Improving the Accuracy of Small and Medium Enterprise Sales Predictions in Deli Serdang Regency by Implementing Business Intelligence Using the Decision Tree Algorithm

M Dico Triyadi, Darmeli Nasution[2]
[1,2,3,4,5] Master Of Information Technology, Universitas Panca Budi

ABSTRACT

This study focuses on improving the accuracy of sales prediction in Small and Medium Enterprises in Deli Serdang Regency through the application of Business Intelligence (BI). By using the Decision Tree algorithm, a prediction model is built based on historical sales data, seasonal factors, and macroeconomic variables. The evaluation results show that the developed model is able to predict sales with the right accuracy. In addition, this model also successfully identifies key factors that influence sales, such as price, promotion, and economic conditions. This study concludes that the application of BI can be an effective tool for Small and Medium Enterprises in making better decisions and increasing competitiveness.

Keyword : **Business Intelligence**; **Data Mining**; **Decision Making; Small and Medium Culinary Enterprises**

Corresponding Author:	*Article history:*
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Universitas Pembangunan Panca Budi	Accepted Jan 11, 2020
Jl. Jend. Gatot Subroto Km 4,5 Sei Sikambing 20122, Medan, Indonesia	
Email : m.dicotriyadi@gmail.com	

1.   INTRODUCTION

In the era of increasingly rapid digitalization, Small and Medium Enterprises are faced with the challenge of remaining relevant and competitive. One important aspect of business success is the ability to predict sales accurately. This study aims to improve the accuracy of sales predictions in Small and Medium Enterprises in Deli Serdang Regency through the application of Business Intelligence (BI). By utilizing the Decision Tree algorithm, a prediction model is built based on historical sales data, seasonal factors, and macroeconomic variables. The results of this study are expected to provide a significant contribution to the development of Small and Medium Enterprises in the area, by enabling business actors to make more informed decisions regarding production, inventory, and marketing strategies.

The development of Micro, Small, and Medium Enterprises (MSMEs) is one of the government's strategies to increase economic growth, public welfare, and equitable development throughout Indonesia (Gusti Achmad, Et All, 2023). The existence of MSMEs is very important in the country's economic growth and can benefit and distribute people's income (Atsna Himmatul Aliyah, 2022). MSMEs play a joint role in many industries, namely as supporting organizations that provide more opportunities for vertical integration in remote or rural areas, thus this sector makes a very large contribution to the country's fiscal progress (Albert Jhoni, et all, 2023).

2.   RESEARCH METHOD

In this study, the Decision Tree algorithm will be used. Decision Tree is a structure that resembles a flowchart, where each internal node performs a test on the attribute variable, and its branches reflect the results of the test, while the outermost node (leaf) functions as a label (Ekin Adhi Guna, 2023). The application of Decision Tree in data classification is very relevant, especially in the context of car evaluation. Car assessment plays an important role for consumers and manufacturers, and by using the Decision Tree algorithm, a model can be created to classify cars based on their features or attributes. Decision Tree is one of the popular machine learning algorithms for classification and regression. This algorithm takes the form of a tree structure containing decisions and rules that are used to classify or predict target values based on existing input features (Nurussakinah, 2023)

3. RESULTS AND DISCUSSION

In This research, several stages will be used, namely collecting raw data, cleaning raw data and analyzing processed data. The following are the stages of the research process,

A. Collecting Data Row

In This Data collection requires several attributes, namely the name of business actor, how long the business actor has ben running this business, and the income of the last 1 month in running the business. The following is the business actor data that has been collected

	A	B	C	D	E	F	G	H
1	nomor	Produk	Minggu 1	Minggu 2	Minggu 3	Minggu 4	Nilai	Hasil
2	1	Kerupuk Ubi Original	47	27	29	13	116	Laris
3	2	Kerupuk Ubi Pedas	46	11	4	50	111	Laris
4	3	Keripik Pisang Manis	47	3	26	25	101	Laris
5	4	Keripik Pisang Original	0	13	3	28	44	Tidak Laris
6	5	Basreng Pedas	45	2	13	17	77	Tidak Laris
7	6	Basreng Extra Pedas	19	42	41	33	135	Laris
8	7	Basreng Balado	29	43	42	33	147	Laris
9	8	Keripik Kentang Pedas	37	6	15	31	89	Tidak Laris
10	9	Keripik Kentang balado	23	27	39	40	129	Laris
11	10	Keripik Kentang Original	16	5	27	14	62	Tidak Laris
12								
13								
14								

