SIMBA: Sistem, Informasi, Manajemen, dan Bisnis Adaptif
Volume 1 No 2 December 2025
e-ISSN: 3109-0273, Hal 20-28
DOI: https://doi.org/10.63985/simba.v1i2.71
*Available online at*: https://apinusa.com/index.php/SIMBA/index

# From Big Data to Smart Decisions: The Influence of Augmented Analytics on Managerial Decision-Making Quality

Firayani[1], Rustiyana[2]

[1]Universitas Islam Sulthan Thaha Saifuddin Jambi, Jambi, Indonesia
[2]Universitas Bale Bandung, West Java, Indonesia

**Article Info**

Article History
Received : 10-12-2025
Revised : 25-12-2025
Accepted : 31-12-2025

Keywords
Augmented Analytics;
Managerial Decision-Making Quality;
Big Data;
Smart Decisions;

**Abstract**

The exponential growth of big data has increased the complexity of managerial decision-making, challenging managers to transform vast and heterogeneous data into timely and high-quality decisions. In response to these challenges, augmented analytics integrating artificial intelligence, machine learning, and advanced analytics has emerged as a promising approach to enhance decision-making processes. This study aims to examine the influence of augmented analytics on managerial decision-making quality. Using a quantitative approach, data were collected through a structured questionnaire from 100 managerial-level respondents who actively utilize analytical systems in organizational decision-making. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to evaluate both the measurement and structural models. The results demonstrate that augmented analytics has a positive and statistically significant effect on managerial decision-making quality, indicating its role in improving decision accuracy, speed, consistency, and relevance. The structural model shows a moderate explanatory power, suggesting that augmented analytics is a key determinant of decision quality while acknowledging the presence of other influencing factors. These findings contribute to the literature on information systems and decision-making by providing empirical evidence on the strategic value of augmented analytics beyond traditional analytics approaches. Practically, the study highlights the importance for organizations to move beyond data availability toward the intelligent integration of augmented analytics to support high-quality managerial decisions in data-intensive environments.

Corresponding Author
**Rustiyana**
Universitas Bale Bandung
rustiyana.unibba@gmail.com

## INTRODUCTION

The development of digital technology has led to an explosion of big data in modern organizations, characterized by an increase in the volume, speed, and diversity of data generated from various operational and market sources (Theodorakopoulos et al., 2024). Although the availability of abundant data opens up opportunities for more informed decision-making, many managers face significant challenges in processing complex and unstructured data into appropriate, accurate, and timely decisions (Kumar et al., 2023). Conventional data-driven decision-making approaches often still rely on manual analysis and limited interpretation, making them less capable of responding to the needs of a dynamic and uncertain business environment (Elgendy et al., 2022). This situation has prompted a shift towards augmented analytics, an analytical approach that integrates artificial intelligence, machine learning, and advanced analytics to help managers generate insights automatically, predictively, and contextually (Hassan, 2025). Thus, augmented analytics is becoming increasingly relevant

as an intelligent analytics solution to improve the quality of managerial decision-making in the era of big data (Paramesha et al., 2024).

Augmented analytics is an analytical approach that utilizes artificial intelligence and machine learning to automate data processing, analysis, and intelligent insight presentation (Ansari & Gunta, 2025). The main characteristics of augmented analytics include automation in data exploration, AI-assisted insights that can automatically identify patterns and predictions, and natural language analytics that allow users to interact with data through natural language (Desai & Desai, 2025). Unlike traditional analytics and conventional business intelligence, which generally rely on manual queries, static dashboards, and the technical expertise of data analysts, augmented analytics is designed to support more intuitive and real-time decision making (Ogeawuchi et al., 2024). This approach plays an important role in bridging the gap between the complexity of big data and managerial information needs, especially for non-technical managers, by presenting insights that are easy to understand, relevant, and can be directly used in the decision-making process.

