Identifying trends for emerging technologies in global IT

Annual report, 17 March 2021

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OUTLINE

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EXECUTIVE SUMMARY

- The purpose of this document is to present a global overview of the most in-demand programming languages and skills for IT industry.
- We use many data sources for this report, which will be detailed as well as illustrated by graphics.
- Data Analysis, tends to show that for programming languages, the so-called Javascript, Html/CSS, Python and SQL remain in strong-demand
- On the other hand, Databases skills tends to move toward unstructured data with emergence of three noSQL technologies in the Top5 in-demand skills (MongoDB, Radis, ElasticSearch) but open-source SQL platforms are still in high-demand.

INTRODUCTION

- Contains our annual data analysis on the next year’s emerging skills.
- This report is a thorough analysis of present and future skills needed in the IT industry. It uses statistical methods as well as graphical analysis in order to find useful trends.
- It is first addressing to the decision-makers of the company, in order to help our annual strategy, as well as everyone interesting in this subject.
- Reading this document will give you a good overview of the actual market, and future skills to invest.
- Our purpose is to answer to the following questions :

  - What are the top programming languages in-demand?
  - What are the top databases skills in-demand ?
  - What are the most popular IDEs ?

We’ll give also some elements of the Demographic data repartition of developers (Gender, Age, Location).

METHODOLOGY

- We mainly collect the data from **Jobs postings** and **surveys**
- Job postings comes from the **GitHub public Job API**, which give us the number of jobs according to a specific technology (e.g. Python, Java, C++,…) in a defined town or area (e.g. USA, India or New-York, New Delhi).
  - ➢ *We didn't select location parameter, in order to have a global market view (world)*
  - ➢ *We put request a job offers for a dozen of well-known technologies (C, C++, Java, Python,…)*
- Surveys comes from Stack Overflow, a popular website for developers which conducted an online survey of software professionals across the world in 2019 and has around 90,000 responses. He is now open sourced and you can reach it with the link below

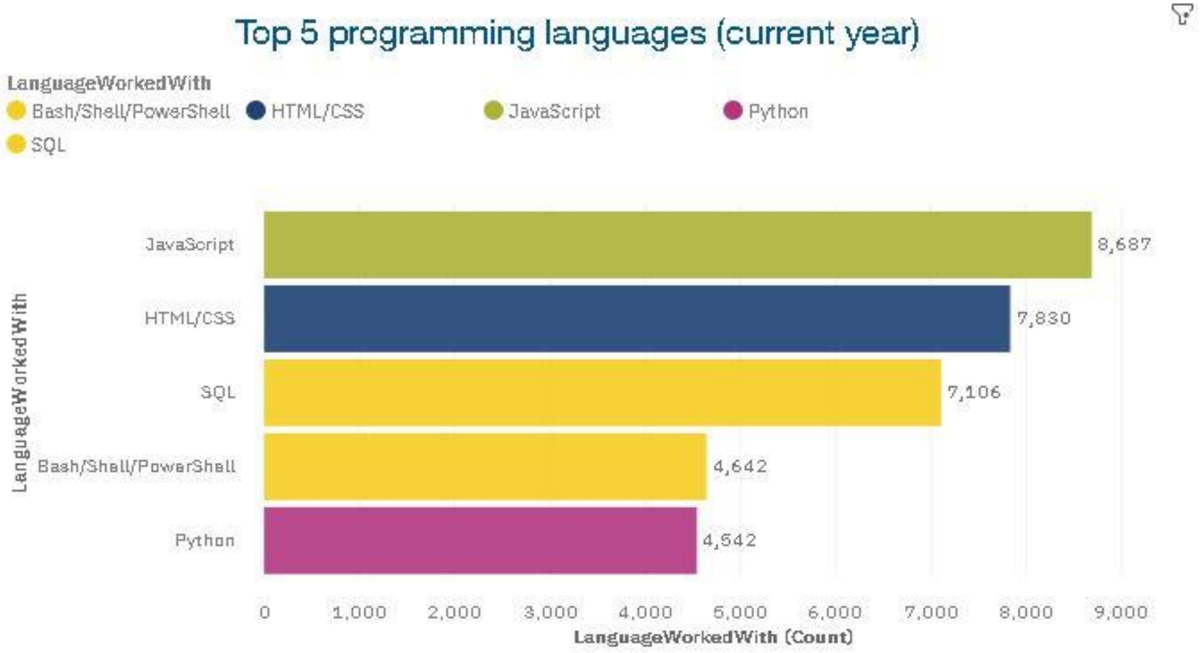
https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/ under an **Open Database License**.

