A Deep Dive into the Tech Sector's Data

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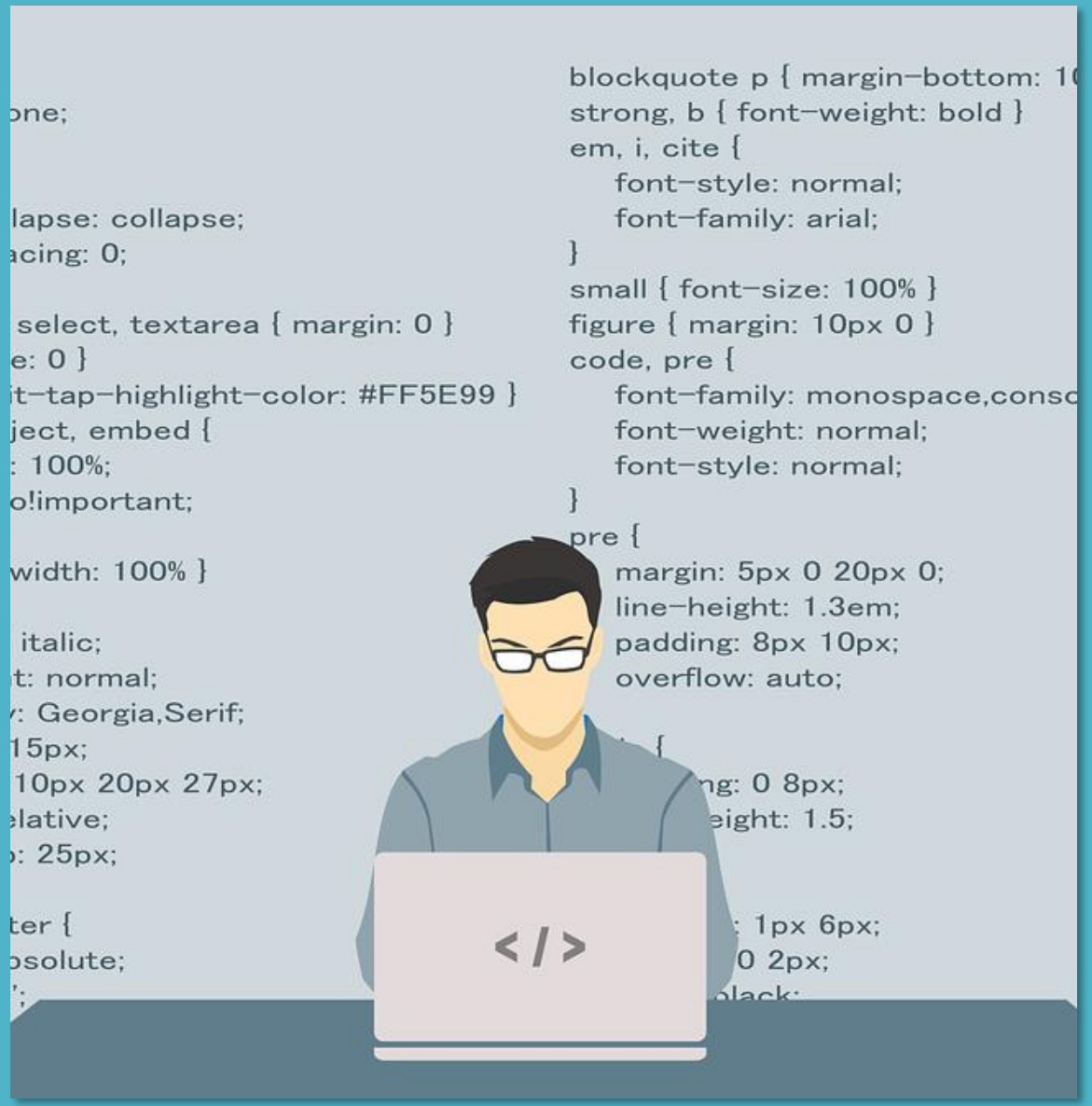

OUTLINE

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2. Introduction
3. Methodology
4. Results
    1. Visualization Charts
    2. Findings & Implications
5. Discussion
    1. Database Trends
    2. Findings & Implications
6. Dashboards
7. Insights From Dashboards
8. Overall Findings & Implications
9. Conclusion
10. Appendix

1. EXECUTIVE SUMMARY

Objective

Analyze Stack Overflow Survey data to uncover key insights about the tech industry, including programming languages, education level, and work trends.

Key Findings

- **Programing Languages: JavaScript**, **HTML/CSS** and **TypeScript** are the top used languages. **PostgreSQL** is the top used database and also the top desired for next year.
- **Education Level: 45%** of the respondents have a **Bachelor's Degree**, **26%** with **Master's** degree, and 0.7% have Primary School only.
- **Remote Work:** 85% of the respondents work either **remotely** or on **hybrid mode**, and only **15% fully on-site**.

Implications

Companies must adapt to remote work and competitive salaries to attract top talent.

Developers should focus on upskilling in high-demand technologies to maximize career growth.

Conclusion

The tech sector is rapidly evolving - data-driven decisions are essential for success.

2. INTRODUCTION

Background

The technology industry is constantly evolving, with new programming languages, work trends, and skill requirements shaping the job market. Understanding these trends is essential, for both companies and professionals, to make informed decisions.

Purpose of the Study

This analysis explores key insights from the **Stack Overflow Developer Survey**, a widely recognized dataset that captures the experiences, skills, and preferences of tech professionals worldwide.

Scope of Analysis

The study focuses on:

- Identifying the most widely used programming languages and databases.
- Educational background and its impact on career.
- Work preferences, including remote vs. on-site work.
- Implications for companies and tech professionals.

Significance

By analyzing this data, we aim to provide actionable insights that help businesses adapt to workforce expectations and assist developers in strategic career planning.

3. METHODOLOGY

Dataset

- **Source**: Stack Overflow Developer Survey
- **Data Coverage**: Global responses from tech professionals
- **Key Variables**: Programming languages, education, job roles, remote work, compensation, and more.
- **Disclaimer**: For the purpose of the Coursera assignment, it was used a modified subset of that data set.

