

Data Speaks: Exploring Developer Tech Stack

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OUTLINE



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- Methodology
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 - Visualization – Charts
 - Dashboard
- Discussion
 - Findings & Implications
- Conclusion
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EXECUTIVE SUMMARY



- Staying Competitive in IT Industry
- Study Overview
 - Utilizes data analytics and spotlights present and projected trends in coding languages, databases, and tech areas
 - Analyzes the demographic characteristics of technology professionals
- Data Sources
 - Stack Overflow survey, IBM website
- Data Analysis Process
 - Collection -> Cleaning -> Exploratory analysis -> Visualization through dashboards
- Key Findings
 - Top programming languages in demand:
 - JavaScript, HTML/CSS, SQL, Typescript, Bash/Shell/PowerShell, Python
 - Top database skills in demand:
 - My SQL, Microsoft SQL Server, PostgreSQL, SQLite, MongoDB



INTRODUCTION








- This presentation analyzes current and future skill demands in programming languages, databases, platforms, and web frameworks using data analytics.
- Key questions explored:
 - Which programming languages are most in demand?
 - What are the top database skills sought?
 - Which IDEs and web frameworks are most popular?
- Audience: IT professionals, HR managers, and tech sector stakeholders.
- Goal: Highlight essential, future-proof IT skills in each domain.
- Let's explore the key findings.



METHODOLOGY



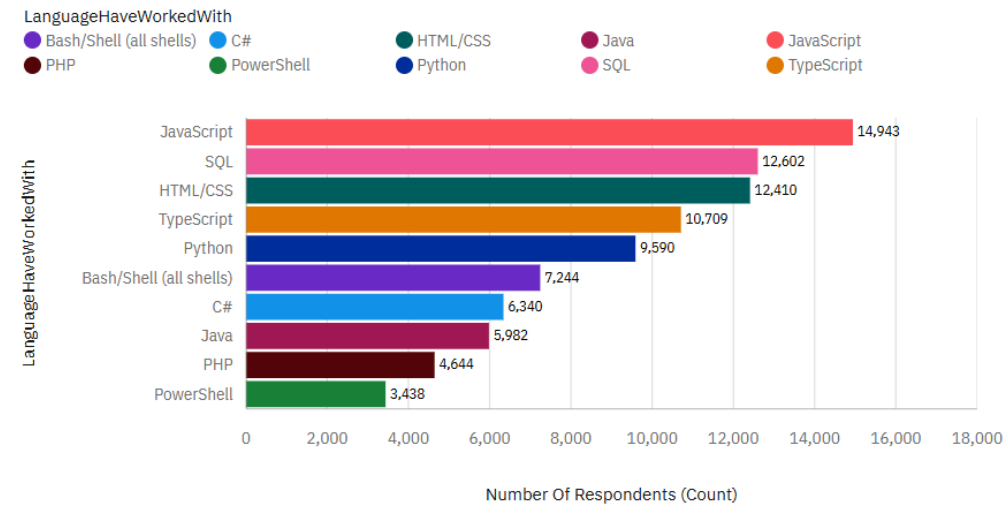
- Data Collection 
 - Collected survey and web data via web scraping and public APIs using Python's requests library.
- Data Wrangling 
 - Cleaned and structured the data by removing unnecessary separators and handling missing values (e.g., deletion or imputation based on defined criteria).
- Exploratory Data Analysis (EDA) 
 - Analyzed data distributions, addressed outliers, and identified key correlations between variables.
- Data Visualization 
 - Employed various visualization techniques to represent distributions, relationships, compositions, and comparisons within the dataset.
- Dashboard Development 
 - Built interactive dashboards to present insights in a clear, accessible, and user-friendly format.



