FINAL IBM CAPSTONE REPORT

2024

A SURVEY DATA OF TECHNOLOGIES LANGUAGE FAVOURABLE

DATE: 25 AUGUST, 2024

CREATED BY: PATRICK NGO

Table Of Contents

1.EXECUTIVE SUMMARY

The IBM Data Analytics Capstone Project report provides a comprehensive analysis of current and future technology trends, focusing on languages, databases, platforms, and web frameworks.

The report is based on data gathered from a diverse set of respondents, showcasing preferences and trends in the technology landscape. Key findings indicate that HTML/CSS, SQL, and Python are among the most widely used programming languages, while MySQL and PostgreSQL lead in database usage.

Looking towards the future, JavaScript, Python, and PostgreSQL are expected to see increased demand.

The report also highlights demographic insights, with a notable gender disparity in technology participation and varying levels of formal education among respondents.

These insights are crucial for organizations aiming to align their strategies with evolving technological preferences and workforce demographics.

---

2. INTRODUCTION

In the rapidly evolving field of technology, understanding the current usage patterns and anticipating future trends is critical for organizations seeking to maintain a competitive edge.

This report presents the findings of the IBM Data Analytics Capstone Project, which aimed to analyze and interpret data related to the most commonly used and desired technologies in various domains.

The report focuses on programming languages, databases, platforms, and web frameworks, providing insights into both current usage and future aspirations among technology professionals.

By examining these trends, the report aims to equip businesses and decision-makers with the information needed to make informed strategic decisions.

- There will be analysis in current technology usage, future technology trend and demographics of respondents
- Charts and calculations would help the report more understandable to readers.

3. METHODOLOGY

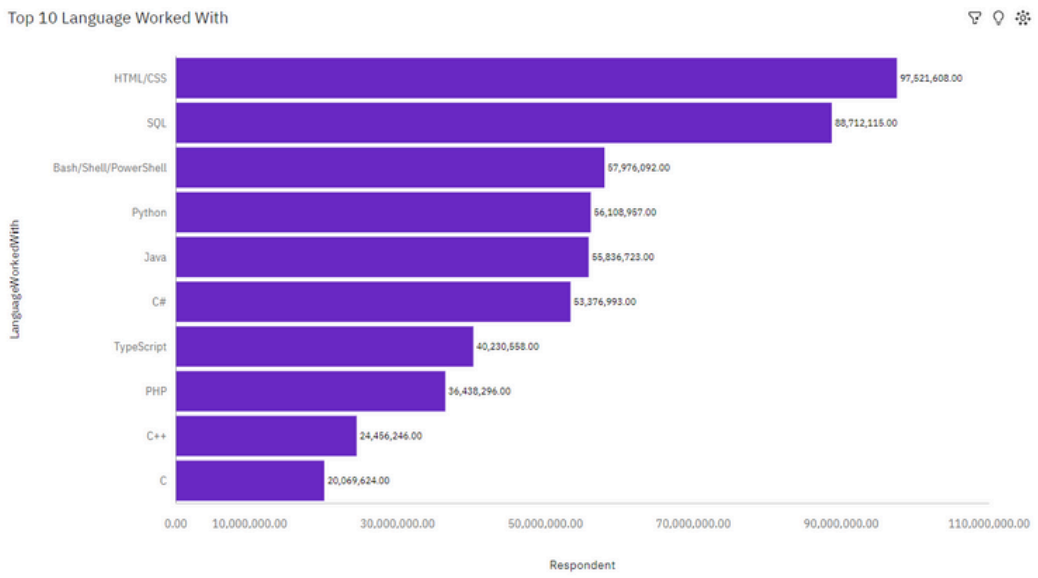
The analysis in this report is based on data collected from a wide range of respondents, representing diverse geographical regions, educational backgrounds, and professional experiences. The data was gathered through a structured survey, which included questions on the technologies currently used by respondents, as well as those they aspire to work with in the future. The survey data was then processed and visualized using IBM Cognos, a robust business intelligence tool, to identify key trends and patterns. The report also includes demographic analysis to provide context for the technological preferences and to highlight any significant disparities in technology adoption. This approach ensures a comprehensive understanding of the current and future state of technology across different sectors.

