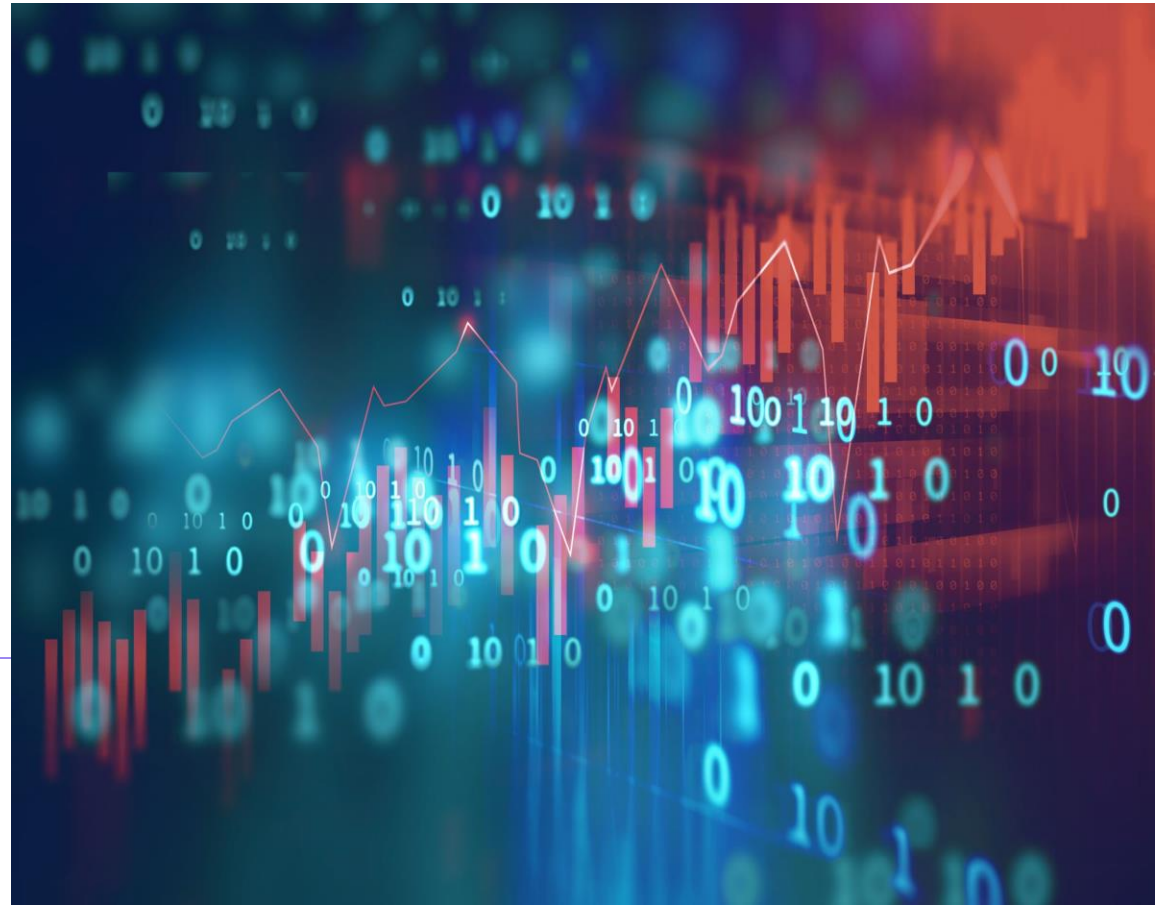
IBM Data Analyst Capstone Project

By: Di Giacomo Nunzia

20/11/25



OUTLINE

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

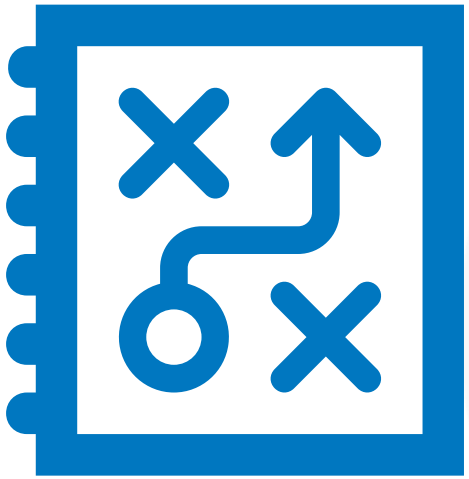
EXECUTIVE SUMMARY

- Python, JavaScript, and HTML/CSS are the most widely used programming languages among developers.
- PostgreSQL and MySQL lead in database use, with continued dominance projected next year.
- AWS, Azure, and Google Cloud remain top cloud platforms in both use and demand.
- Job market data shows strong hiring for C, Java, and Python across U.S. cities.
- The dashboards provide a holistic view of technology trends and workforce demographics.

