JMK (Jurnal Manajemen dan Kewirausahaan)
http://ejournal.uniska-kediri.ac.id/index.php/ManajemenKewirausahaan
JMK 10 (1) 2025, 25-37
P-ISSN 2477-3166 E-ISSN 2656-0771

Utilization of Artificial Intelligence through Value Co-Creation in increasing MSME Sales based on Local product advantages

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Abstract

Micro, Small, and Medium-Sized Enterprises (MSMEs) constitute a significant economic sector in Indonesia, accounting for 97% of the country's workforce and contributing 61.07% of the country's GDP (BPS, 2023). In Lamongan Regency, 120,235 MSMEs contribute to 55.27% of the GDP and 78.49% of the workforce. The objectives of this study are to comprehend the role that AI plays in value co-creation in MSMEs, to pinpoint and examine how AI supports value co-creation, and to create a thorough framework for examining the effects of AI on value co-creation in MSMEs. This study employs an explanatory research paradigm in conjunction with a quantitative technique. The sample studied was 120 respondents, and quantitative data sampling using simple random sampling was then processed using SEM PLS 3.0. The study's findings support the first hypothesis, which states that artificial intelligence improves sales performance. According to the second hypothesis, Value Co-creation can act as a mediator between artificial intelligence and sales performance. According to the third hypothesis, Value Co-Creation improves sales performance. The fourth hypothesis then demonstrates that the relationship between Value Co-Creation and Sales Performance can be moderated by Product Excellence.

Keywords: Artificial Intelligence, Value Co-Creation, Product Advantages, Sales Performance

DOI	:	http://dx.doi.org/10.32503/jmk.
Article History	:	Article received (Oct 12, 2024); revised (Dec 26, 2024); accepted (March 10, 2025)
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Introduction

Micro, Small, and Medium-Sized Enterprises (MSMEs) in Indonesia have enormous potential to maintain economic stability amid global economic challenges and competition, especially from overseas e-commerce and online platforms that are more advanced in digital marketing strategies (Kadeli, et. al., 2023). In 2024, the Ministry of Cooperatives and SMEs will focus on developing the green economy and blue economy, namely aquaculture and agriculture, as well as expanding benefits to young people, women, and people with disabilities. Government, private, and community support is key in improving the competitiveness of MSMEs through training, market access, adoption of artificial intelligence-based technology, and improved regulations. The challenges faced by MSMEs are global economic fluctuations and regulatory changes. Adaptation and innovation are considered the keys to success in dealing with business dynamics. The government targets to integrate 30 million MSMEs into the digital ecosystem by the end of 2024. Based on the National MSME Data Statistics, East Java occupies the 3rd National position with a total of 1,153,576 registered MSME players in the period 2010 - 2023 (Dikopukm Jatim, 2024). The MSME data in East Java Province is depicted in the graph below:

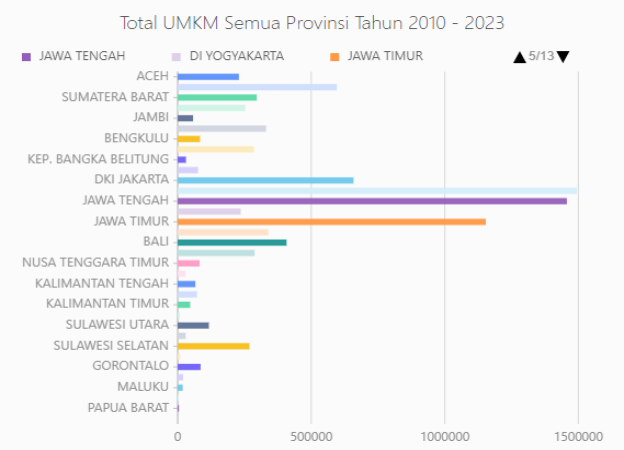

Figure 1. Graph of Number of MSMEs in Indonesia

Small, Micro, and Medium-Sized Enterprises (MSMEs) constitute a significant economic sector in Indonesia, accounting for 97% of the country's workforce and contributing 61.07% of the country's GDP (BPS, 2023). In the Lamongan Regency, 120,235 MSMEs contribute to 55.27% of the GDP and 78.49% of the workforce (Disperindag Lamongan, 2023). The large potential of MSMEs in growing the regional economy makes the Lamongan Regency Government optimize the potential of MSMEs through the application of technology to help the government meet its goals regarding the digital ecosystem.