4. RESULTS

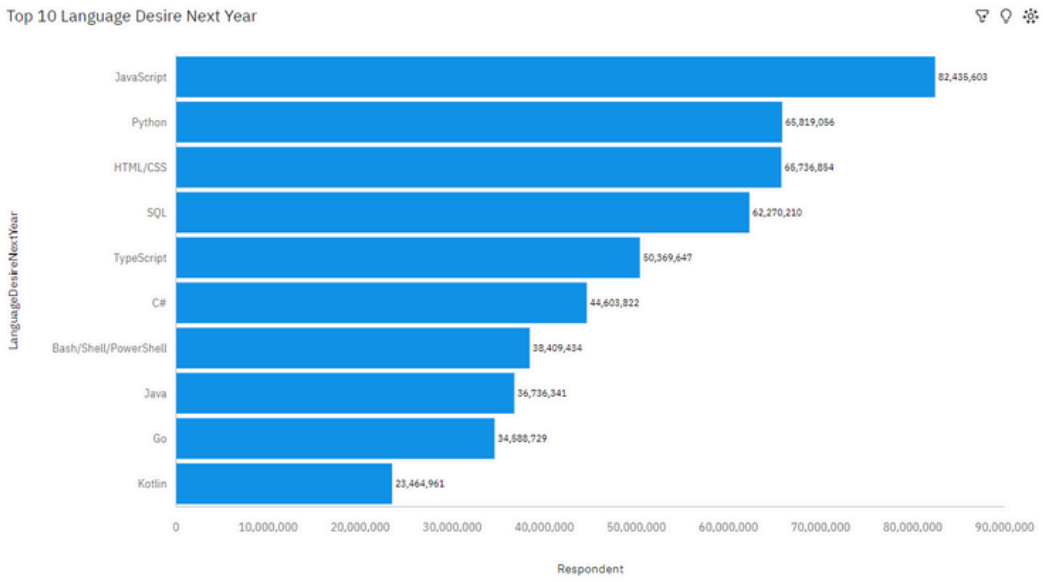
The results I got here is the three dashboard tabs of programming language trends, database trends and demographic trends. Visualizations are given for better understanding. After that will be the discussion of findings and implications.

4.1. PROGRAMMING LANGUAGE TRENDS

CURRENT YEAR



NEXT YEAR



4.2. PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

Current trends:

- HTML/CSS and SQL are the most widely used programming languages, with 97,521,608 and 88,712,115 respondents respectively. This highlights their foundational role in web development and database management.
- Bash/Shell/PowerShell and Python also show strong usage, with over 56 million respondents each. These languages are critical in automation, scripting, and data science.
- Java and C# continue to be relevant, especially in enterprise-level applications, with around 55 million users each.

Future trends:

