Enhancing Business Decision-Making of Purwakarta MSMEs through AI-Based Market Analysis

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Abstract.
Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in economic development; however, they face increasing challenges in making effective business decisions due to rapidly evolving market dynamics. Artificial Intelligence (AI) has emerged as a strategic tool to enhance decision-making processes through data-driven insights. This study aims to analyze the effect of AI-based market analysis on decision-making quality and its impact on business performance among MSMEs in Purwakarta. A quantitative approach was employed using survey data from 165 MSME owners, analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that AI-based market analysis significantly improves decision-making quality ($\beta = 0.66$, $p < 0.001$), which subsequently enhances business performance ($\beta = 0.61$, $p < 0.001$). Furthermore, data readiness strengthens the effectiveness of AI utilization. These findings contribute to the literature on digital transformation and provide practical insights for MSMEs in adopting AI-driven strategies.

Keywords: *Artificial Intelligence, Decision-Making, MSMEs, Market Analysis, PLS-SEM.*

1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in supporting economic growth and employment in developing countries, including Indonesia. In recent years, rapid digital transformation has significantly changed business environments, requiring organizations to adopt more adaptive and data-driven strategies. Artificial Intelligence (AI) has become a key technological innovation that enables businesses to process large volumes of data, generate insights, and improve decision-making efficiency [1], [2].

The adoption of AI in MSMEs has been recognized as a critical factor in enhancing competitiveness and innovation. AI applications such as predictive analytics, customer sentiment analysis, and market trend forecasting allow businesses to make more accurate and timely decisions [3], [4]. Studies show that AI adoption contributes to improved operational efficiency and strategic performance, particularly in small business environments [5].

In Indonesia, MSMEs significantly contribute to regional economies. In areas such as Purwakarta, particularly in the ceramic industry in Plered, MSMEs are essential for local economic development. However, many MSMEs still rely on intuition-based decision-making due to limited access to digital tools, lack of analytical capabilities, and low data literacy [6]. These limitations hinder their ability to compete in increasingly

dynamic markets.

Previous studies have explored AI adoption in large enterprises; however, empirical research focusing on AI-based market analysis in MSMEs remains limited, especially in local industrial clusters [7]. Furthermore, organizational readiness, particularly data availability and digital capability, plays a crucial role in determining the success of AI implementation [8].

Therefore, this study aims to analyze the impact of AI-based market analysis on decision-making quality and its subsequent effect on business performance among MSMEs in Purwakarta. Additionally, this study examines the moderating role of data readiness in strengthening AI utilization effectiveness.

Fig 1. Ceramic Production is Marketed Both Nationally and Internationally

II. METHODS

A. Research Design

This study employs a quantitative research approach with a causal design to examine relationships between variables. The study uses Structural Equation Modeling (SEM) to test the proposed hypotheses.

B. Population and Sample

The population consists of MSMEs in Purwakarta, particularly in the ceramic industry cluster in Plered. A total of 165 respondents were selected using purposive sampling, based on criteria such as active business operations and familiarity with digital tools.

C. Data Collection

Primary data were collected through structured questionnaires distributed to MSME owners. The instrument was designed based on previous studies on AI adoption and decision-making [3], [9].

D. Measurement of Variables

The study includes four variables:

- AI-Based Market Analysis (independent variable)
- Decision-Making Quality (mediating variable)

- Business Performance (dependent variable)
- Data Readiness (moderating variable)

All variables were measured using a five-point Likert scale.

A. Data Analysis Technique

Data were analyzed using PLS-SEM with SmartPLS software. The analysis includes measurement model evaluation (validity and reliability) and structural model evaluation (path coefficients, R^2, and hypothesis testing) [10].