PROGRAMMING LANGUAGE TRENDS

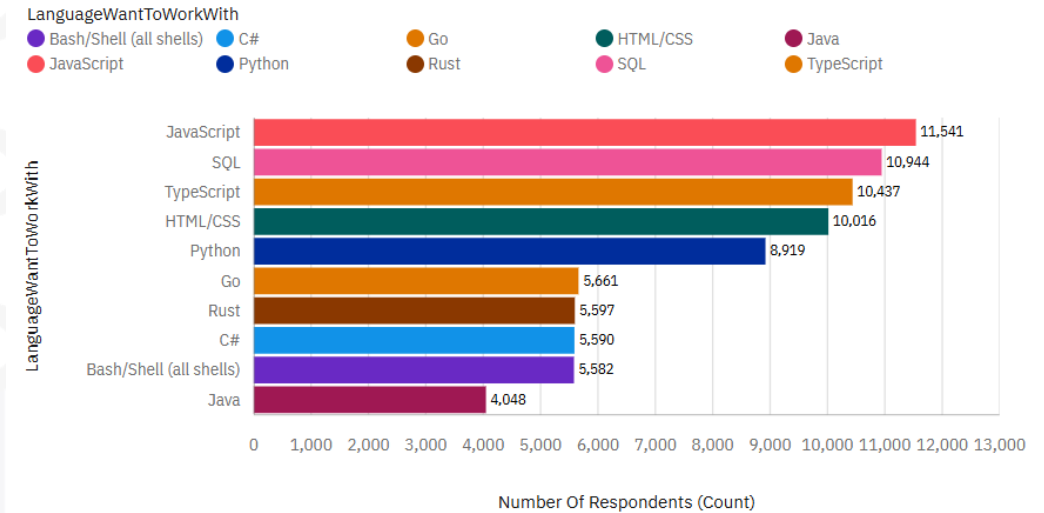
Current Year

Top 10 Language Have WorkedWith



Next Year

Top 10 Language WantTo WorkWith



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

Current Year - **Languages Worked With:**

- JavaScript, SQL, HTML/CSS, and TypeScript dominate usage.
- Python and Bash/Shell remain popular.

Next Year - **Languages Wanted to Work With:**

- JavaScript stays most desired.
- TypeScript gains popularity, moving up in interest.
- Go and Rust emerge as new languages of interest.
- Java sees decreased interest.

Implications

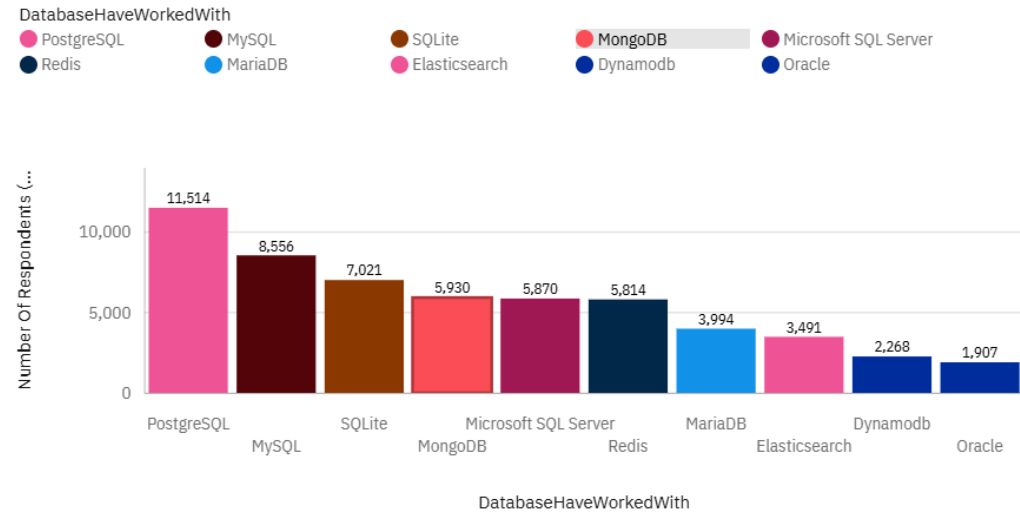
- The dominance of JavaScript and HTML/CSS underscores their essential role in modern web development; mastering them is crucial for developers.
- The widespread use of SQL highlights the vital importance of data management and querying across various software applications.
- The growing popularity of Python reflects its versatility and ease of use, attracting developers from fields like data science and software development.
- The rising interest in Go and Rust signals a trend towards modern, performance-oriented programming languages.
- A decline in interest for Java may indicate a gradual shift away from some traditional enterprise languages.
- Developers, recruiters, and educators should align skills development and hiring strategies with these evolving trends to stay competitive and future-ready.



