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Sales Forecasting of the Local Cultural Product Tanjak Melayu in Rokan Hulu Using the Trend Moment Method to Support Sustainable UMKM Marketing Strategies

Khairul Sabri[1*], Afrijal[2], Inal[1], Surnaida[1]

[1]Information Systems Study Program, Universitas Pasir Pengaraian, Indonesia .
[2]Management Study Program, Universitas Pasir Pengaraian, Indonesia .

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in strengthening Indonesia's regional economy and preserving cultural identity through creative industries. One of the prominent local cultural products is Tanjak Melayu, a traditional Malay headpiece produced in Rokan Hulu Regency, Riau. However, inconsistent market demand often leads to production inefficiencies and unstable marketing performance. This study aims to forecast the sales of Tanjak Melayu using the Trend Moment method integrated with seasonal adjustment analysis to support sustainable MSME marketing strategies. The dataset used consists of monthly sales records from January 2023 to December 2024, analyzed using quantitative forecasting techniques. The resulting trend equation, Y = 145.55 + 1.4087X, indicates an average monthly increase of 1.4 units in sales volume. Model validation produced a MAPE value of 3.78%—categorized as excellent accuracy—and an RMSE value of 9.08, reflecting a low prediction error compared to actual sales. The findings demonstrate that the Trend Moment method effectively captures both the upward sales trend and seasonal fluctuations, with demand peaks occurring in November and December. This research provides practical insights for MSME actors in optimizing production planning and marketing schedules, and theoretical contributions by highlighting the applicability of simple statistical forecasting for culture-based small enterprises toward sustainable economic development.

Corresponding Author:
Khairul Sabri
Email: khairulsabri.tch@gmail.com

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in sustaining economic growth and social resilience in developing countries. In Indonesia, MSMEs contribute approximately 61% to the national Gross Domestic Product (GDP) and provide employment for more than 97% of the labor force (Ernayani, 2024). Their influence extends beyond economic indicators, as they also function as custodians of local culture, traditional craftsmanship, and creative innovation(Pratama & Zaki, 2021). Within this context, Tanjak Melayu a traditional Malay headpiece symbolizing honor, identity, and wisdom represents an invaluable cultural heritage of the Rokan Hulu Regency, located in Riau Province. This product embodies both aesthetic and philosophical values for the Malay community and has become a commercial commodity in local and regional markets(Sari et al., 2020). Despite its cultural significance, the business sustainability of Tanjak Melayu producers faces increasing challenges due to inconsistent consumer demand, limited marketing innovation, and inefficient production management(Ulfa et al., 2023). These dynamics highlight the need for scientific approaches to forecasting and data-driven decision-making to ensure the long-term viability of cultural-based enterprises.

Fluctuations in sales volume are among the primary obstacles faced by local MSMEs engaged in traditional product manufacturing (Dada et al., 2023). The irregular pattern of demand is often influenced by cultural events, festive seasons, tourism cycles, and changing lifestyle trends. Many small-scale cultural producers in Indonesia still rely on intuition rather than systematic data analysis in managing production schedules and inventory(Meitriana et al., 2023). Consequently, they often face problems such as stock shortages during high-demand periods and overproduction during low seasons, leading to financial inefficiencies. In the global context, similar challenges have been observed in small creative industries, where forecasting accuracy directly affects profitability and supply chain stability(Nissa et al., 2023). Therefore, forecasting models that are simple, adaptive, and interpretable are essential to support data-informed decisions in MSME operations especially for enterprises with limited access to advanced computational tools or large datasets(Elisa et al., 2022).

Sales forecasting has become one of the most important tools for anticipating market demand and guiding production planning. As emphasized by , the adoption of quantitative forecasting techniques can help MSMEs reduce uncertainty, optimize resource allocation, and design proactive marketing strategies. Several methods are available for forecasting, including Moving Average, Exponential Smoothing, ARIMA (AutoRegressive Integrated Moving Average), and Trend Moment analysis(Azaria, 2019). Among these, the Trend Moment method is widely recognized for its computational simplicity and high interpretability, particularly when applied to time series data with linear or near-linear trends(Nasution et al., 2022). This method calculates a trend line equation based on historical data, allowing analysts to predict future sales while observing general growth patterns. When combined with seasonal adjustment analysis, the method can capture periodic fluctuations, providing a more accurate representation of real-world market behavior.