INTRODUCTION

- The goal of this project is to analyze global developer technology usage and job demand using real-world datasets.
- The target audience includes technology professionals, HR managers, and developers aiming to align their skills with market trends.
- The analysis provides value by identifying the most in-demand technologies, expected future trends, and workforce demographics shaping the industry.
- This analysis connects developer survey results with real-world job demand to uncover actionable insights.

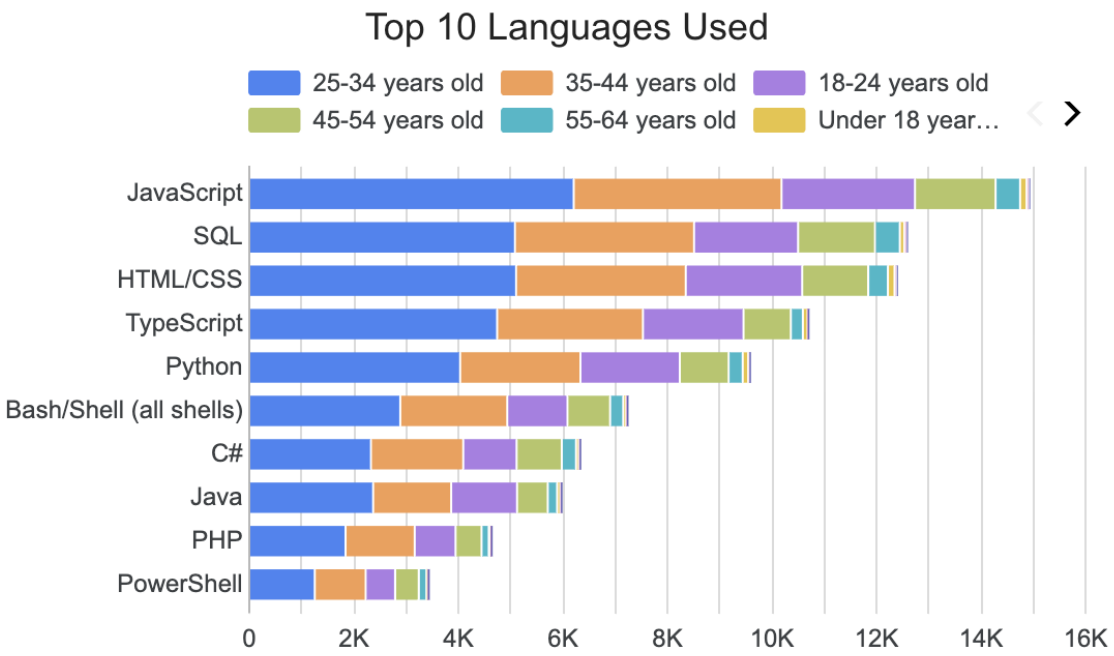
METHODOLOGY



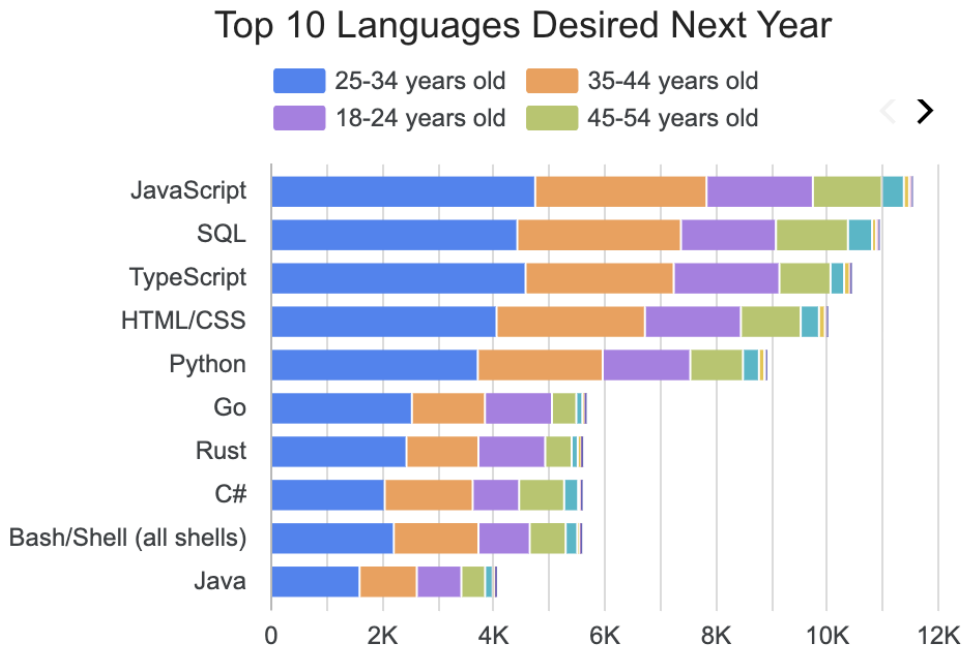
- **Data Sources**:
  - Stack Overflow Developer Survey 2024 (CSV file: survey-data-updated.csv)
  - Job postings data collected using an API (job-postings.xlsx)