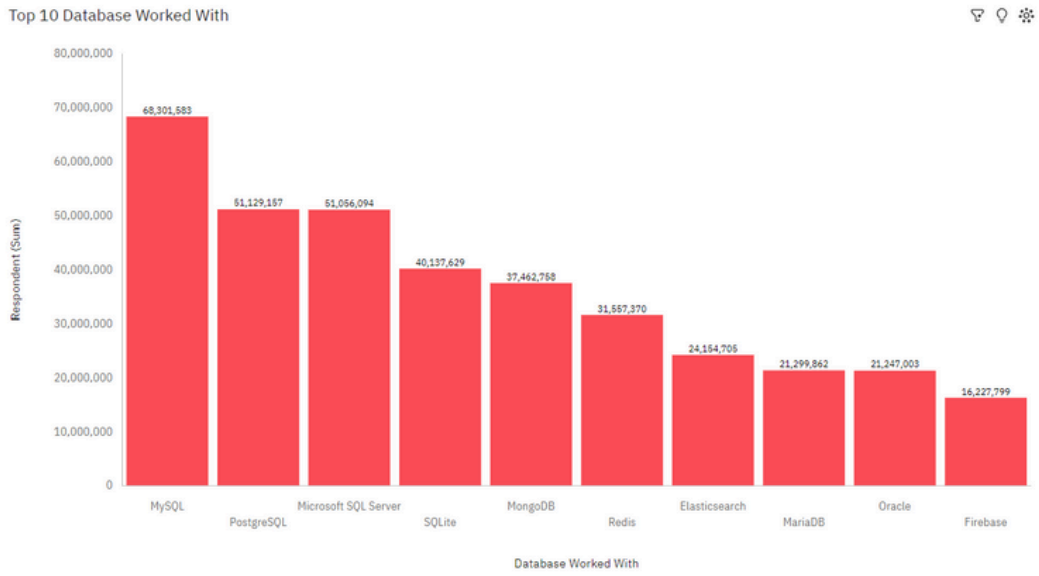
- JavaScript is the most desired language for the future, with 82,435,603 respondents expressing interest. This indicates a strong shift towards front-end and full-stack development.
- Python remains a significant contender for future usage, closely following JavaScript, signaling its continued importance in data science, machine learning, and general-purpose programming.
- TypeScript and Go are emerging as languages of interest, with 50,369,647 and 34,588,729 respondents respectively, showing a growing trend towards type-safe and scalable applications.

IMPLICATIONS

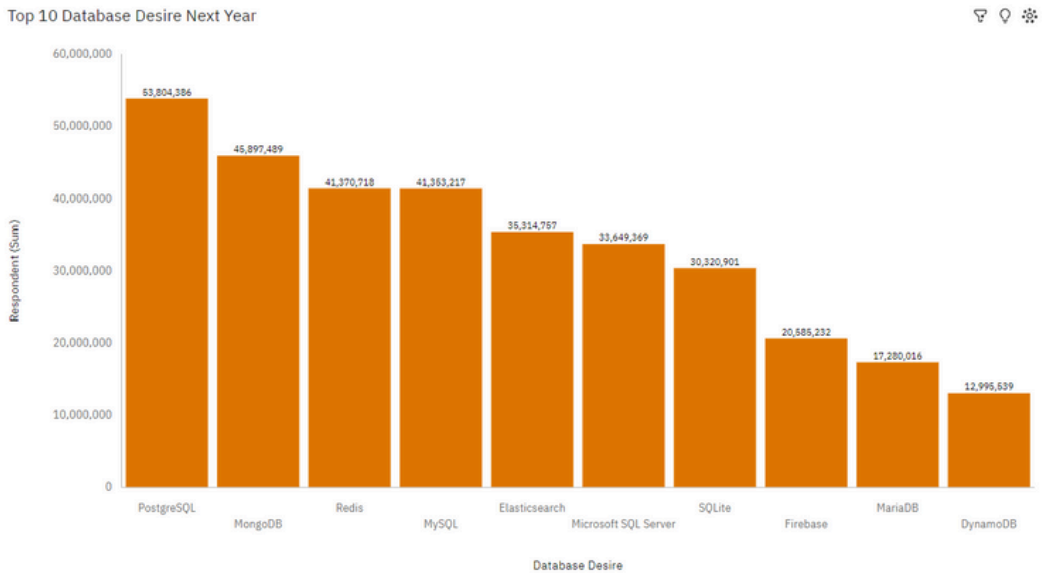
- Organizations should continue investing in HTML/CSS and SQL expertise, as they remain core to most web and database applications.
- The continued relevance of Java and C# indicates a need to maintain a strong talent pool in these languages, particularly for enterprise-level solutions and legacy systems.
- Go's rising popularity highlights the need for efficient, concurrent applications. Adopting Go for backend services and cloud-native applications could provide performance and scalability benefits.