Currently, the significant digital gap between MSMEs and large corporations makes MSMEs' adoption of AI and value co-creation technology more sluggish (Aulia Azizah A, 2024). Many MSMEs in Indonesia do not yet understand the potential of AI and co-creation as a means of boosting sales (Anggraini, 2020). Limited resources, knowledge, and skills in implementing AI and Value Co-Creation strategies are the main obstacles for MSMEs. Traditional marketing strategies that MSMEs currently rely on, such as print advertisements and

brochures, are considered less effective in reaching a wider target market and increasing sales. Acceleration through the utilization of artificial intelligence technology and innovation through value co-creation will be the solution to improve product excellence and competitiveness of MSMEs.

This research is highly relevant to current and future challenges and needs, particularly about boosting MSMEs' competitiveness and local economic development (Rajguru, K., 2024). With technological advances and digital developments, Artificial Intelligence offers opportunities to improve efficiency and effectiveness in various aspects of business, including marketing and sales. However, the utilization of Artificial Intelligence in the context of MSMEs, especially in increasing sales of local products, still requires further research to understand how Artificial Intelligence can be properly integrated into MSME marketing strategies. In addition, this research also aims to identify and analyze how Artificial Intelligence can facilitate the Value Co-Creation process that can increase shared value between MSMEs and customers, which in turn is also relevant to the targets of the National Research Priorities and SDGs, as it helps MSMEs in achieving sustainability and sustainable economic growth (Surya B., et. al., 2021). Thus, it is anticipated that this study would significantly advance the body of knowledge on artificial intelligence and value co-creation, and offer a thorough methodology for examining how AI may boost MSME sales through Value Co-Creation, with a focus on the context of MSMEs based on local product excellence.

Many previous studies have shown that AI contributes to improved business performance in general, especially in large industries or B2B sectors. Anggraini (2020) emphasized how AI may improve value co-creation in business-to-business settings, while Manser Payne et al. (2021) explored how AI enhances digital servitization in financial services. However, not many studies have emphasized the application of AI to MSMEs, especially those based on local product excellence. The gap is the absence of empirical data demonstrating AI's direct influence on MSMEs' sales success, especially in the local-based sector. This research will close the gap by investigating the beneficial correlation between the application of AI and enhanced sales performance of regional MSMEs with a focus on products (Rajguru, 2024; Chandra & Rahman, 2023).

H1: Artificial Intelligence has a positive effect on MSME Sales Performance

Previous research such as that conducted by Gao et al. (2023) showed that AI can improve customer engagement and co-creation, but focused more on large or service industries. Yang (2023) also looked at how AI affected the co-creation experience for customers but did not explore the mediation of co-creation in improving the sales performance of MSMEs. In the context of MSMEs, especially those based on local products, this study fills the gap by showing that co-creation is an important mechanism that mediates the effect of AI on sales performance. This research will contribute by emphasizing the role of co-creation as an unexplored mediating variable in the context of MSMEs (Chandra & Rahman, 2023; Barile et al., 2021).

H2: Value Co-Creation can mediate the effect of Artificial Intelligence on MSME Sales Performance

Some studies such as Ranjan and Read (2016) have underlined how crucial

value co-creation is to generating value for clients. but most of these studies focus more on the industrial or service sector in general. Surya et al. (2021) discussed open innovation and productivity of MSMEs, but have not taken into account the co-creation role while trying to boost sales performance. This study will close the gap by demonstrating that, in light of local product quality, value co-creation positively and directly affects MSMEs' sales, a context that has not been widely explained in previous literature (Ranjan & Read, 2016; Solakis et al., 2022).

H3: Value co-creation has a positive effect on MSME sales performance

Local product advantage can be a key factor in improving sales performance through co-creation. Chandra & Rahman (2023) and Huang & Rust (2018) highlight the importance of competitive advantage in co-creation interactions, but the contexts discussed are large-scale industries or global services. Previous research has also insufficiently explored the role of local product excellence as a moderator that increases cocreation's impact on MSME sales performance. With a focus on local products in Lamongan Regency, this study will fill the gap by showing that local product excellence strengthens the value co-creation and MSME sales performance are positively correlated. (Surya et al., 2021; Barile et al., 2021).