DATABASE TRENDS

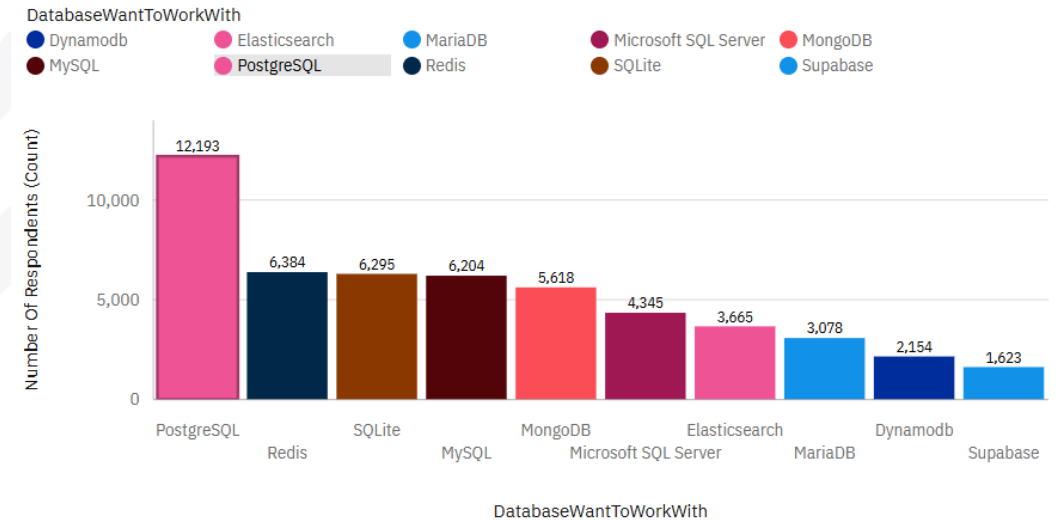
Current Year

Top 10 Database Have WorkedWith



Next Year

Top 10 Database Want To WorkWith



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

Current Year - **Database Worked With:**

- PostgreSQL is the most used database, followed by MySQL and SQLite.
- MongoDB, Microsoft SQL Server, and Redis also have significant usage.
- Emerging databases like Elasticsearch, DynamoDB, and Oracle have moderate adoption.

Next Year - **Database Wanted to Work With:**

- PostgreSQL is expected to remain the top choice, with even higher interest.
- SQLite and Redis show increased demand compared to current usage.
- MongoDB, MySQL, and Microsoft SQL Server continue to be popular choices.
- Cloud-native and NoSQL databases like DynamoDB maintain steady demand.

Implications

- The strong preference for PostgreSQL indicates a trend towards robust, open-source relational databases favored for their versatility and advanced features.
- Continued demand for SQLite and MySQL suggests their importance for lightweight and web-based applications.
- The growing interest in MongoDB and Redis reflects a shift towards NoSQL and in-memory databases that support scalability and performance.
- Adoption of Elasticsearch and DynamoDB highlights the importance of specialized databases in modern applications, including search and cloud-native environments.
- Database professionals and organizations should consider diversifying skills to include both traditional SQL and emerging NoSQL technologies to stay competitive.
- Businesses planning infrastructure upgrades should evaluate hybrid approaches to leverage the strengths of both relational and NoSQL databases.



