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# Descriptive Analytics Sales Data Visualization at Kebab Made Using Google Data Studio

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**ABSTRACT**

*Kebab Made is a company engaged in the sale of food. It applies an information system in recording and managing data that produces operational information, including sales reports were presented in tabular form. The report cannot display the information about sales growth. The difference in product sales comparison is a weakness of the report results. Thus, another application is needed to reprocess tabulated data into information in the form of graphs. In this study, a system was built using website-based google data studio tools to assist companies in processing tabulated data into a graphs that do not require a long time. The research method used in thisresearch is Kimball's Nine Steps method and conducted through the stages of functional requirements analysis, data warehouse design, Extract Transform Load (ETL) process, system implementation, and system testing. The system was tested using User Acceptance Test (UAT), and showed that the system had run according to the needs. The result of this research is a dashboard that displays information in graphical form to assist in decision making. This visualization allows companies to easily see and analyze sales developments, so they can make more precise and quick decisions.*



## 1. Introduction

The use of information technology is used to be a means of supporting company performance in carrying out the data analysis process. Data will become very important information if it has been processed and visualized. The amount of data is very large and numerical in nature, which requires analysis that tends to use computing systems (Arya et al., 2022; Herlina, 2024; Simanjuntak et al., 2023). In making decisions, management needs information that comes from the results of data analysis, in a form that is easy to understand and as needed. Intuitive direct decision making can no longer be used to get the best decision, especially in companies that are large enough and have a lot of data and parameters that are interrelated (Jabid et al., 2023; Laksmana & Ningsih, 2024; Ramli et al., 2022; Sirat et al., 2023; Sumesta & Satyawan, 2024).

Kebab Made is an individual culinary business with a kebab theme that applies an information system for recording products, recording transactions and printing proof of purchase based on the W&O POS (Point Of Sale) application since January 2023. The report format is presented in tabular form, and has limitations in presenting information interactively, such as describing sales growth or comparing sales differences. So that in the current condition, the company needs a more attractive and

interactive data display such as the use of graphics in data presentation, in order to facilitate understanding and communication of information.

Based on the problems encountered in the company, the researchers feel that Kebab Made needs to design a data archive in the form of a data warehouse, namely data processing into information with better quality so that the information can be used by the company in the future (Lin, 2024; Saputra et al., 2022; Suryadana & Sarasvananda, 2024). The data warehouse development in this study was carried out using the nine steps kimball method, then for the Extract, Transform, and Load (ETL) process using the Pentaho Data Integration (PDI) Kettle application. This research aims to create data visualization which is expected with the application of data visualization, Kebab Made is expected to utilize stored information that is easier to understand and can analyze company operational data, and make it easier to make business continuity decisions.

## 2. Literatur Review

### Data Visualization

Data visualization is a process that converts numerical data into graphical or visual forms, such as diagrams, charts, or maps, to make it easier for users to understand and interpret. By using data visualization, users can easily identify patterns, trends, and relationships between complex data, making it easier to make decisions and develop solutions (Septiani et al., 2024). In addition, data visualization also helps in explaining complex information in a more intuitive and attention-grabbing way (Sudipa et al., 2023).

### Data Warehouse

Data warehouse is a concept and combination of technologies that facilitate organizations to manage and maintain historical data obtained from operational systems or applications. The use of data warehouse technology is almost needed by all organizations, including libraries (Riyanti et al., 2024). A data warehouse allows the integration of various types of data from various applications or systems. This ensures a “one-stop” access mechanism for management to obtain information and analyze it for decision-making (Urva et al., 2023).

### Extraction, Transformation, and Loading (ETL)

ETL is a set of processes to collect, filter, process, and combine data that must be passed in the formation of a data warehouse. This ETL process consists of Extracting, transforming, and loading processes (Kwintiana et al., 2023). Extracting is the process of selecting and retrieving data from a company's data set. Transforming is the process of cleaning and changing the data structure from the original form to a form that suits the needs of the data warehouse. Load is the last process that functions to enter data into the data warehouse (Radhitya et al., 2024). The ETL process itself consists of extracting, transforming, loading.

### Testing User Acceptance Testing (UAT)

User Acceptance Testing (UAT) is testing the interaction between the end-user and the system directly which serves to verify that the features have run according to the user's needs (Apriyanthi et al., 2024; Arslayandi et al., 2024; Mertha et al., 2021; Putra et al., 2024; Putri et al., 2024). UAT testing includes the last phase in the system testing process, where the system has been completed through the development stage. UAT becomes one of the final series of tests of the software and is carried out before it is developed and launched.

