Data Analysis of the Stack Overflow Survey

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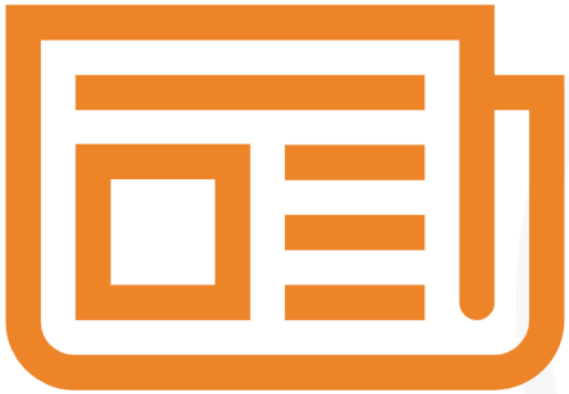
EXECUTIVE SUMMARY

- The analysis was based on annual developer survey by Stack Overflow.
- It explores technology usage trends, developer preferences and future projections.
  - Shows how languages like JavaScript and SQL continue to dominate as the most used programming languages.
  - PostgreSQL and MySQL remained the most used databases.
  - Shows how React and Node.js remian to be the most coveted frameworks that developers will want to use in the future.
- Also shows how rust and Typescript are on the rise
- The report has included visual dashboard and data driven insights
- Key implications are drawn for developers, companies

INTRODUCTION

- The annual Stack Overflow Developer Survey gathers responses from a vast number of developers worldwide.
- This survey offers a glimpse into the present technological landscape and anticipates upcoming shifts within the developer community.
- The report in question examines the most recent survey findings from the year 2024.
- Key topics covered in the survey encompass programming languages, database systems, various job positions, and additional relevant areas.
    - It assists businesses in comprehending the adoption of new technologies.
    - It aids novice developers in charting their educational journey and planning their career trajectory.

METHODOLOGY

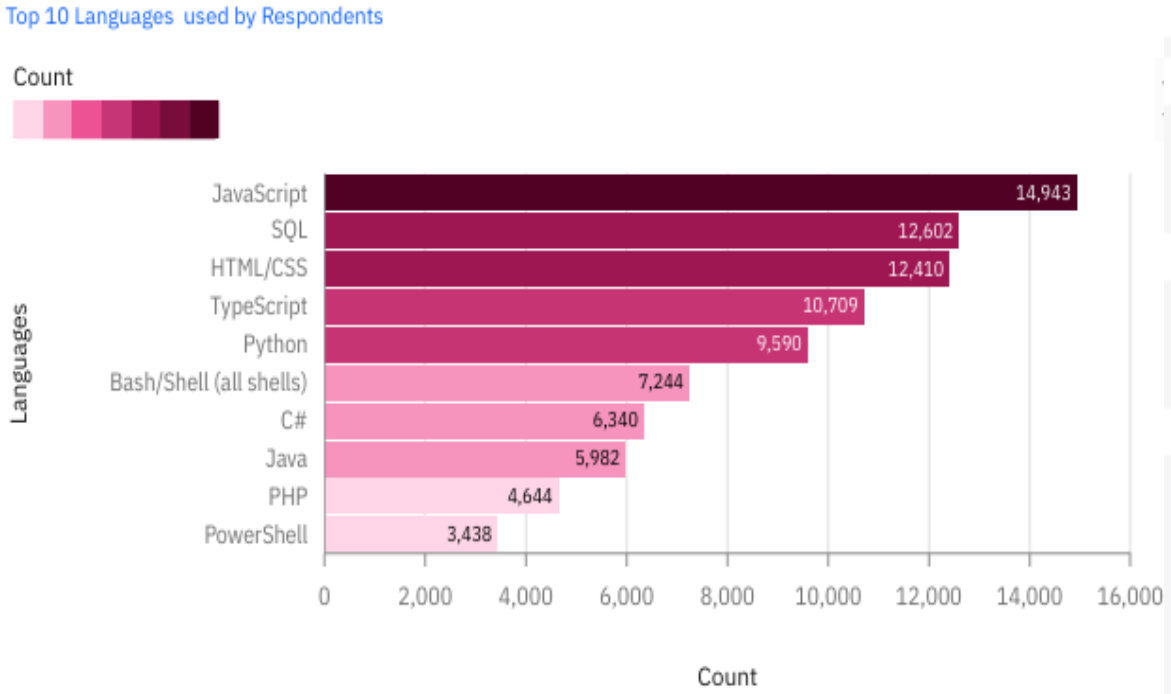


- The information was obtained from the public dataset of Stack Overflow's 2024 survey.
- The initial phase of data handling involved managing missing data and standardizing formats.
- Tools such as Python, Pandas, and Matplotlib were employed for data analysis and to create visual representations.
- Visual aids were constructed to illustrate trends, preferences, and the spread of job roles.
  - The process of filtering and categorizing data facilitated the recognition of leading technologies.
  - Links were established between the level of experience and the selection of technological tools.

