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IMPLEMENTATION OF BUSINESS INTELLIGENCE FOR SALES DATA ANALYSIS AND VISUALIZATION OF MSME's BUKET_BYATIQ USING MICROSOFT POWER BI

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ABSTRACT
This study aims to implement Business Intelligence using Microsoft Power BI at Buket_Byatiq MSME to replace the less effective manual recording system. The research method used is a case study, processing 2024 sales data through the ETL process and developing an interactive dashboard visualization. This study employs the BI Roadmap (framework), a Business Intelligence system that guides the design and data analysis process in creating visualizations. The main stages include collecting historical sales and expense data, followed by processing and designing through data cleaning, transformation, loading, and relational table modeling. The process culminates in the development of an interactive dashboard that presents real-time sales information to support data-driven decision-making. The results of the study show that the implementation of Business Intelligence using Microsoft Power BI effectively supports Buket_Byatiq MSME in making more accurate and efficient business decisions. The developed interactive dashboard successfully presents key information such as revenue, profit, monthly and weekly sales trends, best-selling products, dominant sales platforms, purchasing methods, and ordering regions. This visualization not only simplifies analysis compared to manual record-keeping but also reveals that sales are still influenced by certain seasonal moments, with WhatsApp Business serving as the main sales channel and the market remaining limited to the Tasikmalaya area. With the application of BI, business owners can more easily understand sales patterns, determine production strategies, and design more targeted marketing efforts to enhance competitiveness in the digital era and achieve desired sales targets.

Key words: Business Intelligence; Microsoft Power BI; Sales Data Analysis; MSME; Data Visualization; ETL Process; Interactive Dashboard

INTRODUCTION

The development of digital transformation has made data a strategic asset for business actors. The ability to manage data quickly, accurately, and in a structured manner has become the key to facing competition, including for Micro, Small, and Medium Enterprises (MSMEs). However, a common challenge faced is how to process the data so that it can provide meaningful insights and be used to support strategic decision-making. Data presented only in the form of numbers and tables often fails to provide a clear picture of business performance. Therefore, tools are needed that can transform raw data into information that is easier to understand and analyze. This condition is similar to Buket_Byatiq MSME, a micro business engaged in selling gift bouquets.

Buket_Byatiq MSME still uses a manual method for recording sales transactions, resulting in unstructured sales data that lacks data-driven information and makes it difficult to conduct analysis for decision-making. Consequently, order cancellations often occur due to unprepared raw material stock or mismatches between products and customer demands. This makes it challenging for business owners to process business information and determine sales strategies such as sales methods, most-used sales platforms, marketing strategies, and overall business performance. According to Gita Novi Yanti (2024), relying on manual methods can cause delays in providing critical information for fast business decision-making and hinder a company's ability to identify sales trends, consumer behavior, or potential business opportunities.

Previous research conducted by Steven et al. (2021) found that the implementation of Business Intelligence using Microsoft Power BI at PT. Suryaplas helped stakeholders monitor sales growth and transaction details as a foundation for decision-making. The novelty of this study lies in the application of Business Intelligence to small-scale businesses such as MSMEs, using a simpler implementation method and available data.

Business Intelligence is a technology that can be utilized to collect, retrieve, and analyze data as a step to assist decision-makers in choosing the right decisions (Zahra et al., 2025). Microsoft Power BI serves as a tool and one of the main components for creating data visualizations. According to Najib et al. (2024), Microsoft Power BI is capable of transforming complex data into informative and actionable insights. Furthermore, Tjahyono et al.

(2024) stated that Power BI is a free product from Microsoft that revolutionizes the way data is discovered, captured, organized, and modeled—allowing it to be sliced, diced, queried, and presented interactively in visual form. Therefore, Power BI can assist small business owners by providing easy data connectivity without high costs, enabling them to obtain more detailed and meaningful information.

METHOD

This study employs a qualitative method with a BI Roadmap approach. The method aims to explore in depth how the implementation of Business Intelligence and the design of an interactive dashboard using Microsoft Power BI can assist business decision-making in MSMEs. In this research, data are analyzed descriptively and visualized using Power BI to provide a comprehensive understanding through data analysis and visualization, helping the business processes of Buket_Byatiq MSME in making data-driven business decisions.

