# Evaluation of Software Technologies

Current Usage and Future Trend

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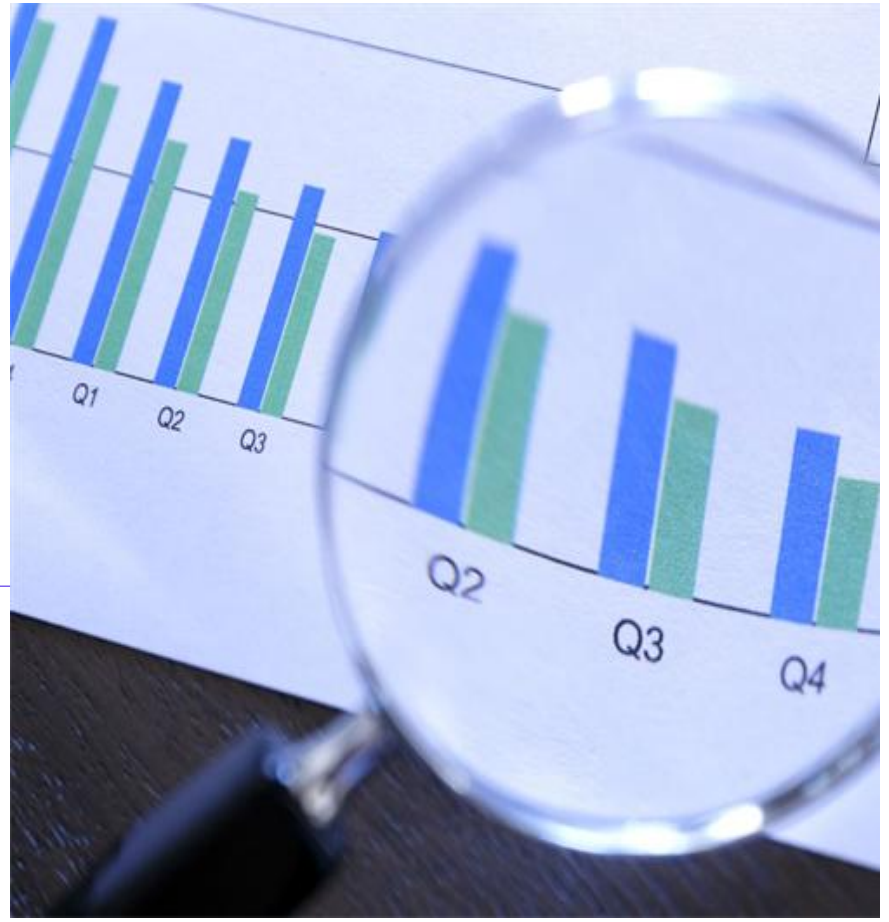


# OUTLINE

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

# EXECUTIVE SUMMARY

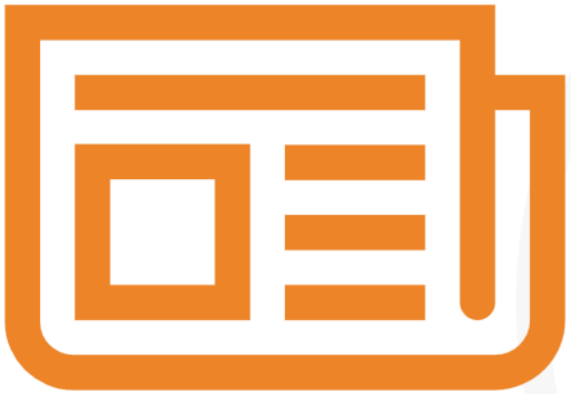
The report provides a comprehensive view of how current trends in programming languages, databases and technology platforms are transforming the software landscape.

- Key findings
  - Web based languages continue to be the most used and most desired: HTML, CSS, and JavaScript, TypeScript
  - Enduring Demand for SQL and C#
  - Shift Towards Flexible and Scalable: PostgreSQL and MongoDB
  - Redis as a Key Performance Optimizer
  - Python’s Dominance in AI, Data Science and Automation
  - Use of Hybrid Database Solutions: MySQL, PostgreSQ

# INTRODUCTION

- This report explores the current usage and future demands of these technologies, offering insights into how they are evolving, what the future holds, and the demographics involved.
- By understanding these trends, businesses and organizations, software developers, and educational institutions and trainers can better prepare for the future and leverage emerging technologies to stay competitive in an increasingly digital world.
- This report creates value by ensuring informed decision making, career and skill development, and strategic technology planning.