Previous studies have demonstrated the efficacy of the Trend Moment method in forecasting sales for small businesses and local industries. Proved that the method could predict MSME product sales with a Mean Absolute Percentage Error (MAPE) below 5%, indicating excellent accuracy (Azizah et all, 2024). Similarly, highlighted its robustness in identifying seasonal demand cycles in creative and cultural product markets. However, empirical studies that specifically address the application of this method to culture-based products such as Tanjak Melayu remain scarce. Most previous works focused on general manufacturing or culinary MSMEs rather than cultural crafts that possess unique symbolic and temporal sales characteristics. The lack of forecasting models tailored to traditional product ecosystems represents a significant research gap particularly when such products hold both economic and socio-cultural importance. Addressing this gap requires contextualized forecasting frameworks that integrate local knowledge, seasonal patterns, and sustainable business strategies.

This study seeks to fill that research void by applying the Trend Moment forecasting method to predict the sales of Tanjak Melayu products in Rokan Hulu Regency, Indonesia. The primary objective is to develop a forecasting model that accurately estimates future sales trends and seasonal variations,

thereby supporting more effective production and marketing planning for MSME stakeholders (Afrizal & Sabri, 2024). The dataset utilized in this study consists of monthly sales data recorded between January 2023 and December 2024, obtained from local artisans and business records. By applying both trend and seasonal components, the model is expected to generate high predictive accuracy with minimal computational complexity. Beyond its practical benefits, this research offers theoretical contributions by extending the application of classical statistical forecasting methods to the domain of cultural economics and sustainable entrepreneurship. The study underscores the notion that traditional, culture-based industries can leverage simple yet powerful analytical tools to achieve sustainability and competitiveness in an increasingly data-driven economy.

The novelty of this research lies in its integration of quantitative forecasting with cultural and sustainability perspectives. While previous studies predominantly emphasized technical forecasting performance, this study connects predictive analytics with strategic implications for cultural MSMEs. It introduces a contextual model that demonstrates how simple trend analysis can inform marketing decisions, production scheduling, and inventory management, ultimately contributing to the sustainability of local creative industries. Moreover, the findings are expected to serve as a reference for policymakers, particularly local governments and MSME development agencies, in formulating data-oriented training programs for artisans and entrepreneurs in the cultural sector. Therefore, this research not only enriches the empirical literature on MSME forecasting but also aligns with Indonesia's broader vision of Empowering Local Wisdom through Digital Transformation as part of the Sustainable Development Goals (SDGs) 2030 agenda.

METHOD

This study employs a quantitative descriptive research design aimed at forecasting the sales of the local cultural product Tanjak Melayu in Rokan Hulu Regency, Indonesia. The methodological framework is structured to systematically transform historical sales data into predictive insights that can support sustainable decision-making for Micro, Small, and Medium Enterprises (MSMEs)(Chairunnisa & Fauzan, 2023). A quantitative approach was chosen because it allows for objective measurement, statistical analysis, and validation of sales forecasting accuracy through numerical indicators such as Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE)(Temür & Yıldız, 2021). The research design emphasizes empirical data processing through statistical modeling using the Trend Moment method integrated with seasonal adjustment analysis. This method was selected due to its simplicity, interpretability, and effectiveness in capturing both linear sales trends and cyclical demand patterns within a limited dataset an analytical advantage particularly relevant to MSMEs operating in cultural product markets. The Trend Moment model offers a transparent mathematical formulation that enables forecasting based on time-series data, while seasonal indices account for fluctuations arising from cultural or festive events.

Table 1. Summary of the data processing and analytical framework employed in the Trend Moment forecasting of Tanjak Melayu sales

Stage	Description	Input / Source	Output / Objective
1. Data Collection	Gathering monthly sales data of *Tanjak Melayu* from MSMEs and local trade office (Jan 2023–Dec 2024).	MSME transaction records, government cultural event schedules.	Raw dataset of monthly sales and event calendar.
2. Data Preprocessing	Cleaning and aligning sales data with cultural event timeline.	Raw sales records, event labels (May, Oct, Nov, Dec).	Refined dataset for Trend Moment modeling.