DASHBOARD



You can find the dashboard link below:

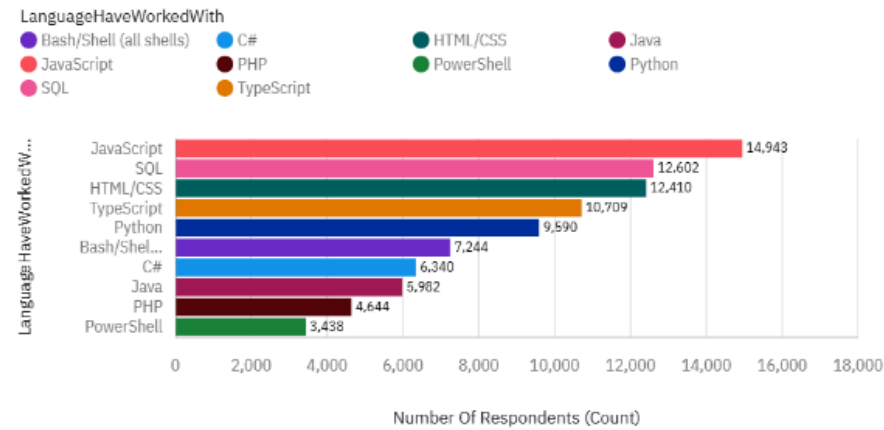
https://github.com/trushitr/CapstoneProject/blob/main/DashBoard/IBM_Capstone.pdf