H4: Product excellence can moderate the effect of Value Co-Creation on MSME Sales Performance

Methodology

The Explanatory Research method is the approach that will be applied in this study. An explanatory study is frequently employed to ascertain the causes of a phenomenon and the correlation between variables (Cresswell, 2014). This approach is quantitative and uses statistical analysis to evaluate hypotheses and establish the validity of the link between the variables. The Explanatory Research method allows the research to explore and understand the complex context in which MSMEs operate, before attempting to measure their effectiveness in adopting AI and creating value co-creation. This research will investigate the relationship between Artificial Intelligence (AI) utilization, Value Co-Creation, local product excellence, and MSME sales. This research model utilizes a moderation mediation approach which is used to understand the more complex relationships between variables. According to Edwards and Lambert (2007), they propose a model that integrates the concepts of mediation and moderation in more depth, through modeling direct interactions between variables in various combinations. Using this method, one may investigate how moderators can impact the link between independent factors, mediators, and dependent variables as well as distinguish direct impacts from indirect effects. The population in this study are MSMEs in Lamongan Regency that are members of Go Digital MSMEs. Quantitative data sampling uses simple random sampling and A 120-person sample of responders is acquired. In this study, questionnaires were sent to gather quantitative data, which was then analyzed using Structural Equations Modeling PLS 3.0 to assess research hypotheses related to mediation and moderation.

Result and Discussion

Result

Validity and Reliability

Hair et al. (2019) emphasized that in PLS-SEM analysis, validity and reliability become more critical because this method is used to test more complex models. Thus, these tests must be carried out rigorously so that the model can provide valid and reliable results. In variance-based SEM models, invalid or unreliable instruments can lead to biased or incorrectly interpreted results. According to Hair et al. (2019), loading factor or factor loading is a coefficient that shows the extent to which each indicator or item represents a construct (factor) in the measurement model. The strength of the association between the indicator and the construct it represents is shown by the loading factor value. Loading factors above 0.70 indicate that the indicator has a strong contribution to the measured construct. Indicators with this value are considered ideal and are often the standard in research. Average Variance Extracted is another tool used to quantify convergent validity (AVE). Hair et al. (2019) say that a good AVE number is above 0.50, indicating that the construct in question can account for more than 50% of the indicator's variance.

Table 1. Loading Factor and Average Variance Extracted (AVE)

Variable	Indicator	Loading Factor	Average Variance Extracted (AVE)	Information
Artificial Intelligence (AI)	AI.1	0,900	0,689	Valid
	AI.2	0,885		
	AI.3	0,792		
	AI.4	0,789		
	AI.5	0,774		
Value Co-creation (VCC)	VCC.1	0,821	0,701	Valid
	VCC.2	0,879		
	VCC.3	0,884		
	VCC.4	0,856		
	VCC.5	0,739		
Product Advantage (KPR)	KPR.1	0,826	0,647	Valid
	KPR.2	0,726		
	KPR.3	0,846		
	KPR.4	0,801		
	KPR.5	0,818		
Sales Performance (KP)	KP.1	0,791	0,639	Valid
	KP.2	0,796		
	KP.3	0,784		
	KP.4	0,806		
	KP.5	0,820		

Source: Primary Data Processing, 2024

According to Table 1, loading factor values for the variables (AI, VCC, KPR, and KP) under examination are often higher than 0.70, by Hair et al. (2019) recommendations. This suggests that each indicator makes a significant contribution to the assessed construct. Additionally, every variable (AI = 0.689, VCC = 0.701, KPR = 0.647, KP = 0.639) has an AVE value greater than 0.50, indicating that the constructs have enough convergent validity. This indicates that the pertinent constructs account for more than half of the variance of the indicators.