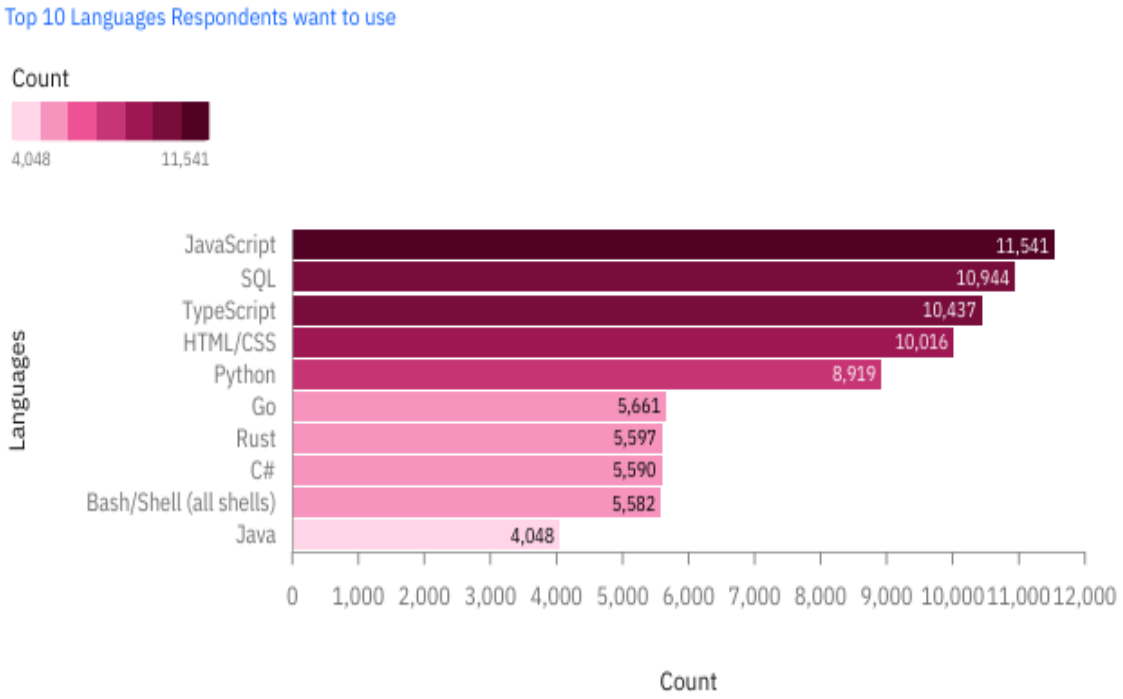
RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