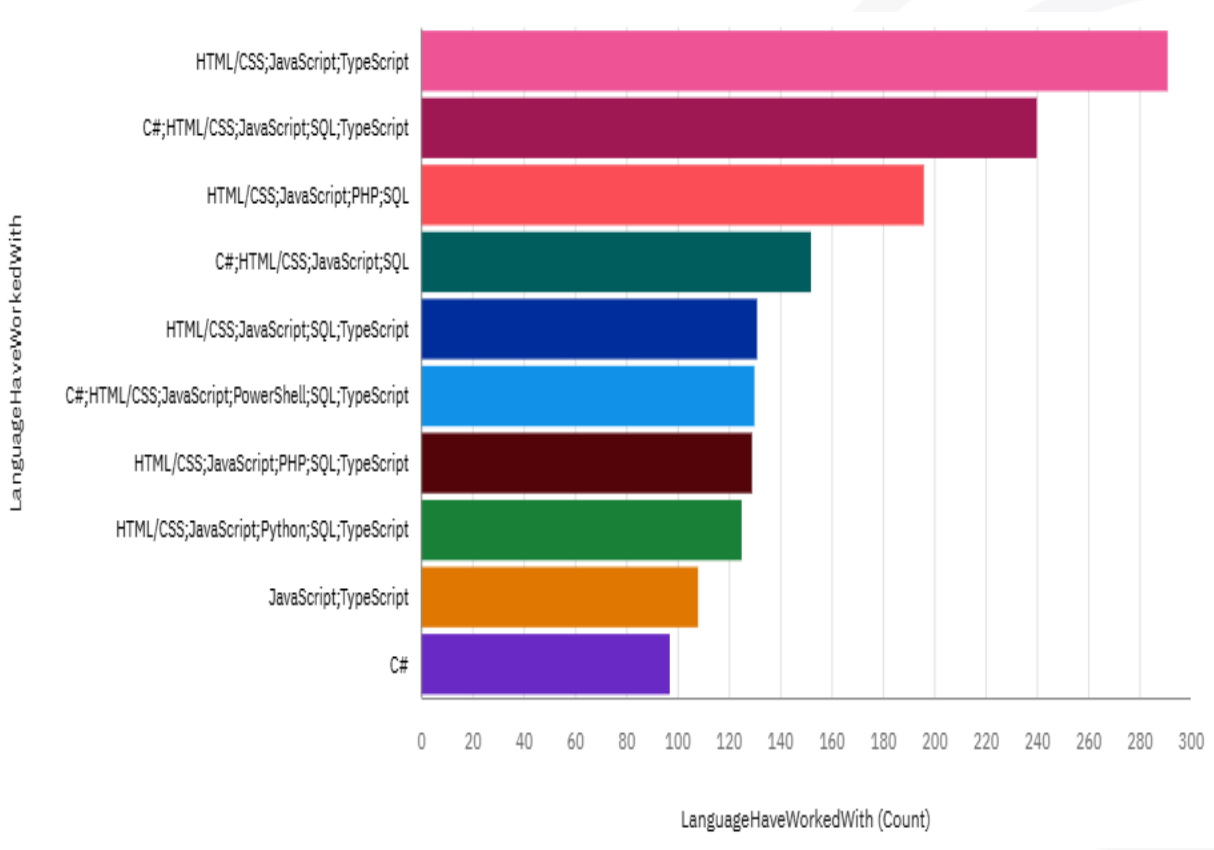
# METHODOLOGY



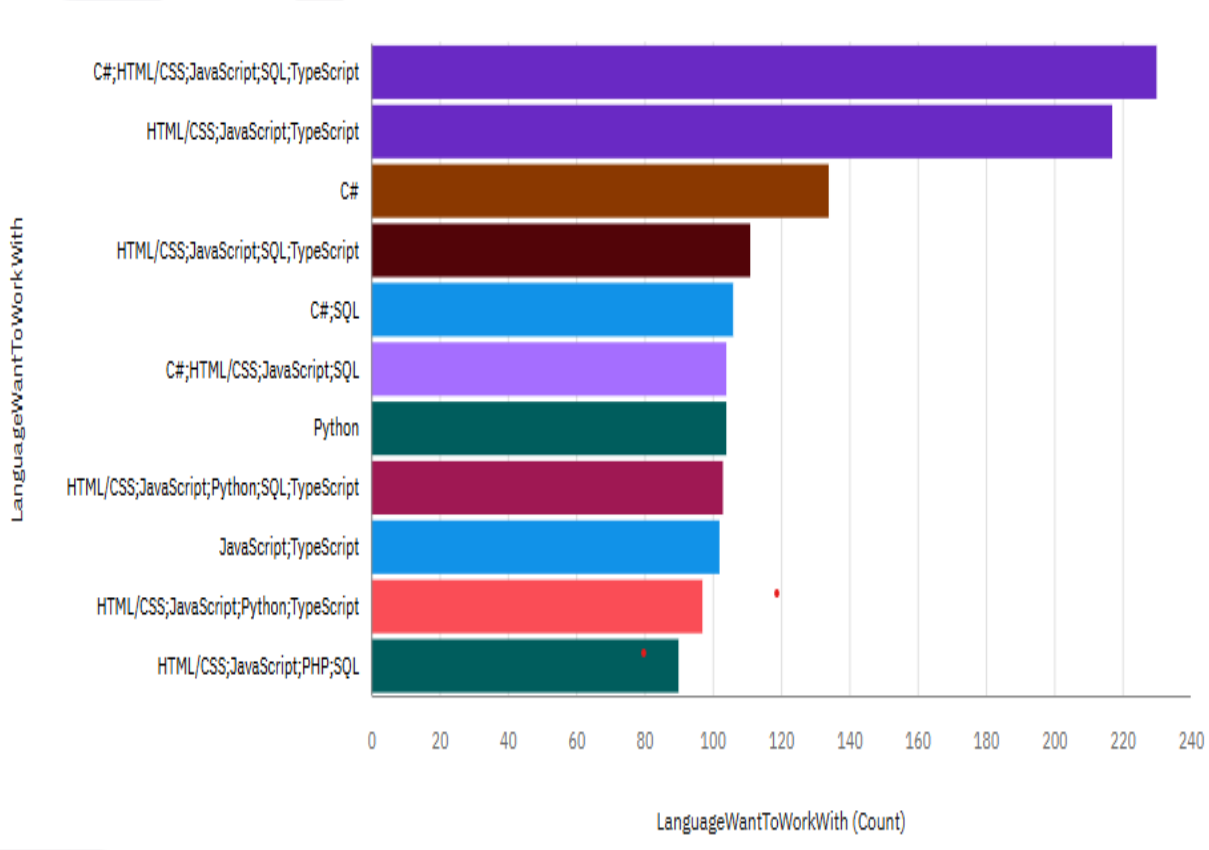
- Data collection methods:
  - Collected Stack Overflow survey data with 65,437 responses and 114 variables using web scraping techniques. Respondents provided details on their work experience, preferred technologies, and future interests.
- Data wrangling tasks:
  - Handled duplicates, identified and addressed missing values, normalized the data
- Exploratory data analysis:
  - Examined distribution of responses, performed visualization and identified significant patterns, such as correlations, missing data and outliers.
- Data visualization:
  - Created various plots, such as Histograms, pie charts, bar charts, etc. to highlight trends
- Dashboard:
  - Developed Interactive dashboards with IBM Cognos Analytics including the plots and charts

