#### 16

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

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#### 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

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#### 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

	А	В	С	D	E	F	G	Н
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								



#### **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

Impo	port Data - Select the cells to import.										
	Select the cells to import.										
She	Sheet: Sheet1  Cell range: A:H Select All Define header row: 1										
	Α	В	С	D	E	F	G	н			
1	nomor	Produk	Minggu 1	Minggu 2	Minggu 3	Minggu 4	Nilai	Hasil			
2	1.000	Kerupuk Ubi	47.000	27.000	29.000	13.000	116.000	Laris			
3	2.000	Kerupuk Ubi	46.000	11.000	4.000	50.000	111.000	Laris			
4	3.000	Keripik Pisa	47.000	3.000	26.000	25.000	101.000	Laris			
5	4.000	Keripik Pisa	0.000	13.000	3.000	28.000	44.000	Tidak Laris			
6	5.000	Basreng Pe	45.000	2.000	13.000	17.000	77.000	Tidak Laris			
7	6.000	Basreng Ext	19.000	42.000	41.000	33.000	135.000	Laris			
8	7.000	Basreng Bal	29.000	43.000	42.000	33.000	147.000	Laris			
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10	9.000	Keripik Kent	23.000	27.000	39.000	40.000	129.000	Laris			
11	10.000	Keripik Kent	16.000	5.000	27.000	14.000	62.000	Tidak Laris			

Fig 2. Data Collection

				Format you	r columns.			
	nomor integer	errors v	with missing values G Produk	Minggu 1	Minggu 2 🔹 🔻	Minggu 3 🔹 🔻	Minggu 4 🔹 🔻 integer	Nil inte
1	1		Kerupuk Ubi Orig	47	27	29	13	11
2	2		Kerupuk Ubi Ped	46	11	4	50	11
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ŀ	4		Keripik Pisang O	0	13	3	28	44
;	5		Basreng Pedas	45	2	13	17	77
	6		Basreng Extra Pe	19	42	41	33	13
	7		Basreng Balado	29	43	42	33	14
	8		Keripik Kentang	37	6	15	31	89
	9		Keripik Kentang	23	27	39	40	12
D	10		Keripik Kentang	16	5	27	14	62
	<							>

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.

Import Data - Where to store the data? X	Sind a										
Where to store the data?	8					Resul	History				
Local Repository (Local)     Local Adda			Open in 📑	Turbo Prep	Auto Model	📥 Interacti	ve Analysis		Filte	er (10 / 10 examples	): all
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			1	1	Kerupuk Ubi	47	27	29	13	116	Laris
		Σ	2	2	Kerupuk Ubi	46	11	4	50	111	Laris
		Statistics	3	3	Keripik Pisan	47	3	26	25	101	Laris
			4	4	Keripik Pisan	0	13	3	28	44	Tidak Laris
		<b>S</b>	5	5	Basreng Ped	45	2	13	17	77	Tidak Laris
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			8	8	Keripik Kenta	37	6	15	31	89	Tidak Laris
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Lacation /Local Repository/data virm (les Rapid Miner) 2			ExampleSet (10	examples,0 specia	al attributes,8 regula	r attributes)					

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

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Repository ×	Process				Раг
G Import Data	Process		,e ,e 🗎 🖡	🖂 💊 💣 🔛	Ċ
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We found "Weka Extension" in the Marketplace. Show mel		Activate Wisdom of Crow	rds		

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.

Reposit	tory ×		Process	
	🕒 Import Data	≡ ▼	Process	🔎 🔎 🗎 🚺 📿 🔍
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No re	esults were found		Activate Wisdom of C	Crowds

# 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.

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	Leverage the Wisdom of	Crowds to get operator recommended	tions based on your process design	1	Thomas the
×	Leverage the Wisdom of				
stplace. <u>Show me!</u>		Activate Wisdo	om of Crowds		Change co

## 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 9 Report



## Fig 10 Report

# 4 CONCLUSE

**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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