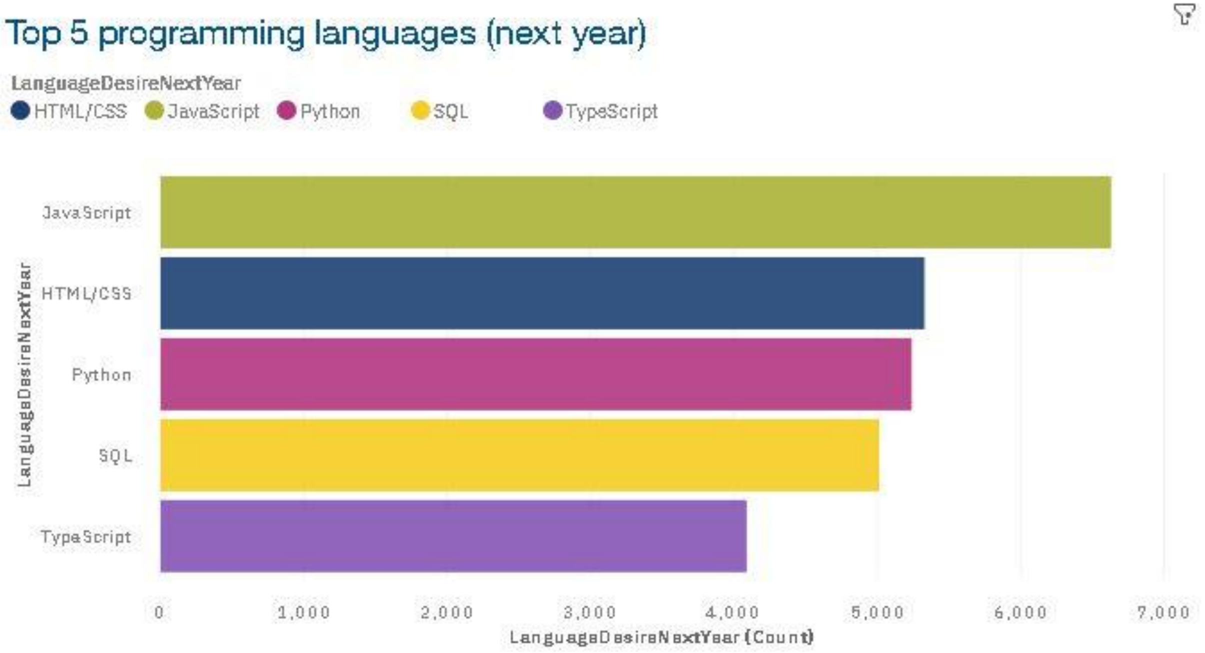
For sake of simplicity, we have limited our analysis to a subset of 1/10 that is 9000 respondents, which represent a quite good amount of data.

- Another survey from IBM give us the average annual salary per language. This give us a good insight of the most in demand language by industry : you can find the source on this link : IBM salary survey
- Once we collected all this data, we apply different methods in order to clean and prepare it for analysis (removing of missing values, outliers,…)

RESULTS

PROGRAMMING LANGUAGE TRENDS - graphics


Top 5 programming languages (current year)


Top 5 programming languages (next year)

