TECHNOLOGY TRENDS AND ANALYSIS

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OUTLINE

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

EXECUTIVE SUMMARY

- Trends in Programming Languages, Databases, Platforms and Web Frameworks:
  - Current usage
  - Future trends
- Demographic insights:
  - Formal education levels
  - Gender distribution
  - Age group
- Technical preferences
- Cultural Trends

INTRODUCTION

- This report delivers an in-depth analysis of current technology trends, highlighting programming languages, databases, web frameworks, and demographic distributions.

- As technology evolves rapidly, it becomes crucial to understand which tools and technologies are gaining traction and which are losing popularity. This understanding is essential for organizations to make informed decisions about technology adoption, training, and investment.

- Questions for Analysis:

  - Which programming languages are currently the most widely used and which ones are expected to gain popularity next year?

  - What are the preferred databases among respondents, and how are their preferences shifting?

  - Which web frameworks are most commonly used, and what trends are emerging in this area?

  - What demographic factors are influencing the technology landscape, and how do they impact technology adoption and usage?

METHODOLOGY

- Gathering data sources:
  - Stack Overflow Developer 2019 Survey
  - GitHub Job Postings
  - Programming Languages Annual Salary
- Data Cleaning and Processing
- Exploratory Data Analysis (EDA)
- Data Transformation
- Data Analysis
- Data Visualization and Presentation
  - Create clear and informative visualizations (e.g., bar charts, line graphs, pie charts) to represent findings.
  - Summarize key insights and implications based on the analysis.
- Data Findings Report

RESULTS

- **Current Technology Usage**
  This section presents an overview of the most widely used technologies among respondents. It includes detailed statistics on programming languages, databases, and web frameworks that are currently prevalent in the industry. Visual representations such as bar chart, column chart, world cloud chart and hierarchy bubble chart illustrate the dominance and usage trends of various technologies, providing insights into the tools and platforms that are integral to current development practices.

- **Future Technology Trends**
  This section focuses on the anticipated trends and preferences for the upcoming year. It highlights which programming languages, databases, and web frameworks respondents are looking to adopt or learn next. The data is visualized through graphs and charts, showcasing the shifting landscape of technology preferences and predicting emerging trends. This section helps identify the technologies that are poised to gain traction and influence the industry in the near future.
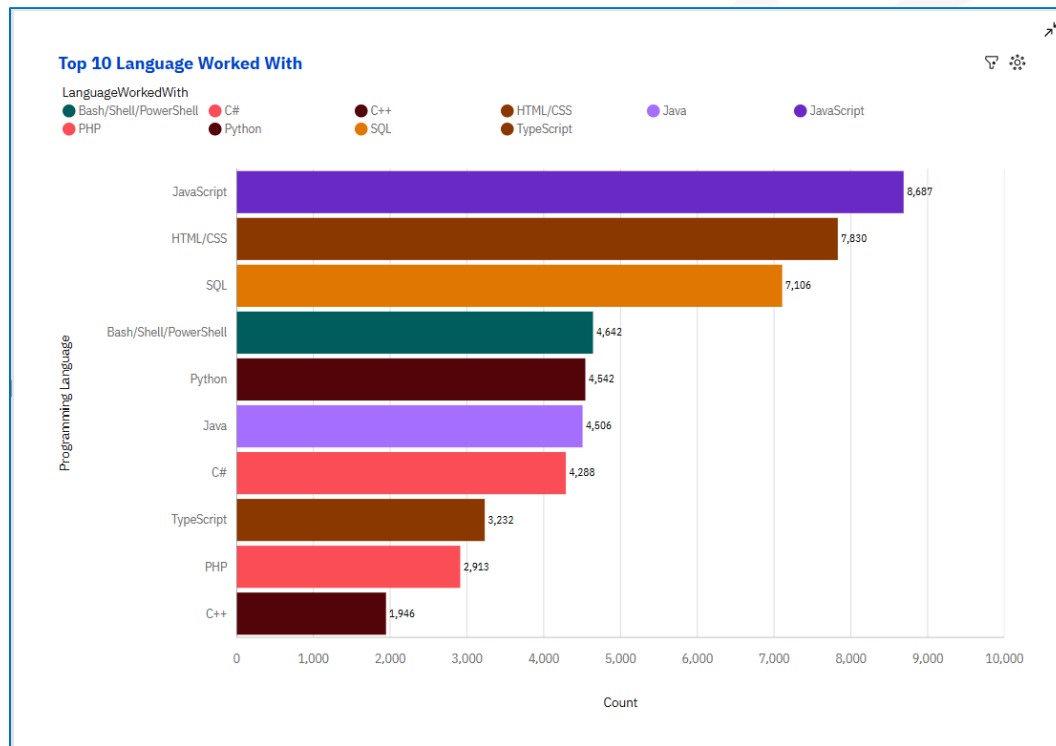
- **Demographics**
  This section provides a detailed analysis of the respondents' backgrounds, including education levels, gender distribution, and other relevant factors. This section uses visual aids like pie charts line chart, map chart and stacked bar chart to represent the diversity and composition of the respondent pool. It sheds light on the educational qualifications and gender dynamics within the tech community, offering insights into how these demographic factors impact technology usage and preferences.
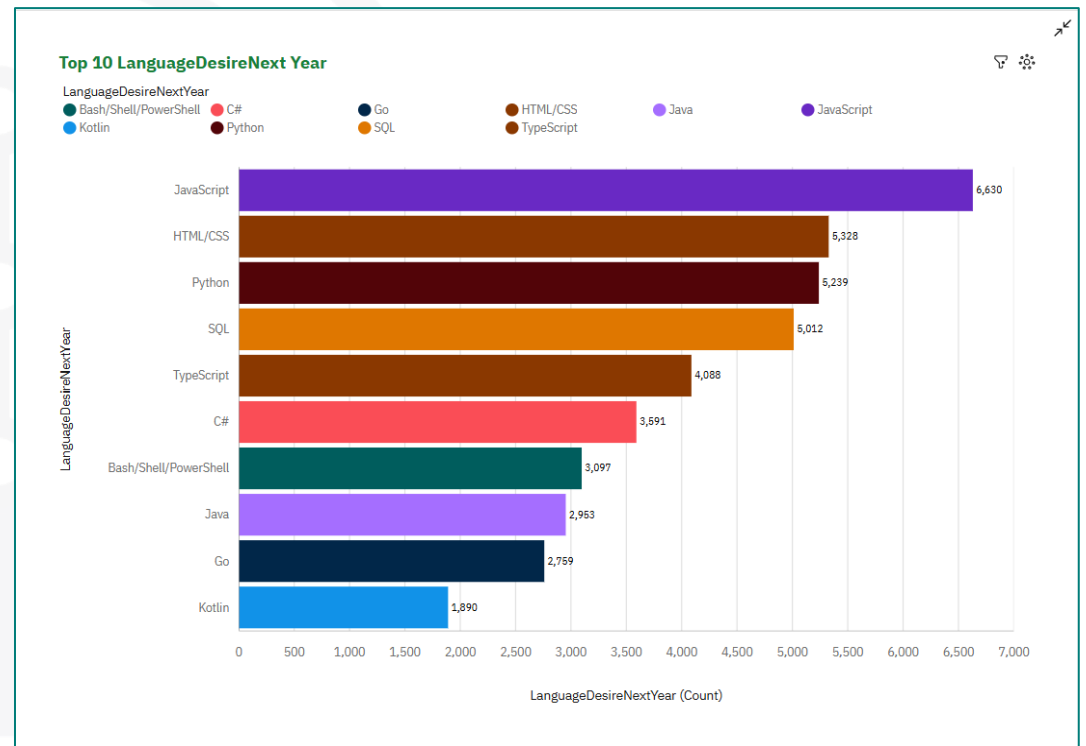
PROGRAMMING LANGUAGE TRENDS