The quality of managerial decision-making refers to the extent to which decisions made by managers are accurate, timely, consistent, and relevant to the organization's objectives (Moshood et al., 2025). In an increasingly complex, uncertain, and big data-driven business environment, managers are under pressure to make quick decisions with information that is often abundant but difficult to interpret (Almheiri et al., 2025). This situation increases the risk of cognitive overload, judgment bias, and inconsistency between available data and decisions made. Therefore, decision-making quality is a key factor that determines the effectiveness of strategies, operational efficiency, and overall organizational performance, making it worthy of being positioned as the main outcome variable in this study.

Augmented analytics has strong potential to improve the quality of managerial decision-making by helping managers identify hidden patterns, generate predictions, and automatically present decision recommendations from complex data (Alghamdi & Al-Baity, 2022). By leveraging artificial intelligence and machine learning, augmented analytics simplifies the analysis process and delivers relevant insights without requiring users to have advanced technical skills (Ahmed et al., 2025). In addition, this approach plays a role in reducing cognitive overload, which managers often experience due to information overload, while minimizing subjective bias in decision-making through data-driven analysis and algorithms. Therefore, intelligent analytics technologies such as augmented analytics can be viewed as strategic enablers that have the potential to improve the accuracy, speed, and consistency of managerial decisions, thereby strengthening the overall quality of decision-making (Yesufu & Alajlani, 2025).

Although the literature on big data analytics and business intelligence has grown rapidly, most research still focuses on traditional analytical approaches and their impact on overall organizational performance. Empirical research that specifically examines augmented analytics as an AI-based analytical approach is still relatively limited, especially in the context of managerial decision-making. In addition, existing studies tend to place analytical results at the organizational outcome level, while the quality of managerial decisions as a process and direct result of analytical utilization has not been widely explored. The lack of empirical evidence examining how augmented analytics affects the accuracy, speed, and relevance of managerial decisions indicates a significant research gap, particularly in the context of managerial decision-making in big data-based business environments.

Based on this research gap, this study aims to analyze the effect of augmented analytics on the quality of managerial decision-making in the context of big data-based organizations. Theoretically, this study is expected to enrich the literature in the fields of analytics, decision-making, and information systems by providing empirical evidence on the role of augmented analytics as an intelligent analytical approach in supporting managerial decisions. From a practical standpoint, the findings of this study are expected to provide insights for organizations and managers in optimizing the use of augmented analytics to improve the accuracy, speed, and relevance of decisions, thereby enabling them to respond more effectively to the dynamics of the business environment.

## METHODS

This study uses a quantitative approach with an explanatory research design, aiming to empirically test the effect of augmented analytics on the quality of managerial decision-making. Data were collected through a survey using a structured questionnaire distributed to middle and senior managers directly involved in data-based decision-making processes in organizations. The sampling technique used purposive sampling, with the criterion that respondents had experience using analytical systems or data-based dashboards in managerial activities. The number of samples analyzed was 100 respondents, which was considered adequate for further statistical analysis.

The research instrument was developed using a five-point Likert scale and was derived from previous literature. The augmented analytics variable was measured using indicators that reflect the level of analysis automation, AI-assisted insights, and ease of data interpretation, while the quality of managerial decision-making was measured based on the aspects of accuracy, speed, consistency, and relevance of decisions. The validity and reliability of the instrument were tested prior to hypothesis testing to ensure the accuracy of the measuring tool. Data analysis was performed using variance-based Structural Equation Modeling (SEM) to test the measurement model and structural model simultaneously. This approach was chosen because it is capable of handling models with latent constructs and comprehensively testing causal relationships between variables. The results of the analysis were used to explain the extent to which augmented analytics contributes to improving the quality of managerial decision-making in big data-based organizational environments.

## RESULTS AND DISCUSSION

The research data was obtained from 100 respondents who held managerial positions and were directly involved in data-driven decision-making processes in their respective organizations. The presentation of respondent characteristics was intended to provide empirical context regarding the respondents' backgrounds and to ensure that participants had relevant experience and exposure to the use of analytical systems, particularly augmented analytics, in supporting the quality of managerial decision-making.

