EMERGING TECHNOLOGY SKILLS AND TRENDS

ANNUAL REPORT

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EXECUTIVE SUMMARY

- As a global leader in the IT and business consulting industry, our firm has initiated an annual analysis to identify emerging and future in-demand tech skills in response to the fast-paced technology landscape, to ensure that an organization can complete in the ever-changing technological landscape.
- This year's analysis sought to uncover the most sought-after programming languages, database technologies, and other technologies, using various sources that are publicly available, IBM's internal databases, a Stack overflow survey, and job postings. The data was collected, cleaned, subjected to exploratory analysis and visualized on the report's dashboards.
- The findings illustrate the strong current usage of JavaScript, and while Python is becoming more popular, the outlook shows that JavaScript will remain the language of choice in the future. PostgreSQL is the industry standard and looks to remain that way as we move into the future as the top database utilized around the world, but there has been an increased interest in other options like SQL Light.

INTRODUCTION

- This report utilizes multiple data analytics tools to understand and highlight the knowledge and skills that organizations will require relating to programming languages, databases, web frames, and platforms, and has a proposed target audience of:
  - Executive Leadership & Strategy Teams
  - Talent Acquisition & Human Resources
  - Learning & Development (L&D) Departments
  - Technical Delivery Managers & Practice Leads
  - Clients & Partners
- The analysis aims to answer critical questions such as:
  - What programming languages are most in demand in 2025?
  - Which database technologies are currently preferred?
  - Which IDEs are most frequently used by developers?
  - What tare the target demographics of the individuals utilizing the technology?

METHODOLOGY

Data Collection

Primary Sources:

- Stack Overflow Developer Survey 2024: used as a benchmark dataset representing global developer trends.
- Skills Network (IBM): scraped from reputable employment platforms to assess real-time demand for technical skills.

Data Wrangling

- Standardized column names and data formats across sources, and handled missing values, duplicates, and outliers
- Transformed categorical variables (e.g., programming languages, tools) into consistent taxonomies
- Merged datasets using common fields for unified analysis

Exploratory Analysis

- Used Python libraries such as pandas, NumPy, and matplotlib/seaborn for initial analysis
- Applied statistical techniques to identify frequency and ranking of languages, tools, and technologies
- Measured correlation between job demand and survey popularity

Visualization and Insights

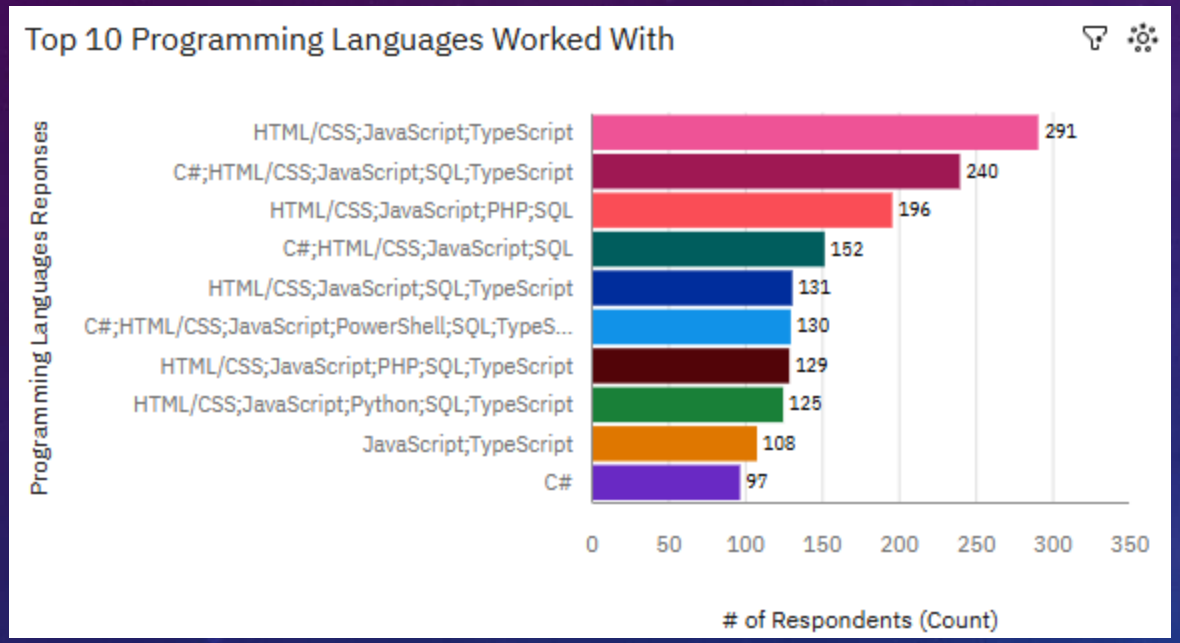
- Built interactive dashboards in IBM Cognos Analytics to present:
  - Top programming languages and databases by demand
  - Emerging vs. declining technologies
  - IDE preferences across user groups
- Dashboards enabled drill-down capabilities by region, job type, and experience level

