

## **Artificial Intelligence Adoption and Business Performance: The Mediating Role of Sustainable Competitive Advantage in the Food and Beverage Industry**

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### **Abstract**

This research aims to analyze the impact of adapting Artificial Intelligence (AI) on business performance with mediating sustainable competitive advantage (SCA) in the Food and Beverage (F&B) industry located in West Jakarta. The population was all F&B companies in West Jakarta. The sample includes 120 respondents selected with purposive sampling, with criteria including respondents who understand and have adopted AI in their business operations for a minimum of three years. The data used Likert-scale questionnaires adapted from previously validated and reliable instruments. Data analysis using SEM by SmartPLS software. The results indicate that adapting AI has a positive but insignificant effect on the business performance of F&B companies in West Jakarta. Additionally, the study found that adapting AI has a positive and significant impact on sustainable competitive advantage, which in turn has a positive and significant effect on business performance. Mediation analysis revealed that sustainable competitive advantage mediates the relationship between adapting AI and business performance. This suggests that adapting AI does not directly affect business performance but rather indirectly through sustainable competitive advantage. Sustainable competitive advantage directly influences business performance. The conclusion of this research is that adapting AI is a crucial strategy for improving business performance through sustainable competitive advantage in the F&B industry in West Jakarta. Companies that invest in AI technology and integrate it into their business strategies have the potential to achieve superior performance by maintaining their sustainable competitive advantage in the long term.

**Keywords:** **artificial intelligence, business performance, sustainable competitive advantage, food and beverage industry.**

### **INTRODUCTION**

The new era of society 5.0 is currently bringing rapid changes in the delivery of information and ways of communicating, the use of advanced technology namely Artificial Intelligence (AI) is inevitable in human life. This transformation has not only altered the way people work and interact but has also significantly impacted business performance. In the era of Society 5.0, business performance plays in driving investment for innovation business. Effective business performance contributes to a more dynamic market environment and improved consumer experiences. Consequently, effective business performance supports the development of a robust digital ecosystem, attracting investment and stimulating economic growth. Business performance measures an organization's ability to achieve its financial and

strategic objectives, focusing on effectiveness and efficiency (Al-Dmour & Abbod, 2018; Salamah, 2023).

Business is a crucial element in determining the success of a company, especially in the dynamic digital era. Superior performance facilitates increased investment, job creation and innovation, which in turn creates a more responsive market environment and a more personal consumer experience (Hsu & Wang, 2023). Therefore, maintaining and improving effective business performance is very important to attract investment, encourage economic growth and build a strong digital ecosystem (Nambisan et al., 2023).

Adoption of AI (Artificial Intelligence Adoption) is defined as the process of acquiring, applying, integrating and using AI technology in organizational practices that produce changes in processes, decisions, capabilities and business models. Lee & Kim, 2023; Zhang et al., 2023; Martins et al., 2022). Wang et al., (2022) found that adapting artificial intelligence (AI) has become a determining factor in increasing competitiveness which ultimately can improve performance. AI allows personalization of customer services, accurate market demand prediction, optimization of inventory management, and significant improvement of operational efficiency (Haque, 2024). By utilizing AI, companies can understand consumer behavior patterns more accurately and design more effective marketing strategies (Wang et al., 2022). In Jakarta, AI adaptation in the F&B industry is increasingly widespread, starting from food delivery platforms that use machine learning for restaurant recommendations and driver matching, to POS providers that use AI-based analytics for sales forecasting and stock management. Artificial Intelligence (AI) in the context of food and beverage retail includes technologies such as machine learning for product recommendations, demand forecasting, chatbots for customer service, computer vision for inventory management, and process automation (Davenport & Ronanki, 2018; Mikalef et al., 2021).

