The Future of Tech Skills Data-Driven Insights

IBM Developer SKILLS NETWORK

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OUTLINE

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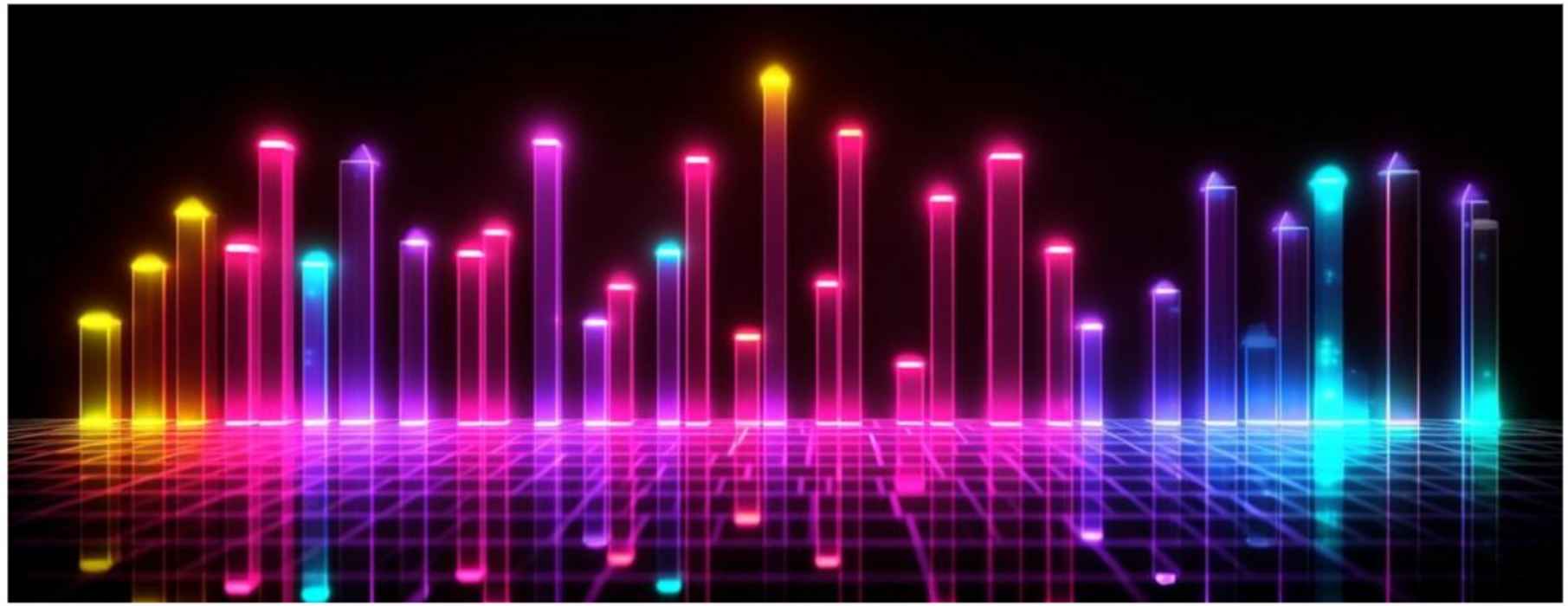
Executive Summary



This project analyzes emerging technology skills in the IT industry to help organizations stay competitive. As a Data Analyst, I collected data from job postings, training platforms, and industry surveys to identify the most in-demand programming languages, database systems, and development tools. Key findings include high demand for JavaScript, Python, MySQL, and cloud platforms like AWS. Using IBM Cognos Analytics, I visualized trends to assist in hiring and training strategies. The results offer valuable insights to guide skill development and talent acquisition, ensuring alignment with industry demands and future innovation.

Introduction

In today’s fast-changing tech landscape, understanding emerging skill demands is essential for IT consulting firms to remain competitive. As a Data Analyst at a global IT firm, my project focuses on identifying in-demand technical skills through data from job postings, training platforms, and Surveys.

The analysis will cover key programming languages (JavaScript, Python), popular database systems (MySQL, MongoDB), and development tools. Data will be collected via web scraping and APIs, then wrangled for analysis. IBM Cognos Analytics will create visual dashboards to present insights.

The final conclusion will highlight critical skills and tools, providing strategic guidance for talent acquisition and skill development to meet industry demands.

Methodology

This project follows a 5-stage approach to identify emerging tech skills: data collection, data wrangling, exploratory data analysis, data visualization, and insights presentation.

1.**Data Collection**: Gathered from job postings, training portals, and the Stack Overflow Developer Survey using web scraping and APIs.

2.**Data Wrangling**: Cleaned and standardized data, categorizing key variables like programming languages and tools.

3.**Exploratory Data Analysis**: Analyzed trends in programming languages and databases, exploring correlations with developer demographics.