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

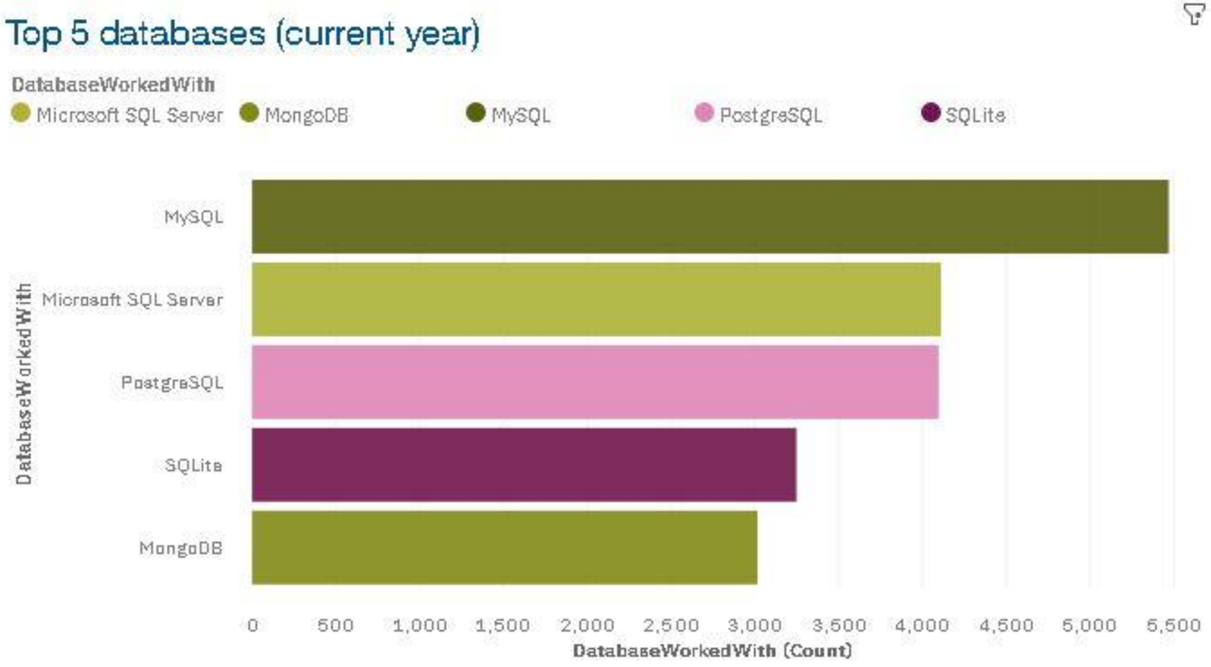
Findings/ Key results

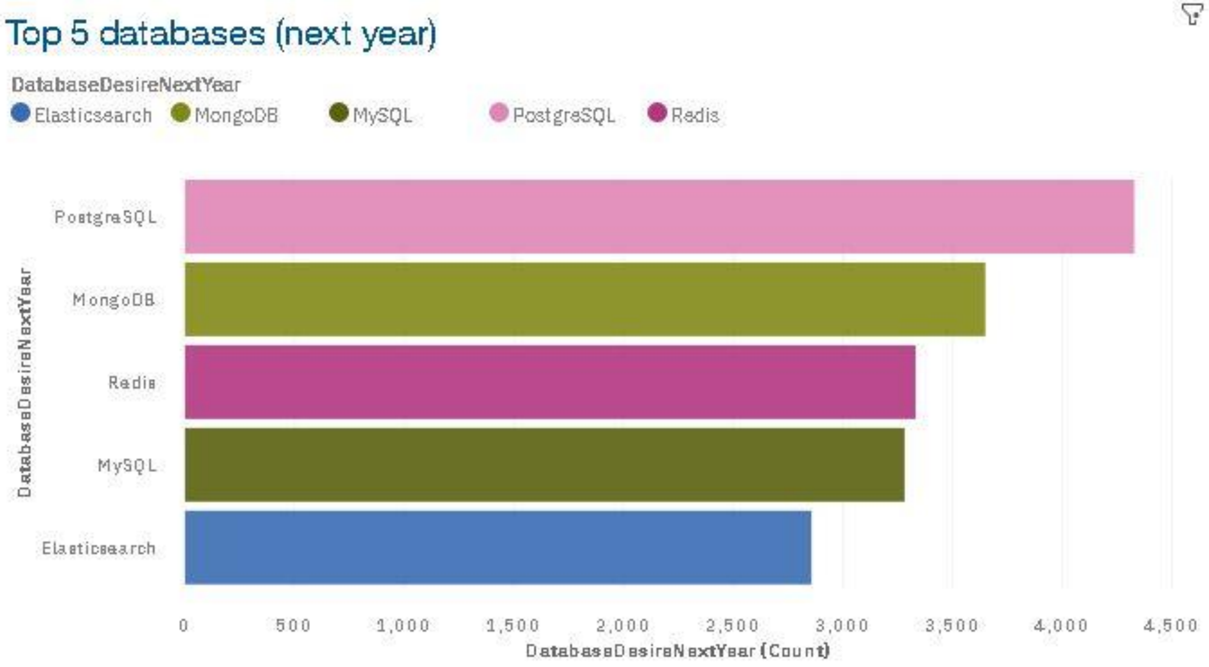
- Javascript and HTML rank 1 in both surveys
- SQL looses 1 rank
- Python takes 2 ranks
- Bash/Shell/PowerShell get out of the Top 5

Implications

- Javascript and HTML/CSS are highly utilized languages and will remain next year as crucial technologies
- SQL is and will stay an essential skill
- Interest in Python is growing fast
- Bash/Shell/PowerShell, if largely utilized in the developpers community, tends to be less useful than past years.

DATABASE TRENDS - graphics





DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- 2 Databases get out of the Top 5 next years : Microsoft SQL and SQLite
- Mongo DB growths of 3 rank
- PostgreSQL takes the rank 1 in next year's in-demand skills
- Elastic Search and Redis enter the Top 5 next year's

Implications

- PostgreSQL, which is an open-source database system, seems to be the next hot skill to have in for structured database management (SQL request)
- Interest for noSQL databases (semi-structured or unstructured data) strongly increases

