

Technology Trend

ANALYSIS OF TECHNOLOGY IN
DEMAND ON DEMOGRAPHY

FERDOUS HAQUE

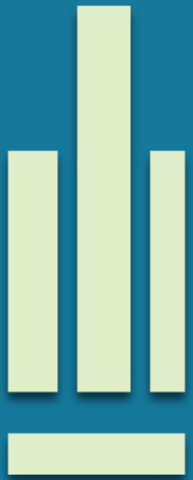
IBM DATA ANALYST PROFESSIONAL
CERTIFICATE

11-03-2024

Technology
In
Motion



OUTLINE



Tech



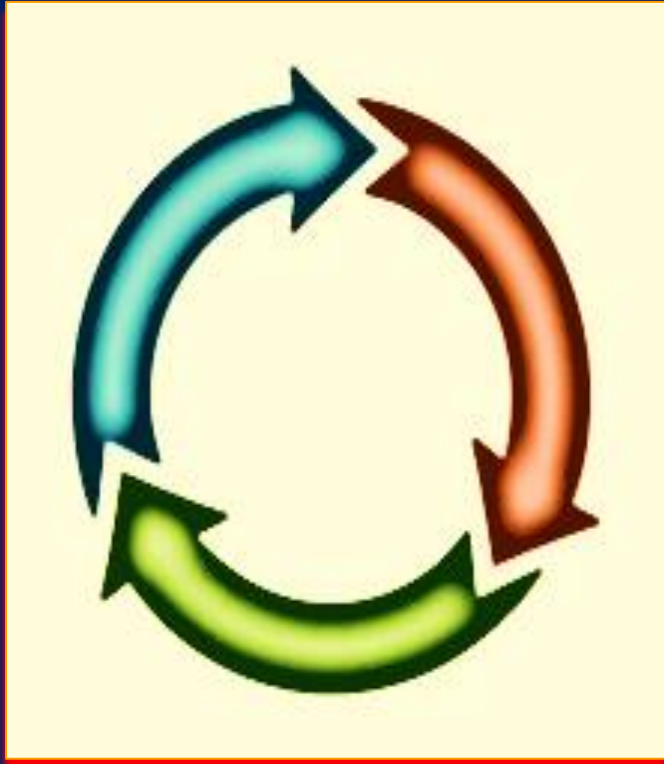
- Executive Summary
- Introduction
- Methodology
- Results
 - Visualization – Charts
 - Dashboard
- Discussion
 - Findings & Implications
- Conclusion
- Appendix

EXECUTIVE SUMMARY



- The purpose of this presentation is to highlight both current and future global technology trends based on empirical data collected from Stack Overflow and its sister company, Prosus. This data provides valuable insights into the evolving landscape of technology adoption and innovation.
- This entity plays a pivotal role in capturing, sharing and collaborating on knowledge globally an unprecedented scale. Through its extensive data collection and analysis efforts, it has become the largest technology investor worldwide, providing a comprehensive view of technological advancements and market dynamics.
- We utilized visualization tools such as IBM Cognos and Google Looker Studio to depict the top ten technological demands across four major areas: computer programming languages, databases, platforms, and web frameworks. These visualizations, which include plots, charts, and spatial data analytics, provide insights into current and future trends in these domains.

INTRODUCTION



- We initiated our data exploration by tackling a massive dataset, extracting a sample of over seventy-four thousand respondents from an approximately population of one billion. Our focus group is significantly smaller, as we narrowed down the data to the top ten entries from each major area of the study, as detailed in the Executive Summary. Additionally, a considerable number of the respondents had missing or null values.
- A research study from the Harvard Kennedy School of Government demonstrates a triangular relationship among knowledge, technology, and economic growth. It identifies technology as the driving force behind economic growth in different geographical area.
- Our visual representation aligned well with this study, illustrating how the current and future technology demand can converge into economic growth within a globally dynamic demographic. Additionally, this can support the study's hypothesis depicting in visualization.

METHODOLOGY



- Our methodology employs a combination of categorical analysis and statistical analysis. Initially, categorical analysis involves organizing technological tools into one of four predefined groups, as detailed in the Executive Summary. This is followed by statistical analysis, which utilizes frequency distribution to illustrate how frequently each tool was selected by respondents, highlighting their popularity.
- Subsequently, we identify top ten tools within each category based on respondents' choices, using frequency distribution to focus on the tools of interest. Our analysis then examines quantitative measures to identify the key trends in technological demand, providing insights into which tools are gaining popularity. The outcomes are depicted through visualizations such as graphs and charts.

