



# Software Technologies and its Adoption

Analysis on Stack Overflow Developer Survey 2019

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# OUTLINE

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- Executive Summary
- Introduction
- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
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# EXECUTIVE SUMMARY

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- Methodologies and findings of an analysis on the data collected by Stack Overflow by conducting a survey among Software Professionals is discussed through this presentation.
- Key insights generated from the analysis are as follows :
  - Current trend and future demand for languages used, databases, platforms and web frames
  - Demographic details of respondents by age, gender, country and educational level

# INTRODUCTION

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- Stack Overflow, a popular website for developers has been conducting Stack Overflow Annual Developer Survey
- Objective of the survey is to analyze the current trend of various technologies such as programming languages, databases, platforms, etc. used and future preferences of the same.
- Findings from the analysis can aid job seekers, recruitment process, training for existing workforce and other business stakeholders to make an informed decision in future.

## METHODOLOGY

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- ✓ Data Source
  - Stack Overflow Annual Survey 2019
  - Random subset of size  $1/10^{\text{th}}$  of actual dataset (Around 90,000)
- ✓ Data Cleaning
  - Python's *Numpy* and *Pandas* libraries were used to clean the data
  - Cleaning procedures involved: Removing duplicates, imputing missing values, and normalizing data
- ✓ Exploratory Data Analysis
  - Data distribution, Outliers, and Correlation were analyzed using Python
- ✓ Data Visualization
  - Various plots such as histogram, scatter plots, bar charts, line charts for relevant data was created

RESULTS

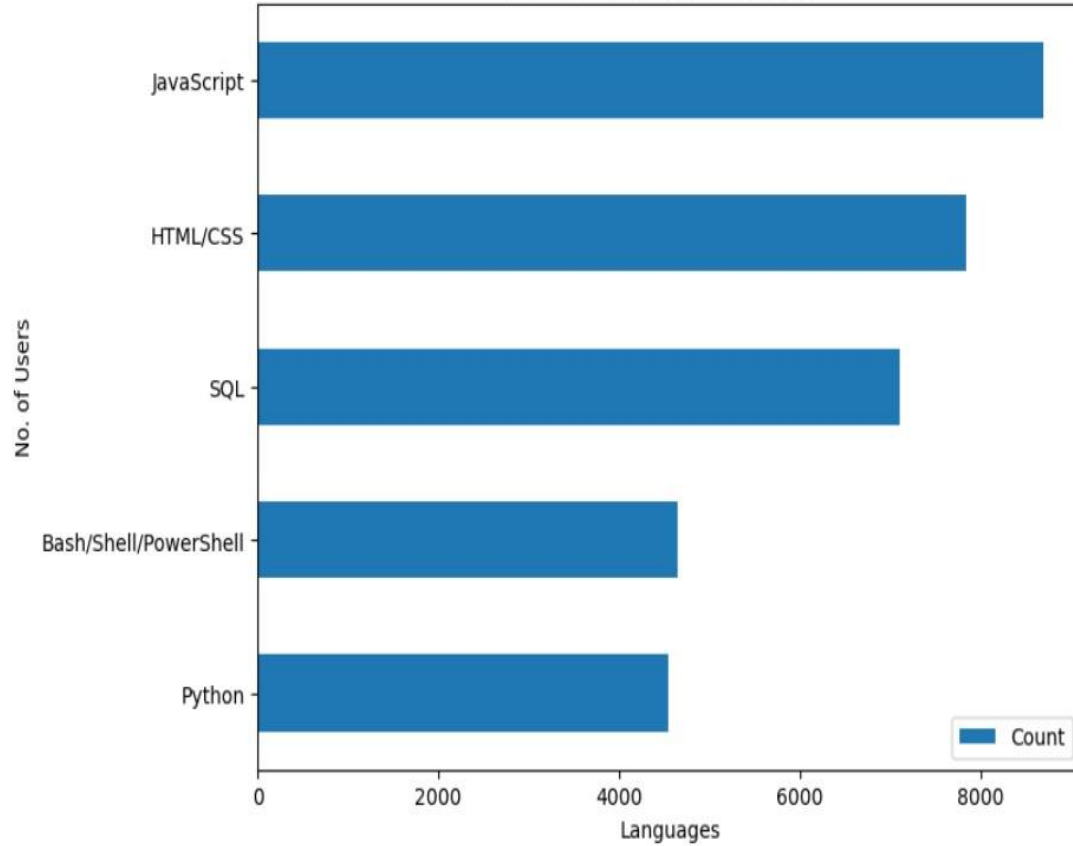
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FINDINGS