Tools Used

- **Python (Pandas, Matplotlib, Seaborn)** for data analysis & visualization
- **Google Looker Studio** for interactive dashboards
- **Excel/Google Sheets** for initial data exploration

Data Processing and Analysis

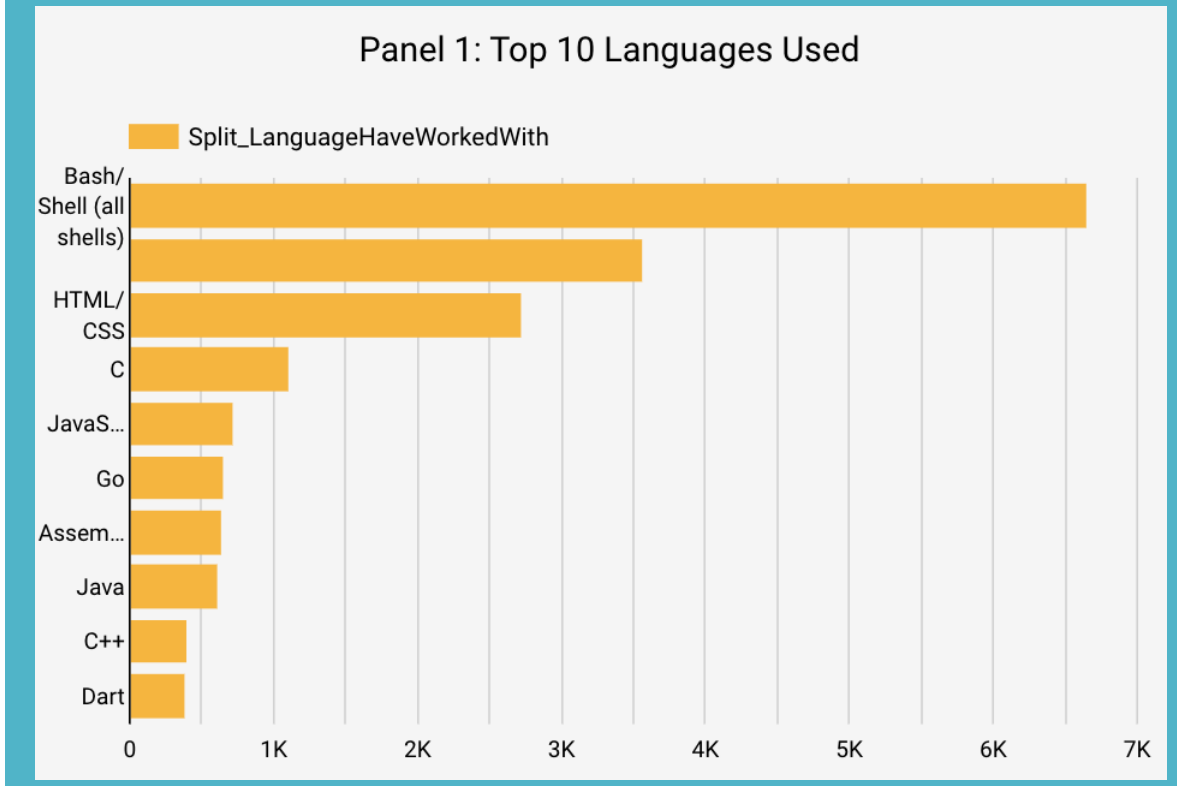
- **Data Cleaning**: Handled missing values, duplicated values, incorrect data types.
- **Data Wrangling**: Transformed and structured data for analysis:
  - Identifying and handling inconsistencies,
  - Standardizing columns to consistent format,
  - Encoding categorical variables.
- **Exploratory Data Analysis (EDA)**:
  - Understanding Data Structure
    - df.head(), df.shape, df.info(), df.columns, df.describe()
  - Visualizing Data Distribution and Relationships
    - df["column"].hist(), df.plot.scatter()
  - Identifying Correlations
    - df.corr()

4. RESULTS

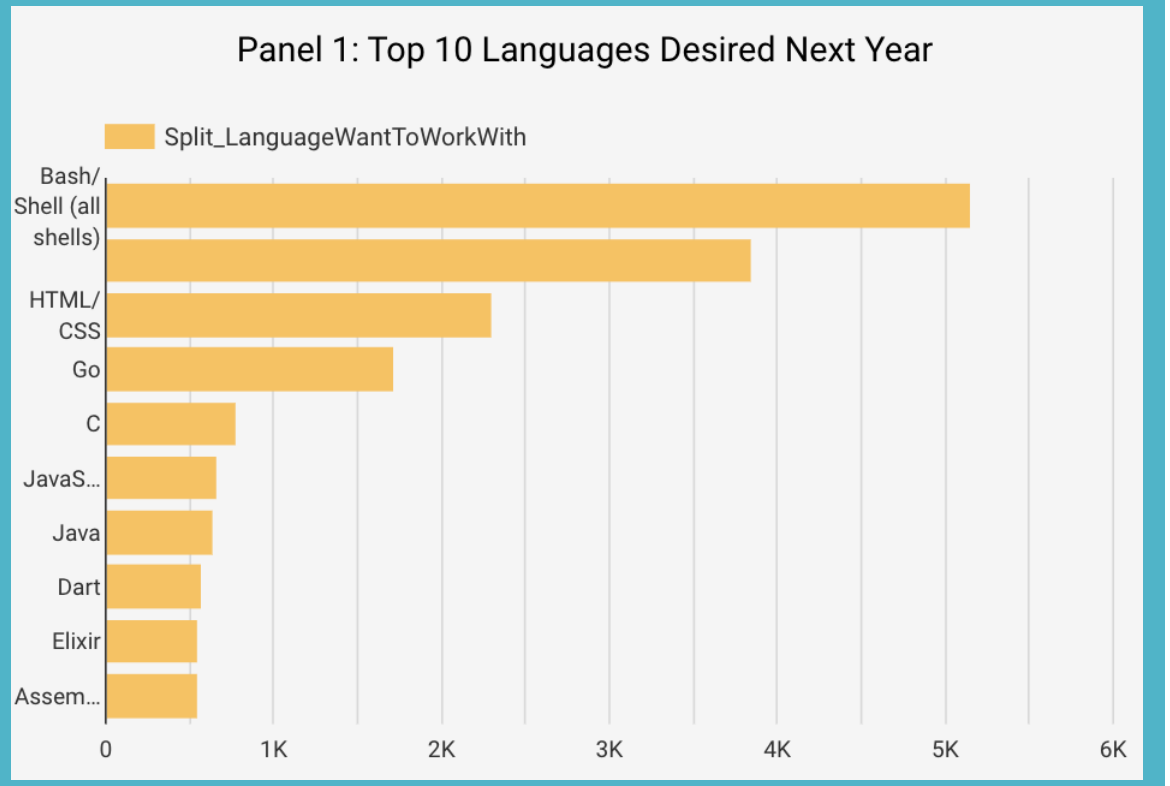
1. VISUALIZATION CHARTS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



4. RESULTS

2. FINDINGS & IMPLICATIONS

PROGRAMMING LANGUAGE TRENDS

Findings

1. Bash/Shell, C# and JavaScript are the top used languages and tend to remain trending next year.
2. Elixir starts to show up will a low interest but might be a promising language in the years ahead.
3. Go is growing in interest for next year, although in the current year it is not vastly used.

Implications for Professionals

1. Developers should keep refining their skills in these languages as job opportunities will likely stay strong.
2. For those interested in niche skills can gain an advantage by learning it early.
3. Learning **Go** now can provide a competitive edge as demand rises.