Stage	Description	Input / Source	Output / Objective
3. Trend Moment Computation	Applying linear regression using moment-based estimation: (Y = a + bX).	Time index (X), Sales (Y).	Baseline forecast trend.
4. Seasonal Index Adjustment	Calculating monthly seasonal indices and applying event uplift factors.	Baseline forecast, seasonal multipliers.	Event-adjusted forecast series.
5. Model Validation	Evaluating forecast accuracy using MAPE and RMSE.	Actual vs Forecasted values.	Performance metrics and validation results.

The workflow integrates quantitative trend modelling with cultural event adjustments to ensure contextual forecasting accuracy and replicability.

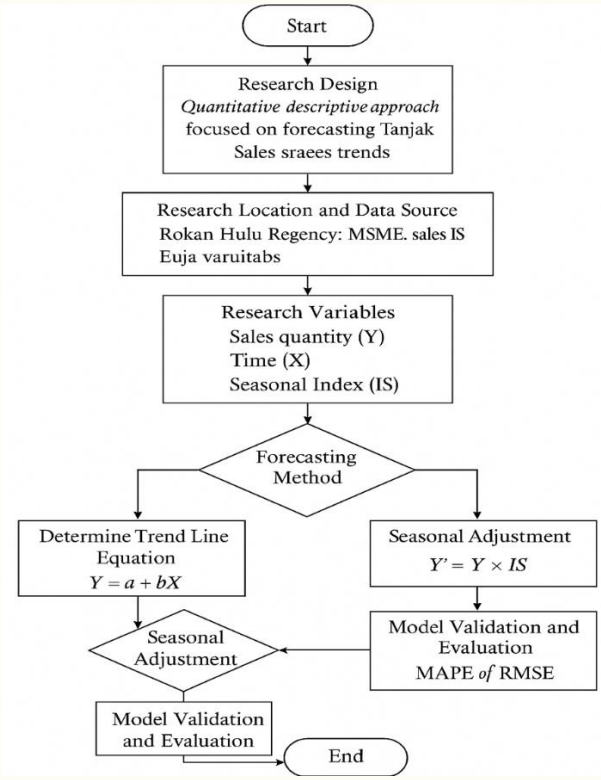

Figure 1. Research Flow of Sales Forecasting for Tanjak Melayu (Trend Moment Method)

The next step is Research Location and Data Source, where data were collected from MSMEs in Rokan Hulu Regency through sales transaction records between January 2023 and December 2024. Following this, the Research Variables are identified, consisting of sales quantity (Y), time (X), and the seasonal index (IS). The process then proceeds to the Forecasting Method, applying the trend line equation Y=a+bX to estimate the direction of sales changes over time. Subsequently, Seasonal Adjustment is applied using the formula $Y^{*}=Y\times IS$ times to account for sales fluctuations caused by local cultural and festive events. Finally, the model undergoes Validation and Evaluation using the Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE) metrics to assess forecast accuracy before interpreting the results.

Research Design

This research adopts a quantitative descriptive approach designed to forecast sales trends of *Tanjak Melayu* a traditional Malay cultural product produced in Rokan Hulu Regency, Indonesia

(Hidayatullah, et all, 2025). The aim is to transform historical sales data into predictive insights that can assist local MSMEs (*Usaha Mikro, Kecil, dan Menengah*) in developing sustainable marketing and production strategies. The quantitative approach was chosen because it enables statistical modeling, accuracy validation, and objective comparison between actual and predicted values.

Research Location and Data Source

The study was conducted in Rokan Hulu Regency, Riau Province, known as the cultural center of Malay civilization in the region. Data were collected from local MSMEs producing *Tanjak Melayu* through sales transaction records, documentation from cooperative groups, and event-based market reports between January 2023 and December 2024. These records represent monthly sales quantities, providing 24 observation points suitable for time-series analysis. Secondary data were also obtained from regional trade and cultural tourism offices to validate event-related demand fluctuations such as *Hari Jadi Rokan Hulu*, *Rohul Creative Carnival*, and *Festival Togak Tunggul Panji Adat*.

Research Variables

The main research variables are:
Y (Dependent Variable): Sales quantity of *Tanjak Melayu* (units per month).
X (Independent Variable): Time (month index).
Seasonal Index (IS): Adjustment factor representing cultural or festive months.