Fig 1. Data Collection

B. Data Processing

In This processing will directly use the rapid miner tool. In it use, we simply upload the data that we have prepared before into the rapid miner tool, after that it will enter into several poits, the first of which is to ensure that the data is correct
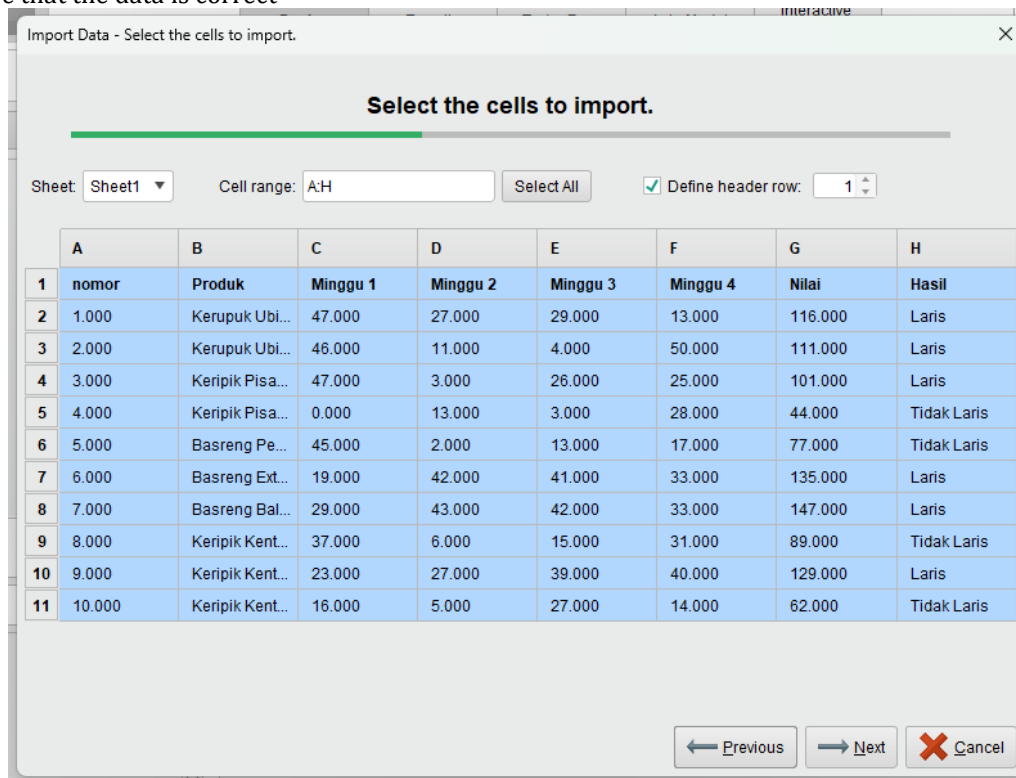