RESULTS

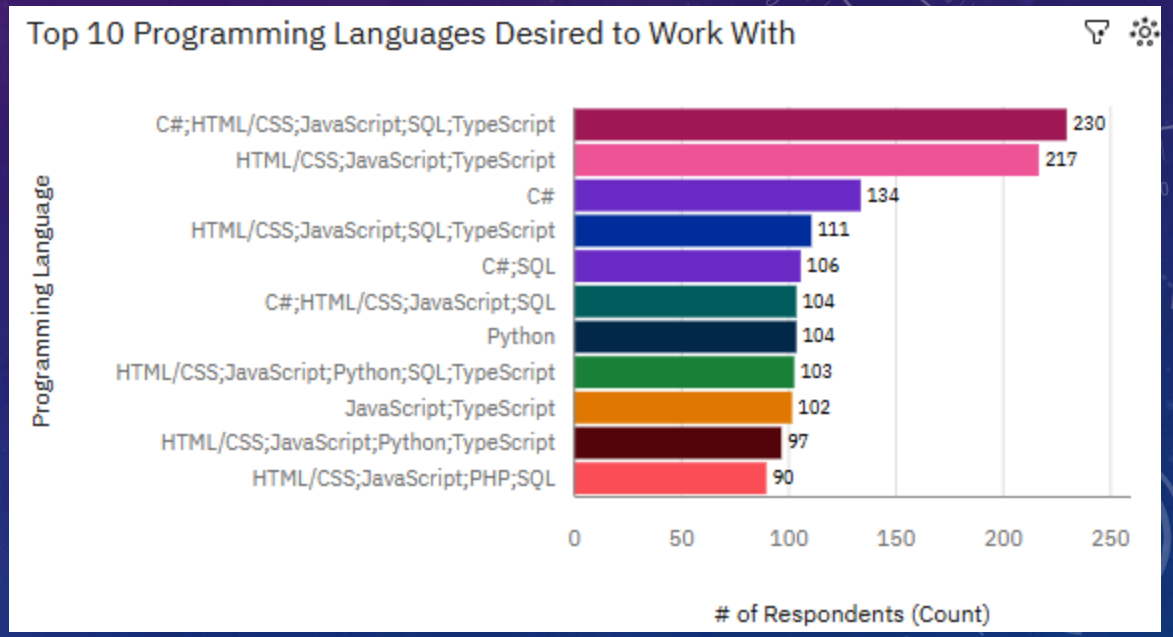
After conducting extensive data collection, cleaning, and analysis, the results reveal clear patterns in the current demand for programming skills, database technologies, and development tools across the tech industry. The integrated dataset highlights both consistent trends and emerging shifts in the global developer landscape. The following findings present a data-driven view of which technologies are leading the market, which skills are gaining traction, and how these trends align with industry training and hiring behavior. These insights provide valuable guidance for workforce planning, curriculum development, and strategic consulting.

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING TRENDS FINDINGS & IMPLICATIONS

Findings

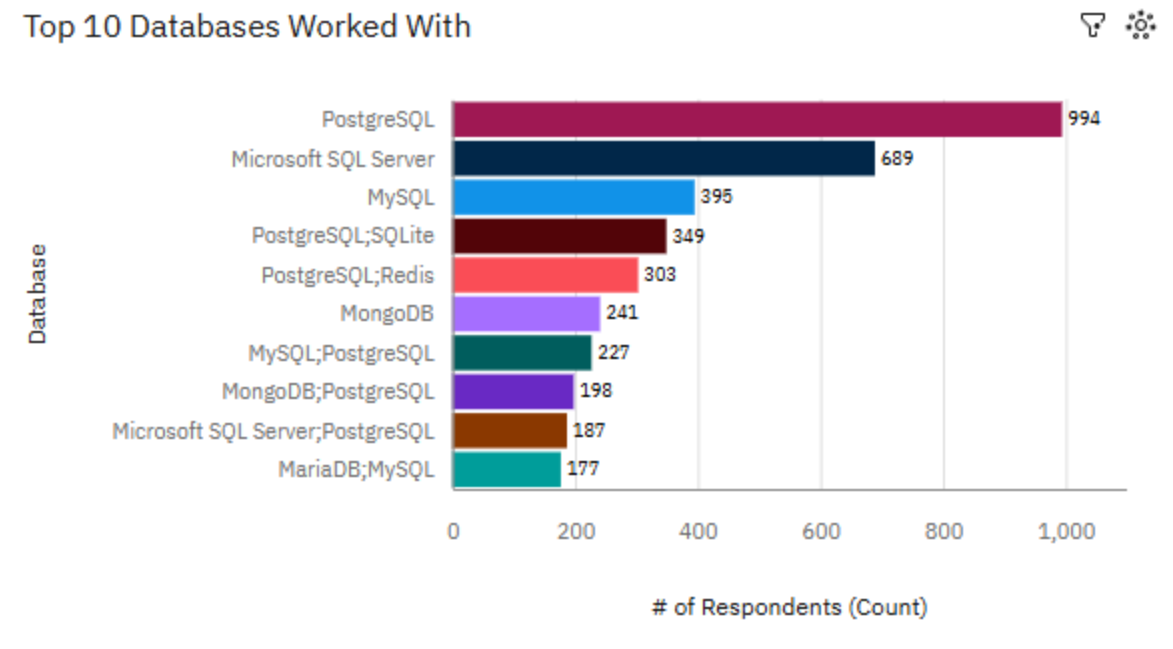
- Respondents overwhelmingly utilize multiple programming languages and are not dedicated to one or the other.
- JavaScript, TypeScript, HTML/CSS, and C+ are currently the most accepted programming languages, with outlook for the future remaining the same.
- The future outlook illustrated that Python and SQL are gaining traction and are projected continue a steady increase of usage due to the changing technological environment.

