Emerging Tech Trends: Analyzing Developer Skills and Future Demands in IT

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June 24,2024

IBM Developer

SKILLS NETWORK

OUTLINE

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

EXECUTIVE SUMMARY

- **Objectives:**
  - Gain insights into current market trends and future developments for developers.
  - Analyze tools, technologies, locations, demographics, and salaries.
- **Methodology**:
  - **Data Collection**: Web scraping using Python.
  - **Data Preprocessing**: Handling missing values, duplicates, and normalizing data.
  - **EDA**: Analyzing data distribution, outliers, and correlations.
  - **Data Visualization**: Visualizing distributions, relationships, compositions, and comparisons.
  - **Dashboard Creation**: Identifying trends using IBM Cognos Analytics.
- **Key Findings**:
  - Majority of participants are aged 20-40.
  - Top databases: MySQL, PostgreSQL, MongoDB, Redis, Elasticsearch.
  - Top programming languages: JavaScript, SQL, Python.
  - Most used platforms: Windows, Linux, Docker.
  - Majority of developers reside in the US.
  - Gender distribution: 93.5% men, 6.5% women.
- **Conclusions**:
  - Most jobs are in the US.
  - Linux is the most desirable platform to learn.
  - React.js is the most desirable web framework.

INTRODUCTION

- **Background**:
  - Overview of the global IT and business consulting services firm.
  - Importance of staying competitive by identifying future skill requirements.
- **Project Objective**:
  - To gather insightful information about the current market and future trends in the developer field.
  - Focus areas include tools, technologies, locations, demographics, and salaries.
- **Scope**:
  - Collecting data from job postings, training portals, and surveys.
  - Analyzing top programming languages, database skills, and popular IDEs.

METHODOLOGY

- **Data Collection**:
  - Sources: Job postings, training portals, surveys.
  - Techniques: Web scraping using Python.
- **Data Preprocessing**:
  - Handling missing values and duplicates.
  - Normalizing data to ensure consistency.
- **Exploratory Data Analysis (EDA)**:
  - Analyzing data distribution, identifying outliers, and finding correlations.
  - Visualizing data distribution, relationships, compositions, and comparisons.
- **Data Visualization**:
  - Creating visualizations using Matplotlib and Seaborn to identify patterns and trends.
- **Dashboard Creation**:
  - Using IBM Cognos Analytics to develop interactive dashboards for trend analysis.

RESULTS

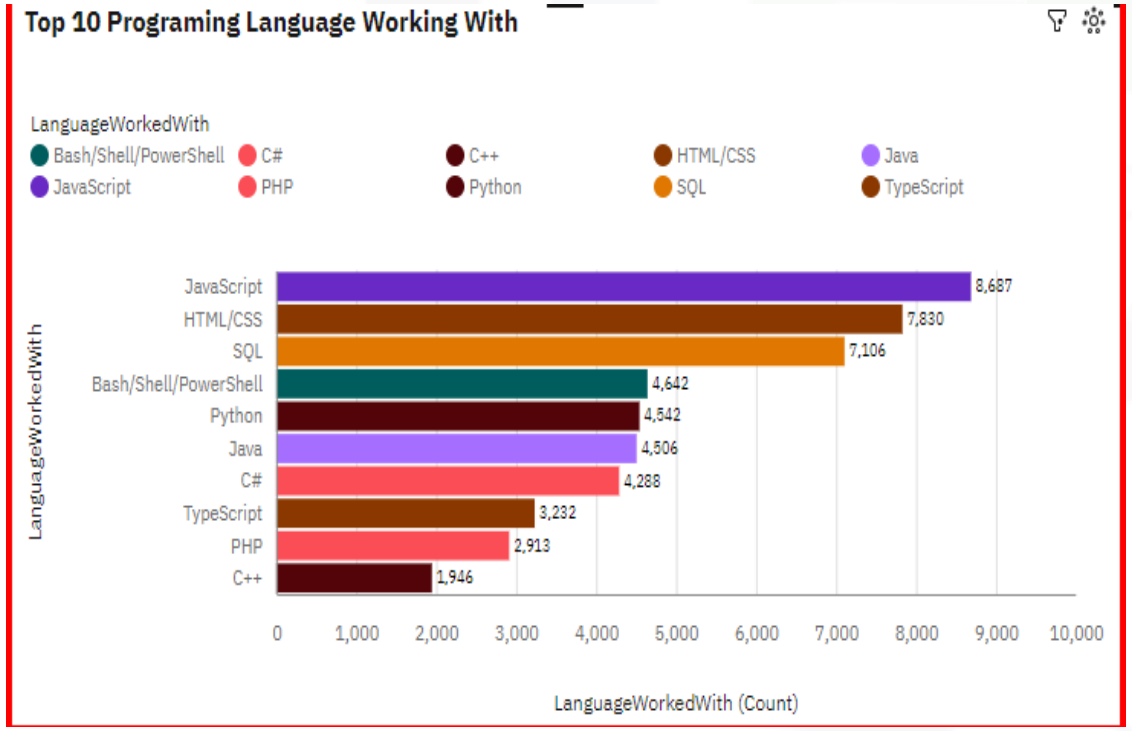
- Demographics:
  - Majority of participants are aged between 20-40 years old.
  - Gender distribution: 93.5% men, 6.5% women.
  - Most developers reside in the US.

- Top Programming Languages:
  - JavaScript: 8,687 users.
  - SQL: 7,830 users.
  - Python: 7,106 users.
  - C#: 4,642 users.
  - PHP: 4,506 users.