Fig 2. Data Collection

Next, after confirming the data, immediately determine the format of the data that has been imported
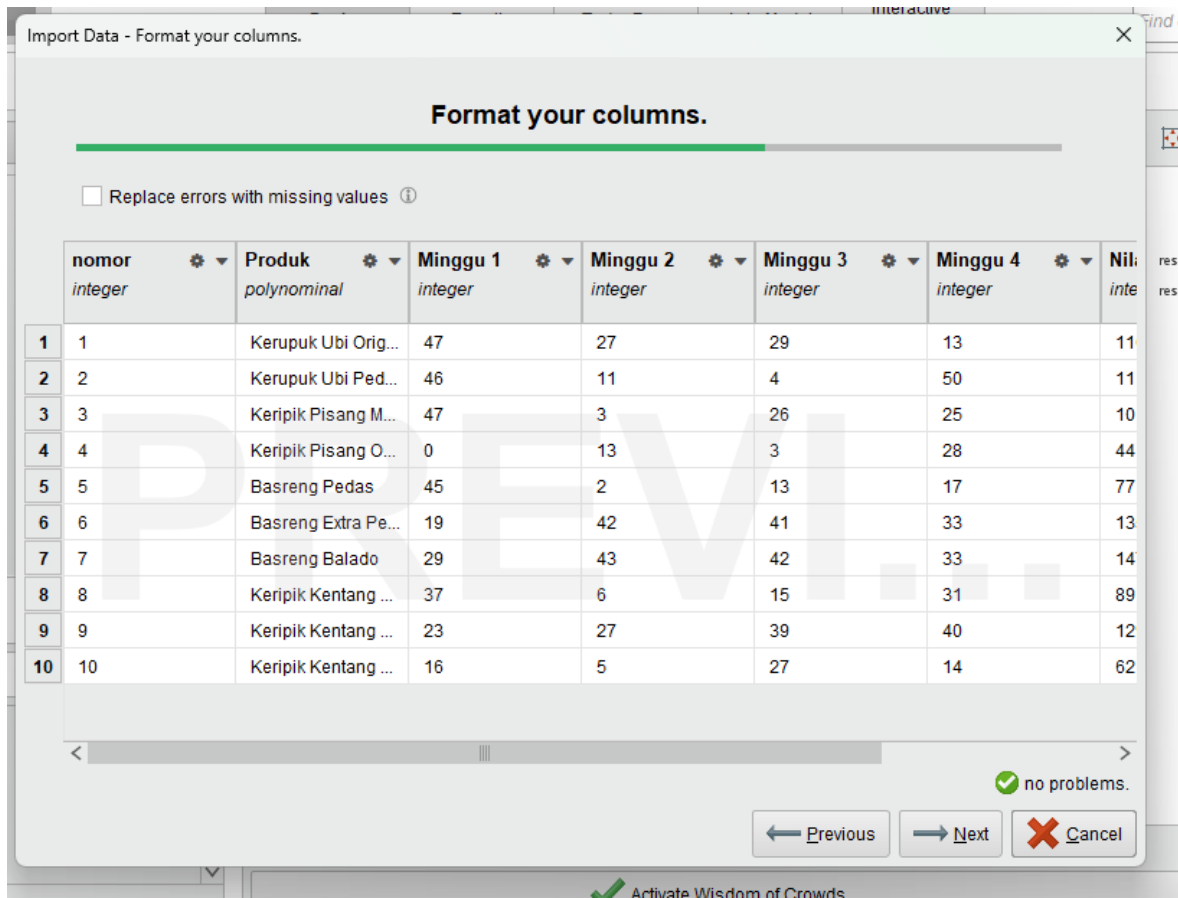

Fig 3. Format Data

After determining the table format, the next step is to place the data that will be processed later after the data is imported.
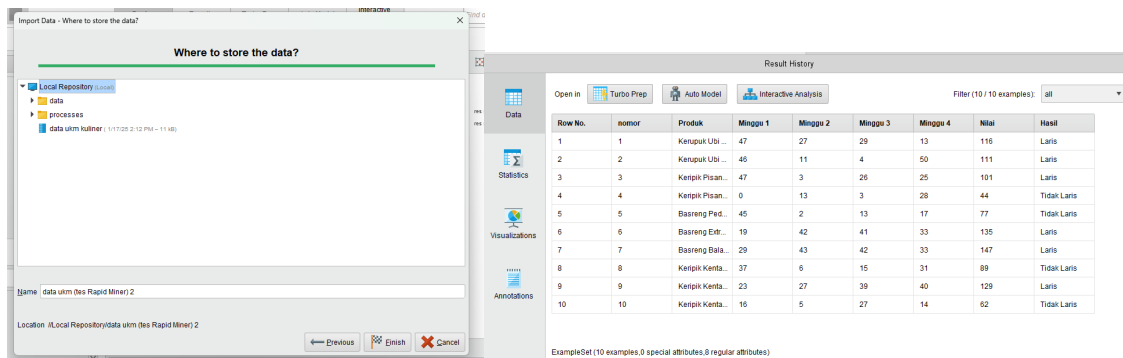