- **Tools**:
  - Jupyter Lite Notebook & Visual Studio Code (Python for analysis)
  - Google Looker Studio (for dashboard visualization)
  - Key Data Wrangling Steps (Labs 5–15):
  - Found and removed duplicates
  - Identified and imputed missing values
  - Normalized columns for consistency
  - Split ;-separated responses (e.g., multiple languages in one cell)
  - Filtered out null values to focus on top 10 per category

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

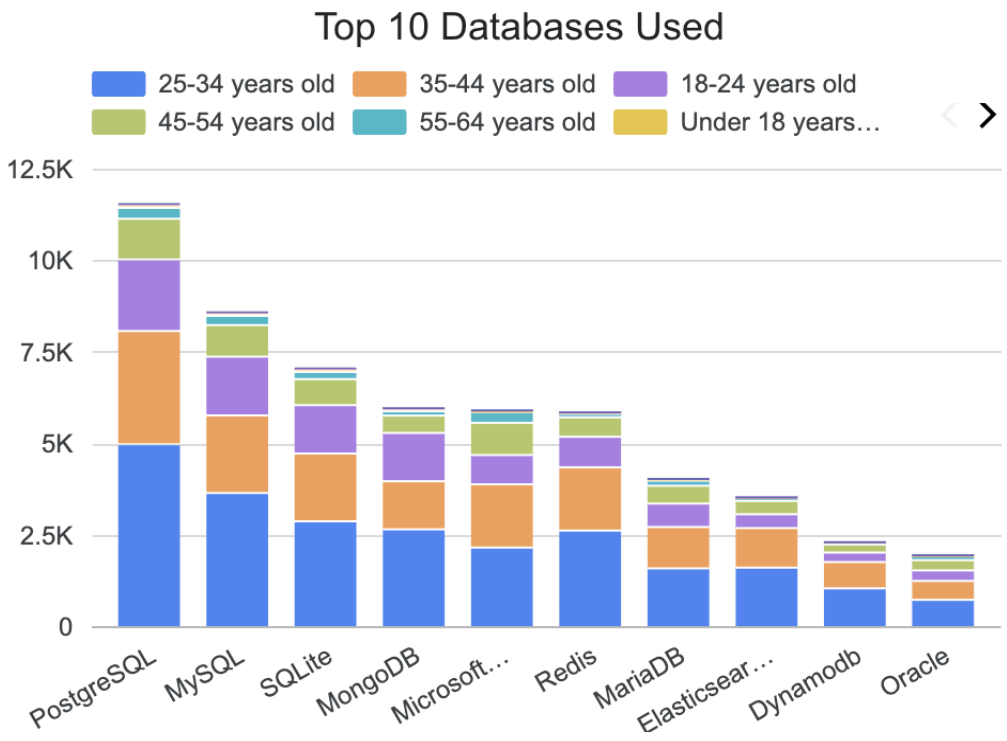
- JavaScript remains the most widely used and desired language.
- TypeScript and Go show growing interest among developers.
- Older languages like C and Python continue to hold relevance in enterprise environments.