DASHBOARD

<link to the Dashboard on IBM Cognos>

*** be patient, loading is very long on IBM cloud !***

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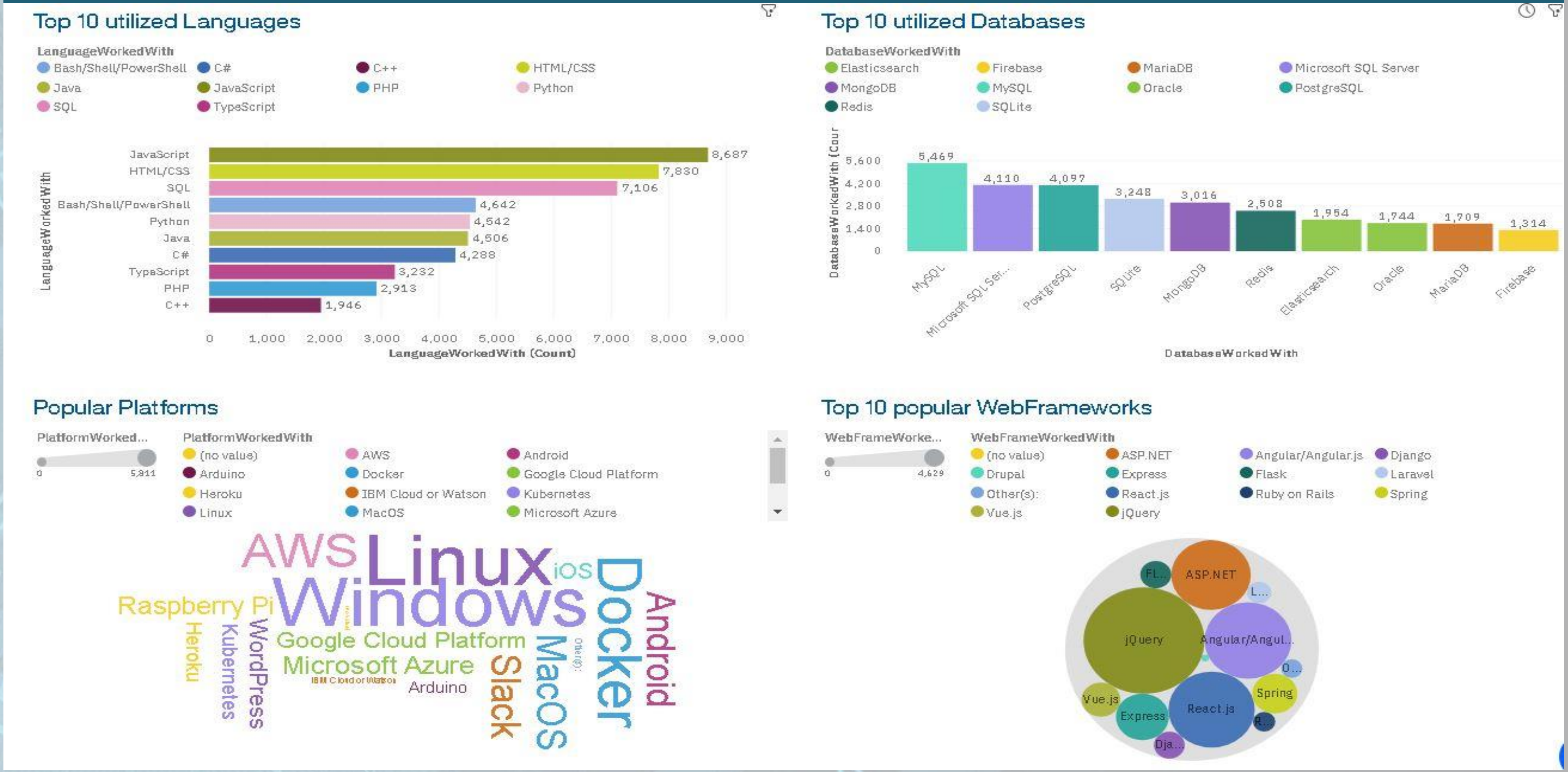
DASHBOARD TAB 1 : Current Technology Usage


Top 10 utilized Languages
LanguageWorkedWith
Bash/Shell/PowerShell
C#
C++
HTML/CSS
Java
JavaScript
PHP
Python
SQL
TypeScript
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
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
LanguageWorkedWith (Count)
LanguageWorkedWith
Top 10 utilized Databases
DatabaseWorkedWith
Elasticsearch
Firebase
MariaDB
Microsoft SQL Server
MongoDB
MySQL
Oracle
PostgreSQL
Redis
SQLite
DatabaseWorkedWith (Cour
5,600
4,200
2,800
1,400
0
MySQL 5,469
Microsoft SQL Ser... 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
DatabaseWorkedWith
Popular Platforms
PlatformWorked...
0
5,911
PlatformWorkedWith
(no value)
AWS
Android
Arduino
Docker
Google Cloud Platform
Heroku
IBM Cloud or Watson
Kubernetes
Linux
MacOS
Microsoft Azure
AWS
Linux
iOS
Windows
Raspberry Pi
Docker
Android
Heroku
Kubernetes
WordPress
Google Cloud Platform
Microsoft Azure
IBM Cloud or Watson
Arduino
Slack
MacOS
Other(s):
Top 10 popular WebFrameworks
WebFrameWorke...
0
4,629
WebFrameWorkedWith
(no value)
ASP.NET
Angular/Angular.js
Django
Drupal
Express
Flask
Laravel
Other(s):
React.js
Ruby on Rails
Spring
Vue.js
jQuery
FL...
ASP.NET
L...
jQuery
Angular/Angul...
O...
Vue.js
Spring
Express
React.js
R...
Dja...