The consistency of indications while assessing the same construct is what reliability demonstrates. Cronbach's Alpha and Composite Reliability are often utilized metrics. The internal dependability of the indicators that comprise the

construct is assessed using Composite dependability. Over 0.7 is considered a good CR rating. In the meantime, the internal consistency of the indicators that comprise a construct is assessed using Cronbach's Alpha. Plus, a strong Cronbach's Alpha is higher than 0.7 (Hair, et. al., 2019). The outcomes of the Cronbach's Alpha and Composite Reliability tests are as follows :

Table 2. Composite Reliability and Cronbach's Alpha

Variable	Composite Reliability	Cronbach's Alpha	Information
Artificial Intelligence (AI)	0,917	0,885	reliable
Value Co-creation (VCC)	0,921	0,893	reliable
Product Advantage (KPR)	0,902	0,863	reliable
Sales Performance (KP)	0,898	0,859	reliable

Source: Primary Data Processing, 2024

Table 2 demonstrates that every variable has a Composite Reliability greater than 0.70, indicating a very strong consistency in variable measurement. Hair et al. (2019) explain that a CR number above 0.70 denotes very high dependability and that a value above 0.70 implies strong reliability. All variables in Cronbach's Alpha have a value greater than 0.80, indicating good internal reliability for each construct, and the indicators are consistent in measuring the constructs represented. Hair et al. (2019) recommend a minimum Cronbach's Alpha value of 0.70, so all of these variables meet this standard.

Inner Model Evaluation Results

According to Hair et al. (2019), the inner model evaluation in PLS-SEM aims to assess the quality of the relationship between latent constructs, or how exogenous variables affect endogenous variables. The following is a picture of the bootstrapping results:

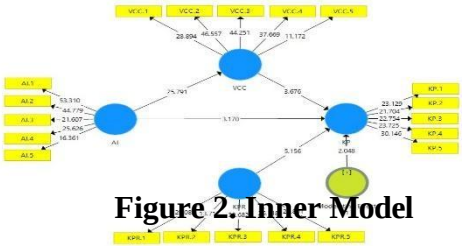

Figure 2. Inner Model

Figure 2's inner model results demonstrate that Artificial Intelligence (AI), Value Co-creation (VCC), and Product Excellence (KPR) significantly positively affect the Sales Performance (KP) of MSMEs. AI influences sales performance directly as well as through the intermediary of VCC, which strengthens the influence of AI on KP. In addition, KPR moderates the relationship between VCC and KP, arguing that better products enhance value co-creation's impact on sales success. Overall, the application of AI, collaboration in value creation, and superior products jointly improve the sales performance of MSMEs.

R Square

Hair et al. (2019) describe R-Square (R^2) as a metric that indicates the extent to which external constructs (independent variables) can account for variation in endogenous constructs (dependent variables). Higher values indicate a stronger capacity of the model to predict outcomes. R2 is a number between 0 and 1.

Table 3. *R Square*

Variable	*R Square*	*R Square Adjusted*
Kinerja Penjualan (KP)	0,862	0,858
***Value Co-Creation* (VCC)**	0,715	0,712

Source: Primary Data Processing, 2024

The R Square value for the Sales Performance variable is 0.862, according to Table 5's R Square test findings, meaning that MSME Sales Performance can be explained by the Artificial Intelligence (AI) and Value Co-Creation (VCC) variables by 86.2%, while other factors account for the remaining 13.8%. Value Co-creation (VCC) can be explained by the Artificial Intelligence (AI) and Product Excellence (KPR) variables by 71.5%, with the remaining 28.5% being explained by other variables. The R Square value for the VCC variable is 0.715.

Hypothesis Testing

The p-value and T-statistic value show the results of hypothesis testing. The purpose of the T-statistic value test is to ascertain how different variables inside an idea (construct) interact. This study's T-value is 1.96, and its significance level is 0.005. The hypothesis is accepted if the p-value is less than 0.05 and the T-statistic value is more than 1.96 (Setiaman, 2023).