Implications for Businesses

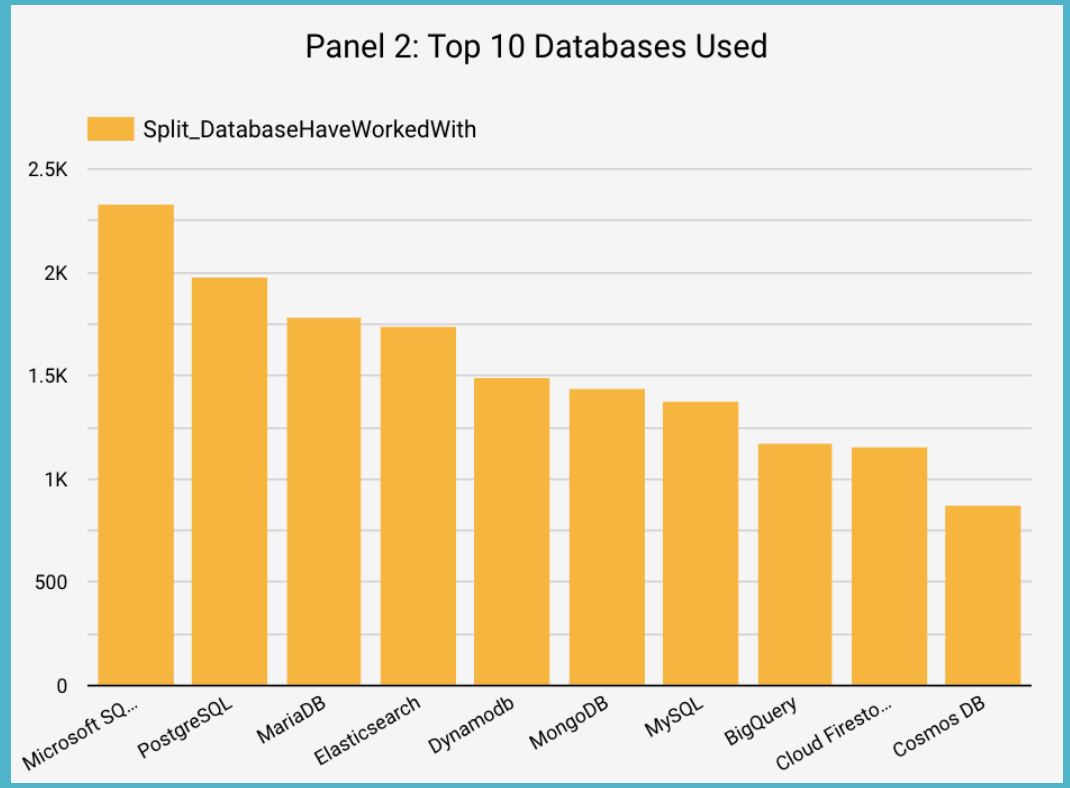
1. Businesses can confidently invest in projects using these technologies.
2. Companies exploring scalability might start adopting Elixir.
3. Investing in **Go** could improve performance and scalability, especially for backend and cloud applications.

5. DISCUSSION

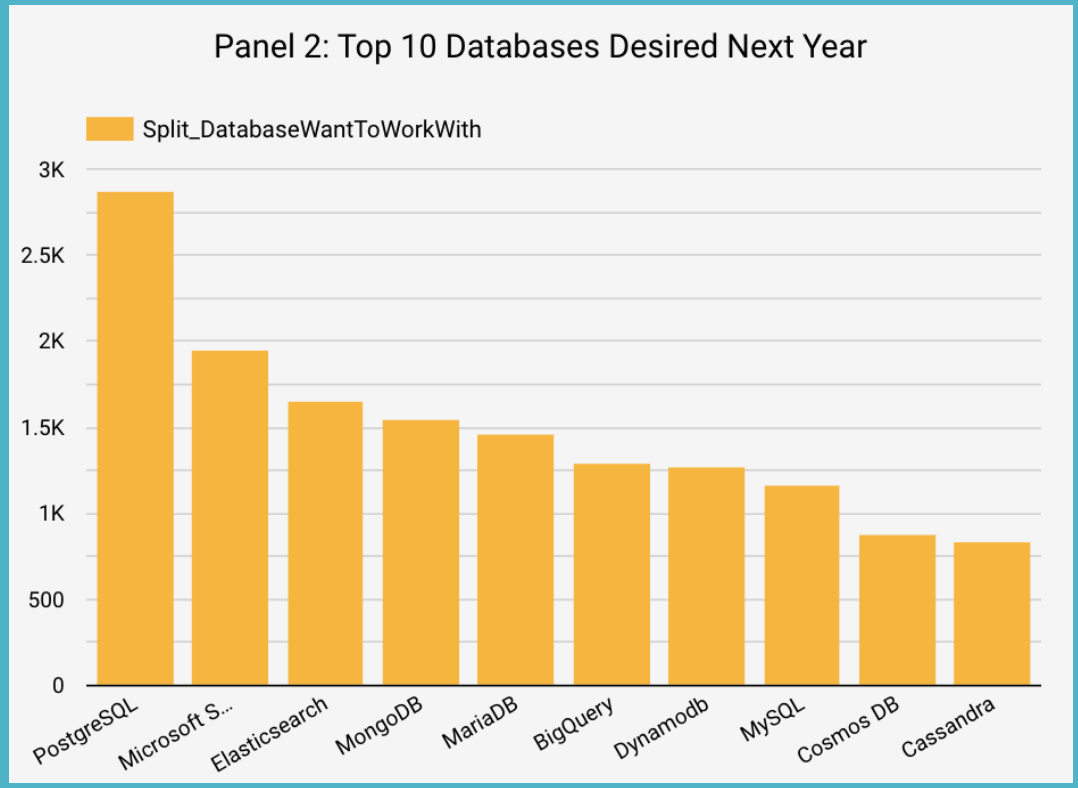
1. VISUALIZATION CHARTS

DATABASE TRENDS

Current Year



Next Year



5. DISCUSSION
2. FINDINGS & IMPLICATIONS

DATABASE TRENDS

Findings

1. **PostgreSQL** maintains strong adoption, with demand projected to grow next year.
2. **Cloud Firestore** ranks in the current Top 10 but does not have remarkable presence in future demand, suggesting a decline in interest.
3. **Cassandra** emerges in the list of desired databases, indicating potential future adoption.