4.3. DATABASE TRENDS

CURRENT YEAR



NEXT YEAR



4.4. DATABASE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

Current trends:

- MySQL is the most widely used database, with 68,301,583 respondents indicating it as their database of choice. This reflects MySQL's dominance in web applications and its strong community support.
- PostgreSQL and Microsoft SQL Server also have significant usage, with 51,129,157 and 51,056,094 respondents, respectively. PostgreSQL is known for its advanced features, while Microsoft SQL Server is popular in enterprise environments.

Future trends:

- PostgreSQL is projected to become even more popular, with 53,804,386 respondents expressing a desire to work with it in the future. This suggests growing recognition of its robustness and feature set.
- MongoDB and Redis show a significant increase in future desirability, with 45,897,489 and 41,370,718 respondents, respectively. This indicates a shift towards NoSQL databases for handling large, unstructured data and caching.

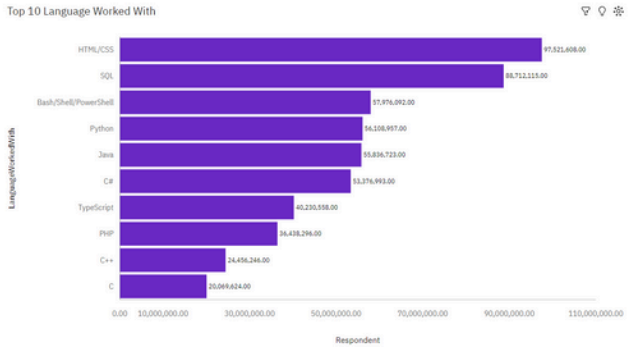
IMPLICATIONS

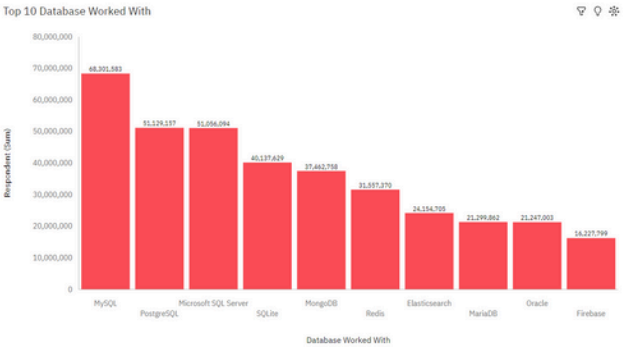
- Organizations currently relying on MySQL should continue leveraging its strengths but should also explore PostgreSQL for its advanced features, particularly if they require scalability and complex queries.
- To meet future demands, companies should focus on upskilling their database administrators and developers in PostgreSQL, MongoDB, and Redis. This will ensure they can leverage the most powerful features of these databases.
- The growth in interest for Redis as a caching solution highlights the importance of optimizing application performance. Companies should evaluate their current caching strategies and consider integrating Redis to improve response times.

