Data Visualization Using Google Data Studio: A Case Study of the 2019 Presidential Indonesia Election Results

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Article Info	ABSTRACT
	Analyzing and visualizing data plays a crucial role in improving decision-making and understanding complex datasets. This research explores the use of Google Data Studio for data visualization in the context of the 2019 Indonesian Presidential Election. The study utilizes official election data from the Central Statistics Agency (BPS) and processes it into an interactive dashboard. Data collection involves sourcing verified datasets, which are then filtered and formatted into CSV and XLSX files for visualization. The methodology includes steps for integrating data sources, designing graphical representations, and building an intuitive dashboard. Key visualization elements, such as scorecards, pie charts, bar charts, and tables, are employed to represent election results effectively. The findings demonstrate that Google Data Studio is a versatile tool for creating interactive dashboards, providing insights into regional vote distributions and overall results. This research aims to guide users in leveraging data visualization to improve data accessibility and interpretation across various domains.

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1. INTRODUCTION

In increasingly advanced times, data has become an essential asset for organizations and companies. Data that has been collected is expected to provide benefits for various purposes, including research and decision-making processes. After collecting the data, an effective method of conveying the information is required. Data visualization serves as an important tool for explaining complex data, making it easier for people to understand. Studies have shown that effective data visualization significantly aids business development by improving the ease of data interpretation, thereby optimizing data management efforts [1].

Data visualization involves transforming raw data into visual formats such as graphs, tables, maps, and other visual elements. By designing interactive dashboards, data delivery can be enhanced, ensuring clarity and engagement. Numerous tools are available for converting data into visualizations, and Google Data Studio stands out as a versatile platform for creating interactive dashboards [2]. Google Data Studio enables users to visualize data through dynamic and engaging reports, supporting various data sources and integration options.

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This journal discusses data visualization using Google Data Studio, focusing on the 2019 Indonesian Presidential Election as a case study. By utilizing this tool, the goal is to transform raw election data into an accessible dashboard that categorizes data based on relevant metrics, such as vote income in different regions. The visualizations include interactive graphs and tables, enhancing data accessibility and interpretability for a broad audience. This approach aligns with studies emphasizing the importance of using dashboards to improve data comprehension and decision-making [3].

The purpose of this journal is to provide a practical guide for creating dashboards with Google Data Studio, emphasizing simplicity, interactivity, and accessibility. Utilizing Google Data Studio for data visualization facilitates better understanding and analysis across various demographics. With visualizations like donut graphs and percentage-based representations, users can easily interpret election data categorized by regional vote income, supporting more informed discussions and analyses.

Google Data Studio is a data visualization platform developed by Google that allows users to process and integrate data from diverse sources to create visually appealing and interactive dashboards. Its user-friendly interface enables users to design reports and visualizations without requiring extensive programming knowledge. According to Abdullah et al. (2019), Google Data Studio supports various visual elements such as tables, bar charts, pie charts, and maps, offering interactive features for real-time data exploration [4]. Additionally, its ability to integrate data from sources like Google Sheets, Google Analytics, and BigQuery provides users with dynamic and automatically updated dashboards as source data changes.

Dashboards have become a fundamental tool for presenting data visually and intuitively across industries, including business, finance, and public policy. According to Rasmussen (2020), setting clear goals and success criteria is crucial for dashboard development. Goals may include improving data understanding, monitoring performance, or supporting decision-making, with performance metrics such as response time and user satisfaction serving as success criteria [5]. Well-designed dashboards ensure data comprehension and accessibility, enhancing user interaction and decision-making efficiency.

Google Spreadsheet, also known as Google Sheets, is a cloud-based spreadsheet application that provides features similar to Microsoft Excel, with the added advantage of real-time collaboration and seamless integration with other Google tools [6]. Google Sheets is frequently used for organizing and analyzing data before visualizing it in platforms like Google Data Studio. Its compatibility with formats like Excel and CSV enhances its usability across diverse workflows [7].

General elections, as a democratic process, enable citizens to choose their representatives in government. According to Sarbaini (2015), elections represent a competitive arena for filling political positions through a method of selection by eligible voters [8]. In this study, election data from the 2019 Indonesian Presidential Election is utilized to demonstrate the application of data visualization in understanding and analyzing voting trends across regions. Election datasets serve as a basis for developing interactive dashboards that categorize and present data in accessible formats, fostering better insights into electoral outcomes..