Implications for Professionals

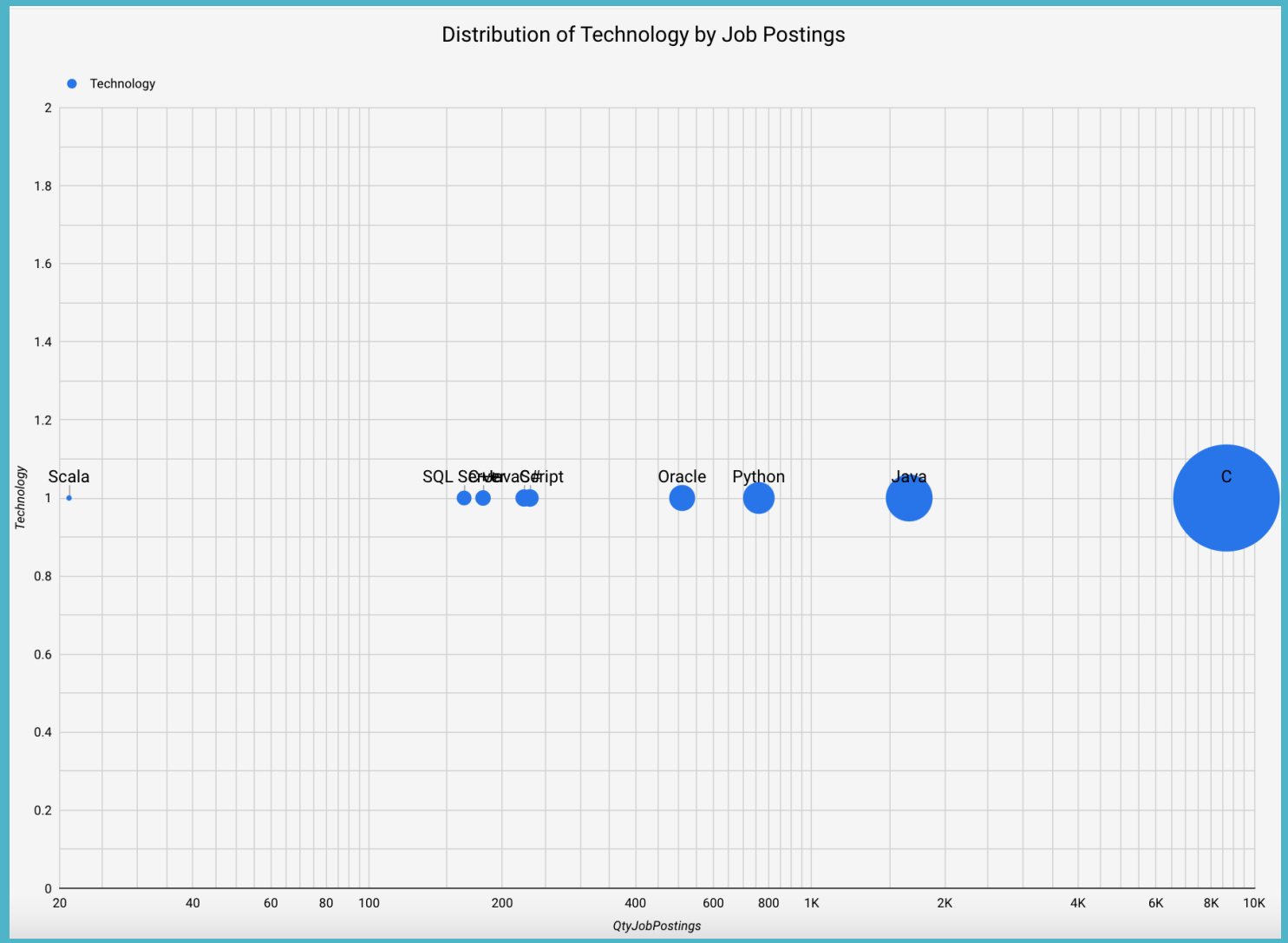
1. Enhancing PostgreSQL expertise can boost career opportunities.
2. Consider diversifying database skills to avoid reliance on declining technologies.
3. Learning Cassandra can provide an edge in big data and distributed systems roles.

Implications for Businesses

1. Investing in PostgreSQL ensures long-term scalability and industry relevance.
2. Evaluate long-term viability before committing to Cloud Firestore for new projects.
3. Exploring Cassandra could enhance scalability for high-volume, distributed applications.

JOB POSTINGS

Scatter chart from Module 1 – Another visualization for chart from Slide 10



6. DASHBOARDS

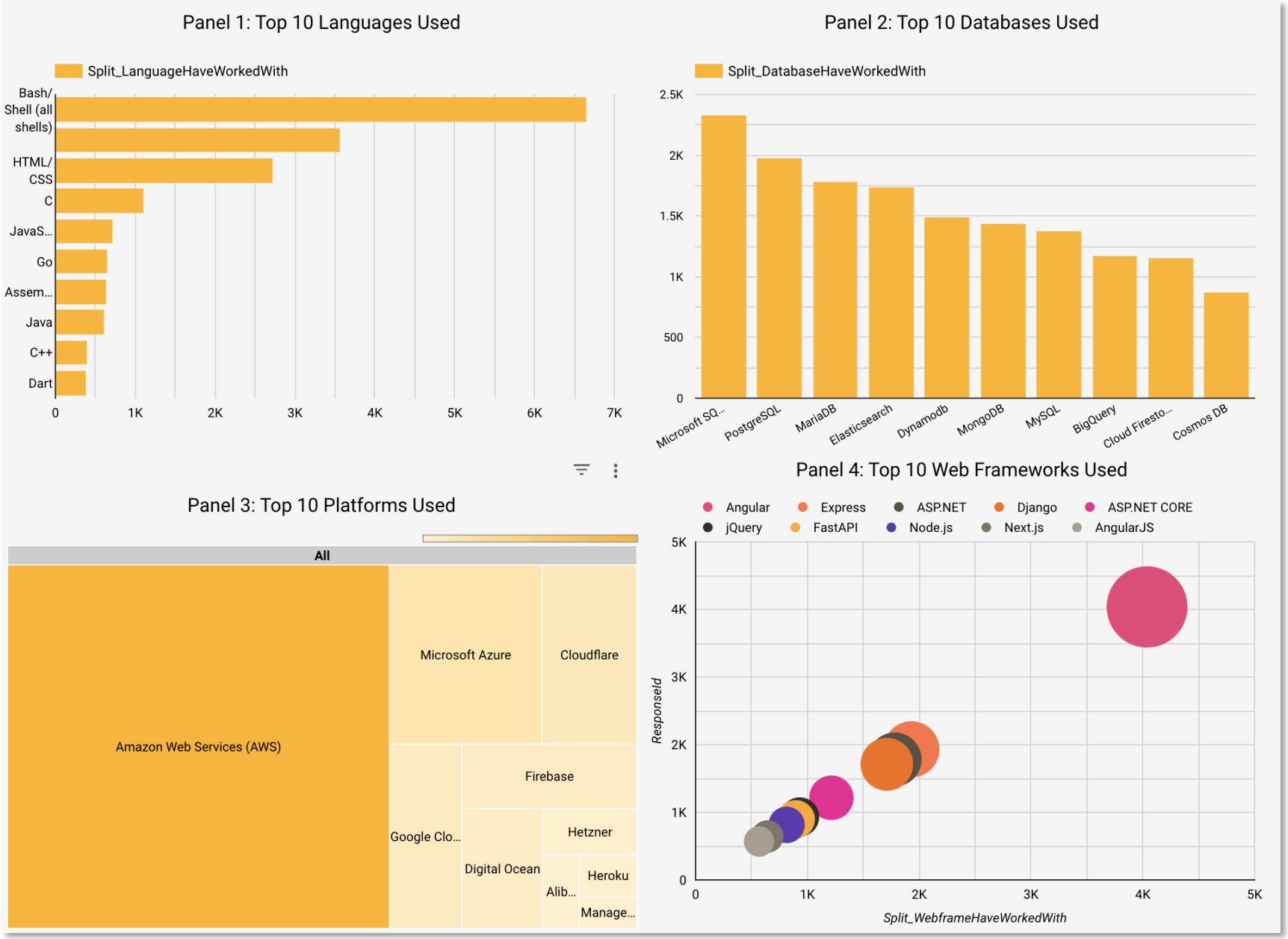
The following Dashboards were created utilizing