Implications

- The top use-case for JavaScript and HTML is web-development and the industry is proficient in these areas, and the demand continues to grow into the future.
- Python is seeing increased acceptance and usage, primarily due to the increased demand for Artificial Intelligence and Machine Learning, as well as it improve ease of use over legacy languages.
- Data professionals look to SQL as the industry leading language, due to ease of use and integration with Python.

DATABASE TRENDS

Current Year



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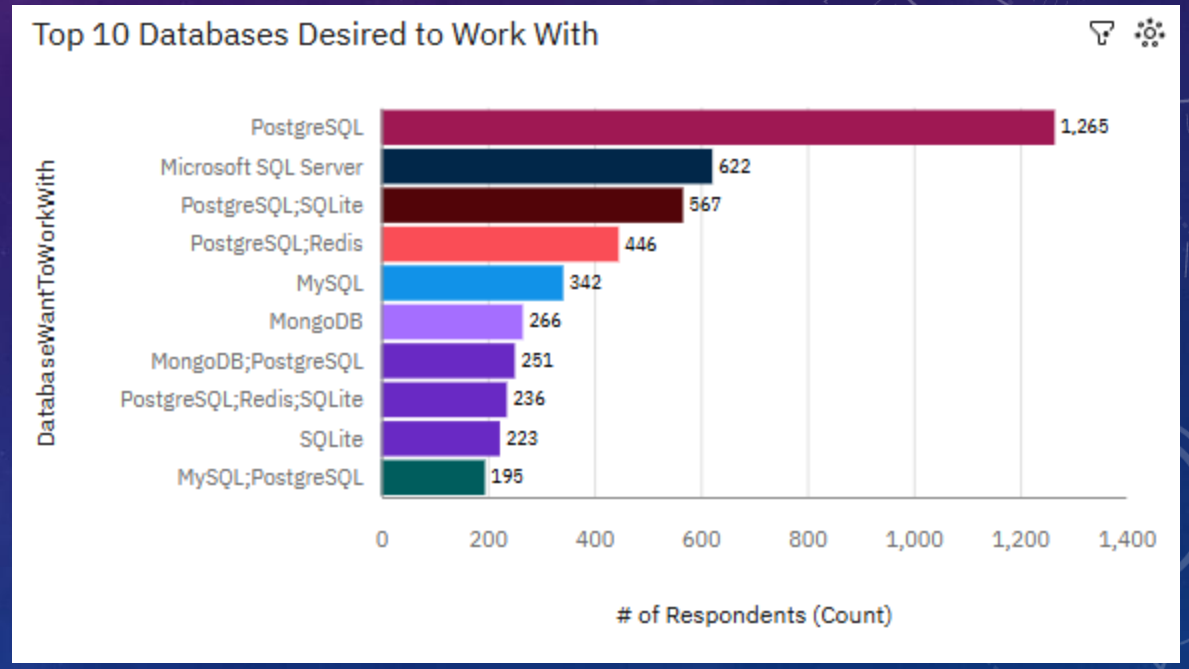


DATABASE TRENDS
FINDINGS & IMPLICATIONS

Findings

- Postgre SQL, MicrosoftSQL Server, and MySQL are currently the top 3 most-used databases.
- SQLite is projected to grow in usage and acceptance, as it seamlessly works within the Python language.
- MariaDB is projected to lose its share of usage to the increased usage of SQL, Redis, and Mongo.

Implications

- While in different forms and structures, SQL is still the go-to tool for IT industry professionals, specifically within data specializations.
- The popularity of Postgre SQL among developers will drive growth in popularity as more management and team members utilize more, due to the ability to handle multiple data types are sources.
- Open-source databases offer more flexibility and adaptability hence the linear and correlated growth between Python usage and Postgre SQL

PLATFORMS & WEBFRAMES FINDINGS & IMPLICATIONS

Findings

- Amazon Web Service (AWS) and Microsoft Azure have a massive footprint and are the overwhelmingly preferred platform by developers.
- Spring Boot is the leading web-frame utilized, with React and Node.js coming in just behind them.
- Developers are looking towards new solutions for platforms, as Digital Ocean, Hetzner, and Cloudfare have become popular choices that developers are beginning to work with.