Implications

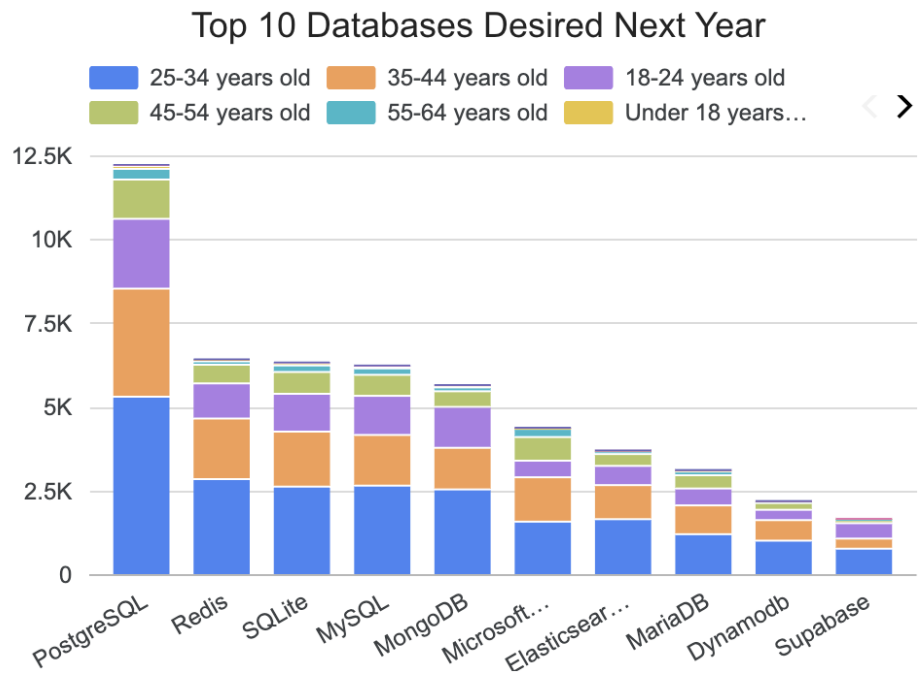
- Developers should prioritize Python for both current and future opportunities.
- TypeScript's growth shows increasing importance of scalable web applications.
- Enterprises will maintain demand for legacy languages like Java and C, ensuring their relevance.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Relational databases (PostgreSQL, MySQL) dominate usage.
- NoSQL databases like MongoDB and Redis are gaining interest.
- Developers' preferences remain consistent between current and future projections.

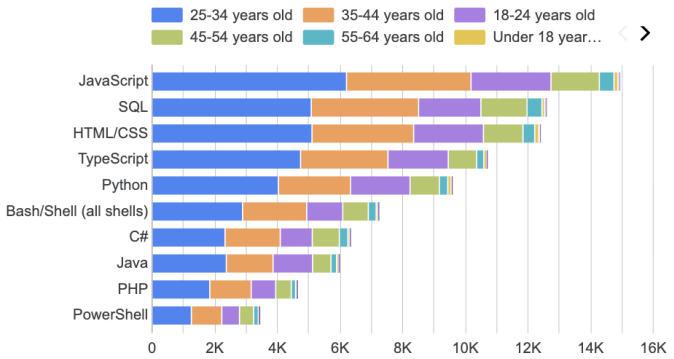
Implications

- Traditional SQL skills remain essential for most organizations.
- Knowledge of emerging NoSQL systems provides a competitive advantage.
- Companies should prepare for hybrid database environments combining SQL and NoSQL.