## 3. Research Method

The place where this research was conducted was at Kebab Made, one of the kebab food brands located on Jl. Tukad Pakerisan No. 6, Panjer, South Denpasar, Denpasar City, Bali. Data collection is done based on the needs of the system to be built. The data collection methods used in this research are primary and secondary. Primary data collection method is obtained through interviews with Kebab Made Owner and obtained through observations of sales reports taken from the W&O Pos system. Secondary data used is related to the documentation of Kebab Made Company sales documents and obtained from references derived from various journals (Ibrahim et al., 2023). The research method used in this research is Kimball's Nine Steps method. The research was conducted through the stages of functional requirements analysis, data warehouse design, Extract Transform Load (ETL) process,

system implementation, and system testing. This system was tested using the User Acceptance Test (UAT) testing method.

## 4. Result and Discussions

### System Implementation

### Process Extract Transform Load (ETL)

In this research there are several ETL processes, namely ETL product dimensions, ETL expenditure dimensions, ETL product sales facts and expenditure facts. In this ETL process using Kebab Made operational data that has been stored in the sqlyog database and then extracted in CSV form. The tools used to perform this ETL process is using Pentaho Data Integration Kettle application, then it will be stored in the data warehouse using SQLyog.

This Pentaho sales schema is a process that begins with an input table where this process is to retrieve sales data then the next process is select value to display the fields to be used. Furthermore, String operations is a transform process that will be used to adjust the writing format of the data. The next process is select value 2 for selecting data that will be displayed for the next steps. Next is sort rows which is sorting based on the itemid field. Next is the unique rows process which is the process of removing duplicate rows and will produce unique rows for the next process. The next process is select value 3 for selecting data that will be displayed for the next steps. The last process is the output table or load process where this process stores data into sales facts and sales facts into the data warehouse.

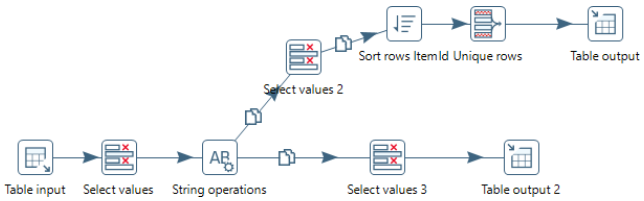


**Fig. 1**. Pentaho Schema Sales Facts

Expense ETL is a process that begins with Microsoft Excel input where this process is retrieving expense data, the next process is string operations which is a transform process that will be used to adjust the writing format of the data, the next process is sort rows which is sorting by field item, then select value to display the field to be used, then the unique rows process which is the process of deleting duplicate data or duplicate rows and will produce unique rows for the next process. Next is the Add Sequence process, which is the addition of a numerical sequence or sequence value to the dataset, then Stream lookup, which is the process of retrieving items from the input teble, the last process is the output table or load process where this process stores data into expense facts, expense facts into the data warehouse.

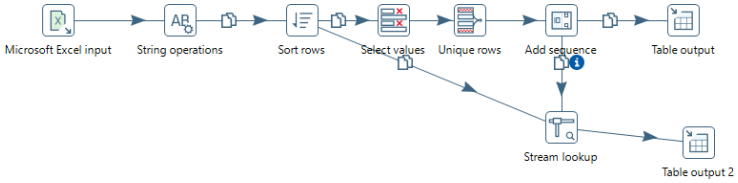


**Fig. 2** Expenditure Fact Pentaho Schema

### User Interface Implementation

The implementation of the user interface will discuss each interface that has been built in accordance with the user interface design in the previous chapter. At the stage of implementing the user interface, making graphs using tools from Google Data Studio. In this display, line graphs, bars, circles, dropdown menus are found, allowing users to easily see the trend of data they want to know. In addition, the data is also more informative and interesting to use as a basis for decision making. The display is on several dashboard pages, which include expenses, sales, and company profits.

A line graph depicting the company's expenditure from month to month. On this page, users can clearly see the ups and downs of the company's expenses. That way, companies can monitor and

predict expenses, and take quick action if there is an overrun in company expenses. This visualization helps companies manage budgets more effectively and plan better financial strategies to maintain operational stability.

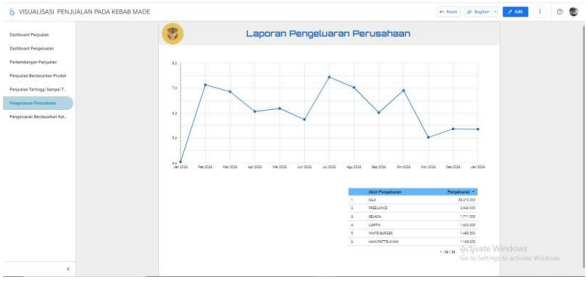


**Fig. 3**. Example of Line Diagram in Expenses Dashboard Page

A bar graph depicting the sales of various products in the company. On this page, the company can see the comparison of total sales between products from month to month based on the selected year through the drop-down menu. The company can also choose to compare the sales of 2 or 3 specific products by selecting the product name in the drop-down menu. With this graph, the company can make decisions to stock ingredients from the products that sell best each month. Based on the visualization results, it can be seen that the chicken kebab menu is the most sold menu. This visualization provides important insights for the company to develop marketing strategies and stock management more effectively.