Implications

- As acceptance and use of new languages and databases are increasing, it is leading to new IDE platforms and web-frames that align with the ease of use and customization.
- New platforms like Cloudflare will continue to see a shift from traditional databases, and shift to the newer versions like SQLite and MongoDB

DASHBOARD

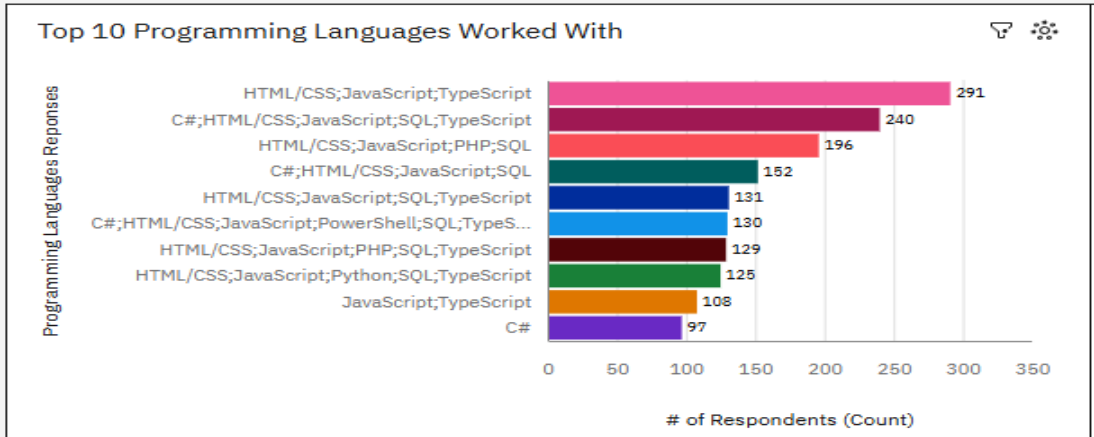
The following slides show the different tabs of the IBM COGNOS Dashboard.

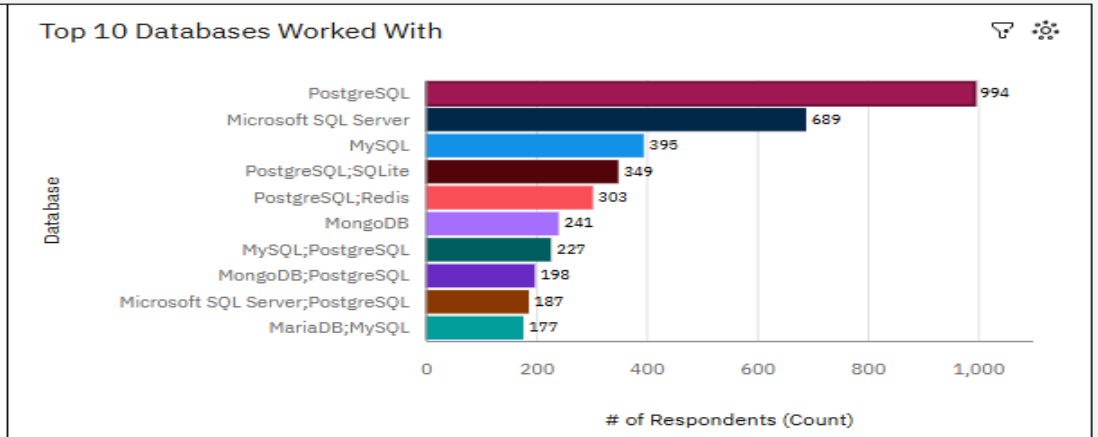
The link to the IBM Cognos dashboard is as follows:

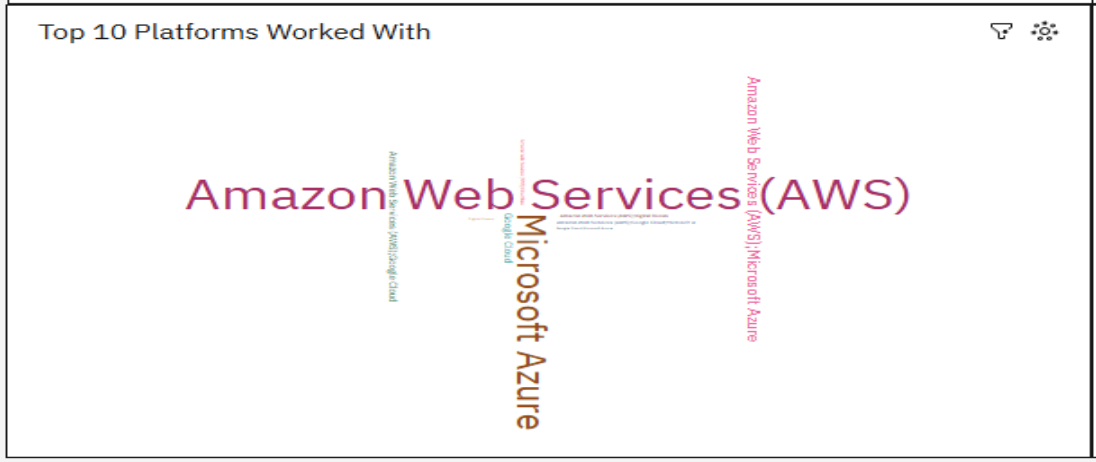
IBM COGNOS DASHBOARD
https://github.com/theoriginalrubix/IBM-Data-Analysist-Capstone-Project/blob/main/Capstone%20Dashboard.pdf