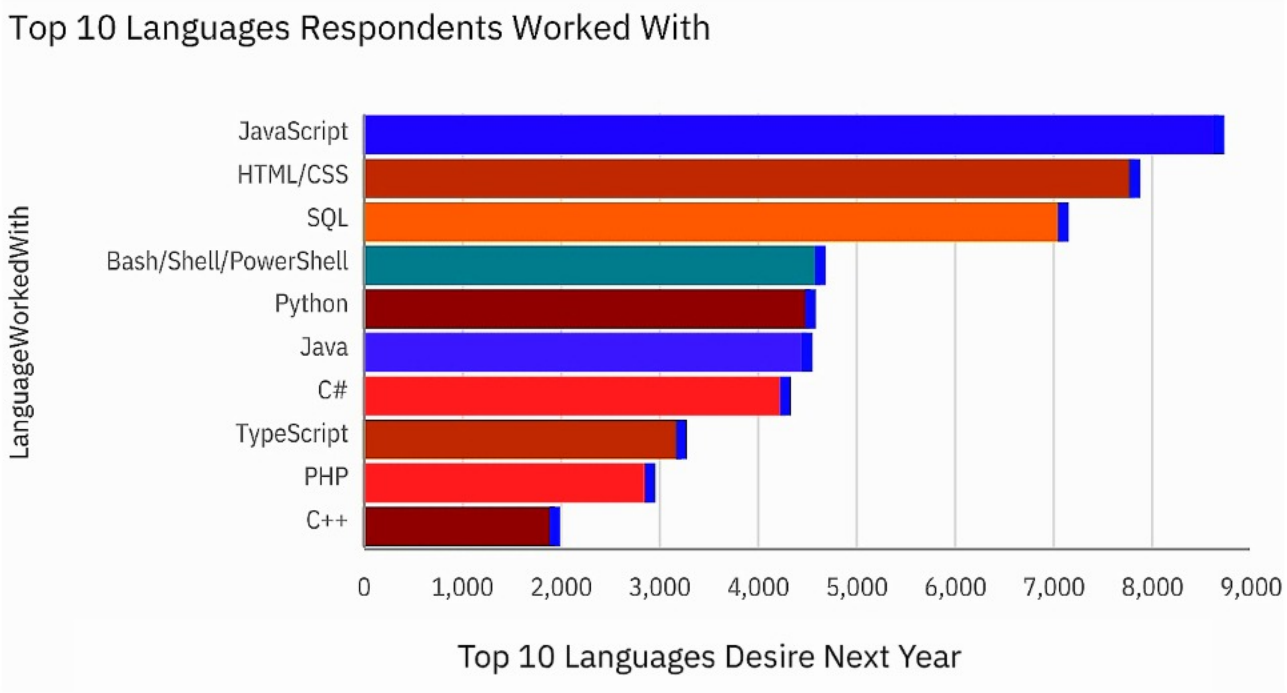
4.**Data Visualization**: Used IBM Cognos Analytics to create clear visualizations of key metrics on programming languages and database systems.

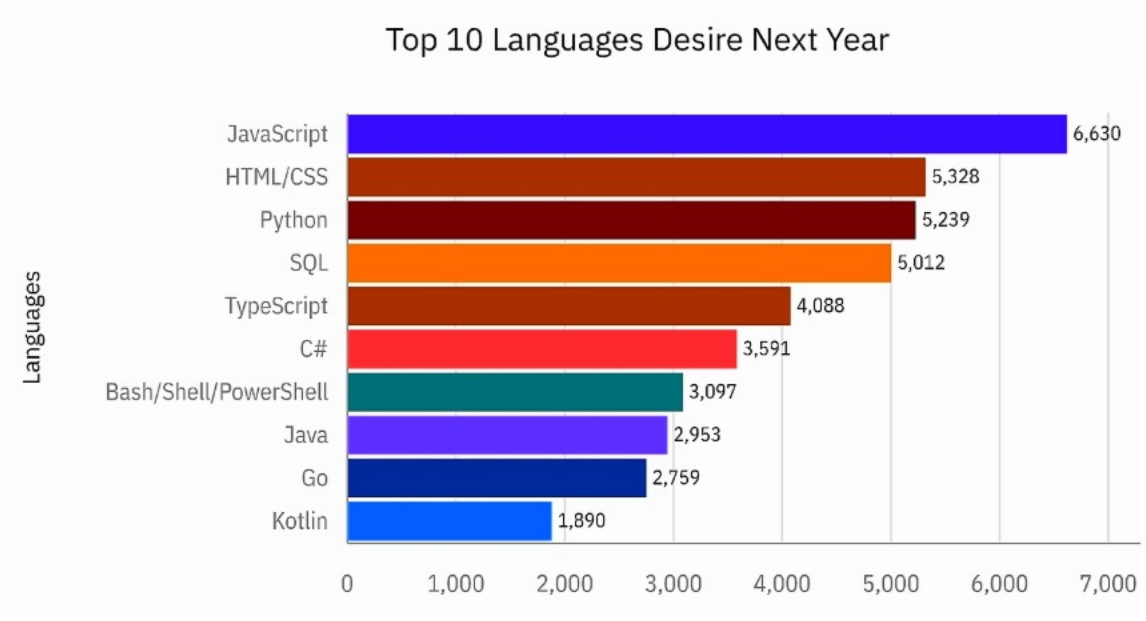
5.**Insights Presentation**: Presented findings with strategic implications for skill development and talent acquisition.