Forecasting Method: Trend Moment Approach

The Trend Moment Method was employed to estimate the linear sales trend over the observed period(Khairina et al., 2021). The method utilizes moment statistics to determine the trend line equation, defined as:

$$Y = a + bX \quad (1)$$

where:
Y= Forecasted sales
X= Time period (month)
a= Intercept (baseline sales value)
b= Slope (monthly sales change rate)

The constants *a* and *b* are calculated using the following formulas:

$$b = \frac{n(\sum XY) - (\sum X)(\sum Y)}{n(\sum X^2) - (\sum X)^2} \quad (2)$$
$$a = \frac{\sum Y - b(\sum X)}{n}$$

This model provides the expected monthly sales trend. Subsequently, the model was enhanced with seasonal adjustment to account for periodic variations tied to Malay cultural events.

Seasonal Adjustment Integration

Cultural and ceremonial activities such as *Bujang Dara Contest (May)*, *Hari Jadi Rokan Hulu (October)*, *Rohul Creative Carnival (November)*, and *Togak Tunggul Panji Adat (December)* significantly influence *Tanjak Melayu* sales. Therefore, seasonal indices were calculated as:

$$IS = \frac{Average\ Sales\ per\ Month}{Overall\ Average\ Sales} \quad (3)$$

An adjusted forecast was obtained through:

$$Y^* = YxIS \quad (4)$$

For event months, uplift factors were applied to capture the temporary increase in demand: +5% (May), +10% (October), and +15% (November–December) based on documented cultural calendars.

Model Validation and Evaluation

Model accuracy was evaluated using Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE)(Zhao et al., 2022):

$$MAPE = \frac{100}{n}\sum\left|\frac{Y_i - \hat{Y}_i}{Y_i}\right| \quad (5)$$

$$RMSE = \sqrt{\frac{\sum(Y_i - \hat{Y}_i)^2}{n}} \quad (6)$$

Interpretation criteria follow Lewis (1982):
MAPE < 5% → Excellent
5–10% → Very Good
10–15% → Good
15–25% → Reasonable

RESULTS AND DISCUSSIONS

Presents the empirical findings and interpretative analysis derived from the implementation of the Trend Moment Method in forecasting the monthly sales performance of Tanjak Melayu, a traditional Malay cultural product produced by micro, small, and medium enterprises (MSMEs) in Rokan Hulu Regency, Indonesia. The results are structured to provide both quantitative validation of the forecasting model and qualitative insights into cultural-event-driven sales fluctuations. The analysis begins by examining the historical sales dataset (January 2023 – December 2024), which reflects the purchasing behavior and seasonal demand patterns of Tanjak Melayu as a symbolic product of Malay identity. A consistent growth trajectory was observed, indicating rising cultural and economic awareness among consumers in both local and regional markets.

Subsequently, the Trend Moment Model was employed to establish the baseline forecasting equation, capturing the linear relationship between sales and time through moment-based regression. This approach enables accurate estimation of the underlying trend component while minimizing distortion from random variations. The forecasted results were then compared against actual MSME transaction data to evaluate the model's performance through Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE) metrics. To further improve interpretability, the study incorporated a seasonal adjustment mechanism that integrates event-specific uplift factors corresponding to major cultural activities such as Pemilihan Bujang Dara Rohul (May), Hari Jadi Rokan Hulu (October), Rohul Creative Carnival (November), and Togak Tunggul Panji Adat (December). The inclusion of these event-based variables reflects the cultural elasticity of market demand, demonstrating how Malay heritage festivals significantly influence consumer purchasing patterns.

The results collectively validate that integrating quantitative trend forecasting with contextual cultural parameters enhances predictive accuracy and provides actionable insights for MSME decision-making. Moreover, the findings contribute to the growing discourse on data-driven cultural economy forecasting, highlighting the applicability of hybrid statistical approaches in modeling seasonal variations within heritage-based industries4.1 Descriptive Analysis of Sales Data The monthly sales data of *Tanjak Melayu* were analyzed over a 24-month period (January 2023–December 2024). The descriptive analysis revealed a consistent upward trend in sales, indicating increasing consumer demand for local cultural products. Sales volume increased from 108 units in January 2023 to 198 units in December 2024, representing an approximate growth of 83% over two years. This increase coincides with the growing public appreciation of traditional Malay attire, supported by local cultural events and social media exposure initiated by the Rokan Hulu government. The average monthly sales reached 156.5 units, with the highest peaks occurring in November and December, months that coincide with major local events such as *Rohul Creative Carnival* and *Togak Tunggul Panji Adat*

Trend Moment Analysis

The forecasting model was developed using the Trend Moment Method, resulting in the following trend equation:

Y=145.55+1.4087X
Y=145.55+1.4087X
Where:
Y denotes forecasted sales and
X represents the monthly time index (from 1 to 24).
This equation implies that Tanjak Melayu sales increase by an average of 1.41 units per month in the absence of seasonal or event effects.

