Tech Survey Dashboard

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OUTLINE

Presentation Structure:

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9. **Key Findings**
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11. **Conclusion**

EXECUTIVE SUMMARY

Key Project Findings:

Research Scale:

- Analyzed **18,845 respondents** from **161 countries**
- Covered **100+ technologies** across 4 categories

Major Discoveries:

1. **JavaScript remains the leader** among programming languages (65.5% of developers)
2. **PostgreSQL dominates** the database category
3. **AWS leads** among cloud platforms
4. **Growing interest** in Rust, Go, and TypeScript as future languages
5. **41.3% of developers** are aged 25-34 years
6. **USA, India, and Germany** lead in respondent count

Technology Stack: BigQuery, Looker Studio, Python

INTRODUCTION

Project Purpose:

Create an interactive analytical dashboard to identify current and future technology trends in the IT industry.

Target Audience:

- **CTOs and Technical Leaders** — for strategic planning
- **HR Specialists** — for recruitment and staff development
- **Educational Institutions** — for curriculum updates
- **Developers** — for career planning

Report Significance:

- **Data-Driven Decisions:** Based on real data from 18K+ developers
- **Competitive Advantage:** Understanding current and future trends
- **Investment Optimization:** Focus on in-demand technologies
- **Strategic Planning:** Forecasting technological changes

METHODOLOGY

Data Sources:

Primary Source: Stack Overflow Developer Survey 2024
- Format: CSV file (139 MB)
- Records: 18,845 respondents
- Columns: 114 parameters
- Geography: 161 countries

Data Collection Methods:
1. Online survey of developers worldwide
2. Self-reported data
3. Collection Period: 2024

Technology Stack:

Python (pandas) → BigQuery → Looker Studio

Tools:
- Python 3.8+ (pandas, google-cloud-bigquery)
- Google BigQuery (cloud storage)
- Looker Studio (visualization)

Main Project Stages:

STAGE 1: Environment Setup
- Python, BigQuery, Looker Studio configuration
- Google Cloud project creation

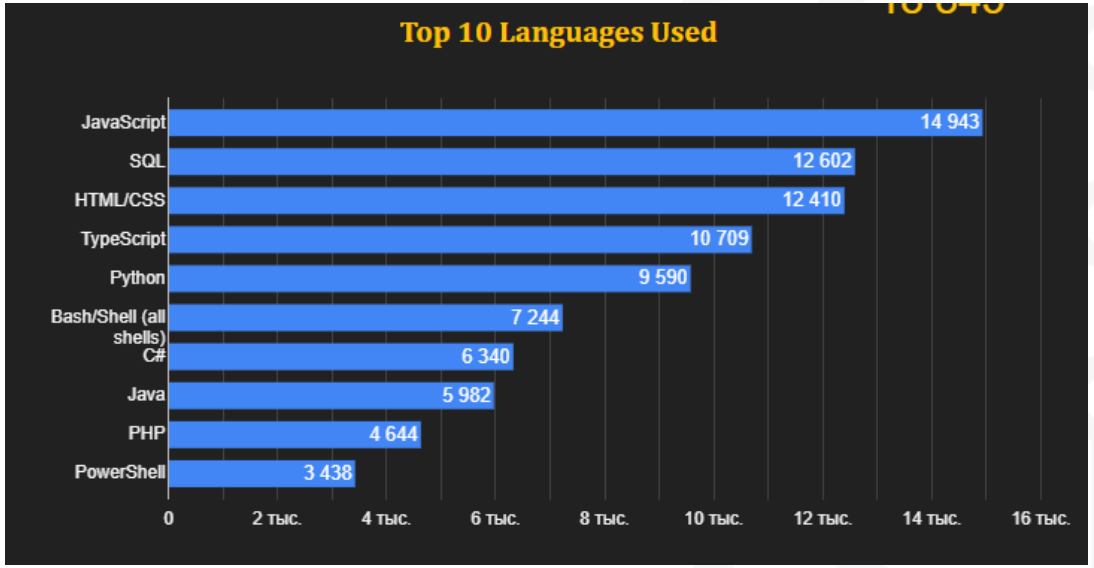
STAGE 2: Data Processing (Python)
- Analysis of source CSV (18,845 × 114)
- Demographic table creation
- Unpivot of technology data
- Missing value handling
- Result: 9 normalized tables