Fig 4 Data location placement

Next, go directly to the Design section of the Rapid miner application. In this design section, we will pull the data that has been uploaded earlier to be processed in rapid miner as shown in the image below
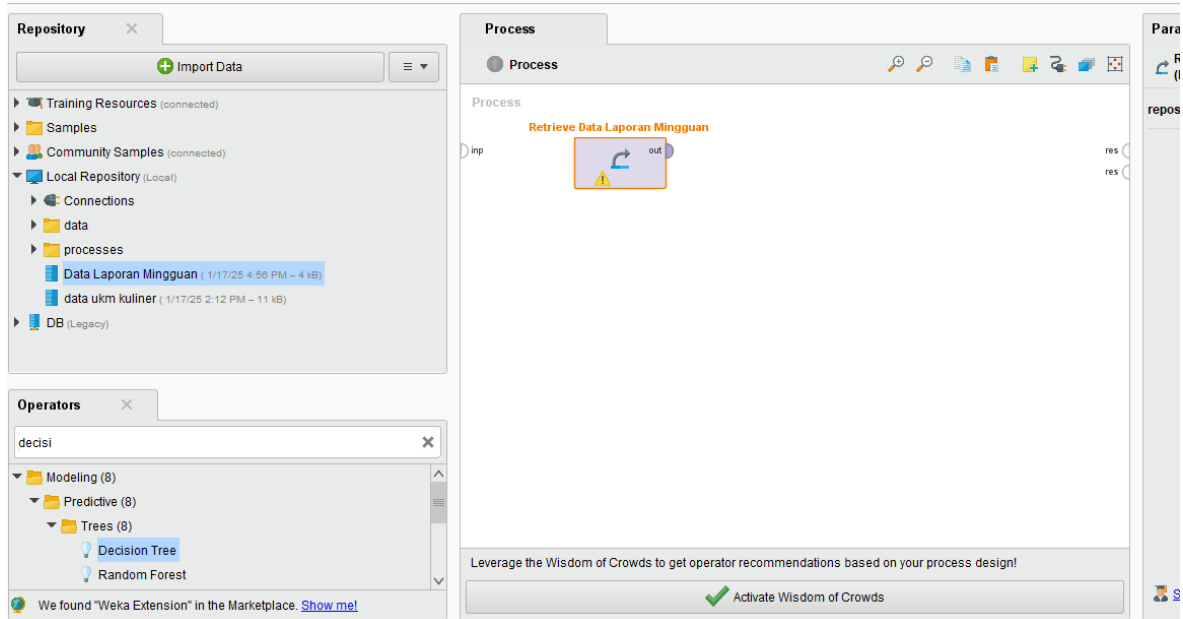
Fig 5 Design Rapid Miner

After it has been entered into the process section, then next please determine the role first in the operator section in rapid miner as shown in the image below.
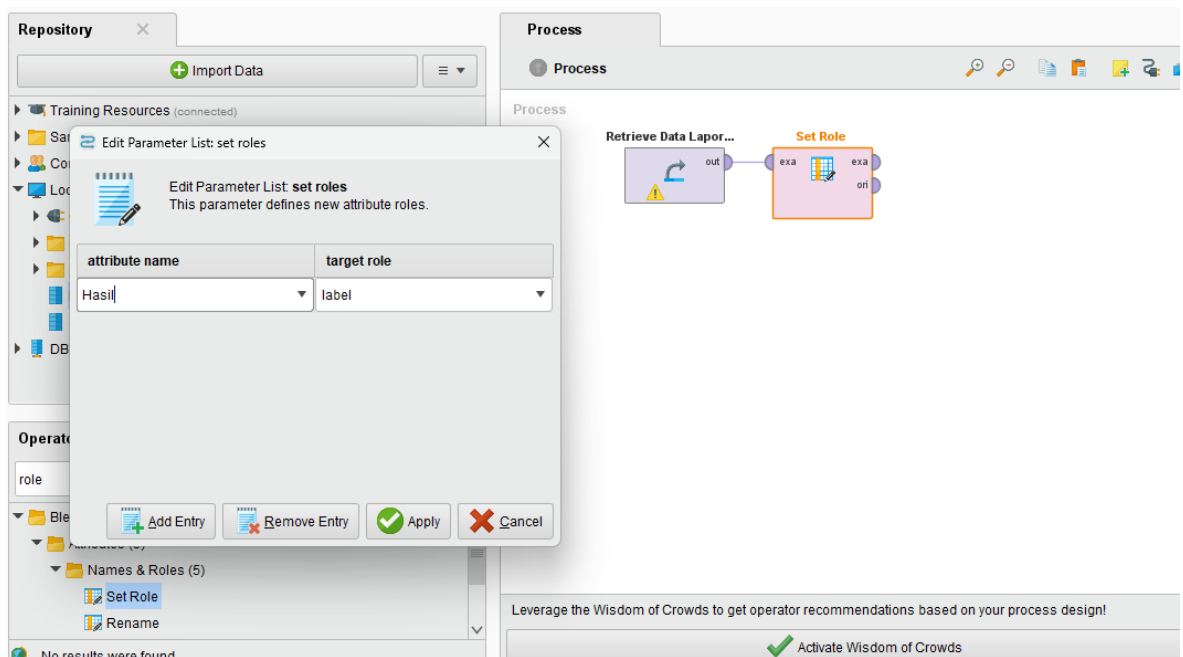

