



# Analysis report on the trend of IT technology in next year

Yuangang Yang

Apr 3, 2023

# OUTLINE

---



- Executive Summary
- Introduction
- Methodology
- Results
  - Portrait of respondents
  - Technology trends
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix



# EXECUTIVE SUMMARY

---

To keep up with changing technologies and stay competitive, this report collected data from current job portals, Weibo, and surveys, and analyzed them to help determine changes in skills requirements for IT technicians in the next year.

- There are more and more young people with professional backgrounds in the IT Industry.
- Changing of Programming languages: the demand for Python is rising rapidly, JavaScript, html/CSS, and python rank among the top three in demand next year, while SQL and bath/shell/power shell are declining.
- Changing of Database: The demand for PostgreSQL and MongoDB is rising rapidly. They and Redis will be ranked in the top three next year respectively, while MySQL is declining.
- Changing of Platform: Linux still ranks first. The demand for the Docker platform is increasing rapidly and surpassing Linux. Docker and AWS are ranked second and third, and the demand for Windows is declining
- Changing of Web Frame: React.js and Vue.js have risen rapidly and separated into the first and second places. The demand for jQuery is declining.

# INTRODUCTION

---

With the rapid development of IT technology, more and more people are engaged in IT industry. Such questions are always asked by job seekers:

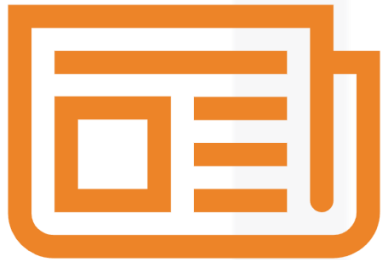
- What is the general portrait of an IT person?
- How much does an IT job's compensation?
- What are the top programming languages in demand?
- What are the top database skills in demand?
- What are the popular IDEs?

As a data analyst of a global IT and business consulting services company, I will answer these questions for you through professional analysis of relevant data from job portals and Weibo.



# METHODOLOGY

---



- Collecting public datasets from Stack Overflow and grabbing data on GitHub Jobs with Python. (Please view the appendix for data link)
- Data wrangling with Python, converting all compensation style to annual Compensation for comparison
- Exploratory analysis of data distribution, outliers, and correlations between elements in the dataset with Python
- Use Cognos Dashboard Embedded (CDE) on IBM Cloud Pak for Data to visualize, and it can obtain a permanent sharing link of the dashboards for your convenience.

# RESULTS

---



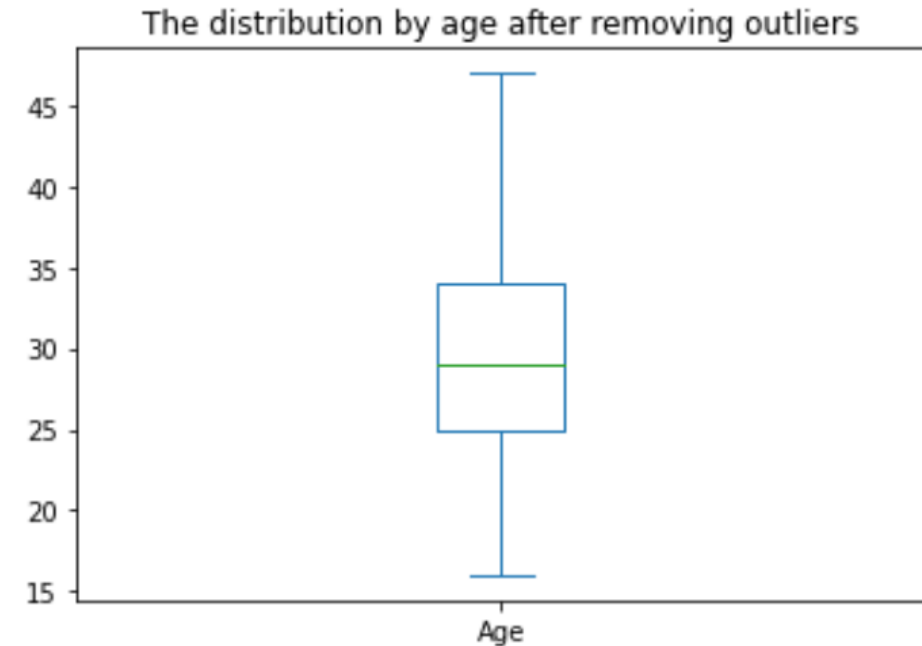
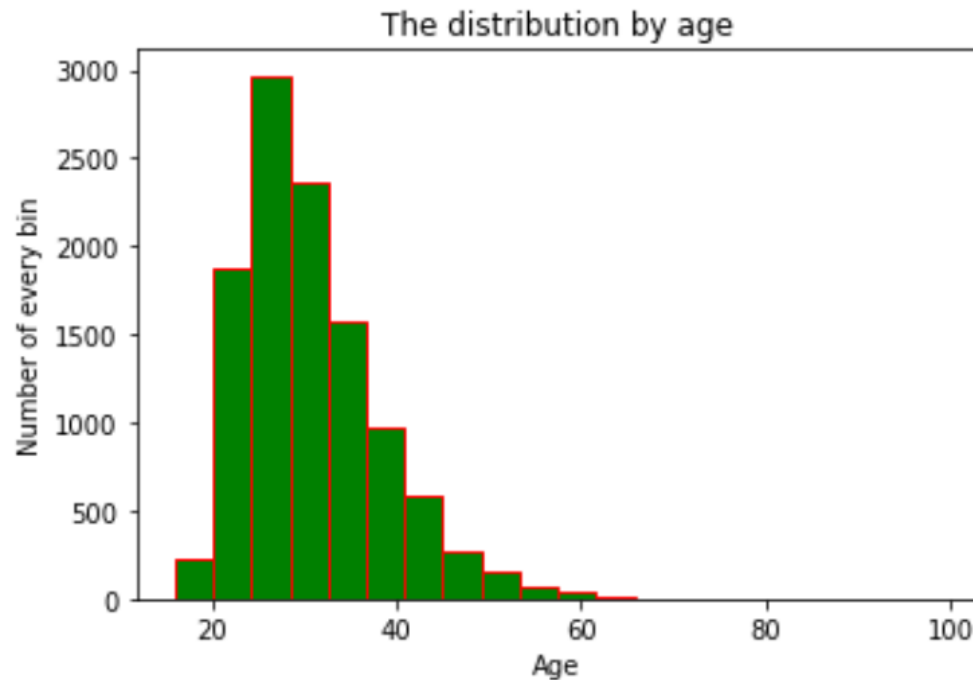
## Portrait of respondents