Google Looker Studio.

6. DASHBOARDS

TAB 1

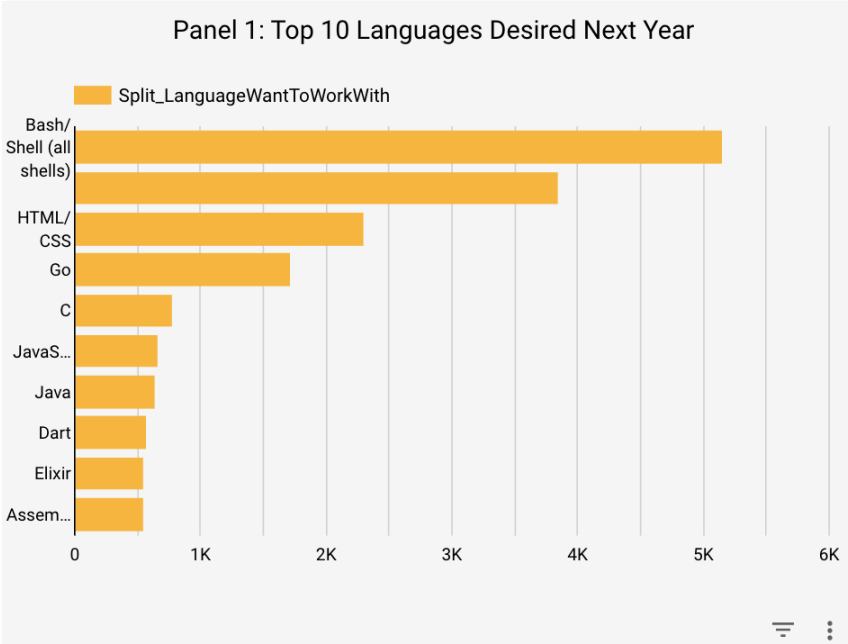
CURRENT TECHNOLOGY

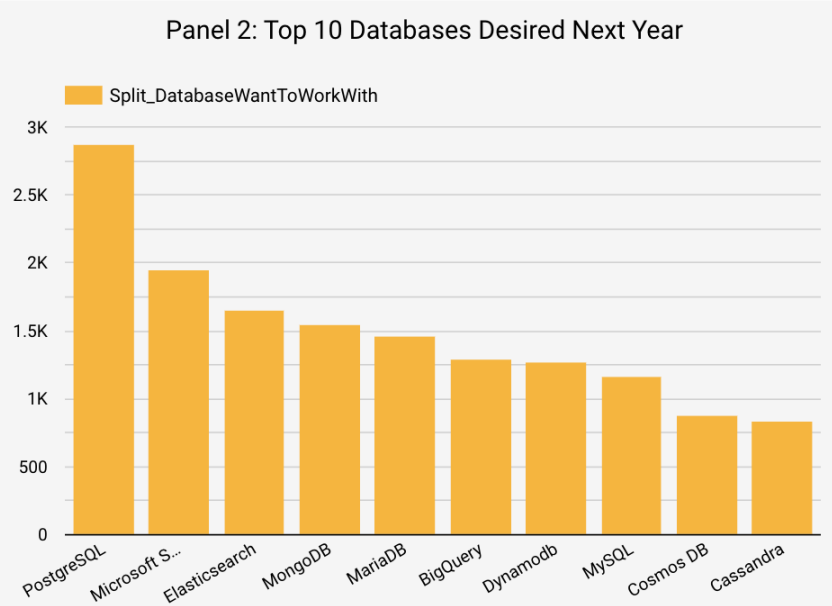


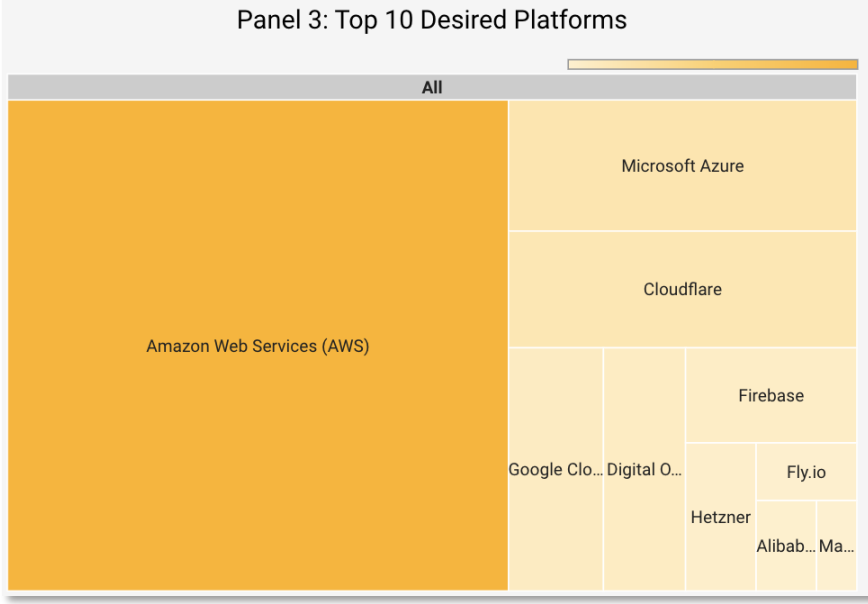
6. DASHBOARDS

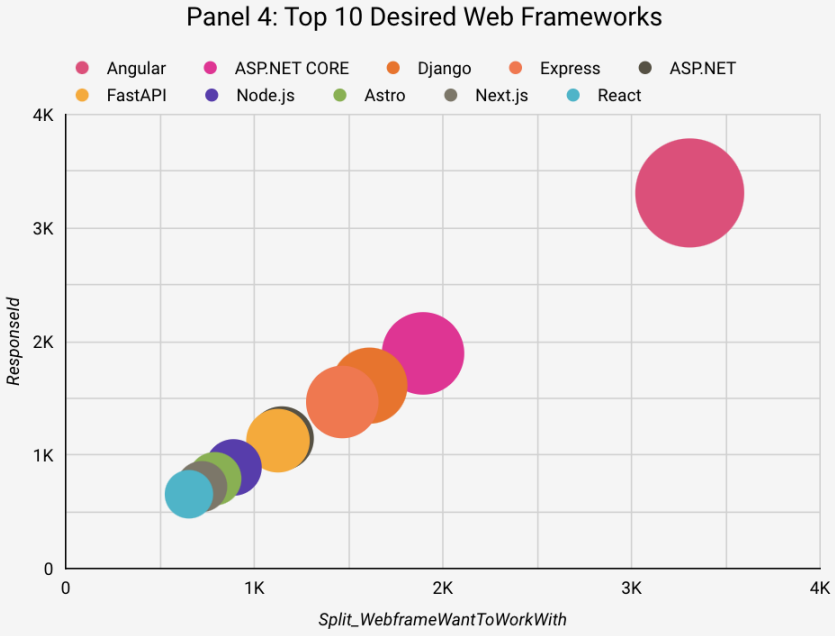
TAB 2

FUTURE TECHNOLOGY TRENDS







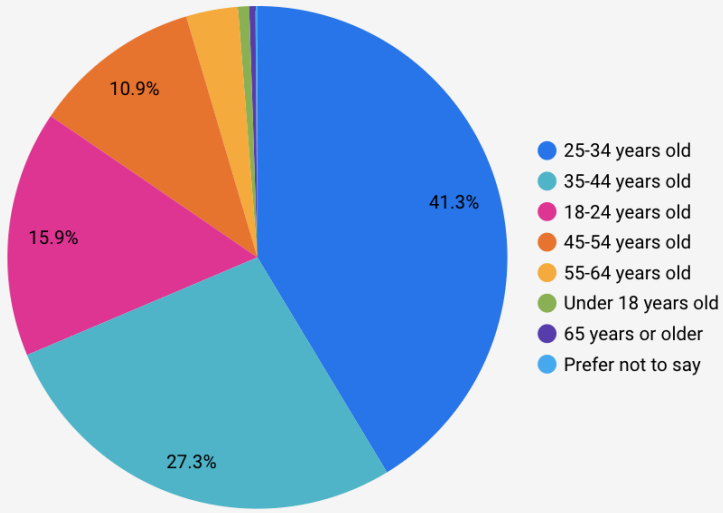


6. DASHBOARDS

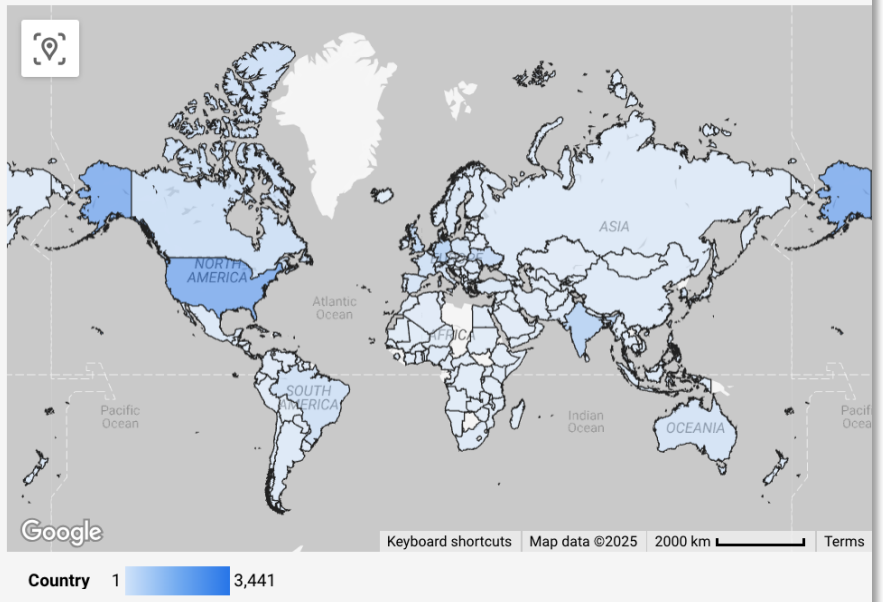
TAB 3

DEMOGRAPHICS

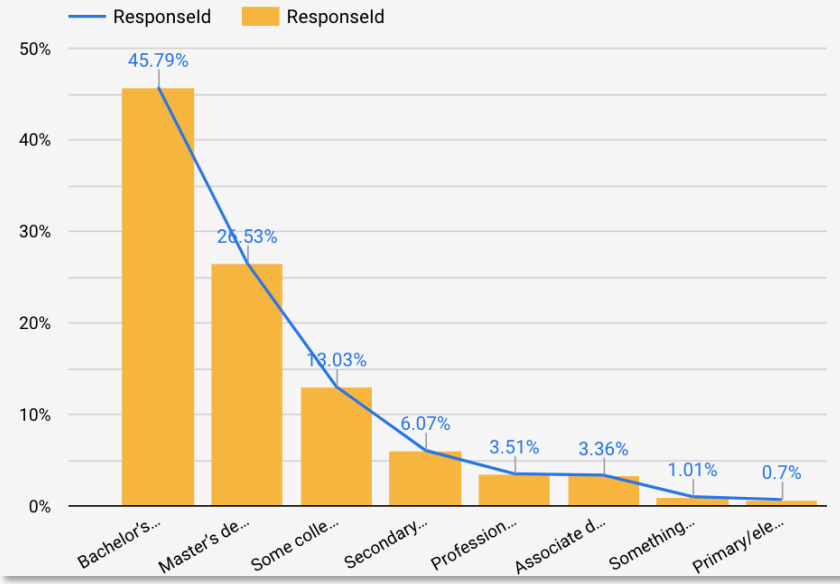
Panel 1: Respondents by Age



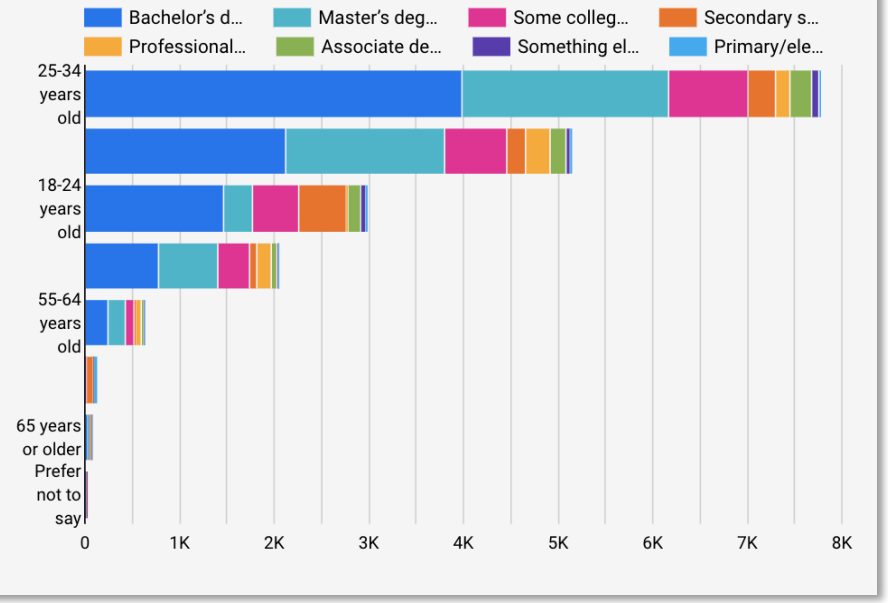
Panel 2: Respondent Count by Country



Panel 3: Respondent Distribution by Education Level



Panel 4: Respondent Count by Age, Classified by Education Level



7. INSIGHTS FROM DASHBOARDS

Programming Languages

The most widely used programming languages today, including **Bash/Shell, HTML/CSS, C#, and JavaScript**, are expected to remain highly relevant next year. Emerging languages such as **Go and Dart** are beginning to gain traction, signaling potential growth in adoption.

Databases