2. METHOD

This journal uses a dataset method obtained from the bps.go.id website in the form of CSV format data. This data set will be converted into a graphic display or visual. The tools used are: *Google Data Studio*.
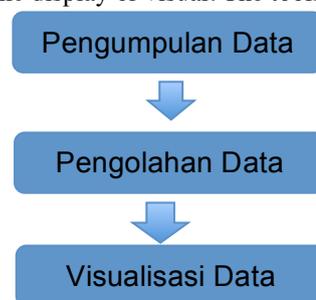

Figure 1. Research Stages

3.1 Data Collection

Data collection has been carried out by the BPS from the 2019 presidential election data with a total of 154,257,601 voters from Indonesia.

3.2 Data Processing

At this stage, the data filtering process is carried out from the total number of votes to a number of votes according to regional categories or presidential candidates. And the results of this filtering are saved in CSV or . .xlsx before visualizing using Google Data Studio.

3.3 Data Visualization

This stage explains the procedures or steps in creating a dashboard using Google Data Studio. Starting from selecting the data source, creating graphs, to designing the graphs into a dashboard..

3. RESULTS AND DISCUSSION

Data visualization is a way to display data in graphical form so that it is easier to understand. An effective data visualization must be able to explain the data presented well and arouse curiosity in the reader (Novitasari et al., 2022). It is hoped that the graphic or table settings will make it easier for readers to understand the number of votes for each presidential candidate.

3.1 Data Processing
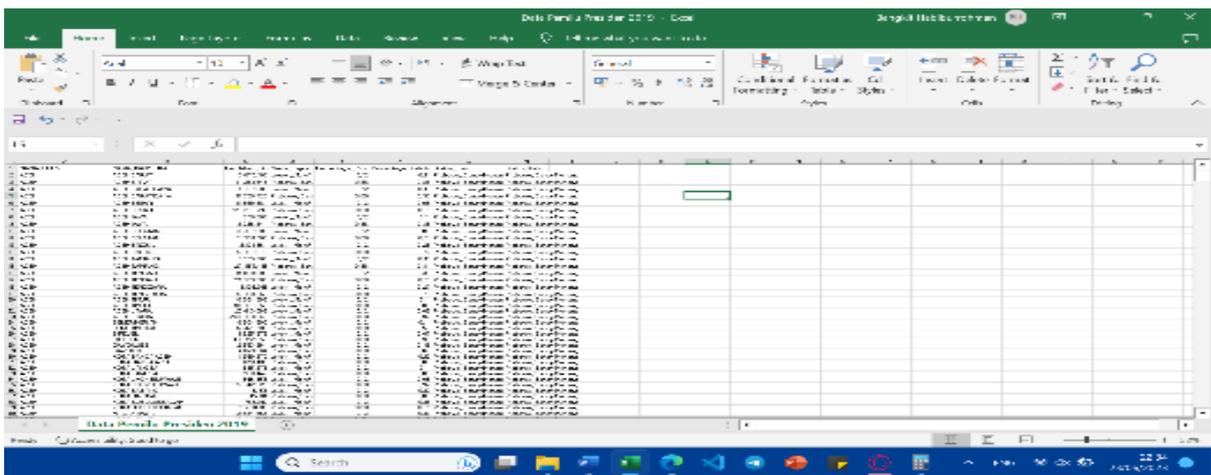
Figure 2. Dataset after processing

The data used in this research comes from Google, which is taken from the data set provided by bps.go.id

4.2 Visualization

At this stage the data that has been obtained will be converted into graphic form to make it easier to read. If using a data source. The following are visualization results using Google Data Studio.
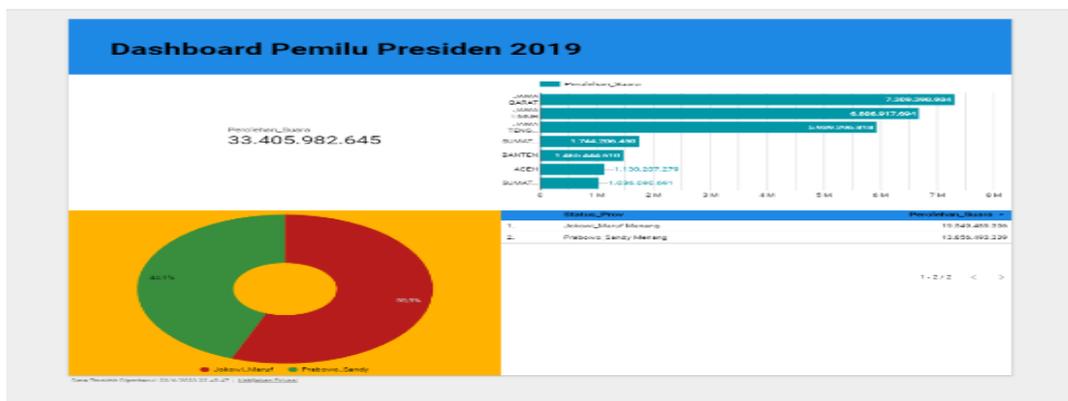