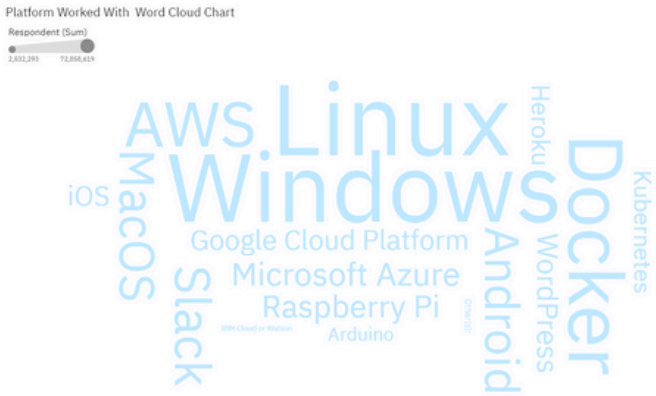
4.5. DASHBOARD

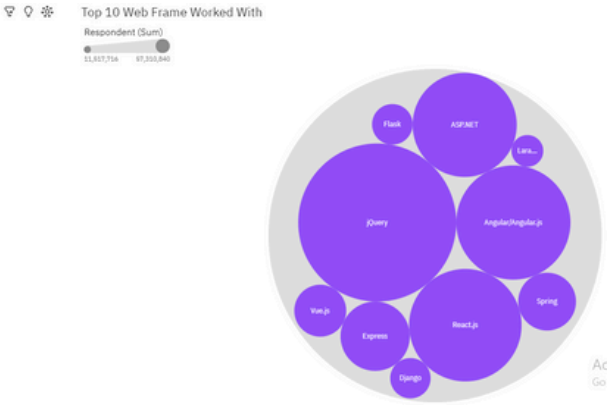
LINK OF THE COGNOS DASHBOARD GOES HERE

4.6. DASHBOARD TAB1

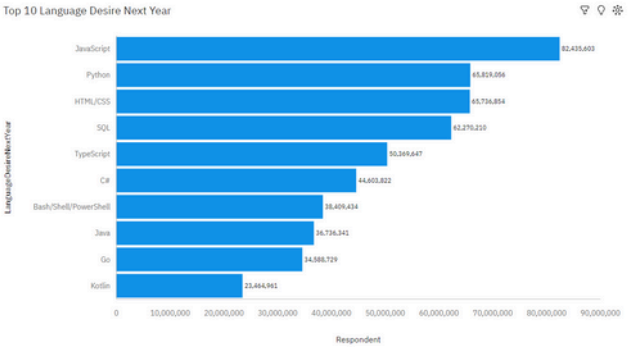


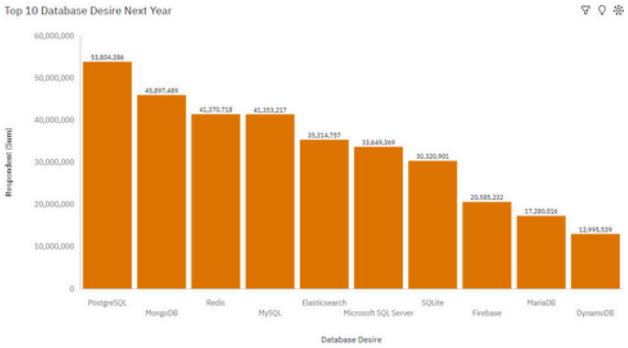


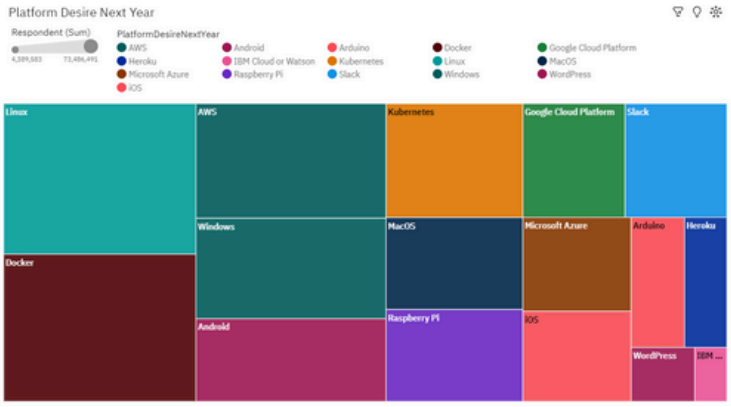


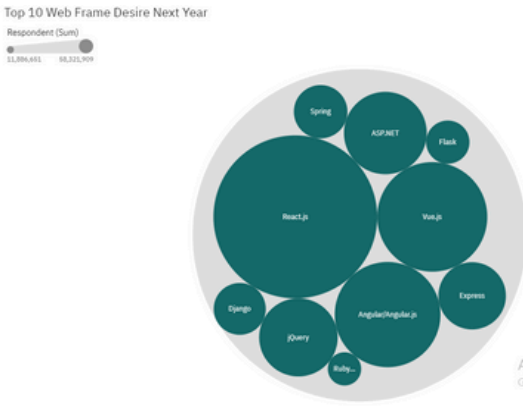


4.7. DASHBOARD TAB2

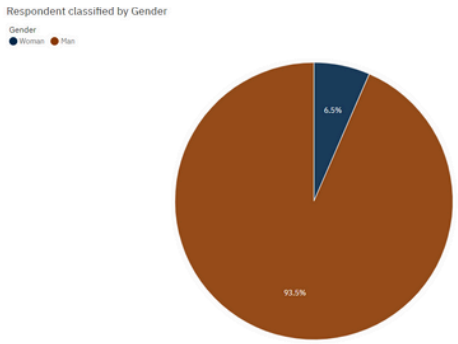


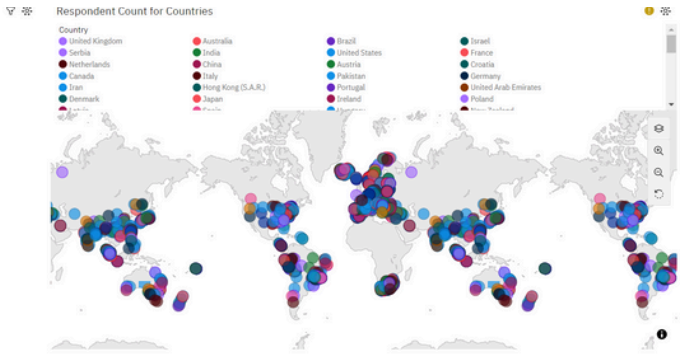


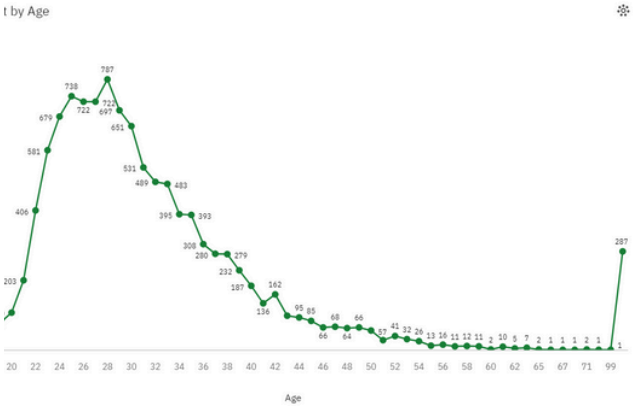


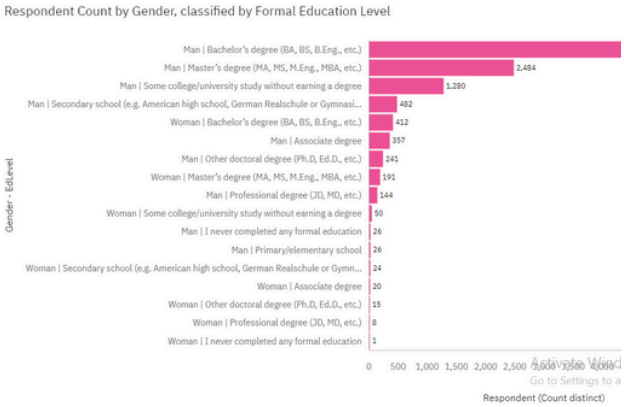


4.8. DASHBOARD TAB3









5. DISCUSSION

With all these analysis there are some findings and implications be given below for further discussion

5.1. OVERALL FINDINGS & IMPLICATIONS

Findings:

Dominance of MySQL in Current Usage:

- MySQL is the most widely used database, reflecting its significant presence in web applications and open-source projects. This dominance suggests that MySQL has become a default choice for many developers and organizations, particularly for applications where licensing costs and ease of use are critical considerations.