This approach ensures a thorough, actionable analysis of in-demand tech skills.

Results

PROGRAMMING LANGUAGE TRENDS





PROGRAMMING LANGUAGE TRENDS FINDINGS & IMPLICATIONS

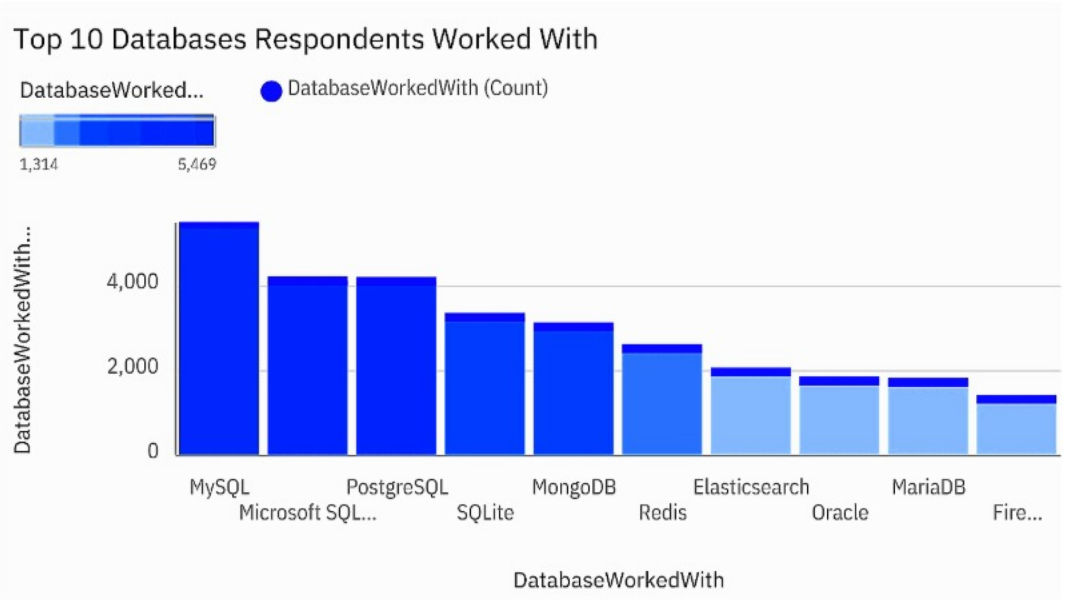
Findings:

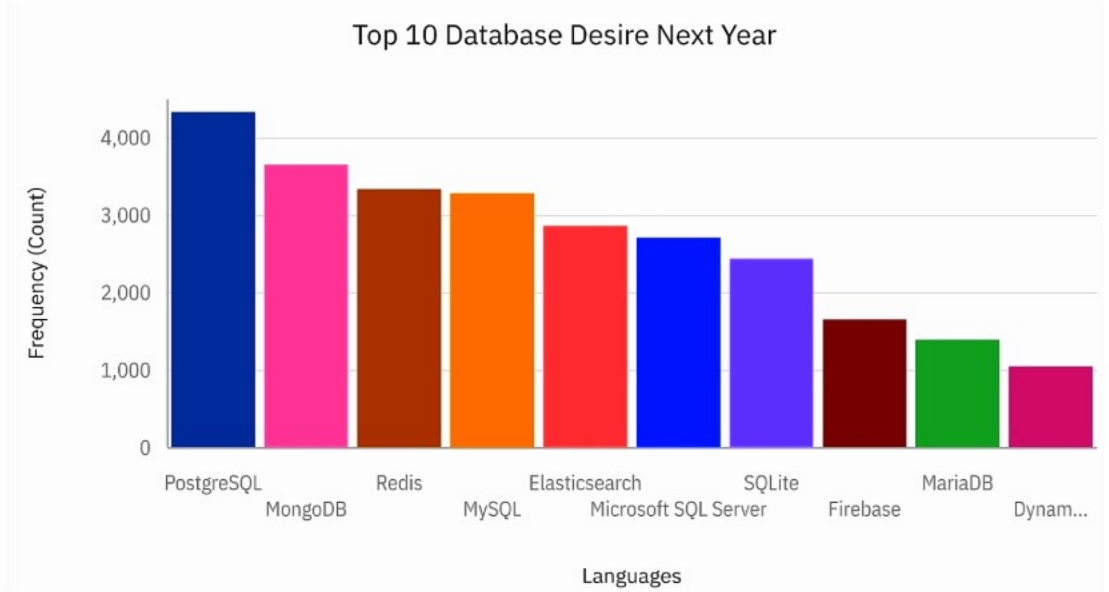
- JavaScript, HTML/CSS, and SQL are the top programming languages used this year.
- Developer interest in Python and TypeScript is growing significantly for next year.
- PowerShell usage is expected to decline in the upcoming year.

Implications:

- Demand for web development roles will stay high, with JavaScript, HTML/CSS, and TypeScript skills being essential.
- SQL remains critical for data storage and querying in big data applications.
- As AI and machine learning expand, Python's popularity will drive new job opportunities in these fields.