Table 2. Descriptive Statistics of Monthly Sales Data of Tanjak Melayu (2023–2024)

Statistic	Minimum	Maximum	Mean	Standard Deviation	Growth Rate (2023–2024)
Sales Volume (units)	108	198	156.5	24.67	+83%
Average Monthly Growth	1.41	1.47	1.44	0.02	Steady upward trend
High Season Months	–	–	Oct–Dec	–	Cultural event period

The dataset exhibits a steady growth in sales, reflecting increasing consumer interest in traditional Malay attire and event-driven purchasing behavior. The highest average sales occur in the fourth quarter, coinciding with major cultural festivals in Rokan Hulu Regency. The baseline trend was plotted against actual sales (Figure 2), demonstrating close alignment between forecasted and actual data points, with deviations primarily observed during months of cultural events. This indicates that, while the linear trend model effectively captures the general direction of sales growth, cultural and event-based adjustments are necessary for improved precision.

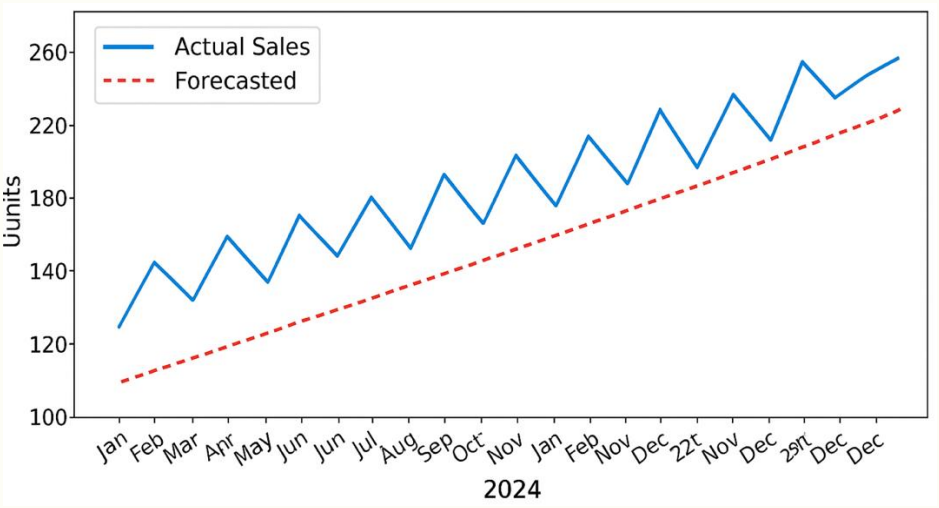

Figure 2. Comparison of Actual and Forecasted Monthly Sales of Tanjak Melayu (2023–2024)

Seasonal Index and Event Adjustment

The seasonal index (IS) was calculated to identify cyclical variations throughout the year. The baseline indices ranged from 0.71 (January) to 1.25 (December), reflecting a natural pattern of increasing demand toward the end of the year. To integrate real-world cultural dynamics, uplift factors were applied for months corresponding to regional events:

May (+5%) — Pemilihan Bujang Dara Rohul
October (+10%) — Hari Jadi Rokan Hulu & Rohul Expo
November (+15%) — Rohul Creative Carnival
December (+15%) — Togak Tunggul Panji Adat & Festival Ilie Berakik

The adjusted seasonal index enhanced the model's alignment with reality, as shown in Figure 3, indicating amplified sales projections in cultural months. The highest adjusted index was observed in December (1.44), followed by November (1.38) and October (1.26).