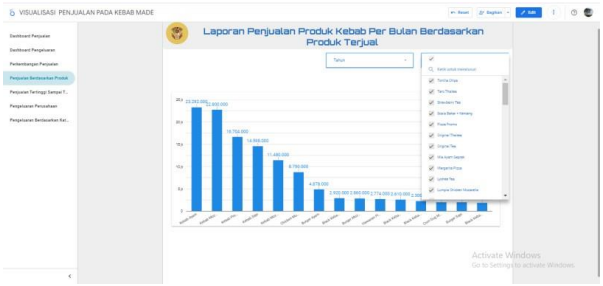


**Fig. 4**. Sales Dashboard Page Bar Diagram and Dropdown Menu Example

A pie chart depicting the percentage of sales by product. On this page, users can see the percentage of sales for each product, so that companies can identify the highest and lowest selling products based on the year selected through the drop-down menu. By knowing which products have the lowest sales, companies can take strategies to further promote or offer these products. Based on the results of the data visualization, it can be seen that kebabs contribute the most to sales. This visualization helps the company to make better decisions to increase the sales of less sold products and maintain the performance of the most sold products.

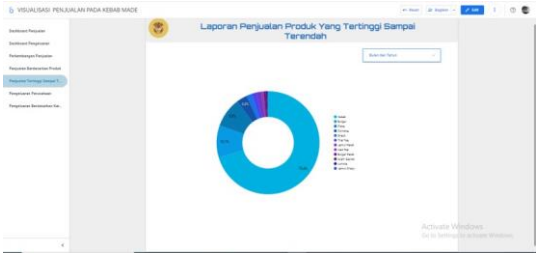


**Fig. 5**. Example of Highest to Lowest Sales Dashboard Page Pie Chart

## System Testing Using User Acceptance Test (UAT)

The test results at Kebab Made company using the user acceptance test (UAT) testing method. UAT testing involves 4 respondents, namely the owner and several employees in the company.

**Table 1**. Questionnaire Results UAT.

| No | Question | SS | S | CS | TS | STS |
|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | Is the data visualization system that has been built in accordance with the needs of the company? | 2 | 2 |
| 2 | Is the information graph displayed according to the company's needs | 2 | 2 |
| 3 | In your opinion, do the menus available on the data visualization displayed can provide information that is clear and easy to understand? | 3 | 1 |
| 4 | Whether the data used in the charting process is valid and there are no errors | 2 | 2 |
| | **Total** | **9** | **7** |

**Table 2**. Testing Results UAT.

| UAT Highest Score | Number of Questionnaires* Number of Respondents*Highest Score of Questionnaires (4*4*5=80) |
|---|---|
| Strongly Agree (SS) | 5*9=45 |
| Agree (S) | 4*7=28 |
| Moderately Agree (CS) | 3*0=0 |
| Disagree (TS) | 2*0=0 |
| Strongly Disagree (STS) | 1*0=0 |
| **Total** | **45+28+0+0+0 = 73** |
| | **73/80*100% = 91%** |

**Table 3**. Testing Percentage UAT.

| Persentase | Keterangan |
|---|---|
| 0% - 19.99% | Strongly Disagree (STS) |
| 20% - 39.99% | Disagree (TS) |
| 40% - 59.99% | Moderately Agree (CS) |
| 60% - 79.99% | Agree (S) |
| 80% - 100% | Strongly Agree (SS) |

Based on the results of the user acceptance test (UAT) conducted on Kebab Made, it can be seen from the results of the UAT test that the system built on Kebab Made gets a very agreeable assessment with a percentage of 91% which means that this sales data visualization is in accordance with the needs of the Kebab Made company.

## 5. Conclusion

The conclusion of this research is that the visualization of sales data at Kebab Made was successfully built based on the problems found. The author designs data visualization by using the nine steps kimball method to design a data warehouse, using Pentaho Data Warehouse tools, then using Google Data Studio tools to visualize data in graphical form. The display has been tested with the User Acceptance Test and provides results with a percentage of 91% (strongly agree) or is in accordance with the needs of the Kebab Made company. Suggestions that can be given to developers who are expected in the future, namely, it is hoped that there will be further developers by adding other information graphics and strengthening the security of the visualization system to avoid leakage of Kebab Made company data.

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