Figure 3. Visualization

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4.2.1 Element Dashboard
a. Scoreboard

Perolehan_Suara
33.405.982.645

Figure 4 element scorecard

The Element Scorecard as in Figure 3 displays data on overall voter votes. The number on the scorecard depends on the selected category.

b. Donut Chart

44,1%

55,9%

● Jokowi Maruf   ● Prabowo Sandy
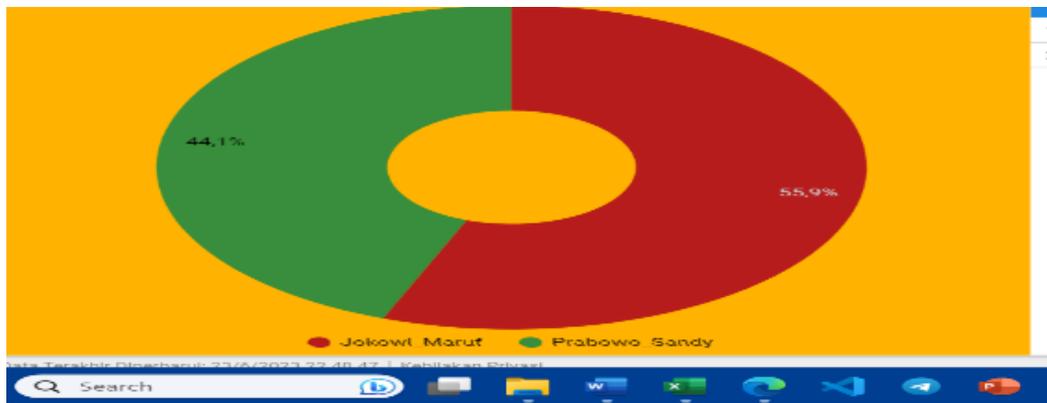
Figure 5. Element Donat Chart

As in Figure 4, the data displayed on this donut chart contains many types of data, the data displayed is usually in the form of percentages.

c. Bar Diagram

Perolehan_Suara

JAWA BARAT	7.309.398.984
JAWA TIMUR	6.686.917.694
JAWA TENG...	5.939.296.818
SUMAT...	1.744.206.450
BANTEN	1.465.444.610
ACEH	1.130.207.279
SUMAT...	1.036.090.691
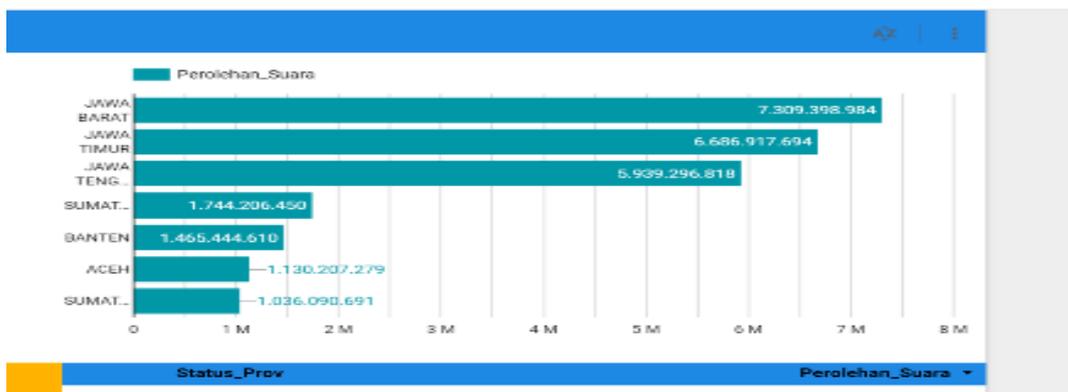
Figure 6. Trunk diagram element

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Bar charts use horizontal or vertical bars to display comparisons between categories. The longer a bar, the greater the value it represents. One axis on the diagram represents the categories (dimensions) being compared, and the other axis represents discrete values (metrics). The data above shows the number of votes from each region.

d. Table

Figure 7. Element Tabel

The image above shows the number of votes for the presidential candidates. Because there are only 2 presidential candidates, the table displayed only has 2 columns

CONCLUSION

This study highlights the effectiveness of Google Data Studio in transforming complex data from the 2019 Indonesian Presidential Election into accessible and interactive dashboards. Using verified datasets, key visualization elements such as scorecards, donut charts, bar charts, and tables were employed to present data comprehensively, including total votes, percentage distributions, and regional comparisons. The scorecard provided an overview of total votes, while donut charts and bar charts illustrated vote percentages and regional distributions effectively. These visualizations enhanced data comprehension and accessibility for a broad audience, including policymakers and the public. By showcasing the versatility and practicality of Google Data Studio, this research provides a valuable guide for leveraging data visualization tools in similar applications, emphasizing their importance in improving decision-making processes and promoting data-driven insights. This study reaffirms the role of accurate and real-time visualizations in fostering better understanding and engagement with critical datasets.