**Table 1.** Respondent Characteristics

| Characteristics | Category | Number (n = 100) | Percentage (%) |
|---|---|---|---|
| Managerial position | Middle management | 65 | 65,0 |
| | Top management | 35 | 35,0 |
| Length of work experience | < 5 years | 18 | 18,0 |
| | 5–10 years | 44 | 44,0 |
| | > 10 years | 38 | 38,0 |
| Intensity of analytics usage | Low | 14 | 14,0 |
| | Currently | 51 | 51,0 |
| | Height | 35 | 35,0 |
| Type of organization | Manufacturing | 28 | 28,0 |
| | Services | 46 | 46,0 |
| | Technology/Digital | 26 | 26,0 |

Based on Table 1, the majority of respondents are in middle management positions, which generally serve as a link between organizational strategy and data-driven operational implementation. In terms of work experience, most respondents have been working for more than five years, reflecting an adequate level of understanding of organizational dynamics and decision-making processes. The intensity of analytical system usage is dominated by the medium to high category, indicating that respondents are accustomed to utilizing analytical tools in their daily managerial activities. In addition, the diversity of the respondents' organizations indicates that the use of augmented analytics has been applied across sectors. Overall, these characteristics show that the respondents have relevant experience and exposure, making the data obtained suitable for analyzing the impact of augmented analytics on the quality of managerial decision-making.

In addition to respondent characteristics, descriptive statistical analysis was conducted to describe the level of augmented analytics adoption and respondents' perceptions of the quality of managerial decision-making. These statistics aim to provide an initial overview of the empirical conditions before testing the relationship between variables, particularly regarding the extent to which augmented analytics is utilized and the quality of decisions made in a managerial context.

**Table 2.** Descriptive Statistics of Research Variables

| Variable | Key Indicators | Mean | Standard Deviation |
|---|---|---|---|
| Augmented Analytics | Data analysis automation | 4,12 | 0,61 |
| | AI's ability to generate insights | 4,18 | 0,58 |
| | Ease of data interpretation for managers | 3,95 | 0,66 |
| | Prediction and decision recommendation support | 4,22 | 0,55 |
| **Average Augmented Analytics** | | **4,12** | **0,60** |
| Quality of Managerial Decision Making | Decision accuracy | 4,20 | 0,57 |
| | Speed of decision-making | 4,26 | 0,54 |
| | Consistency of decisions | 4,05 | 0,62 |
| | Relevance of decisions to the issue | 4,17 | 0,59 |
| **Average Decision Quality** | | **4,17** | **0,58** |

Descriptive statistics show that the adoption rate of augmented analytics is in the high category, with an overall average score of 4.12. The highest score was given to the system's ability to support predictions and decision recommendations, indicating that respondents feel that augmented analytics is particularly useful in assisting prospective analysis and prediction-based decision making. Meanwhile, indicators with relatively lower scores relate to the ease of

data interpretation, showing that even though analytics technology is becoming more sophisticated, there are still challenges in terms of understanding and analytics literacy at the managerial level.

In terms of managerial decision-making quality, the average score of 4.17 reflects respondents' positive perceptions of the decisions made. Decision-making speed was the most dominant aspect, indicating that augmented analytics plays an important role in accelerating the information processing and managerial response processes. Conversely, decision consistency received the lowest score, indicating that there is still room for improvement in ensuring the stability and consistency of decisions across time and contexts. Overall, these findings provide initial indications that augmented analytics contributes positively to improving the quality of managerial decision-making, particularly in terms of speed and accuracy.

Before testing the relationship between variables in the structural model, a measurement model evaluation was conducted to ensure that all constructs and indicators used met the validity and reliability criteria. This evaluation included testing convergent validity, internal reliability, and discriminant validity to ensure the accuracy of the measuring instruments in representing the constructs of augmented analytics and the quality of managerial decision-making.

**Table 3.** Convergent Validity and Construct Reliability Test Results

| Variable | Loading Factor | AVE | Cronbach's Alpha | Composite Reliability |
|---|---|---|---|---|
| Augmented Analytics | 0,71 – 0,86 | 0,63 | 0,88 | 0,91 |
| Quality of Managerial Decision Making | 0,73 – 0,89 | 0,66 | 0,90 | 0,93 |

The results of convergent validity testing show that all indicators have factor loadings above the threshold of 0.70, indicating a strong contribution of the indicators to their respective latent constructs. In addition, the Average Variance Extracted (AVE) value for all variables exceeds 0.50, so it can be concluded that the constructs are able to explain more than half of the variance of the indicators. In terms of reliability, Cronbach's Alpha and Composite Reliability values for all variables were above 0.70, indicating excellent internal consistency and measurement stability. To complete the measurement model evaluation, discriminant validity was tested to ensure that each construct was unique and did not overlap conceptually with other constructs.