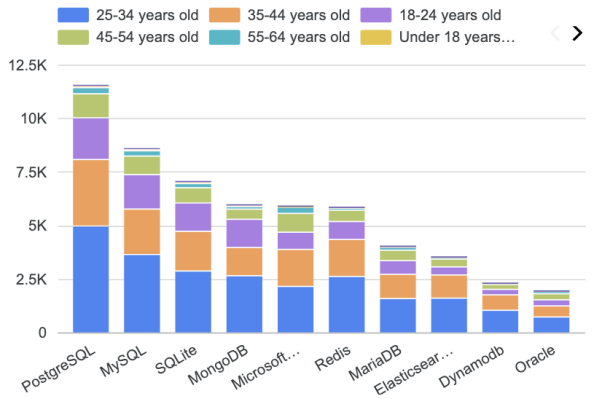
DASHBOARD TAB 1

Current Technology Usage

Top 10 Languages Used

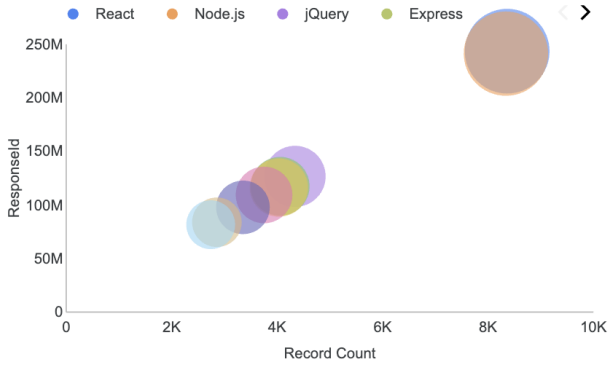


Top 10 Databases Used



Top 10 Platforms Used

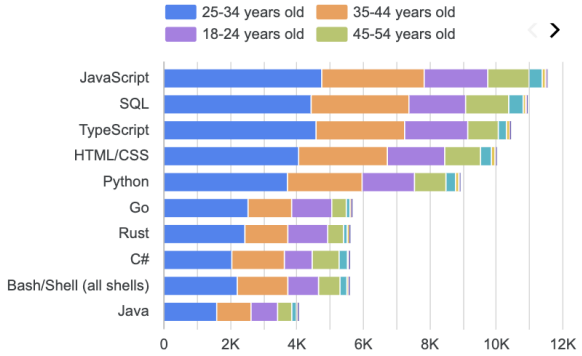
Top 10 Web Frameworks Used



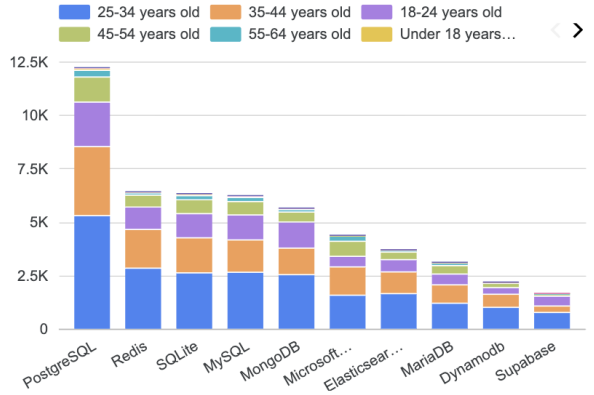
DASHBOARD TAB 2

Future Technology Trends

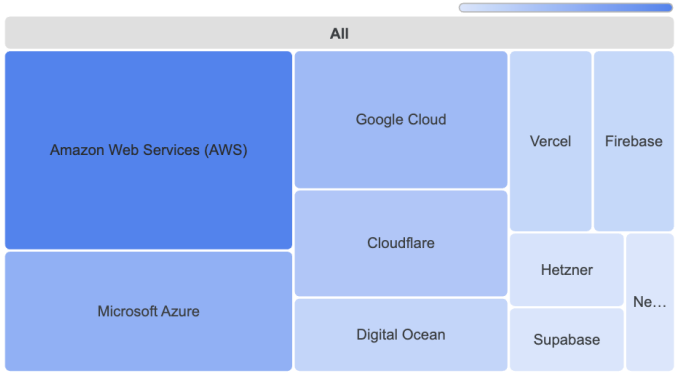
Top 10 Languages Desired Next Year



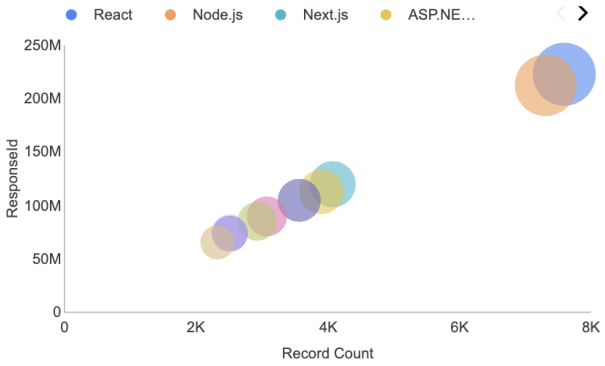
Top 10 Databases Desired Next Year



Top 10 Desired Platforms



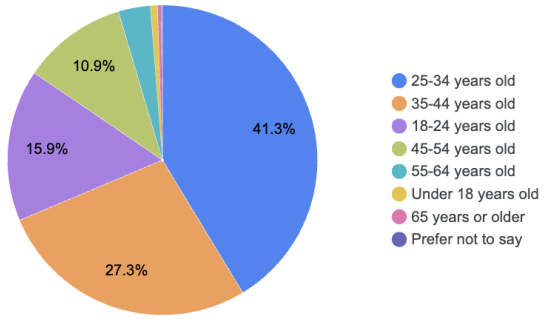
Top 10 Desired Web Frameworks



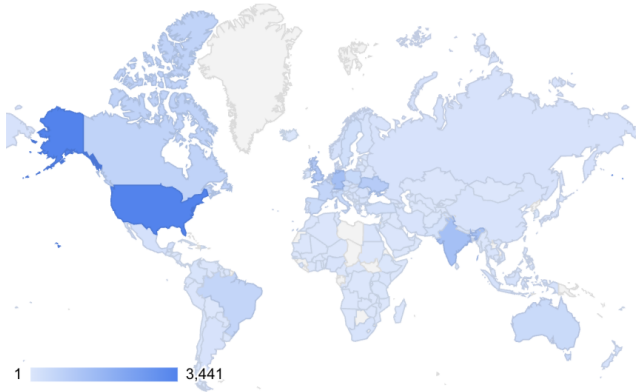