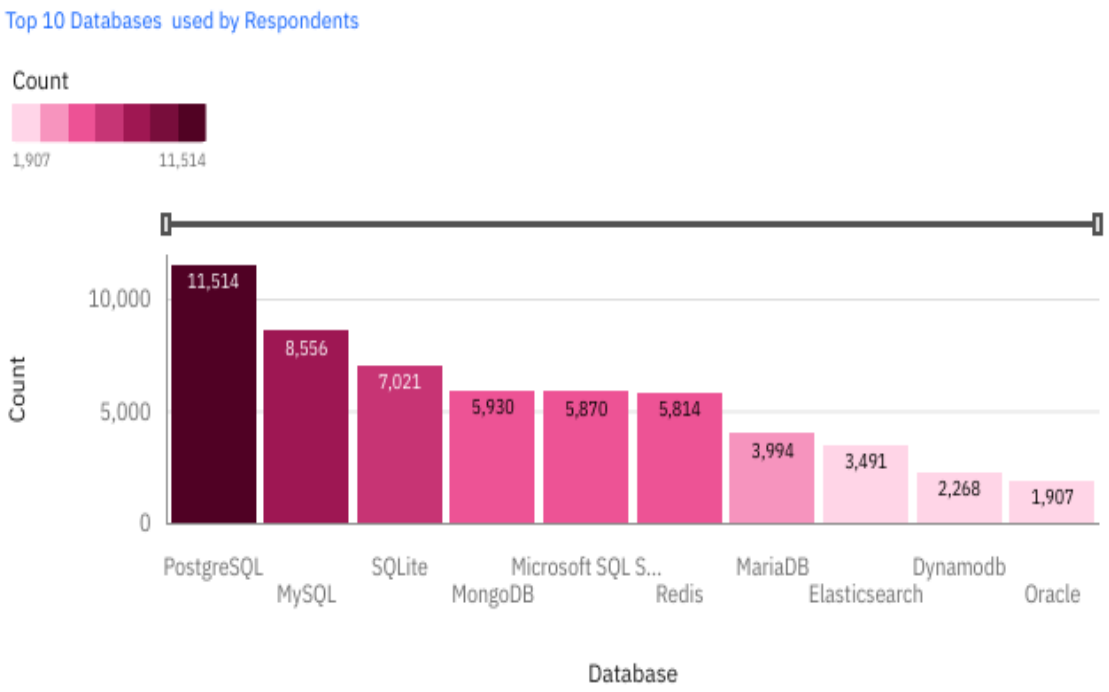
- JavaScript is the most used language in both the current year and the next year, with a significant lead over other languages.
- SQL and HTML/CSS are consistently among the top languages used by respondents, both in the current year and the next year.
- TypeScript and Rust are among the top languages that respondents want to use in the next year, indicating a growing interest in these languages

Implications

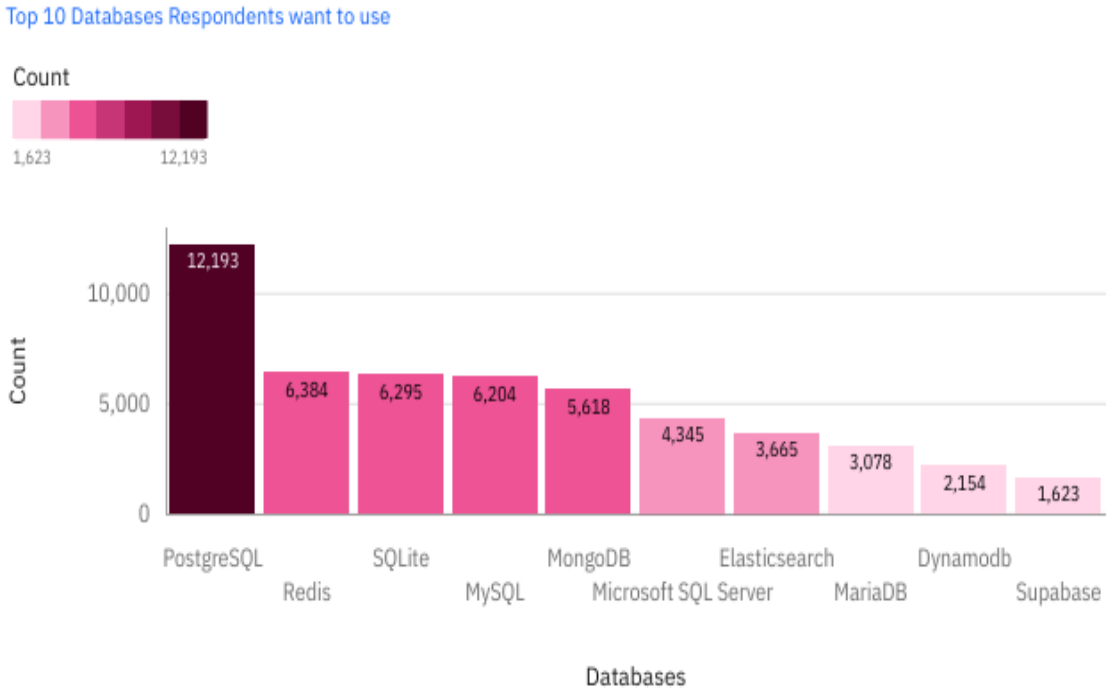
- This dominance suggests that JavaScript will continue to be a crucial skill for developers. Companies relying on web technologies will likely prioritize JavaScript proficiency in their hiring processes. Additionally, the continued popularity of JavaScript may drive further development and enhancement of its ecosystem, including frameworks and libraries.
- The steady use of SQL and HTML/CSS indicates their enduring importance in data management and web development, respectively. SQL's role in handling databases and HTML/CSS's role in structuring and styling web pages are fundamental and unlikely to be replaced soon. This consistency suggests that these skills will remain valuable for developers across various domains.
- The increasing interest in TypeScript and Rust suggests that developers are looking for more robust and efficient alternatives to some of the more established languages. TypeScript offers static typing and improved tooling for JavaScript, which can enhance code quality and developer productivity. Rust, known for its performance and safety features, might be attracting developers looking for alternatives to C++ in systems programming.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgrSQL leads as the most used database
- NoSQL databases like MongoDB and Firebase are continuing the be adopted
- Relational databases like MySQL and SQL server remain overly coveted