RESULTS AND DISCUSSION

The results of the study show that the implementation of Business Intelligence using Microsoft Power BI is able to support Buket_Byatiq MSME in making business decisions more effectively and accurately. The developed interactive dashboard successfully presents important information such as revenue, profit, monthly and weekly sales trends, favorite products, dominant sales platforms, purchasing methods, and ordering regions. This visualization not only simplifies analysis compared to manual record-keeping but also reveals that sales are still influenced by certain moments, with WhatsApp Business as the main channel and the market still limited to the Tasikmalaya area. With the implementation of BI, business owners can more easily understand sales patterns, determine production strategies, and design more targeted marketing efforts to enhance competitiveness in the digital era and achieve the desired sales targets.

1. Design Stage

At the design stage, a data model was developed by creating measures using Data Analysis Expressions (DAX) in Power BI and building relationships between tables to facilitate the process of data visualization design and support the interconnection between dashboards.

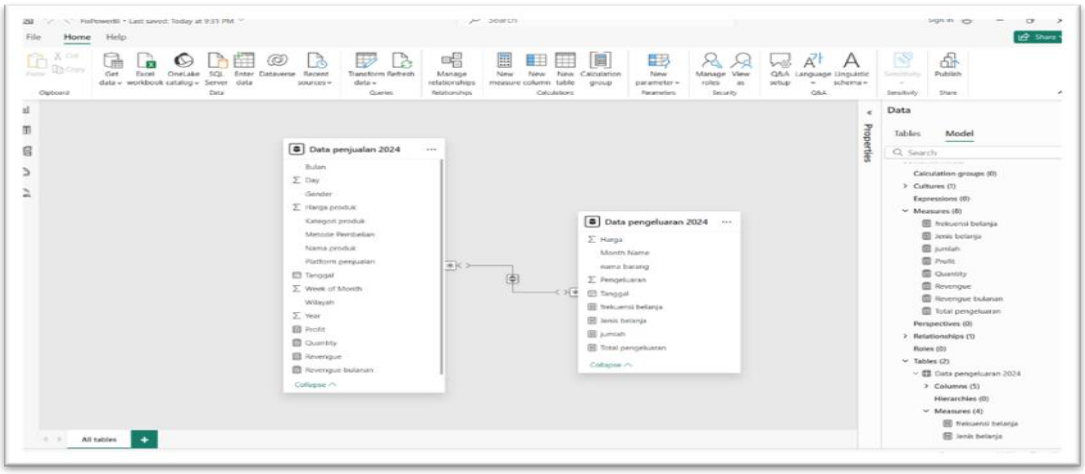

Figure 1. Model and data design

Figure 1. illustrates the data model in Power BI, consisting of sales and expense data tables connected through the date attribute. In this model, measure calculations using DAX were also added to determine profit, revenue, and total expenses for Buket_Byatiq MSME. Additionally, measurements were conducted to identify the quantity of products sold based on customer region, gender, sales platform, and purchasing method during the 2024 period. The processes of modeling, calculation, and measurement were carried out to facilitate the design of an interactive dashboard that provides comprehensive information and simplifies the data analysis process.

2. Construction Stage

The construction stage is the phase of designing the dashboard based on the calculations and measurements from the previous stage, utilizing the visualization features in Microsoft Power BI, as shown in the figure below.