**Table 4.** Discriminant Validity Test Results (HTMT)

| Construction | Augmented Analytics | Quality of Decisions |
|---|---|---|
| Augmented Analytics | — | 0,74 |
| Quality of Managerial Decision Making | 0,74 | — |

The Heterotrait–Monotrait Ratio (HTMT) values generated were all below the conservative limit of 0.85, indicating that the discriminant validity between constructs was fulfilled. This confirms that augmented analytics and managerial decision-making quality are empirically distinct constructs, even though they are theoretically interrelated. With all validity and reliability criteria met, it can be concluded that the measurement model in this study is suitable for use in structural model testing and inter-variable relationship analysis.

After the measurement model has been declared valid and reliable, the next step is to evaluate the structural model to test the causal relationships between the research variables.

This analysis aims to assess the strength, direction, and significance of the influence of augmented analytics on the quality of managerial decision-making, while also evaluating the model's ability to explain the dependent variables.

**Table 5.** Structural Model Evaluation Results

| Interrelationships | Path Coefficient (β) | t-statistic | p-value |
|---|---|---|---|
| Augmented Analytics → Quality of Managerial Decision Making | 0,62 | 8,47 | 0,000 |

The test results show that augmented analytics has a positive and significant effect on the quality of managerial decision-making, with a path coefficient value of 0.62. The t-statistic value, which far exceeds the threshold of 1.96, and the p-value < 0.05 indicate that the research hypothesis is statistically accepted. These findings confirm that the higher the level of augmented analytics utilization in an organization, the better the quality of decisions made by managers in terms of accuracy, speed, consistency, and relevance. In addition, the model's ability to explain the dependent variable was evaluated using the coefficient of determination ($R^2$).

**Table 6.** Structural Model Evaluation Results

| Dependent Variable | $R^2$ |
|---|---|
| Quality of Managerial Decision Making | 0,38 |

An $R^2$ value of 0.38 indicates that augmented analytics can explain 38% of the variation in managerial decision-making quality, while the remainder is influenced by factors outside the research model. This value is moderate, reflecting that augmented analytics is an important determinant in improving the quality of managerial decisions, although there is still an opportunity to include additional variables such as managerial competence, decision-making culture, or organizational support in future research.

Based on the results of the structural model evaluation, testing of the main research hypothesis shows that augmented analytics has a positive effect on the quality of managerial decision-making. This relationship is supported by a positive and statistically significant path coefficient value ($\beta = 0.62$; $t = 8.47$; $p < 0.001$). Thus, the hypothesis proposed in this study is accepted, confirming that intensive use of augmented analytics can improve the accuracy, speed, and relevance of decisions made by managers in data-driven organizational environments.

The results of this study indicate that augmented analytics has a positive and significant effect on the quality of managerial decision-making. The relatively strong path coefficient values indicate that the use of augmented analytics can improve managers' ability to make more accurate, faster, consistent, and relevant decisions. In practical terms, these findings confirm that the integration of analytical automation, artificial intelligence, and machine learning-based recommendations enables managers to utilize big data more effectively without having to be directly involved in complex technical analysis processes. Thus, augmented analytics not only functions as a data analysis tool, but also as a strategic decision support mechanism that improves the quality of managerial judgment, as emphasized in the modern decision support systems literature (Erica et al., 2024; Shollo et al., 2015).

Furthermore, augmented analytics plays an important role in reducing the complexity and cognitive overload faced by managers in big data-driven business environments. The high volume, variety, and velocity of data often exceed the cognitive processing capacity of individuals, potentially reducing the quality of decisions. The findings of this study support the argument that augmented analytics simplifies this complexity by converting raw data into insights that are easy to understand, predictive, and actionable. With the support of automatic visualization, predictive analytics, and natural language explanations, managers can focus more on strategic interpretation and business implications, rather than on the technical process of data processing. This role positions augmented analytics as a decision support enhancer that strengthens managers' bounded rationality in the context of complex decision-making (Brynjolfsson et al., 2011).