DATABASE TRENDS





DATABASE TRENDS
FINDINGS & IMPLICATIONS

Findings:

- MySQL leads as the most widely used database, closely followed by Microsoft SQL Server.
- PostgreSQL is gaining popularity for its ability to manage large datasets and complex queries.
- NoSQL databases like MongoDB and Redis are increasingly favored by developers.
- Elasticsearch is emerging as a go-to for search functionality across websites and apps.

Implications:

- Open-source databases continue to be the preferred choice in many organizations.
- The rise of NoSQL databases reflects the need for flexible data storage, especially with unstructured data.
- Developers will benefit from knowledge of both SQL and NoSQL databases to stay competitive.
- Elasticsearch's popularity highlights a growing demand for integrated search capabilities in digital platforms.

The link below provides access to an interactive Cognos dashboard that highlights:

1) Current technology usage

2) Emerging technology trends

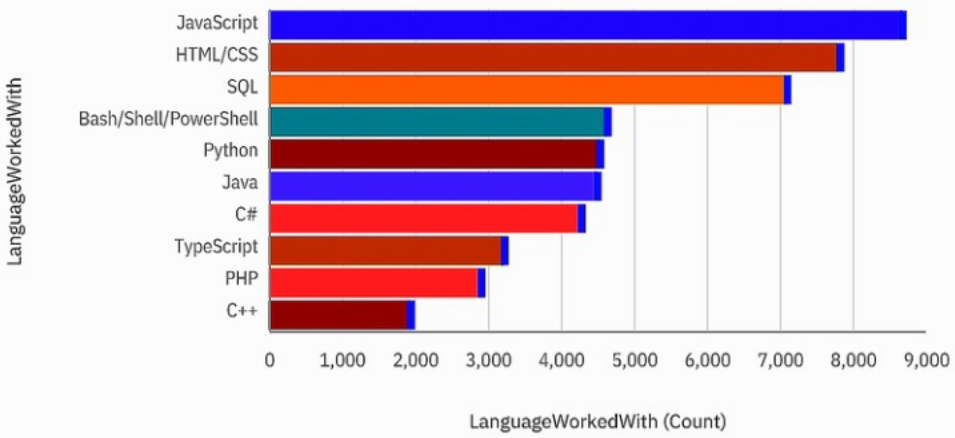
3) Developer demographics

Github Link
AaronKGoldman/IBM-Data-Analytics-Capstone

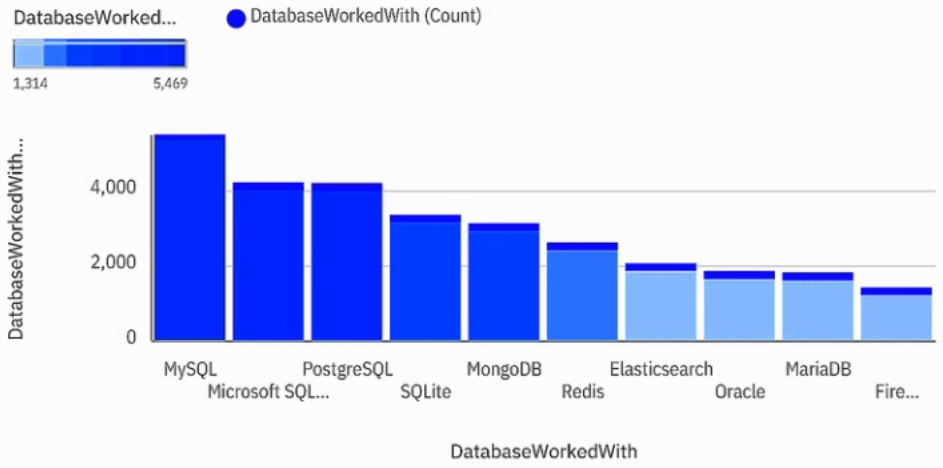
Dashboard # 1

Current Technology Usage

Top 10 Languages Respondents Worked With



Top 10 Databases Respondents Worked With



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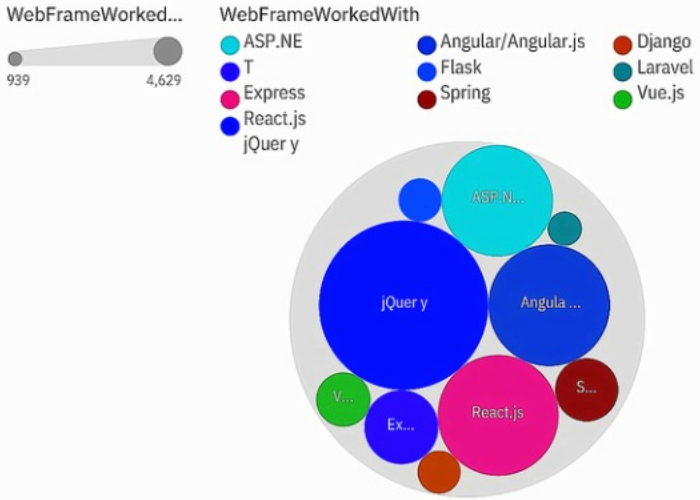
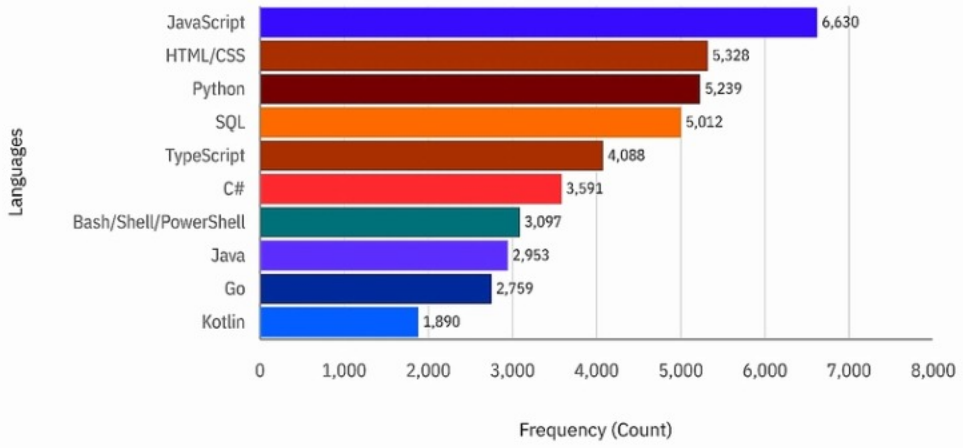
Top 10 WebFrames Respondents Worked With