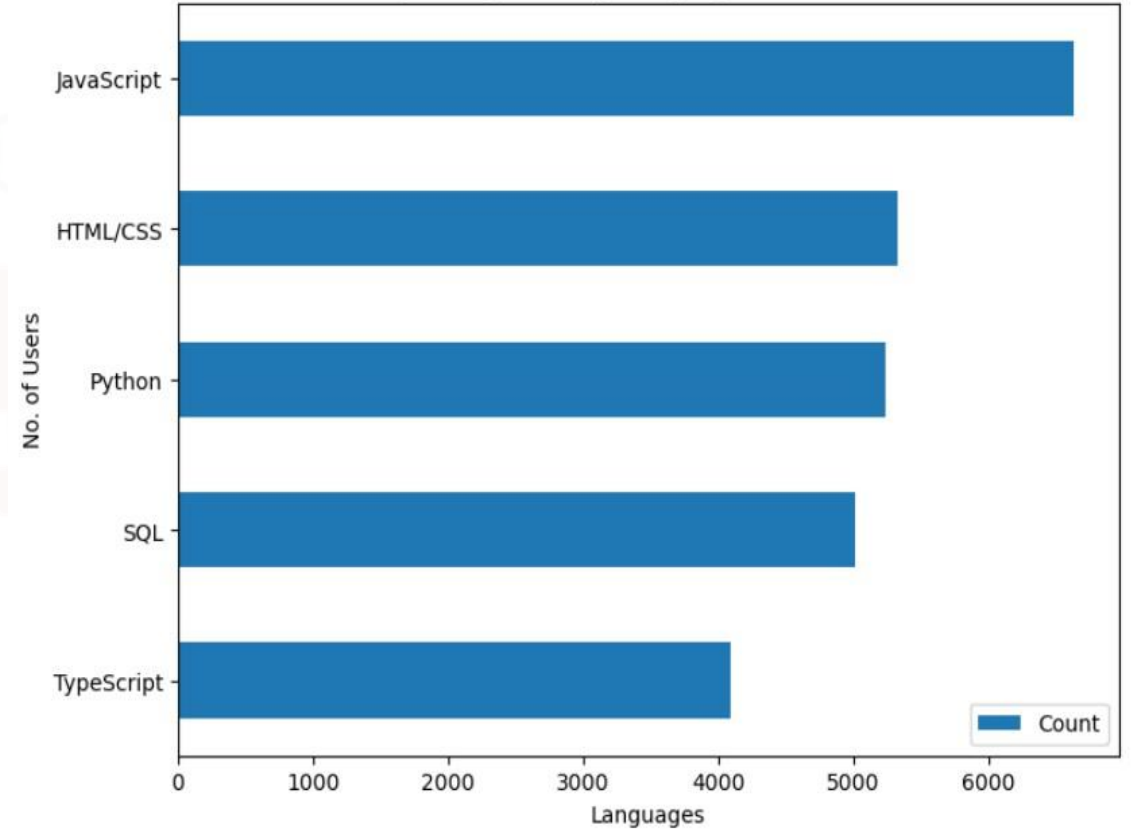


# PROGRAMMING LANGUAGE TRENDS

Top 5 Programming Languages



Top 5 Programming Languages for Next Year



# PROGRAMMING LANGUAGE TRENDS – FINDINGS & IMPLICATIONS

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## Findings

- Top Most Programming Languages for this year and next year : JavaScript and HTML/CSS
- Programming Languages Gaining Interest : Python and TypeScript
- Programming Languages Losing Interest : SQL and Bash/Shell/PowerShell