# Top 10 PROGRAMMING LANGUAGE TRENDS

## Current Year




## Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

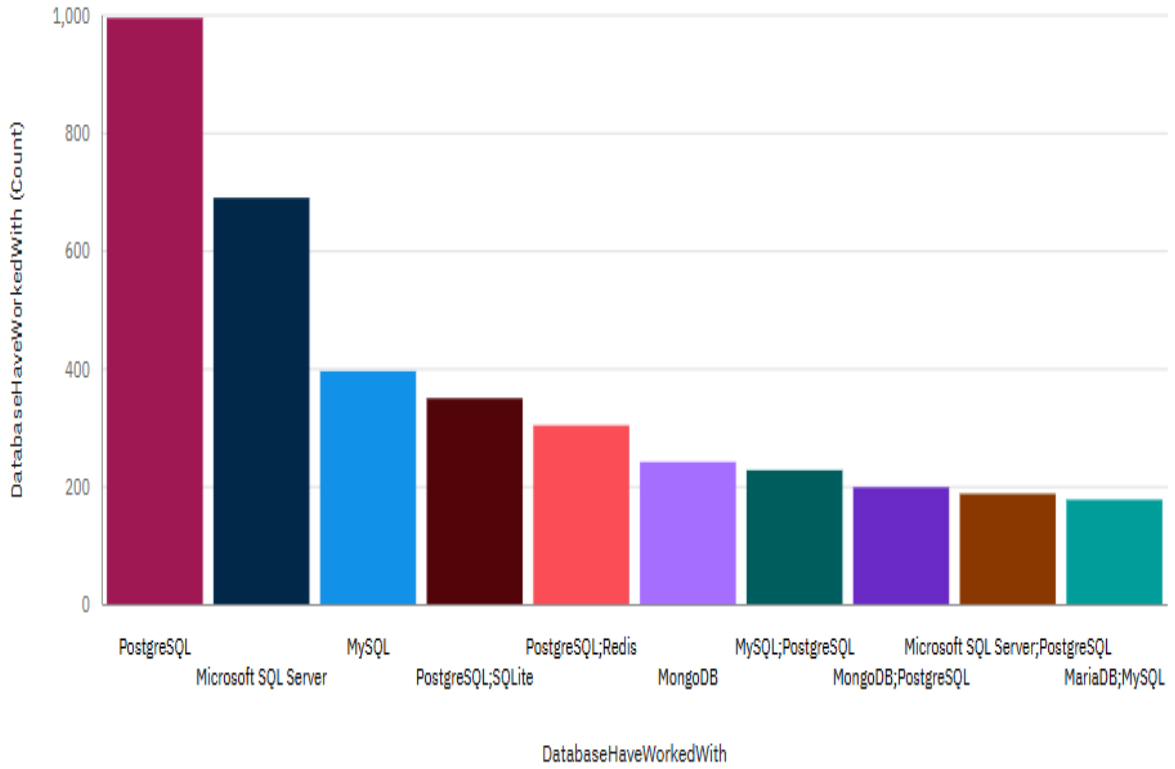
- HTML, CSS, C#, JavaScript are identified as the most popular languages, indicating a strong demand for web development skills.
- SQL and TypeScript are also highly desired, suggesting a growing need for database management and modern JavaScript tools for enhanced tooling and type safety.
- Python continues to see immense popularity and growth, with its widespread use in data science, machine learning, web development, and automation.
- Despite criticisms regarding its perceived outdated nature, PHP remains highly popular, especially for server-side web development.

## Implications

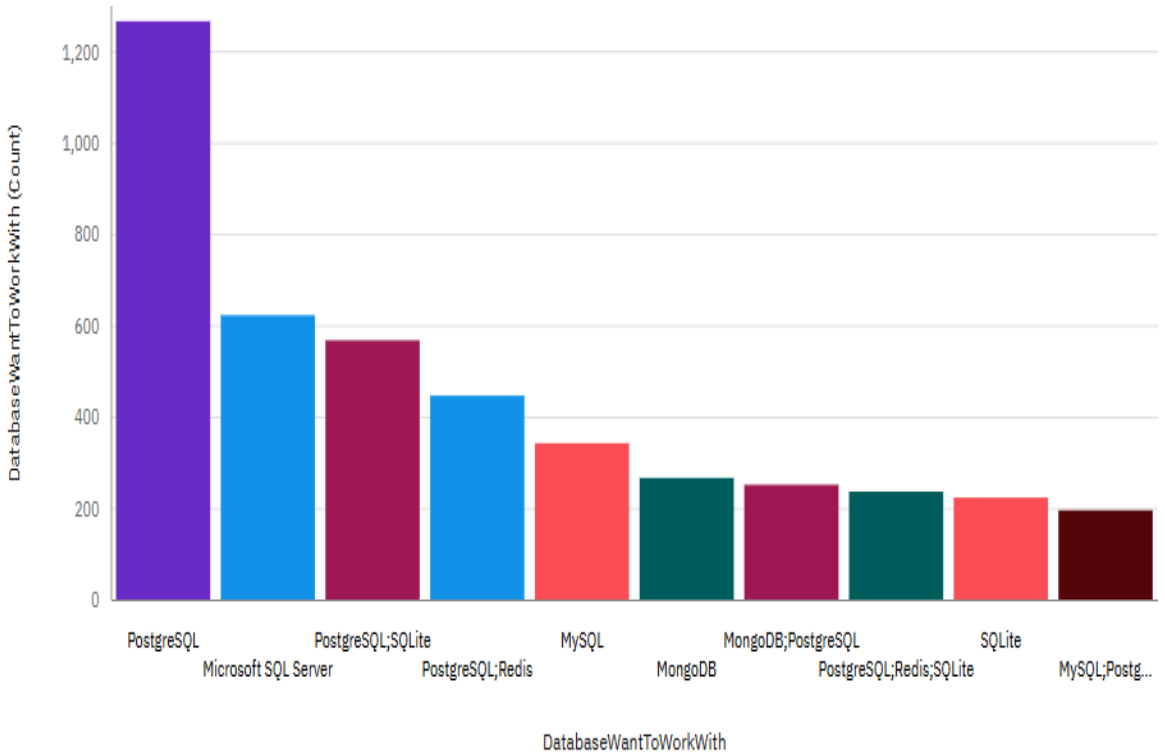
- For individuals aiming to stay competitive in the job market, focusing on web development languages (HTML, CSS, JavaScript, and C#) and database management skills (SQL) will be essential.
- Developers should consider learning TypeScript alongside JavaScript, as it helps improve code quality and maintainability in larger applications
- For educational institutions and training programs, offering courses that cover a wide range of these in-demand languages would be beneficial.
- Developers should focus on learning best practices for writing clean, efficient code and managing databases effectively to align with industry trends.

# Top 10 DATABASE TRENDS

## Current Year




## Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- The databases like MariaDB, Microsoft SQL Server, MongoDB, PostgreSQL, MySQL continue to be dominant choice and gaining popularity.
- Microsoft SQL Server, a preferred choice for businesses already committed to Microsoft infrastructure.
- MongoDB, a NoSQL database, for handling unstructured data and applications requiring flexibility in the data schema.
- MySQL, one of the most popular open-source relational databases while MariaDB, a drop-in replacement for MySQL, offering enhanced features, performance, and scalability.
- PostgreSQL has emerged as one of the most powerful and advanced open-source relational databases
- Redis, in-memory data structure stores, known for speed and efficiency.