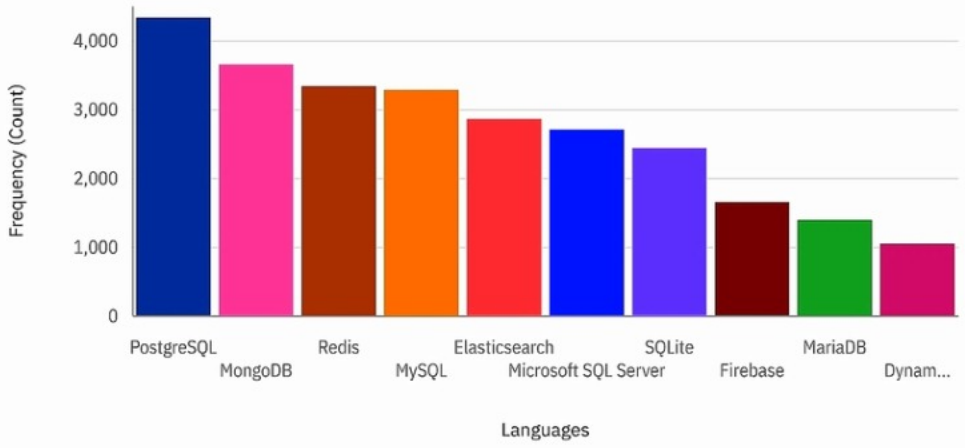
Dashboard # 2

Future Technology Trend

Top 10 Languages Desire Next Year

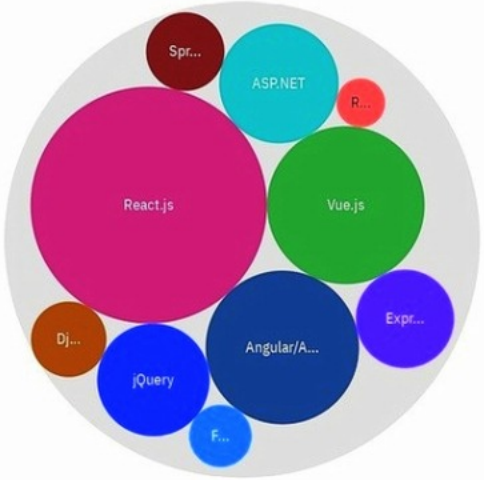


Top 10 Database Desire Next Year



Platform Desire Next Year

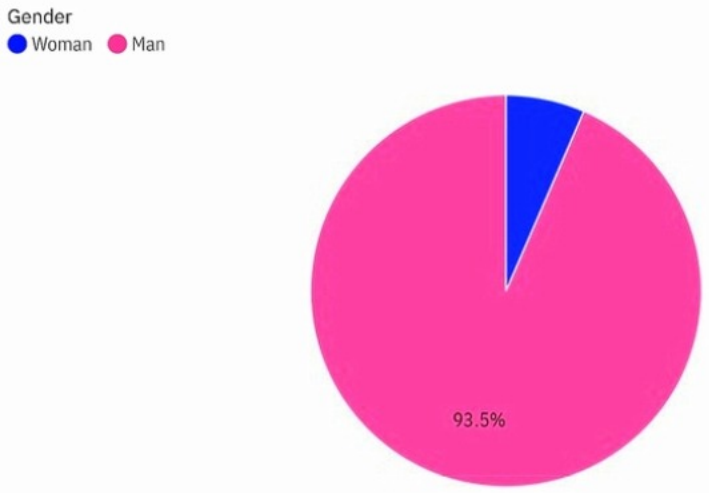
Top 10 Web Frame Desire Next Year



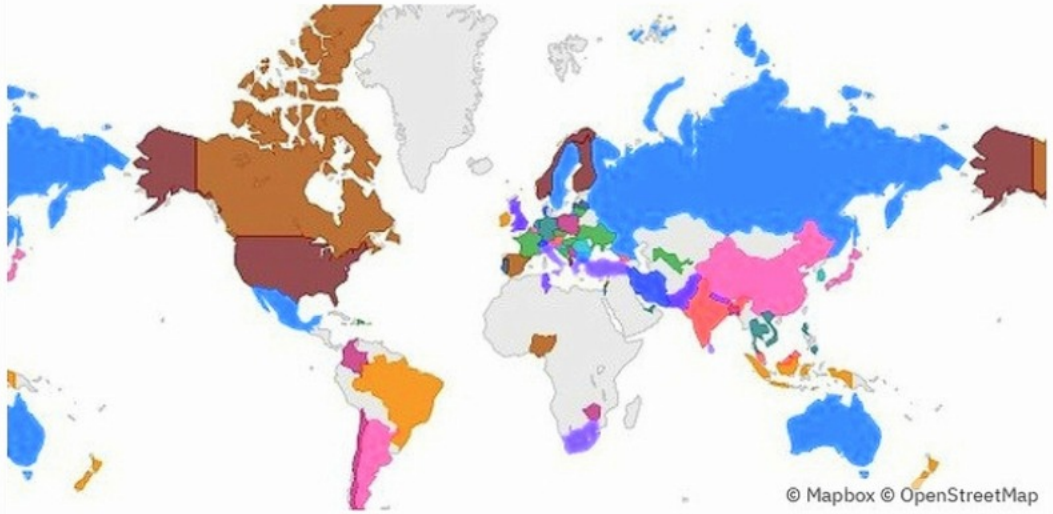
Dashboard # 3

Demographics

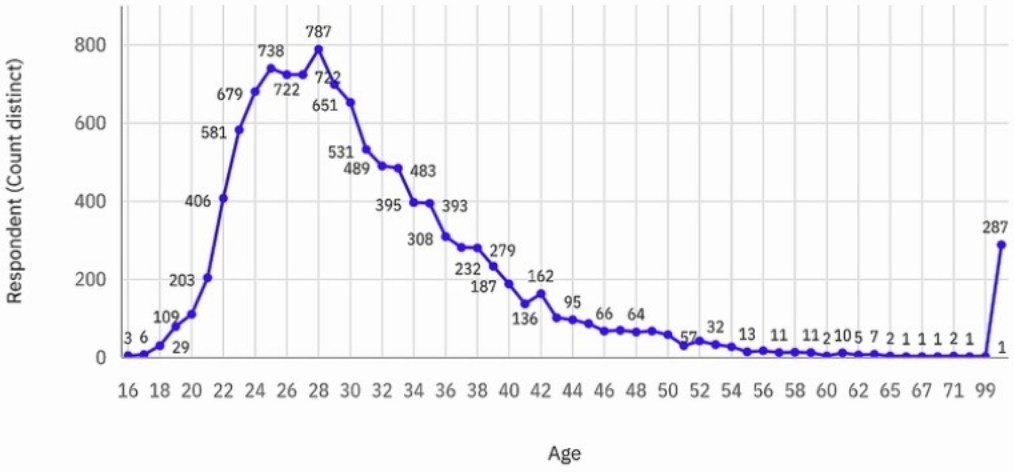
Percentage of Male and Female Respondents



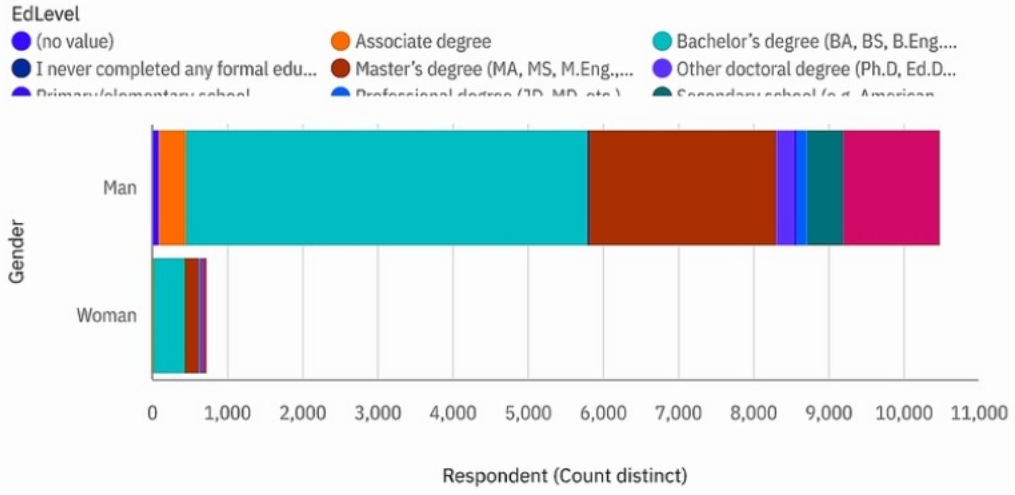
Respondent from different countries



Respondent by Age



Respondent count by gender and there formal education level



Discussion

- What factors are driving the high demand for web developers?
- Which technologies should aspiring developers and data professionals focus on?
- What is contributing to the significant decline in MySQL's popularity?
- Could NoSQL databases eventually replace relational databases entirely?
- Is there a link between programming language expertise and salary levels?
- Why do gender, age, and educational gaps persist in the tech industry?
- Current and future technology trends
- Importance of training and reskilling
- Increasing female representation in tech
- Bridging the tech gap in developing regions
- Reducing age and education biases in hiring

OVERALL FINDINGS & IMPLICATIONS

Findings

• Technology trends shift yearly, but JavaScript and HTML/CSS remain top languages, with increasing interest in TypeScript.