Implications

- The increase in NoSQL usage shows a need for data systems that can grow and adapt easily.
- PostgreSQL's ongoing popularity suggests it can handle a wide range of tasks.
- Businesses might start using a mix of SQL and NoSQL in their data strategies.

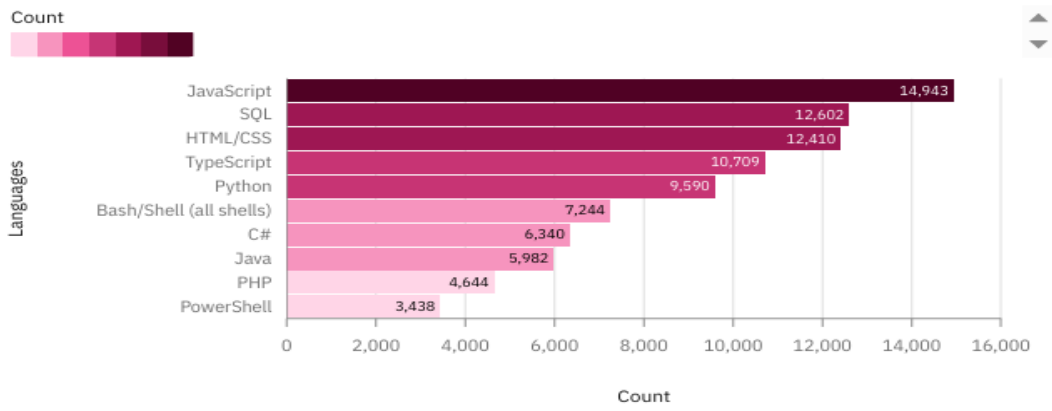
DASHBOARD

<https://ap2.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FdASHBOARD%2BCAPSTONE&action=view&mode=dashboard&subView=model000001969f2b3458_00000002>