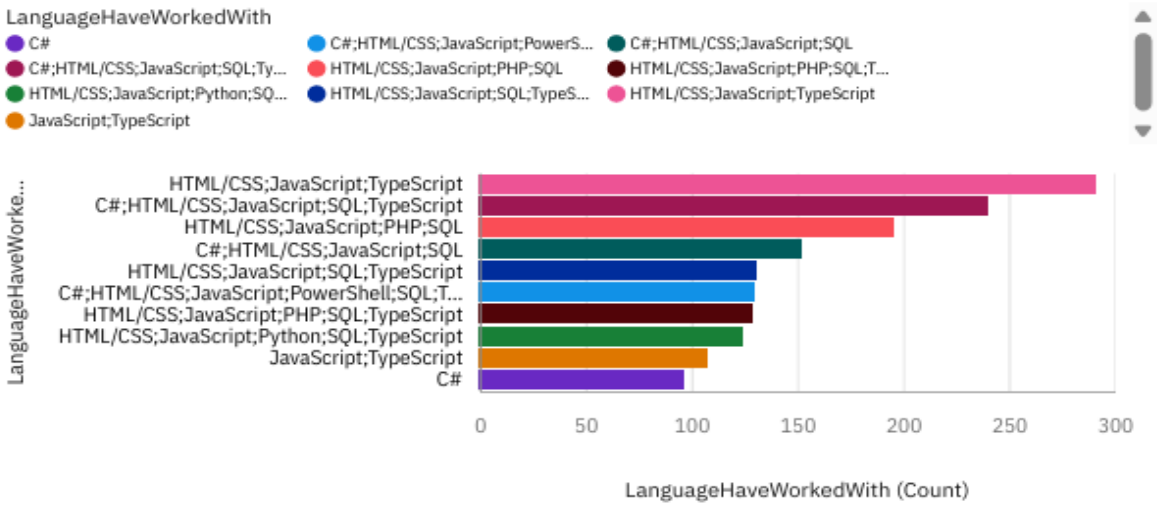
## Implications

- The popularity and demand of these databases have high implications on the learners, trainers, developers and the organizations on this business.
- Continue with MariaDB for a more community-driven, open-source database solution and for flexibility in handling unstructured or semi-structured data.
- Microsoft SQL Server is the go-to choice for large enterprises relying on Microsoft technologies.
- PostgreSQL should be adopted for high-transactional systems and applications that require complex queries, data integrity, and high availability
- MySQL remains a strong option for applications that prioritize simplicity, performance, and cost-effectiveness.

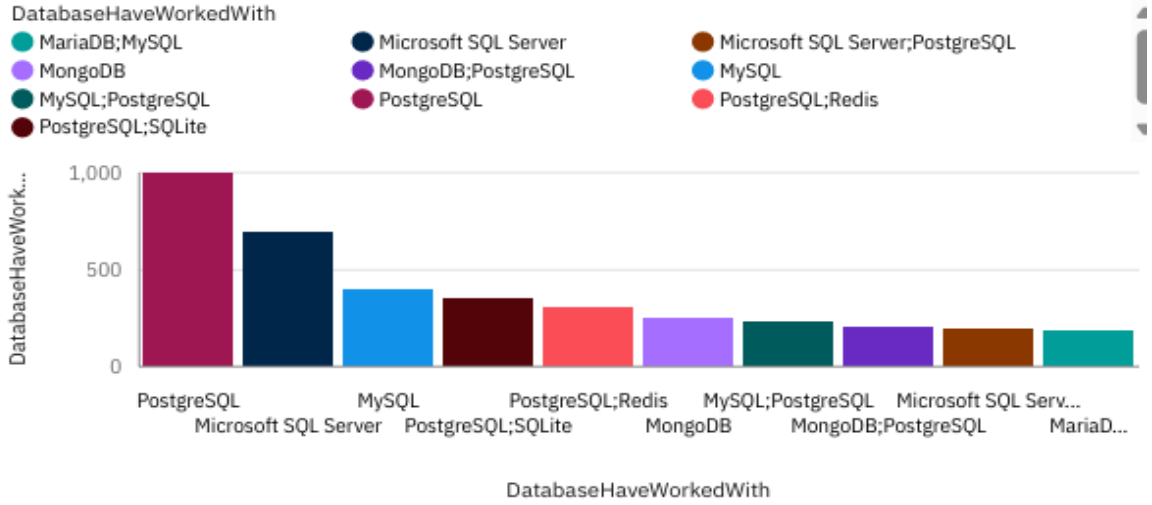
# DASHBOARD

Dashboards are prepared using IBM Cognos Analytics and are presented in the following slides