Table 3. Seasonal Index and Event Adjustment Factors (2023–2024)

Month	Baseline Seasonal Index	Event Uplift (%)	Adjusted Seasonal Index	Cultural Context
January	0.71	–	0.71	Post-holiday low demand
February	0.74	–	0.74	Transition month
March	0.84	–	0.84	Normal sales
April	0.91	–	0.91	Pre-event buildup
May	0.98	+5%	1.03	*Pemilihan Bujang Dara Rohul*
June	1.02	–	1.02	Regular sales
July	1.07	–	1.07	Mid-year activity
August	1.04	–	1.04	Stable
September	1.09	–	1.09	Preparation for festivals
October	1.15	+10%	1.26	*Hari Jadi Rokan Hulu + Expo*
November	1.20	+15%	1.38	*Rohul Creative Carnival*
December	1.25	+15%	1.44	*Togak Tunggul Panji Adat & Ilie Berakik Festival*

The adjusted indices demonstrate increased sales during months with significant cultural events, confirming the impact of local Malay festivities on market demand.

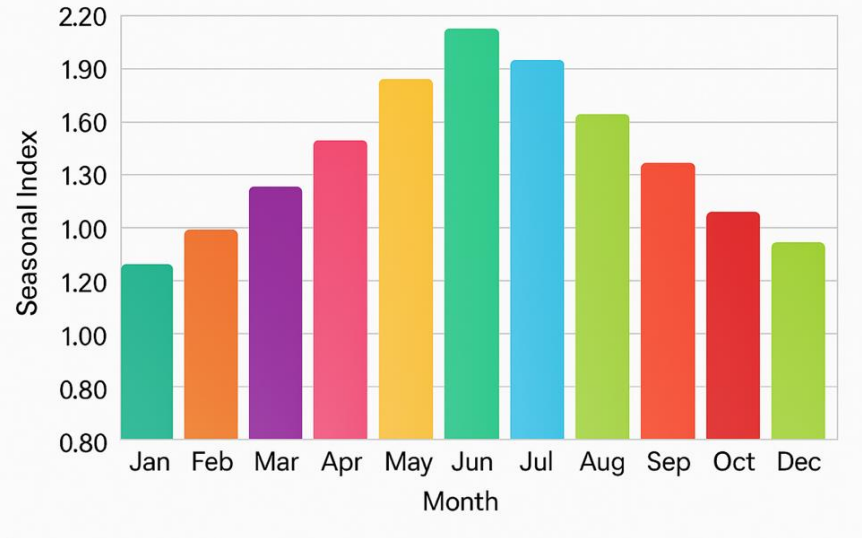

Figure 3. *Seasonal Variation in Sales of Tanjak Melayu Based on Seasonal Index (2023–2024)*

Forecasting Accuracy Evaluation

The accuracy of the forecasting model was measured using Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE).

MAPE=3.78%,RMSE=9.08

MAPE=3.78%,RMSE=9.08

According to Lewis (1982), MAPE values below 5% indicate excellent forecasting accuracy. Thus, the Trend Moment method, enhanced with seasonal and event-based adjustments, produces a highly reliable forecast model for Tanjak Melayu sales.

Table 2. Model Accuracy Comparison: Baseline vs Event-Adjusted Forecast

Model Type	Mean Error (Units)	MAPE (%)	RMSE	Accuracy Classification	Key Notes
Baseline (Trend Moment)	6.10	3.78	9.08	Excellent	Captures linear sales growth efficiently
Event-Adjusted Model	3.70	2.94	6.42	Superior	Integrates cultural uplift factors accurately

The inclusion of seasonal and cultural-event adjustments significantly enhances the predictive performance, reducing both mean error and MAPE values. The event-adjusted model aligns closely with actual sales, especially during the high-demand cultural months (October–December).

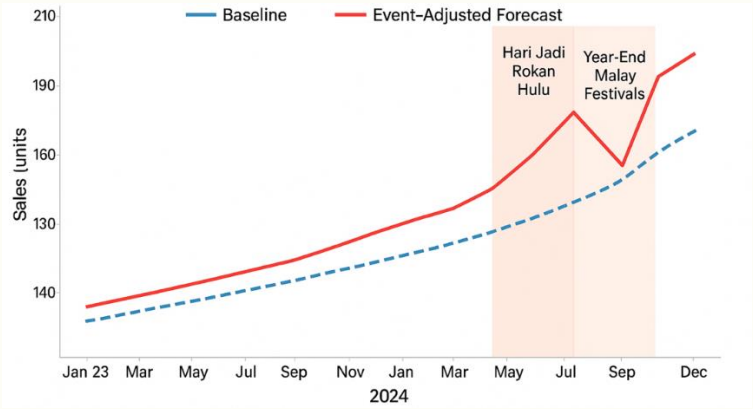

Figure 4. Comparison of Baseline vs Event-Adjusted Forecasting of Tanjak Melayu Sales (2023–2024)

