Analyzing the Stack Overflow Developer Survey data

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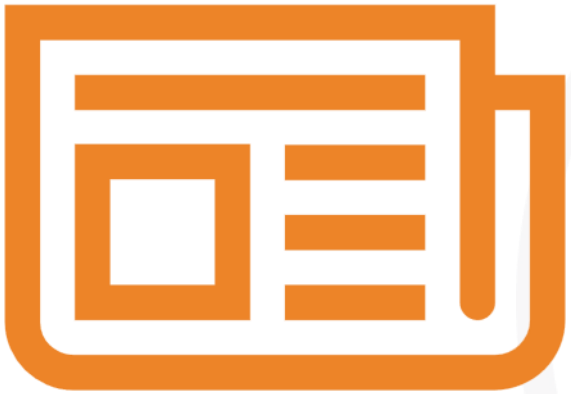
EXECUTIVE SUMMARY

- This presentation provides an analysis of current and future technology trends and developer demographics based on the 2024 Stack Overflow Developer Survey
- C# dominates in languages in the current year usage and the next year preference:
  - Account for 97 in the current year, and
  - Account for 134 in the next year
- In Database sector, there is no change trend, Respondent still Choose PostgresSQl either in the current year or the next year
- Platform category trend expectantly will remain Unchanged, Amazon Web Service is the most people choice in the current year and the next year
- Web Framework mirror the unchanged trend too, where people choose spring boot as their web framewok

INTRODUCTION

- This presentation leverages insights from the comprehensive 2024 Stack Overflow Developer Survey, a globally recognized and invaluable resource for understanding the evolving landscape of the developer ecosystem.
- Understanding current and future technology trends is crucial for businesses to strategize, for developers to hone relevant skills, and for educational institutions to align their curricula with industry demands.
- Our analysis will focus specifically on key trends in programming languages, database technologies, and the demographic profile of developers, providing a multi-faceted view of the industry
- We will begin by outlining our methodology, followed by key findings, a visual dashboard showcasing detailed data, a discussion of implications, and concluding remarks