Current Year

Top 10 Language Worked With

LanguageWorkedWith
● Bash/Shell/PowerShell ● C# ● C++ ● HTML/CSS ● Java ● JavaScript
● PHP ● Python ● SQL ● TypeScript

Programming Language	Count
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shell/PowerShell	4,642
Python	4,542
Java	4,506
C#	4,288
TypeScript	3,232
PHP	2,913
C++	1,946

Next Year

Top 10 LanguageDesireNext Year

LanguageDesireNextYear
● Bash/Shell/PowerShell ● C# ● Go ● HTML/CSS ● Java ● JavaScript
● Kotlin ● Python ● SQL ● TypeScript

LanguageDesireNextYear	Count
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088
C#	3,591
Bash/Shell/PowerShell	3,097
Java	2,953
Go	2,759
Kotlin	1,890

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **JavaScript** remains the most frequently used language (8,687 respondents) and continues to be highly desired for the next year (6,630 respondents).

- **TypeScript** is gaining traction, with 3,232 current users and 4,088 respondents desiring to work with it next year.

- **Python** is both widely used (4,542 respondents) and highly desired for the next year (5,239 respondents), showing significant growth.

Implications

- Developers and companies should continue to invest in JavaScript skills and resources, as it remains a cornerstone of web development.

- Growing preference for TypeScript's enhanced features over plain JavaScript, suggesting a trend towards adopting TypeScript for better code maintainability and development efficiency.