The global AI market in the food and beverage industry is showing tremendous exponential growth, "The AI market valuation in the food and beverage retail sector reached USD 8.45 billion in 2023 and is projected to grow to USD 84.75 billion in 2030, with a compound annual growth rate (CAGR) of 39.1%." Other projections show that the F&B industry is expected to reach \$13.39 billion in 2025, which illustrates massive and rapid adoption of technology in this sector. García and Pereira (2022) explain that companies that digitize processes and sustainability reporting using AI receive an increase in net profit of 10-15% within two years. A study by Wang and Chen (2022) reinforces the conception that AI accelerates the development of innovative products that suit market trends and are more efficient in terms of resources, thereby increasing market share and profit margins by up to 12%. In addition, longitudinal studies from Zhou et al. (2024) confirms that organizations that implement & automate AI-based decision-making processes are able to consistently improve financial performance with a growth rate of around 8-12% per year. These empirical studies are also supported by data from various industrial sectors, including manufacturing, services, retail and technology, which shows that AI can provide a significant impact on cost efficiency, product innovation, risk management, as well as corporate image and reputation. The positive relationship between AI adaptation and business performance is not automatic and is influenced by certain factors. Organizational capabilities are the main variable that strengthens the positive relationship between AI adaptation and business performance. According to García and Pereira (2022), companies that have high capabilities in managing data, innovation and information technology are able to integrate AI more effectively. Information technology and digital capabilities are factors that inherently affect the success rate of AI adaptation and its impact on business performance. The higher the company's digital capabilities, the more efficient and optimal the application of AI will have a positive impact on business performance (Li et al., 2023). Adapting AI technology strategically and

effectively has a significant positive influence on overall business performance. The influence of AI adaptation on business performance can be explained through dynamic capabilities theory (Teece, 2018), which states that organizations that are able to integrate and reconfigure their technological resources quickly will be more adaptive to changes in the business environment. This capability has an impact on increasing efficiency, customer satisfaction and ultimately improving business performance (Nguyen et al., 2023). In addition, according to Resource-Based View (RBV), AI is a valuable resource that is difficult to imitate and becomes the basis of sustainable competitive advantage.

The academic literature has explored the various dimensions of the relationship between AI, and organizational performance. Davenport & Ronanki (2018) developed a comprehensive AI adoption framework, but based on case studies of large multinational companies. Mikalef & Gupta (2021) in their meta-analysis study found the positive impact of AI capabilities on firm performance, but acknowledged that 78% of the studies analyzed came from advanced economic contexts (North America, Europe, and parts of East Asia) with different market characteristics, regulations, and technological maturity in developing countries such as in Indonesia, which was conducted in this study. Most research on AI and digital transformation focuses on the high-tech manufacturing or services sector. This study uses the food and beverage retail industry to have unique characteristics: thin profit margins, product perishability, supply chain complexity, direct interaction with consumers, and high sensitivity to health and environmental issues. These characteristics make the mechanism of influence technology on performance different and requires a separate investigation.

Verhoef et al. (2021) in their comprehensive review of digital transformation identified that understanding of "the black box" of how digital transformation translates into superior performance is still limited. However, previous studies have shown several patterns and limitations that need to be criticized. Previous studies have tended to see a direct link between technology adoption and business performance without exploring complex mediation mechanisms, but are still limited. Existing studies often ignore the role of critical mediating variables such as sustainable competitive advantage that can explain the causal path from technology to performance. Existing studies often overlook the role of critical mediating variables such as sustained competitive advantage that can explain the causal pathway from technology to performance. However, the effects of AI on performance are often mediated by the formation of a sustained competitive advantage as was done in this study.

SCA refers to capabilities and resources that provide a long-term advantage because it is difficult for competitors to imitate, including unique technological capabilities, exclusive data access, efficient operational processes, and brand reputation. AI helps build SCA through several mechanisms: collecting and analyzing large-scale data creates valuable data assets; the ability to automate and optimize processes increases efficiency that is difficult to imitate without similar investment; and continuous personalization strengthens customer loyalty and market differentiation (Mittal & Prasad, 2022; Kumar et al., 2023). Thus, the relationship between AI adaptation and business performance can occur not only directly but also through the SCA formed by AI capabilities. AI as an important component influences the formation of sustainable competitive advantage, which then has a positive impact on Li and Liu's performance (2023).

Chen, 2021 explains that sustainable competitive advantage is the company's ability to maintain its competitive position in the long term through the use of unique resources and capabilities that are difficult for competitors to imitate. This allows companies to maintain performance and value that continues to be in the market and be able to adapt to changes in the external environment effectively. In the context of the digital era, competitive advantage no longer only comes from cost factors or product differentiation, but also from the company's

ability to innovate, adapt to technology, and integrate sustainability values into its business strategy (Porter & Heppelmann, 2022). Sustainable competitive advantage is the company's ability to maintain and maintain its competitive privileges consistently over time.

Through unique, valuable resources, capabilities and innovations that are not easily duplicated by competitors (Chen, 2022; Zhou & Li, 2022). Singh, Rao, and Mehta (2023) examine how integrating AI into managerial processes improves organizational response speed to regulatory changes and customer preferences. These dynamic capabilities are important in the context of sustainable excellence because they allow organizations to adapt quickly to external pressures without losing focus on sustainability goals. In the context of research, the latest literature strengthens the evidence that AI adaptation makes a positive contribution to sustainable competitive advantage. Garcia and Pereira (2022) emphasize the role of AI in increasing the accuracy of sustainability reporting and supply chain traceability. Li et al. (2023) shows the effect of AI on supply chain optimization that reduces energy and waste; Singh et al. (2023) highlight the strengthening of dynamic capabilities through AI; and Zhou et al. (2024) confirms the benefits of AI-powered DSS for sustainable strategic decision making. Even though each study highlights different aspects of operational, product, decision, reputation, and organizational capabilities, the overall findings consistently confirm that AI functions as a multifaceted enabler for sustainable competitive excellence. In the context of the organization, AI adaptation is not just the application of technological tools, but rather the process of integrating digital capabilities into the company's structure, processes, and culture, thereby producing new cognitive resources. The Resource Based View (RBV) and Dynamic Capabilities place AI as an intangible asset which, when combined with the organization's ability to adapt and reconfigure resources, can generate sustainable competitive excellence (SCA) (Mittal & Prasad, 2022; Wang & Zhang, 2022).

Empirical literature strengthens the positive relationship between sustainable competitive advantage and business performance. Garcia and Pereira (2022) show that companies that strengthen sustainability practices and report performance transparently experience an increase in net profit of 10–15% within three years, thanks to increased stakeholder confidence, Studies by Singh and Kumar (2024). In addition, cross-sector and country studies show that applying sustainable competitive advantage not only has a positive impact on financial aspects, but also on social and other social sustainability indices. Martínez Ruiz et al. (2022) show that sustainable competitive advantage, as a conception that is based on innovation, efficiency and differentiation, is empirically proven to have a positive influence on business performance both from a financial, market and social and environmental sustainability aspects. Thus, theories and practices about sustainable competitive excellence and its impact on business performance will increasingly become stronger and more applicable for the development of future strategic management theories.

Based on the previous opinion, this research aims to analyze and find out the influence of AI adaptation on business performance directly, and indirectly through the mediation of sustainable competitive excellence. Knowing and analyzing the direct influence of AI adaptation on sustainable competitive advantage. As well as the influence of sustainable competitive excellence on business performance. This study was conducted on the food and beverage industry located in West Jakarta.

## METHOD

This research is quantitative, with the population being the entire food and beverage industry located in West Jakarta. Researched 120 responden were examined, who were selected as research samples using purposive sampling. This selection is based on the criteria that respondents understand and have adopted AI in running the business. The business has

been running for a minimum of 3 years. Moving in the retail food and beverage industry with small and medium business scale. AI variable instrument adapted from Jebran & Chen, 2023; Nguyen & Tran, 2023, using 9 indicators (actively recognizing opportunities, understanding AI, the ability to identify, having resources, HR competence, facility availability, support, availability of funds, security risks). Performance variable adapts from Iqbal et al., (2022); Kumar & Rahman (2022), using 11 indicators (Increase in income, stable profit, production efficiency, productivity, optimal resources, customer satisfaction, customer retention, innovative new products, process innovation, sustainability practices, establishing relationships). Sustainable Competitive Advantage variable adapts from Chen, 2022; Zhou & Li, 2022; Tidd & Bessant, 2014 using 10 indicators (consistently innovating, innovation strategy, product uniqueness, ability to manage resources, internal capabilities, partnerships, market response, strategic decisions, business transformation, response to technological changes). Data obtained using questionnaires by coming to industry parties and online questionnaires with google-form. The scale likert with five alternative choice, are strongly agree once (5), strongly agree (4), neutral (3), disagree (2) and strongly disagree (1). The analysis SEM with SmartPLS software.

Sekaran & Bougie, (2016), "Structural Equation Model (SEM) analysis consists of two analyses, number one is outer model which consists of validity and reliability. Validity uses the convergent validity and discriminant validity method. Reliability uses the cronbach's alpha and composite reliability method have been met for all variables and indicators in the research, number two is inner model analysis which aims to determine the relationship between the variables contained in the research". The PLS model specification is:

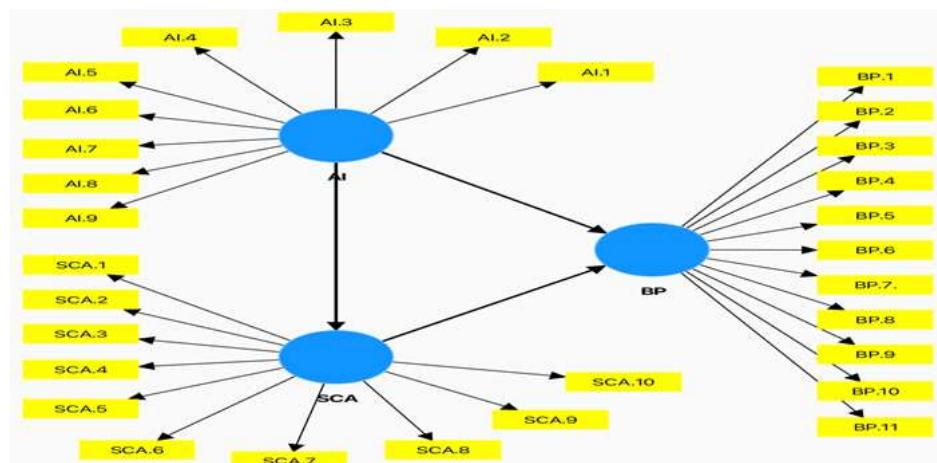


Figure 1. Research Model Specifications

## RESULT AND DISCUSSION

### Respondents Descriptions

This study involved 120 respondents from various F&B industry located in West Jakarta. Respondents were randomly selected from the business association database. F&B in West Jakarta. The respondent profiles are summarized as follows: By Business Type: Respondents consisted of 40% restaurants, 60% cafes, and 20% snack food producers. This reflects the diversity of the F&B sector in West Jakarta. Business Scale: The majority of respondents (35%) are Small and Medium Enterprises (SMEs) with an annual turnover below 5 billion Rupiah. 45% are medium-sized businesses with a turnover of between 5-20 billion Rupiah, and the rest (20%) are large businesses with a turnover of over 20 billion Rupiah. Length of Operation: Most respondents (70%) have been operating for more than 5 years, demonstrating experience and stability in this industry. 30% have been operating between 3-5 years. Respondent

Position: Most respondents (80%) are business owners or managers who have in-depth knowledge of the company's operations and strategy. The rest are senior staff involved in decision making.

### Outer Loading

**Table 1. Convergent Validity Analysis**

	Average variance extracted (AVE)
AI (Artificial Intelligence)	0.598
BP (Business Performance)	0.659
SCA (Sustainable Competitive Advantage)	0.618

Source: SmartPLS Processing

In table 1 the convergent validity is seen from the AVE value, the result shows above 0.50 which means fulfilling.

**Table 2. Internal Consistency Reliability Analysis**

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)
AI	0.916	0.929	0.930
BP	0.946	0.950	0.954
SCA	0.930	0.934	0.618

Source: SmartPls Processing Results

In table 2, each item gets composite reliability and Cronbach's alpha > 0.60 is declared reliable to measure variable.

### Inner Model

**Table 3. Coefficient of determination (R-Square)**

	R-Square	R-Square Adjusted
BP	0.937	0.936
SCA	0.924	0.923

Source: Smartpls Processing

Table 3 show R-Square on the endogenous Business Performance is 0.937. All exogenous variables have a strong influence, namely 93.7% on Business Performance. Meanwhile, the remaining 6.3% is influenced by the others.

The coefficient of determination on the Sustainable Competitive Advantage mediating is 0.924. It's means have a strong influence, namely 92.4% on Sustainable Competitive Advantage. Meanwhile, the remaining 7.6% is influenced by the other's

### Inner Model Testing

Testing of path coefficients is carried out with the aim of finding out whether there is an influence between variables in this study. The following are the results of testing the path coefficients which can be seen in Figure 4 which shows the results of bootstrapping.

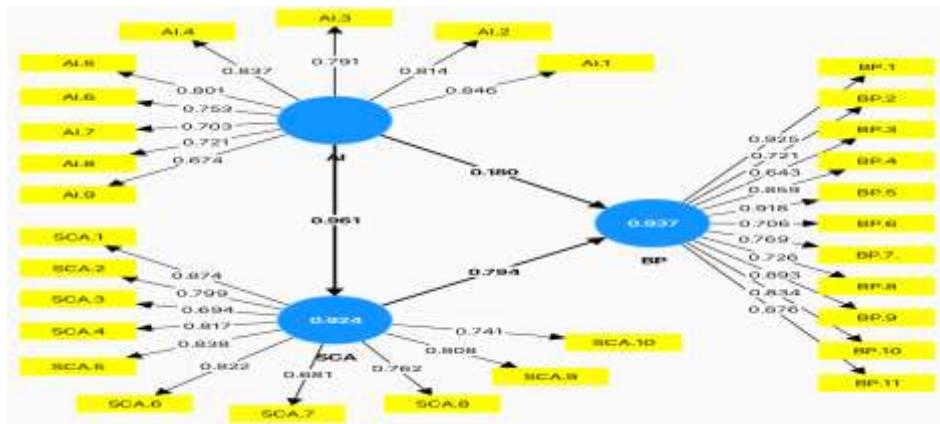


Figure 2. Bootstrapping Test Result

The Table 4, explain final path coefficient was:

Table 4. Path Coefficient Result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
AI → BP	0.180	0.176	0.106	1.698	0.090
AI → SCA	0.961	0.963	0.005	188.177	0.000
SCA → BP	0.794	0.798	0.798	7.694	0.000

Source: Smartpls Processing Results

There is 1 hypothesis that is rejected, namely the influence of Artificial Intelligence variables on Business Performance, because the P value is more than 0.05.

Table 5. Final Specific Indirect Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
AI → SCA → BP	0.763	0.769	0.100	7.595	0.000

Source: SmartPLS Processing Results

Sustainable Competitive Advantage is proven to mediate the relationship between Artificial Intelligence and Business Performance.

Based on the path coefficient test results, so can be explain that:

The influence of AI (Artificial Intelligence) on BP (Business Performance), p value was  $0.090 > 0.05$ , T statistic of  $1.698 < 1.96$  and the path coefficient is positive at 0.180. So, the meaning was AI (Artificial Intelligence) has a positive not significant influence on business performance (BP), which means hypothesis 1 of the research is rejected.

The influence of AI (Artificial Intelligence) on SCA (Sustainable competitive advantage), p value was  $0.000 < 0.05$ , T statistic of  $188.177 > 1.96$ , So the meaning was AI (Artificial Intelligence) has a positive and significant influence on SCA (Sustainable competitive advantage), which means hypothesis 2 of the research is accepted.

The influence of SCA (Sustainable competitive advantage) on BP (business performance), p value was  $0.000 < 0.05$ , T statistic of  $7.595 > 1.96$  and the path coefficient is

positive at 0.763. So, the meaning was SAC (Sustainable competitive advantage) has a positive and significant influence on BP (business performance), which means hypothesis 3 of the research is accepted.

On the mediation path, which shows the influence of AI (Artificial Intelligence) on BP (Business Performance) mediated by SAC (Sustainable competitive advantage), the p value obtained is 0.000 with a T statistic of 7.694 and the path coefficient is positive at 0.794. Because the p value on the path is  $< 0.05$ , the T statistic is  $>1.96$  and the path coefficient is positive, it can be concluded that AI (Artificial Intelligence) has a positive and significant influence on BP (Business Performance) with the mediation of SAC, which means hypothesis 4 of the research is accepted.