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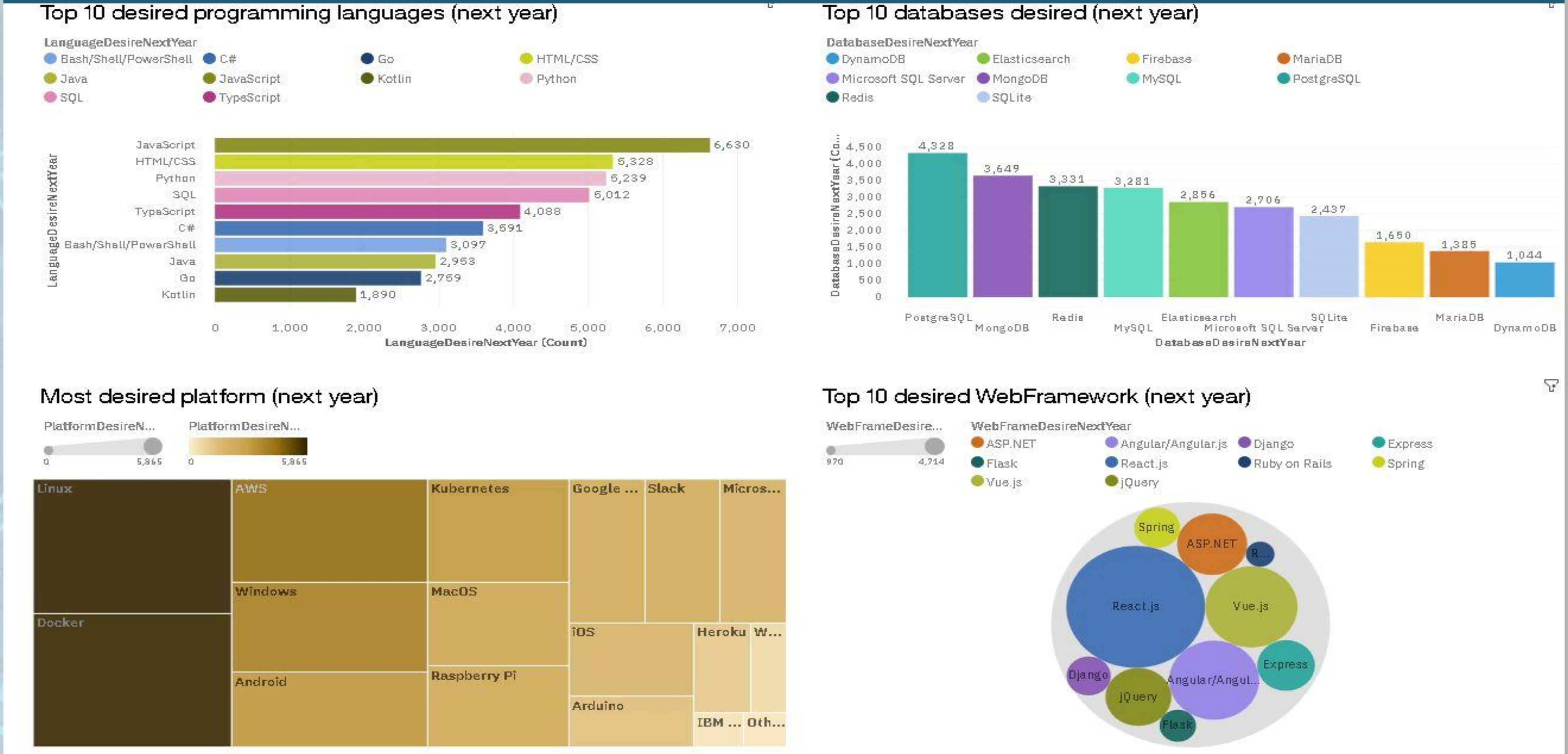
DASHBOARD TAB 2 : Future Technology Trends



Top 10 desired programming languages (next year)

Top 10 databases desired (next year)

Most desired platform (next year)

Top 10 desired WebFramework (next year)

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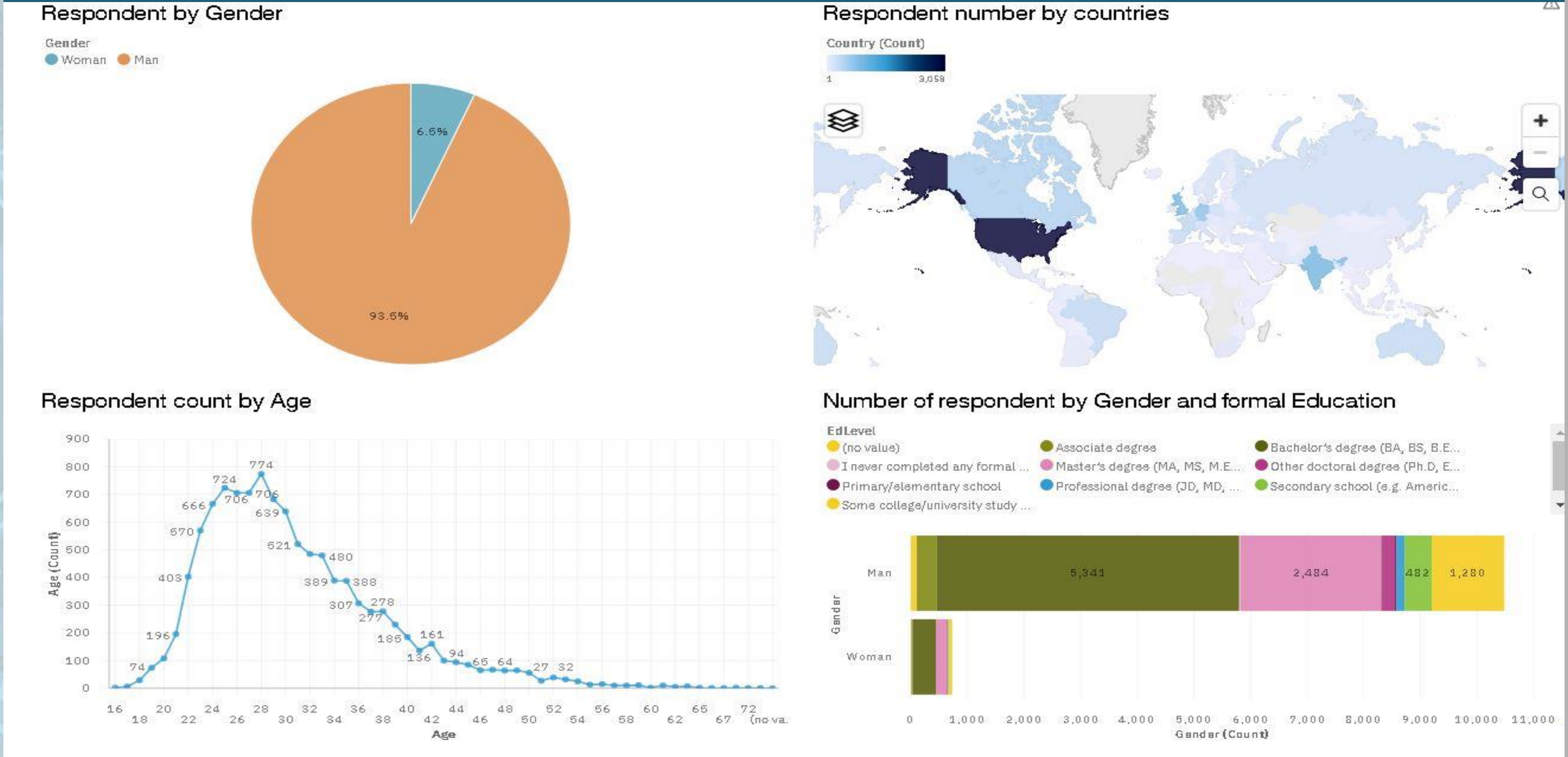
DASHBOARD TAB 3 : Demographics