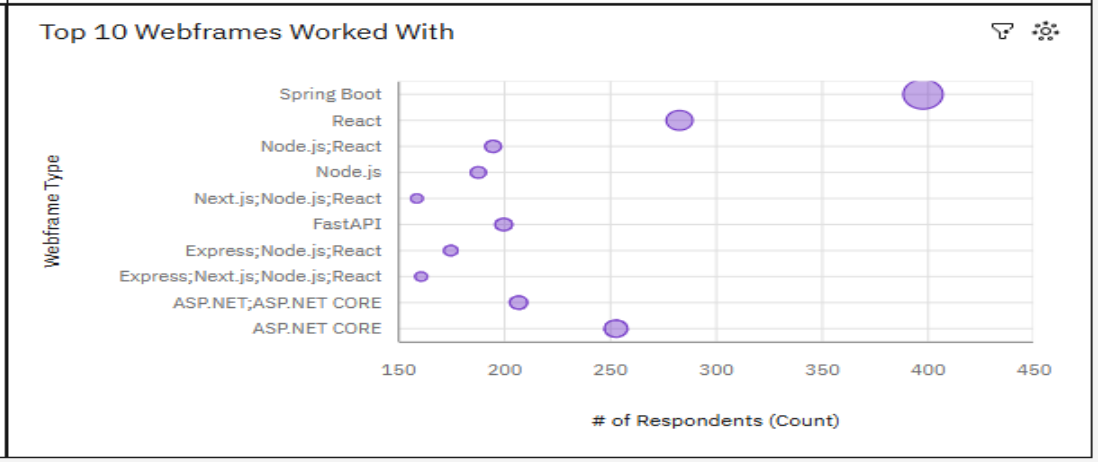
DASHBOARD TAB 1

Current Technology Usage | Future Technology Trend | Demographics





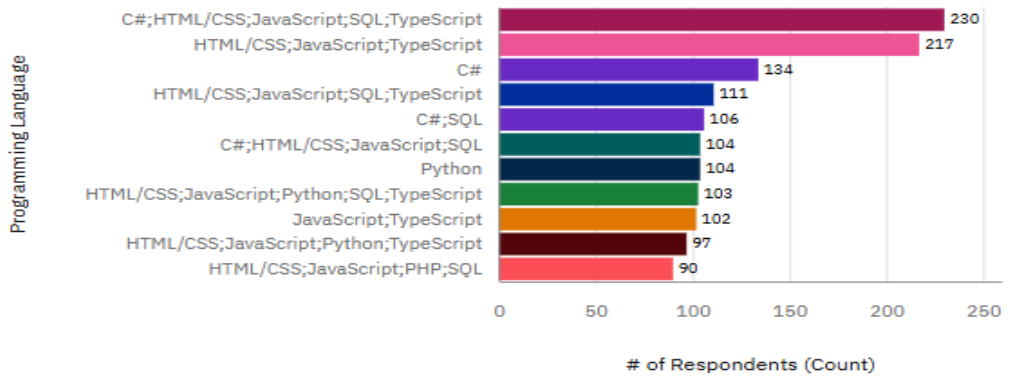




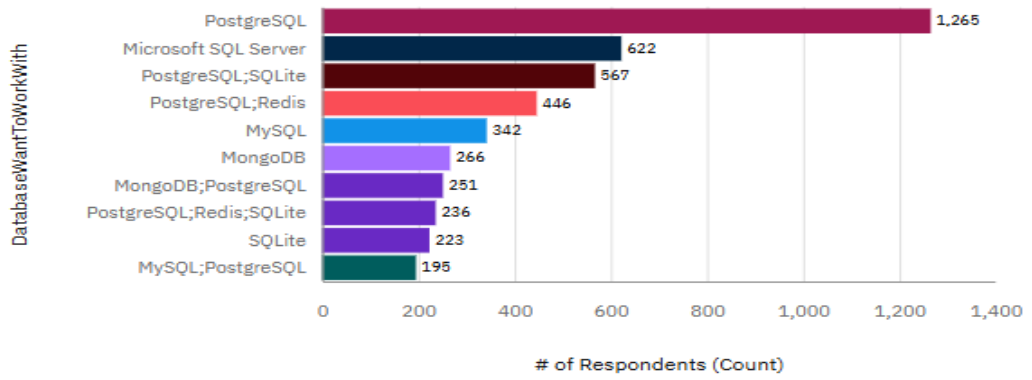
DASHBOARD TAB 2

Current Technology Usage | Future Technology Trend | Demographics

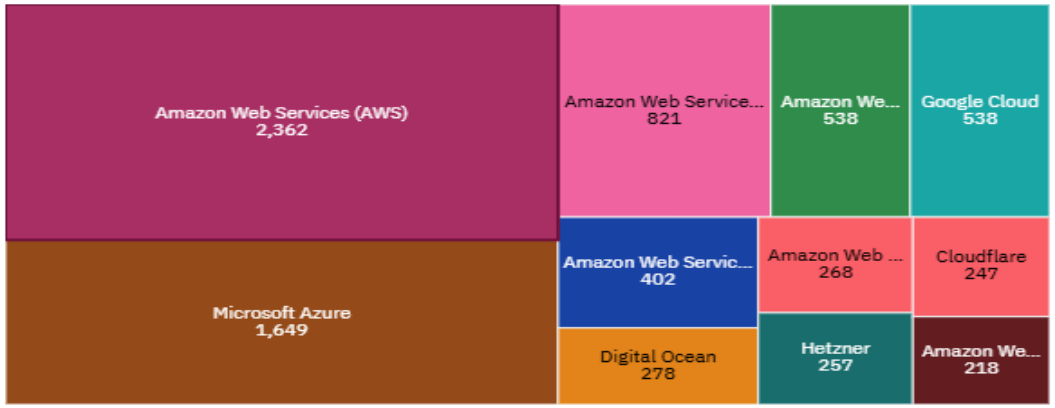
Top 10 Programming Languages Desired to Work With