DASHBOARD TAB 3

Demographics

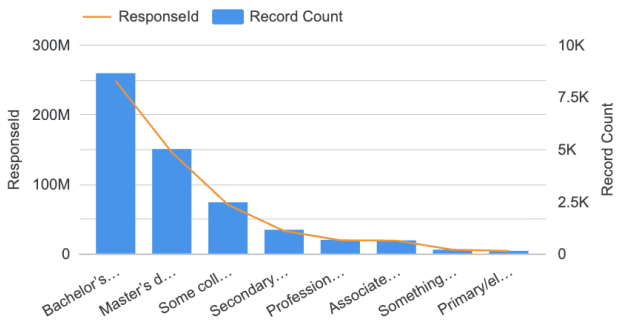
Respondents by Age



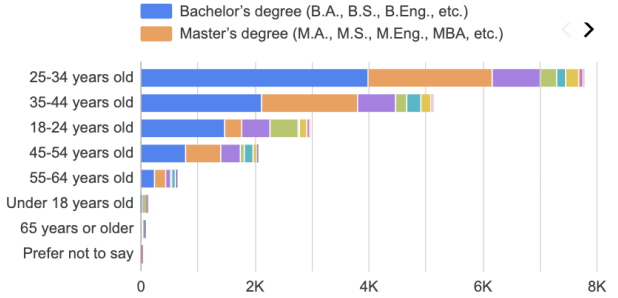
Respondent Count by Country



Respondent Distribution by Education Level



Respondent Count by Age, Classified by Education Level



DISCUSSION

- JavaScript and SQL dominate job postings, confirming strong enterprise demand.
- Python’s presence reflects its versatility in development and data science.
- SQL-based roles remain prevalent, emphasizing data management skills.
- These job trends align with survey findings: technologies popular among developers are also in highest demand by employers.

OVERALL FINDINGS & IMPLICATIONS

Findings

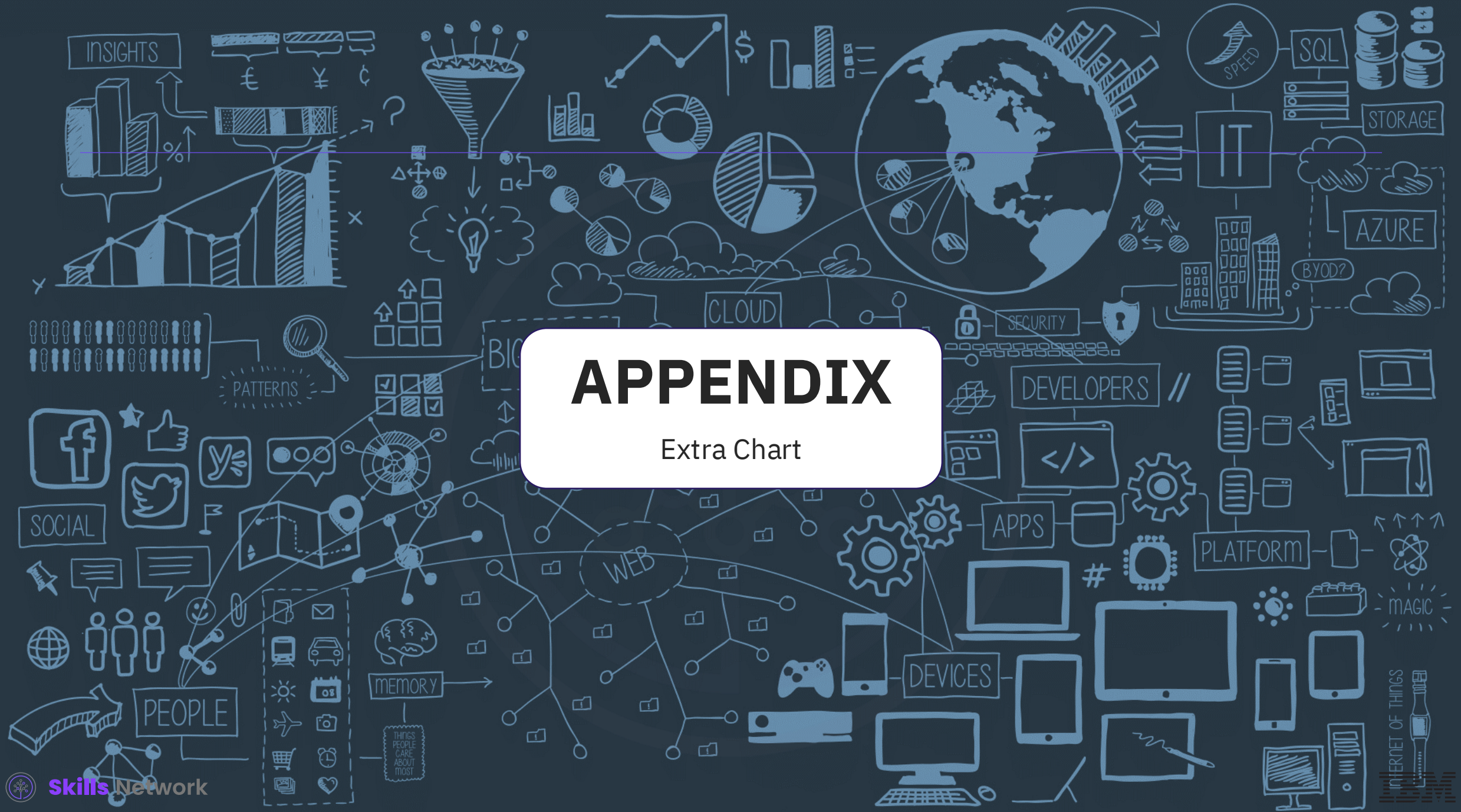
- Developer trends strongly favor Python, JavaScript, and cloud platforms.
- SQL databases remain foundational across applications.
- Job market data confirms consistency between developer interest and employer demand.

Implications

- Developers should focus on Python and cloud skills to stay competitive.
- Organizations can target PostgreSQL and AWS expertise for scalability.
- Educational programs should emphasize modern web and data technologies.