Rise of PostgreSQL:

- PostgreSQL is showing strong usage currently and is projected to gain even more traction in the future. The database's advanced feature set, including support for complex queries and data integrity, makes it increasingly attractive for applications requiring high reliability and scalability.

JavaScript and Python's Continued Relevance:

- JavaScript remains the most desired language for future use, reflecting its essential role in front-end development. Python's strong position both in current and future trends highlights its versatility and importance in data science, automation, and web development.

Implications:

Strategic Investment in Database Technologies:

- Organizations currently using MySQL should consider evaluating PostgreSQL for new projects, especially those requiring robust data integrity and complex query support. As PostgreSQL continues to grow in popularity, it may become the preferred choice for enterprise-grade applications.

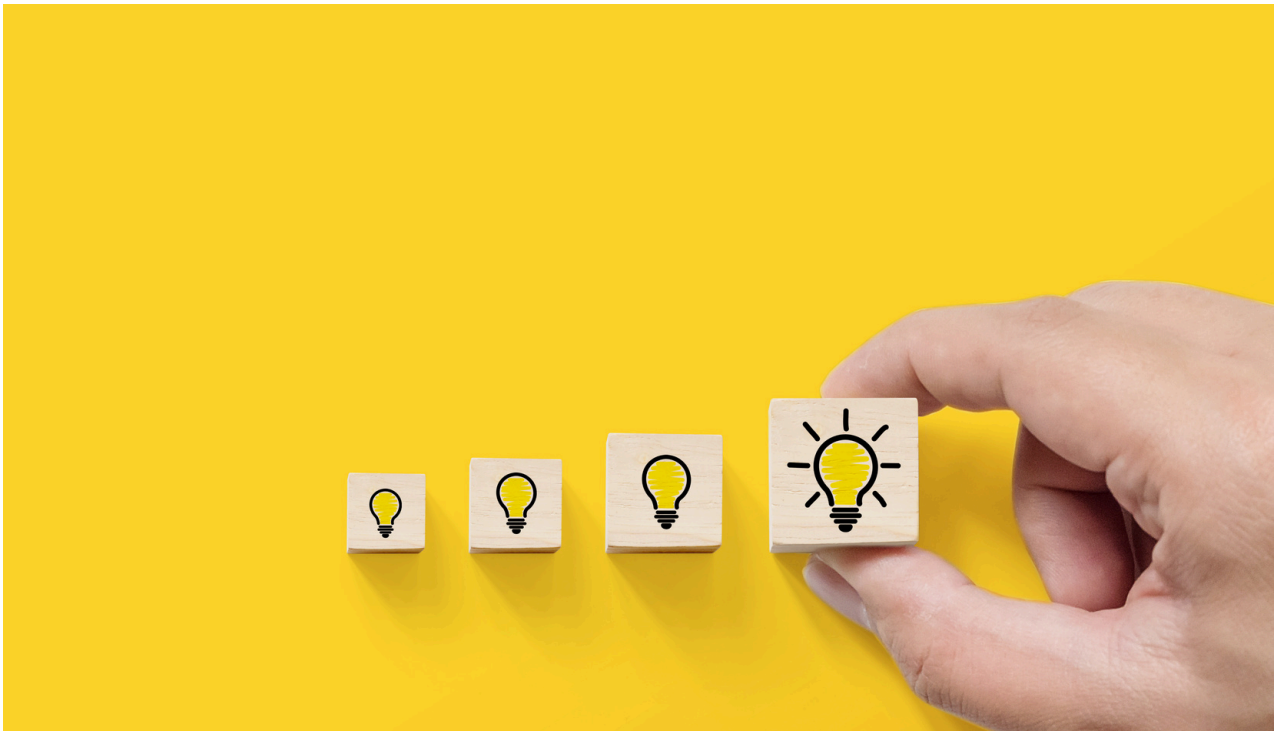
Focus on JavaScript and Python Proficiency:

- Given their continued relevance, businesses should ensure their teams are proficient in JavaScript and Python. This will not only support current project needs but also position the organization to take advantage of future developments in web and data-driven applications.

