

Sales Prediction at Caffe Resto Omah Lawas Using the Naive Bayes Method

Putra Vira Madya^{1*}, Munif²

^{1,2} Informatics Engineering Study Program, Faculty of Science and Technology,
Islamic University of Lamongan, East Java, Indonesia
putravira45@gmail.com^{1*}, munif@unisla.ac.id²

Abstract

This study discusses the design and implementation of a sales prediction system for Caffe Resto Omah Lawas using the Naïve Bayes method. The objective of this research is to assist business owners in anticipating fluctuations in customer demand, optimizing product inventory, and improving data-driven marketing strategies. The research process includes sales data collection, data preprocessing to clean and prepare the dataset, transformation of numerical attributes into categorical attributes, and dataset splitting into 80% training data and 20% testing data. The system was developed using the PHP programming language and MySQL database and implemented as a web-based application to facilitate accessibility and ease of use. The experimental results show that the proposed system achieved an accuracy of 90%, with excellent performance in the "Best-selling" and "Unsold" classes, while the performance for the "Normal" class was relatively lower. Furthermore, the system provides strategic recommendations based on prediction results, including inventory adjustment, promotional planning, and product development according to customer preferences. Therefore, the implementation of the Naïve Bayes method has proven to be effective as a data-driven decision support tool for sales and marketing management.

Keywords: Data Mining; Naïve Bayes; Sales Prediction; Information System.

1. Introduction

The rapid development of information technology has encouraged businesses to adopt more adaptive, efficient, and data-driven strategies [1]. Digital transformation has not only changed the way companies conduct business processes but also reshaped how data are collected, managed, and utilized as a basis for decision-making. Increasingly intense business competition requires companies not only to improve product quality but also to understand changes in consumer behavior, market dynamics, and evolving demand trends. According to [2], business success is influenced by the ability to improve product quality, diversify products according to customer needs, and adapt to dynamic market changes. Furthermore, the utilization of data as the foundation for decision-making has become increasingly important for improving marketing effectiveness, operational efficiency, and business competitiveness. Decisions based on data analysis tend to be more objective than those relying solely on intuition or managerial experience [3].

One of the major challenges faced by business owners is the inability to accurately predict sales levels. Fluctuations in consumer demand, influenced by changing trends, seasonal factors, purchasing power, and promotional strategies, make sales difficult to forecast [4]. As a result, business owners often encounter difficulties in determining the optimal inventory level to meet market demand. This condition may lead to either overstock or understock, both of which negatively affect business performance. Overstock increases storage costs and the risk of product deterioration, whereas understock may result in lost sales opportunities and decreased customer satisfaction. Therefore, an approach capable of processing historical sales data into accurate and meaningful information is required to support inventory management and marketing decision-making.

One of the approaches widely applied to analyze sales patterns is data mining [5]. Data mining is the process of extracting valuable information from large datasets to discover hidden patterns, relationships, and trends that can support business decision-making. Through this technique, historical sales data can be transformed into useful knowledge for improving business performance. One of the most widely used classification algorithms in data mining is the Naïve Bayes algorithm. This algorithm applies Bayes' Theorem by assuming that each attribute is statistically independent of the others when determining the class of a data instance [6]. Despite this simplifying assumption, Naïve Bayes offers fast computation, ease of implementation, and competitive classification performance, making it suitable for various applications, including sales prediction.

Several previous studies have demonstrated the effectiveness of the Naïve Bayes algorithm in sales prediction. A study conducted by [7] on the prediction of *jumputan* fabric sales achieved an accuracy of 89.47%, indicating that the algorithm was capable of producing predictions close to actual sales conditions. Another study by [8] also reported that the Naïve Bayes method could support marketing

strategy formulation through sales data classification with satisfactory predictive performance. These findings indicate that Naïve Bayes is capable of identifying patterns within historical sales data and generating predictions that support business decision-making. Nevertheless, most previous studies have primarily focused on evaluating the predictive performance of the algorithm without integrating the prediction results into an information system that can be directly utilized by business owners.