CONCLUSION

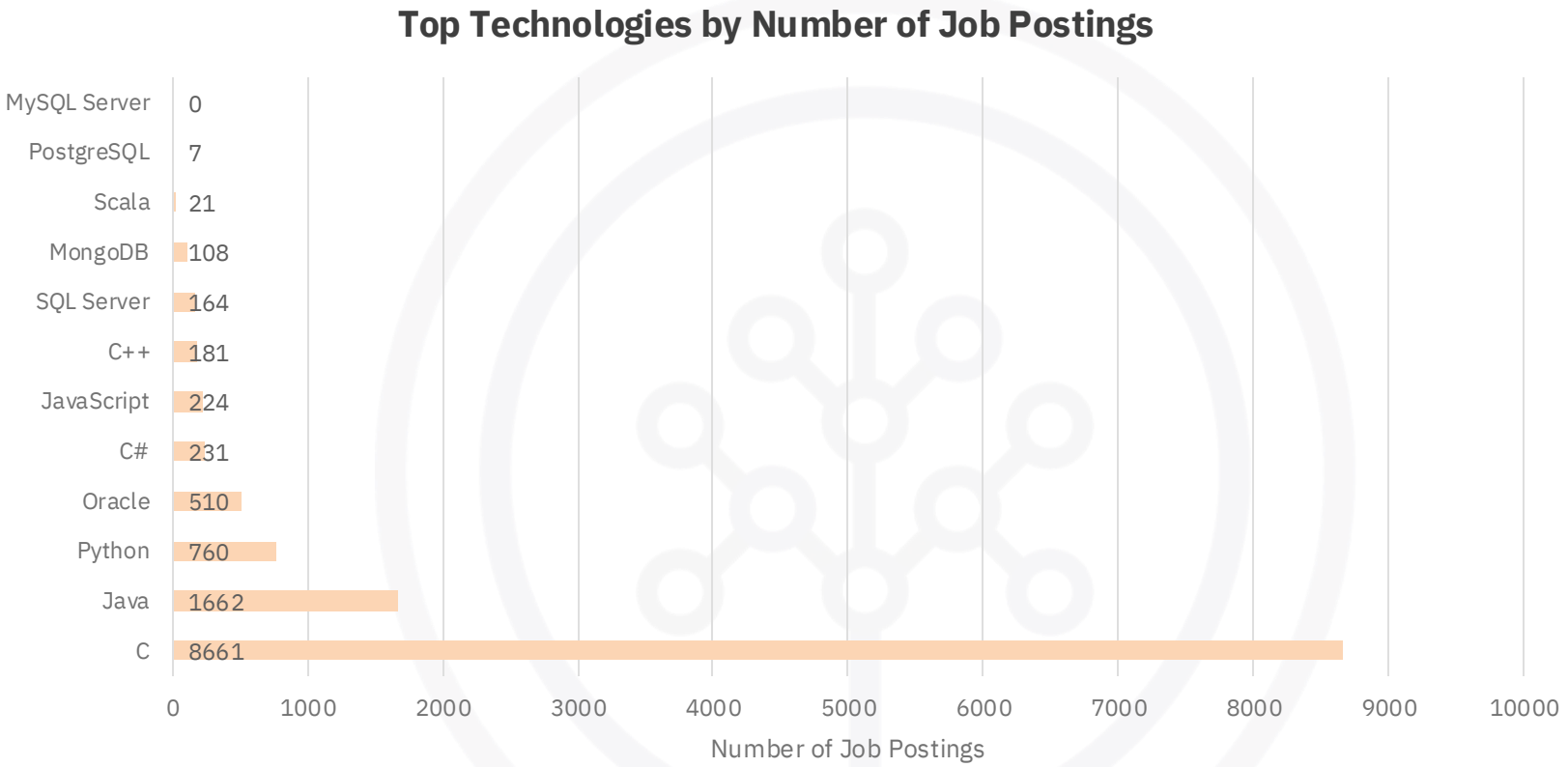
- The analysis confirmed alignment between developer trends and real-world job demand.
- Python remains a leading skill across multiple domains.
- Cloud computing and database expertise continue to grow in importance.
- Future analysis could explore correlations between demographics and technology choices.
- This project demonstrates how data collection, cleaning, and visualization can reveal meaningful insights about the evolving tech landscape.



APPENDIX

Extra Chart

JOB POSTINGS



The job postings analysis reveals that C, Java, and Python lead in demand across major cities in the US, followed by Oracle and C#. This confirms the continued importance of multi-language proficiency and database expertise in the job market.