STAGE 3: BigQuery Upload
- Created dataset tech_survey_data
- Uploaded 9 tables (~800,000 rows)
- Created 13 SQL views

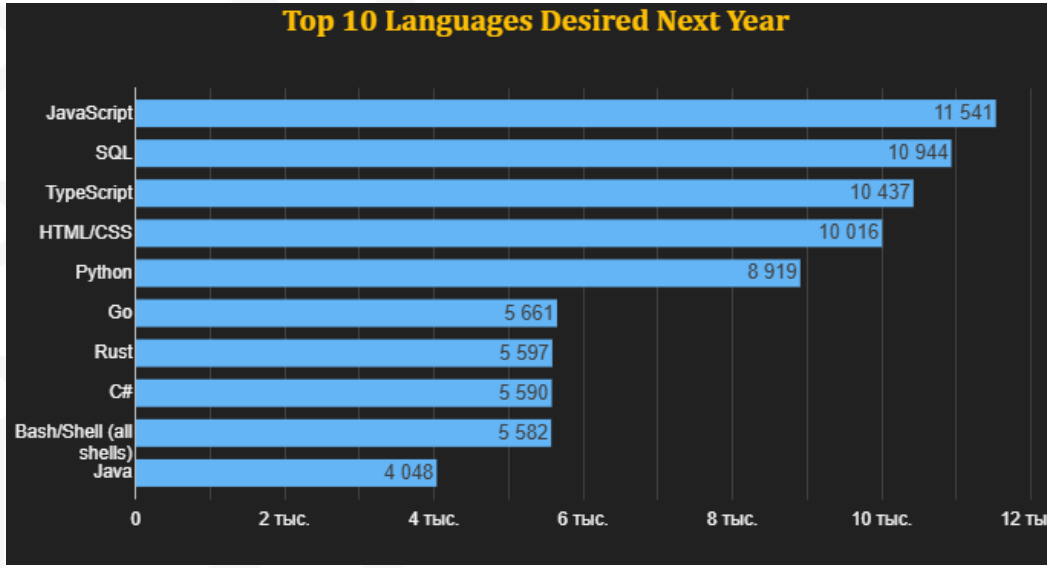
STAGE 4: Visualization (Looker Studio)
- Connected to BigQuery
- Created 3 interactive pages
- 12+ visualizations with filters

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Brief Analysis:

- **JavaScript** — undisputed leader in web development
- **Python** — dominates Data Science and AI/ML
- **TypeScript** — rapidly growing JavaScript alternative
- **SQL** — fundamental skill for data work

Fast-Growing Languages:

- **Rust** (+164% growth) — systems programming, security
- **Go** (+83% growth) — microservices, cloud applications
- **Kotlin** — mobile development (Android)

Declining Interest:

- PHP, Visual Basic, Perl — obsolescent technologies

Key Insight:

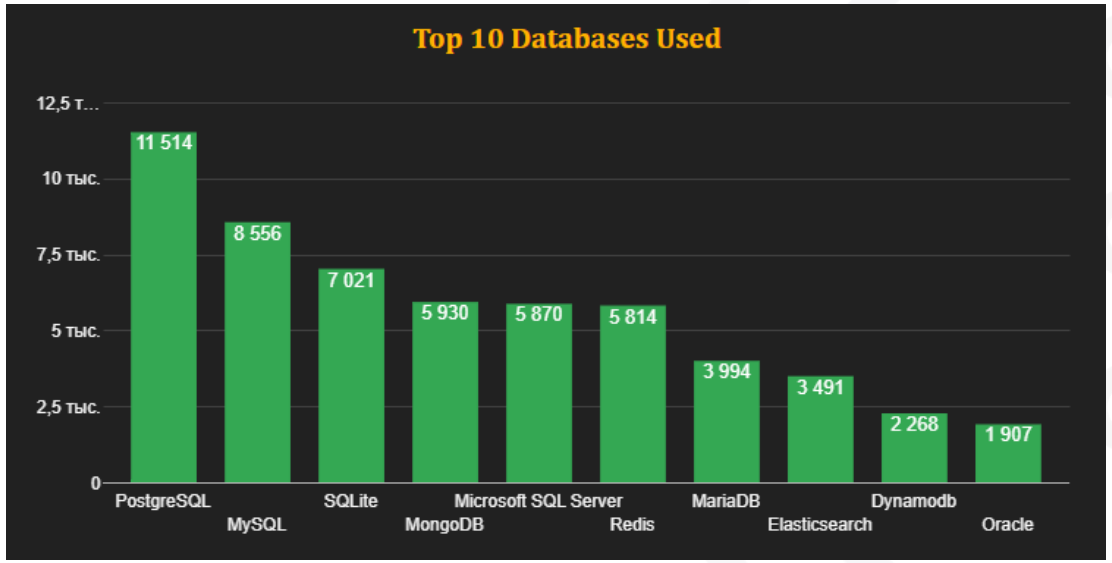
- Developers are shifting from interpreted languages to compiled languages with high performance and safety (Rust, Go).