Caffe Resto Omah Lawas is one of the culinary businesses experiencing difficulties in estimating future sales for each product. Inventory decisions are currently based mainly on previous sales observations and managerial experience, which may result in discrepancies between stock availability and actual customer demand. Such conditions reduce operational efficiency and may negatively affect customer service quality. Therefore, this study not only applies the Naïve Bayes algorithm as a classification method but also integrates it into a web-based information system that enables business owners to perform sales predictions more efficiently, accurately, and automatically. This study aims to develop a web-based sales prediction system for Caffe Resto Omah Lawas using the Naïve Bayes algorithm. The proposed system is expected to assist business owners in predicting product sales categories based on historical sales data, thereby supporting inventory management, marketing strategy planning, and improving overall operational efficiency.

2. Research Method

2.1. Research Stages

This study employed an implementation-oriented approach by developing a web-based sales prediction system using the Naïve Bayes algorithm. The research began with the collection of historical sales data from Caffe Resto Omah Lawas. Subsequently, a data preprocessing stage was carried out to improve data quality before it was used for the classification process. The processed dataset was then divided into training and testing datasets, followed by the classification process using the Naïve Bayes algorithm. Finally, the model performance was evaluated using the Confusion Matrix method to determine the effectiveness of the proposed classification model.

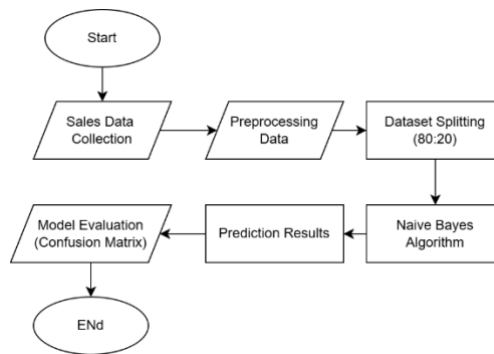


Fig. 1: Research Flowchart

Figure 1 illustrates the research stages applied in developing the sales prediction system using the Naïve Bayes algorithm. The process begins with sales data collection from Caffe Resto Omah Lawas, followed by data preprocessing, which includes data cleaning, attribute selection, and data transformation to ensure compatibility with the classification algorithm. The preprocessed dataset is then split into 80% training data and 20% testing data. The training dataset is used to build the Naïve Bayes classification model, while the testing dataset is used to generate sales predictions. Finally, the model is evaluated using the Confusion Matrix, with performance measured based on accuracy, precision, recall, and F1-score.

2.2. Research Data

The data used in this study consisted of sales transaction records obtained from Caffe Resto Omah Lawas during September 2023. The initial dataset comprised 116 sales records with several attributes, namely product, alternative/variant, group, sold quantity, total sales, total net sales, average QF, and price. However, not all attributes were utilized in the classification process because an attribute selection stage was performed during the data preprocessing phase.

Table 1: Raw Dataset

Product	Alternative/ Variant	Group	Sold Qty	Total Sales	Total Sales (Net)	Average Qf	Price
Penyetan	Bebek	Aneka Penyetan	47	-19000	897000	1.15	19000
Penyetan	Lele	Aneka Penyetan	19	0	285000	1.05	15000
Penyetan	Tahu Tempe	Aneka Penyetan	16	0	160000	1.07	10000
Penyetan	Ayam	Aneka Penyetan	42	0	672000	1.1	16000
Nasi Bebek Mercon		Aneka Penyetan	14	0	266000	1.17	19000
Nasi Bedur		Aneka Penyetan	5	0	88000	1.1	19000
Crispy Banana Tiramisu		Aneka Snack	32	0	546000	1.19	17000
...	...	...	...	...	...	...	...
Espresso		Coffee	3	0	30000	1.2	10000

Vietnam Drip	Coffee	5	0	95000	1.33	1900
Kopi Susu Aren	Coffee	12	0	168000	1.33	1400
						0

Table 1 presents only a portion of the raw dataset as a representative sample of the initial research data. Based on the raw dataset, a preprocessing stage was performed to obtain the attributes required by the Naïve Bayes algorithm, resulting in a dataset suitable for the classification process.