- The increasing popularity of Python underscores its versatility and applicability in various fields. Organizations should consider integrating Python into their projects and training programs to stay competitive.
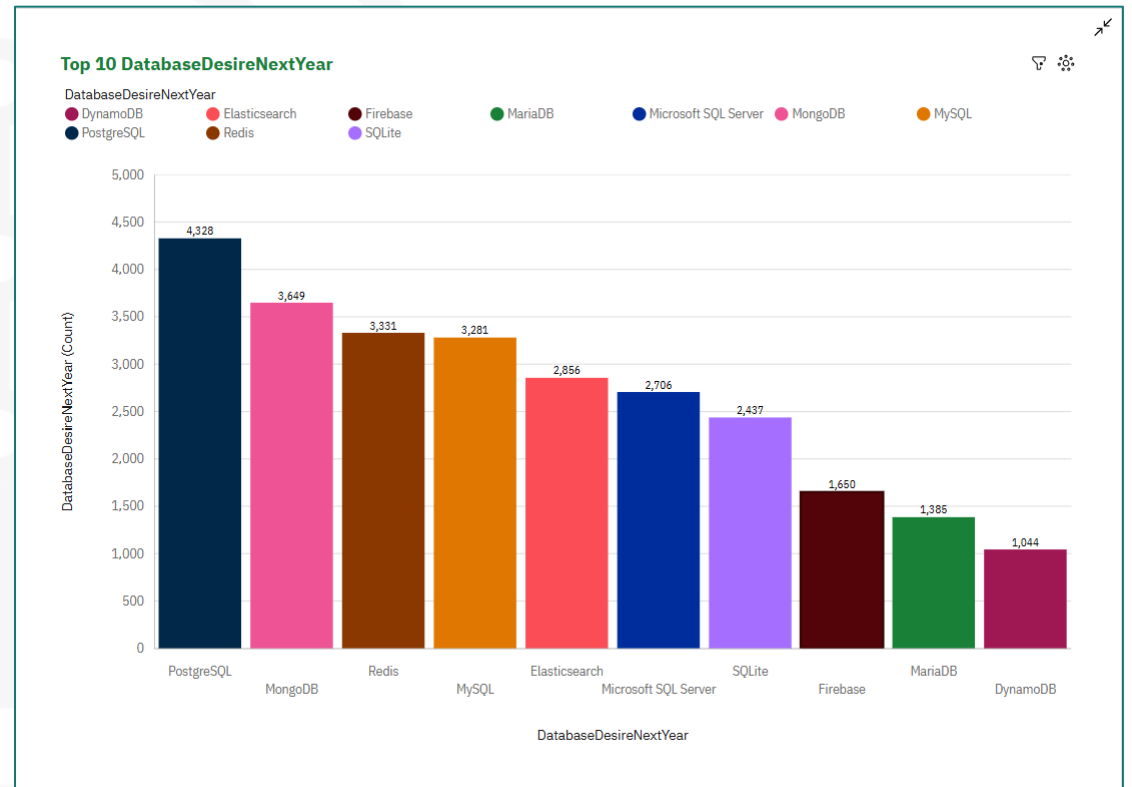
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DATABASE TRENDS

Current Year

Next Year

Top 10 Database Worked With

DatabaseWorkedWith
● Elasticsearch ● Firebase ● MariaDB ● Microsoft SQL Server ● MongoDB ● MySQL ● Oracle
● PostgreSQL ● Redis ● SQLite

DatabaseWorkedWith (Count)

- MySQL: 5,469
- Microsoft SQL Server: 4,110
- PostgreSQL: 4,097
- SQLite: 3,248
- MongoDB: 3,016
- Redis: 2,508
- Elasticsearch: 1,954
- Oracle: 1,744
- MariaDB: 1,709
- Firebase: 1,314

Top 10 DatabaseDesireNextYear

DatabaseDesireNextYear
● DynamoDB ● Elasticsearch ● Firebase ● MariaDB ● Microsoft SQL Server ● MongoDB ● MySQL
● PostgreSQL ● Redis ● SQLite

DatabaseDesireNextYear (Count)

- PostgreSQL: 4,328
- MongoDB: 3,649
- Redis: 3,331
- MySQL: 3,281
- Elasticsearch: 2,856
- Microsoft SQL Server: 2,706
- SQLite: 2,437
- Firebase: 1,650
- MariaDB: 1,385
- DynamoDB: 1,044

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **MySQL** is the most used database for this year with 5,469 respondents using it.

- **PostgreSQL** and **MongoDB** are among the top desired databases for next year, with 4,328 and 3,649 respondents, respectively.

- **Redis** and **Elasticsearch** are seeing increased interest, with 3,331 and 2,856 respondents desiring to use them next year.

Implications

- The decreased interest in Microsoft SQL Server, MySQL, and SQLite suggests a market shift towards more modern and feature-rich databases like PostgreSQL and MongoDB. Organizations should consider diversifying their database strategies to include these newer options, aligning with current trends.

- With the rising popularity of PostgreSQL and MongoDB, companies should prioritize training and development resources for these databases to leverage their advanced functionalities.