The database landsc**ape follows a similar trend, with Microsoft SQL Server and** PostgreSQL ranking among the top-used and most desired technologies for the coming year. **Cloud Firestore** appears to be losing momentum, as it does not feature in the top 10 desired databases. Conversely, **Cassandra**, which is not currently among the top-used databases, has emerged as one of the most sought-after for the future, indicating growing industry interest.

Web Frameworks

Angular leads as the most widely preferred web framework, holding a strong position over its competitors. **ASP.NET Core and** React are projected to see increased adoption next year. Meanwhile, **Express and AngularJS** show signs of declining interest, suggesting a shift in developer preferences.

Demographics

The majority of respondents (68%) fall within the **25 to 44 age range**, representing a workforce with established experience and career growth potential. In terms of education, **45% hold a Bachelor's degree**, while **26% have earned a Master's degree**, highlighting a strong academic background among professionals in the field.

These insights provide valuable guidance for both professionals and businesses, helping them align their skill development and technology investments with emerging trends.

8. OVERALL FINDINGS & IMPLICATIONS

Findings

1. Established technologies remain dominant, while emerging ones like **Go, Dart,** and **Cassandra** show growth potential.

2. **PostgreSQL** and **Microsoft SQL** continue to be widely used and in demand, while **Cloud Firestore's** relevance appears to be declining.

3. Web framework preferences are shifting, with **Angular leading, React** and **ASP.NET Core** gaining traction, and **Express** and **AngularJS** showing a downward trend.

Implications

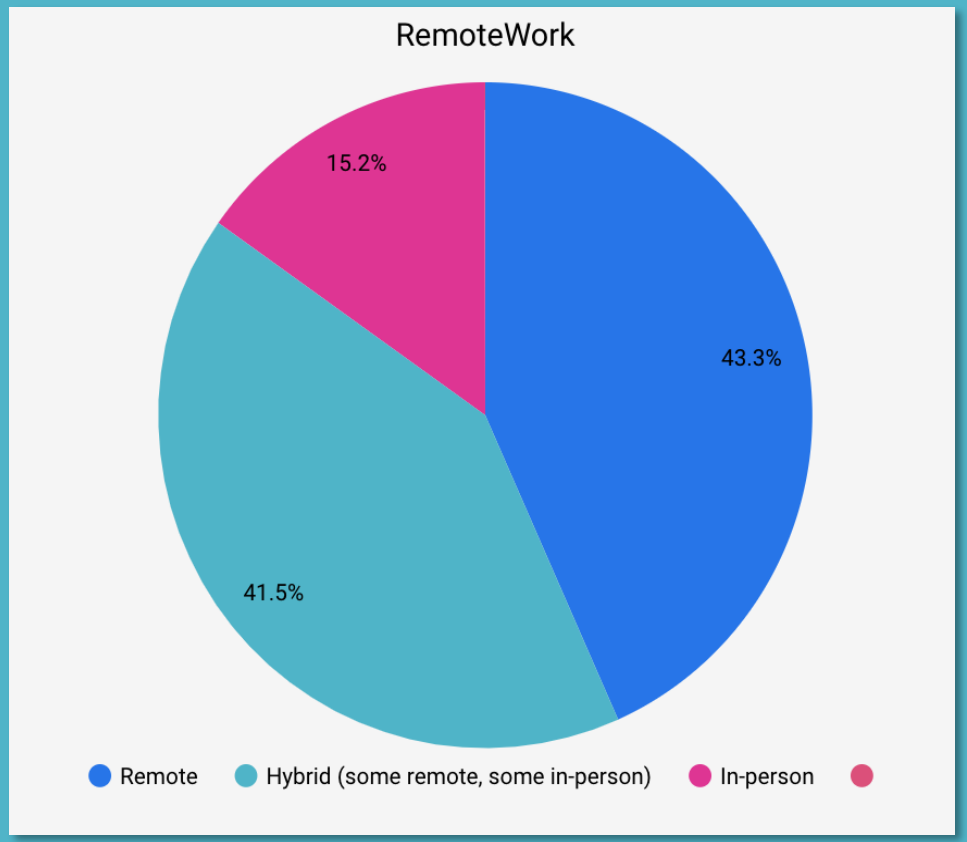
- **For Professionals:**
  Staying proficient in leading technologies is essential, but learning rising tools like **Go**, **Dart**, and **Cassandra** can offer a competitive advantage.
- **For Businesses:**
  Investing in stable technologies ensures reliability, but keeping an eye on emerging trends helps maintain a future-ready tech stack.
- **For the Industry:** Changing web framework trends and database preferences suggest a continuous evolution, requiring adaptability from both developers and companies.