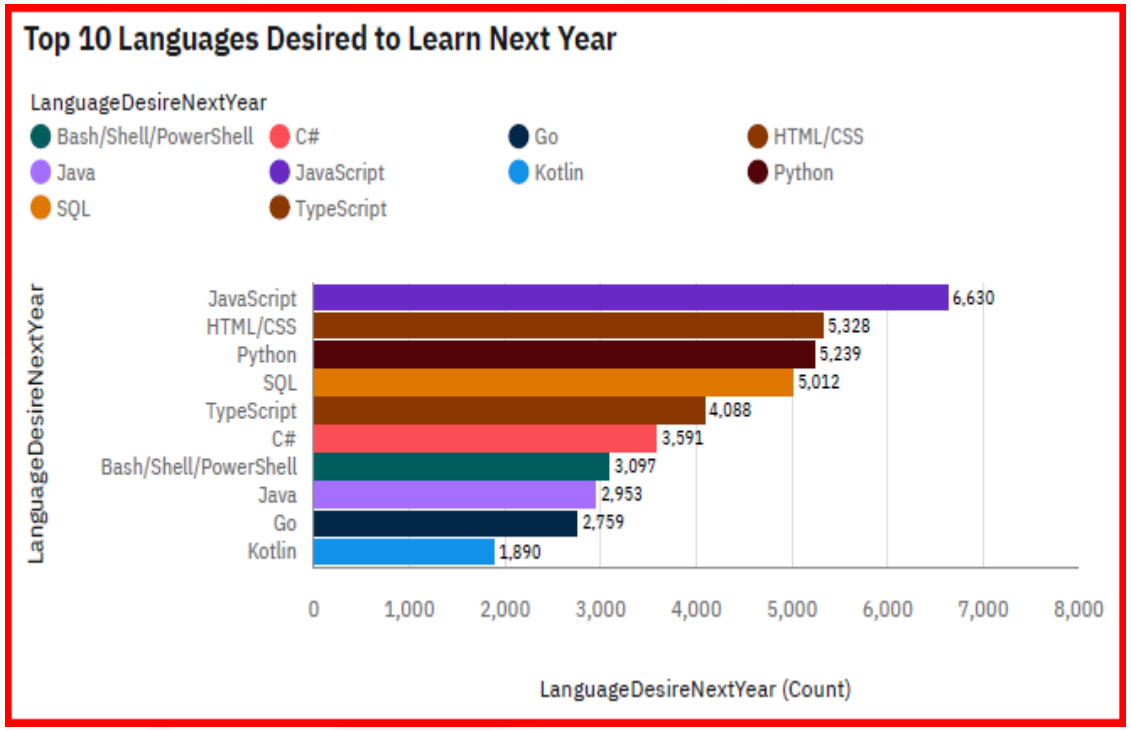
- Top Databases:
  - MySQL: 5,469 users.
  - Microsoft SQL Server: 4,110 users.
  - PostgreSQL: 4,097 users.
  - SQLite: 3,248 users.
  - MongoDB: 3,016 users.
- Popular Platforms:
  - Windows: 5,811 users.
  - Linux: 5,469 users.
  - Docker: 4,110 users.

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

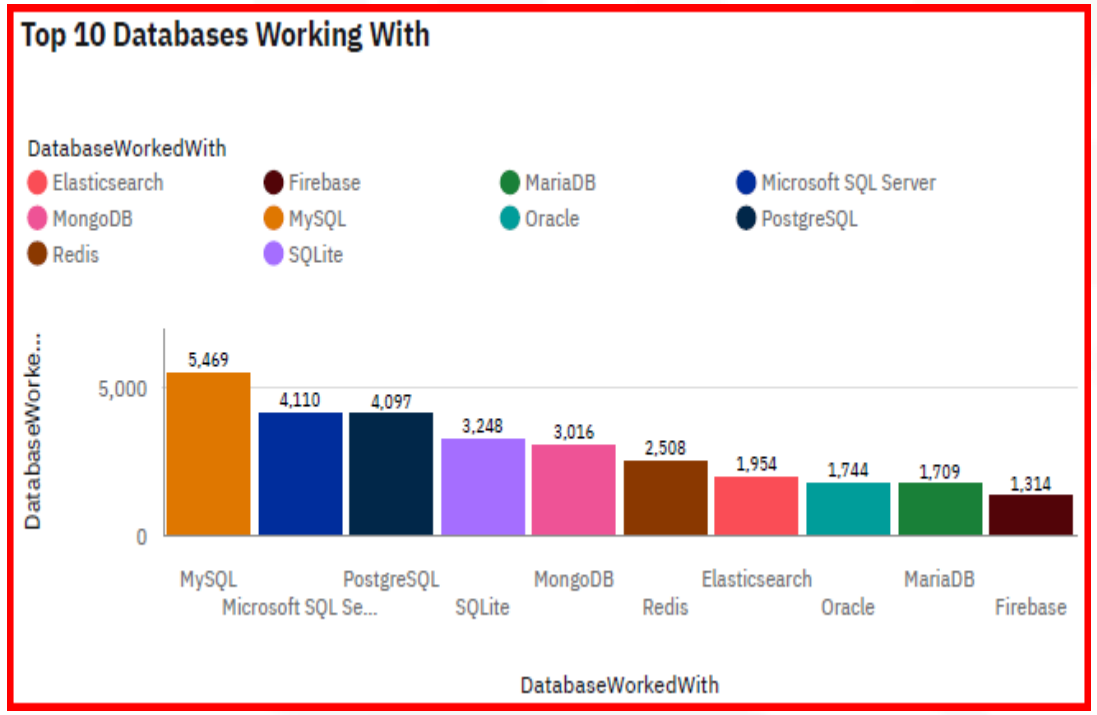
- JavaScript Dominance: JavaScript is the most used programming language with 8,687 users and also the most desired to learn next year with 6,630 desires, highlighting its critical role in web development.
- Data Management and Analysis: SQL and Python are highly used (7,830 and 7,106 users respectively) and desired (5,012 and 5,239 desires respectively), underscoring their importance in data management and analysis tasks.
- Front-End Development: HTML/CSS remains essential for front-end development, with significant usage (1,946 users) and high interest for future learning (5,328 desires).
- Emerging Languages: Go and Kotlin are gaining traction, indicating a shift towards modern and efficient technologies, with notable desires to learn next year (2,759 for Go and 1,890 for Kotlin).

Implications

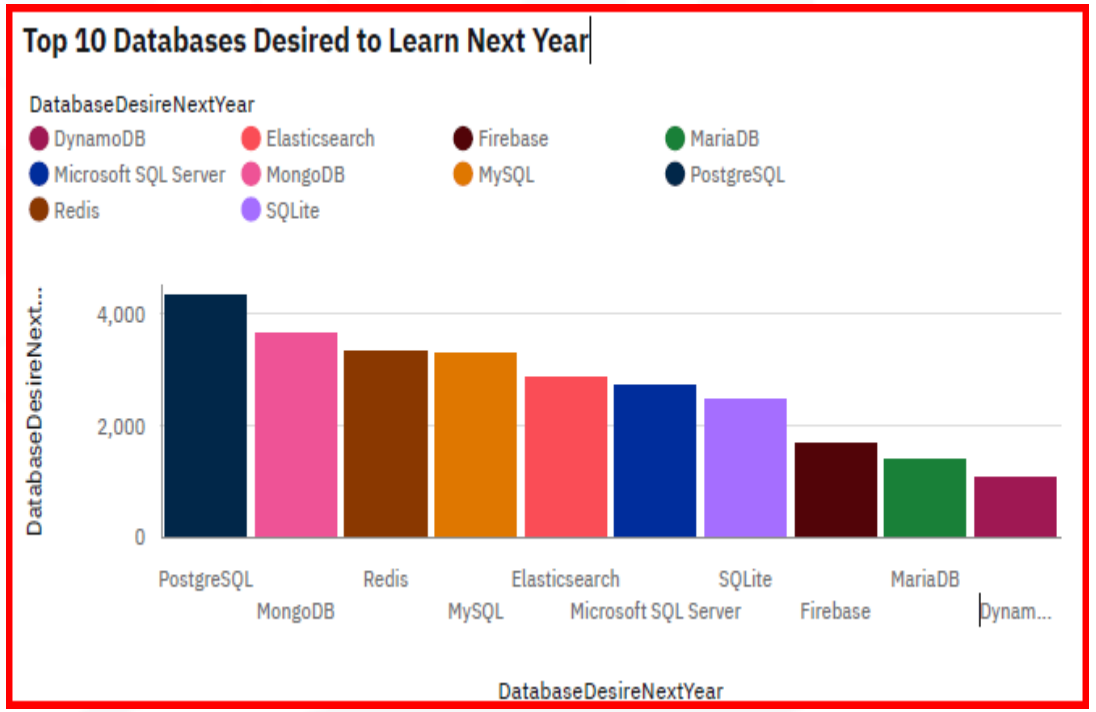
- **JavaScript** is the most used and desired language, vital for both current projects and future learning.
- **Python** and **SQL** are essential for data-related tasks, showing a growing need for skills in data analysis and management.
- The rise in interest for **Go** and **Kotlin** suggests a trend towards learning more modern and efficient programming languages.
- Emphasis on **HTML/CSS** alongside JavaScript signals the ongoing importance of robust front-end development skills.
- Companies should focus on training programs that cover these top languages to ensure their workforce remains competitive and up-to-date with industry trends.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

Current Database Usage:

- **MySQL** is the most used database with 5,469 users.
- **Microsoft SQL Server** and **PostgreSQL** follow closely with 4,110 and 4,097 users respectively.
- **MongoDB** and **SQLite** are also popular, with 3,248 and 3,016 users respectively

Future Learning Desires:

- **PostgreSQL** is the most desired database to learn next year, with 4,328 desires.
- **MongoDB** and Redis are also highly desired, with 3,649 and 3,331 desires respectively.
- **MySQL** remains a strong contender for future learning, with 3,281 desires

Emerging Technologies:

- **Elasticsearch and Firebase** are gaining traction, with significant numbers of users (2,508 and 1,744 respectively) and desires to learn (2,856 and 1,709 respectively).
- **DynamoDB** is also emerging as a desired technology, with 1,314 users currently and 1,890 desires to learn next year

Implications

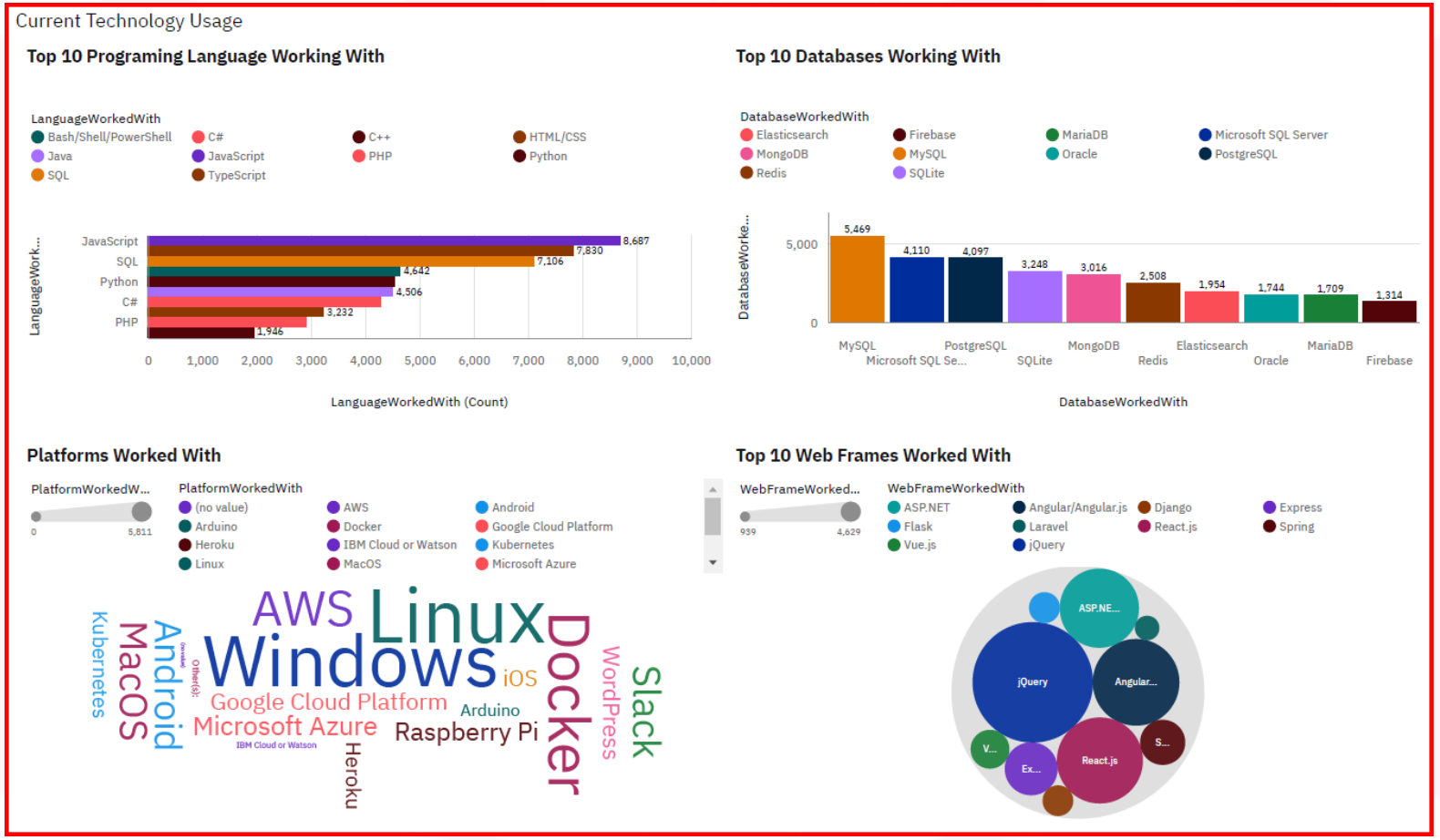
- **Web Development Dominance**: JavaScript's top position in both usage and learning desires underscores its critical role in web development.
- **Data Skills in High Demand**: Strong presence of SQL and Python highlights the growing importance of data management and analysis capabilities.
- **Full-Stack Proficiency**: High interest in both back-end (JavaScript, Python) and front-end (HTML/CSS) technologies indicates a trend towards full-stack development skills.
- **Emerging Technologies**: Rising interest in Go and Kotlin suggests a shift towards modern, efficient languages for future projects.
- **Versatility is Key**: The diverse range of languages in use and desired for learning emphasizes the need for developers to be proficient in multiple programming languages.

DASHBOARD

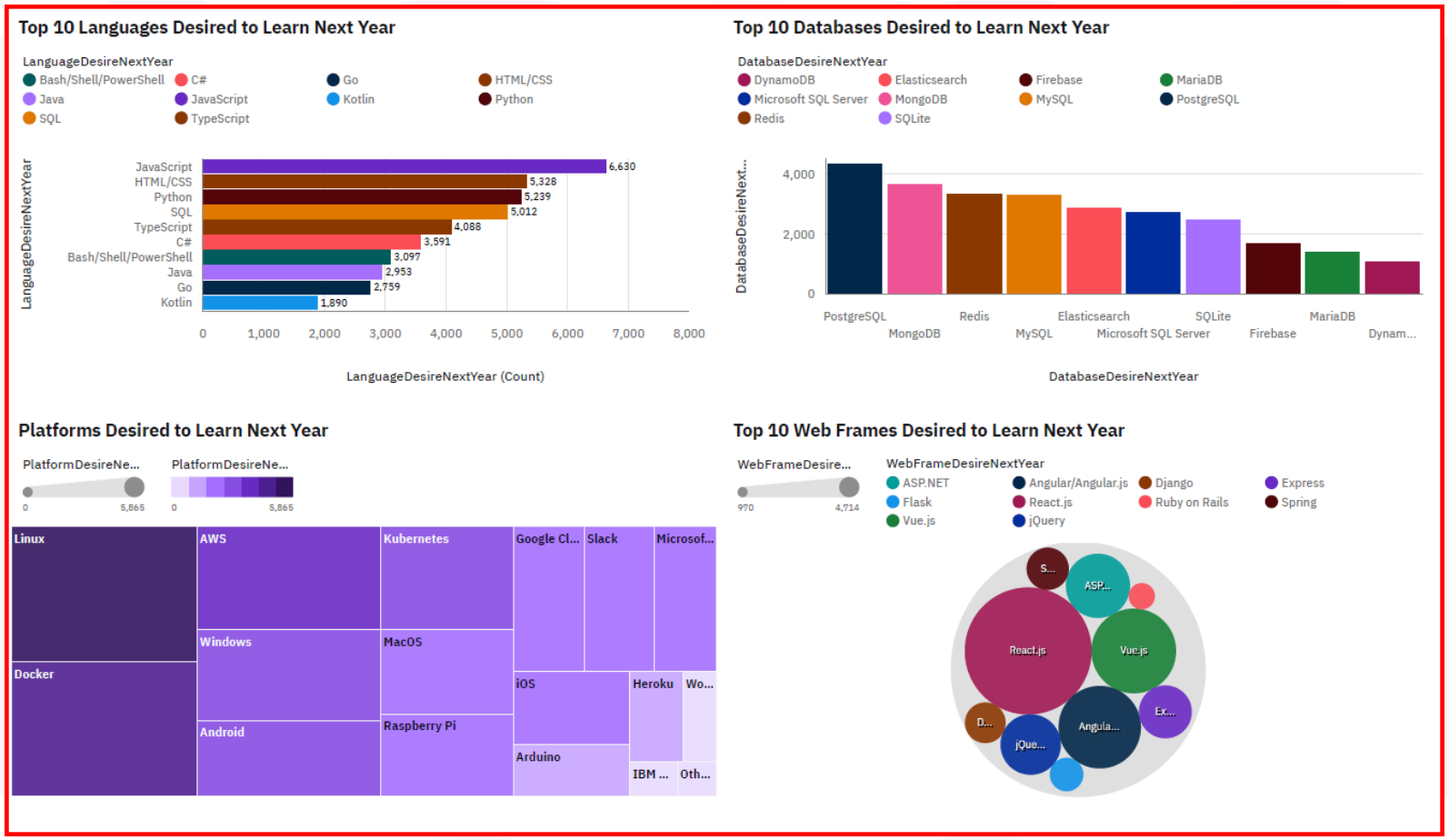
Checkout our Cognos Dashboard here:

https://github.com/bnoruzi/Case-study-future-skill-requirements.-in-Tech/blob/9629a0cda9aa9a4aa303e62c33edd63d1040a028/README.md