Table 4. Results of Hypothesis Test

	T Statistics	**P Values**	**Information**
AI -> KP	3,170	0,002	**H1 didukung**
AI -> VCC -> KP	3,570	0,000	**H2 didukung**
VCC -> KP	3,676	0,000	**H3 didukung**
Moderating Effect 1 -> KP	2,048	0,041	**H4 didukung**

Source: Primary Data Processing, 2024

Table 4 displays the results of the statistical tests, which indicate that the data support the four presented hypotheses. For hypothesis 1 (H1), the relationship between Adaptability Intelligence (AI) and Employee Performance (KP) is significant with a T-statistic of 3.170 and a P-value of 0.002. Hypothesis 2 (H2), which states that Voluntary Career Commitment (VCC) mediates the relationship between AI and KP, is also supported with a T-statistic of 3.570 and a P-value of 0.000. Hypothesis 3 (H3) confirms that VCC is significantly related to KP with a T-statistic of 3.676 and a P-value of 0.000. Finally, hypothesis 4 (H4) regarding the moderating effect is also supported by a T-statistic of 2.048 and a P-value of 0.041. All hypotheses show a significant relationship with a significance level of 5%, thus supporting the proposed model.

Discussion

Artificial Intelligence and Sales Performance

Based on the study's findings, it can be concluded that artificial intelligence improves MSMEs' sales performance. This shows that the better the utilization of artificial intelligence, the more it will improve the sales performance of MSMEs in Lamongan Regency. Facts show that the use of AI in MSME businesses around the world, including in Indonesia, is increasing along with digitalization. AI helps MSMEs in various operational aspects, such as sales data analysis, marketing automation, customer service improvement, and supply chain optimization. AI can analyze market trends and customer behavior more accurately, allowing MSMEs to adjust their sales strategies more precisely. AI has been shown to help lower business risks and speed up digital transition in MSMEs during the COVID-19 epidemic, especially in the sales sector (Rosnita et.al., 2022) (Nick Drydackis, 2022). This is by the statements of respondent MSME players who show an upward trend in the use of AI in 2021-2022.

The conclusion that artificial intelligence (AI) significantly affects MSMEs' sales performance is supported by earlier studies. For example, a study by Badghish and Soomro (2024) showed that the adoption of AI by MSMEs helps improve operational and economic performance through increased efficiency and product innovation. Kedi et al. (2024) showed that AI helps MSMEs increase sales through marketing personalization. The study found that AI enables MSMEs to provide customized product recommendations to increase customer engagement and retention, thereby contributing to increased sales. Grashof and Kopka (2022) also supported these findings in their study, which showed that AI can drive new technology opportunities and innovation in MSMEs. They concluded that the integration of AI into the innovation process and business knowledge can significantly improve productivity and growth. Renil Septiano et al (2024) highlighted the importance of implementing digital technologies, such as data analytics and digital marketing applications, to improve the efficiency and competitiveness of MSMEs. This is in line with your findings that AI plays a significant role in driving sales of MSMEs in Lamongan. AI technology can help MSMEs process sales and customer behavior data, thereby improving marketing strategies.

Mediating Role of Value Co-creation

It has been demonstrated that value co-creation can mitigate artificial intelligence's impact on sales performance. The analysis's findings indicate a positive coefficient, which means that if Value Co-creation rises, AI's impact on MSMEs' sales performance in Lamongan Regency would also rise. Facts in the field show that AI has the ability to facilitate customer involvement in the value-creation process. AI enables MSMEs to comprehend client needs more fully and preferences through data analytics, interaction automation, and personalized services. When MSMEs use these technologies, they can improve the customer experience, leading to increased participation in the process of co-creating value. When using a field application, this hypothesis shows high relevance, especially for MSMEs that generally have limited resources to run advanced technologies such as AI. Although AI makes a significant contribution, customer engagement through value co-creation maximizes the results. This is because AI, although efficient,

cannot fully replace the personal touch obtained through direct interaction with customers. Therefore, value co-creation is an important element in achieving improved sales performance.

The conclusion that value co-creation in a B2B setting is essential to enhancing corporate performance is supported by earlier studies. Technologies such as AI enable better collaboration between companies and customers, which accelerates value co-creation. These findings support the hypothesis that AI, value co-creation can have a favorable impact on MSMEs' sales success (Saha, et.al., 2022). Additional research demonstrates that value co-creation acts as a positive mediator in the connection between technology adoption, such as AI, and improved sales performance. They stress how crucial it is for customers to be included in the value-creation process when using technology to produce more inventive solutions that satisfy consumer demand. Leclercq & Associates, 2016.