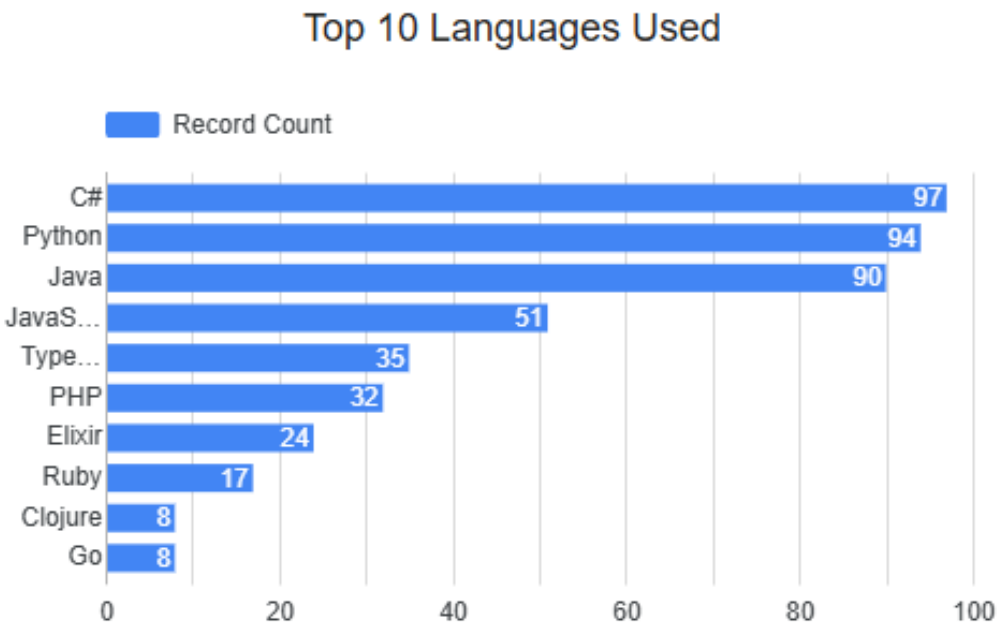
METHODOLOGY



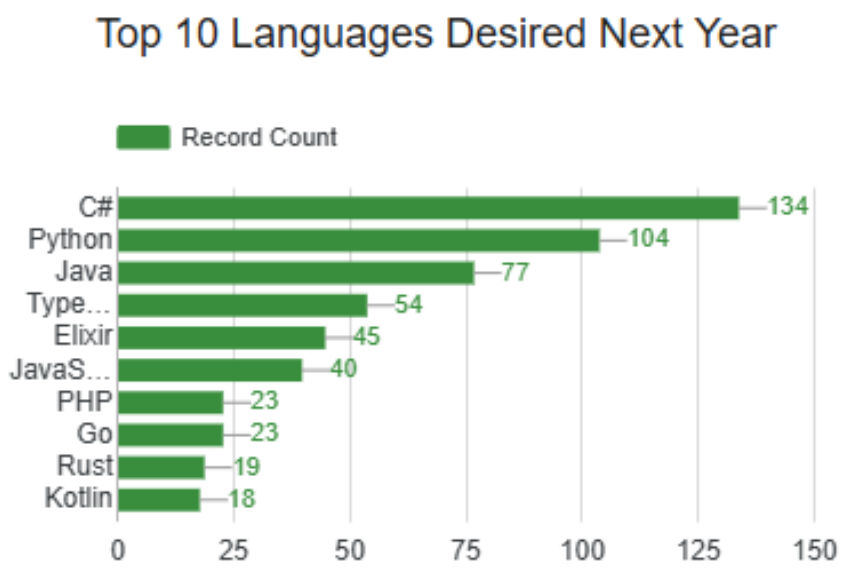
- The primary dataset for this analysis is survey_data_updated.csv, a modified subset of the official 2024 Stack Overflow Developer Survey results, providing a rich source of developer insights
- Data analysis and visualization were primarily conducted using Google Looker Studio, a powerful and intuitive platform for creating interactive dashboards and reportsPoint3
- Prior to visualization, the raw data underwent essential preparation, including handling of null values and the unnesting of multi-valued fields (e.g., programming languages, databases) to ensure accurate individual counts
- Our analysis involved frequency distributions to identify top technologies, cross-tabulations to explore relationships between variables, and various demographic breakdowns to understand the respondent base

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

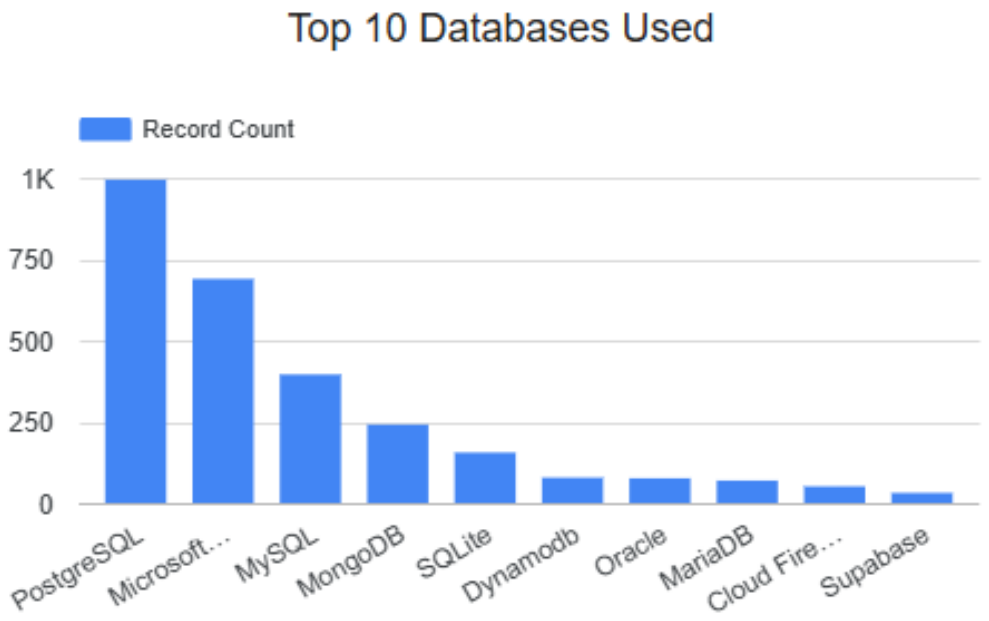
- C#, Python, and Java maintain their strong positions as the most used languages, with C# and Python showing a significant increase in desired usage for the upcoming year
- Emerging languages like TypeScript, Elixir, Go, Rust, and Kotlin are gaining considerable traction, indicating a growing interest and potential shift in the developer landscape
- Languages such as Ruby, Clojure, JavaScript, and PHP show a relative decrease in future desire or fall out of the top 10, suggesting a potential decline in their widespread adoption