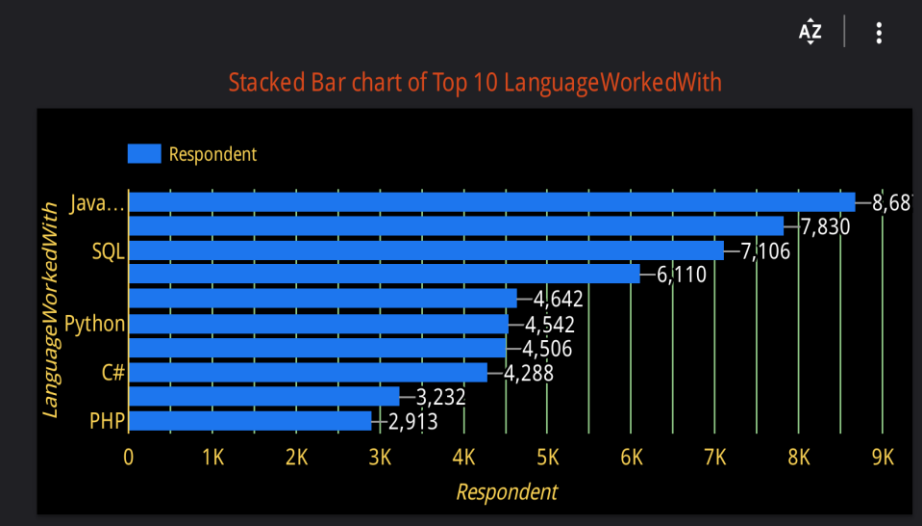
RESULTS



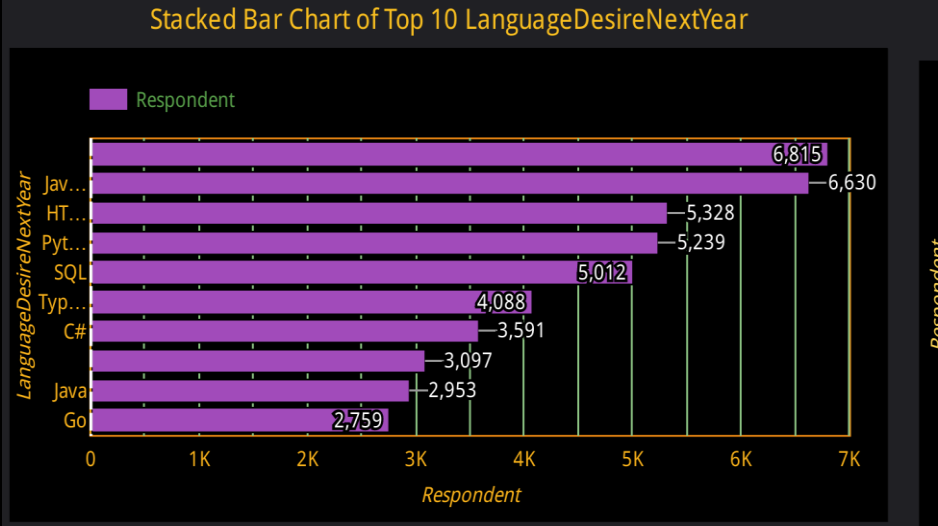
- Our raw data has been translated and represented in a visual context using charts, text annotations, spatial maps, and graph. We will analyze these visual elements to extract potential insights for quantitatively analysis, as raw data is no longer the primary focus of this analysis.
- In the following slides, we have included graphs and dashboards to optimize the visualization of technology trends at a glance, independent of the raw data.
- A cursory examination of these visual objects reveals that several cutting-edge technological trends, such as computer programming languages, databases, frameworks, and platforms remain consistent across both current and future time frames. Additionally, the demographic analysis indicates an increase in male representation across all aspects of technology trends spatially.

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- ▶ Current trend in programming language shows Java Script at the top followed by HTML/CSS, SQL Bash/Shell/ PowerShell and Python.
- ▶ This ranking is expected to change slightly next year with Java Script and HTML/CSS maintaining their top positions despite a significant drop in popularity.
- ▶ Notably, Python is the only language that has seen a dramatic increase in popularity.