2.3. Data Preprocessing



Fig. 2: Flowchart Preprocessing Data

The preprocessing stage was carried out to improve the quality of the dataset before applying the Naïve Bayes algorithm. This process ensures that the data are valid, consistent, and suitable for the classification model. The preprocessing steps performed in this study are described as follows:

1. **Data Cleaning**
The first step involved removing incomplete, inconsistent, and duplicate records to obtain a valid and reliable dataset for further analysis.
2. **Data Transformation and Attribute Selection**
Numerical attributes were transformed into categorical attributes to meet the requirements of the Naïve Bayes classification algorithm. For example, the price attribute was categorized into predefined price categories, while the sales quantity attribute was classified into three categories: Best-selling, Normal, and Unsold, based on predetermined criteria. Furthermore, an attribute selection process was conducted to retain only the attributes relevant to the classification model. Attributes such as total sales, total net sales, and average QF were excluded because they were not used as input variables in the Naïve Bayes algorithm.
3. **Final Dataset Generation**
The output of the preprocessing stage was a final dataset that was ready to be divided into training and testing datasets for the Naïve Bayes classification process.

Table 2. Dataset

No.	Product Category	Price	Demand	Sales Quality
1	Aneka Penyetan	Normal	Tinggi	47
2	Aneka Penyetan	Normal	Normal	19
3	Aneka Penyetan	Normal	Normal	16
4	Aneka Penyetan	Normal	Normal	20
5	Aneka Penyetan	Normal	Tinggi	53
6	Aneka Penyetan	Mahal	Rendah	2
7	Aneka Penyetan	Normal	Normal	14
8	Aneka Penyetan	Murah	Rendah	4
9	Aneka Snack	Normal	Tinggi	32
10	Aneka Snack	Normal	Rendah	2
...	...	...	...	...
114	Tradisional	Normal	Tinggi	29
115	Tradisional	Normal	Rendah	1
116	Tradisional	Normal	Rendah	3

2.4. Naïve Bayes

The **Naïve Bayes** method was employed to determine the sales category based on the probability value of each attribute. This algorithm calculates the posterior probability of each class using the available training data, and the class with the highest probability is selected as the prediction result. Naïve Bayes is one of the most widely used classification algorithms due to its simple computational process, fast execution time, and competitive performance across various classification problems. Furthermore, the Naïve Bayes algorithm is recognized for its ability to achieve high classification accuracy while maintaining computational efficiency, particularly when applied to large datasets [9]. In general, the probability in the Naïve Bayes algorithm is calculated using Equation (1).

$$P(X) = \frac{P(Y) \cdot P(Y)}{P(X)} \dots\dots\dots(1)$$

Keterangan

1. $P(Y | X)$ posterior probability of class Y given the observed data X ;
2. $P(X | Y)$ likelihood of attribute X given class Y ;
3. $P(Y)$ prior probability of class Y ;
4. $P(X)$ probability of the observed data.

2.5. System Implementation

The proposed system was developed using the PHP programming language with MySQL as the database management system and implemented as a web-based application. The system provides several features, including product data management, sales data management, sales prediction, and prediction result visualization. A web-based implementation was selected to improve accessibility and facilitate integrated sales data management, enabling users to perform sales predictions more efficiently.

2.6. Model Evaluation

Model evaluation was conducted to measure the performance of the Naïve Bayes algorithm in classifying sales data using the prepared testing dataset. The evaluation method employed in this study was the Confusion Matrix, which compares the predicted class labels with the actual class labels to determine the classification performance of the proposed model [10]. The Confusion Matrix was selected because it provides a comprehensive assessment of classification performance by identifying both correct and incorrect predictions, making it one of the most widely used evaluation methods in machine learning and data mining research [11].