Fig 6 Design Rapid Miner Role

Next, after determining the role on the rapid miner, we immediately type in the operator section to use what algorithm to process the data. As explained earlier, the algorithm used is the Decision Tree algorithm.
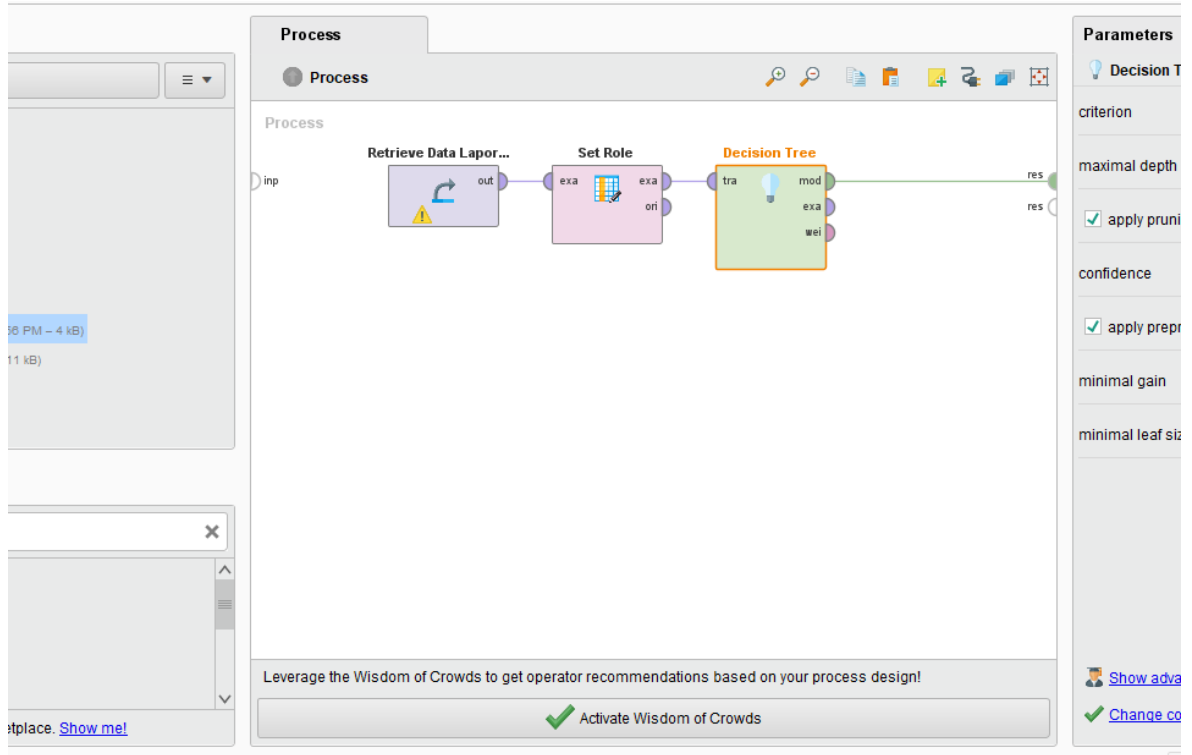
Fig 7 Algorithm Decision Tree