Compared to previous studies, the results of this study are in line with the literature on big data analytics and business intelligence, which emphasizes the role of analytics capability in improving organizational performance and decision effectiveness. However, this study expands on previous findings by specifically highlighting augmented analytics as an advanced analytical approach that differs from traditional analytics. Unlike conventional business intelligence, which still relies on manual analysis and technical interpretation, augmented analytics offers AI-based insight and recommendation automation that is more adaptive to decision-makers' needs. Thus, this study's focus on the quality of managerial decisions rather than solely on organizational performance enriches the information systems literature by positioning augmented analytics as a direct link between analytical capabilities and decision quality (Günther et al., 2017).

From a theoretical perspective, the findings of this study make an important contribution to the development of technology-based decision-making theory and analytics capability. The results of the study reinforce the view that the quality of decisions is not only determined by the availability of data, but also by the organization's ability to manage, interpret, and augment that data through intelligent technology. Augmented analytics can be understood as a strategic capability that expands the framework of technology-enabled decision-making, where technology not only supports decisions but also actively shapes managers' cognitive and evaluative processes. Thus, this study strengthens the conceptual relationship between analytics capability and decision quality in the context of modern information systems.

The practical implications of this research emphasize that organizations need to do more than just invest in big data infrastructure or traditional analytics dashboards. Organizations need to adopt integrated augmented analytics to ensure that the available data actually leads to high-quality decisions. In addition, improving data literacy and analytical understanding at the managerial level is an important prerequisite for maximizing the benefits of augmented analytics. Managers need to be equipped with the ability to understand AI-based insights critically and ethically, so that this technology is used as a decision-support tool that is responsible and adaptive to business dynamics.

However, this study has several limitations. First, the cross-sectional research design limits the ability to capture the dynamics of augmented analytics usage and changes in decision quality in the long term. Second, the measurement of variables is based on respondents' perceptions, which may contain subjective bias. Therefore, future research should use a

longitudinal design to observe the ongoing impact of augmented analytics, as well as combine quantitative and qualitative approaches to explore the decision-making process in greater depth. The addition of mediating or moderating variables, such as data literacy or organizational culture, could also provide a more comprehensive understanding of the mechanisms by which augmented analytics influences the quality of managerial decisions.

## CONCLUSIONS AND RECOMMENDATIONS

This study concludes that augmented analytics has a positive and significant effect on the quality of managerial decision-making. The use of augmented analytics enables managers to process big data more effectively through automated analysis, AI-based recommendations, and easy-to-understand insights, thereby improving the accuracy, speed, consistency, and relevance of decisions. These findings confirm that the quality of managerial decisions is not only determined by the availability of data, but also by the ability of intelligent analytics technology to support managers' cognitive and evaluative processes. Thus, augmented analytics can be viewed as a strategic capability that strengthens the role of information systems in organizational decision-making.

Based on these findings, organizations are advised to strategically integrate augmented analytics into managerial decision-making processes, not only as a reporting tool, but as an active and adaptive decision support system. Investment in technology needs to be accompanied by increased data literacy and analytical understanding at the managerial level so that the insights generated can be utilized optimally and ethically. For further research, it is recommended to use a longitudinal design, a mixed-method approach, and add contextual variables such as organizational culture and analytical competence in order to gain a more comprehensive understanding of the role of augmented analytics in improving the quality of managerial decisions.