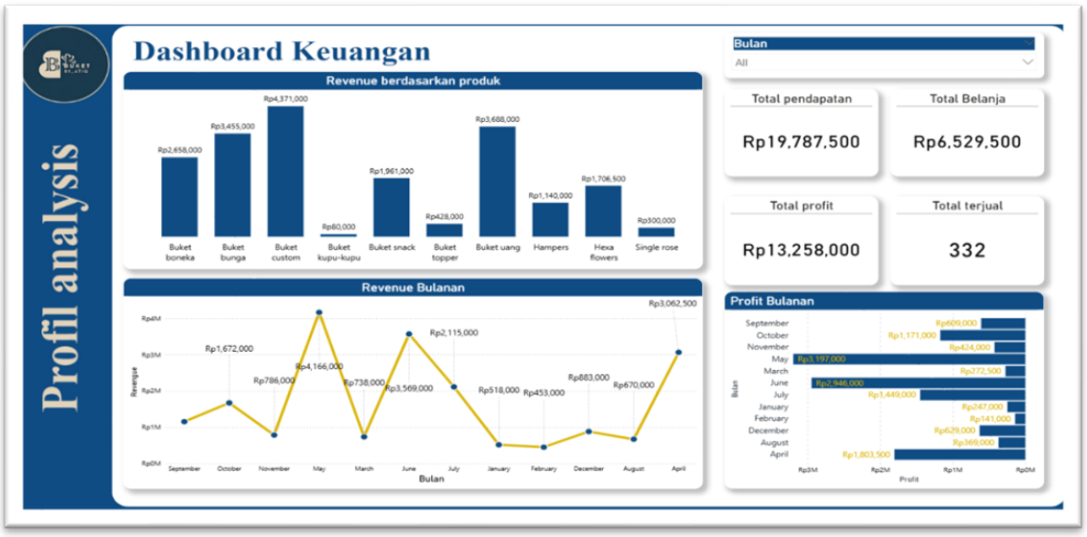

Figure 2. Sales Dashboard

Figure 2. shows the financial dashboard of UMKM Buket_byatiq, featuring indicators such as revenue by product, monthly revenue, monthly profit, total products sold, total income, total expenses, and total profit for the year 2024.

Furthermore, in this study, the author added a slicer to filter the dashboard by month, aiming to help business owners easily monitor their monthly income and expenses.

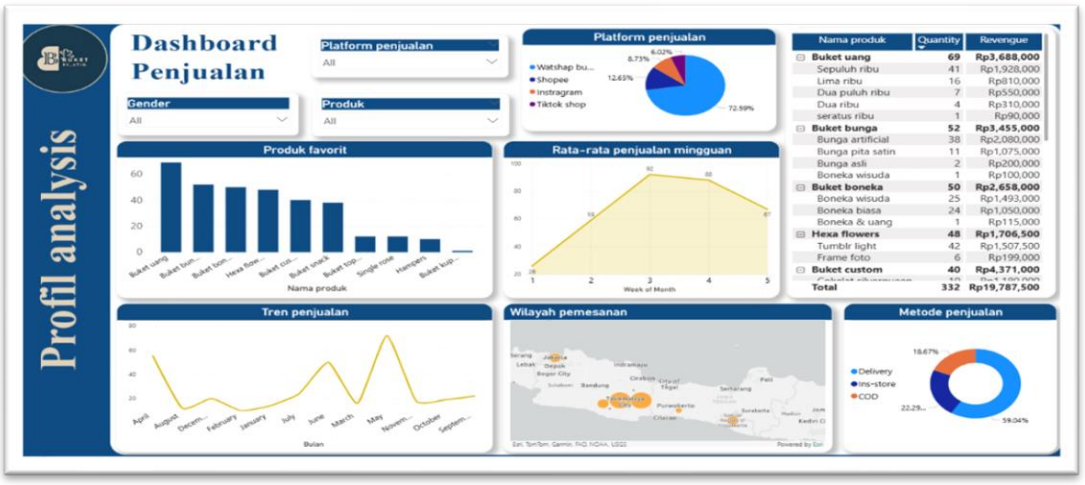

Figure 3. Sales Dashboard

Figure 3. presents the sales dashboard of UMKM Buket_byatiq, which displays various indicators such as favorite products, sales trends, average weekly sales, sales platforms, and sales methods. In addition, the dashboard includes a matrix containing product types, product categories, quantities, and prices of each item sold.

Overall, this dashboard was designed to support interactivity, making it easier to analyze the raw materials of each product for production efficiency. Furthermore, slicers were added based on sales platform, product type, and buyer gender, allowing for more in-depth data analysis and the discovery of business insights to identify potential opportunities for data-driven decision-making.