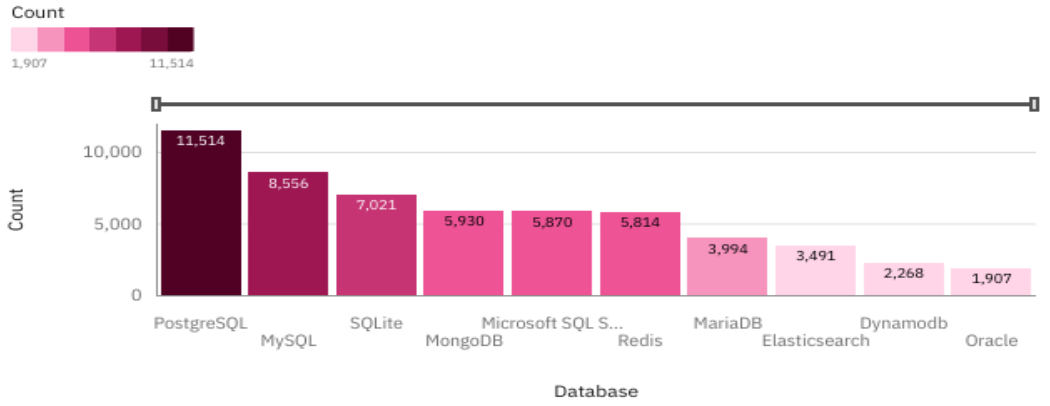
DASHBOARD TAB 1

Current Technology Usage

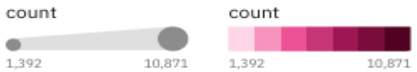
Top 10 Languages used by Respondents



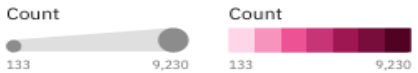
Top 10 Databases used by Respondents

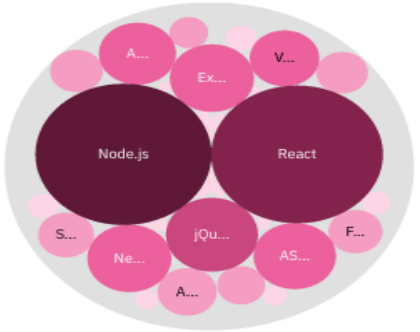


Top 10 Platforms used by Respondents



Top 10 Web Frameworks used by Respondents.

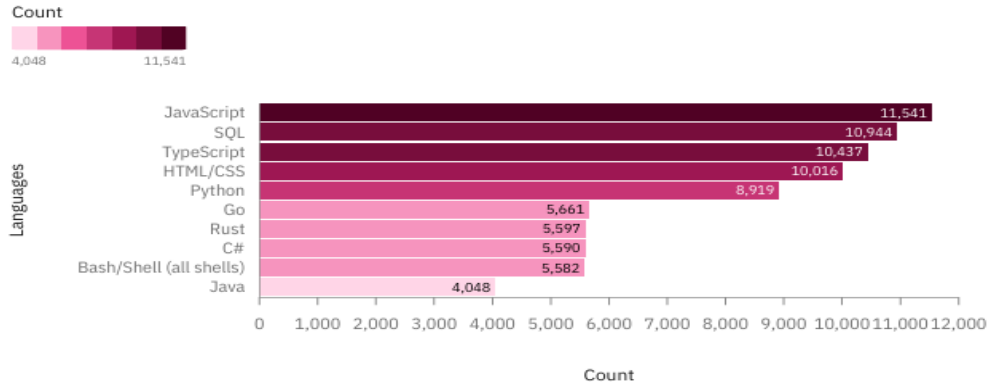




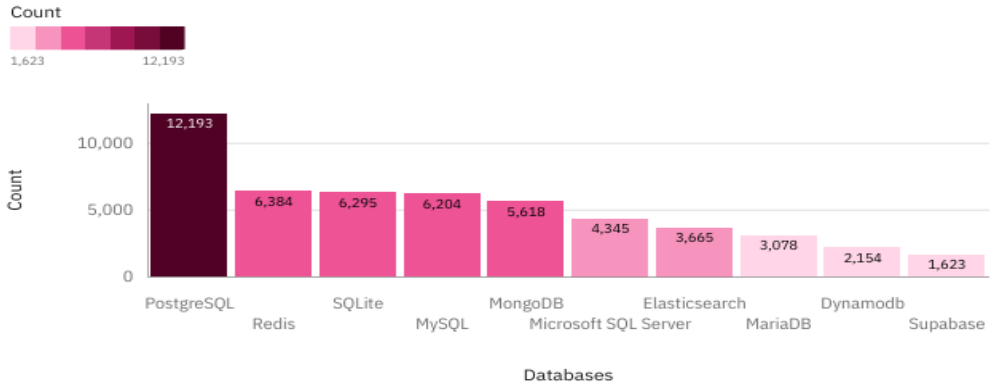
DASHBOARD TAB 2

Future Technology Trend

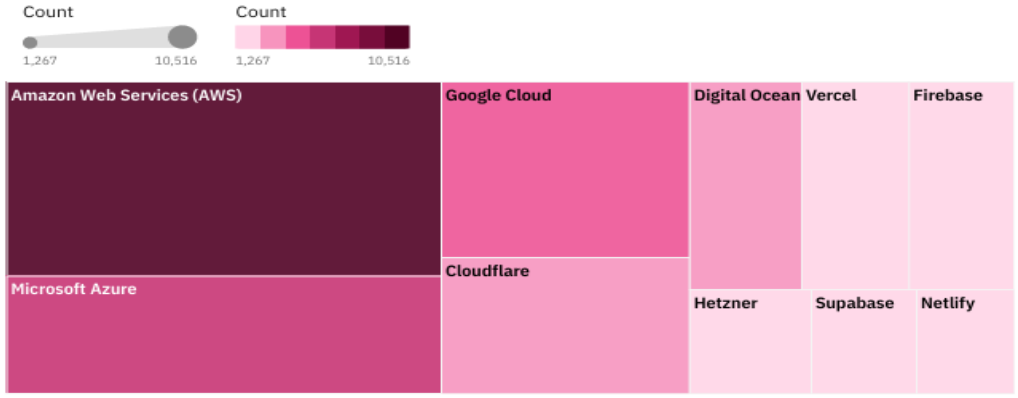
Top 10 Languages Respondents want to use