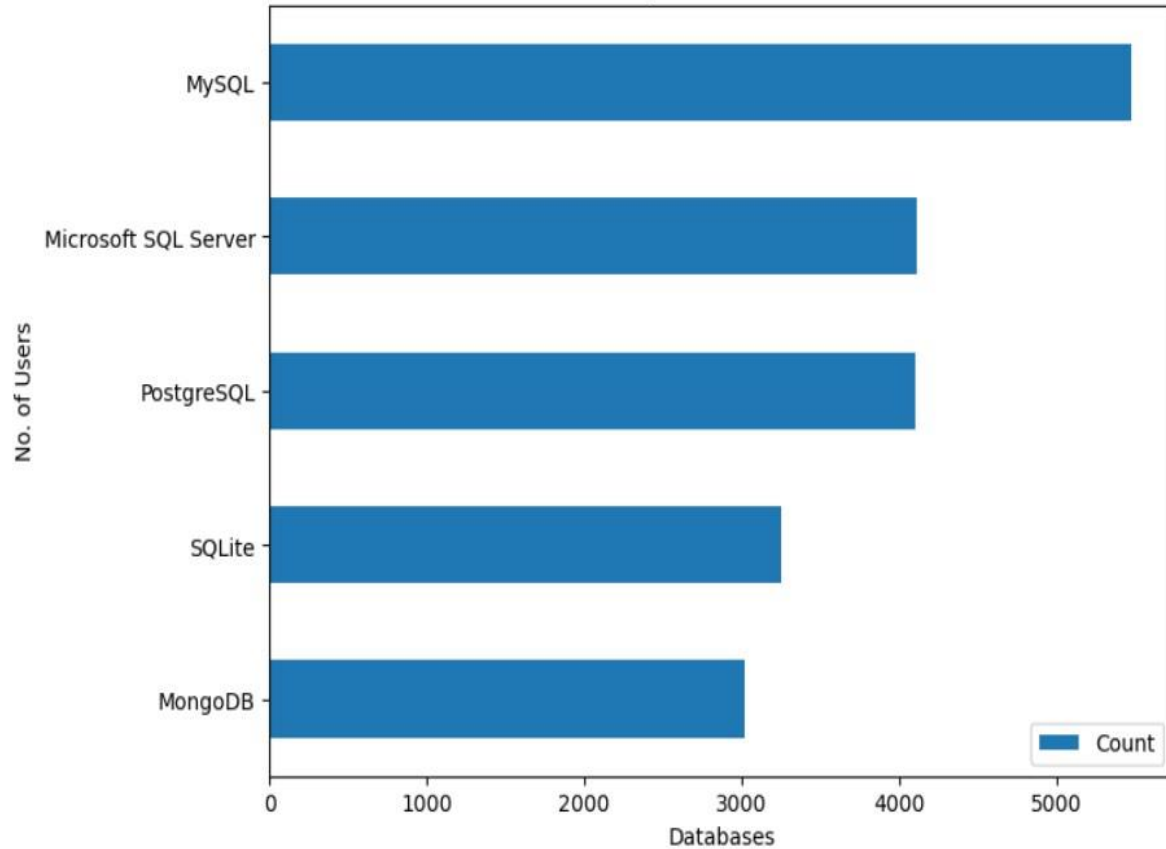
## Implications

- Retain skilled employees in JavaScript and HTML/CSS: Web Development still in demand
- Training required for workforce in Python and TypeScript. : AI and ML catching up pace.
- Querying is still preferred through SQL hence no further recruitment required to meet demand
- Existing workforce using Bash/Shell/PowerShell shall be trained in another language which is picking up pace.

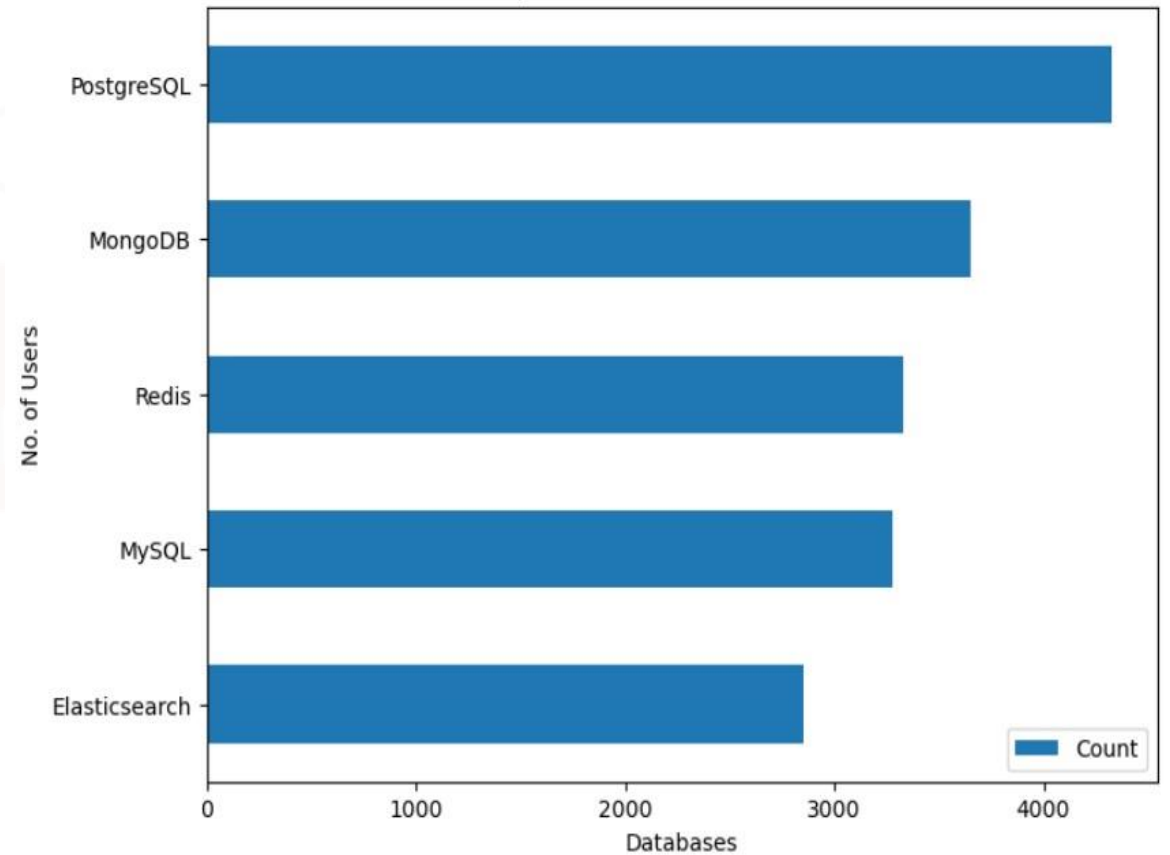


# DATABASE TRENDS

Top 5 Databases



Top 5 Databases for Next Year



## DATABASE TRENDS - FINDINGS & IMPLICATIONS

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### Findings

- SQL Database are the popular choice for the current year.
- MySQL is the most popular followed by MS SQL Server, PostgreSQL and SQLite for the current year.
- PostgreSQL is picking up pace among the developers.
- MongoDB and Elasticsearch gaining higher interest among the developers.