## REFERENCES

Ahmed, F., Ahmed, Md. R., Kabir, M. A., & Islam, M. M. (2025). Revolutionizing Business Analytics: The Impact of Artificial Intelligence and Machine Learning. *American Journal of Advanced Technology and Engineering Solutions*, *1*(01), 147–173. https://doi.org/10.63125/f7yjxw69

Alghamdi, N. A., & Al-Baity, H. H. (2022). Augmented Analytics Driven by AI: A Digital Transformation beyond Business Intelligence. *Sensors*, *22*(20), 8071. https://doi.org/10.3390/s22208071

Almheiri, R. K., Jabeen, F., Kazi, M., & Santoro, G. (2025). Big data analytics and competitive performance: The role of environmental uncertainty, managerial support and data-driven culture. *Management of Environmental Quality: An International Journal*, *36*(5), 1071–1094. https://doi.org/10.1108/MEQ-08-2024-0361

Ansari, S. F., & Gunta, S. K. (2025). Augmented Analytics for Democratizing Data Insights. *IARJSET*, *12*(4). https://doi.org/10.17148/IARJSET.2025.12451

Brynjolfsson, E., Hitt, L. M., & Kim, H. H. (2011). Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1819486

Desai, D., & Desai, A. (2025). Integrating Generative AI in Business Intelligence: A Practical Framework for Enhancing Augmented Analytics. *International Journal of Mathematical, Engineering and Management Sciences*, *10*(3), 704–728. https://doi.org/10.33889/IJMEMS.2025.10.3.036

Elgendy, N., Elragal, A., & Päivärinta, T. (2022). DECAS: A modern data-driven decision theory for big data and analytics. *Journal of Decision Systems*, *31*(4), 337–373. https://doi.org/10.1080/12460125.2021.1894674

Erica, A., Gantari, L., Qurotulain, O., Nuche, A., & Sy, O. (2024). Optimizing Decision-Making: Data Analytics Applications in Management Information Systems. *APTISI Transactions on Management (ATM)*, *8*(2), 115–122. https://doi.org/10.33050/atm.v8i2.2202

Günther, W. A., Rezazade Mehrizi, M. H., Huysman, M., & Feldberg, F. (2017). Debating big data: A literature review on realizing value from big data. *The Journal of Strategic Information Systems*, *26*(3), 191–209. https://doi.org/10.1016/j.jsis.2017.07.003

Hassan, T. (2025). *Augmented Analytics in Financial Forecasting Enhancing Risk Management and Investment Strategies through AI-Driven Insights*. SSRN. https://doi.org/10.2139/ssrn.5179431

Kumar, P., Tveritnev, A., Jan, S. A., & Iqbal, R. (2023). Challenges to Opportunity: Getting Value Out of Unstructured Data Management. *Gas & Oil Technology Showcase and Conference*, D021S034R005. https://doi.org/10.2118/214251-MS

Moshood, T. D., Rotimi, J. O. B., & Shahzad, W. (2025). Enhancing construction organizations' performance through strategic decision-making: Unveiling the mediating role of quality of information. *International Journal of Organizational Analysis*, *33*(9), 2956–2991. https://doi.org/10.1108/IJOA-01-2024-4228

Ogeawuchi, J. C., Uzoka, A. C., Daraojimba, A. I., Ubanadu, B. C., Gbenle, T. P., & Kisina, D. (2024). Innovations in Data Visualization for Real-Time Business Intelligence Decision-Making Using Cloud-Based Data Tools. *International Journal of Future Engineering Innovations*, *1*(1), 138–145. https://doi.org/10.54660/IJFEI.2024.1.1.138-145

Paramesha, M., Rane, N., & Rane, J. (2024). Big data analytics, artificial intelligence, machine learning, internet of things, and blockchain for enhanced business intelligence. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4855856

Shollo, A., Constantiou, I., & Kreiner, K. (2015). The interplay between evidence and judgment in the IT project prioritization process. *The Journal of Strategic Information Systems*, *24*(3), 171–188. https://doi.org/10.1016/j.jsis.2015.06.001

Theodorakopoulos, L., Theodoropoulou, A., & Stamatiou, Y. (2024). A State-of-the-Art Review in Big Data Management Engineering: Real-Life Case Studies, Challenges, and Future Research Directions. *Eng*, *5*(3), 1266–1297. https://doi.org/10.3390/eng5030068

Yesufu, L., & Alajlani, S. (2025). Enhancing Strategic Decision-Making With AI: Unveiling the Untapped Potential. In A. Günar (Ed.), *Advances in Finance, Accounting, and Economics* (pp. 415–436). IGI Global. https://doi.org/10.4018/979-8-3693-7036-0.ch018