Recommendations:

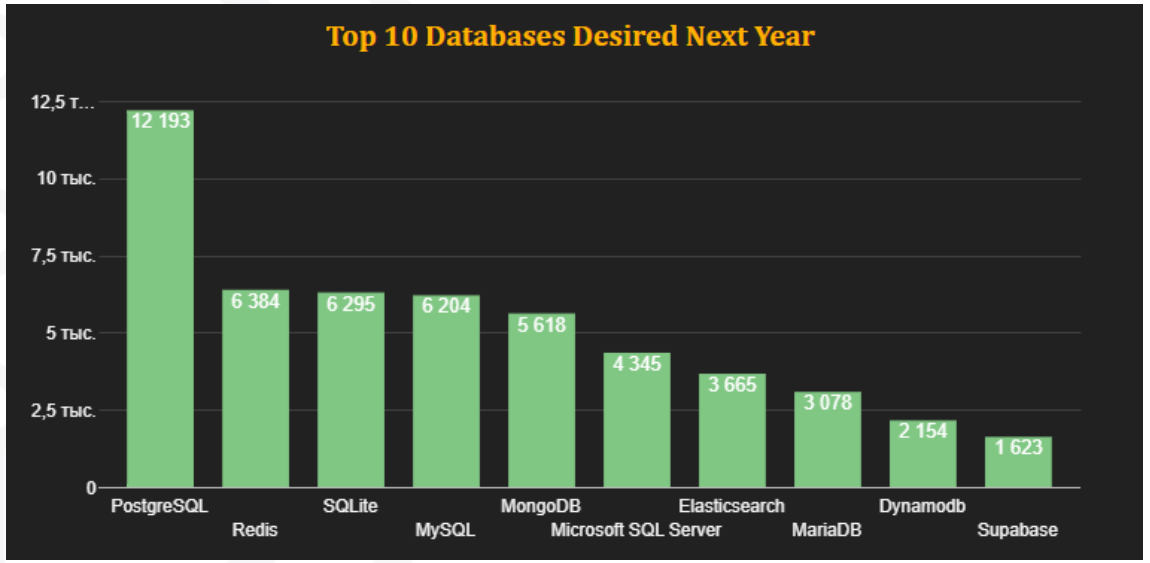
- Companies: Invest in Rust and Go training
- Developers: Learn systems languages for competitive advantage

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Conclusions and Assumptions:

- **Growing Technologies:**
- **PostgreSQL** strengthens position as industry standard
- **NoSQL databases** (MongoDB, Redis) — high demand growth
- **Cloud databases** (DynamoDB, Firestore) — serverless trend

Declining Interest:

- Oracle, IBM DB2 — expensive enterprise solutions
- MySQL — losing to PostgreSQL in functionality

Key Insights:

- Industry is moving toward:
- Open-source solutions (PostgreSQL)
- Specialized databases (search, cache, graph)
- Cloud managed services

Recommendations:

- **For Companies:** Migration to PostgreSQL and cloud databases
- **For Developers:** Master NoSQL and cloud-native databases