### Implications

- Developers moving towards Open-source database programmes from SQL
- Increased preference towards NoSQL showing the shift to unstructured and non-relational databases.
- Companies should focus on training the workforce in NoSQL database to meet the future demands

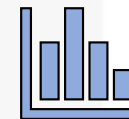
## DASHBOARD: Access Link

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Link for accessing IBM Cognos Dashboard which visualizes the following views is appended below:

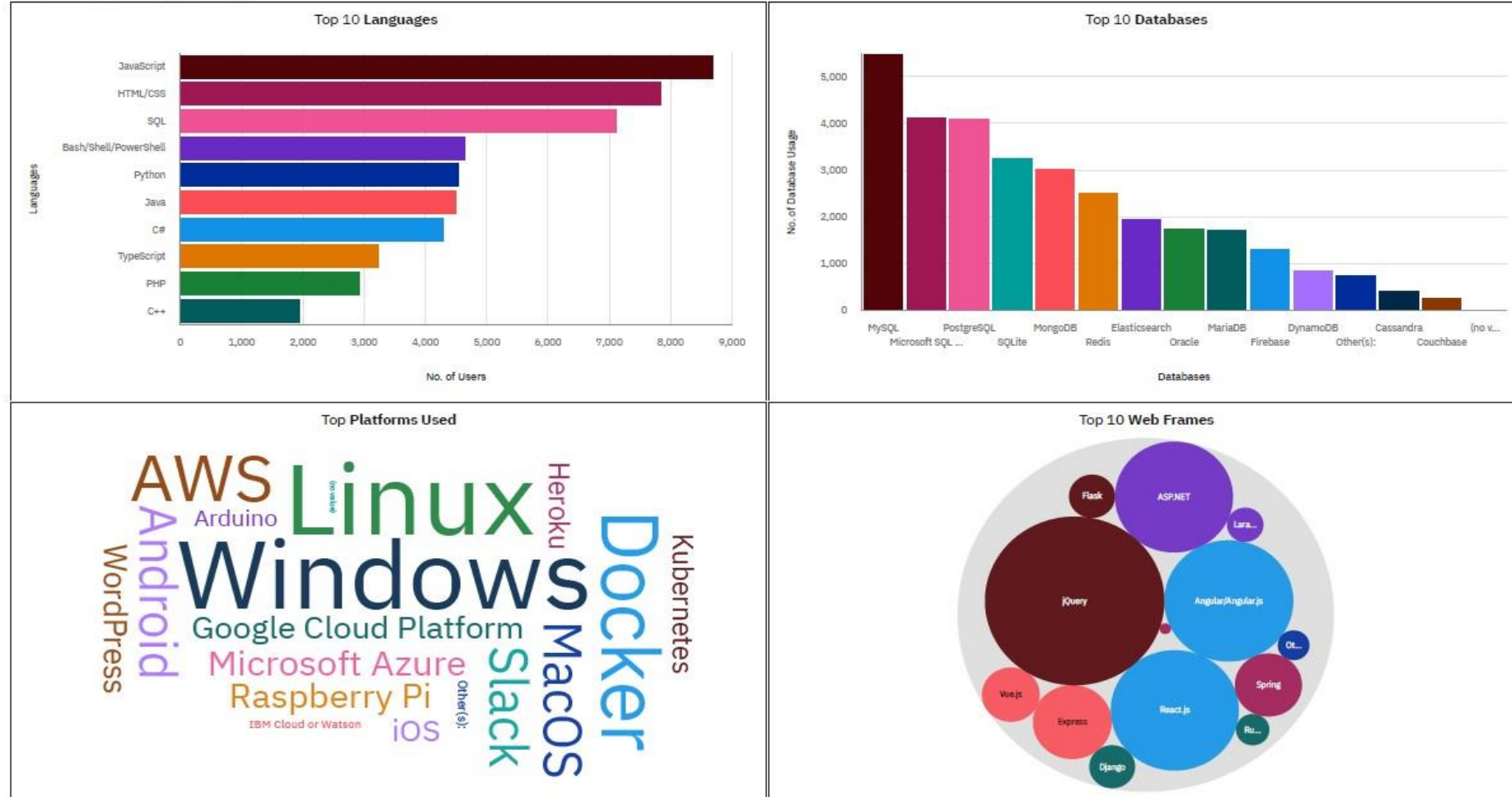
- Current Technology Usage
- Future Technology Usage
- Demographic Details