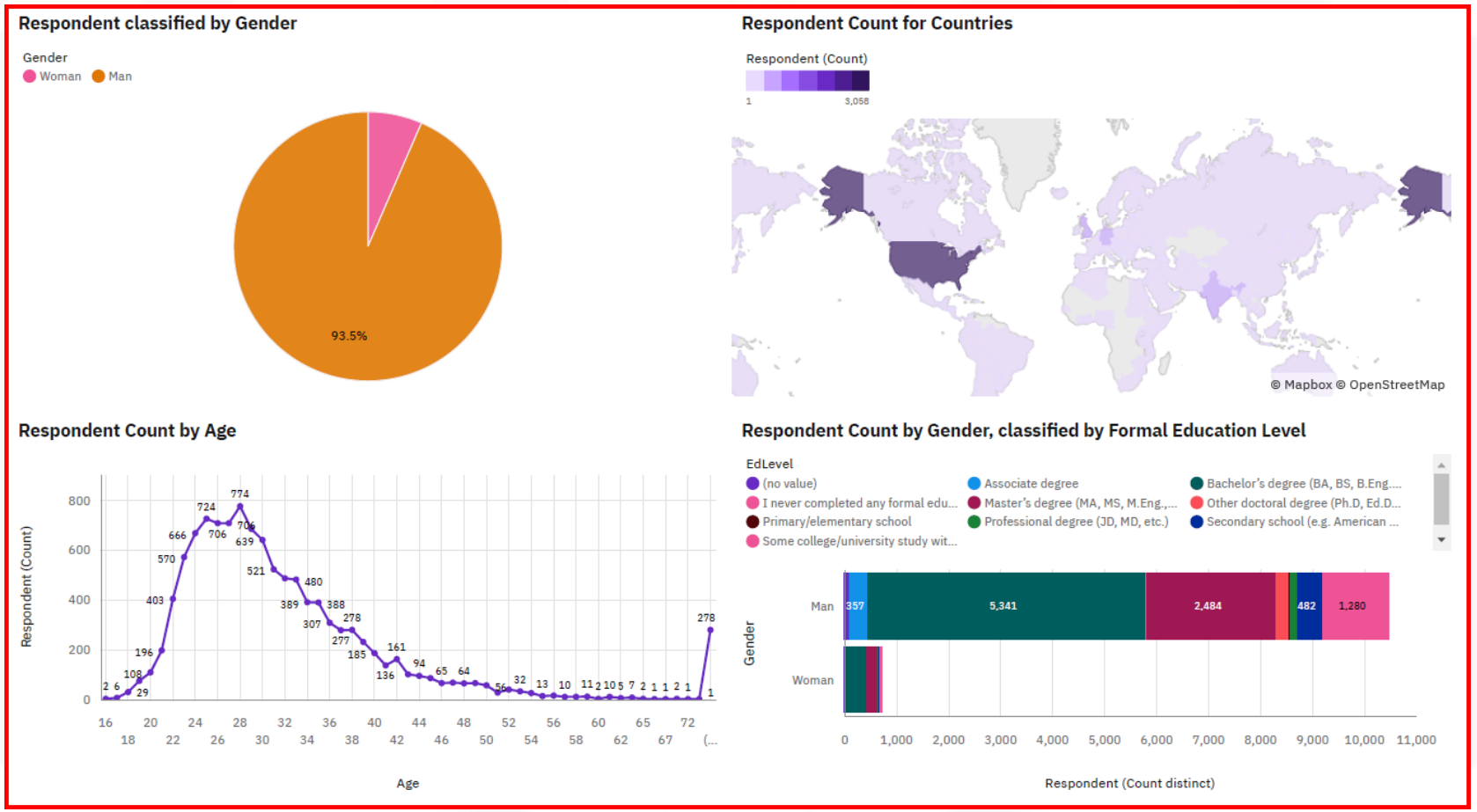
DASHBOARD TAB 1



DASHBOARD TAB 2



DASHBOARD TAB 3



DISCUSSION

- **Dominance of Web Technologies**: JavaScript's top position in both current usage and future learning desires underscores the continued importance of web development skills in the IT industry
- **Data-Driven Decision Making**: The high ranking of SQL and Python in both current and desired skills highlights the growing emphasis on data management and analysis capabilities
- **Full-Stack Development Trend**: Strong interest in both back-end (JavaScript, Python) and front-end (HTML/CSS) technologies suggests a shift towards full-stack development skills
- **Emerging Technologies**: Rising interest in languages like Go and Kotlin indicates a trend towards modern, efficient languages for future projects
- **Geographical Concentration**: The high concentration of developers in the US suggests potential opportunities for talent acquisition and development in other regions

The Rise of Cloud and Container Technologies

- **Cloud and Container Adoption Trends**

- **Docker Dominance**:
  - 3rd most used platform (4,110 users)
  - Indicates strong adoption of containerization technologies
- **Cloud Platform Popularity**:
  - Google Cloud Platform: 2nd most used platform (5,469 users)
  - Microsoft Azure: 4th most used platform (3,248 users)
  - AWS: 9th most used platform (1,709 users)
- **Future Learning Trends**:
  - Docker and Kubernetes among top platforms desired to learn
  - Indicates continued growth in container and orchestration technologies

OVERALL FINDINGS & IMPLICATIONS

Findings

- **Top Programming Languages**:
  - JavaScript (8,687 users), SQL (7,830 users), and Python (7,106 users) are the most used programming languages.
  - HTML/CSS and TypeScript are also highly desired for learning next year, with 5,328 and 4,088 desires respectively.
  - Emerging languages like Go and Kotlin are gaining interest, with 2,759 and 1,890 desires to learn next year.
- **Top Databases**:
  - MySQL (5,469 users) and PostgreSQL (4,097 users) are the most used databases.
  - PostgreSQL is also the most desired database to learn next year (4,328 desires), followed by MongoDB (3,649 desires) and Redis (3,331 desires).
  - Elasticsearch and Firebase are gaining traction, with significant desires to learn (2,856 and 1,709 desires respectively).
- **Demographics and Platforms**:
  - Majority of participants are aged between 20-40 years old, with 93.5% men and 6.5% women.
  - Most developers reside in the US.
  - Popular platforms include Windows, Linux, and Docker.