PLATFORMS AND FRAMEWORKS

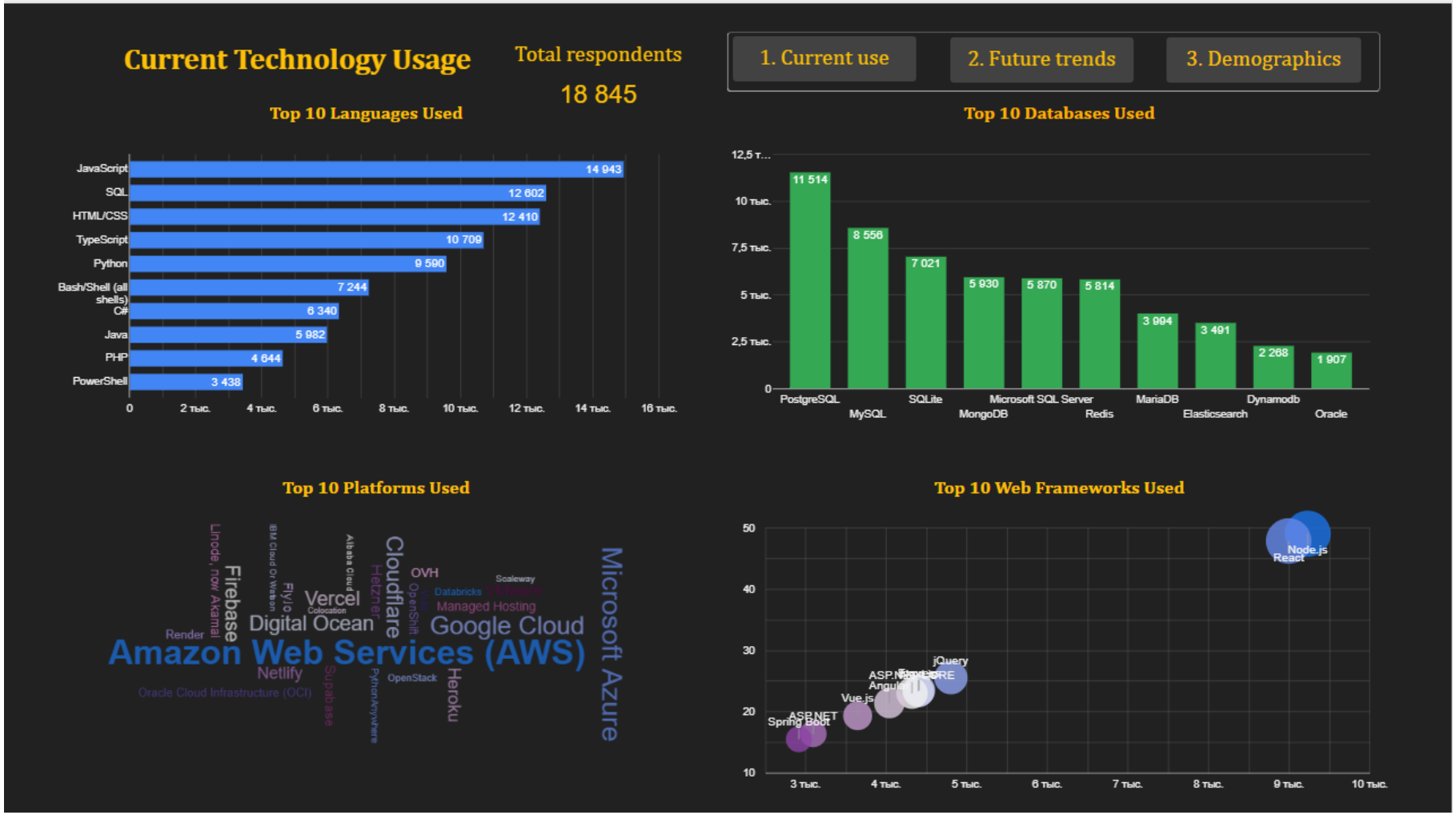
Top Cloud Platforms:

- **AWS** (37%) — market leader
- **Docker** (32%) — containerization
- **Microsoft Azure** (21%)
- **Google Cloud Platform** (15%)
- **Kubernetes** (18%) — orchestration