Respondent by Gender

Gender
Woman
Man
6.5%
93.5%

Respondent number by countries

Country (Count)
1
3,059

Respondent count by Age

900
800
700
600
500
400
300
200
100
0
Age (Count)
774
724
706
706
666
639
570
521
480
403
389
388
307
278
277
196
185
161
136
94
74
65
64
27
32
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
65
67
72
(no va.
Age

Number of respondent by Gender and formal Education

EdLevel
(no value)
I never completed any formal ...
Primary/elementary school
Some college/university study ...
Associate degree
Master's degree (MA, MS, M.E...
Professional degree (JD, MD, ...
Bachelor's degree (BA, BS, B.E...
Other doctoral degree (Ph.D, E...
Secondary school (e.g. Americ...
Man
Woman
Gender
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
Gender (Count)

DISCUSSION

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OVERALL FINDINGS & IMPLICATIONS

Findings

- Programming languages : web technologies are very popular and remains in high-demand (Javascript, HTML, CSS) and Python's interest growing fast.
- Databases : interest growing for noSQL databases, and open-source DBMS more in-demand for SQL, in contrary of commercial SQL platforms.
- Linux appears to be the proeminent OS next year, Docker appears to be the most-in-demand framework for containerization
- Web-frameworks: React.js, Angular
- AWS is the most desired cloud for next year
- Most developers are men, between 20 and 35 years-old, and have an associate-degree.

Implications

- Apart from the strong interest for web technologies (using Javascript, HTML/CSS and SQL), all the other skills are widely utilized for Big Data analytics
- Computer science needs skills more than diploma.

