rapidly.
- Current job market favors **web, database, and established stacks**.
- Future favors **Python, TypeScript, Go, Kotlin**; SQL remains critical/indispensable.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL, Microsoft SQL Server and Postgre SQL are the most used and in demand databases in the current year.
- However, Postgre SQL, MongoDB and Redis are projected to become more popular in the future.
- Oracle will lose its relevances in the future times.

Implications

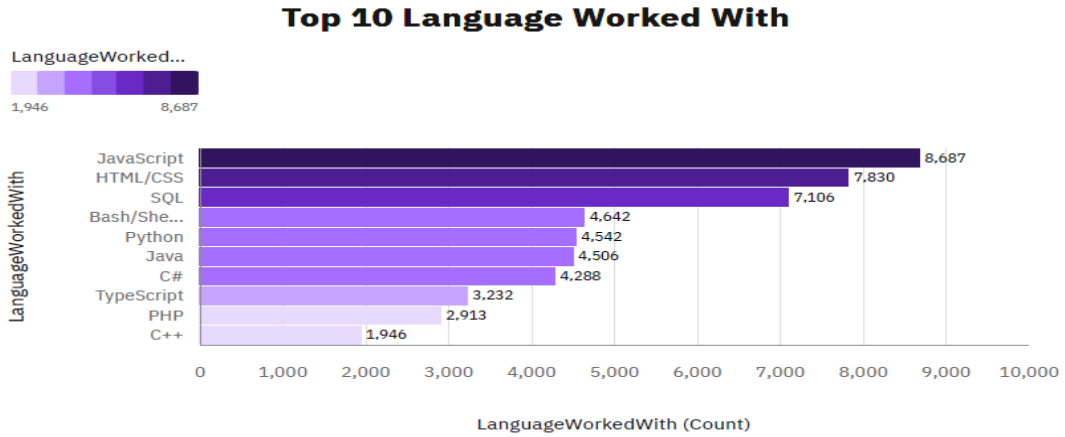
- The popularity of MySQL ,Microsoft SQL Server and Postgre SQL underscores the importance of relational databases in various applications.
- The high usage of MongoDB reflects the growing trend towards NoSQL databases, driven by the need for flexible data models and scalability, particularly in modern web and mobile application.