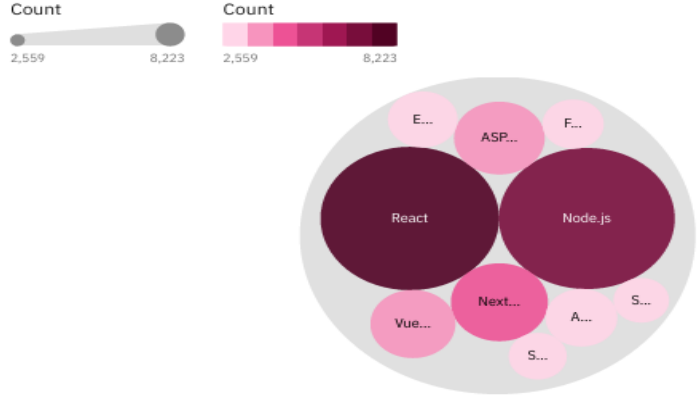
Top 10 Databases Respondents want to use



Top 10 Platforms Respondents want to use



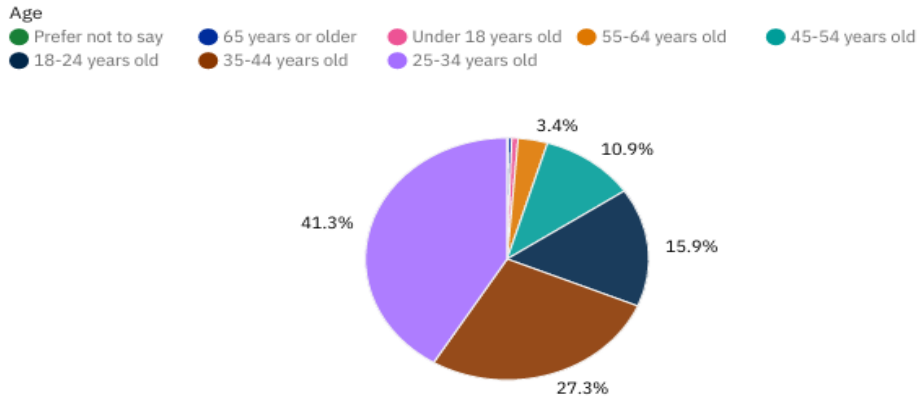
Top 10 FrameWorks Respondents want to use



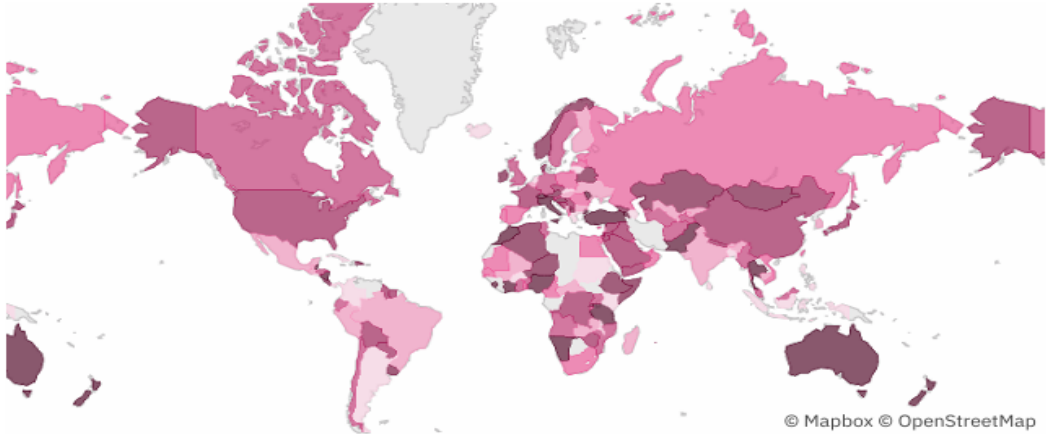
DASHBOARD TAB 3

Demographics.