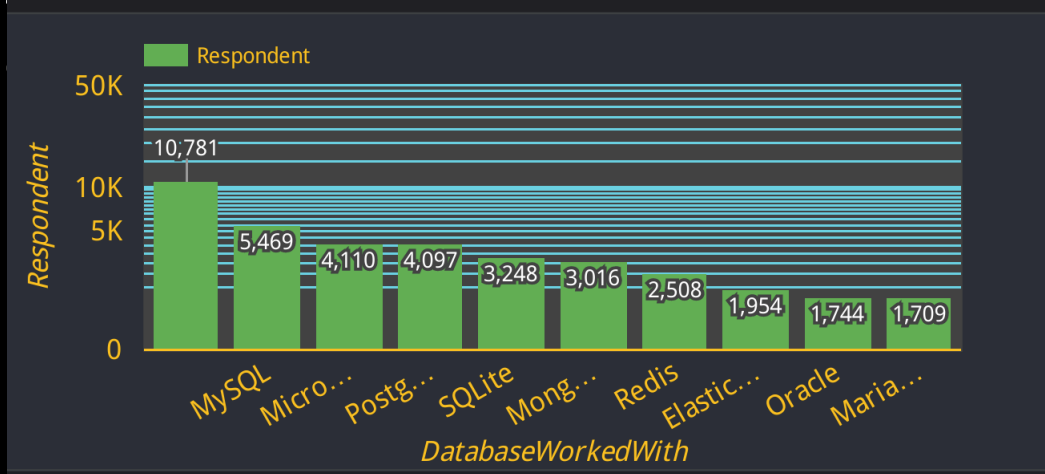
Implications

- ▶ We observed a downturn in Java Script's popularity by approximately 24%, followed by nearly 32% decrease for HTML/CSS.
- ▶ Python's demand increased by about 15% during the same period, indicating growing interest and potential future dominance.
- ▶ Bash/Shell/Power Shell has completely dropped from the ranking, suggesting a shift in preference away from these tools.

DATABASE TRENDS

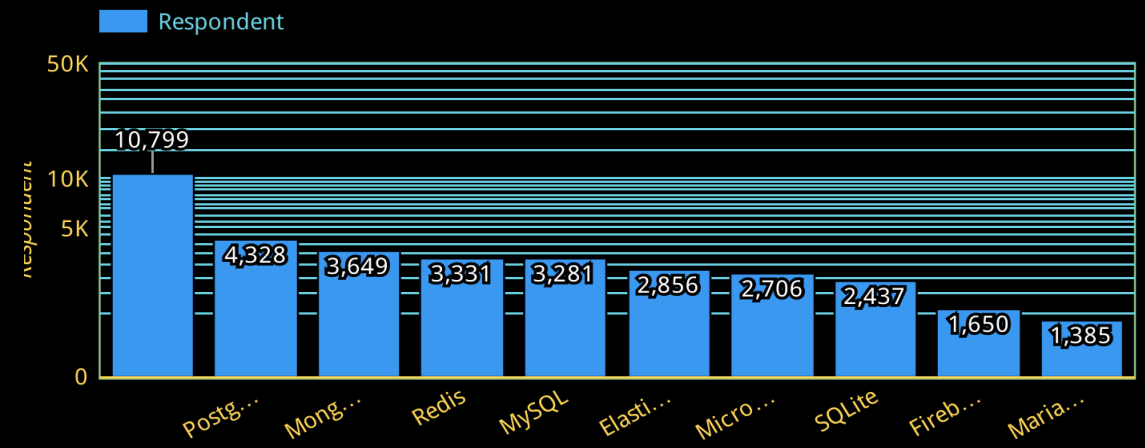
Current Year

Stacked Column chart of Top 10 DatabaseWorkedWith



Next Year

Stacked Column chart of Top 10 DatabaseDesiredNextYear



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- ▶ The current trend in database shows MySQL with the highest popularity followed by Microsoft SQL Server, PostgreSQL, SQLite, and MongoDB as the top five databases.
- ▶ With a significant 40% drop in MySQL's popularity, PostgreSQL is projected to rise to the top with a modest 5% increase next year. The new ranking will feature MongoDB with a 21% increase, Redis with nearly 33% increase, and MySQL in fourth place despite the drop.
- ▶ Microsoft SQL Server and SQLite are expected to experience popularity drops of 34/% and 25%, respectively.

Implications

- ▶ Despite some sharp declines in database rankings next year, it is crucial to note that a significant portion of respondents in this category had null values. This, combined with a smaller focus group, may have led to unusual outcomes.
- ▶ Consequently, PostgreSQL is expected to take the top spot with only 5% rise in popularity. Additionally, SQLite is nearly disappearing from the ranking.