[Click here to Access Dashboard](#)



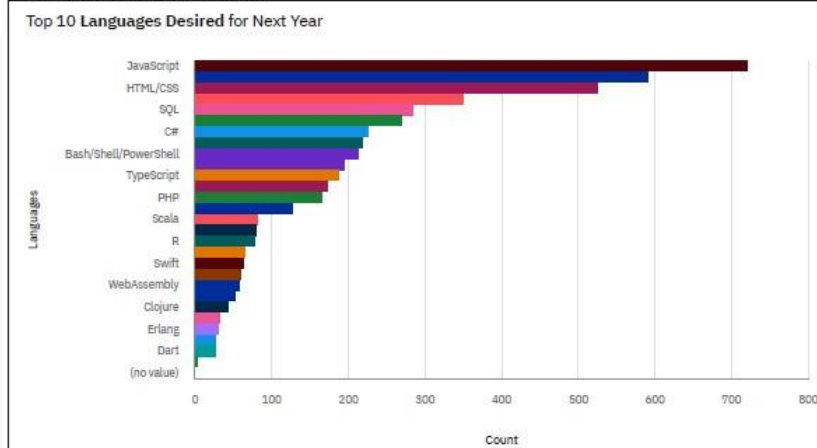
# DASH-BOARD: Current Technology Usage

Current Technology Usage

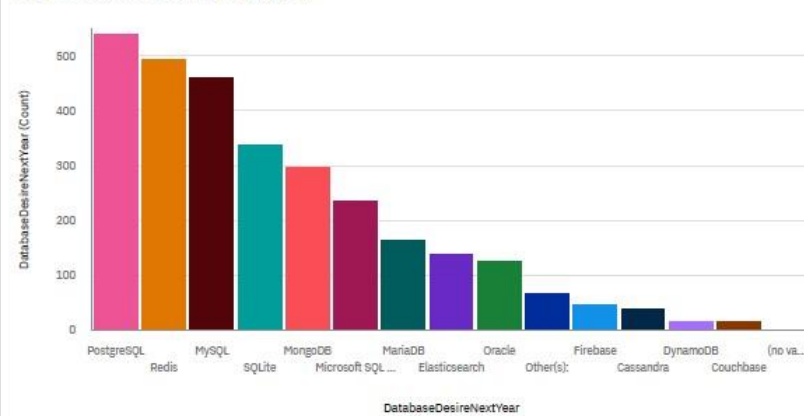


# DASH-BOARD: Future Technology Usage

Future Technology Usage



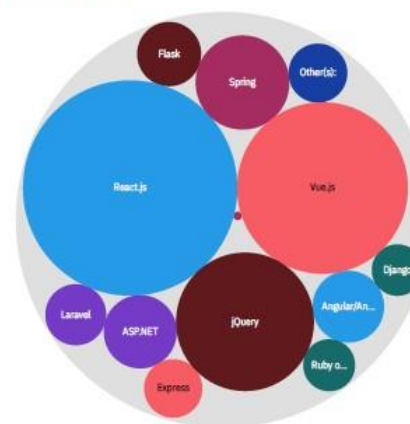
Top 10 Databases Desired for Next Year



Platform Desired for Next Year



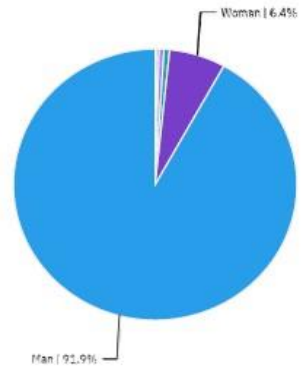
Top 10 Web Frames Desired for Next Year



# DASH-BOARD: Demographics Details

## Demographics

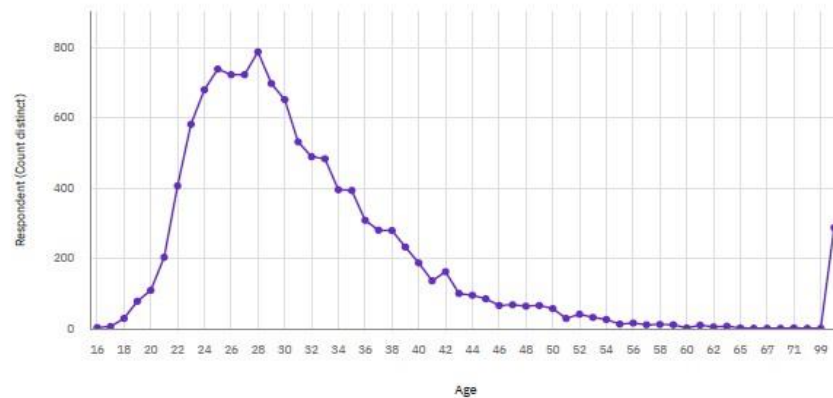
Respondents by Gender



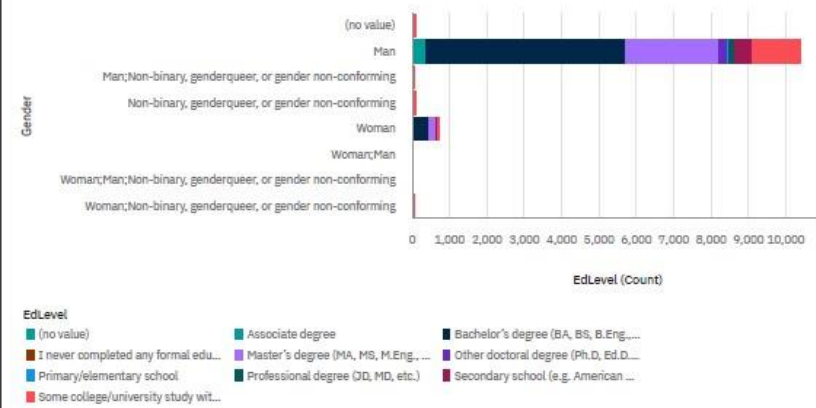
Number of Respondents by Various Countries



Number of Respondents by Age



Education Level by Various Gender Groups





DISCUSSIONS



# OVERALL FINDINGS & IMPLICATIONS

## Findings

- JavaScript and HTML/CSS will continue to be the top programming language used by software professionals and increasing preference towards Python and TypeScript
- Current usage of SQL databases will be gradually shifted to NoSQL databases and open-source database especially MongoDB even though PostgreSQL is preferred database for the coming year.
- A highly skewed representation of men was observed while analysing the gender mix of the workforce.

## Implications

- Web Development is going to be in demand in future too. Current workforce should be upskilled for further demand in the future by the companies.
- We can also see that there is greater preference towards AI and ML which can be observed from the higher usage preference of NoSQL databases and Python languages.
- Training, upskilling and recruitment of women workforce should pace up to improve gender mix.