If the algorithm has been determined and the label has also been determined, then the next process is to simply drag the arrow on the algorithm to the res point in the right corner of the process panel. Then immediately click process, then the data will be processed according to the algorithm used. After being successfully processed, the results will come out which give a decision as shown in the image below
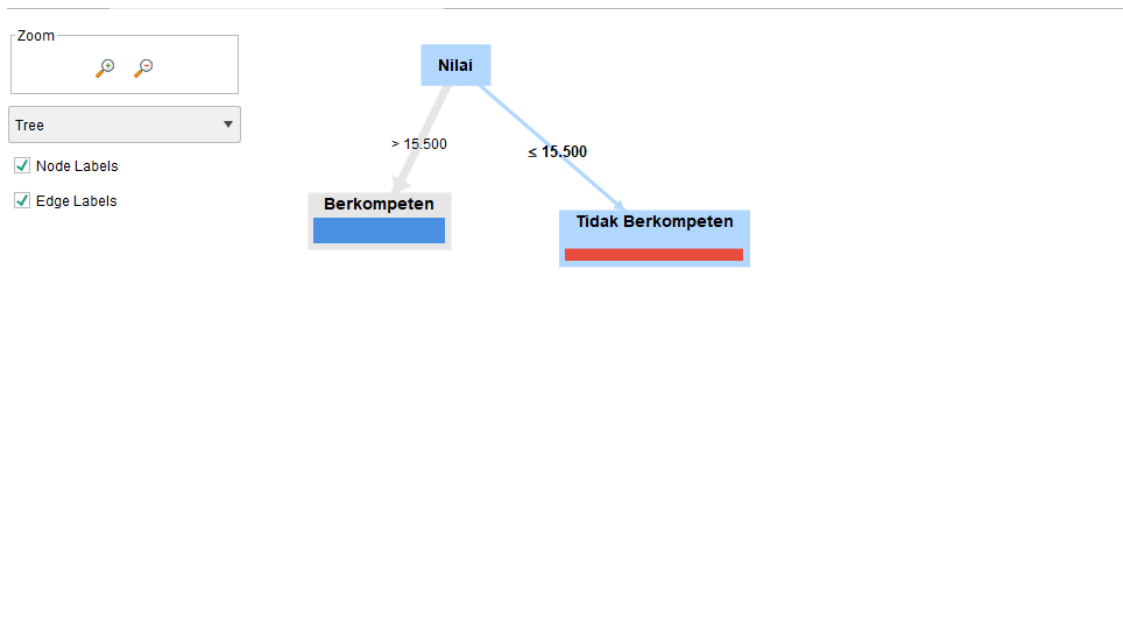

Fig 8 Report

Tree

```
Nilai > 95: Laris {Laris=6, Tidak Laris=0}
Nilai ≤ 95: Tidak Laris {Laris=0, Tidak Laris=4}
```
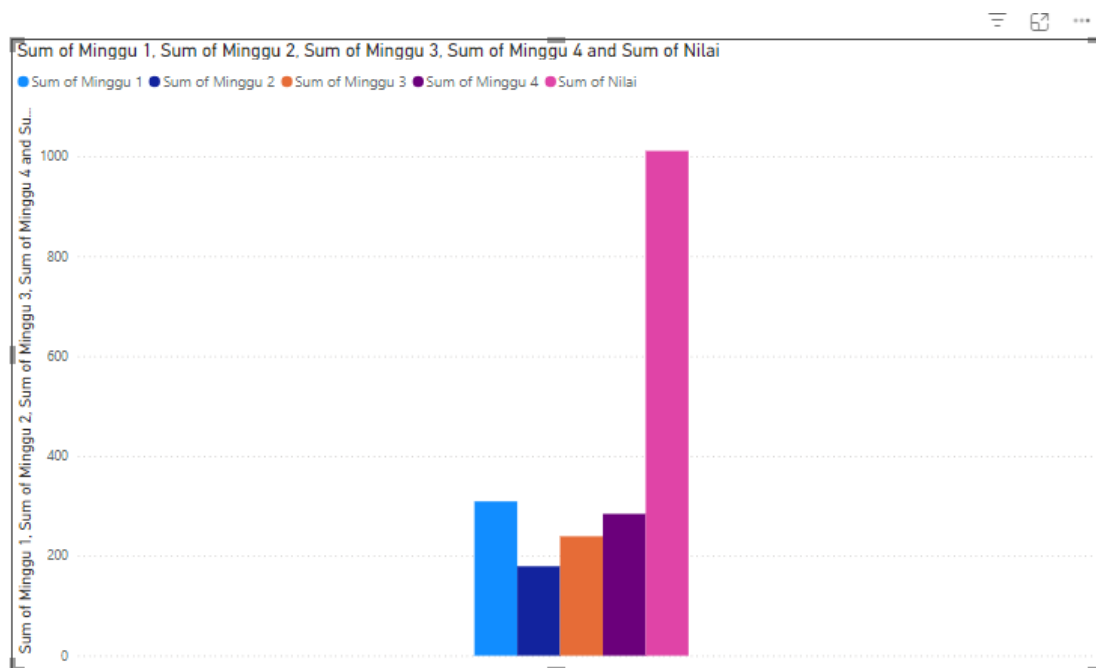
Graph

Description

Annotations

Fig 9 Report

Fig 10 Report

4.   CONCLUSION

This research contributes to the development of science, especially in the field of business and information technology. In addition, this research is also expected to provide practical benefits for MSMEs in Deli Serdang Regency and other areas. Overall, this study provides a clear picture of the importance of sales prediction for MSMEs and how technologies such as BI and Decision Tree algorithms can help in achieving these goals.

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