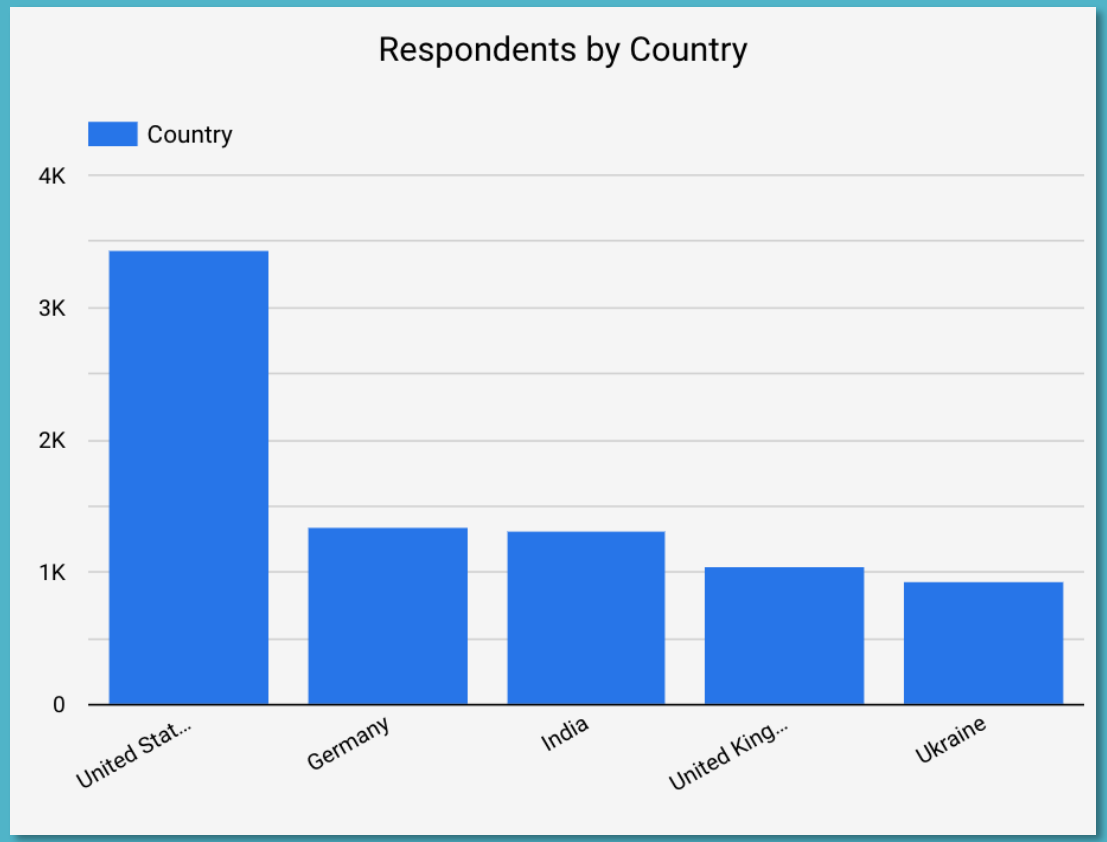
9. CONCLUSION

- Technology trends indicate stability with gradual innovation, as established languages, databases, and frameworks continue to dominate while new ones gain traction.
- Professionals should balance expertise in widely used technologies with learning emerging ones like Go, Dart, and Cassandra to stay competitive.
- Businesses must align their investments with both current demand and future trends, ensuring scalability and adaptability in their tech stacks.
- The industry's evolving landscape requires continuous learning and flexibility, as preferences in web frameworks, databases, and programming languages shift over time.

10. APPENDIX

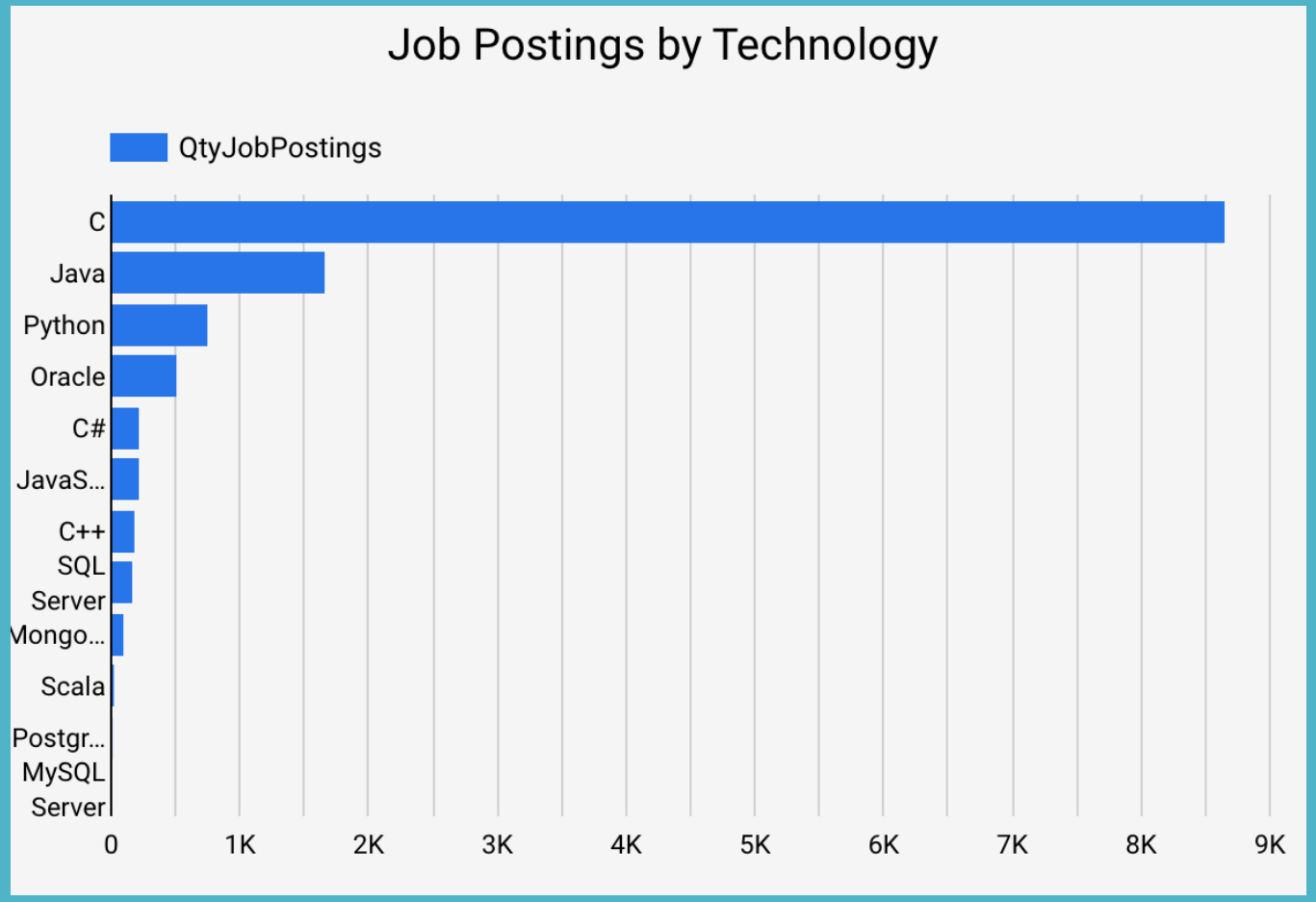
Relevant additional unused charts





JOB POSTINGS

Bar chart from Module 1



POPULAR LANGUAGES

Bar chart from Module 1