Database Training and Talent Development:

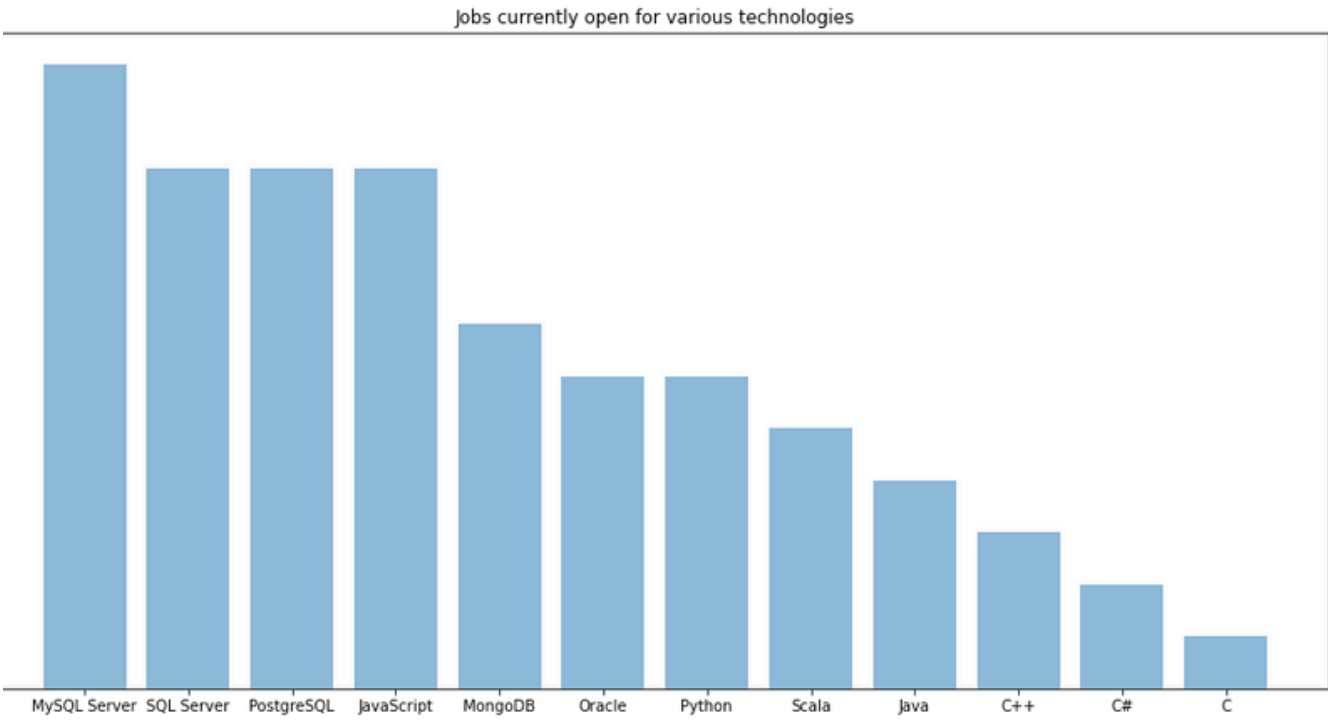
- With the growing complexity of database environments, it is essential for organizations to invest in training their database administrators and developers. Ensuring they are skilled in both traditional relational databases like PostgreSQL and newer NoSQL solutions will allow the organization to choose the best tool for each job, maximizing efficiency and performance.

6. CONCLUSION



The analysis of current and future trends in databases and programming languages reveals critical insights for strategic planning in technology adoption and talent development. By aligning with these trends, organizations can ensure they are well-prepared to meet the evolving demands of the industry and maintain a competitive edge.

7. JOB POSTINGS



8. POPULAR LANGUAGES