Implications

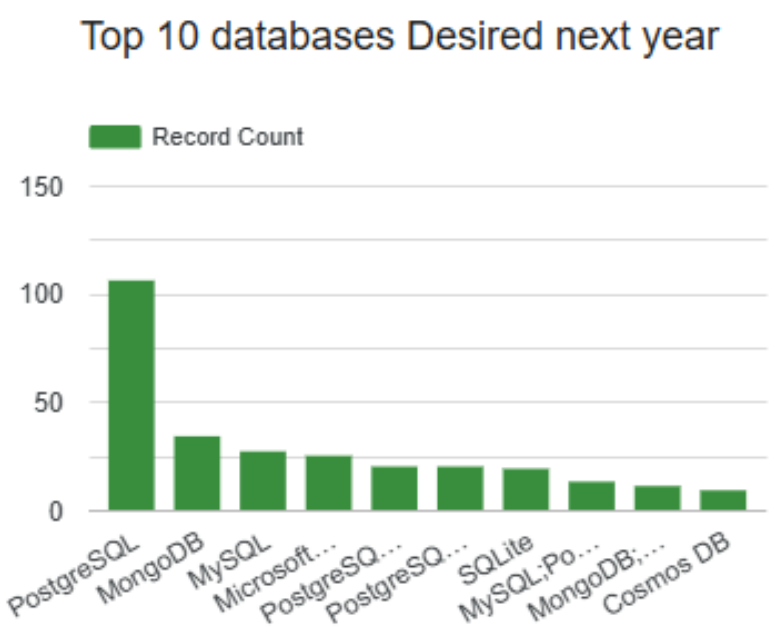
- Developers should prioritize continuous learning in established languages like C#, Python, and Java, while also exploring and acquiring skills in rising technologies such as TypeScript, Elixir, Go, Rust, and Kotlin to stay competitive
- Businesses should align their technology roadmaps and recruitment strategies with these trends, considering the adoption of increasingly desired languages to attract talent and build future-proof solutions
- Educational institutions and training programs should adapt their curricula to emphasize these in-demand and emerging programming languages, ensuring graduates are equipped with relevant skills for the evolving job market

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL Dominance and Growing Desire: PostgreSQL is overwhelmingly the most used database (over 1000 records) and also the most desired for next year (over 100 records), indicating its strong and increasing popularity
- Continued Relevance of Relational Databases: Microsoft SQL Server and MySQL remain highly used databases. While their "desired next year" counts are lower than PostgreSQL, they still feature prominently, suggesting their continued importance in the ecosystem
- Rise of NoSQL and Cloud Databases: MongoDB shows significant desire for next year, moving up in rank compared to its current usage. Cloud-native databases like Cosmos DB also appear in the "desired" list, highlighting a growing interest in flexible and scalable NoSQL and cloud solutions
- Declining Interest in Older/Specific Databases: Databases like Oracle, MariaDB, Cloud Firestore, and Supabase, while present in the "used" list, either have very low "desired" counts or fall out of the top 10 desired list, suggesting a potential shift in preference

Implications

- Strategic Focus on PostgreSQL: For developers, mastering PostgreSQL skills is highly advisable given its current dominance and future demand. For businesses, investing in PostgreSQL infrastructure and expertise can be a strategic move
- Diversification into NoSQL and Cloud: Developers should consider expanding their knowledge to include NoSQL databases like MongoDB and exploring cloud database offerings (e.g., Cosmos DB) to align with evolving architectural patterns
- Modernization Opportunities: Organizations heavily reliant on older or less desired databases might consider migration strategies to more modern and in-demand solutions like PostgreSQL or various NoSQL options to improve scalability, flexibility, and talent acquisition