REFERENCES

[1] K. Abdullah et al., "Pemanfaatan Google Form, Google Spreadsheet dan Google Data Studio (GOENDALA) Dalam Pengelolaan Pemeliharaan Alat Elektromedik di Instalasi Pemeliharaan Sarana RSUD dr. ISKAK Tulungagung," *Prosiding Seminar Nasional Kesehatan*, pp. 136–140, 2019. [Online]. Available: https://accounts.google.com/signup.

[2] I. R. Bahtiar et al., "Peningkatan Kompetensi Pembuatan Dan Visualisasi Data Bagi Tenaga Kependidikan," *Journal of Education and Business*, vol. 3, no. 1, pp. 22–32, 2022. DOI: 10.31949/jb.v3i1.1692.

[3] M. Berdaya et al., "Pemanfaatan Google Data Studio dalam Visualisasi Biografi Periwayat Hadis," *Journal of Religious Studies*, vol. 3, no. 2, pp. 138–144, 2022.

[4] C. E. Budiawan and S. Halim, "Perancangan Dashboard Monitoring Contract Lifecycle Management pada PT X," *Jurnal Titra*, vol. 10, no. 2, pp. 57–64, 2022. [Online]. Available: https://publication.petra.ac.id/index.php/teknik-industri/article/view/12843.

[5] W. P. Cendana and E. P. Silmina, "Visualization of COVID-19 Data in Yogyakarta City Using Data Studio," *Conference SENATIK STT Adisutjipto Yogyakarta*, vol. 7, pp. 189–200, 2022. DOI: 10.28989/senatik.v7i0.444.

[6] S. Diane et al., "Visualisasi Data Survey Lulusan dan Pengguna Lulusan Pada Portal Inspire Manajerial Universitas Sam Ratulangi," *Journal of Management and Education Studies*, vol. 5, no. 2, pp. 101–118, 2022.

[7] C. D. Journal et al., "ESKALASI KEMAMPUAN MENGOLAH DATA BAGI KADER DESA," *Journal of Community Development*, vol. 4, no. 1, pp. 634–640, 2023.

[8] C. R. Market, "Perancangan Dashboard Untuk Visualisasi Harga Dan Pasokan Beras Di Pasar Induk Beras Cipinang," *Jurnal Teknologi Industri Pertanian*, vol. 31, no. 1, pp. 12–19, 2021. DOI: 10.24961/j.tek.ind.pert.2021.31.1.12.

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[9] A. Minatania et al., "Visualisasi Data COVID-19 Tahun 2021 di Jawa Barat," *Journal of Public Health Studies*, vol. 1, pp. 44–51, 2023.

[10] Y. Novitasari et al., "Pemanfaatan Google Apps Online untuk Analisis Kuantitatif Kelengkapan Pengisian Dokumen Rekam Medis Rawat Jalan di Puskesmas," *Journal of Health Informatics*, vol. 18, pp. 104–115, 2022.

[11] D. Nurlaily et al., "Pelatihan Visualisasi Data Menggunakan Google Data Studio," *Journal of Data Visualization Training*, vol. 1, no. 4, pp. 161–166, 2022.

[12] A. Sukawan and S. Nadia, "Menggunakan Google Data Studio Di Puskesmas," *Jurnal Informasi Kesehatan Indonesia*, vol. 8, no. 1, pp. 102–112, 2018.

[13] T. D. Sulistyo, "Model Pembelajaran Flipped Classroom Berbantuan Google Data Studio untuk Pembuatan Dashboard Data Demografi," *Educational Technology Journal*, vol. 8, no. 3, pp. 371–379, 2023.

[14] M. A. Yasin, D. Pratami, and Team, "Perancangan Dashboard Untuk Pengukuran Kinerja Proyek Penyediaan Layanan Paket Elektronik Hotel Platinum Surabaya Dengan Menggunakan Google Studio," *eProceedings*, vol. 8, no. 5, pp. 7462–7473, 2021.

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Please attach clear photo (3x4 cm) and vita. Example of biographies of authors: