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Sales Data Analysis Visualization in an Interactive Google Data Studio Dashboard

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ABSTRACT

In the business sector, the use of information technology is used as a means of supporting company performance. Data visualization is the answer to simplifying complex data into a graphical format so that it is easier to understand the business. Managing sales data is an important process that must be carried out by companies. With good data management, companies get more value. This added value includes information supporting decision making, in order to increase the efficiency and effectiveness of company operations. This research uses data on sales of goods obtained from the internet, namely 69 data. The research was carried out with the help of Google Data Studio tools for creating dashboards. The results obtained are that there are several elements that help make it easier to read information, namely scorecard elements, Pie Chart elements, bar chart elements, geographic diagram elements, and table elements. The Scorecard element displays total income, average price of goods, total items sold, and total buyers. In the Pie Chart, the product insight is displayed in percent, the items that sell best are P010. The bar chart element displays total sales for each month, the highest sales were in August 2021. The geographic diagram element displays the distribution of sales to various countries. The table element displays insight information on price cuts or discounts.

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1. INTRODUCTION

The existence of information technology currently brings quite significant changes to the economic sector, especially sales activities. Sales are activities carried out by organizations or companies to generate profits. In the business sector, the use of information technology is used as a means of supporting company performance[1] . Information technology helps companies carry out data analysis processes. In making decisions, management needs information that is easy to understand and meets their needs [2].

When data becomes too difficult to understand, data visualization is the answer to simplify complex data into a graphical format making it easier to understand the business. Data visualization has become an integral part of the business world and an increasing part of managing everyday life[3].

Data visualization is both art and science. Data visualization is a general term that describes any attempt to help people understand the significance of data by placing the data in a visual contextet. The

economic value of data today has changed. Data drives business acceleration, with data enabling organizations to make smarter decisions, approaching “realtime”. With data, organizations can have the ability to see trends in storage Big Data [4].

In the beginning of data visualization, the best and only way to visualize data is within the capabilities of Excel [5]. Users will start withspreadsheet who are practical and slowly and painstakingly create simplified images to help convey messages or understand business trends. However, now with increasingly rapid development, the challenges for visualizing data are increasing. Good graphics and attractive displays are not only demands, integration with data sources, ease of sharing information are now also demands for data visualization [6].

Managing sales data is an important process that must be carried out by companies. With good data management, companies get more value. This added value includes information supporting decision making, in order to be able to increase the efficiency and effectiveness of company operations. Making decisions in a company is not an easy thing. Intuitive direct decision making can no longer be used to get the best decisions, especially in companies that are quite large and have a lot of data and interrelated parameters. The complexity of the data and parameters that exist in the company requires data processing support to process it into visual data[7]. Where information technology-based visualization is a support in depicting interactive visual data to strengthen observations. Sales is an activity and a way to influence individuals to purchase (deliver) the goods or services offered, based on the price agreed upon by both parties in the activity in cash or credit.

A dashboard is a display or visualization that presents important information using graphs, tables, images and others so that it is interesting and easy to understand by all parties. Dashboards can also be used to present performance quality information from a work process in a company or institutional institution. Malik conducted research using the terminology "Enterprise Dashboard", where a dashboard is defined as a computer interface that presents information in the form of tables, reports, visual indicators and dynamic and relevant warning mechanisms[8].

To try to answer some of the challenges above in this research, the author tried to examine the use of Google Data Studio as a data visualization tool/program. Google Data Studio is a cloud-based program designed as an easy-to-use tool for representing complex data sets in an attractive and clear way. Google Data Studio can be used by anyone and can be accessed anywhere. Launched in May 2016 as part of the Analytics 360 Suit[2][9]e.

Google Data Studio is a program for data visualization that is designed to be easy to use for users but can represent complex data [10][11]. Launched in May 2016 in beta until August 2017. The advantages of Google Data Studio are the ability to collaborate in creating data visualizations and the large number of functions offered for free compared to its competitors[12][13].

Dashboard is a form of data visualization that helps users easily obtain information from the data that has been collected. With the existence of OLAP, according to Nils H. Ramussen there are 4 things that have an impact ondashboard namely: a. Displays data originating from various sources; b. Displays metrics in the form of simple or complex calculations; c. Quick to provide new information on screen with minimal processing time; d. Can drill down into summary data for detailed transactions[14].

Google Spreadsheet is a web-based spreadsheet application that can create complex spreadsheets online, using a web browser, and with advanced formulas and functions[15]. Google spreadsheet also allows users to collaborate and create new functions or formulas for sheets by creating scripts on Google App Script. As well as, it allows users to import data from database regularly realtime.

2. METHOD

This research uses a dataset method obtained fromwebsite https://bit.ly/danalyser-sample-data in the form of xlsx format data. Then, perform data visualization using Google Data Studio.

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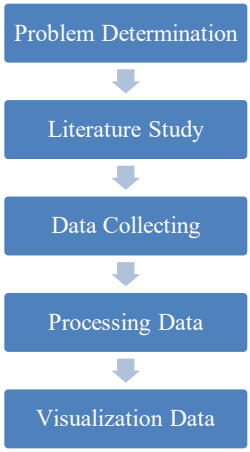

Figure 1. Research Stages

3.1 Problem Determination

Based on observations, managing sales data is an important process that must be carried out by companies. With good data management, companies get more value. This added value includes information supporting decision making, in order to increase the efficiency and effectiveness of company operations;

3.2 Study Literature

Literature study means collecting information obtained by studying books, the internet, or similar previous observations in the hope of obtaining a conclusion on the problem being discussed.

3.3 Data Collection

Data collection is carried out by downloading data from the Internet under the name sales data. The data used is data on sales of goods from August 8 2021 to January 18 2023. The data obtained is 69 data on sales of goods sent to various countries in the world.

3.4 Data Processing

At this stage, the data filtering process is carried out from the hundreds to the required amount of data. The results of the data filtering are saved in .xlsx format before finally being visualized usingGoogle Data Studio

3.5 Visualization

This stage explains the procedures or steps in making itdashboard. Starting from selecting the data source (datasource), making graphs, up 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). The graphical arrangement not only explains the underlying data, but also allows the reader to isolate problematic areas (e.g. suboptimal product sales) for further analysis.[10]

3.1 *Data processing*

Tanggal Penjualan	ID Pembeli	Harga	Kode Kupon	Jumlah Diskon	Mata Uang	ID Transaksi	Tanggal Pembayaran	Kota Tujuan	Negara	Pajak	Kode Barang
8/2/2021	B11	20		0	USD	2222222265	8/2/2021	Penngrove	United States	0	P001
8/20/2021	B05	20	OPENINGSALE	4	USD	2222222133	8/20/2021	van nuys	United States	0	P001
8/20/2021	A11	20	SALE01	4	USD	2222222269	8/20/2021	Penngrove	United States	0	P001
9/2/2021	A04	20		0	USD	2222222129	9/2/2021	Attalla	United States	0	P001
9/8/2021	B04	20		0	USD	2222222125	9/8/2021	Cainta	Philippines	0	P001
9/8/2021	A10	20		0	USD	2222222261	9/8/2021	Dorr	United States	0	P001
9/9/2021	A03	20		0	USD	2222222121	9/9/2021	CANYON CNTR	United States	0	P001
9/9/2021	B10	20		0	USD	2222222257	9/9/2021	Leesburg	United States	0	P001
9/17/2021	B03	30	FLASH20	6	USD	2222222117	9/17/2021	Humacao	United States	0	P004
9/17/2021	A09	30	FLASH20	6	USD	2222222253	9/17/2021	Humacao	United States	0	P004
9/22/2021	A02	22		0	USD	2222222113	9/22/2021	Plymouth	United States	0	P001
10/13/2021	A15	28		0	USD	2222222109	10/13/2021	Porto	Portugal	6,44	P010
10/13/2021	A08	28		0	USD	2222222245	10/13/2021	Toronto	Canada	6,44	P010
10/19/2021	B15	28		0	USD	2222222105	10/19/2021	Lincoln	United States	0	P010
10/19/2021	B08	28		0	USD	2222222241	10/19/2021	Lincoln	United States	0	P010
11/1/2021	A14	28		0	USD	2222222101	11/1/2021	Toronto	Canada	0	P018
11/1/2021	A07	28		0	USD	2222222237	11/1/2021	Toronto	Canada	0	P018
11/2/2021	B14	28		0	USD	2222222097	11/2/2021	Brandon	United States	0	P010
11/2/2021	B07	28		0	USD	2222222233	11/2/2021	Brandon	United States	0	P010
11/11/2021	A13	35	SALE111121	8,75	USD	2222222093	11/11/2021	Scottsville	United States	0	P001
11/11/2021	A06	35	SALE111121	8,75	USD	2222222229	11/11/2021	Scottsville	United States	0	P001

Figure 2. Dataset after processing

The data used in this research comes from Google, namelyhttps://bit.ly/danalyser-sample-data. There is some data in English. To make research easier, the researcher changed it into Indonesian or according to the understanding.

3.2 *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.

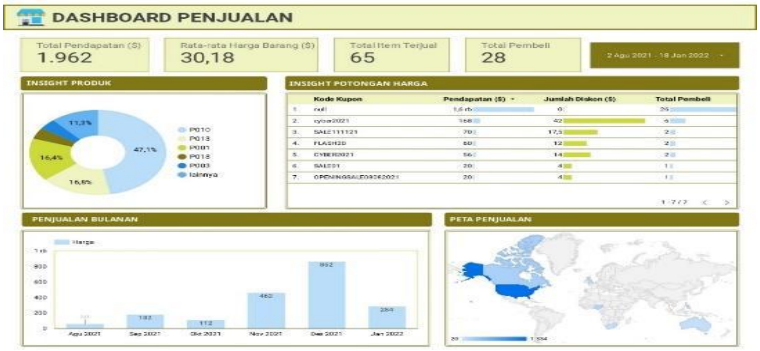

Figure 3. Visualization results using Google Data Studio

3.2.1 Elements Dashboard

a. Scorecard

Figure 3. Scorecard Elements

The Scorecard element as in the image above displays several pieces of information, the first being total revenue during sales from August 2 2021 to January 18 2023. The total revenue generated was 1,962 USD. Then it displays the average price of goods sold. Google Data Studio can display the average price of goods sold during that time period, which is 30.18 USD. Then there is information on the total items or goods sold, namely 65 items in that time period. Apart from that, there are also a total of 28 buyers who have carried out buying and selling transactions. Then finally, Google Data Studio can display the sales period from the data that has been obtained.

b. Chart Pie

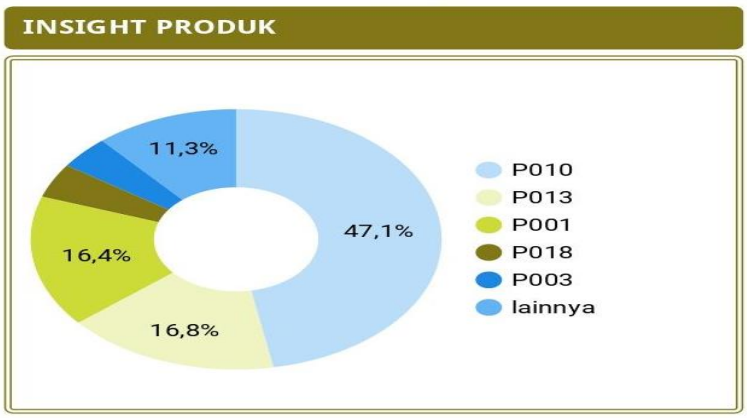

Figure 4. Elemen Chart Pie

A pie chart or pie chart is a circular statistical graph that is divided into several slices and the area depends on the numerical proportion or quantity of the data held. From the image above, information regarding product insight can be obtained. The most sold product is the item with the code P010 with 47.1%. The second largest is goods with the code P013 with 16.8%. The above information is presented in percentage terms.

c. Bar Chart

Figure 4. Bar Chart Elements

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 diagram above displays information related to sales each month. Information was obtained that the highest sales occurred in December 2021, and the lowest sales occurred in August 2021.

d. Geographic Diagram

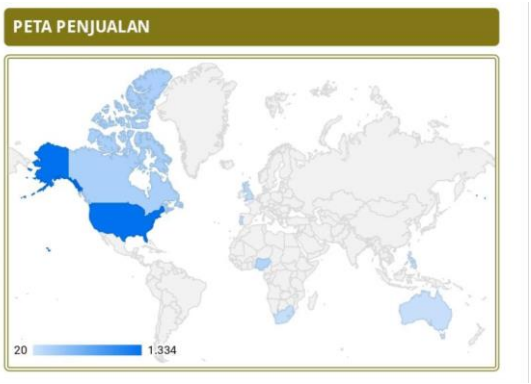

Figure 5. Geographic Diagram Elements

Geographical diagrams are used to display maps of countries, continents or regions (Novitasari*et al.*, 2022). The values for each location are displayed in color. For example, create a map showing the populations of countries in Europe. The geographical diagram above shows the distribution of sales to countries in the world, namely the USA, Philippines, Portugal, Canada.

e. Table

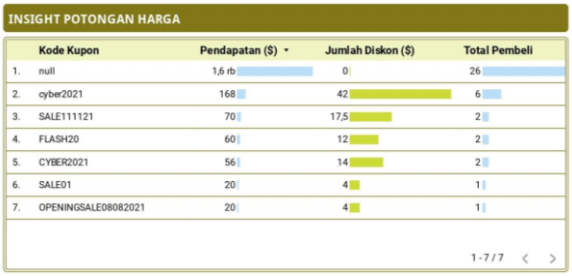

Figure 6. Table Elements

The image above displays information related to Insights regarding price cuts or discounts. During the sale there are 6 discount coupons, each with a different discount value. From the picture above, it can be seen

that many buyers bought goods without using discount coupons, namely 26 buyers. The highest discount amount is the discount with the code "Cyber2021" of 42 USD. Then you can also get information from the diagram above, namely that the most income is generated from sales without using coupon codes or discounts, namely 1600 USD.

4. CONCLUSION

Research has been completed using Google Data Studio to create visualizations of goods sales. There are several elements that help make it easier to read information, namely scorecard elements, Pie Chart elements, bar chart elements, geographic diagram elements, and table elements. The Scorecard element displays total income, average price of goods, total items sold, and total buyers. In the Pie Chart, the product insight is displayed in percent, the items that sell best are P010. The bar chart element displays total sales for each month, the highest sales were in August 2021. The geographic diagram element displays the distribution of sales to various countries. The table element displays insight information on price cuts or discounts. Google Data Studio supports various data sources, making it easy to integrate reports from various existing data sources. With Google Data Studio users can easily share reports without compromising the security of the information conveyed.

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