# PORTRAIT OF RESPONDENTS

---

- 92.2% of respondents are male and 65.5% of respondents are with age between 22 and 35
- 75.3% of respondents are with undergraduate and postgraduate degrees and 61% of respondents major in computer-related fields such as Computer science, computer engineering, or software engineering
- The ratio of respondents working at office is 59.9% contrast to 31.6% at home
- The median of Total Compensation of respondents is USD 52704 in current year and the median of Compensation of respondents increases with age

# DISTRIBUTION BY AGE

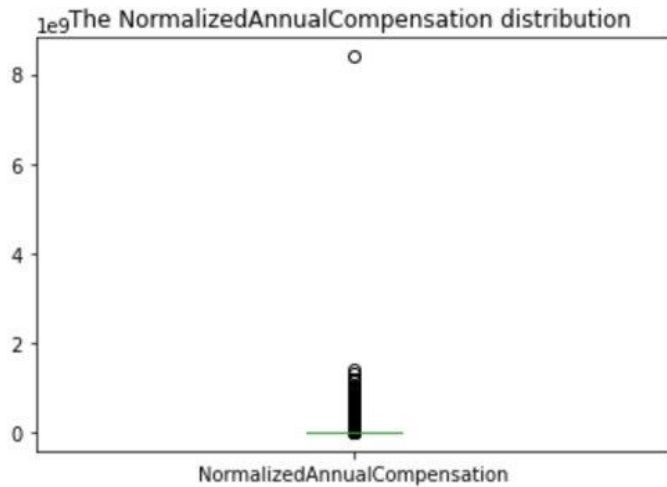


The ratio of respondents with age between 22 and 35 is about 65.5%

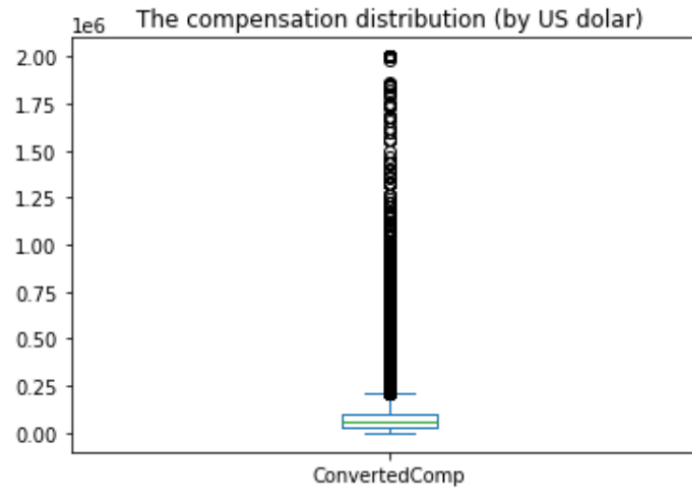
The median of Age is about 30.77 before removing the outliers and 29 after removing the outliers



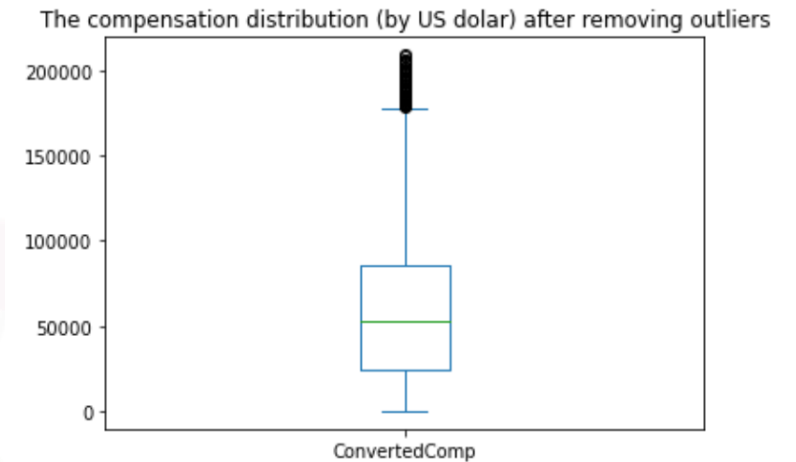
# COMPENSATION DISTRIBUTION



Original



After Cleansing

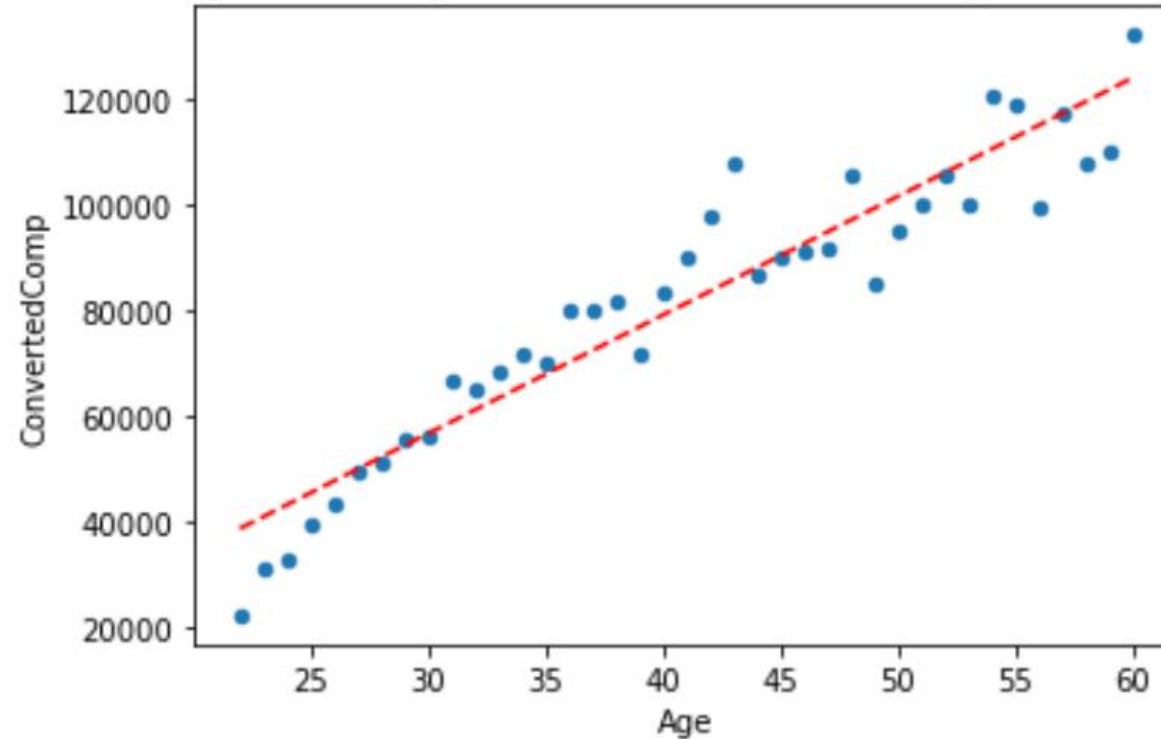


Outliner removed

The median of annual total compensation is USD52704 after data cleaning and removal of outliers.