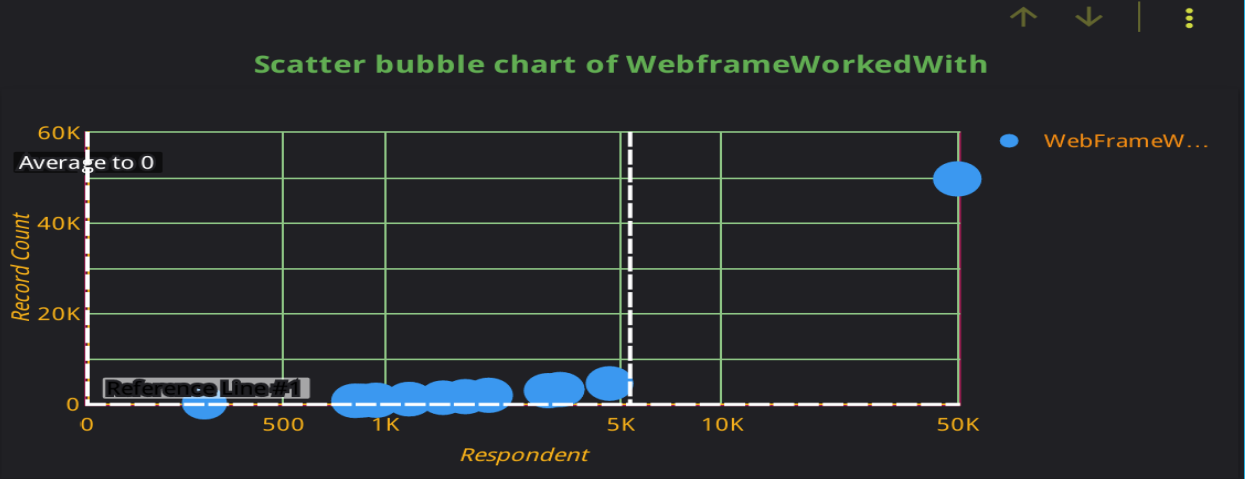
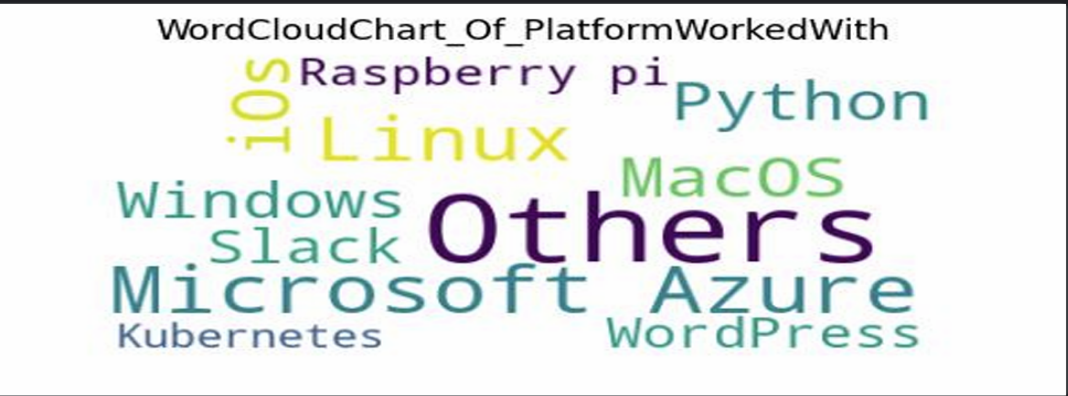
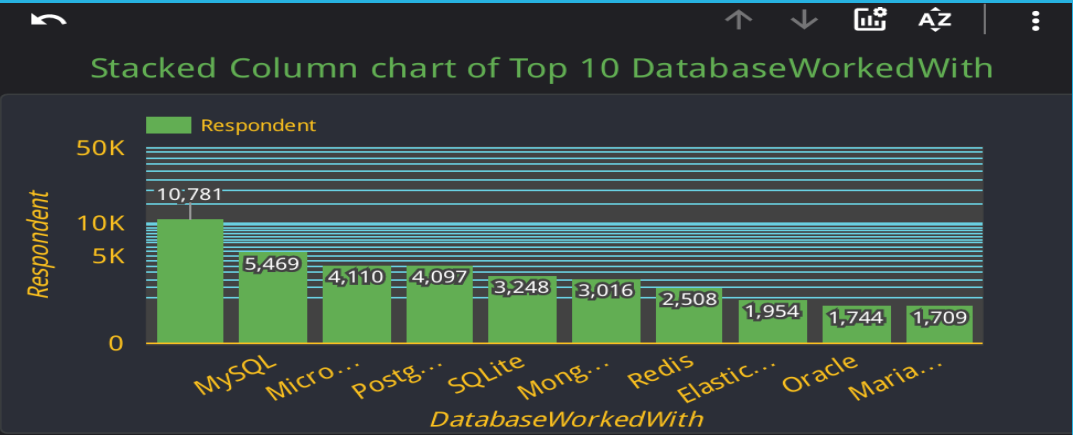
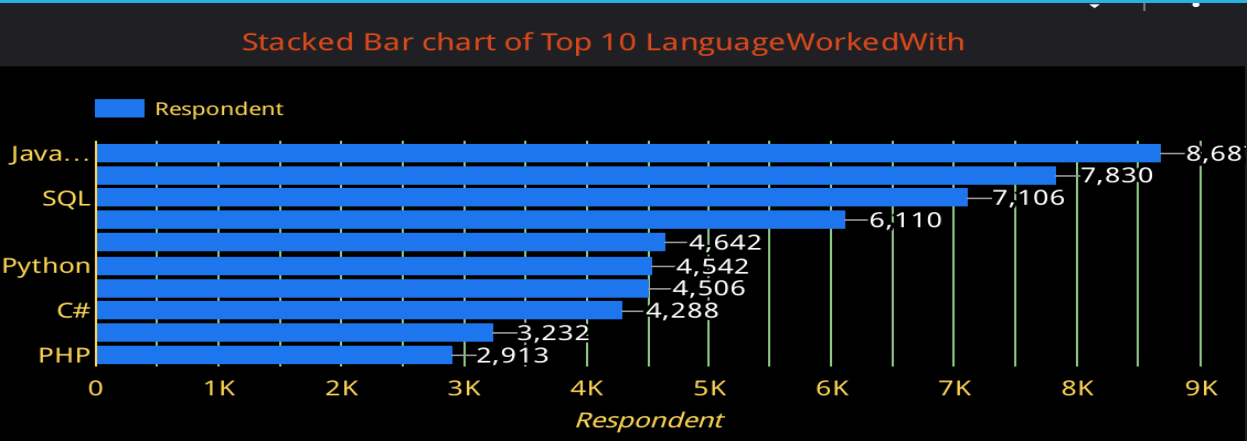
DASHBOARD