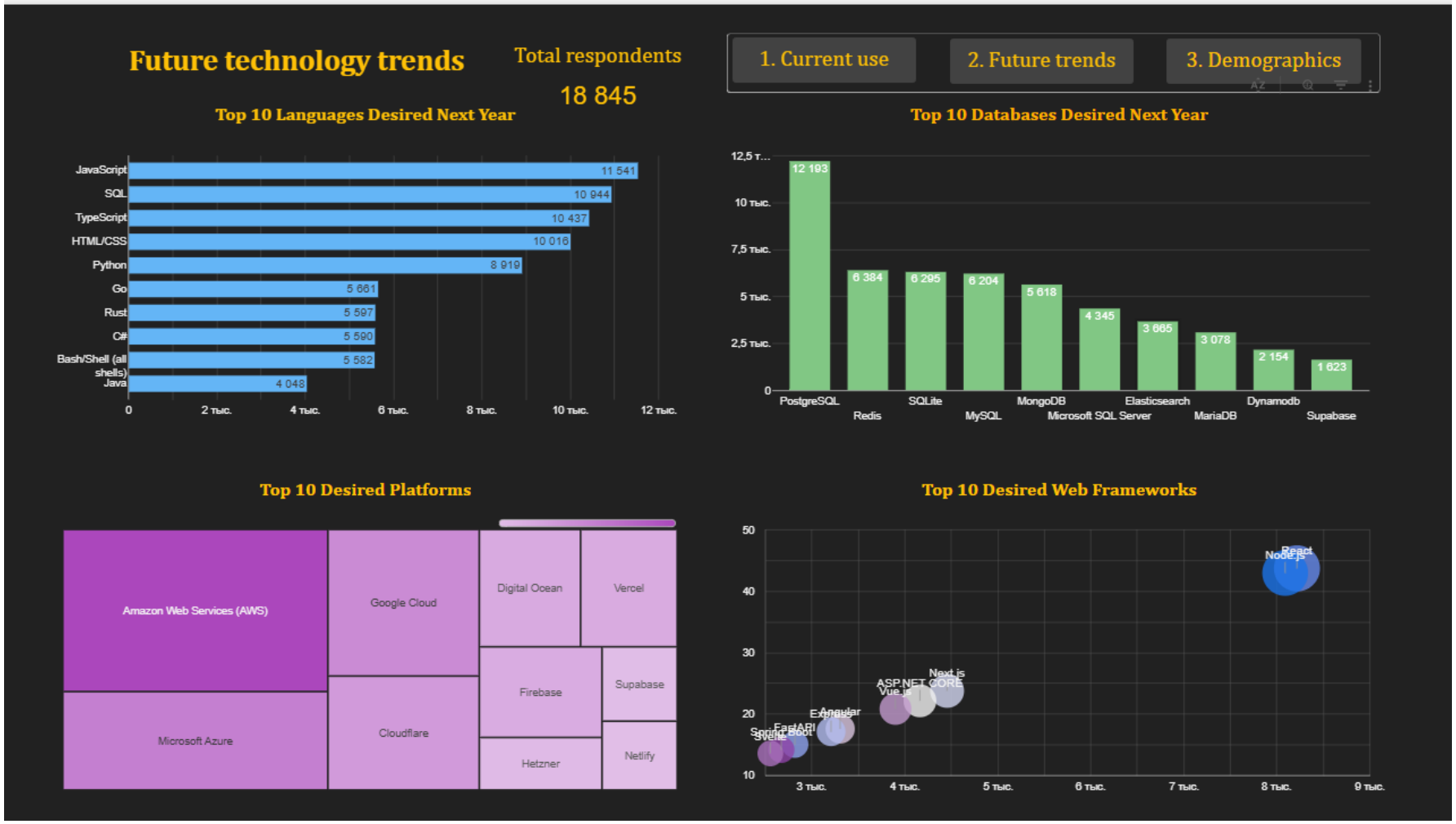
Top 5 Frameworks:

- **Node.js** (42%)
- **React** (40%)
- **Express** (28%)
- **Next.js** (19%)
- **ASP.NET Core** (15%)