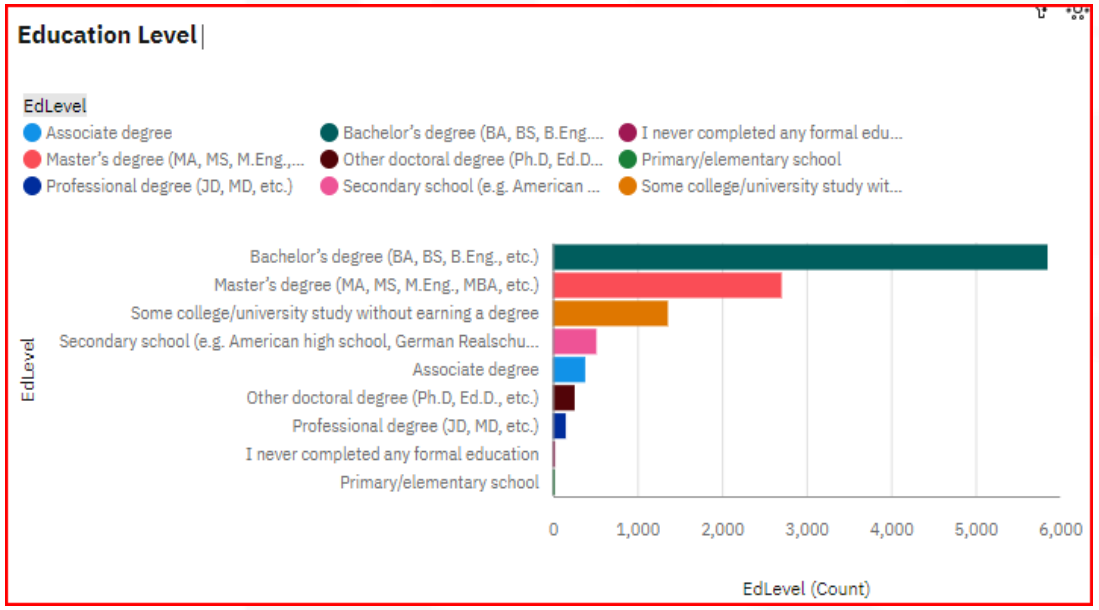
Implications

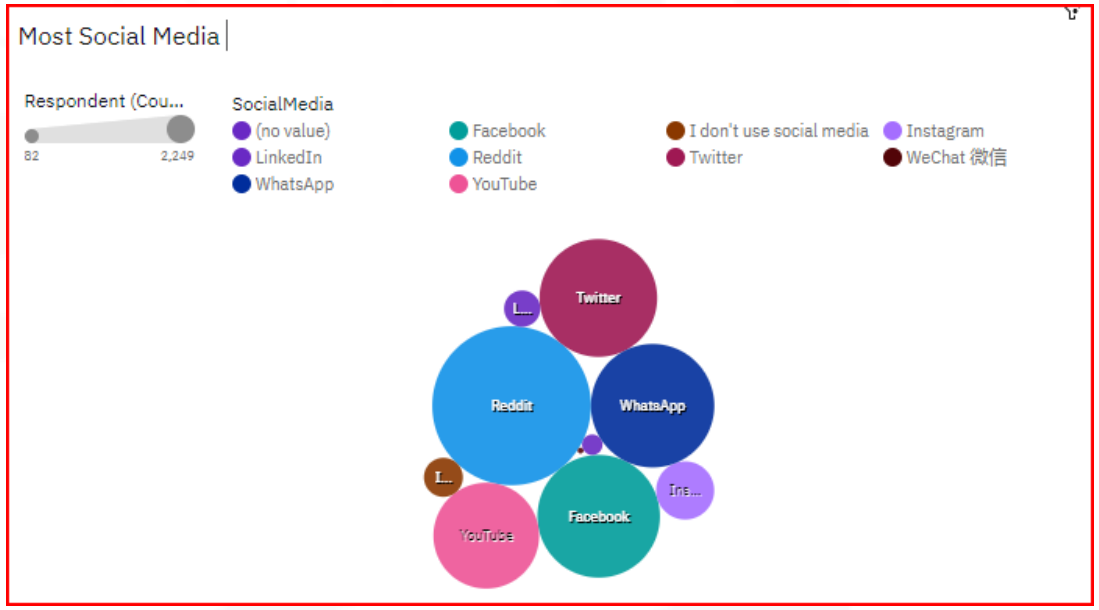
- **Web Development Focus**:
  - The dominance of JavaScript and the high interest in HTML/CSS and TypeScript indicate a strong focus on web development skills.
  - Companies should prioritize training and hiring for web development roles to meet market demand.
- **Data Skills Demand**:
  - The significant usage and learning interest in SQL and Python highlight the growing need for data management and analysis skills.
  - Organizations should invest in data science and analytics training programs to stay competitive.
- **Adoption of Modern Technologies**:
  - The rising interest in Go, Kotlin, Elasticsearch, and Firebase suggests a shift towards modern, efficient technologies.
  - Businesses should consider integrating these emerging technologies into their tech stack and provide relevant training to their teams.

CONCLUSION

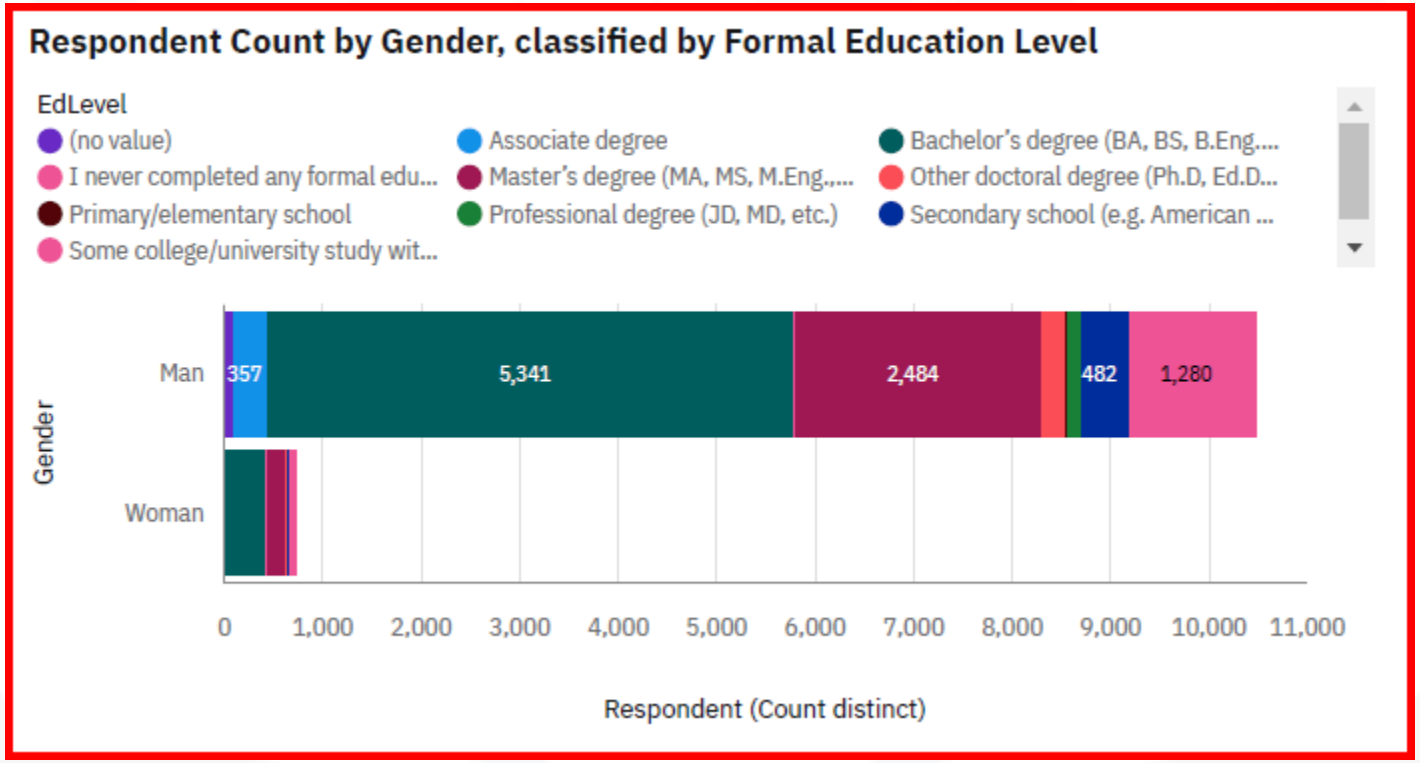
- **Web Development Dominance**: JavaScript's top position in both current usage and future learning desires underscores the continued importance of web development skills.
- **Data-Driven Focus**: High demand for SQL and Python highlights the growing emphasis on data management and analysis capabilities in the tech industry.
- **Emerging Technologies**: Rising interest in Go, Kotlin, and NoSQL databases like MongoDB indicates a shift towards modern, efficient technologies for future projects.
- **Diversity Challenge**: The significant gender imbalance (93.5% men vs 6.5% women) suggests a need for initiatives to promote diversity and inclusion in the tech sector.