Value Co-creation and Sales Performance

The study's findings indicate that value co-creation leads to an improvement in MSME sales performance. This shows that the better the value co-creation of customers, the more it will improve the sales performance of MSMEs in Lamongan Regency. MSMEs in Lamongan Regency, as in other regions, are faced with challenges in facing increasingly fierce market competition. One increasingly popular way to improve business performance is to include clients in the process of creating value, also known as value co-creation. Facts show that customer engagement, for example through product feedback, ideas for service development, or collaboration in marketing campaigns, can increase customer attachment to the brand and improve customer satisfaction. Ultimately, this can improve sales performance, both through increased customer loyalty and increased word-of-mouth recommendations.

Value co-creation has a substantial impact on sales performance, according to several prior research. They show that companies that successfully integrate customer feedback in the product development process experience a significant increase in sales because the products produced are more in line with customer desires (Sweeney and Soutar, 2020). Dahlberg et al. (2022), highlighted the value of co-creation's significance in a business-to-business setting and how it enhances sales effectiveness. They point out that active interaction between providers and clients in the process of creating value can increase loyalty and, in turn, sales. Vargo and Lusch (2021) talk about the significance of value co-creation in building strong relationships between companies and customers. They concluded that companies that utilize this collaboration have a greater chance of improving their sales performance as customers feel more engaged and valued.

Moderating Role of Product Advantage

Product excellence is proven to be able to moderate the connection between sales performance and value co-creation. This shows that if product excellence is provided well, value co-creation and MSMEs' sales success in Lamongan Regency will be positively correlated. products that have advantages in terms of quality, innovation, or unique features are more likely to be in demand by the market. This improves the correlation between sales performance and value co-creation because customers involved in the co-creation process will be more satisfied if they see the

results of their collaboration reflected in high-quality products. MSMEs in Lamongan Regency, as in many other regions, often have to compete in a crowded market and rely on innovation and product quality to survive and thrive.

Some research indicates that the relationship between value co-creation and product quality is moderated and sales performance. This research shows that companies that can produce superior products and collaborate with customers that participate in the value-creation process typically witness notable increases in their sales output Wang et al. (2020). Brodie et al. (2019) demonstrated how the beneficial impact of value co-creation on business success can be strengthened by superior products. They suggested that products with superior attributes create a better customer experience, which has a positive impact on sales. Jiang et al. (2021) noted the importance of value co-creation engaging in the development of superior products results in better sales performance outcomes, especially when customers feel that the product meets their needs better than competing products.

Conclusion

The findings of this study demonstrate that the use of artificial intelligence (AI) has been shown to improve MSMEs' sales performance in Lamongan Regency. This demonstrates that MSMEs' sales performance increases in direct proportion to the effectiveness of their use of AI. AI not only provides direct benefits to sales but also facilitates customer engagement through the value co-creation process. With AI, MSMEs can better understand customer needs and preferences through data analytics, interaction automation, and service personalization, they all boost client participation in value co-creation.

In addition, according to this study, value co-creation serves as a mediator to improve the connection between AI and higher sales. When MSMEs involve customers in the value creation process, especially when local flagship items are generated through this collaboration, the effect of AI on sales grows. It was demonstrated that product advancements mediated the association between value co-creation and sales performance. Products that have advantages in quality, innovation, or unique features are more likely to be demanded by the market, thus strengthening the relationship between customer engagement and sales. This implies that the beneficial impact of customer interaction on sales will increase with the quality of the product given.

This research adds a great deal to the body of knowledge about how AI might boost MSME sales through value co-creation. This study offers fresh perspectives on the significance of customer and MSMEs collaboration, while also confirming the role of product excellence as a moderating element in enhancing the impact of client engagement on sales performance.

For MSMEs, the use of AI and customer engagement in the value creation process can be a key strategy to improve competitiveness. Therefore, it is important for MSMEs to adopt AI technologies and engage customers in the product innovation process. In addition, MSMEs should focus on developing superior products to bolster the value co-creation's beneficial effects on sales.

Future research is recommended to further explore specific aspects of AI use in different types of MSME industries, especially in different sectors, additionally look at more elements that can improve the connection between value co-creation, AI, and sales performance. Research can also examine the influence of the external

environment, such as government policies or technology support, on AI adoption and the value creation process.

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