Based on the Confusion Matrix, four evaluation metrics were calculated, namely Accuracy, Precision, Recall, and F1-score. Accuracy measures the overall proportion of correctly classified instances, while Precision evaluates the correctness of positive predictions made by the model. Recall measures the model's ability to correctly identify all relevant instances within a particular class, whereas the F1-score represents the harmonic mean of Precision and Recall, providing a balanced evaluation of the model's performance. These evaluation metrics were used to assess the effectiveness of the Naïve Bayes algorithm in predicting sales categories and to determine the feasibility of the proposed system as a decision support tool for sales management at Caffe Resto Omah Lawas [12].

$$Accuracy = \frac{TotalTP}{TotalData} \times 100 \dots\dots\dots(2)$$

$$Precision = \frac{TP}{TP+FP} \dots\dots\dots(3)$$

$$Recall = \frac{TP}{TP+FN} \dots\dots\dots(4)$$

$$F1Score = 2 \times \frac{Precision \times Recall}{Precision + Recall} \dots\dots\dots(5)$$

3. Results and Discussion

3.1. System Implementation

The sales prediction system was successfully developed as a web-based application using the PHP programming language and MySQL as the database management system. The system provides several main features, including an administrator login page, dashboard, product management, sales data management, sales prediction, prediction history, and model accuracy evaluation. The implementation of these features aims to facilitate sales data management while enabling users to obtain prediction results quickly and efficiently through an integrated platform.

During the prediction process, users enter sales data based on the predefined attributes. The system then performs the classification process using the Naïve Bayes algorithm based on the available training dataset. The classification results are presented as one of three sales categories, namely Best-selling, Normal, or Unsold, which can be used as a reference for inventory planning and marketing strategy development.

Figure 3 illustrates the core functionality of the proposed system by demonstrating the implementation of the Naïve Bayes algorithm in the sales prediction process.

Fig. 3: Sales Prediction Page

The Sales Prediction page allows users to enter sales-related attributes that will be processed using the Naïve Bayes algorithm. After the classification process is completed, the system displays the predicted sales category, which can be used to support managerial decision-making. In addition to presenting the prediction results, the system also provides inventory management recommendations based on the predicted category, assisting users in making more effective operational decisions.

#	Produk	Harga	Terjual	Prediksi	Saran	Tanggal
4	Penyetan Belut Aneka Penyetan	Rp. 15.000	34x	Laris	Pertimbangkan untuk menaikkan harga sedikit untuk meningkatkan margin keuntungan dan buat menu premium atau paket eksklusif.	2024-12-07
3	Penyetan Tahu Tempe Aneka Penyetan	Rp. 13.000	50x	Laris	Pertimbangkan untuk menaikkan harga sedikit untuk meningkatkan margin keuntungan dan buat menu premium atau paket eksklusif.	2024-12-06
2	Coffee Latte Coffee	Rp. 15.000	20x	Normal	Pertahankan strategi harga normal dan fokus pada peningkatan kualitas pelayanan untuk mempertahankan pelanggan setia.	2024-12-04
1	Penyetan Belut Aneka Penyetan	Rp. 20.000	1x	Tidak Laris	Turunkan harga sedikit dan lakukan promosi khusus untuk menarik minat pelanggan.	2024-11-19

Fig. 4: Prediction History Page

The Prediction History page displays all previously generated prediction results, allowing users to review and evaluate past classification outcomes for future decision-making.