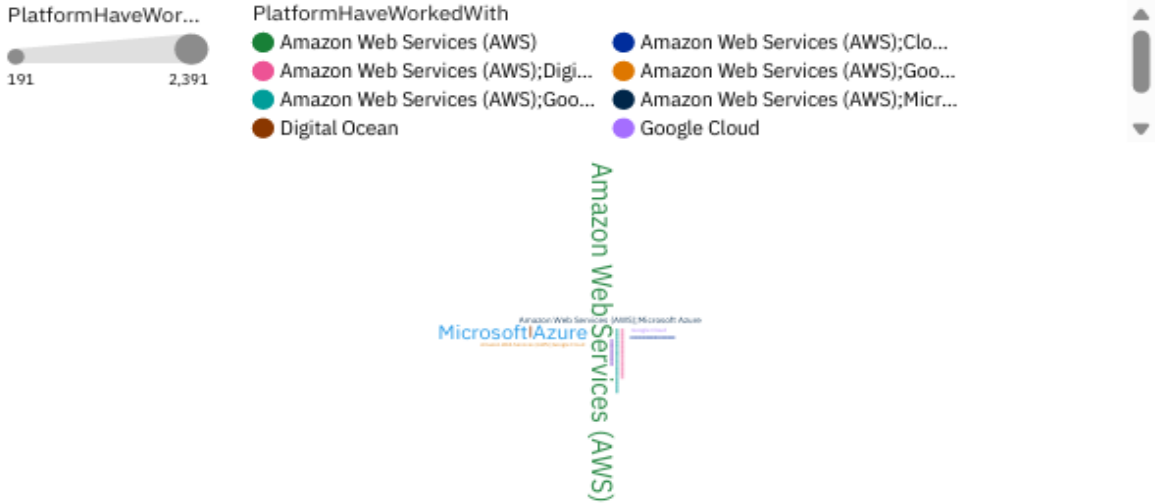
## Top 10 Language experiences



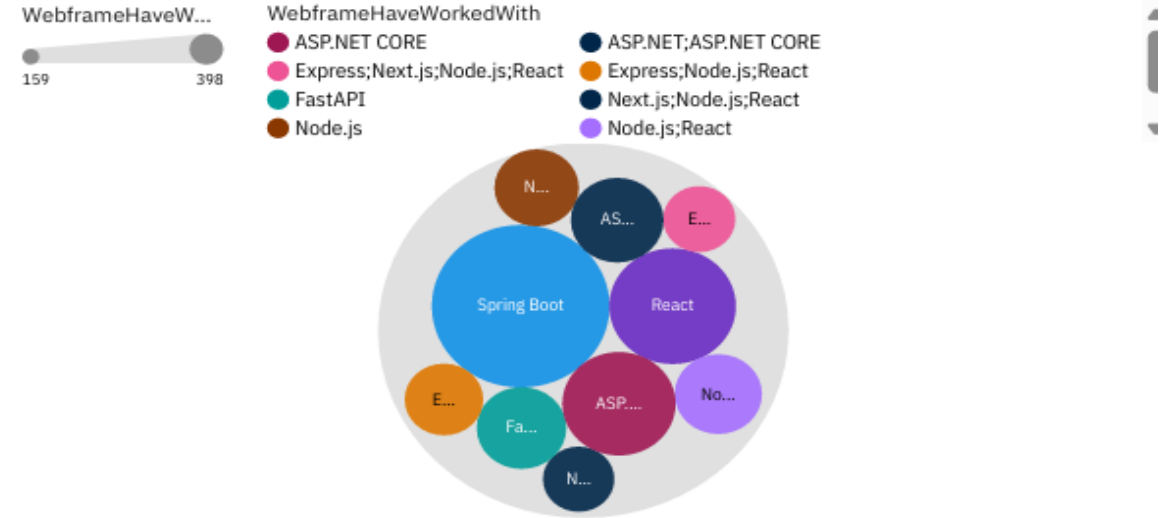

## Top 10 Database Experiences



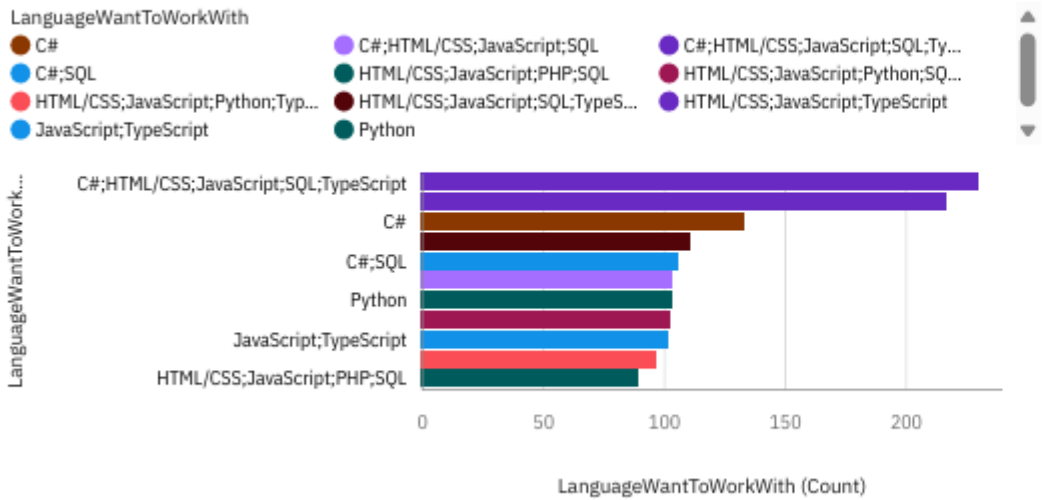

## Top 10 Platform Experiences



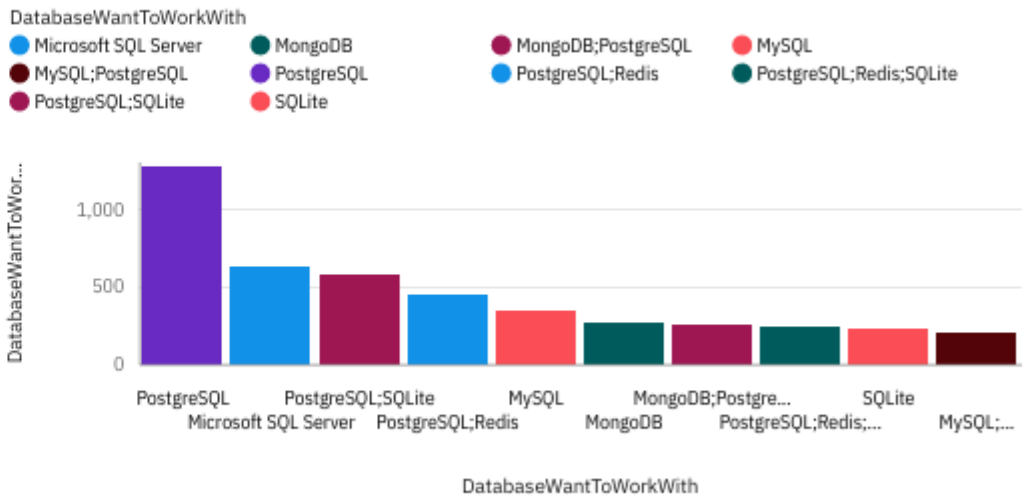

## Top 10 Webframe Experiences



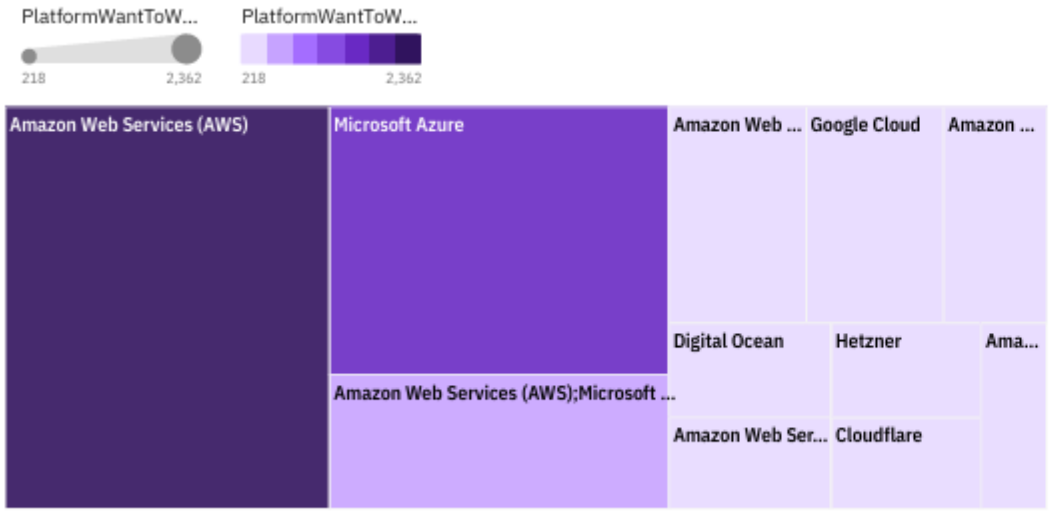
## Top 10 Languages Respondents Want To Work With