GitHub



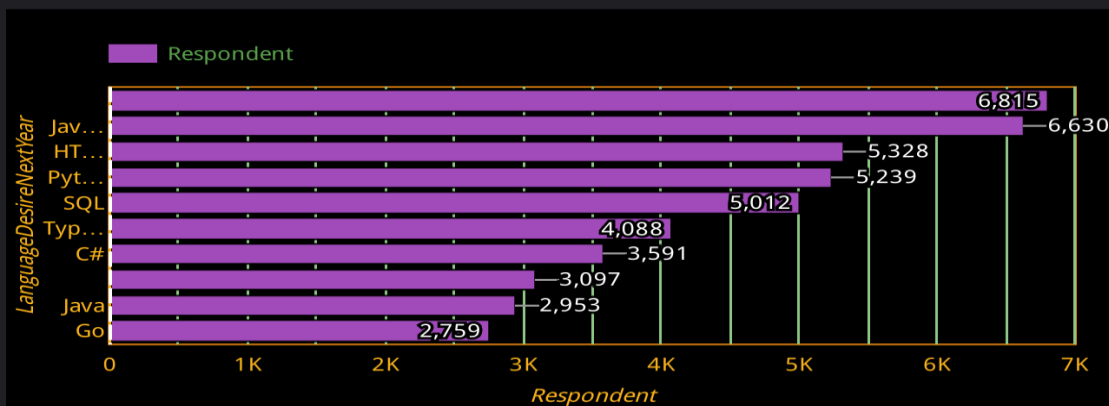
<The GitHub link of the Cognos/Looker Studio dashboard goes here.>

DASHBOARD TAB 1

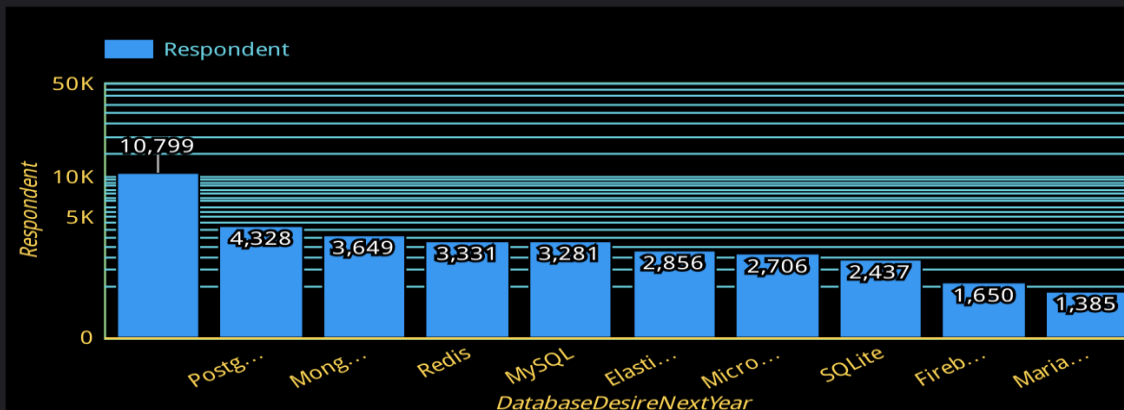


DASHBOARD TAB 2

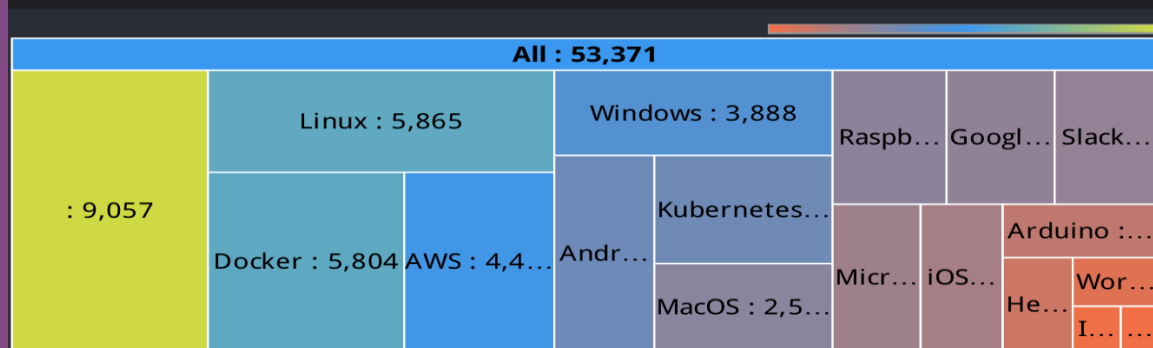
Stacked Bar Chart of Top 10 LanguageDesireNextYear