Produk	Tanggal	Harga	Jumlah Terjual (QTY)	Aktual	Prediksi	Hasil
mur Crispy	-	Rp. 10.000	0	Tidak Laris	Tidak Laris	Benar
mur Crispy	-	Rp. 15.000	21	Laris	Laris	Benar
pozl	-	Rp. 19.000	3	Tidak Laris	Tidak Laris	Benar
pozl	-	Rp. 15.000	79	Laris	Laris	Benar
pozl	-	Rp. 19.000	57	Laris	Laris	Benar
pozl	-	Rp. 19.000	8	Tidak Laris	Tidak Laris	Benar
pozl	-	Rp. 15.000	15	Laris	Normal	Salah
pozl	-	Rp. 15.000	36	Laris	Laris	Benar
pozl	-	Rp. 15.000	22	Laris	Laris	Benar
pozl	-	Rp. 15.000	7	Tidak Laris	Tidak Laris	Benar

Prev 1 2 3 Next

si	91.67%
Tidak Laris : 100.00%	
Normal : 0.00%	
Laris : 100.00%	
Tidak Laris : 100.00%	
Normal : 0.00%	
Laris : 85.71%	
Tidak Laris : 100.00%	
Normal : 0.00%	
Laris : 92.31%	
24	

Fig. 5: Accuracy Evaluation Page

The Accuracy Evaluation page presents the performance evaluation results of the classification model using the Confusion Matrix. This page provides information regarding the classification performance of the Naïve Bayes algorithm, enabling users to assess the effectiveness of the proposed prediction model.

3.2. Model Evaluation Results

The proposed model was evaluated using the testing dataset, which had previously been separated from the training dataset with a composition of 80% training data and 20% testing data. The model performance was assessed using the Confusion Matrix, from which the Accuracy, Precision, Recall, and F1-score metrics were calculated to evaluate the effectiveness of the classification model.

Table 3. Confusion Matrix

<i>Actual \ Predicted</i>	Laris	Normal	Tidak Laris	Total Actual
Laris	10	2	0	12
Normal	0	0	0	0
Tidak Laris	0	0	8	8
Total Predicted	10	2	8	20

Based on Table 3, the values of Accuracy, Precision, Recall, and F1-score were obtained, as presented in Table 4.

Table 4. Confusion Matrix Performance Metrics

Metric	Nilai
Accuracy	90%
Precision	100%
Recall	83%
F1 Score	91%

The experimental results indicate that the proposed Naïve Bayes model achieved an accuracy of 90%, demonstrating that the majority of the testing data were correctly classified according to their respective sales categories. These findings indicate that the Naïve Bayes algorithm is capable of building an effective classification model for sales prediction at Caffe Resto Omah Lawas. In addition to the high accuracy, the evaluation results reveal that the proposed model performed well in classifying the Best-selling and Unsold categories. However, the performance for the Normal category was relatively lower than that of the other categories. This finding suggests that the characteristics of the Normal category overlap with those of the other classes, making it more challenging for the model to distinguish this category accurately.

3.3. Discussion

The findings demonstrate that the Naïve Bayes algorithm can be effectively applied as a classification method for predicting sales categories based on historical sales data. The achieved 90% accuracy indicates that the algorithm is capable of identifying relationships among the selected attributes and generating prediction results that closely reflect actual sales conditions. Consequently, the developed system can support managerial decision-making, particularly in inventory planning and the formulation of more effective marketing strategies.

The results obtained in this study are consistent with those reported by [7] who achieved an accuracy of 89.47% in predicting fabric sales using the Naïve Bayes algorithm. This similarity indicates that the Naïve Bayes algorithm provides reliable and consistent performance across different sales prediction scenarios. Likewise, [8] demonstrated that the Naïve Bayes algorithm can support marketing strategy development through sales data classification. These findings further confirm that Naïve Bayes is an effective classification technique for supporting data-driven decision-making in business environments. The implementation of the proposed web-based system provides additional practical value by enabling users to perform sales predictions automatically without requiring manual calculations. Business owners only need to input sales-related data, after which the system generates prediction results that can be used to determine appropriate inventory levels, minimize the risks of overstock and understock, and improve overall operational efficiency.