DASHBOARD

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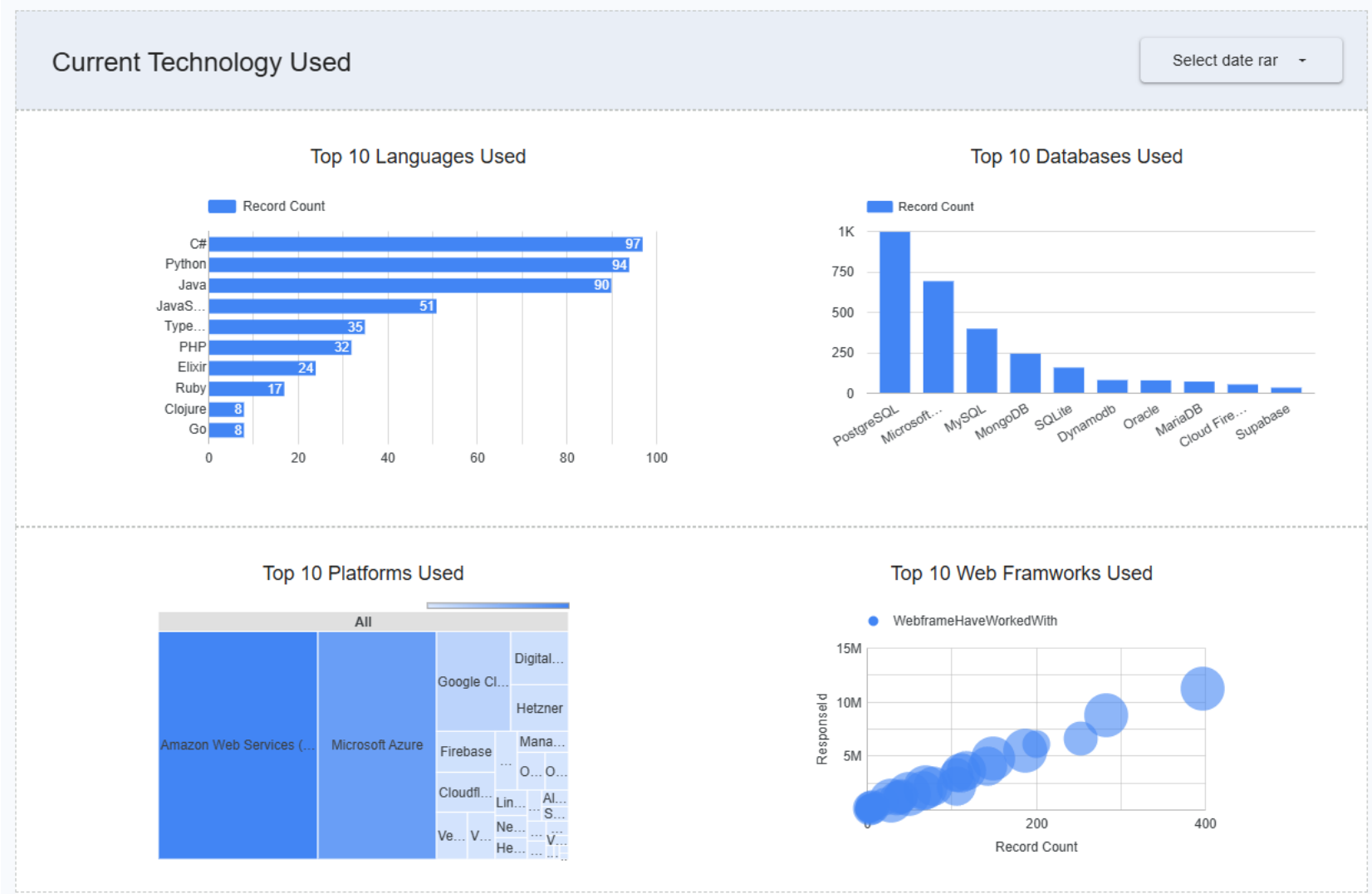
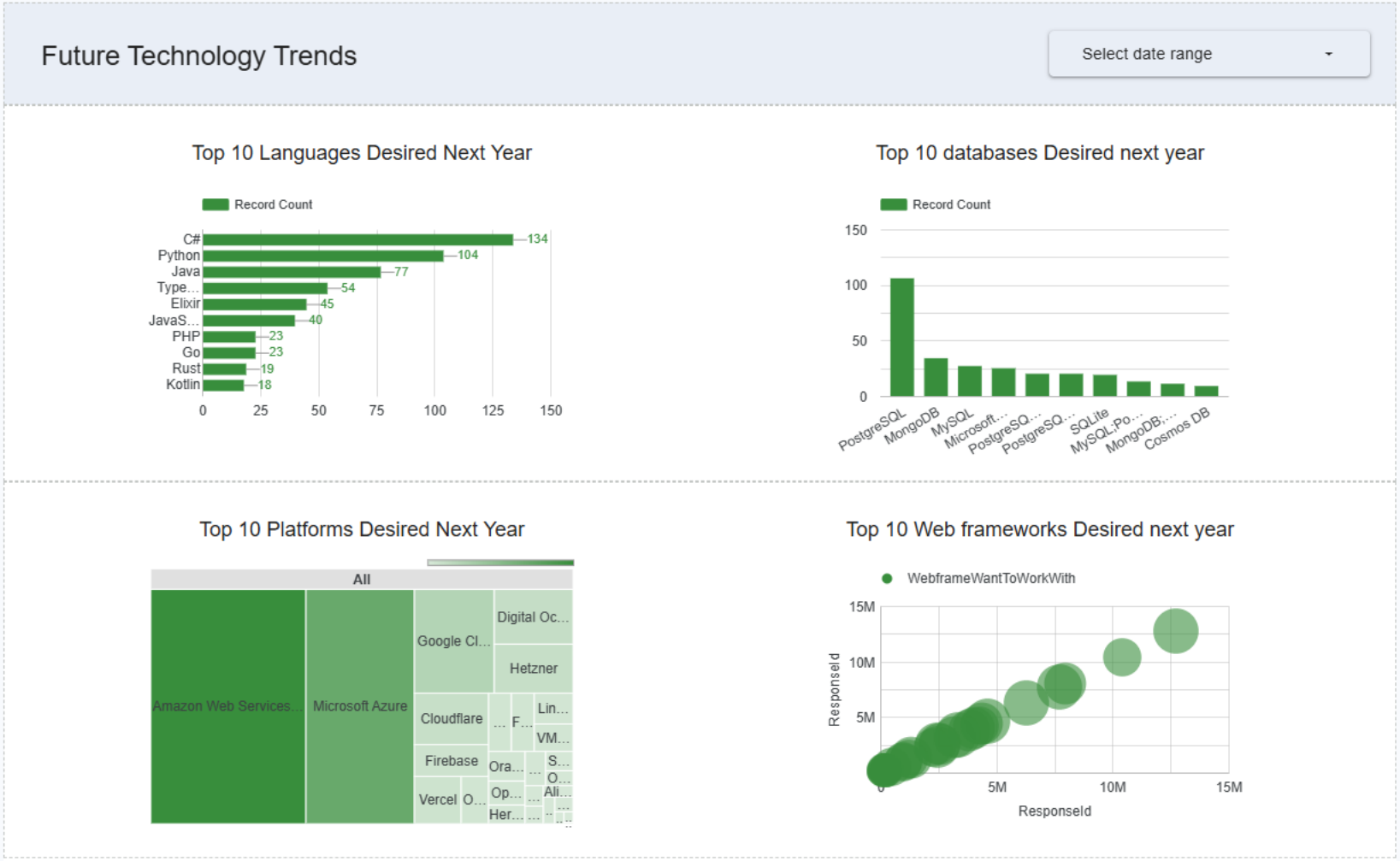
DASHBOARD TAB 1