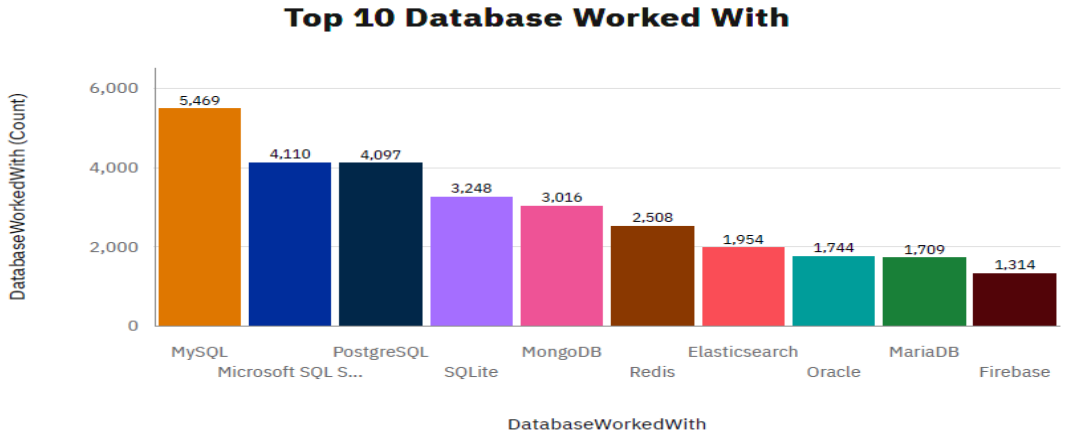
DASHBOARD

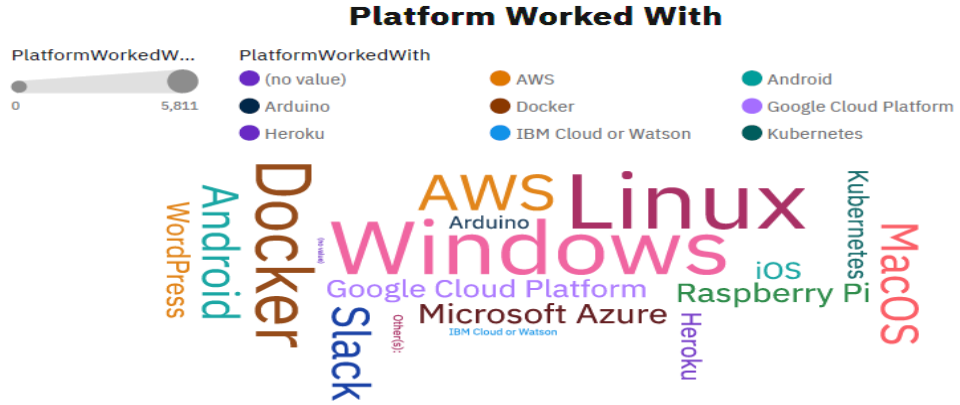
https://github.com/violamoraa/ibm-data-analyst-capstone-project/blob/main/Building_Dashboards_on_Cognos.pdf