• SQL and Python continue to be widely used and are among the most sought-after skills for developers.

• MySQL is popular, though PostgreSQL and NoSQL databases are gaining traction for future use.

• Linux is the preferred platform for developers and is expected to stay dominant.

• Significant gender and age disparities remain within the IT sector.

Implications

• Web development offers strong career prospects, as web-focused languages have high demand.

• Data professionals should develop skills in both SQL and NoSQL, along with Python, to remain competitive.

• Familiarity with Linux is essential for developers, given its widespread use.

• Addressing gender gaps can enhance diversity, with HR and leadership playing a crucial role.

• Companies should stay adaptable, as fast-evolving technology trends and newer platforms like Docker and AWS will shape future deployments.

CONCLUSION

This report successfully identified key technology trends for the current and upcoming year. Developers prioritize languages and tools that are efficient, simple, and minimize errors, often achieved through type-safe technologies.

This analysis serves as a valuable guide for businesses to stay aligned with emerging trends, for learners to understand skill priorities, and for educators to adjust curricula to industry needs. Businesses can better allocate resources toward in-demand skills, support upskilling for employees, and work toward reducing gender disparities in tech.

Future efforts could include machine learning for forecasting trends and salary insights, providing even more actionable data for strategic planning.

Appendix

1.Data Sources:

- Job postings (LinkedIn, Glassdoor)
- Developer surveys (Stack Overflow Developer Survey)
- Online training platforms (Coursera)

2.Tools & Technologies:

- Web Scraping (BeautifulSoup, Scrapy)
- APIs (LinkedIn API, Stack Overflow API)
- Data Analysis & Visualization (IBM Cognos Analytics)