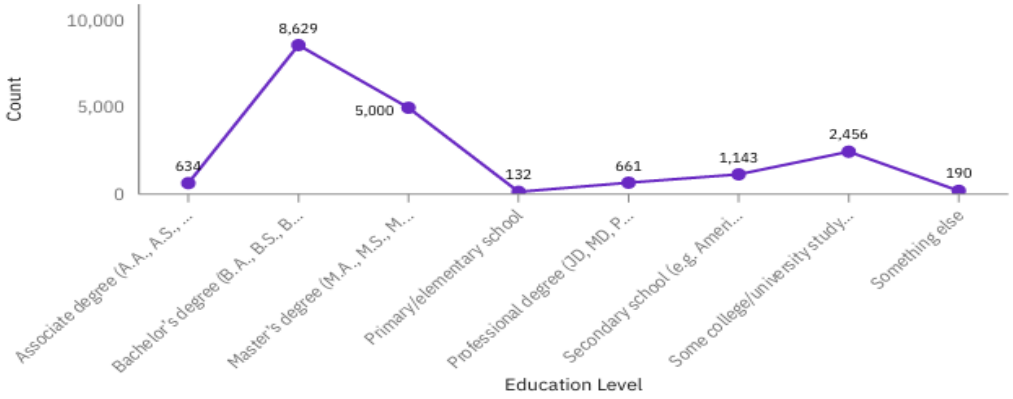
Respondent distribution by Age



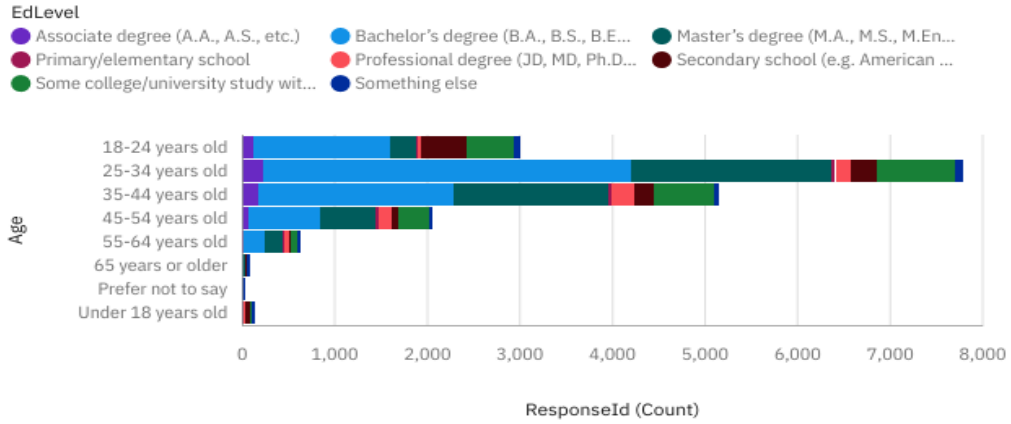
Respondent Count by Country



Respondent distribution by Formal Education Level.



Respondent Count by Age, classified by Education Level.



DISCUSSION

- Python, JavaScript, and SQL lead in usage across various job functions.
- The extensive use of Docker and Git indicates that DevOps practices have become widespread.
- Rust, TypeScript, and Firebase are on the rise for upcoming adoption, especially among newer developers.
- The developer community is largely composed of individuals between the ages of 25 and 34.
- There's significant expansion in the developer base in India and Southeast Asia, with a notable number being either self-taught or having transitioned from other careers.

OVERALL FINDINGS & IMPLICATIONS

Findings

- Python and JavaScript remain the most favored by developers in various positions.
- Both PostgreSQL and MongoDB are gaining acceptance across different sectors in 2024.
- There's a notable increase in the use of Rust and TypeScript among developers who are at the start of their careers.
- Technologies related to cloud computing and DevOps are commonly employed by those with more experience in the field.
- Information about the tech community's demographics indicates a spread across the globe and an increase in diversity.