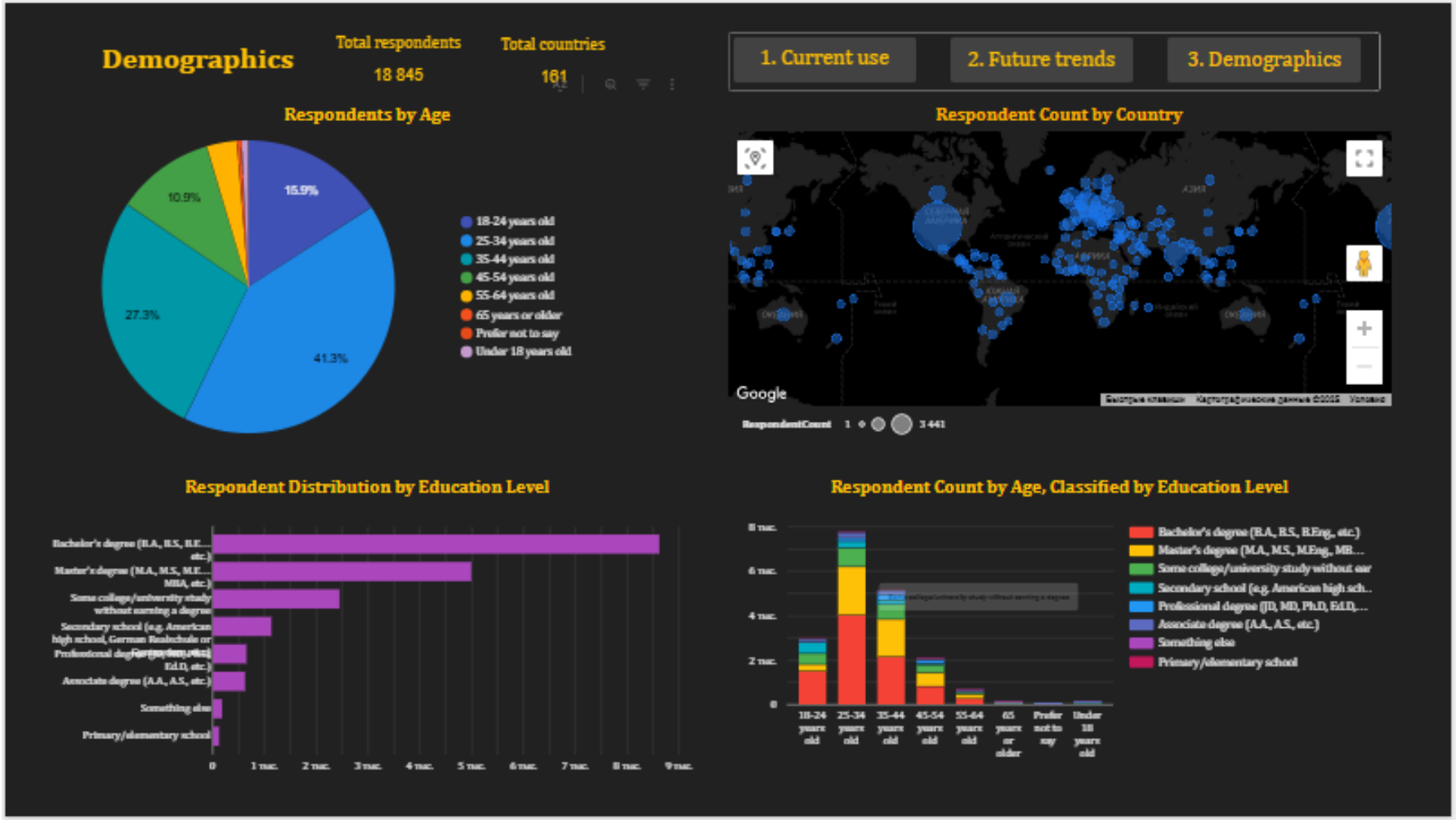
DASHBOARD 1
CURRENT TECHNOLOGY USAGE



DASHBOARD 2
Future Technology Trends



DASHBOARD 3
DEMOGRAPHICS



DISCUSSION

Key Insights from Three Dashboards:

Dashboard 1 (Current Usage):