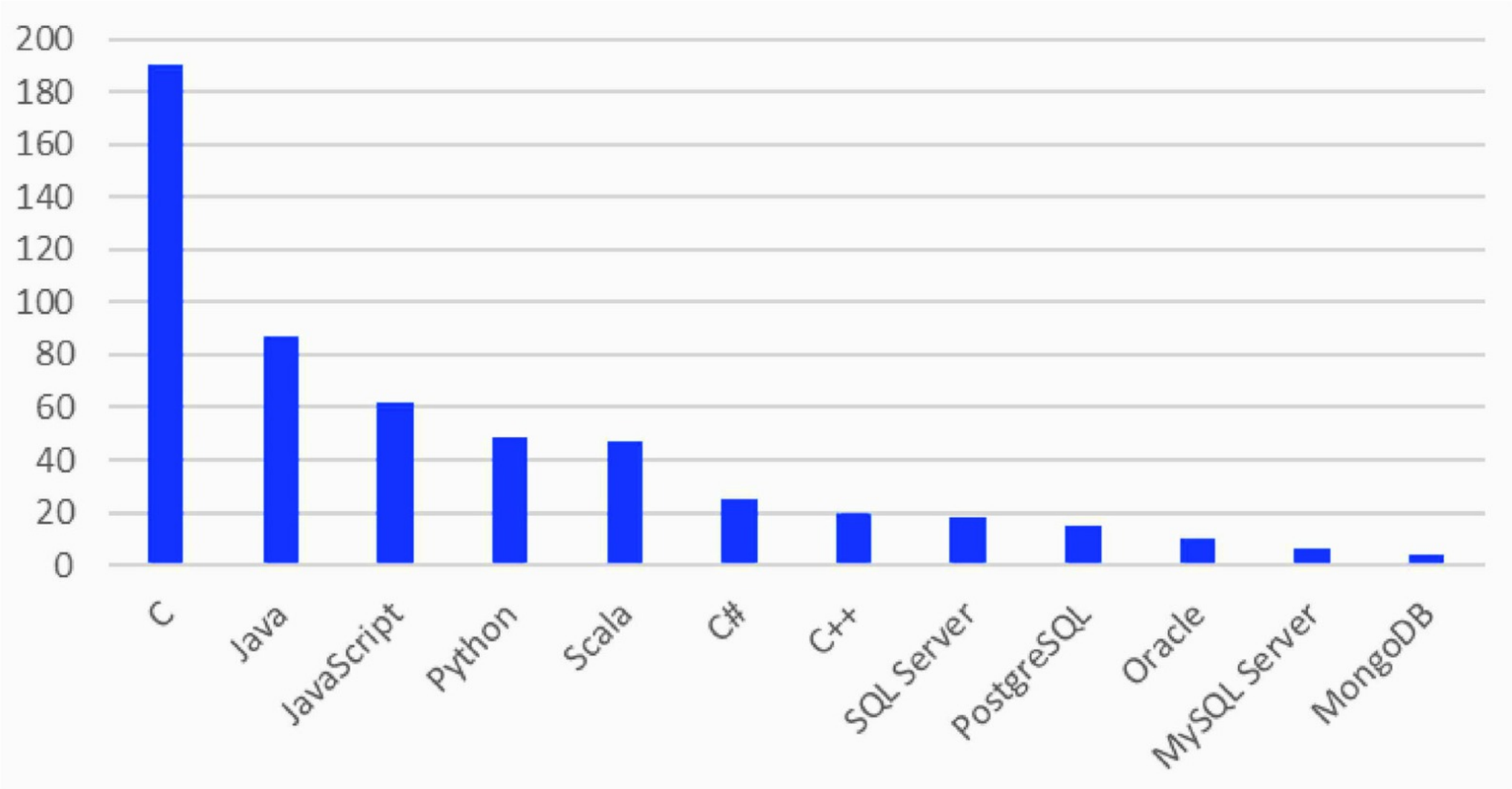
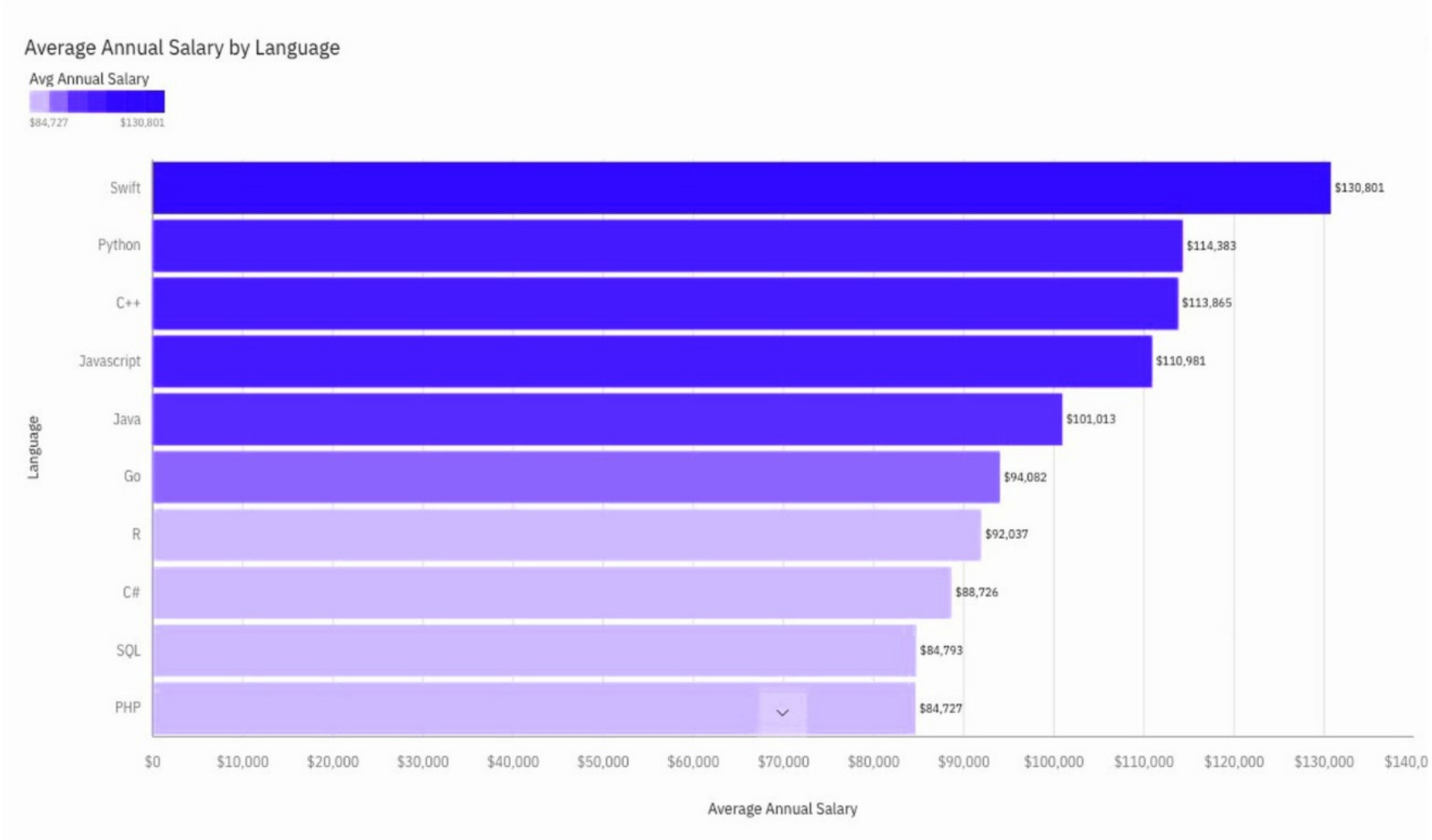
3.Key Metrics:

- Frequency of programming language mentions
- Database system usage statistics
- Popularity of development platforms and tools

4.Data Cleaning Techniques:

- Handling missing values
- Removing duplicates
- Standardizing data formats for analysis

Job Postings



Popular Languages