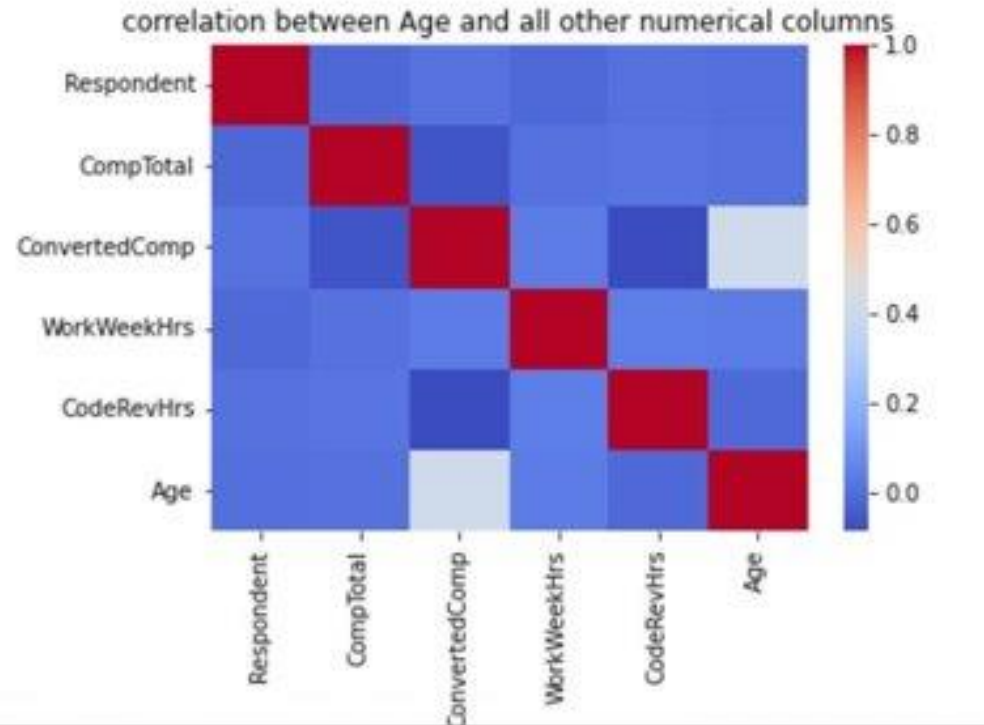
# COMPENSATION BY AGE

The relationship between Age and median ConvertedComp for the age group 25-60



The median of yearly compensation has a trend positively with age

# CORRELATION WITH AGE



With age increasing, the programming time is decreased, and other factors are positive relative to age.

The compensation has the strongest positive correlation with age.

# RESULTS

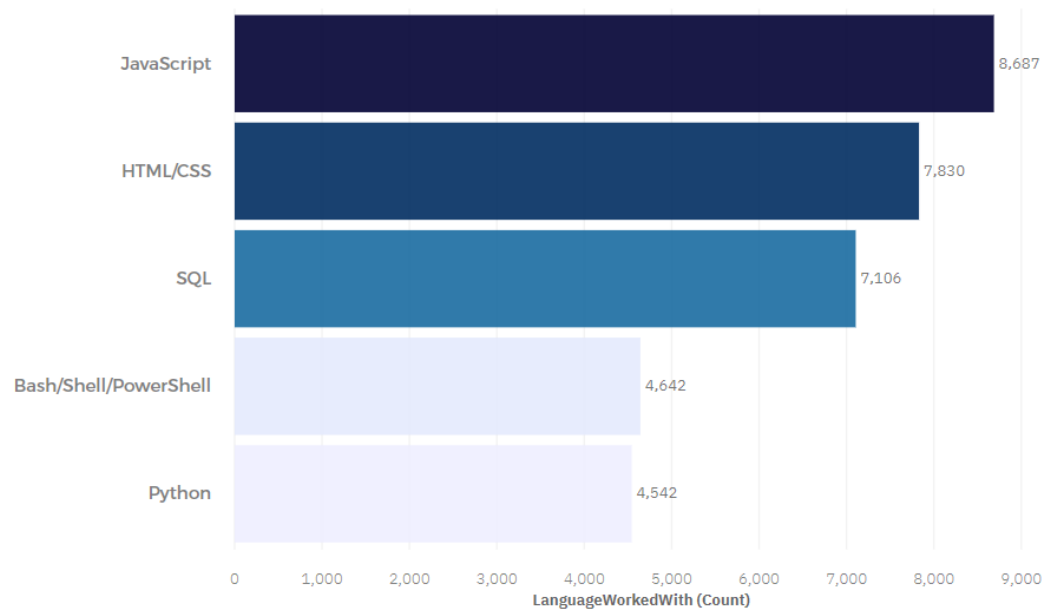
---

**Technology trends**

# PROGRAMMING LANGUAGE TRENDS

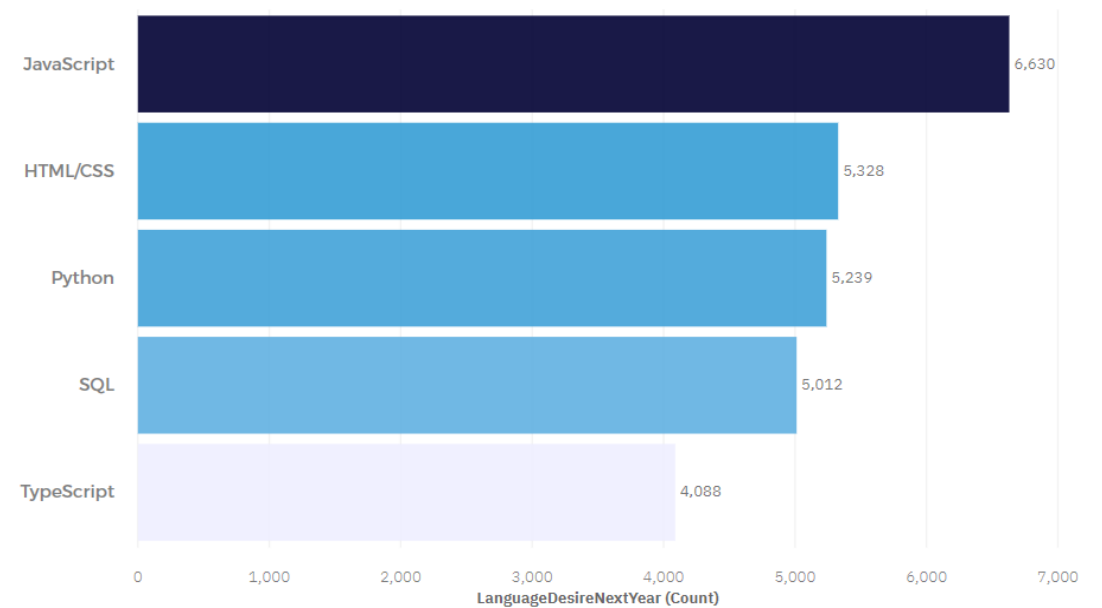
## Current Year

Top 5 programming languages for the current year



## Next Year

Top 5 programming languages for the next year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