APPENDIX A

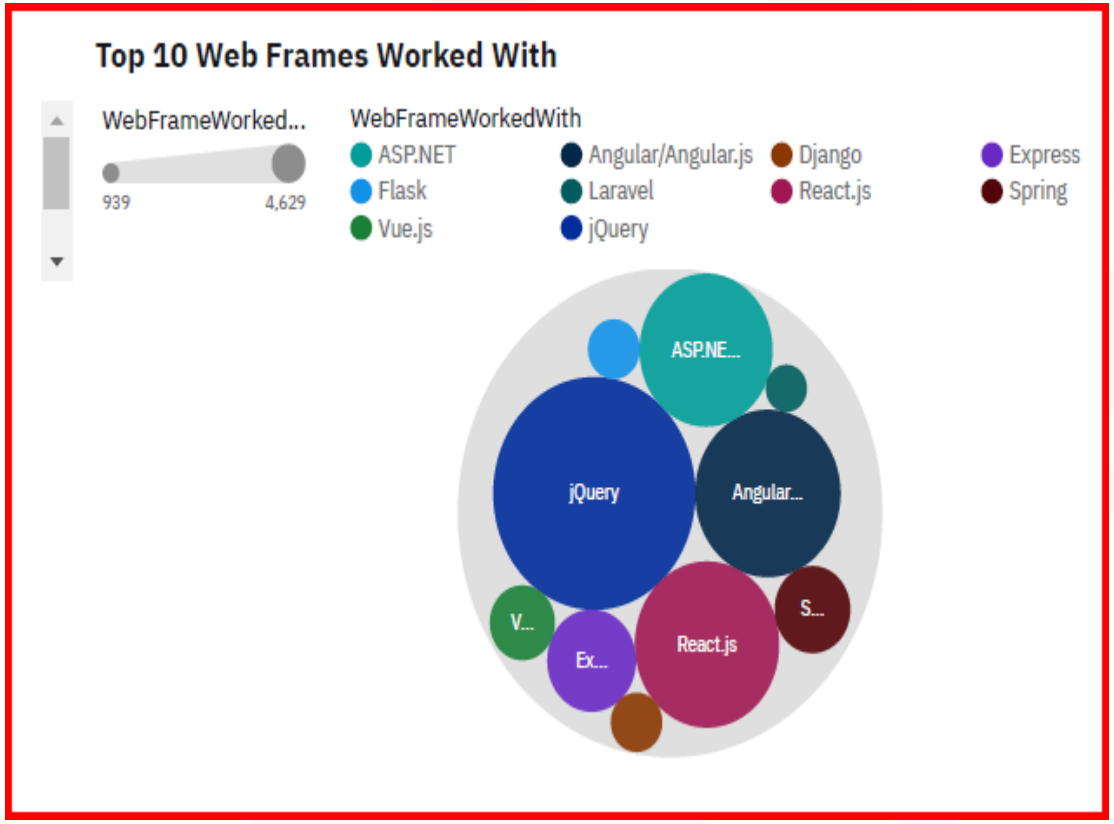

Education Level
EdLevel
Associate degree
Bachelor's degree (BA, BS, B.Eng....
I never completed any formal edu...
Master's degree (MA, MS, M.Eng.,...
Other doctoral degree (Ph.D, Ed.D...
Primary/elementary school
Professional degree (JD, MD, etc.)
Secondary school (e.g. American ...
Some college/university study wit...
Bachelor's degree (BA, BS, B.Eng., etc.)
Master's degree (MA, MS, M.Eng., MBA, etc.)
Some college/university study without earning a degree
Secondary school (e.g. American high school, German Realschu...
Associate degree
Other doctoral degree (Ph.D, Ed.D., etc.)
Professional degree (JD, MD, etc.)
I never completed any formal education
Primary/elementary school
EdLevel
0
1,000
2,000
3,000
4,000
5,000
6,000
EdLevel (Count)