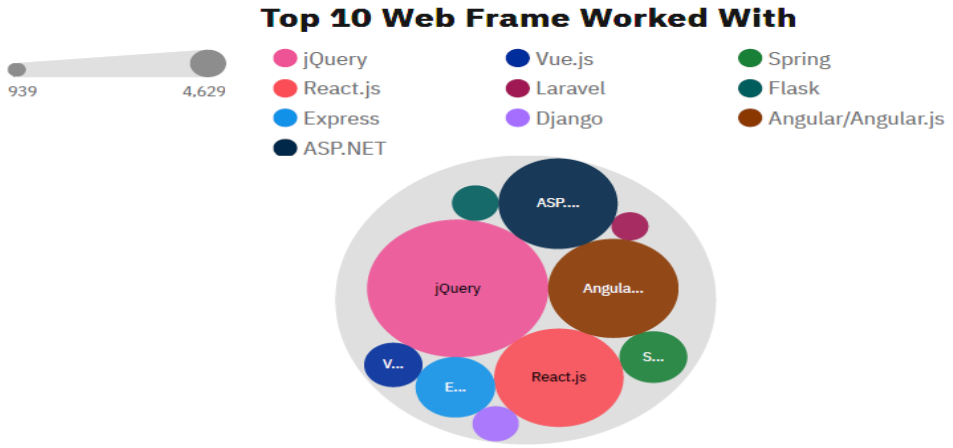
DASHBOARD TAB 1

Current Technology Usage



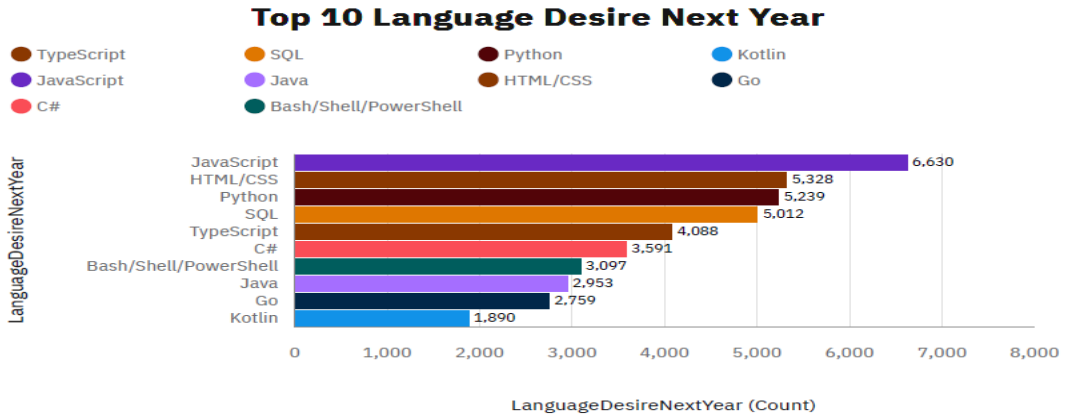


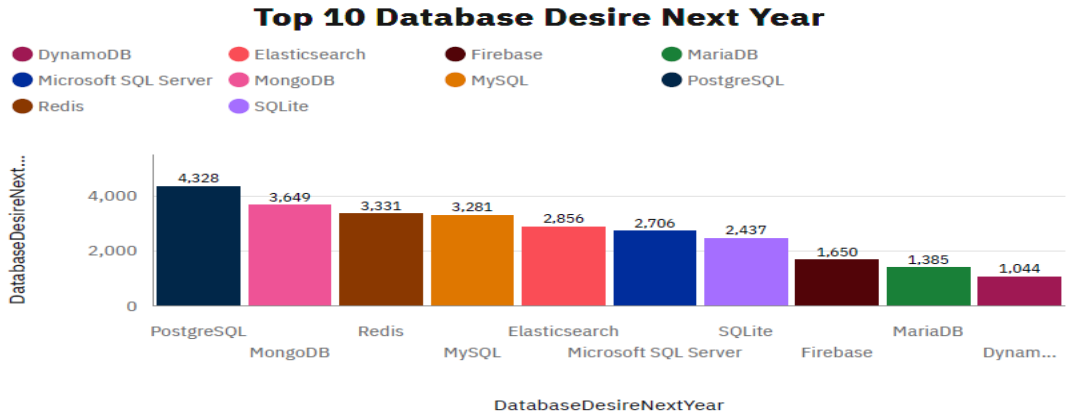


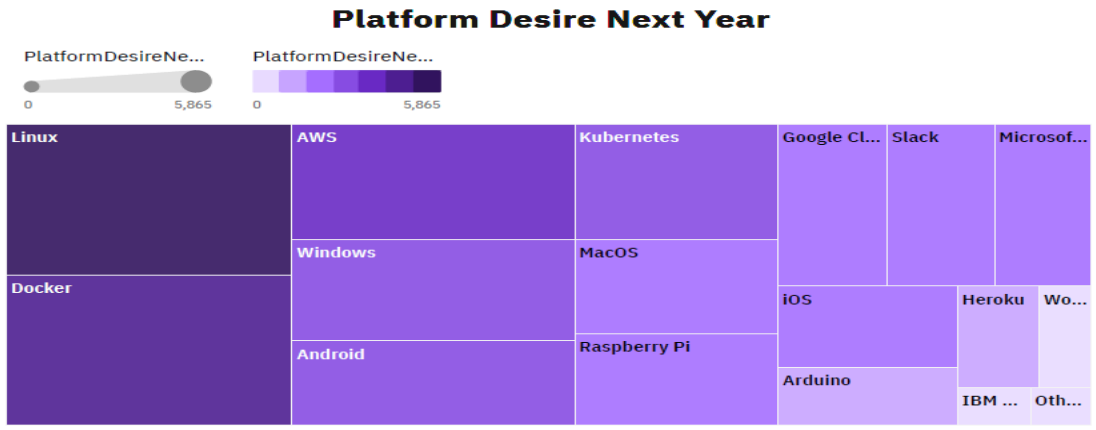


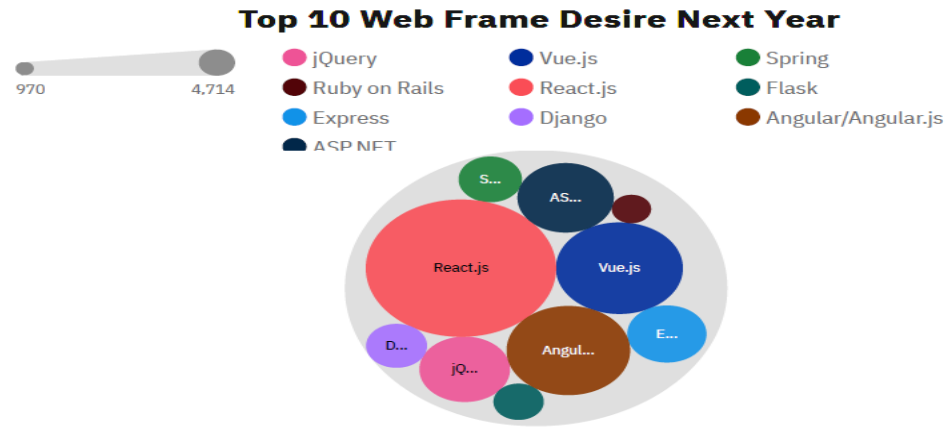
DASHBOARD TAB 2

Future Technology Trend





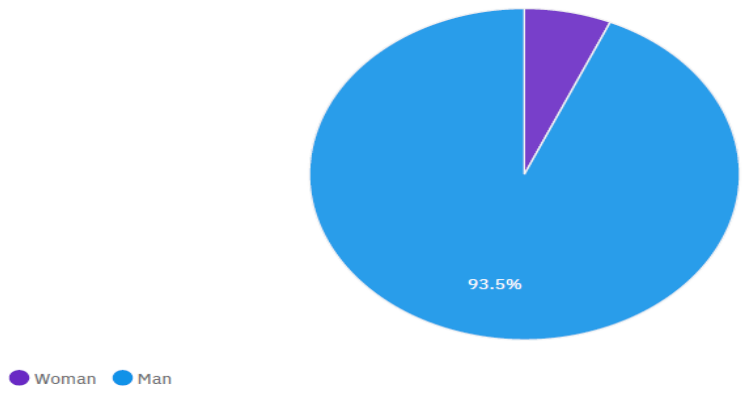




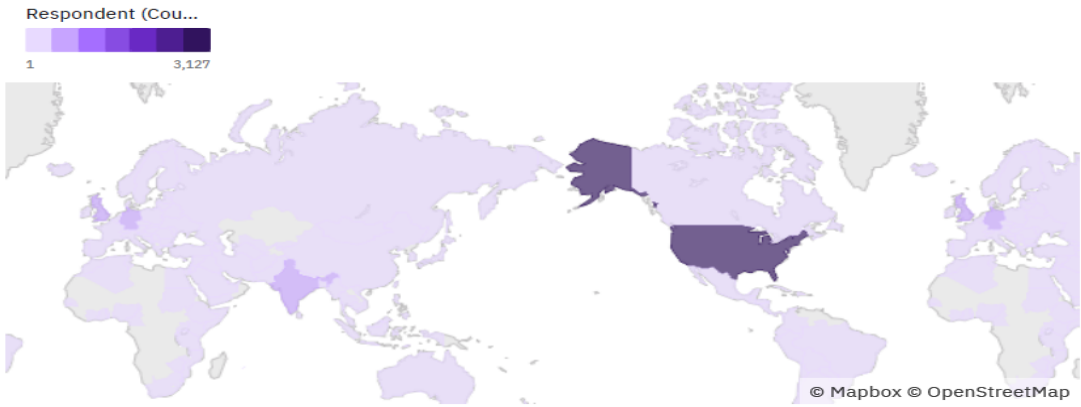
DASHBOARD TAB 3

Demographics

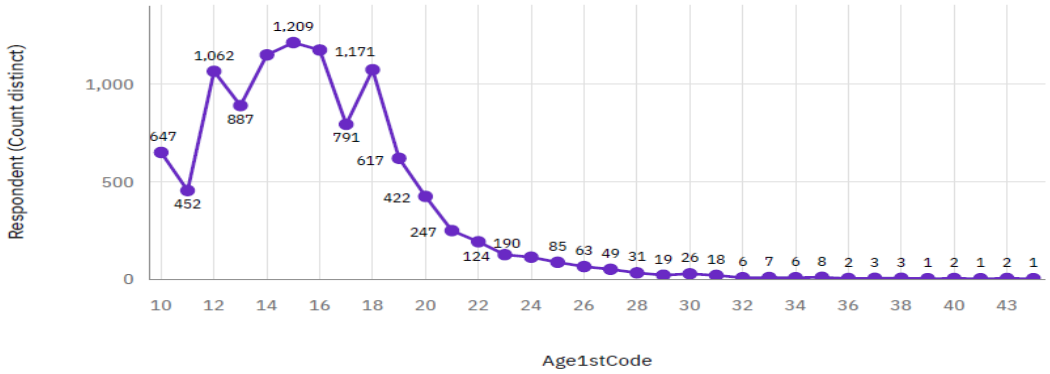
Respondent classified by Gender



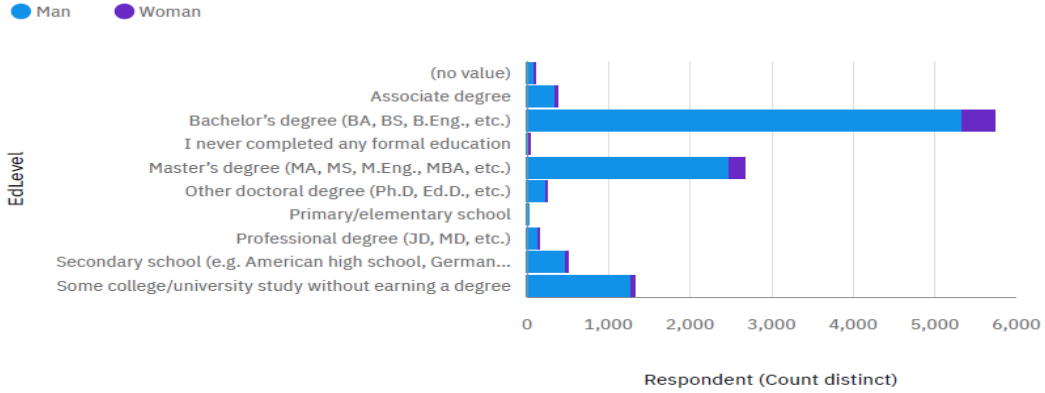
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender and Formal Education Level



DISCUSSION

- **JavaScript**, **HTML/CSS** and **MySQL** remain dominant languages in industry applications.
- There was an indication of gender imbalance, with male respondents representing the majority share compared to female respondents. This highlights the underrepresentation of women in the technology and programming fields. Maybe due to persistent stereotypes portray technology and programming as “male-dominated” careers. Therefore, putting efforts to encourage female participation through mentorship programs, scholarships, and inclusive policies are essential to close the gap.
- Compensation is higher for specialized and in-demand technologies.
- Growing adoption of cloud, AI, and emerging frameworks is reshaping demand.
- Continuous learning and adaptability are critical for professionals.

OVERALL FINDINGS & IMPLICATIONS

Findings

- Male participants dominate the technology field, representing the **largest share** of the workforce.
- Most people in the IT field have a Bachelor's degree led by men.
- The Technology sector is filled with young people under 40 years(majority).