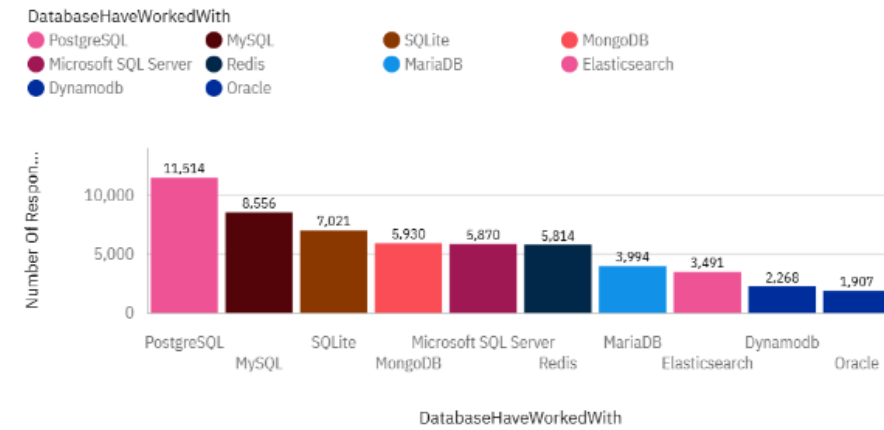
DASHBOARD TAB 1

Current Technology Usage

Top 10 LanguageHaveWorkedWith



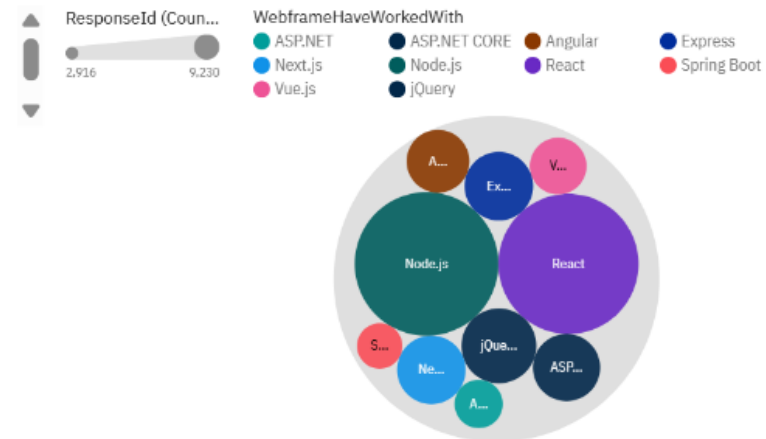
Top 10 DatabaseHaveWorkedWith



Top 10 PlatformHaveWorkedWith



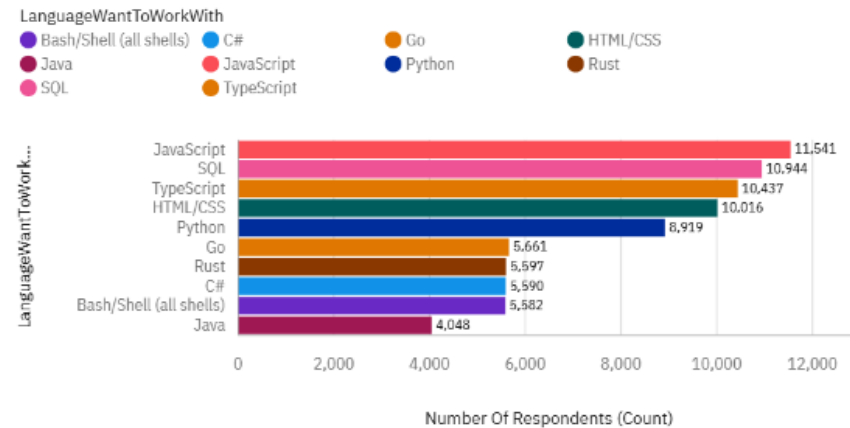
Top 10 WebFrameHaveWorkedWith



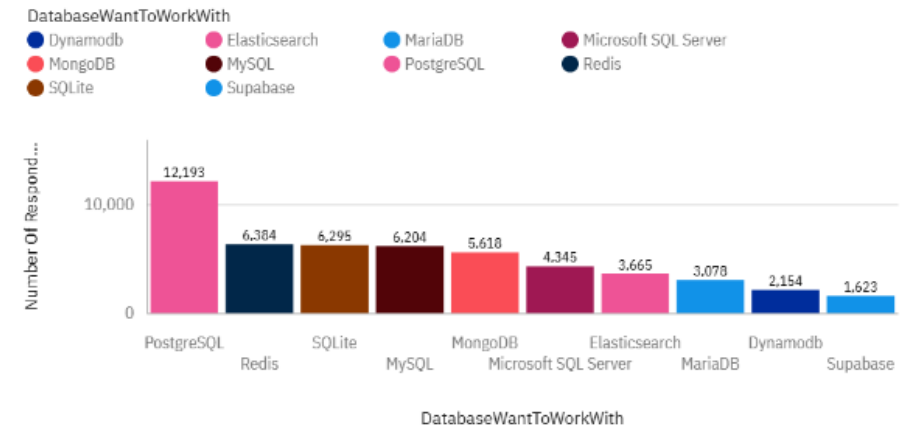
DASHBOARD TAB 2

Future Technology Trend

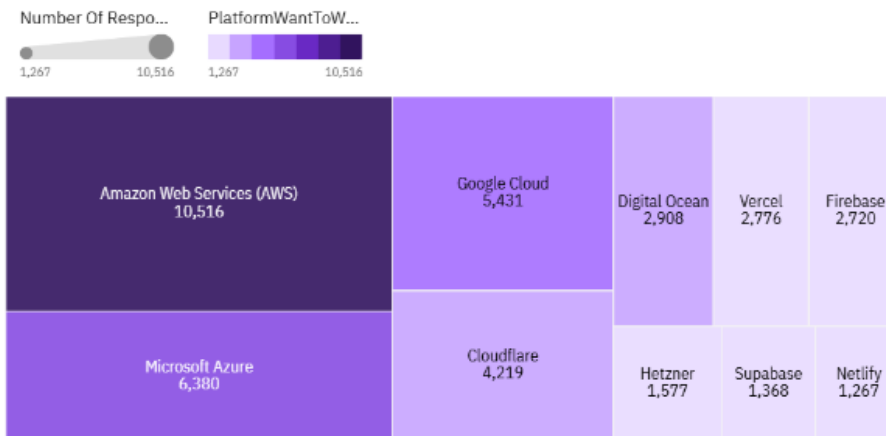
Top 10 LanguageWantToWorkWith



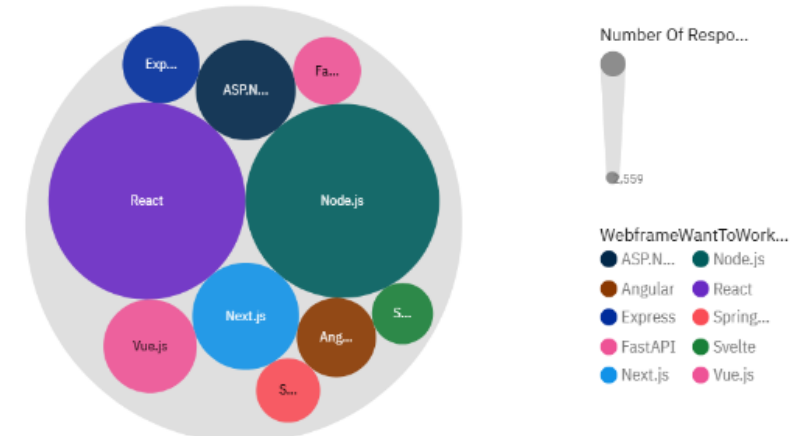
Top 10 DatabaseWantToWorkWith



Top 10 PlatformWantToWorkWith



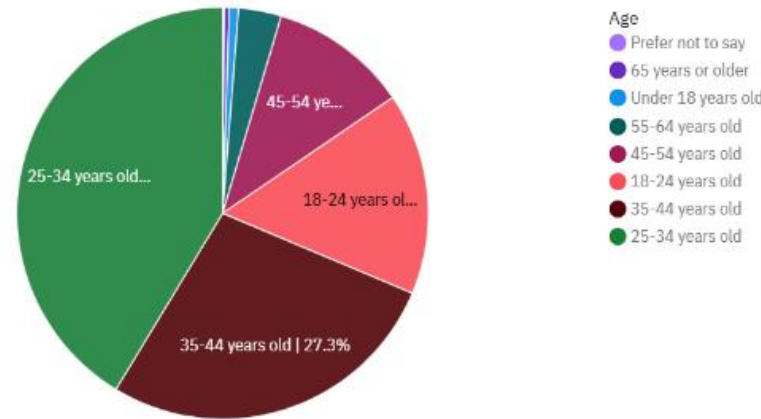
Top 10 WebframeWantToWorkWith



DASHBOARD TAB 3

Demographics

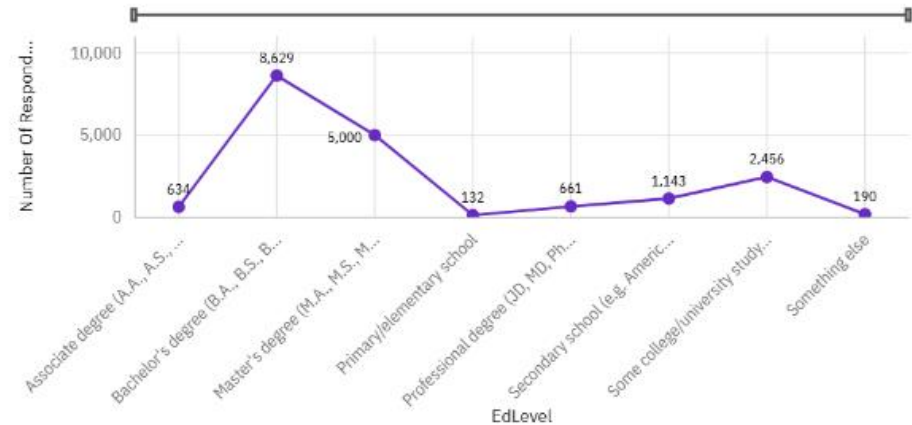
Respondent distribution by Age



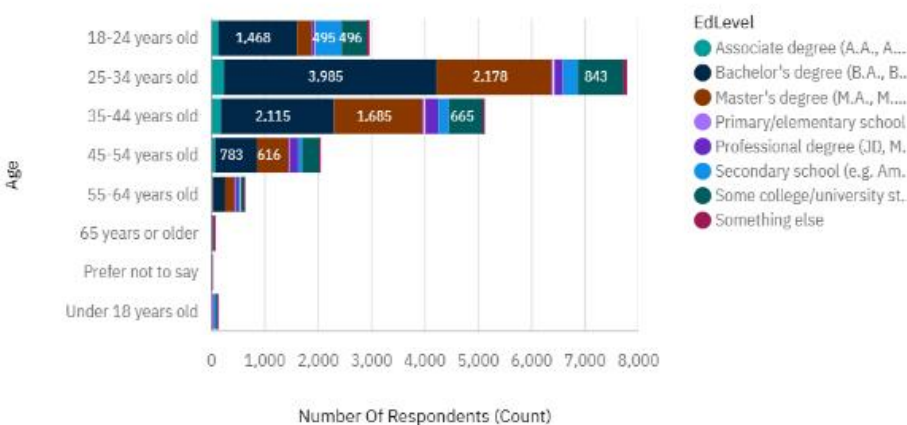
Respondent Count by Country



Respondent distribution by Formal Education Level



Respondent Count by Age, classified by Education Level



DISCUSSION



- The continued dominance of JavaScript and HTML/CSS, along with MySQL as a top database choice, underscores the pivotal role of web development in today's tech ecosystem.