Conclusion

Web frameworks

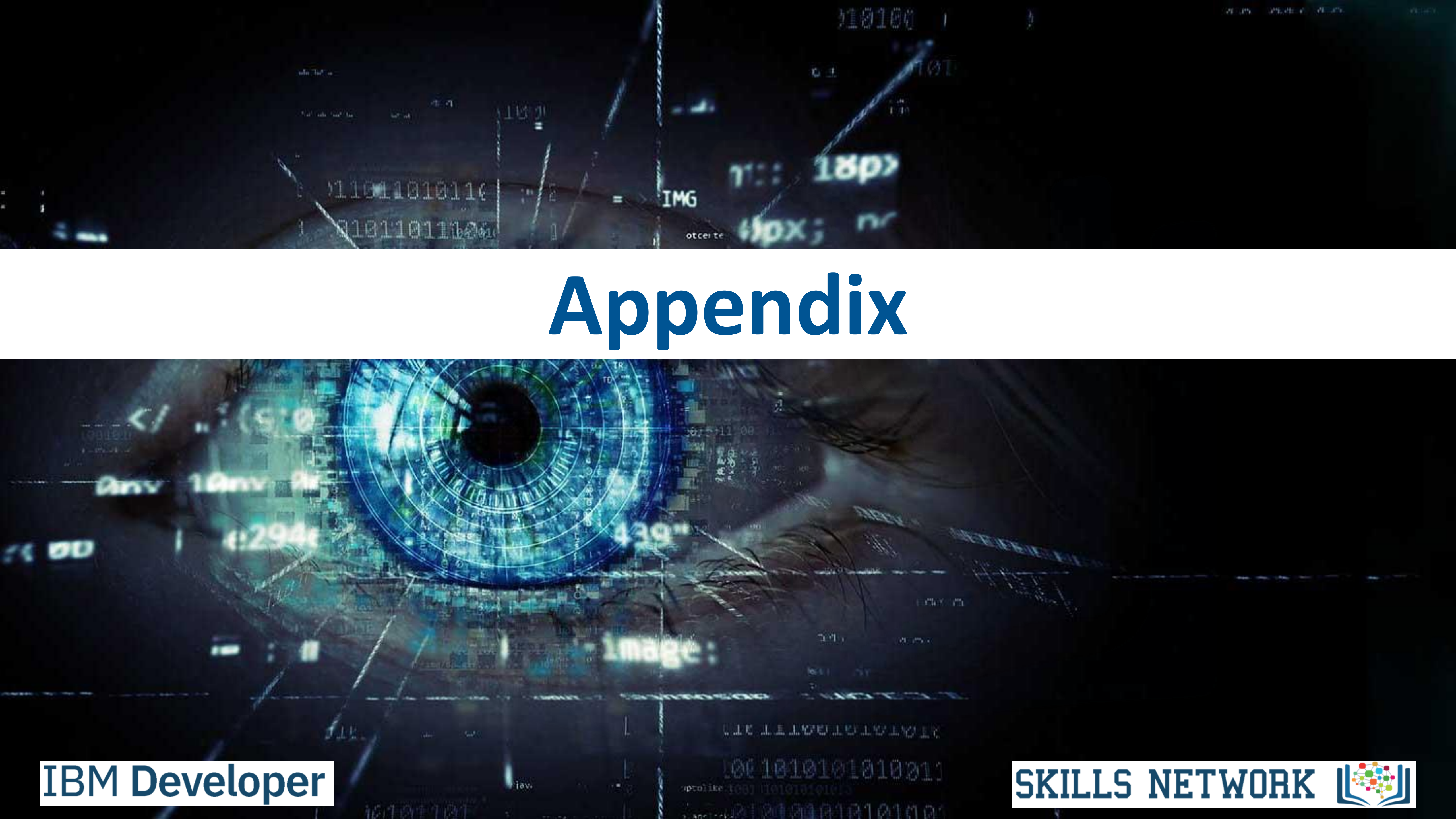
- Remains essentials technologies on the market

Big Data

- Interest is growing more and more (Python, SQL and noSQL)