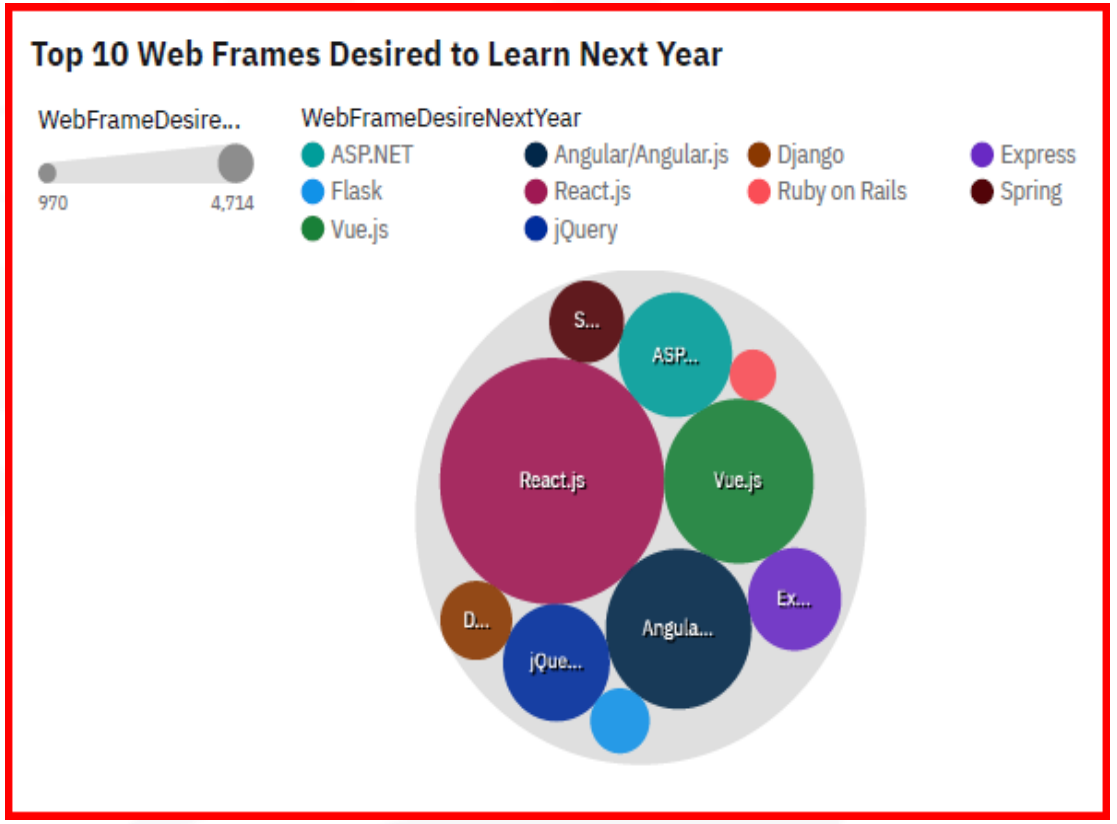

Most Social Media
Respondent (Cou...
82
2,249
SocialMedia
(no value)
Facebook
I don't use social media
Instagram
LinkedIn
Reddit
Twitter
WeChat 微信
WhatsApp
YouTube
Twitter
Reddit
WhatsApp
Facebook
YouTube

APPENDIX **B**

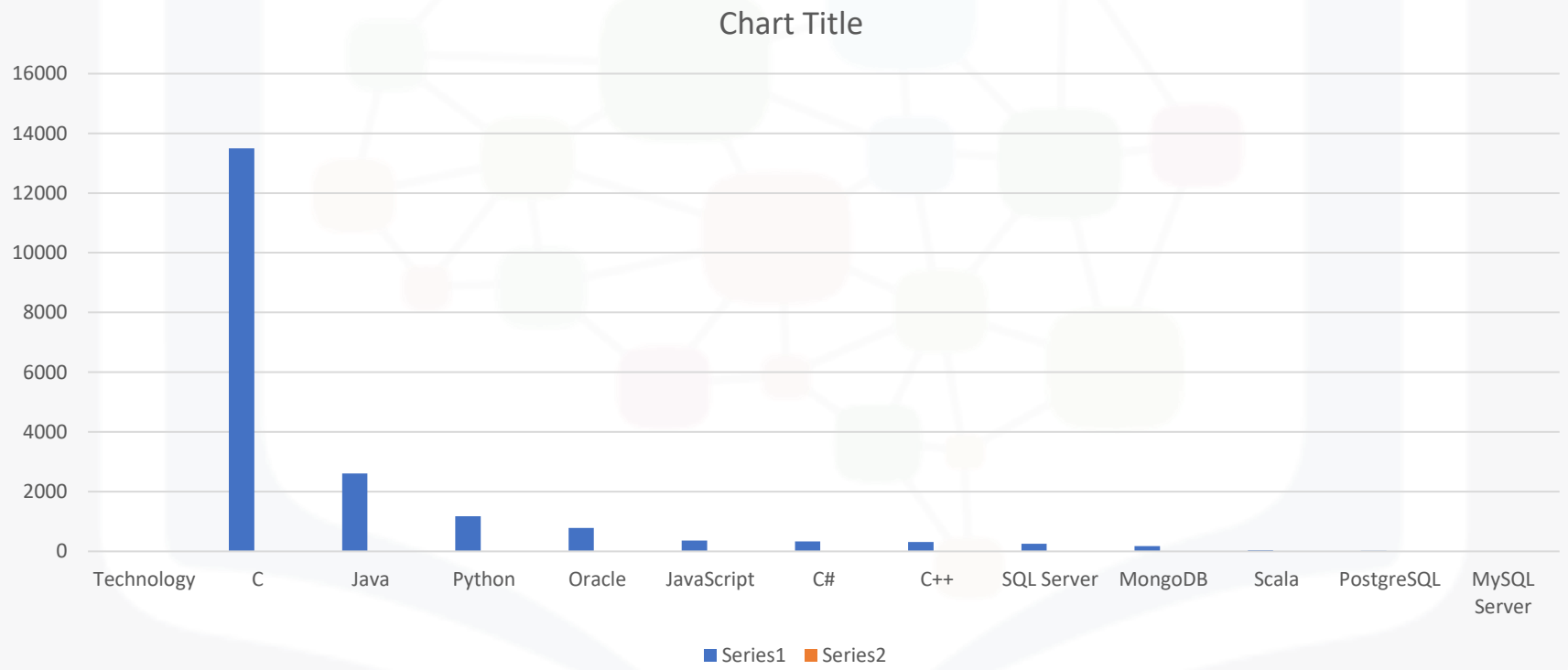

Respondent Count by Gender, classified by Formal Education Level
EdLevel
(no value)
Associate degree
Bachelor's degree (BA, BS, B.Eng....
I never completed any formal edu...
Master's degree (MA, MS, M.Eng.,...
Other doctoral degree (Ph.D, Ed.D...
Primary/elementary school
Professional degree (JD, MD, etc.)
Secondary school (e.g. American ...
Some college/university study wit...
Gender
Man
Woman
357
5,341
2,484
482
1,280
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
Respondent (Count distinct)

APPENDIX C


Top 10 Web Frames Worked With
WebFrameWorked...
939
4,629
WebFrameWorkedWith
ASP.NET
Angular/Angular.js
Django
Express
Flask
Laravel
React.js
Spring
Vue.js
jQuery
ASP.NE...
jQuery
Angular...
V...
Ex...
React.js
S...


Top 10 Web Frames Desired to Learn Next Year
WebFrameDesire...
970
4,714
WebFrameDesireNextYear
ASP.NET
Angular/Angular.js
Django
Express
Flask
React.js
Ruby on Rails
Spring
Vue.js
jQuery
S...
ASP...
React.js
Vue.js
D...
jQue...
Angula...
Ex...

JOB POSTINGS



POPULAR LANGUAGES