3**. The Report Stage**

The report stage is the final phase in the data analysis process, where the results of the design stage are presented in the form of an interactive report. In this study, the report is realized by presenting an analysis of the calculations and measurements of various indicators from the financial dashboard and the sales dashboard. Each indicator is analyzed separately to identify specific patterns and to facilitate the identification of strategic business opportunities.

To determine the revenue, calculations were made by summing up the total prices of each product, and the results were measured based on the month name created in the month name column.

Figure 4. Revenue

Figure 4. shows the revenue of Buket_Byatiq MSME throughout the year, which can be monitored by month. The revenue visualization indicates that Buket_Byatiq achieved its highest income in May, amounting to Rp. 4,166,000, while the lowest income occurred in February, at Rp. 453,000.

From the revenue data visualization above, it can be seen that the income of Buket_Byatiq MSME tends to be unstable and is highly influenced by certain seasonal or moment-based factors. This condition indicates the need for a more efficient sales strategy so that revenue does not rely solely on specific moments but remains more stable, allowing the business to continue to grow sustainably.

Product revenue represents the highest income contribution, calculated based on the total price per product type, which is then multiplied by the quantity of products sold.

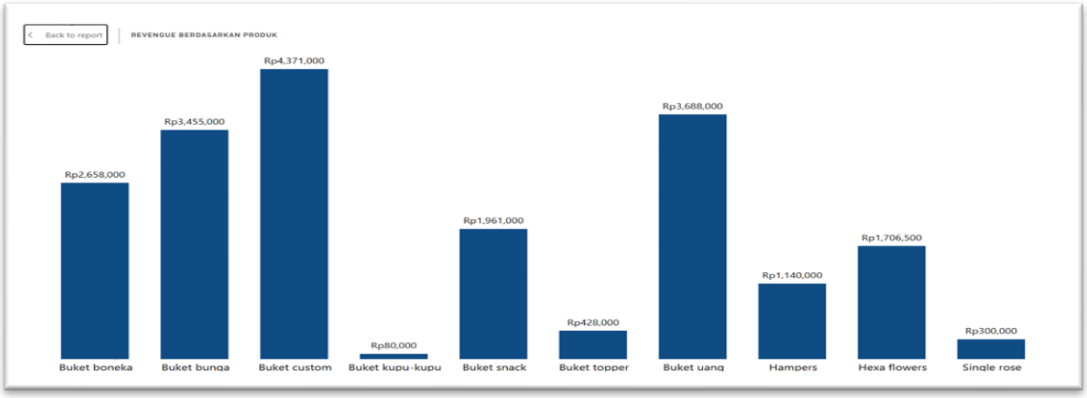

Figure 5. Product Revenue

In Figure 5 the product revenue shows that custom bouquet products generate the highest income of Rp. 4,371,000, followed by money bouquets amounting to Rp. 6,688,000, and flower bouquets at Rp. 3,455,000. Meanwhile, butterfly bouquets and topper bouquets are the products with the lowest revenue among all. The revenue calculation in this visualization is performed by multiplying the unit price of each product by the quantity sold over one year. The results of these multiplications are then summed up to produce the total revenue for each product type. The visualization shows that custom-made bouquets requested by customers contribute more significantly than ready-made bouquets. This is influenced by the varied preferences of customers, which result in more diverse and generally higher product prices. This condition indicates an opportunity for UMKM Buket_byatiq to expand its product variety.

CONCLUSION

The results of the study show that the implementation of Business Intelligence using Microsoft Power BI effectively supports UMKM Buket_byatiq in making business decisions more efficiently and accurately. The developed interactive dashboard successfully presents key information such as revenue, profit, monthly and weekly sales trends, favorite products, dominant sales platforms, purchasing methods, and order regions.

This visualization not only simplifies analysis compared to manual record-keeping but also reveals that sales are still influenced by certain moments, with WhatsApp Business serving as the main sales channel and the market remaining largely concentrated in the Tasikmalaya area. Through the application of BI, business owners can more easily understand sales patterns, determine production strategies, and design targeted marketing efforts to enhance competitiveness in the digital era and achieve desired sales goals.

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