---

## Findings

- JavaScript and HTML/CSS remain in high demand
- The demand for Python and TypeScript is growing, especially Python is developing rapidly
- Zooming in to the comparison of the top 10, it can be found that the demand for SQL and Java is declining

## Implications

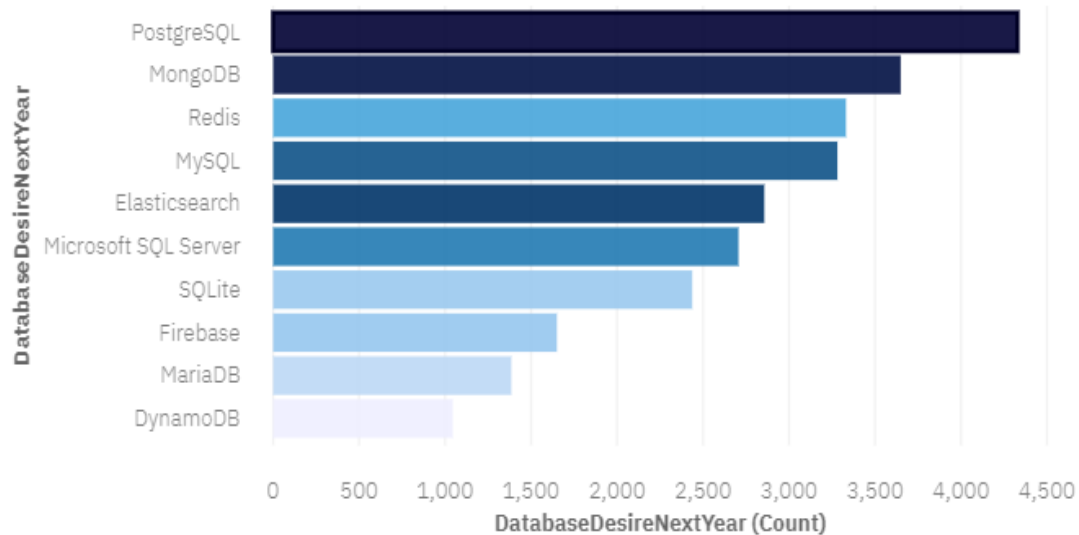
- The development of big data and artificial intelligence, more and more developers have begun to use Python and TypeScript
- Familiarity with or even mastery of python will become the most important impetus for the success of job hunting next year
- Familiarity with TypeScript is also a good choice for job hunting

# DATABASE TRENDS

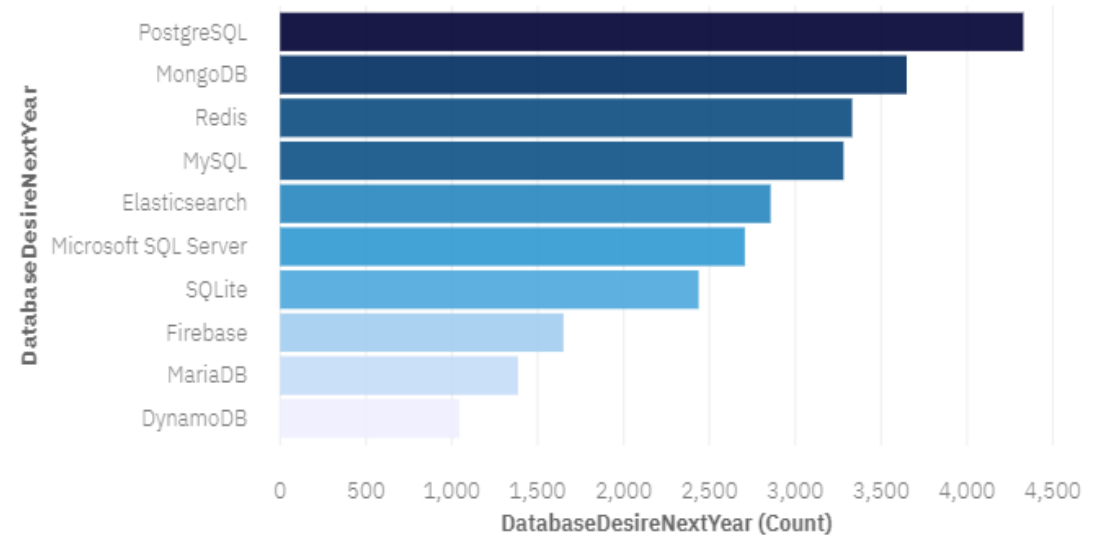
Current Year

Next Year

Top 10 Databases in current year



Top 10 Databases for next year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

---

## Findings

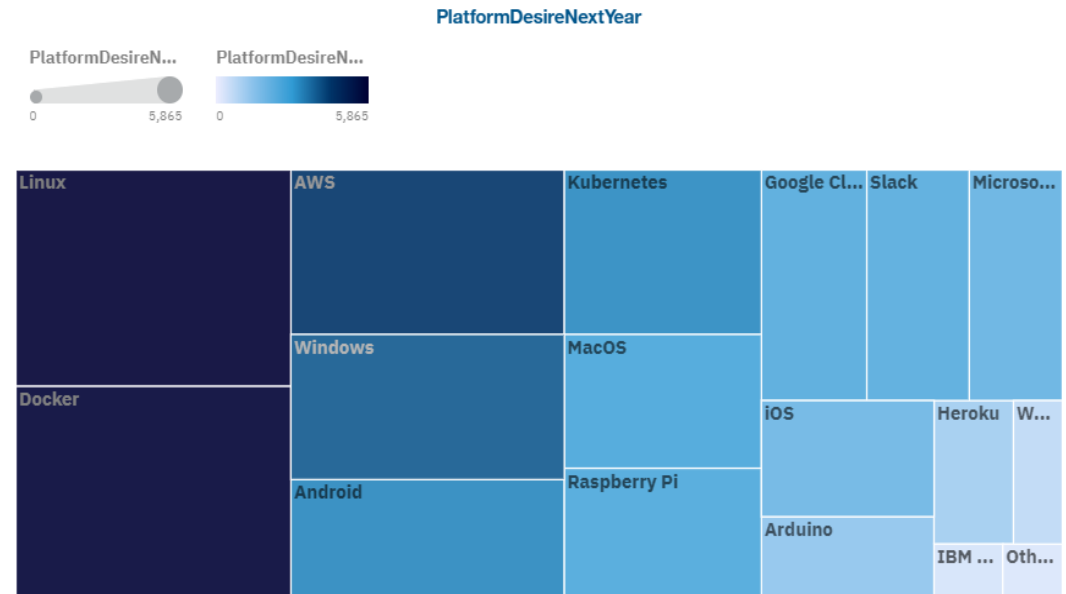
- The requirements for databases have changed a lot, and the requirements of PostgreSQL, MongoDB, Redis and Elasticsearch have jumped to the forefront
- MySQL remains one of the most popular relational databases