Implications

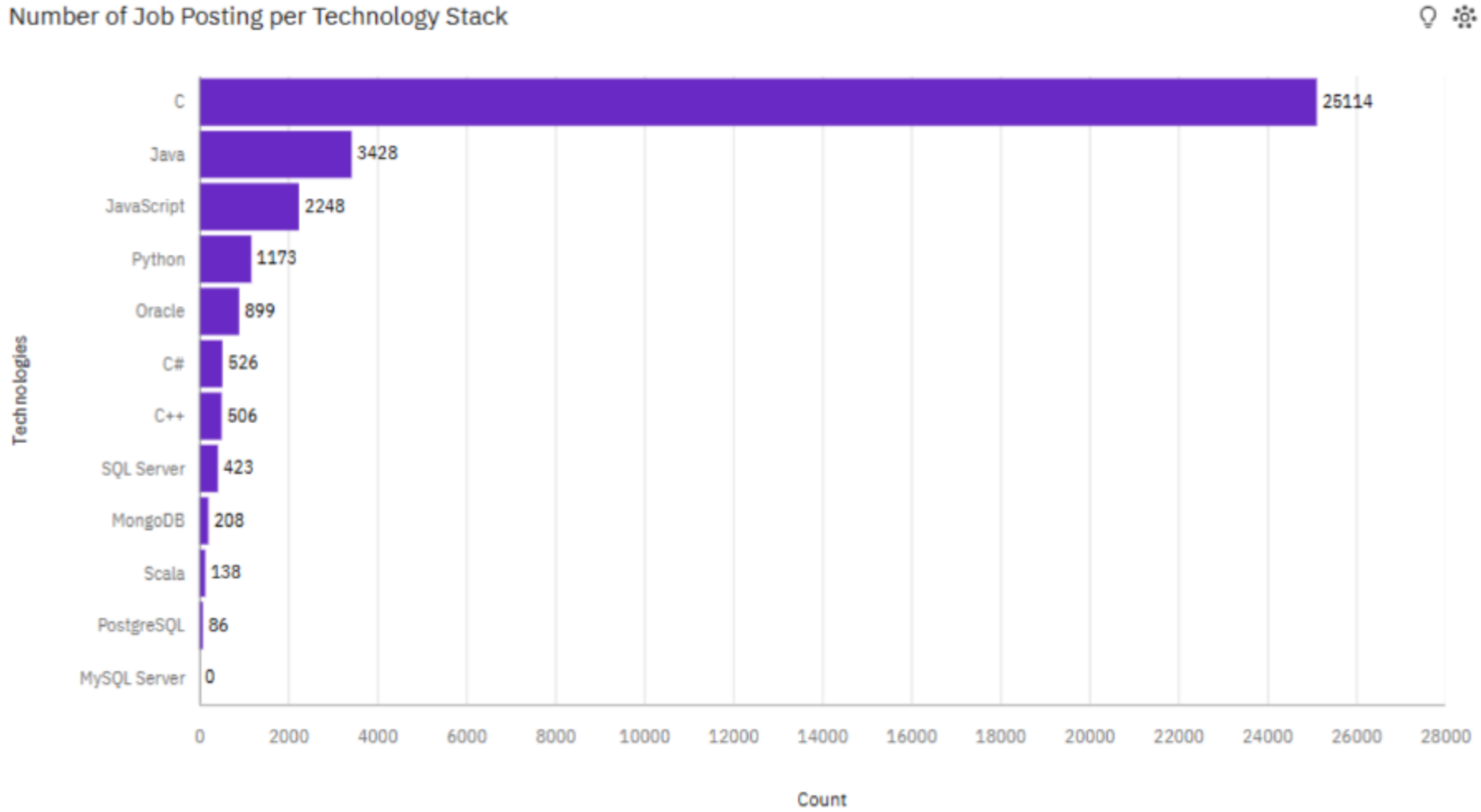
- The first implication is that the community of developers is moving towards more modern, effective, and secure technologies.
- Both educational materials and recruitment methods need to adapt to these new trends.
- The widespread use of PostgreSQL indicates a need for solutions that are both scalable and open-source.
- The rising popularity of Rust and TypeScript shows a trend towards prioritizing performance and dependability.
- The information underscores the necessity of ongoing education in the rapidly changing technology sector.

CONCLUSION

- JavaScript and PostgreSQL maintain their position as leading tools in various sectors.
- TypeScript, Amazon Web Services, Microsoft Azure, React and NodeJs are seen as indicative of the direction software development is heading.
- This information offers practical guidance for those in education, development, and organizational leadership.
- Keeping abreast of the latest trends is essential for developers to stay current and competitive in their field.

APPENDIX

JOB POSTINGS



POPULAR LANGUAGES