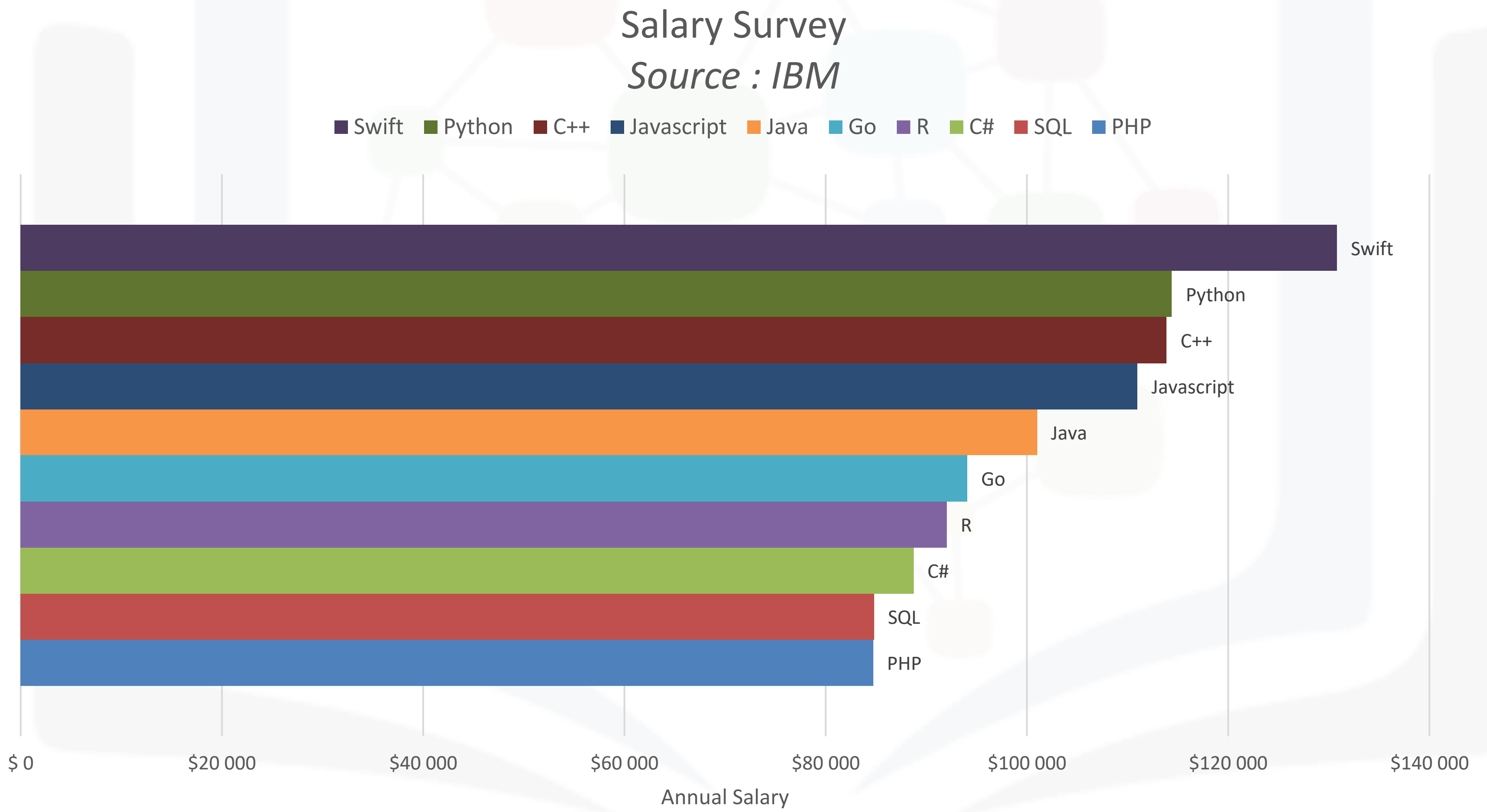
Open-Source

- becoming more popular than commercial softwares.



Appendix

POPULAR LANGUAGES according to salary survey



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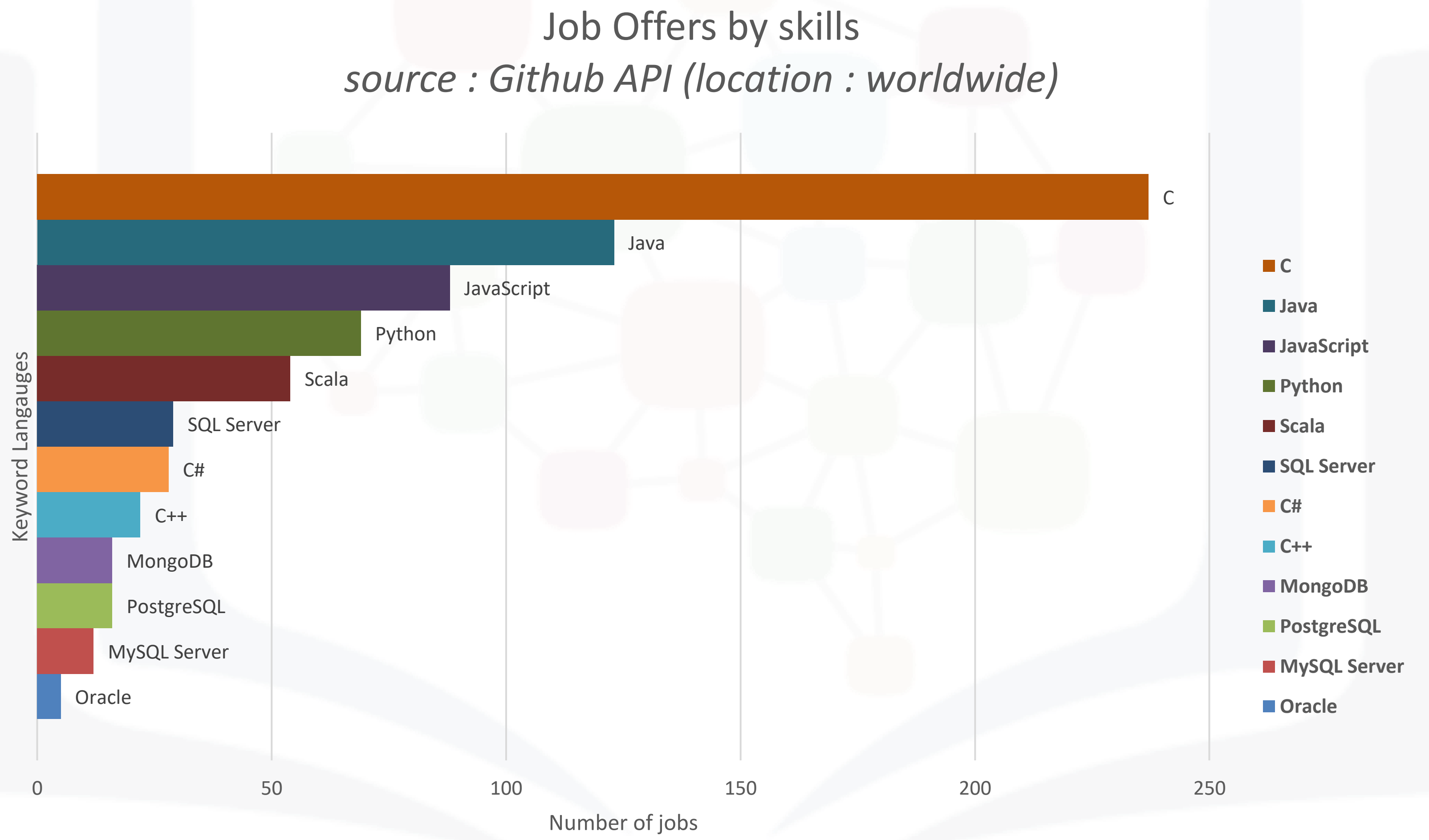GITHUB JOB POSTINGS