The high classification accuracy achieved in this study is influenced by the selected attributes, namely product category, price, and demand level, which effectively distinguish sales patterns across different categories. Nevertheless, the classification performance for the Normal category remains relatively lower because its characteristics overlap with those of the Best-selling and Unsold categories, making it more difficult for the algorithm to accurately differentiate this class. These findings also support previous studies which reported that prediction systems are capable of assisting business owners in planning inventory more effectively. The availability of prediction results enables decision-makers to anticipate product demand, reduce the risk of overstock and understock, and improve operational efficiency. Therefore, the implementation of predictive models in business information systems offers practical benefits beyond algorithmic performance alone [13]. The study further reported that the Linear Regression method achieved better predictive performance than the Weighted Moving Average method for the sales dataset used, indicating that different predictive approaches may produce different levels of performance depending on data characteristics [14].

4. Conclusion

This study successfully developed a web-based sales prediction system for Caffe Resto Omah Lawas using the Naïve Bayes algorithm. The proposed system was developed through several stages, including sales data collection, data preprocessing, dataset splitting into 80% training data and 20% testing data, classification using the Naïve Bayes algorithm, and model evaluation using the Confusion Matrix. The implemented system enables users to automatically predict sales categories and serves as a decision support tool for inventory management and marketing strategy planning.

Based on the experimental results, the proposed Naïve Bayes model achieved an accuracy of 90%, indicating its effectiveness in classifying sales data at Caffe Resto Omah Lawas. Furthermore, the Precision, Recall, and F1-score values demonstrate strong performance in classifying the Best-selling and Unsold categories, although the performance for the Normal category can still be improved. Overall, the findings suggest that the Naïve Bayes algorithm is a suitable approach for historical sales prediction and can effectively support data-driven decision-making in the culinary business sector.

Acknowledgments

With a heart full of gratitude, the author offers praise to Allah SWT for His grace and blessings, enabling the successful completion of the thesis titled "Sales Prediction at Caffè Resto Omah Lawas Using the Naive Bayes Method." Appreciation is also extended to the author's parents and thesis supervisor for their guidance and direction throughout the preparation of this work, as well as to fellow Informatics Engineering students from the Class of 2020 for their encouragement and support both in terms of effort and ideas. Finally, the author wishes to express sincere thanks to the owner of Caffè Resto Omah Lawas for their support and cooperation in providing the necessary data, information, and the opportunity to conduct this research.