Stacked Column chart of Top 10 DatabaseDesiredNextYear



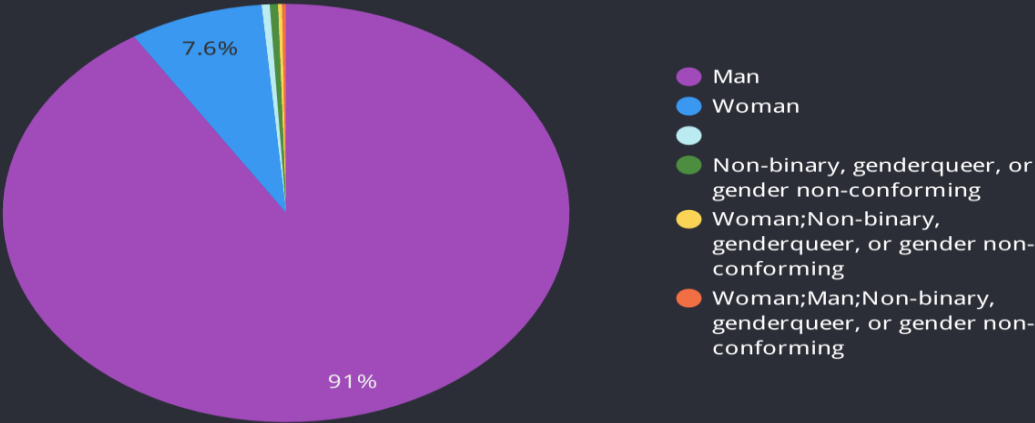
Tree Map Chart of PlatformDesireNextYear



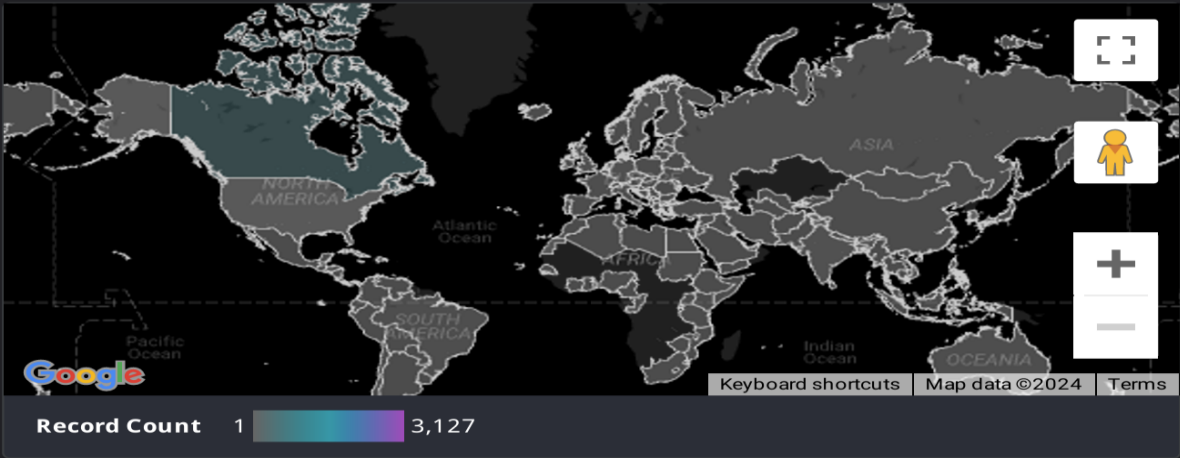
Scatter bubble chart of WebframeWorkedWith

DASHBOARD TAB 3

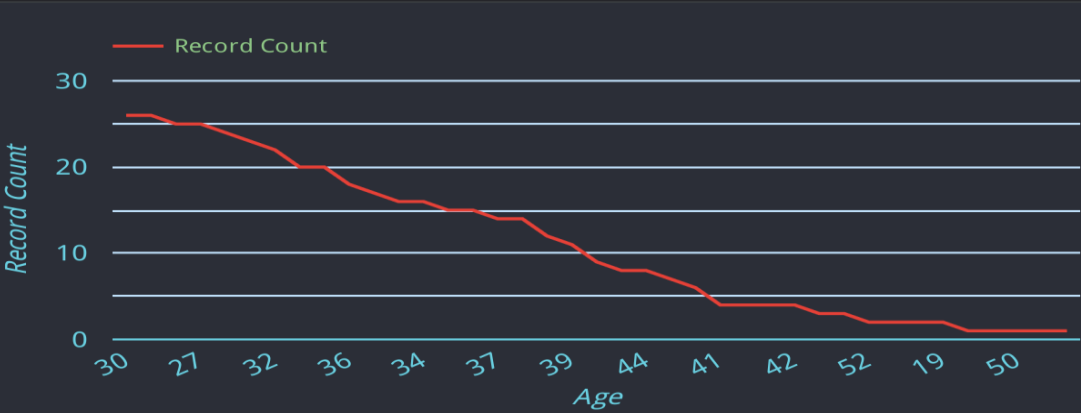
Pie Chart of Respondent classified by Gender