- The growing interest in Redis and Elasticsearch suggests that businesses should consider integrating these technologies to enhance performance and search capabilities in their applications.
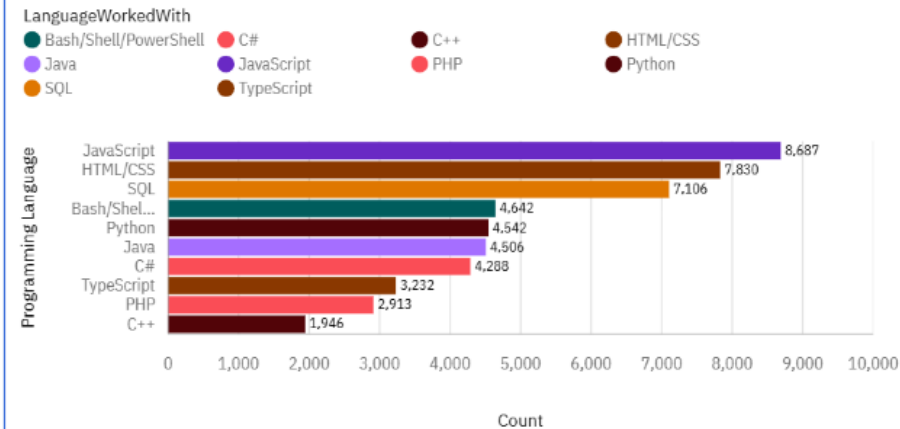
DASHBOARD

https://github.com/jbrent369/IBM-Data-Analyst-Capstone-Project/blob/57687482de99e7d432a10d93bf3b80f964a6c7d0/Building_a_Dashboard_with_IBM_Cognos_Analytics.pdf
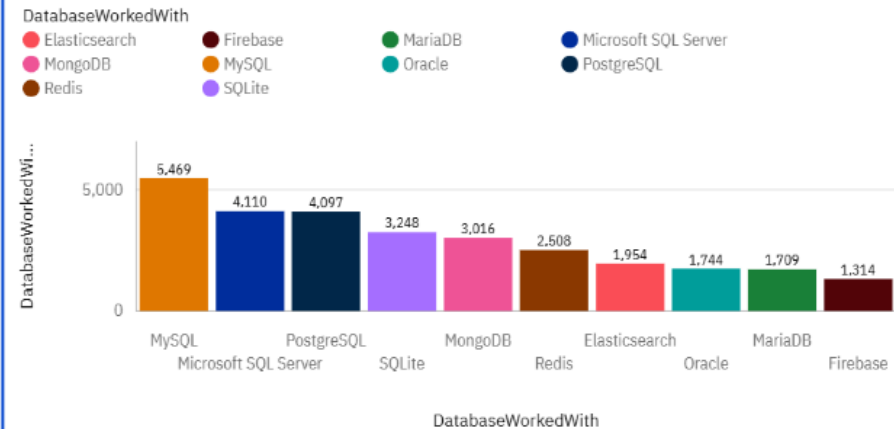
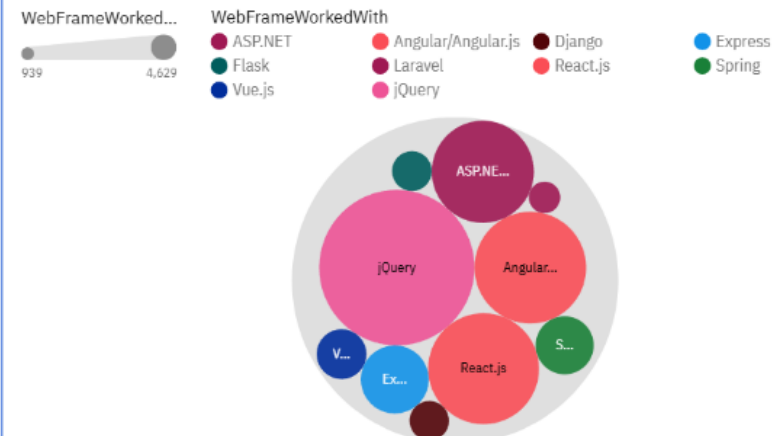# CURRENT TECHNOLOGY USAGE

Top 10 Language Worked With

LanguageWorkedWith
- Bash/Shell/PowerShell
- C#
- C++
- HTML/CSS
- Java
- JavaScript
- PHP
- Python
- SQL
- TypeScript

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Top 10 Database Worked With

DatabaseWorkedWith
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- Oracle
- PostgreSQL
- Redis
- SQLite

DatabaseWorkedWith	Count
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MongoDB	3,016
Redis	2,508
Elasticsearch	1,954
Oracle	1,744
MariaDB	1,709
Firebase	1,314

PlatformWorkedWith

PlatformWorkedW... 215 — 5,811

PlatformWorkedWith
- AWS
- Docker
- IBM Cloud or Watson
- MacOS
- Android
- Google Cloud Platform
- Kubernetes
- Microsoft Azure
- Arduino
- Heroku
- Linux
- Other(s):