## Discussion

AI adaptation in the F&B industry is increasingly widespread, starting from food delivery platforms that use machine learning for restaurant recommendations and driver matching, to POS providers that utilize AI-based analytics for sales forecasting and inventory management. AI has an influence on performance as Li, et al (2023) stated, but this research does not support previous research, where the influence of AI on business performance shows a positive but insignificant result. This research shows that AI adaptation does not directly influence business performance.

On the research results of the influence of AI on sustainable competitive advantage, this research shows positive and significant results, this supports previous research, where AI helps build SCA through several mechanisms: large-scale data collection and analysis creates valuable data assets, the ability to automate and optimize processes increases efficiency that is difficult to imitate without similar investment and continuous personalization strengthens loyalty.

Customers and market differentiation (Mittal & Prasad, 2022; Kumar et al., 2023). Thus, the relationship between AI adaptation and business performance can occur not only directly but also through the SCA formed by AI capabilities. AI as an important component influences the formation of sustainable competitive advantage, which then has a positive impact on the performance of Li and Liu (2023).

In the research results of the influence of sustainable competitive advantage on business performance directly, it has a positive and significant influence, this supports previous research that AI as an intangible asset which, when combined with the organization's ability to adapt and reconfigure resources, can produce sustainable competitive excellence (SCA) (Mittal & Prasad, 2022; Wang & Zhang, 2022). Martínez Ruiz et al. (2022) show that sustainable competitive advantage, as a conception based on innovation, efficiency and differentiation, is empirically proven to have a positive influence on business performance both from a financial, market and social and environmental sustainability aspects.

Furthermore, this research obtained the result that AI has a positive and significant indirect influence on business performance through sustainable competitive excellence, this supports previous research which obtained the result that the influence of AI on performance is often mediated by the formation of sustainable competitive excellence as stated by Wang & Zhang, 2022; Li & Liu, 2023), showing how SCA acts as a connecting channel that translates the technical capabilities of AI into sustainable business performance outcomes through interconnected operational process mechanisms. First, AI creates and utilizes exclusive data assets that come from customer interactions, operational logs and product telemetry. Second, adaptive AI models that are continuously updated improve the quality of predictions and recommendations, which directly impacts the quality of service and operational efficiency. Third, AI integration in the supply chain allows for more efficient resource allocation. Fourth,

AI accelerates product and service innovation processes and opens up opportunities to create new values that are difficult for competitors to imitate. Fifth, the combination of data assets, models, and processes that are optimized through AI strengthens the organization's capabilities in dealing with market disruptions, thereby improving endurance and long-term performance.

## CONCLUSION

AI adaptation has a positive and insignificant influence on business performance. This shows that F&B companies that adopt AI technology have not been able to increase operational efficiency, service personalization, and better decision making, which ultimately improves business performance. AI adaptation has a positive and significant influence on sustainable competitive excellence. This confirms that AI can be a source of product and service innovation, enabling companies to respond to market changes more quickly and effectively. Sustainable competitive excellence has a positive and significant influence on business performance.

This shows that the organization's ability to adapt and reconfigure resources, can produce sustainable competitive excellence as a conception based on innovation, efficiency, and differentiation, is empirically proven to have a positive influence on business performance both from a financial, market and social and environmental sustainability aspects.

Sustainable competitive excellence mediates the relationship between AI adaptation and business performance. This shows that AI adaptation not only has a direct impact on business performance, but also indirectly through increased sustainable competitive advantage.

Future research can expand the sample size, including a wider geographic area, and considering other relevant variables. Research can also use qualitative methods to gain a deeper understanding of the company's experiences in adopting AI.

This study demonstrates that Artificial Intelligence adoption does not directly enhance business performance in the food and beverage industry. Instead, AI contributes to performance outcomes only through the development of sustainable competitive advantage. Grounded in the Resource-Based View and Dynamic Capabilities Theory, the findings highlight that AI functions as a strategic enabler by strengthening firms' innovation capacity, strategic responsiveness, and ability to reconfigure resources. These results underscore the importance of aligning AI initiatives with long-term competitive strategies, particularly for SMEs operating in resource-constrained environments. Overall, the study emphasizes that the performance value of AI emerges through capability-building and sustainable competitive advantage rather than through immediate operational gains.

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