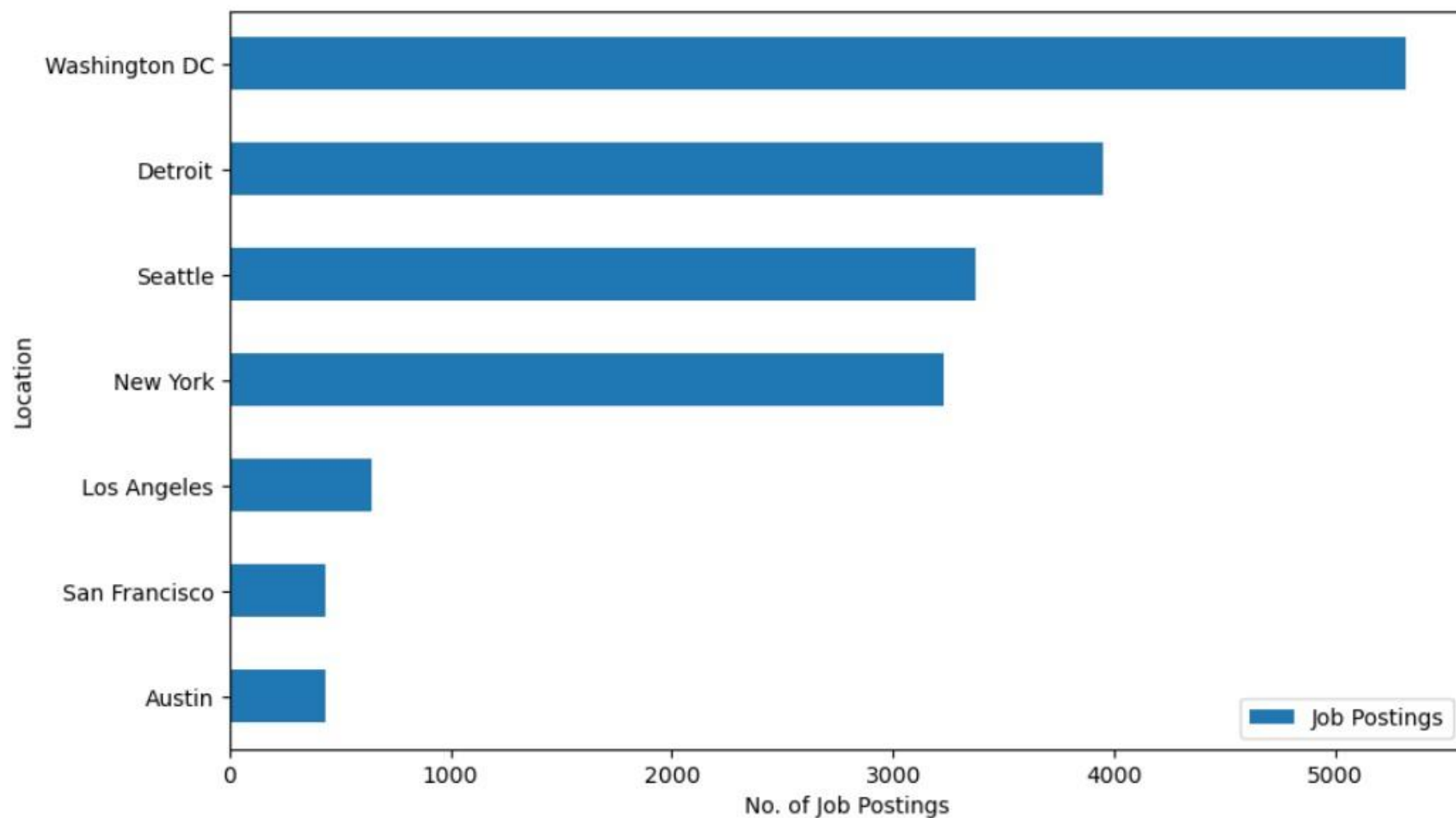
# CONCLUSION

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- Programming languages, databases, platforms, and its usage for the current year and coming years have been analyzed and visualized thoroughly.
- The changing trend of technology usage can be observed through the findings we arrived from the analysis.
- The implications is relevant for various stakeholders such as recruitment team, current and prospective software developers, training and upskilling of current employees by employers.

## Appendix A: Job Postings Based on Location



## Appendix B: Programming Languages Based on Average Annual Salary