References

- [1] I. Annisa, Y. Arsini, N. F. Yasdiana, R. Afito, and N. Jannah, "Digitalisasi Marketing Dalam Mengembangkan Usaha Berbasis Teknologi di Desa Batu Karang Kecamatan Payung Kabupaten Karo," *J. Publ. Sist. Inf. dan Manaj. Bisnis*, vol. 5, no. 1, pp. 29–40, 2026, doi: doi.org/10.55606/jupsim.v5i1.5855.
- [2] Andre and S. Widiatmodjo, "PENGARUH DIVERSIFIKASI PRODUK, INOVASI PRODUK, PENETRASI PASAR, DAN CITRA MEREK TERHADAP KINERJA PERUSAHAAN FAST-MOVING CONSUMER GOODS DI INDONESIA," *J. Manaj. Bisnis Dan Kewirausahaan*, vol. 9, no. 2, pp. 265–279, 2024.
- [3] R. D. T. Haryana and G. D. Prayogi, "NEUROACCOUNTING DAN PENGAMBILAN KEPUTUSAN KEUANGAN: BUKTI EMPIRIS PADA UMKM KULINER DI JAWA TIMUR," *Curr. J. Kaji. Akunt. dan Bisnis Terkini*, vol. 6, no. 3, pp. 538–559, 2025, doi: [10.31258/current.6.3.538-558](https://doi.org/10.31258/current.6.3.538-558).
- [4] C. Chandra, E. A. L. F. A. Hubeis, M. K. S. F. Kurniawan, and Nurhayati, "FLUKTUASI PERMINTAAN PER KUARTAL PERUSAHAAN FMCG," *Integr. Perspect. Soc. Sci. J.*, vol. 2, no. 2, pp. 2120–2129, 2023.
- [5] R. M. Sari and Y. A. M., "Data Mining Untuk Memprediksi Penjualan," *J. Minfo Polgan*, vol. 14, no. 2, pp. 3164–3172, 2025, doi: <https://doi.org/10.33395/jmp.v14i2.15690> e-ISSN.
- [6] K. B. Tani, Y. Pius, K. Kelen, K. Jumarto, and T. Seran, "PENERAPAN ALGORITMA NAIVE BAYES UNTUK MEMPREDIKSI KEHADIRAN MASYARAKAT DALAM PEMILIHAN KEPALA DAERAH STUDI KASUS DESA MATABESI," *Zo. J. Sist. Inf.*, vol. 7, no. 2, pp. 664–675, 2025, doi: <https://doi.org/10.31849/nwpxv71>.
- [7] M. Juanda Saputra and M. Izman Herdiansyah, "Penerapan Naive Bayes Dalam Memprediksi Penjualan Dan Persediaan Kain Jumpitan Pada Toko Batiq Colet Tuan Kentang Palembang," *J. Mantik*, vol. 6, no. 2, pp. 2502–2507, 2022.
- [8] M. F. Rozi, R. Siregar, and N. I. Syahputri, "Penerapan Data Mining Menggunakan Metode Naive Bayes Untuk Klasifikasi Data Penentuan Hasil Penjualan Dalam Strategi Pemasaran," *J. Komput. Teknol. Inf. dan Sist. Inf.*, vol. 2, no. 2, pp. 444–454, 2023, doi: [10.62712/juktisi.v2i2.137](https://doi.org/10.62712/juktisi.v2i2.137).
- [9] R. Fahlapu and Y. Rianto, "Twitter Comment Predictions on Dues Changes BPJS Health In 2020," *Sinkron*, vol. 5, no. 1, p. 170, 2020, doi: [10.33395/sinkron.v5i1.10588](https://doi.org/10.33395/sinkron.v5i1.10588).
- [10] M. Yazid, N. Rafif, B. Priyatna, F. Nurapriani, and B. Huda, "PEMBAYARAN UKT MAHASISWA MENGGUNAKAN ALGORITMA K-NEAREST NEIGHBOR (STUDI KASUS UBP KARAWANG)," *JATI (Jurnal Mhs. Tek. Inform.)*, vol. 10, no. 3, pp. 4940–4947, 2026, doi: <https://doi.org/10.36040/jati.v10i3.18444>.
- [11] E. Nirmala, *METODE KLASIFIKASI MODERN DALAM MACHINE LEARNING MENGGUNAKAN PYTHON*, 2026th ed. Media Pustaka Indo, 2026.
- [12] P. S. Dewi, C. K. Sastradiprja, and D. Gustian, "Sistem Pendukung Keputusan Kenaikan Jabatan Menggunakan Metode Algoritma Naïve Bayes Classifier," *J. Teknol. dan Inf.*, vol. 11, no. 1, pp. 66–80, 2021, doi: [10.34010/jati.v11i1.3593](https://doi.org/10.34010/jati.v11i1.3593).
- [13] M. A. Firdaus, M. Sholihin, and Munif, "Implementasi Weighted Moving Average Berbasis Web Untuk Prediksi Ikan Gabus Dan Mujaer (Studi Kasus Pasar Kiringan)," *J. SHIFT*, vol. 6, no. 1, pp. 24–34, 2026, doi: <https://doi.org/10.24252/shift.v6i1.225>.
- [14] G. Dhias and A. Adiyatma, "Product Sales Prediction System at Starmart Using Linear Regression and Weighted Moving Average Methods," *J. Ilm. Sist. Inf.*, vol. 4, no. 3, pp. 1–21, 2025, doi: <https://doi.org/10.51903/g260jt34>.