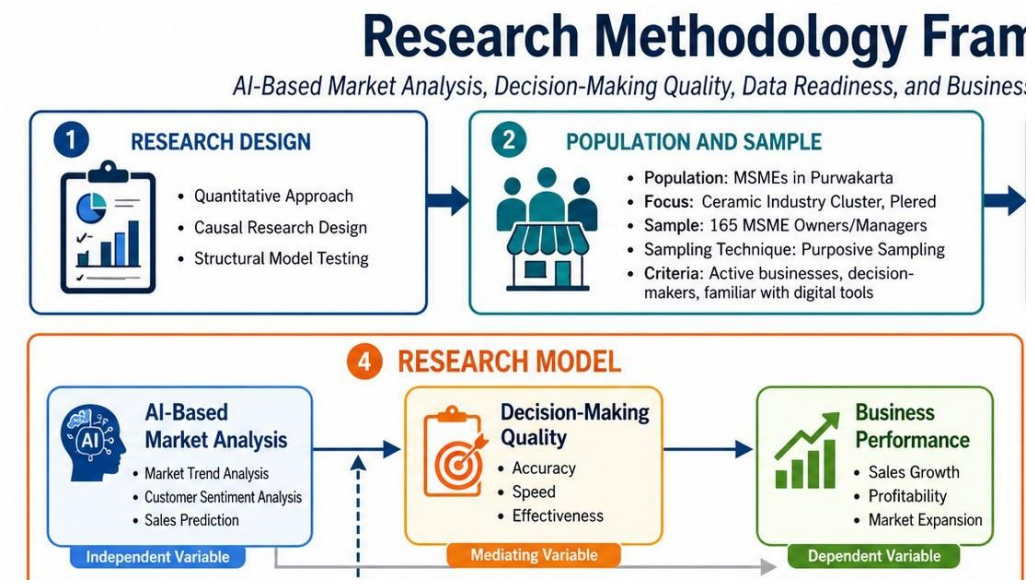

Fig 2. Research Methods

III. RESULT AND DISCUSSION

A. Measurement Model

All indicators met validity and reliability criteria, with AVE values above 0.50 and composite reliability above 0.70, indicating acceptable construct validity.

B. Structural Model

The results show that AI-based market analysis significantly affects decision-making quality (β = 0.66, $p < 0.001$). Decision-making quality also significantly influences business performance ($\beta = 0.61$, $p < 0.001$). The R^2 values indicate moderate explanatory power (0.43 and 0.37).

C. Discussion

The findings confirm that AI enhances decision-making quality by enabling data-driven insights, consistent with previous studies highlighting AI's role in improving predictive accuracy and reducing uncertainty [2], [4]. Moreover, improved decision-making leads to better business performance, supporting the argument that data-driven strategies enhance competitiveness in MSMEs [5].

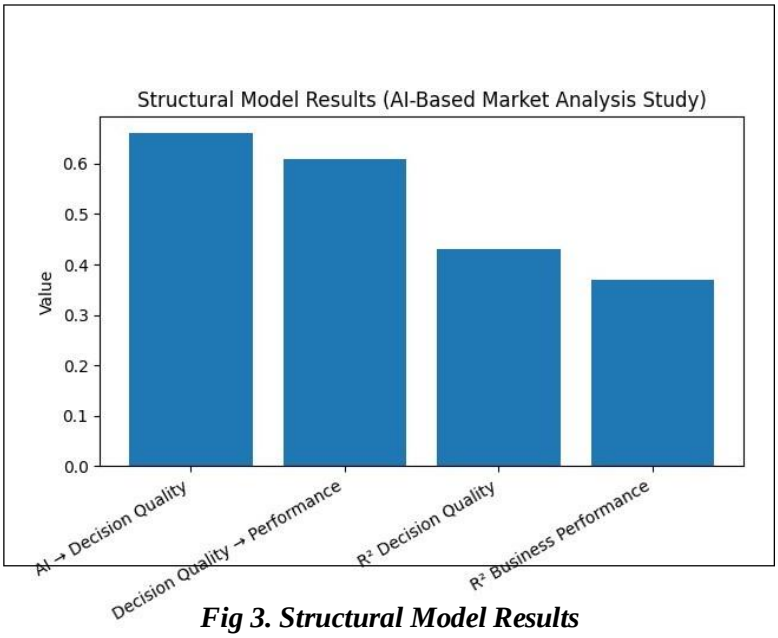

Fig 3. Structural Model Results

The moderating effect of data readiness indicates that technological adoption alone is insufficient without adequate digital capability and data infrastructure. This aligns with studies emphasizing organizational readiness as a key factor in AI implementation success [8].

IV. CONCLUSION

This study demonstrates that AI-based market analysis significantly improves decision-making quality and business performance among MSMEs in Purwakarta. The findings highlight the importance of data readiness in maximizing AI effectiveness. Practically, MSMEs are encouraged to adopt AI tools to enhance competitiveness. Future research should expand the scope to other industries and explore additional variables influencing AI adoption.

V. ACKNOWLEDGMENTS

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