DASHBOARD TAB 2



DASHBOARD TAB 3

DISCUSSION

This analysis, driven by the comprehensive Stack Overflow Developer Survey data and visualized through our interactive dashboard, reveals several critical insights shaping the current and future landscape of software development.

- The data clearly highlights the **enduring strength of established programming languages and relational databases**, with C#, Python, Java, and PostgreSQL consistently leading both current usage and future desire. This indicates a foundational stability in core technologies that continue to power a vast array of applications.
- However, the "desired next year" trends also point towards **significant shifts and emerging interests**. We observe a notable surge in the desire for languages like TypeScript, Elixir, Go, Rust, and Kotlin, suggesting a growing appetite for modern, performance-oriented, or functional programming paradigms. Similarly, in the database realm, while PostgreSQL reigns supreme, the increased desire for NoSQL solutions like MongoDB and the appearance of cloud-native options like Cosmos DB underscore a move towards more flexible and scalable data architectures.

OVERALL FINDINGS & IMPLICATIONS

Findings

- **Programming Languages:** C#, Python, and Java consistently dominate both current usage and future desire. **Databases:** PostgreSQL is the undisputed leader in both current use and future desire.
- The largest age group of respondents is 25-34 years old (41.1%), followed by 18-24 years old (19.5%), indicating a predominantly young and active developer community.
- The "Respondent Count by Age, Classified by Education Level" chart suggests that different age groups and educational backgrounds contribute to the overall technology landscape