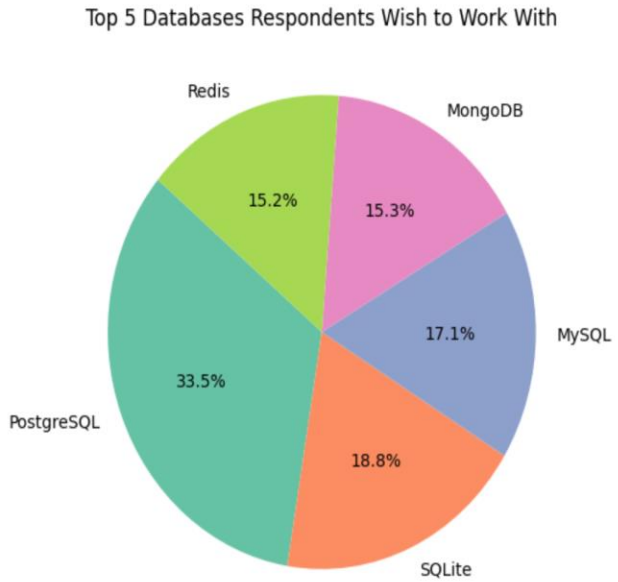
Implications

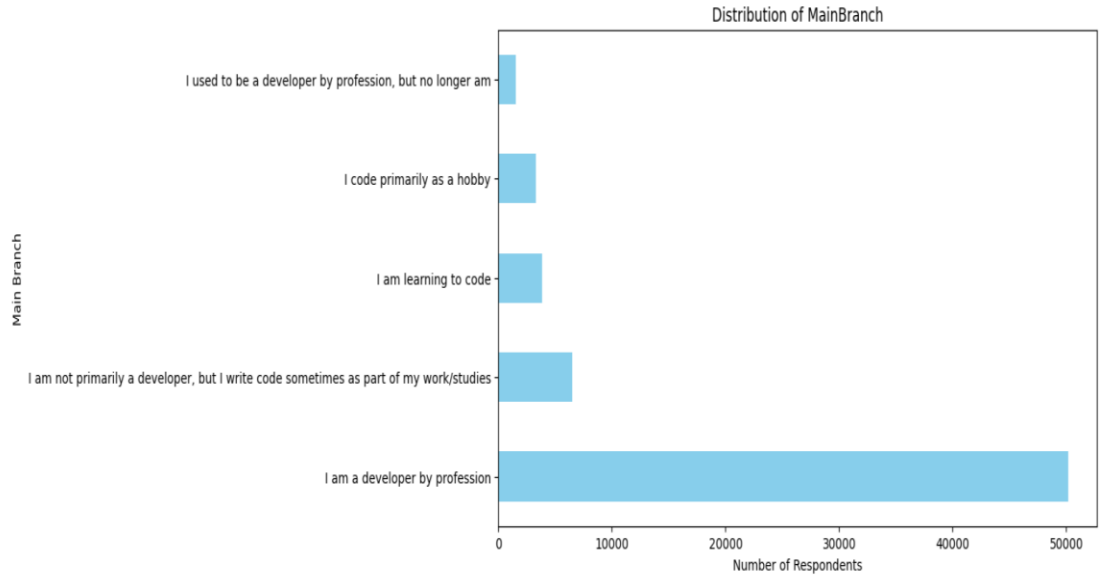
- Individuals should align skills with both current high-demand areas and future technologies.
- Organizations must invest in workforce development and technology adoption strategies.
- Less developed countries need more access to tech training and education