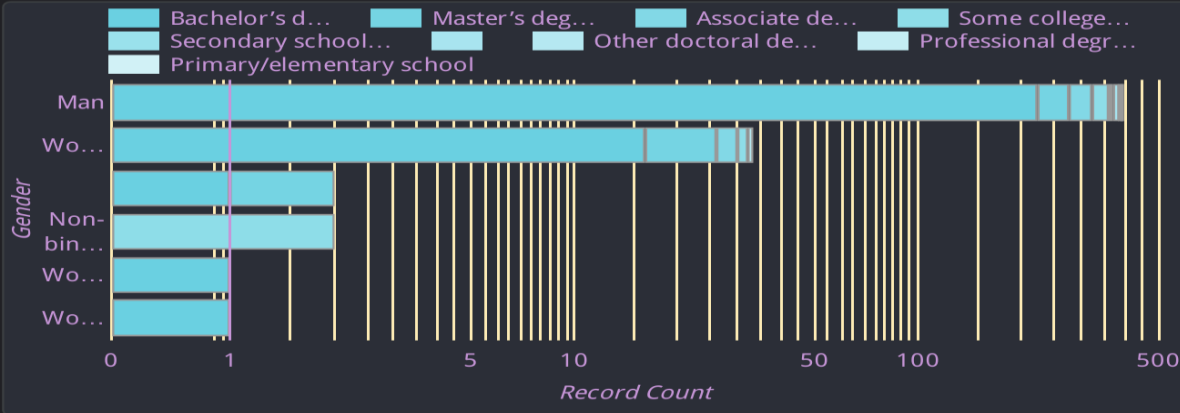
Filled Map Chart by Respondent Count for Countries



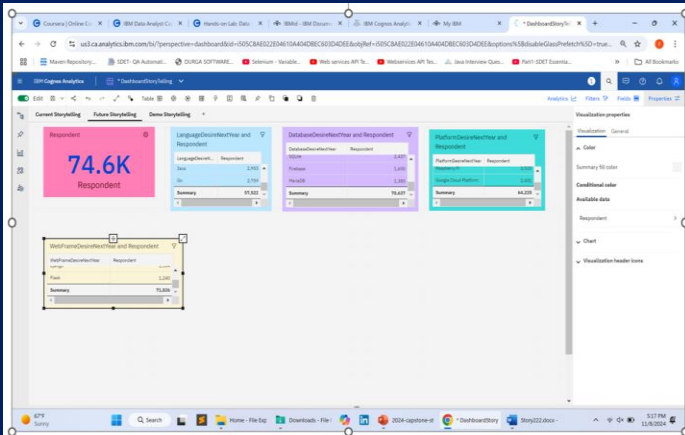
Line Chart by Respondent Count by Age



Stacked bar chart count by Gender and EduLevel



DISCUSSION



- ▶ We inserted the same dataset into both IBM Cognos and Google Looker Studio, and unsurprisingly, their visual portrayals are quite similar.
- ▶ Both tools share common features for creating graphical presentations, such as functions, properties, dimensions, metrics, colors, sizes, and styles. For instance, the drag-and-drop feature allows users to dynamically adjust visual properties instantly.
- ▶ These features enhance the visual representation, making it easier to understand and extract meaningful insights from the data and demographics, which are crucial for informed decision-making.
- ▶ Additionally, a high-level overview of the visualization suggests that the technology and tools remain consistent and reliable for practical purposes over time.

OVERALL FINDINGS & IMPLICATIONS

Findings

- ▶ The trend in the popularity of technological tools among respondents remains largely constant across demographic dimensions, including gender and age.
- ▶ If the sample size for the database group were equal to that of the programming language group, the outcomes might have been more comparable, highlighting the importance of balanced sampling.
- ▶ Notably, Python is the only technology that has shown a significant increase in popularity within our focused time frame. Consequently, Python is expected to become a dominant technological demand in the near future, maintaining consistency across spatial demographics, gender, and age dimensions.