- This highlights the importance of mastering client-side scripting and styling for building dynamic, responsive web applications.
- These trends invite deeper exploration into evolving web development frameworks and the ongoing transformation of web technologies.



OVERALL FINDINGS & IMPLICATIONS

Findings

- **Dominance of Web Technologies:** JavaScript and HTML/CSS continue to lead as the most used programming languages, emphasizing their critical role in modern web development.
- **Strong Data Management Focus:** MySQL, PostgreSQL, and Microsoft SQL Server remain the top databases, reflecting the ongoing importance of robust data handling in applications.
- **Platform Preference:** Amazon Web Services (AWS) is the most popular cloud platform, highlighting the industry's shift towards cloud-based solutions.
- **Web Framework Popularity:** Node.js and React dominate as the primary web frameworks, showing the preference for JavaScript-based full-stack development.
- **Future Demand Growth:** Emerging interest in languages like Go and Rust, and increasing demand for newer platforms and frameworks suggest evolving technology stacks and developer preferences.
- **Developer Demographics:** Majority of respondents are aged 25-34, mostly holding bachelor's degrees, indicating the profile of active technology professionals.

Implications

- **Focus on Web Skills:** Mastery of JavaScript, HTML/CSS, and associated frameworks like React and Node.js is essential for developers aiming to stay relevant.
- **Database Flexibility:** Organizations should be adaptable with database technologies, choosing solutions based on scalability, performance, and specific use cases.
- **Cloud Adoption:** Proficiency in AWS and other cloud platforms is becoming a standard expectation, driving demand for cloud computing expertise.
- **Evolving Skillsets:** Developers and organizations should anticipate shifts toward newer languages and frameworks, investing in continuous learning and technology evaluation.
- **Workforce Planning:** Understanding the age and education demographics helps in tailoring recruitment, training, and retention strategies to the current tech workforce profile.