Top 10 WebFrame Worked With

WebFrameWorked... 939 — 4,629

WebFrameWorkedWith
- ASP.NET
- Angular/Angular.js
- Django
- Express
- Flask
- Laravel
- React.js
- Spring
- Vue.js
- jQuery
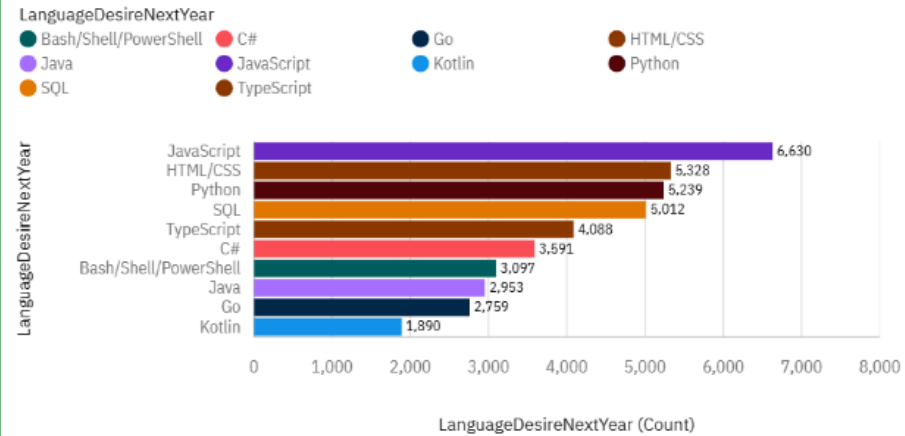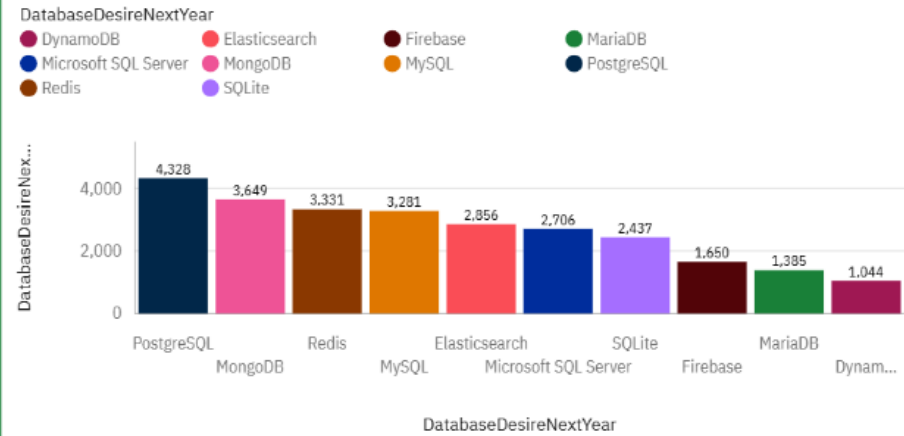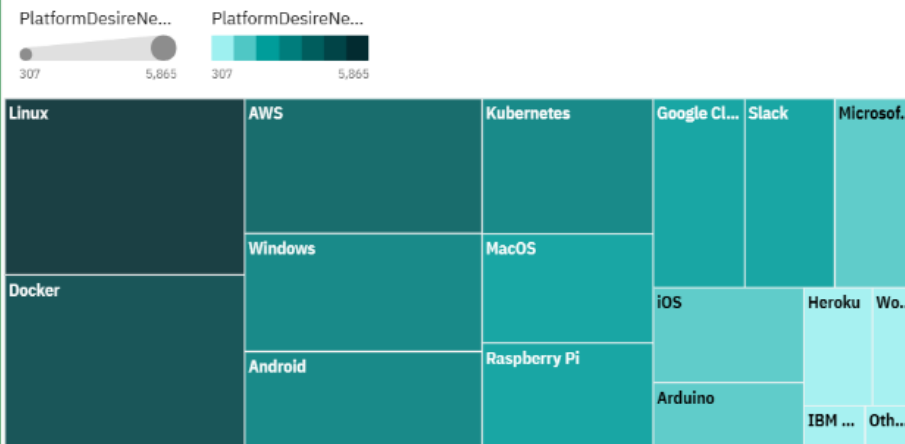
FUTURE TECHNOLOGY TREND
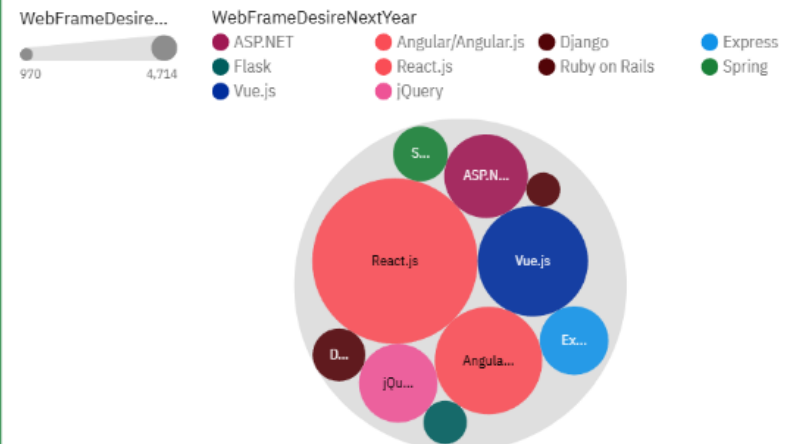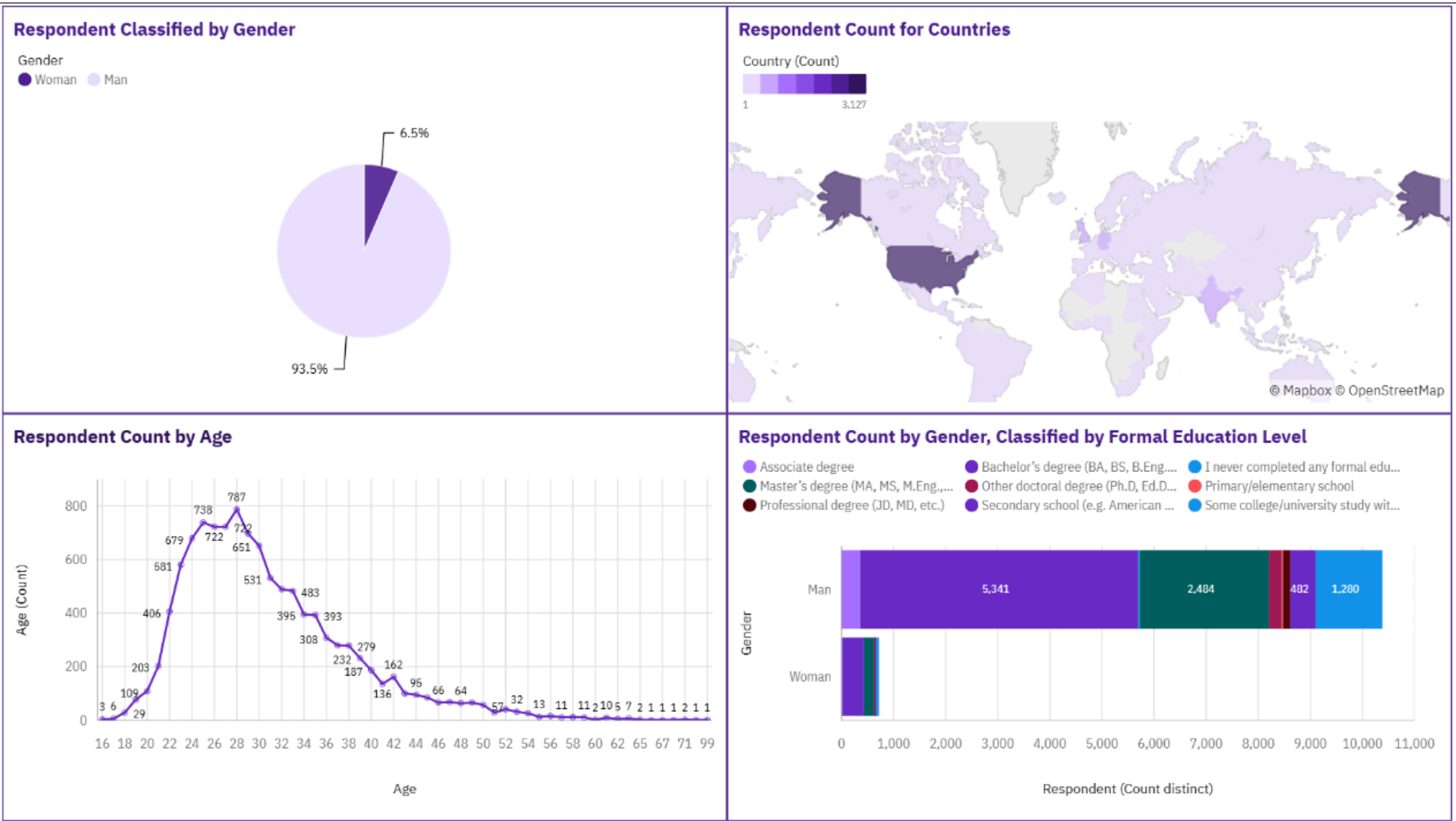
DEMOGRRAPHICS