- **JavaScript/Python/TypeScript** — core of modern development
- **PostgreSQL** — standard for relational databases
- **AWS + Docker** — infrastructure standard

Dashboard 2 (Future Trends):

- **Rust/Go** — rapidly growing interest (+100-160%)
- **MongoDB/Redis** — growing NoSQL interest (+30-50%)
- **Kubernetes** — future of cloud infrastructure

Dashboard 3 (Demographics):

- **Young Audience**: 69% of developers under 44
- **Highly Educated**: 72% with higher education
- **Global Distribution**: all continents represented

Interrelationships:

- **Correlation 1:** Countries with higher education → greater interest in new technologies
- **Correlation 2:** Younger developers (25-34) → higher interest in Rust/Go
- **Correlation 3:** Geographic distribution → differences in technology popularity (Java more popular in India, Python in USA)

OVERALL FINDINGS & IMPLICATIONS

Substantial Results:

1 Technology Shift: Industry transitioning from interpreted to compiled languages:

- **From:** PHP, Ruby, Perl
- **To:** Rust, Go, TypeScript

2 Cloud Transformation: Critical mass achieved:

- 70%+ use cloud platforms
- Containerization (Docker/K8s) became standard

3 Demographic Changes: Industry rejuvenation:

- 69% of developers under 44
- High education level (72% with degrees)

Broader Implications:

For Education:

- **Critical:** Include Rust, Go, TypeScript in curricula
- **Obsolete:** Focus on PHP, Visual Basic in 2025+
- **Priority:** Cloud-native development, containerization

For Business:

- **Hiring:** Rust/Go developer shortage → salary increases
- **Investments:** Cloud migration and modern stacks
- **Risks:** Technical debt in legacy systems (PHP, old Java)

For Industry:

- **Standardization:** PostgreSQL + Docker + K8s — new standard
- **Specialization:** Growing demand for niche specialists (DevOps, Data Engineering)
- **Globalization:** Geographic distribution of developers

Economic Implications:

- Rust developer salaries: +30-50% above average
- Cloud infrastructure investments: $XXX billion
- Legacy system migration costs: increasing

CONCLUSION

Brief Project Summary:

Achieved Goals:

- Created **interactive dashboard** with 12+ visualizations
- Analyzed data from **18,845 developers** across 161 countries
- Identified **current and future technology trends**
- Built **cloud analytical infrastructure** (BigQuery + Looker Studio)

Technical Achievements:

- Processed **139 MB of data** into normalized structure
- Created **13 SQL views** for efficient analytics
- Implemented **interactivity** with filtering and drill-down
- Achieved **load speed** < 3 sec per page

Key Findings:

- **JavaScript/Python** maintain leadership
- **Rust/Go** — future technologies (+100% interest growth)
- **PostgreSQL + Docker + Kubernetes** — new standard
- **Young, highly educated audience** drives industry

Practical Value:

- Ready tool for **strategic planning**
- Foundation for **HR decisions** (hiring, training)
- Guide for **educational programs**
- Data for developer **career planning**

Future Development:

- Multi-year data integration (dynamics trends)
- ML forecasting addition
- Automated data updates
- Expansion to other IT specialties

Q&A (QUESTIONS AND ANSWERS)

- **Q1: How representative is the sample?** A: 18,845 respondents from 161 countries — one of the largest samples in IT industry. Stack Overflow Developer Survey is a recognized industry standard.
- **Q2: How often is data updated?** A: Survey conducted annually. Dashboard can be updated when new data becomes available.
- **Q3: Can I filter by specific country?** A: Yes, dashboard is fully interactive. All visualizations support filtering.
- **Q4: How accurate are the forecasts?** A: "Want to work with" reflects intentions, not guarantees. Historically ~70-80% accurate.
- **Q5: Where can I access the dashboard?** A: [https://lookerstudio.google.com/reporting/83b5e7e6-015b-4dcf-aab3-b3fb17d7943a]
- **Q6: What technologies were used in the project?** A: Python (data processing), Google BigQuery (cloud storage), Looker Studio (visualization).
- **Q7: Can this approach be applied to other industries?** A: Yes, the methodology is universal and can be adapted for any survey data analysis.