CONCLUSION



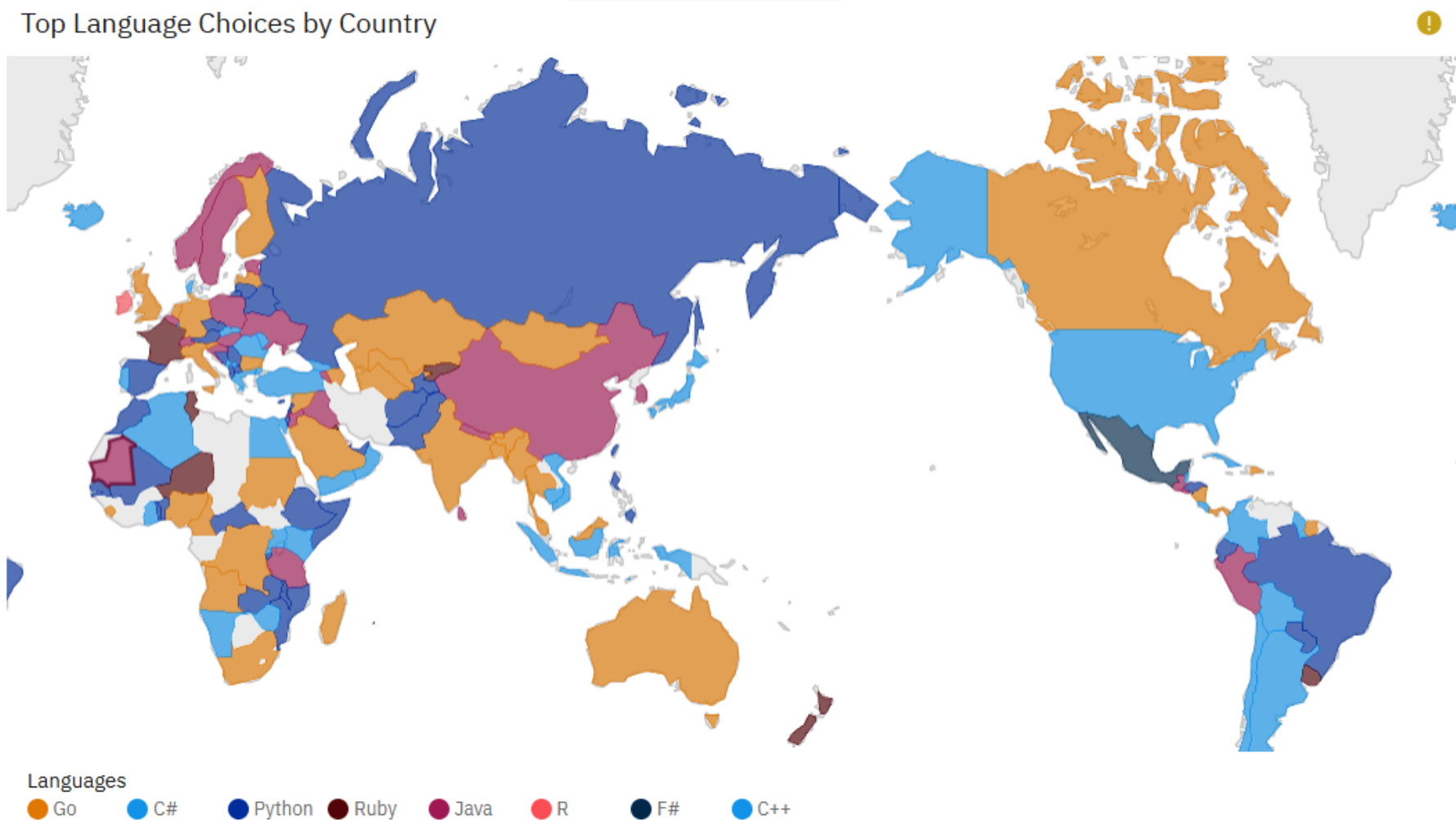
- Web technologies like JavaScript and HTML/CSS lead current and future trends.
- Databases such as MySQL and PostgreSQL remain essential for data management.
- Cloud platforms, especially AWS, dominate infrastructure choices.
- Emerging languages and frameworks highlight the need for continuous learning.
- Adapting to evolving tech is key to staying relevant in the industry.



APPENDIX



Top Language Choices by Country



JOB POSTINGS