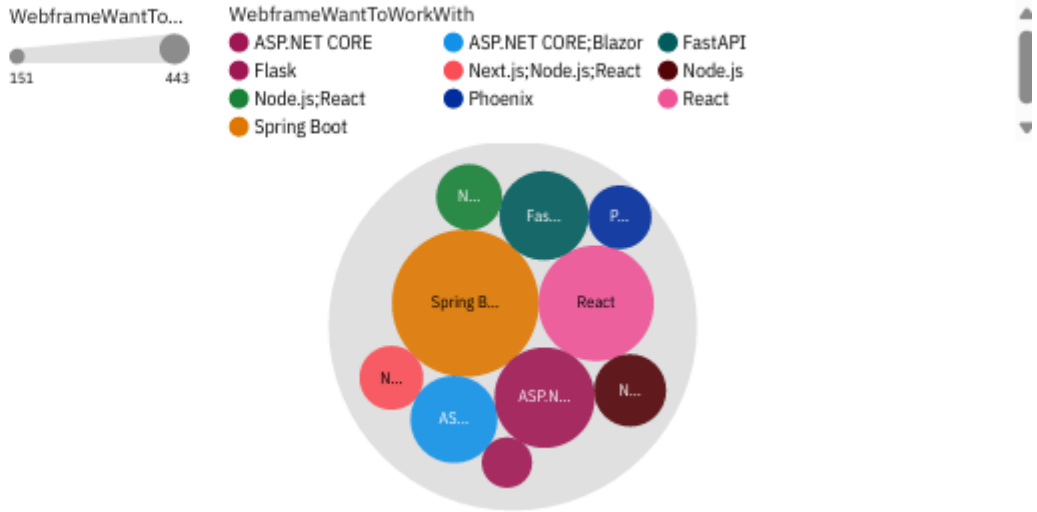

## Top 10 Databases Respondents Want To Work With



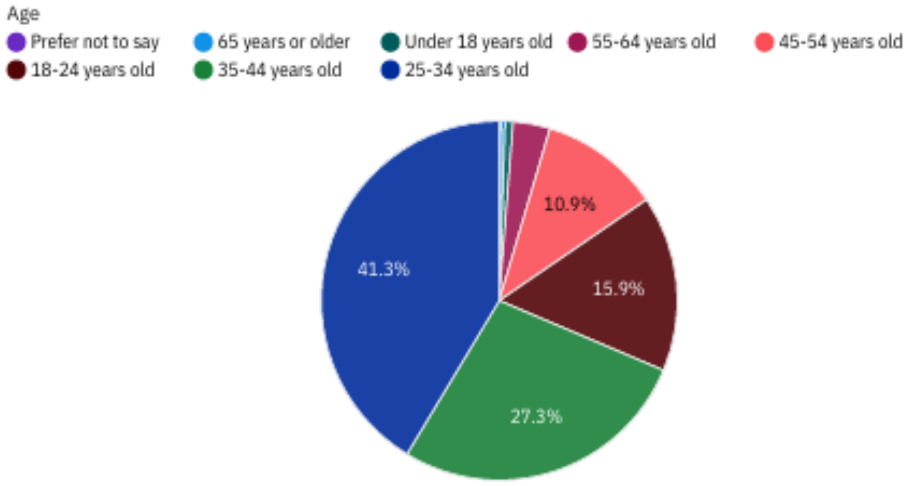

## Top 10 Platforms Respondents Want To Work With



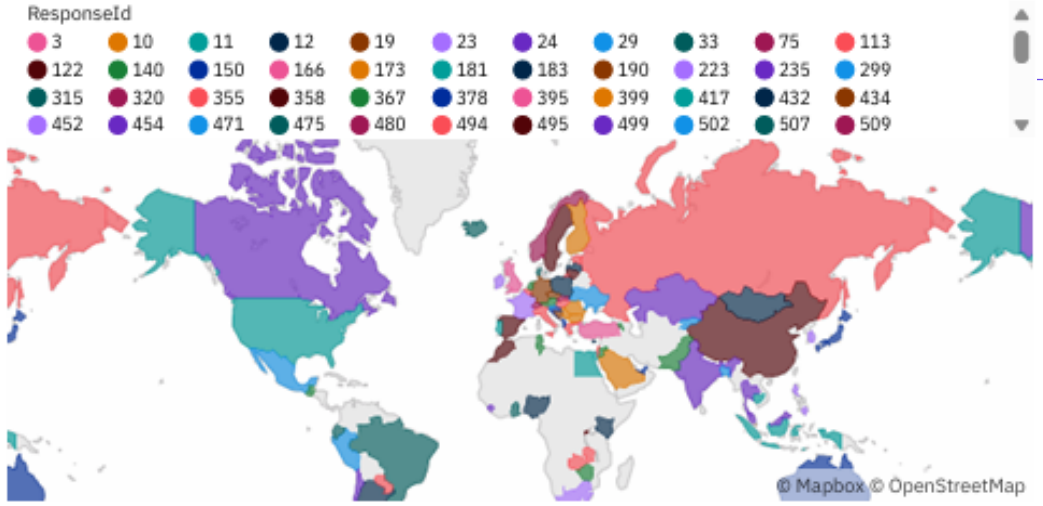

## Top 10 Webframe Respondents Want To Work With



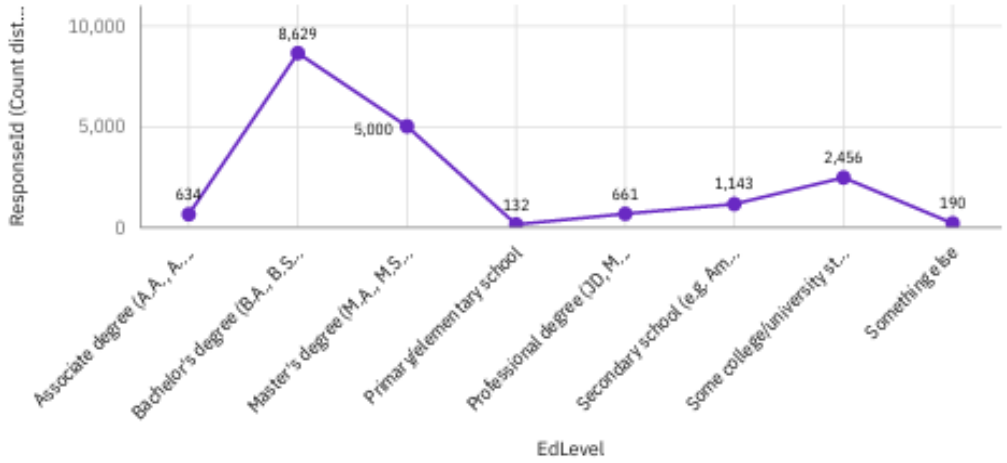
## Respondent distribution by Age



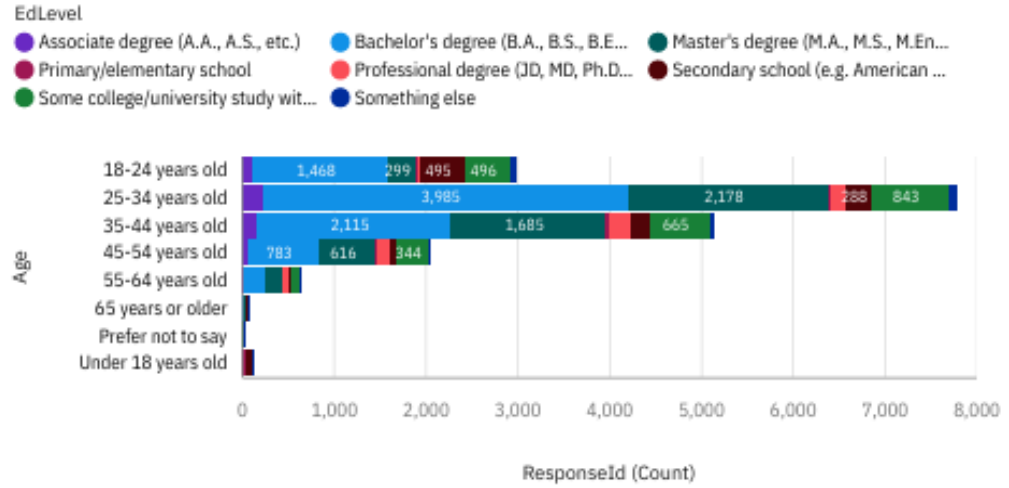

## Respondents Count by Country




## ResponseId by EdLevel




## Respondent Count by Age, classified by Education Level



# DISCUSSION

- **Programming Languages: HTML, CSS, JavaScript, C#, SQL, TypeScript, Python, PHP**
- **Databases: MariaDB, Microsoft SQL Server, MongoDB, PostgreSQL, MySQL, Redis, SQLite**

The trends in both programming languages and databases reflect a broader movement towards flexibility, scalability, and maintainability. The increasing shift towards TypeScript, MongoDB, and PostgreSQL highlights the growing need for developers and companies to adopt technologies that can handle the demands of modern, data-driven applications. Meanwhile, traditional technologies like C#, MySQL, and SQL Server continue to hold significant value, particularly in legacy systems and large enterprises.

# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Programming Languages: HTML, CSS, JavaScript, C#, SQL, and TypeScript dominate the development landscape.
- Databases: MariaDB, Microsoft SQL Server, MongoDB, PostgreSQL, and MySQL are the top databases in use today.
- Redis is gaining popularity as a high-performance, in-memory data store and cache.
- Technologies: Python continues to be a dominant language, particularly in data science, machine learning, and automation.
- PHP, although often criticized, remains highly relevant, especially in content-driven websites.

## Implications

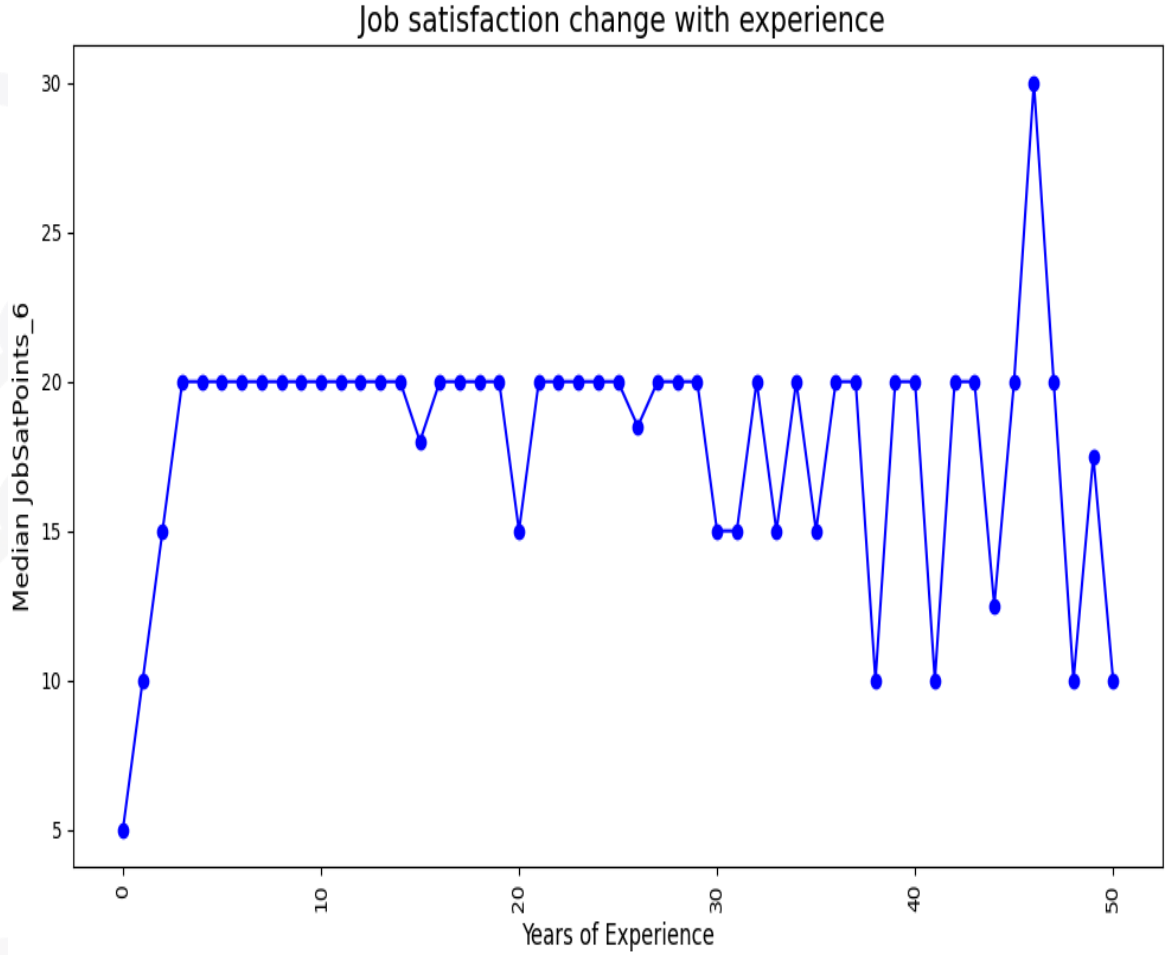
- Developers should aim for database specialization in areas like SQL, PostgreSQL, MongoDB, or Redis, depending on the specific use case, expand Skills in Python and other programming languages like HTML, CSS, JavaScript, C#, SQL, and TypeScript
- Businesses and Organizations should embrace Hybrid Database Solutions using relational databases (e.g., PostgreSQL, MySQL) and NoSQL databases (e.g., MongoDB), Real-Time Data and Caching with Redis,
- Educational Institutions and Training Programs should focus on In-Demand Languages and Frameworks, Database and Cloud Technology Training