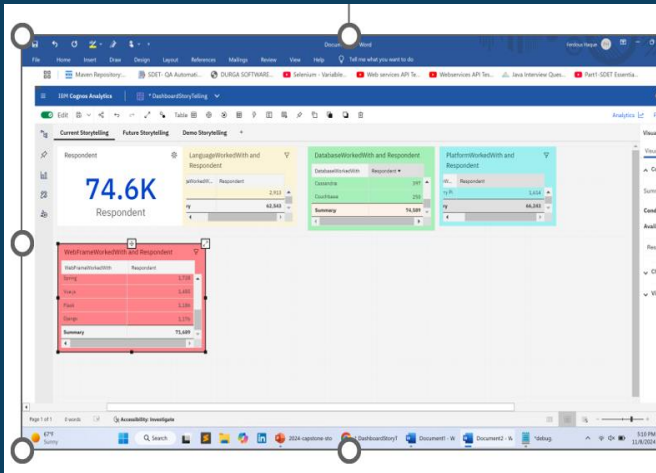
Implications

- ▶ Based on our qualitative analysis of interest in the top ten technologies, we have categorized them into four broad groups: Java Script, Python, Html/CSS, and SQL. These technologies form a cohesive group alongside databases like MySQL, PostgreSQL, Redis, MongoDB, and SQLite.
- ▶ Recognizing these specific tools allows us to relate them to Platforms and Web Frameworks. For instance, SQL and Python are considered Domain-Specific Language (DSL), with Python notably serving dual roles as both a general purpose and domain language. Known for its simplicity and versatility, Python is widely used across various fields, including web development, data science, and machine learning. Its syntax is highly specialized and optimized for specific tasks, supported by a vast library ecosystem and data structure algorithms(DSA), enhancing the application development experience.
- ▶ The benefits of employing Python in application development and programming extensive, and its adoption is expected to continue growing.

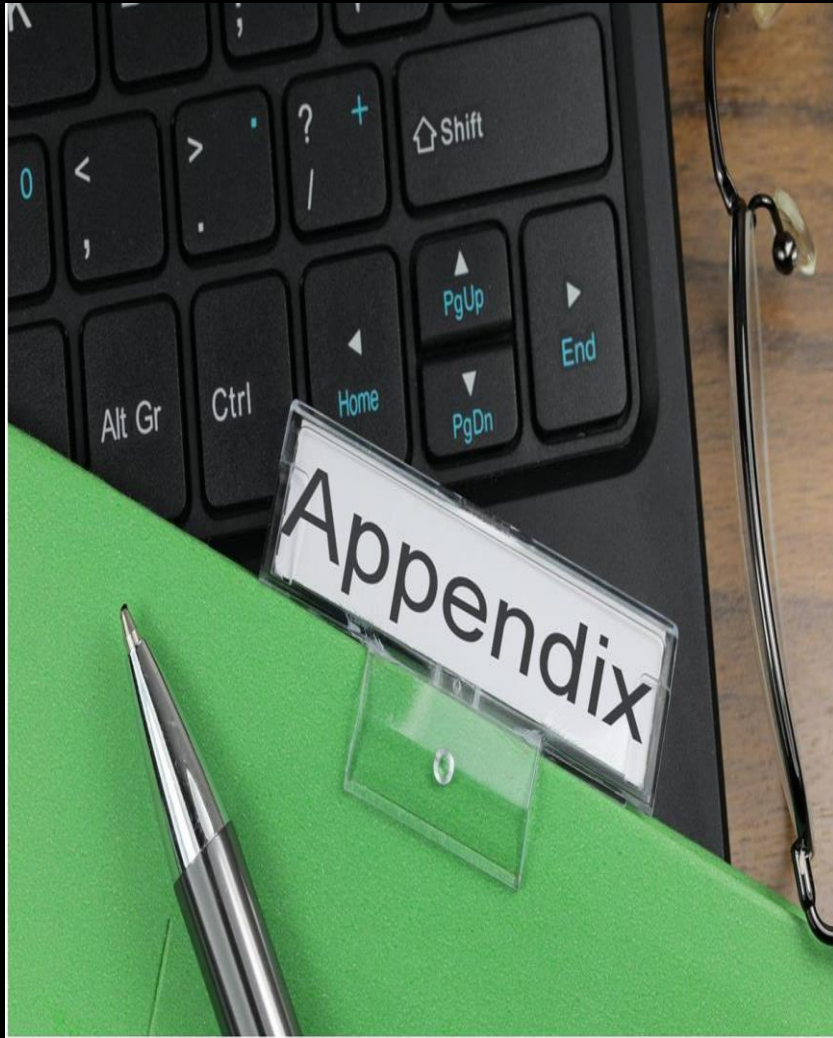
CONCLUSION

Conclusion

- In conclusion, the four leading technology trends discussed in this presentation serve as foundational and cutting-edge tools essential for advancing the modern world. While our presentation was not explicitly based on this premise, it aligns with the assertion that knowledge and technology drive economic growth.
- These standout technologies in visualization can support hypotheses exploring their benefits for policy and decision making purposes.



APPENDIX



- ▶ To the <https://rcc.harvard.edu/>
- ▶ Research/Study Group
- ▶ knowledge-technology-and-complexity-economic-growth
- ▶ <https://www.mckinsey.com>
- ▶ Capabilities
- ▶ Digital/Our-Insights
- ▶ The top trends in tech 2024

<https://www.mckinsey.com>

Capabilities

Digital/Our-Insights

The top trends in tech 2024

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.