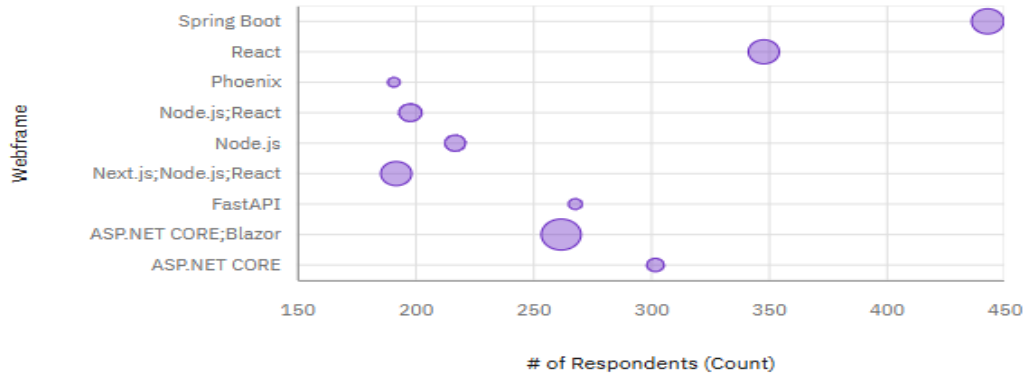
Top 10 Databases Desired to Work With



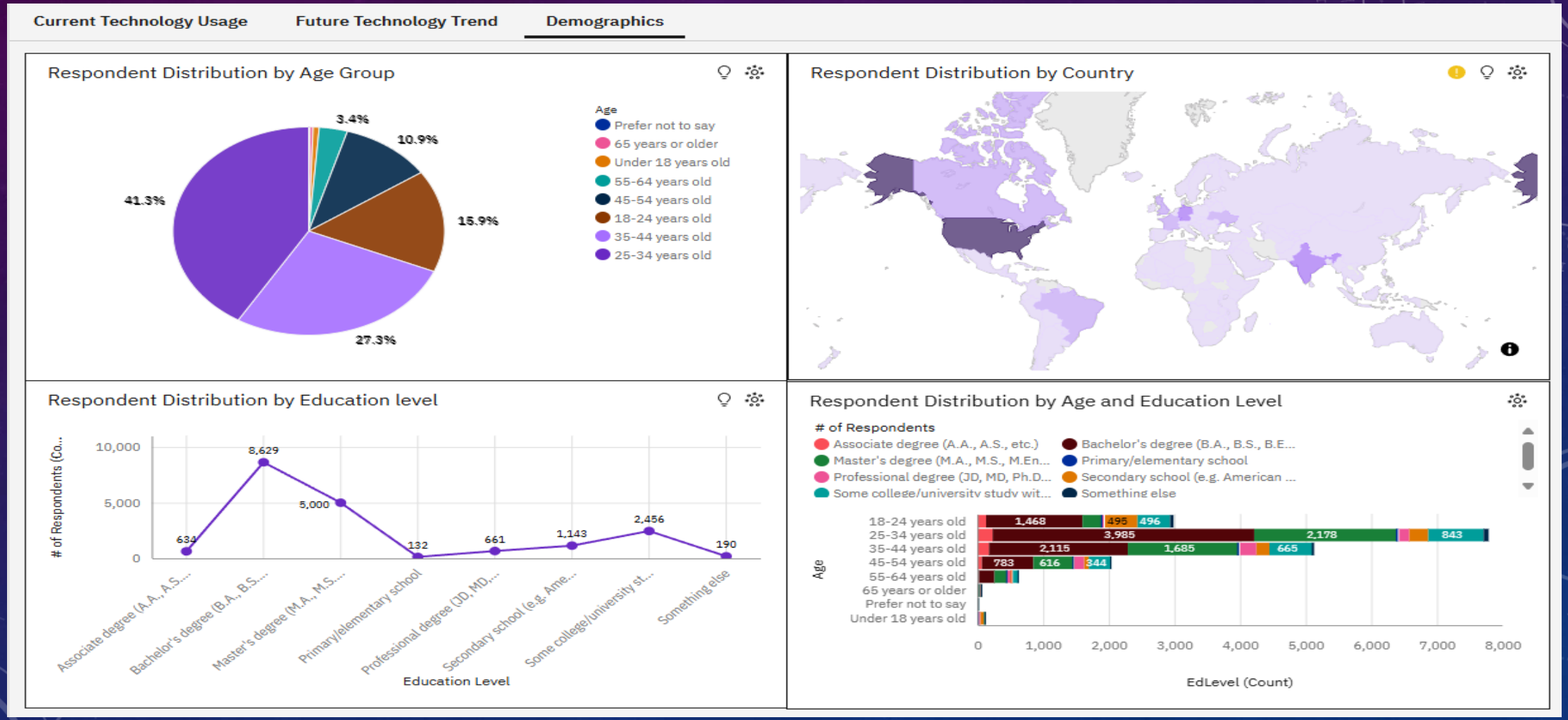
TreeMap of Top 10 Platforms Desired o Work With



Top 10 Webframes Desired to Work With



DASHBOARD TAB 3



DASHBOARD INSIGHTS

- As the younger generation continues to enter the IT and data industry, the more diverse the tool usage will be throughout the industry. More flexible languages like Python have ignited innovation and change within the legacy market.
- Experience within the data science field does not directly correlate with education, opening a question of whether or not it is necessary to be successful.
- More tech education, access to the internet and hardware, is driving increased IT knowledge within developing nations.
- Skilled talent within the tech sector is necessary as more products, services, and requirements from organizations continue to exponentially evolve.

OVERALL FINDINGS & IMPLICATIONS

Findings

- The largest portion of developers in the IT field have a Bachelor's Degree.
- The IT and tech sectors are predominantly comprised of people that fall under the age of 44.
- People want to learn the newer languages such as Python, or the more robust and flexible database and platforms like PostgreSQL.

Implications

- SQL knowledge and understanding is required for data professionals who want to be successful within the industry.
- Web-development is the most saturated segment of the industry but is also on of the most demanded due to the rise of social media advertising which requires constant adaptation to ensure messaging.
- Developmental status of a country dramatically impacts the nations educational competency in the tech field, and more time and resources are needed to involved more of the global population.