DISCUSSION

- Current Technology Usage
- Future Technology Trends
- Demographic Insights
- Organizational Adaptability
- Investment in Training
- Promoting Diversity and Inclusion
- Global Perspective

OVERALL FINDINGS & IMPLICATIONS

Findings

- Dominance of JavaScript and Python programming language.

- There is a significant rise in the popularity of modern databases like PostgreSQL and MongoDB, indicating a preference for their advanced features and scalability.

- React and Angular are leading web frameworks, widely used for building dynamic and responsive web applications.

- The majority of respondents have a formal education level of a Bachelor's degree or higher, and there is a notable gender disparity with significantly more men than women.

Implications

- Companies should prioritize these languages in their development projects and provide ongoing training to ensure their teams are proficient in these critical technologies.

- Organizations need to adopt and integrate these modern databases into their infrastructure, focusing on scalability and performance optimization to stay ahead in the competitive market.

- Development teams should invest in mastering these frameworks to improve efficiency and deliver high-quality user experiences. Additionally, staying updated with the latest developments in these frameworks is crucial.

- Companies and educational institutions should implement targeted initiatives to promote diversity and inclusion, providing scholarships, mentorship, and training opportunities to underrepresented groups, particularly women, to bridge the gender gap in the tech industry.
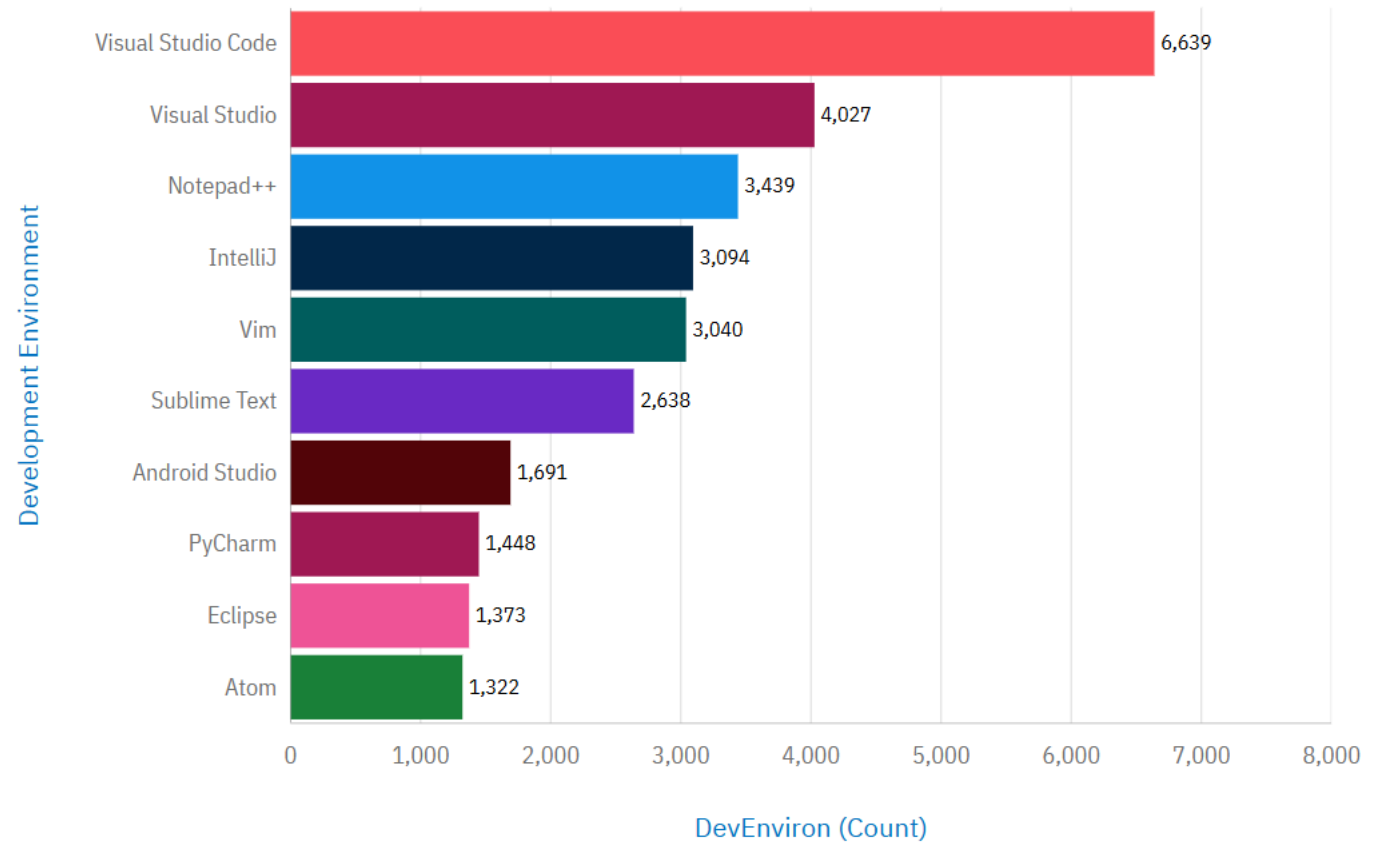
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CONCLUSION

- The analysis highlights the continued dominance of established technologies like JavaScript and MySQL, which remain central to development practices.

- There is a clear trend towards adopting modern tools and technologies such as TypeScript, PostgreSQL, and Redis, reflecting their advanced capabilities and flexibility.

- The majority of respondents hold at least a Bachelor's degree, suggesting that higher education plays a significant role in the tech industry.

- The notable gender disparity among respondents underscores the need for targeted diversity and inclusion initiatives to bridge the gap in the tech workforce.

- The growing interest in high-performance and scalable solutions like Elasticsearch and Kubernetes indicates a focus on optimizing data processing and application performance.