## Implications

- With the development of the Internet, the rise of cloud computing, and the increasing amount of data, more and more enterprises migrate their applications to the cloud.
- Open source technology with extensive community support and an active developer community. These technologies are relatively inexpensive to develop and maintain
- Diverse uses: PostgreSQL can be used for relational data, MongoDB can be used for document data, Redis can be used for memory caching and messaging, and Elasticsearch can be used for full-text search. This variety allows these technologies to meet a variety of different needs



# PLATFORM TRENDS



# PLATFORM TRENDS - FINDINGS & IMPLICATIONS

---

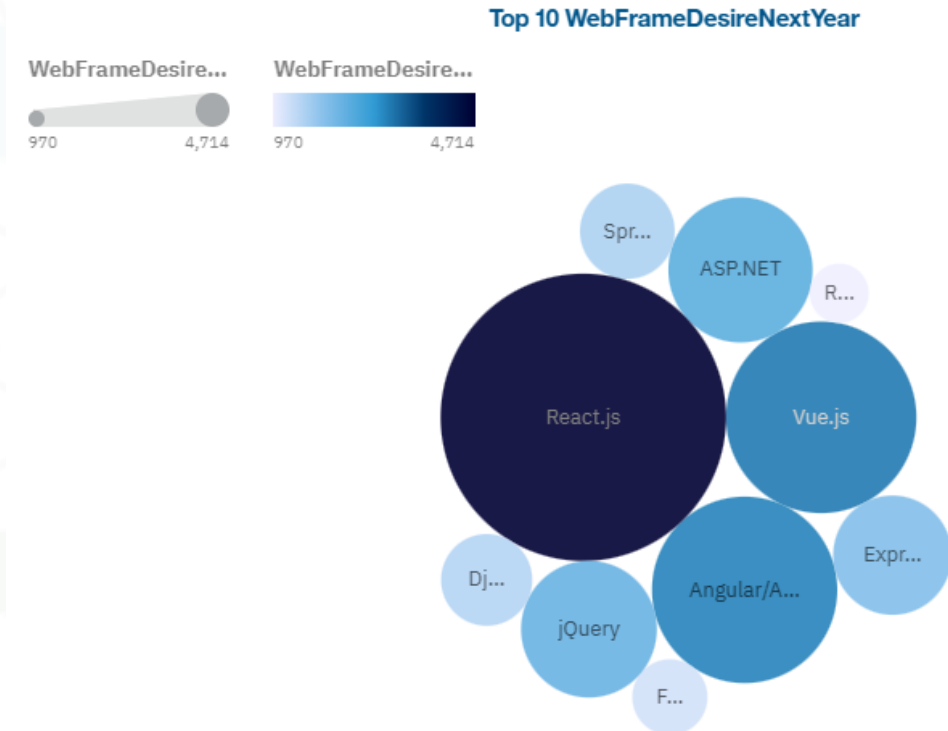
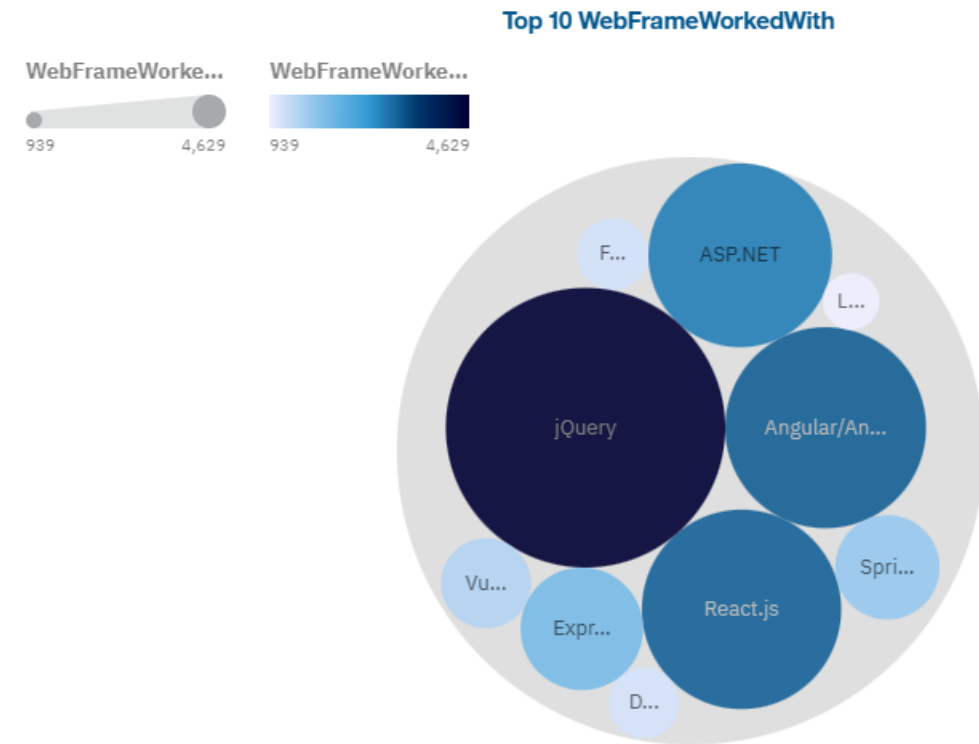
## Findings

- The LINUX platform is still the most popular
- The technology related to the docker platform is rising rapidly.