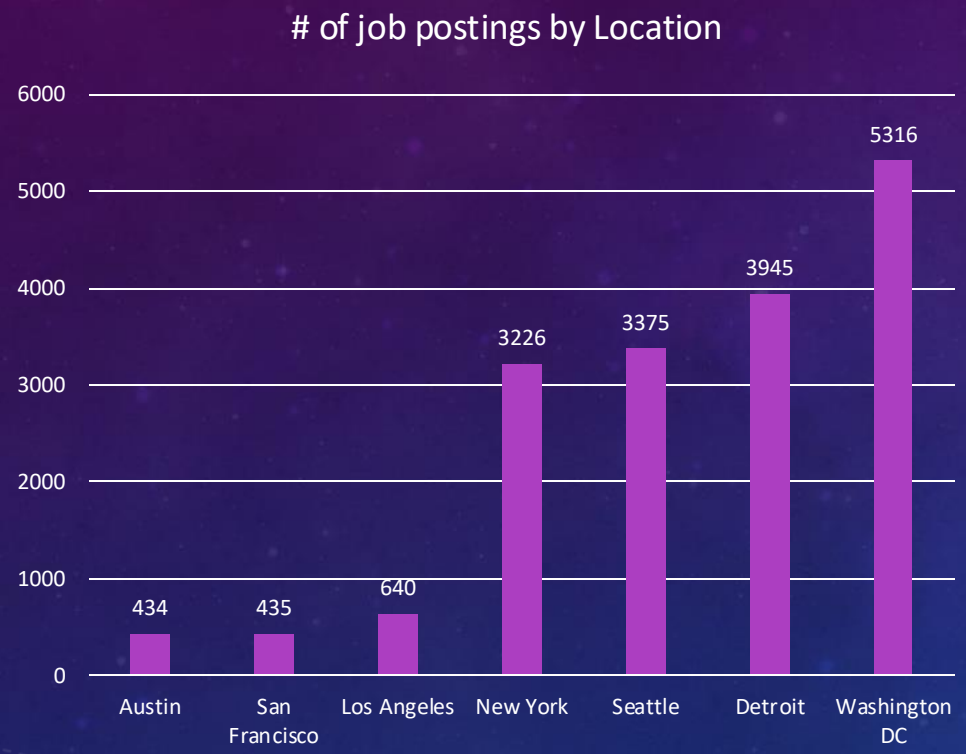
CONCLUSION

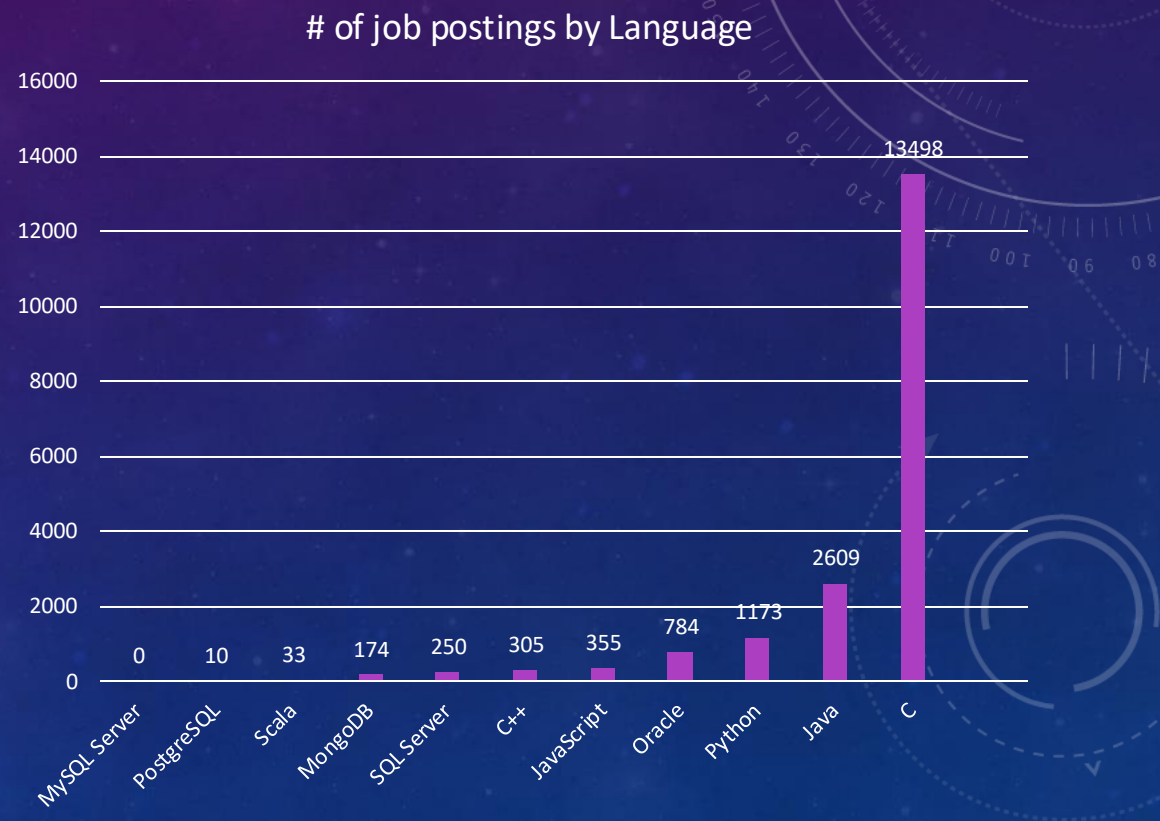
- The development of Artificial Intelligence and Machine-Learning has increased the need for data professionals who can properly collect, processes and then analyze large data sets.
- With the rise of new languages and platforms being utilized throughout the industry, the most prominent data professionals will be required to self-educate and adapt, as to stay relevant within an industry with such an innovation curve.
- Job listings for data professionals is at an all time high, as every organization is grappling with the rise of Artificial Intelligence as a Business Intelligence tool, and scrambling to understand the most efficient uses-cases, while also incurring the ethical questions of how it ‘should’ be utilized.
- While new technology has continued to be available to data professionals, SQL, JavaScript and HTML are legacy tools that most others have been built upon, and a base knowledge of each is the foundational platform for data science.

APPENDIX

- Include any relevant additional charts, or tables that you may have created during the analysis phase.

JOB POSTINGS





POPULAR LANGUAGES