CONCLUSION

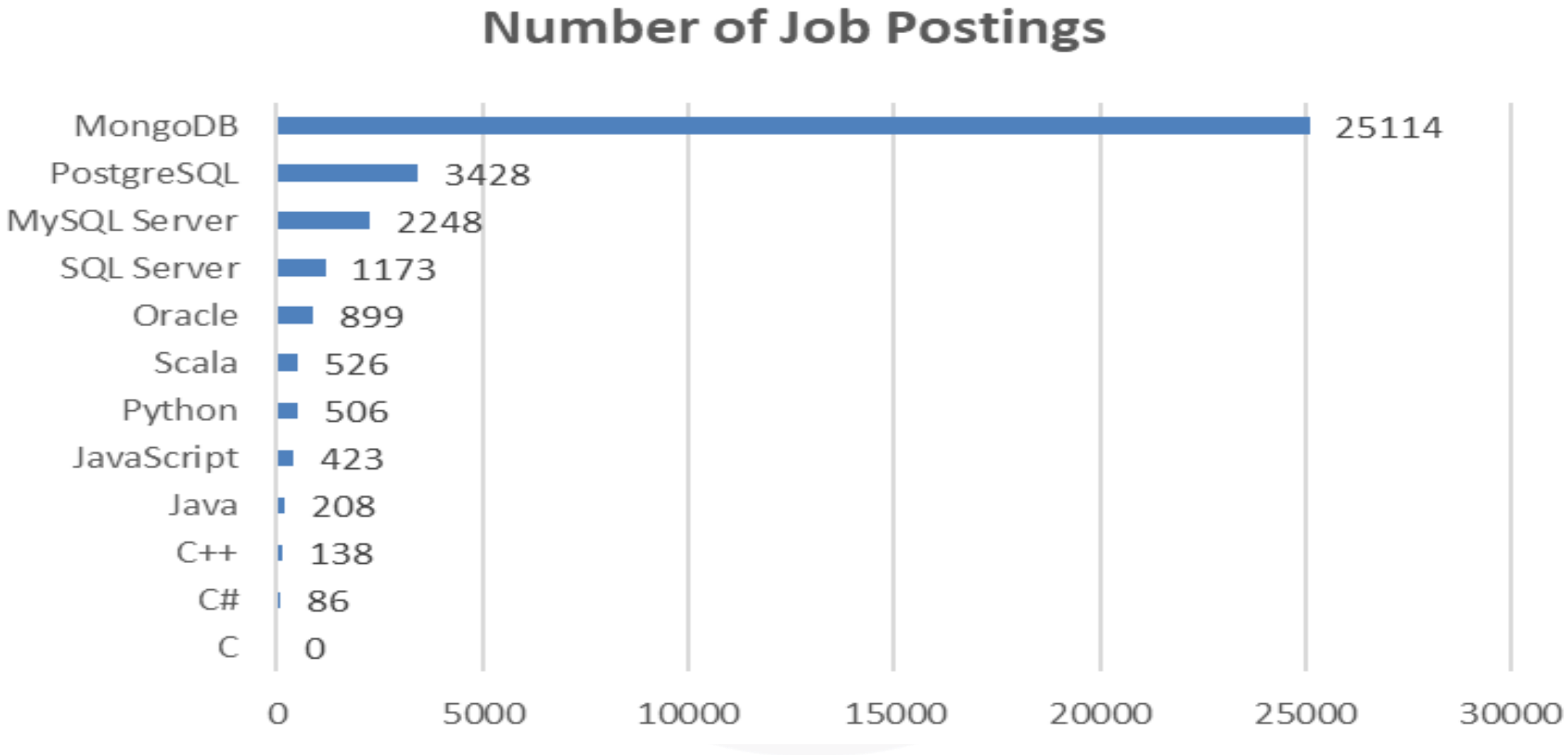
- Technology continues to be a rapidly growing sector, driven by skilled professionals, but still faces challenges in inclusivity and equal representation.
- So, efforts should focus on promoting inclusivity, expanding access to education, and encouraging diverse participation to ensure sustainable growth and innovation in the technology sector.

APPENDIX


Top 5 Databases Respondents Wish to Work With
Redis
MongoDB
MySQL
PostgreSQL
SQLite
15.2%
15.3%
17.1%
33.5%
18.8%


Distribution of MainBranch
I used to be a developer by profession, but no longer am
I code primarily as a hobby
I am learning to code
I am not primarily a developer, but I write code sometimes as part of my work/studies
I am a developer by profession
Main Branch
0
10000
20000
30000
40000
50000
Number of Respondents

JOB POSTINGS



POPULAR LANGUAGES