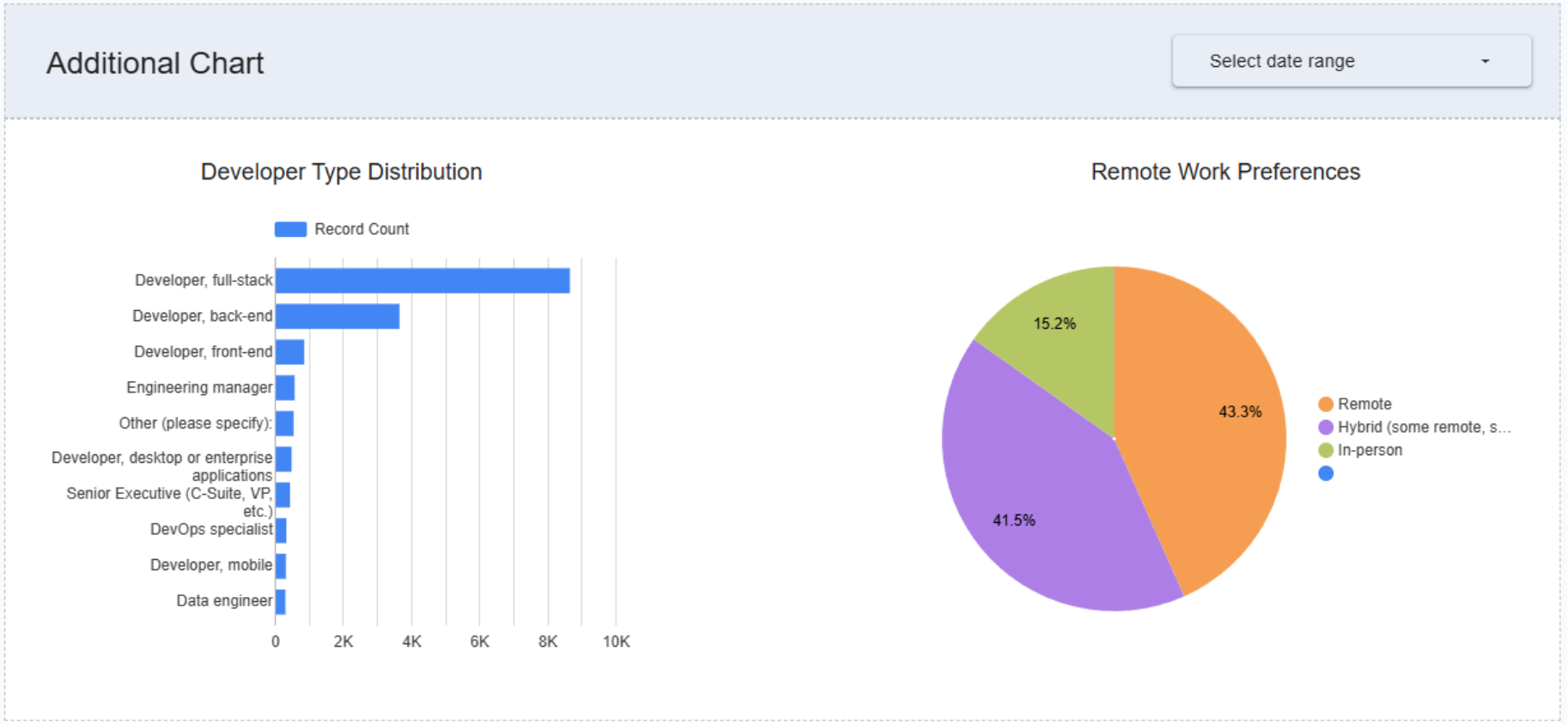
Implications

- **For Developers**: Continuous learning is paramount.
- **For Businesses**: Recruitment strategies should balance the need for established tech stack expertise with the growing demand for skills in newer technologies.

CONCLUSION

- The 2024 Stack Overflow Developer Survey reveals a dynamic yet stable technology landscape, where foundational languages like C#, Python, and Java, alongside databases like PostgreSQL, continue to form the bedrock of development
- Significant future trends indicate a strong desire for modern and performant technologies, with TypeScript, Elixir, Go, Rust, and Kotlin gaining traction in programming languages, and NoSQL solutions like MongoDB showing increased interest in the database space
- The developer community is predominantly young and globally distributed, highlighting the importance of continuous learning and adaptability to stay relevant in an ever-evolving technological environment

APPENDIX


Additional Chart
Select date range
Developer Type Distribution
Record Count
Developer, full-stack
Developer, back-end
Developer, front-end
Engineering manager
Other (please specify):
Developer, desktop or enterprise applications
Senior Executive (C-Suite, VP, etc.)
DevOps specialist
Developer, mobile
Data engineer
0
2K
4K
6K
8K
10K
Remote Work Preferences
15.2%
43.3%
41.5%
Remote
Hybrid (some remote, s...
In-person