- Organizations should prioritize continuous learning, adoption of emerging technologies, and promoting inclusivity to stay competitive and innovative in the rapidly evolving tech landscape.
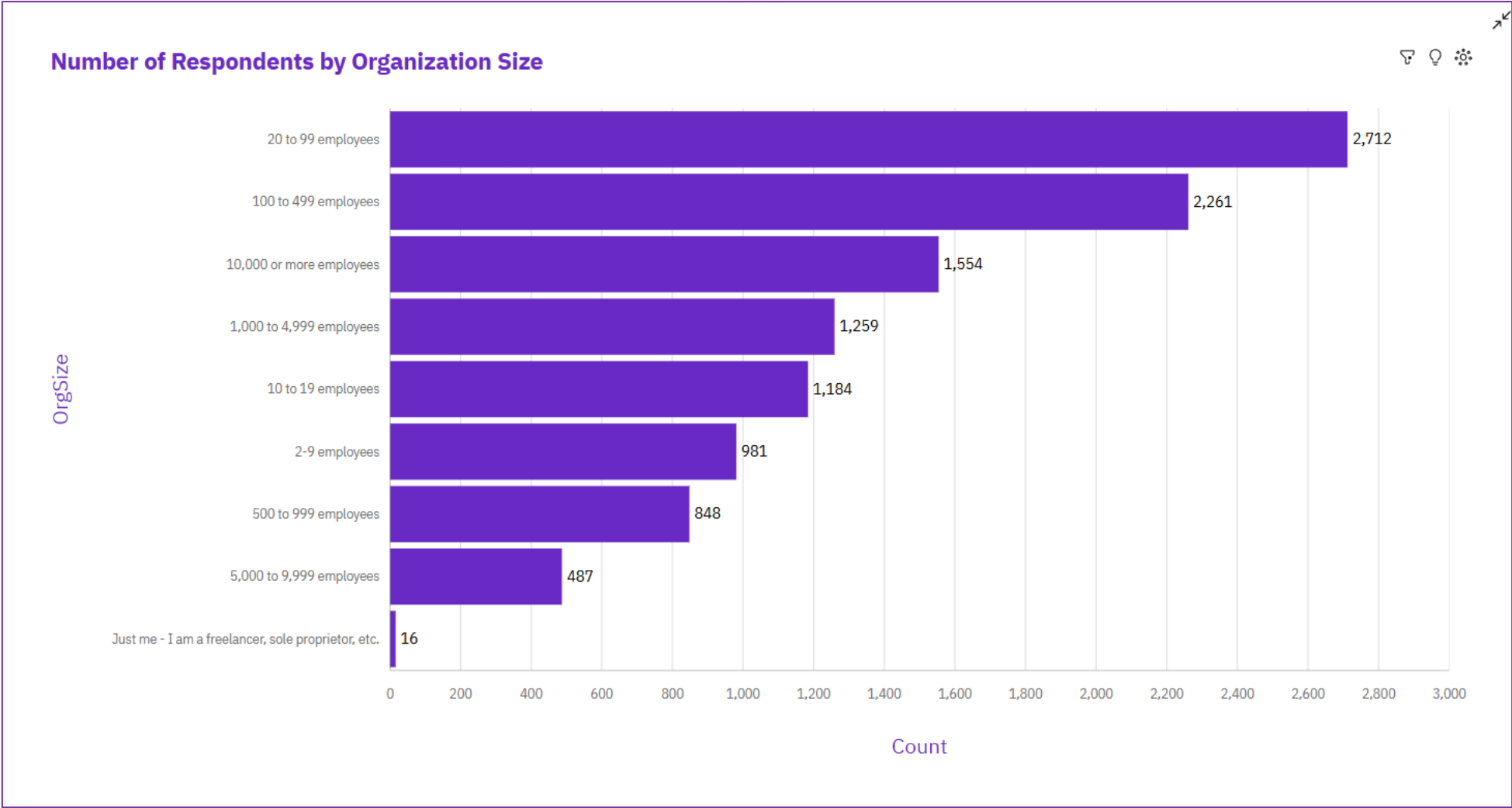
APPENDIX

Top 10 Development Environments

Development Environment	DevEnviron (Count)
Visual Studio Code	6,639
Visual Studio	4,027
Notepad++	3,439
IntelliJ	3,094
Vim	3,040
Sublime Text	2,638
Android Studio	1,691
PyCharm	1,448
Eclipse	1,373
Atom	1,322

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NUMBER OF RESPONDENTS BY ORGANIZATION SIZE

Number of Respondents by Organization Size

OrgSize	Count
20 to 99 employees	2,712
100 to 499 employees	2,261
10,000 or more employees	1,554
1,000 to 4,999 employees	1,259
10 to 19 employees	1,184
2-9 employees	981
500 to 999 employees	848
5,000 to 9,999 employees	487
Just me - I am a freelancer, sole proprietor, etc.	16

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RESPONDENTS BY CAREER AND JOB SATISFACTION

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JOB POSTINGS

Bar Chart of Number Job Postings per Programming Language

POPULAR LANGUAGES

Bar Chart of Average Annual Salary per Programming Language