## Implications

- With the development of cloud computing and open source technology, more and more developers are using Linux-based operating systems
- Docker containers are very lightweight, start quickly, iterate and test applications faster, can run in different operating systems and cloud environments, isolate applications and host operating systems, provide higher security, and reduce potential Security Vulnerabilities and Risks

# WEBFRAME TRENDS



# WEBFRAME TRENDS - FINDINGS & IMPLICATIONS

---

## Findings

- Demand for React.js, Vue.js are rising rapidly,
- Demand for JQuery is on the decline

## Implications

- Demand for the React.js and Vue.js indicates that the mobile and high -performance applications are rapidly increasing.
- This technological trend reflects the development direction of Web applications in modern front -end development, that is, building high -efficiency and scalability , Easy to maintain web applications, and use modern frameworks and tools to manage application status and data flow.

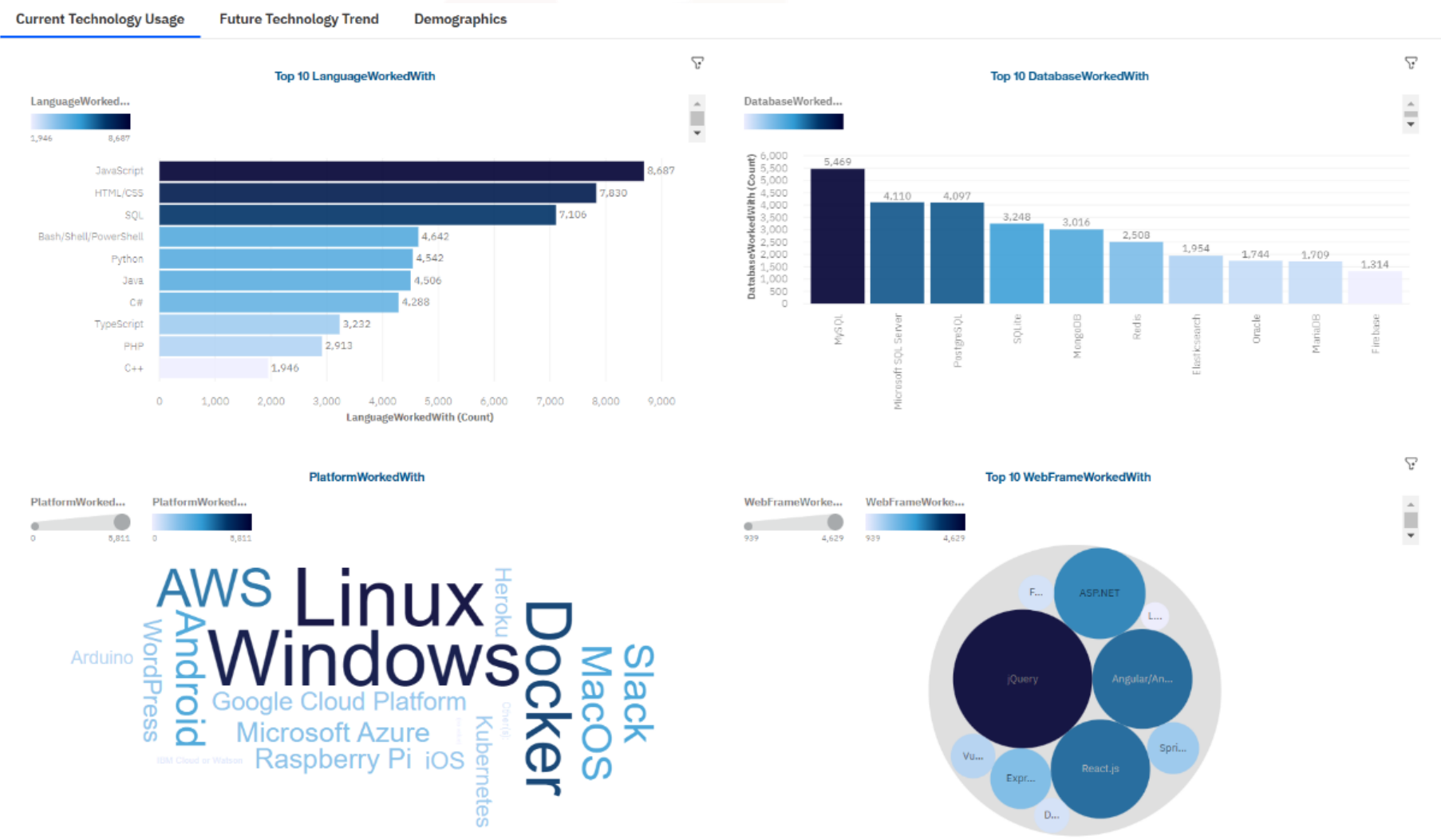
# DASHBOARD

---

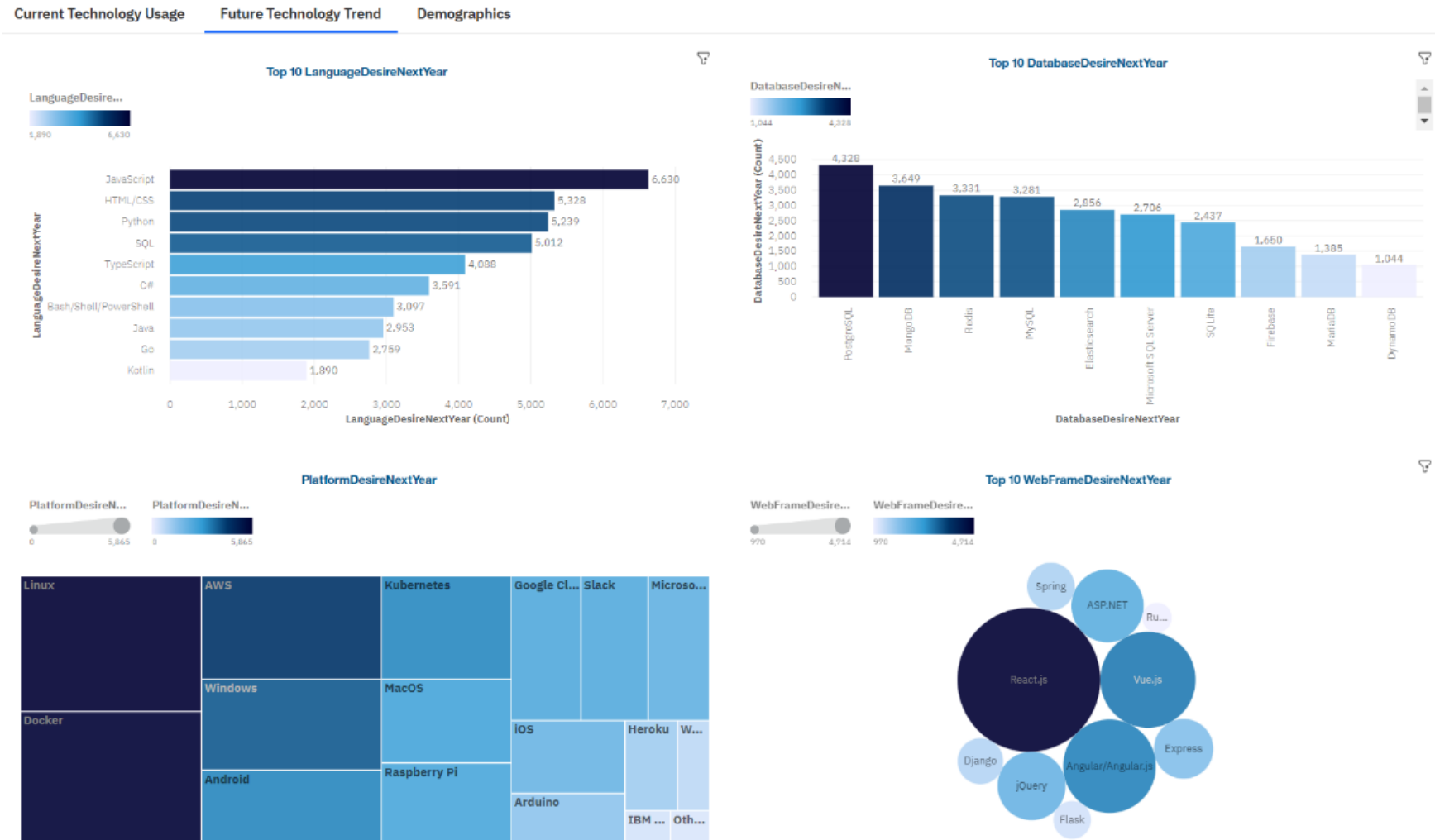


<https://dataplatform.cloud.ibm.com/dashboards/5bf49953-80d4-4c8a-9598-d62a9ac40f80/view/7764fc1a6fad32cd5ee9eae407cd2c537c36205cb1bb800080d47b495a612297a9614599c8261a5ad9160467f0e9140fcd>

# Current Technology Usage



# Future Technology Trend

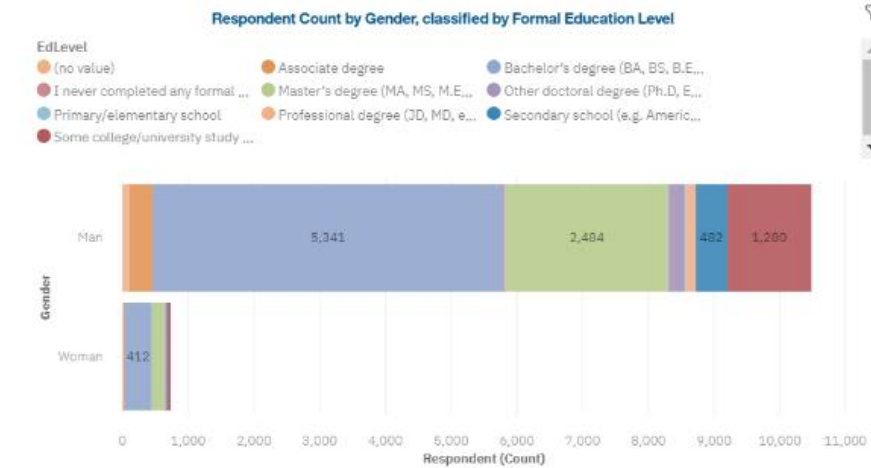
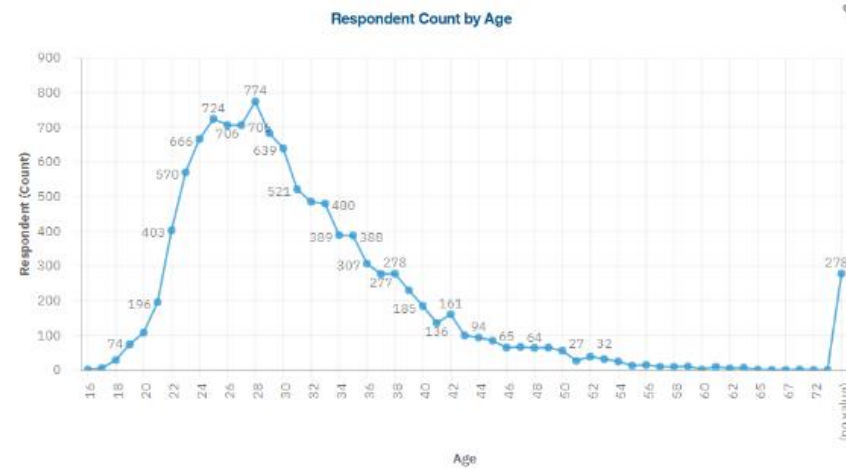
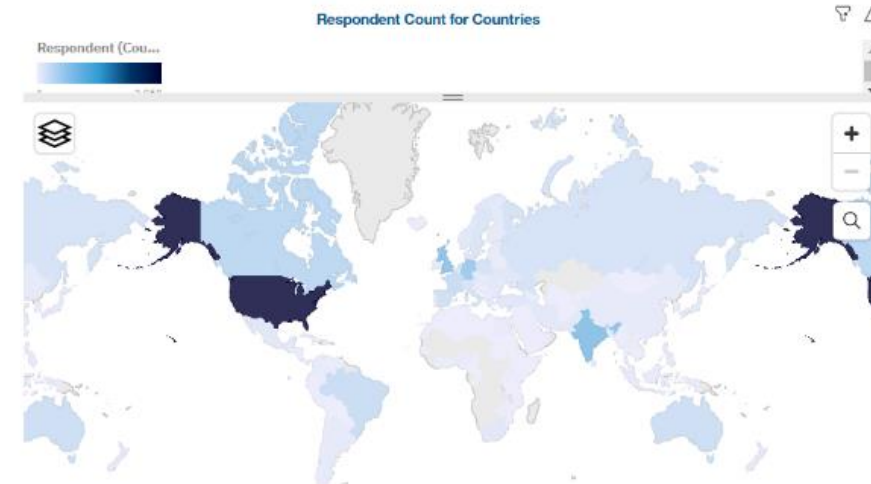
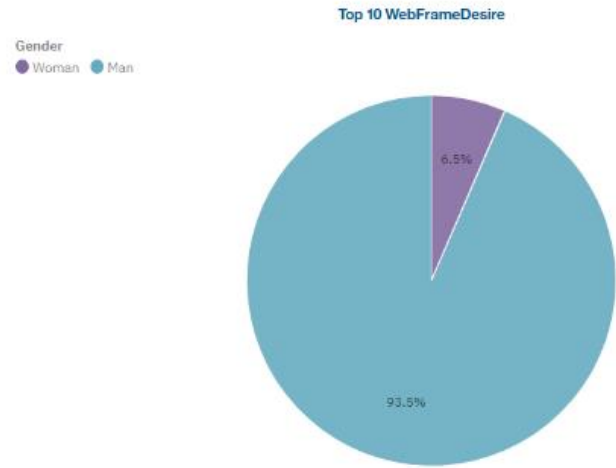


# Demographics

Current Technology Usage

Future Technology Trend

Demographics





# DISCUSSION

---

- Despite more than 20 years of rapid IT development, the IT industry is still full of vitality, and more and more young people are entering the industry. The salary of IT professionals increases with age, indicating that the accumulation of IT knowledge has a significant promoting effect on career development.