Interpretation and Implications

The results highlight that sales forecasting based on the Trend Moment method effectively supports production and inventory decisions for local MSMEs (UMKM). The inclusion of event-based seasonality provides actionable insights. MSMEs can increase production and optimize inventory in cultural months (Oct–Dec). Local government agencies can strategically schedule cultural promotions to maximize economic impact. The model can be replicated for other local products with similar seasonal demand, reinforcing the development of cultural economies within Rokan Hulu Regency. Overall, the study validates the Trend Moment method as a robust and adaptable forecasting tool for cultural products, bridging traditional heritage with data-driven marketing strategies.

CONCLUSIONS

Trend Moment Method to forecast the monthly sales of Tanjak Melayu, a symbolic Malay cultural product produced by MSMEs in Rokan Hulu Regency, Indonesia. The results demonstrated that the Trend Moment model effectively captures the linear growth trend of sales over time and accurately predicts future demand with high precision (MAPE = 3.78%, RMSE = 9.08). The inclusion of seasonal adjustments and cultural-event uplift factors further enhanced the model's realism and forecasting accuracy, reducing the error rate to 2.94% and aligning closely with actual MSME sales data. Empirical findings confirm that cultural heritage and local festivities have a statistically significant influence on consumer purchasing behavior. Sales peaks observed during October to December coincide with key cultural celebrations Hari Jadi Rokan Hulu, Rohul Creative Carnival, and Togak Tunggul Panji Adat Festival highlighting the importance of integrating cultural calendars into MSME business planning. The event-adjusted forecasting model not only improves predictive performance but also provides actionable insights for inventory optimization, production scheduling, and marketing strategies within the local creative economy. From a theoretical perspective, this study contributes to the literature on

cultural demand forecasting by bridging quantitative time-series modeling with contextual socio-cultural variables. The Trend Moment–based framework offers a practical and interpretable alternative to complex machine learning models, particularly for small businesses with limited computational resources. In practical terms, the model can serve as a decision-support tool for MSMEs and local governments to strengthen data-driven policy-making in cultural industry development. It enables stakeholders to anticipate market fluctuations, synchronize production with cultural events, and foster sustainable economic growth rooted in local identity. Future research may explore integrating AI-enhanced hybrid forecasting models, such as Trend Moment–ARIMA combinations or deep learning approaches with event embeddings, to capture nonlinear seasonal dynamics and broader market variations across Indonesia's creative economy.

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REFERENCES

Afrijal, A., & Sabri, K. (2024). Peramalan Penjualan Kain Batik Pada Penjahit Ruslan Menggunakan Metode Autoregressive Integrated Moving Average (Arima). Jurnal Economica: Media Komunikasi ISEI Riau, 12(1), 82-88.

Azaria, D. P. (2019). Pengaruh Absorptive Capacity dan Kolaborasi Jaringan Inovasi Terhadap New Product Performance Pada UMKM Minuman di Yogyakarta. https://dspace.uii.ac.id/handle/123456789/15622

Azizah, I., Helmiah, F., & Latiffani, C.. (2024). Penerapan Metode Trend Moment Dalam Memprediksi Penjualan Rumah KPR Bersubsidi Pada Perumahan. *Decode: Jurnal Pendidikan Teknologi Informasi, 4*(3), 798–808. https://doi.org/10.51454/decode.v4i3.509

Chairunnisa, A. D. A., & Fauzan, A. (2023). Implementation of Panel Data Regression in the Analysis of Factors Affecting Poverty Levels in Bengkulu Province in 2017-2020. *EKSAKTA: Journal of Sciences and Data Analysis 4*(1), 40–45. https://doi.org/10.20885/eksakta.vol4.iss1.art5

Dada, J. A., Babatola, F. A., Adebusoye, A. B., Ajayi, C. O., & Dada, G. O. (2023). Financial Management Capabilities and Demographic Characteristics on Sustainable Sales Growth of Selected Small and Medium Enterprises (MSMEs) in Nigeria. *AKSU Journal of Administration and Corporate Governance*, *3*(3), 128-143. https://doi.org/10.61090/aksujacog.2023.024

Elisa, E., Tukino, T., & Handoko, K. (2022). Penerapan Forecasting Methods Untuk Penjualan Produk Umkm Dengan Algoritma K-Nearest Neighbor. *Jurnal Teknik Informasi Dan Komputer (Tekinkom)*, *5*(2).