# CONCLUSION

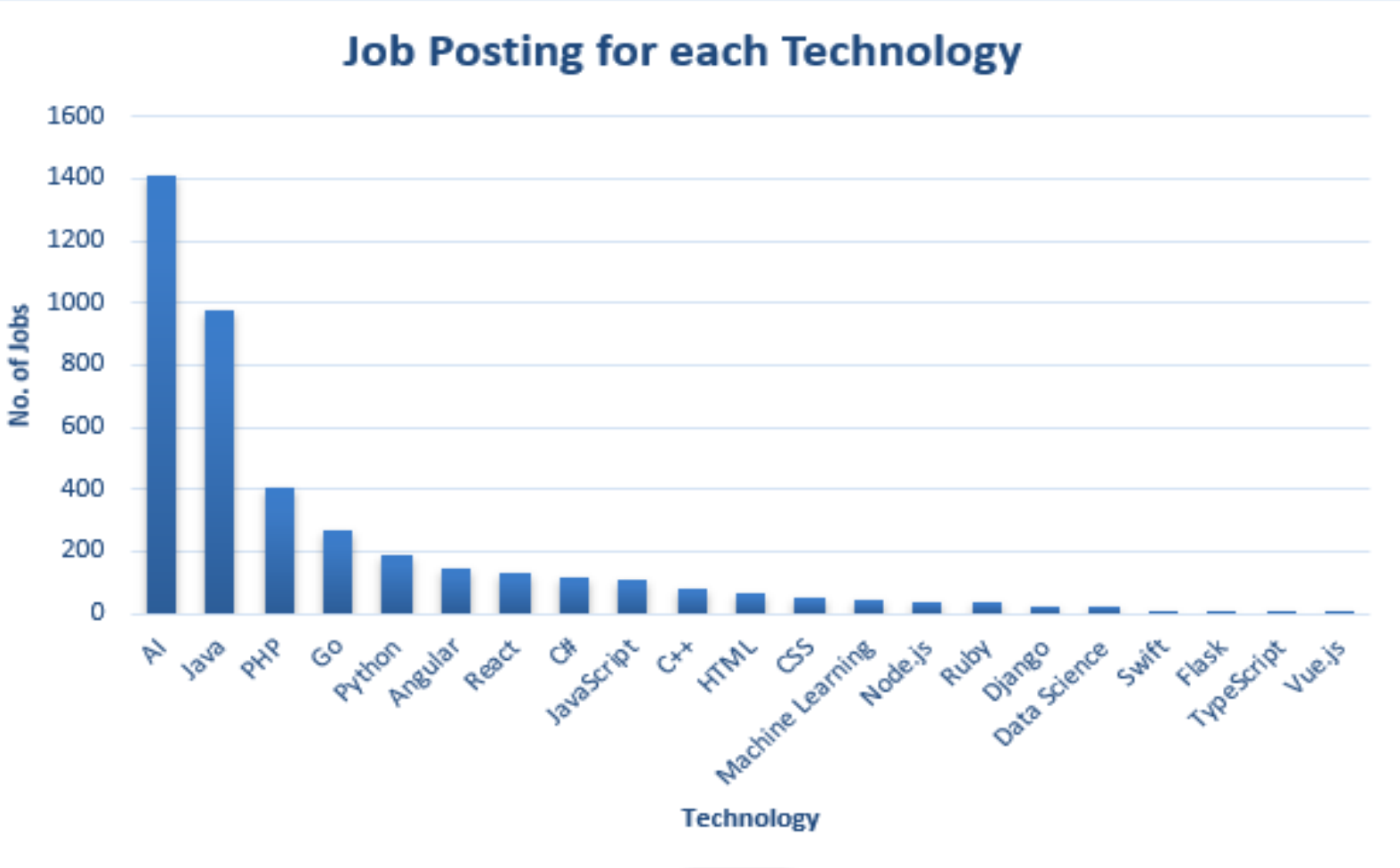
The ongoing popularity of languages like HTML, CSS, JavaScript, Python, C#, and PHP, alongside the increasing adoption of databases such as MariaDB, PostgreSQL, MongoDB, MySQL, and Redis, reflects the growing diversity and specialization in modern software development. For businesses, staying ahead of technological trends and maintaining a flexible, scalable architecture will be crucial for success. For developers, gaining expertise in both foundational technologies and emerging tools will provide long-term career benefits. Educational institutions also play a key role in preparing future talent by focusing on both the core principles and modern innovations in the tech landscape.

# APPENDIX


Median Yearly Compensation with work experience
Median Yearly Compensation ($)
140000
120000
100000
80000
60000
40000
20000
0
10
20
30
40
50
Years of Experience


Job satisfaction change with experience
Median JobSatPoints_6
30
25
20
15
10
5
0
10
20
30
40
50
Years of Experience

# JOB POSTINGS



# POPULAR LANGUAGES