# OVERALL FINDINGS & IMPLICATIONS \*

---

## Findings

- People are increasingly inclined to use open source technologies that are lightweight, portable, capable of isolating applications and host operating systems, and provide higher levels of security. Open source technologies with extensive community support and active developer communities have a significant advantage due to their relatively low development and maintenance costs, including Python, Linux, Docker, React.js, Vue.js, PostgreSQL, and MongoDB, all of which have related characteristics.

## Implications

- With the rapid development of big data, cloud computing, artificial intelligence, web applications, and mobile devices, more and more enterprises are migrating their applications to the cloud.
- The technology update speed of the IT industry is very fast, but all hot technologies tend to be open source, safe, low-cost, and adaptable to various environments. This is also the technical means that enterprises are pursuing. This should become an important factor for us to choose technology and improve technology. in accordance with.

# CONCLUSION: Demographics

---

- There are more and more young people with professional backgrounds in the IT Industry.
- Income in the IT industry rises with age
- Men account for the vast majority of employees in the IT industry



# CONCLUSION: Technology

---



- Changing of Programming languages: the demand for Python is rising rapidly, JavaScript, html/ CSS, and python rank among the top three in demand next year, while SQL and bath/shell/power shell are declining.
- Changing of Database: The demand for PostgreSQL and MongoDB is rising rapidly. They and Redis will be ranked in the top three next year respectively, while MySQL is declining.
- Changing of Platform: Linux still ranks first. The demand for the Docker platform is increasing rapidly and surpassing Linux. Docker and AWS are ranked second and third, and the demand for Windows is declining
- Changing of WebFrame: React.js and Vue.js have risen rapidly and separated into the first and second places. The demand for jQuery is declining.

# APPENDIX

---

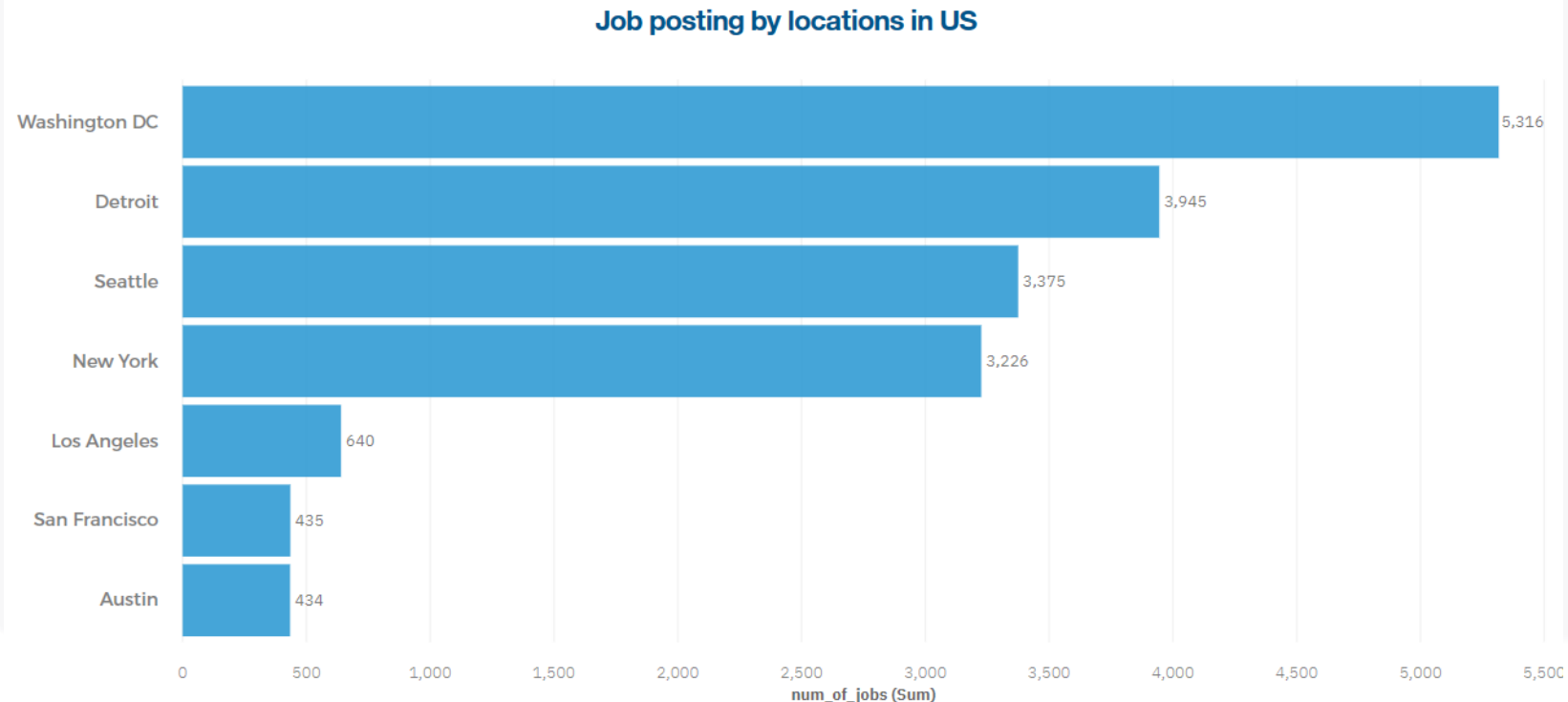
The datasets used in this report come from the following source:



- <https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/> under a ODbL: Open Database License.
- [https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module 1/Exploring the dataset/About\\_the\\_data\\_set.md.html?origin=www.coursera.org](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module%201/Exploring%20the%20dataset/About_the_data_set.md.html?origin=www.coursera.org)

# JOB POSTINGS

In Module 1 you have collected the job posting data using Job API in a file named “job-postings.xlsx”. Present that data using a bar chart here. Order the bar chart in the descending order of the number of job postings.



# POPULAR LANGUAGES

In Module 1 you have collected the job postings data using web scraping in a file named “popular-languages.csv”. Present that data using a bar chart here. Order the bar chart in the descending order of salary.