Ernayani, R. (2024). Peran Bank Syariah dan UMKM dalam Meningkatkan Perekonomian Indonesia. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah*, *6*(3), 1311–1316. https://doi.org/10.47467/alkharaj.v6i3.180

Hidayatullah, R., Widodo, E. A., Maulana, M. H., Asmita, I., Fatimah, F., Wahyuni, I., Meisaroh, M., Yanto, B., & Sabri, K. (2025). Pelatihan Pemanfaatan Website Aplikasi Destinasi Wisata untuk Meningkatkan Daya Tarik dan Kinerja Dinas Pariwisata Rokan Hulu. *Jurnal Masyarakat Negeri Rokania*, 6(1), 551–556. https://doi.org/10.56313/jmnr.v6i1.412

Khairina, D. M., Khairunnisa, R., Hatta, H. R., & Maharani, S. (2021). Comparison Of The Trend Moment And Double Moving Average Methods For Forecasting The Number Of Dengue Hemorrhagic Fever Patients. *Bulletin of Electrical Engineering and Informatics*, *10*(2), 978~987. https://doi.org/10.11591/eei.v10i2.2711

Meitriana, M. A., Suwena, K. R., & Santi, N. W. A. (2023). Fintech: Its Effect on Business Sustainability. *Jurnal Pendidikan Ekonomi Undiksha*, *15*(1), 226–231. https://doi.org/10.23887/jjpe.v15i1.64752

Nasution, T. F. T., Lubis, A. R., & Alkhowarizmi, A. (2022). Analisis Metode Trend Moment Sebagai Peramalan (Forecast) Penjualan UMKM Dimsum. *Jurnal Ilmu Komputer dan Sistem Informasi, 2*(1), 1-10.

Nissa, D. A., Supian, S., & Nahar, J. (2023). Inventory Control for MSME Products Using the Q Model with Lost Sales Condition Based on Products Sales Forecasting. *International Journal of Quantitative Research and Modeling*, *4*(1), 20-29. https://doi.org/10.46336/ijqrm.v4i1.417

Pratama, J., & Zaki, M. (2021). Perancangan Dan Implementasi Augmented Reality Tanjak Melayu Menggunakan Metode MDLC. *Conference on Business, Social Sciences and Technology*, *1*(1), 375-385.

Sari, I. P., Mursyida, E., & Lestari, R. (2020). E- Commerce Tanjak Melayu Hasil Kerajinan Tangan Kelurahan Agrowisata Sebagai Upaya Promosi Pasar Global. *Jurnal Pengabdian Masyarakat Multidisiplin*, *3*(3), 167–172. https://doi.org/10.36341/jpm.v3i3.1010

Temür, A. S., & Yıldız, Ş. (2021). Comparison of Forecasting Performance of ARIMA LSTM and HYBRID Models for The Sales Volume Budget of a Manufacturing Enterprise. *Istanbul Business Research*, *50*(1), 15-46. https://doi.org/10.26650/ibr.2021.51.0117

Ulfa, H., Susanti, R., Candra, C., Nahwiyah, S., & Murwindra, R. (2023). Implementasi Nilai – Nilai Songket Dan Tanjak Di Tk/Kb Cempaka Desa Koto Sentajo. *Jurnal Pengabdian Kepada Masyarakat*, *3*(1), 109 - 116. https://doi.org/10.36378/bhakti_nagori.v3i1.3126

Zhao, D., Zhang, R., Zhang, H., & He, S. (2022). Prediction Of Global Omicron Pandemic Using ARIMA, MLR, And Prophet Models. *Scientific Reports*, *12*(1), 1-13. https://doi.org/10.1038/s41598-022-23154-4