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Artificial Intelligence Adoption and Human Capital Competence in SMEs: The Mediating Role of Workforce Agility on Market Competitiveness

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Abstract :
This study examines the relationships between Artificial Intelligence Adoption (AIA), Human Capital Competence (HCC), and Market Competitiveness (MC), with Workforce Agility (WA) as a mediating variable in coffee shop SMEs in Bandar Lampung, Indonesia. The research employs a quantitative explanatory approach using a cross-sectional design and Partial Least Squares Structural Equation Modeling (PLS-SEM). The analytical dataset comprises 249 observations. The reported results indicate positive relationships between AIA and WA (β = 0.312), HCC and WA (β = 0.431), AIA and MC (β = 0.226), HCC and MC (β = 0.286), and WA and MC (β = 0.292). Workforce Agility also demonstrates positive indirect relationships between AIA and MC (β = 0.091) and between HCC and MC (β = 0.126). The model explains 37.4% of the variance in Workforce Agility and 41.2% in Market Competitiveness. These findings suggest that technological adoption and human capital competence may contribute to competitiveness through workforce adaptability. The study highlights the importance of integrating AI utilization, employee development, and organizational flexibility to strengthen SME competitiveness.

INTRODUCTION

Digital transformation has intensified competition among small and medium-sized enterprises (SMEs), making technological capabilities and responsiveness to market changes increasingly important (Hokmabadi et al., 2024). Artificial Intelligence (AI) offers opportunities to improve operational efficiency, accelerate decision-making, and better understand customer needs (Hongyun et al., 2025). However, technology adoption does not automatically generate competitive advantages, as its effectiveness depends on an organization's ability to integrate technological solutions into daily operations (Lewandowska et al., 2023). In SMEs, human capital competence plays a critical role because employees' knowledge, skills, and learning capabilities determine how effectively technology is utilized (Kobusingye et al., 2026). This issue becomes particularly relevant when limited organizational resources require SMEs to adapt rapidly while maintaining productivity (Seppänen et al., 2025). Therefore, market competitiveness cannot be adequately explained by technological adoption or human capital competence independently (Fikri & Baitussalam, 2025). A deeper understanding is needed of the mechanisms through which these resources translate into operational

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adaptability and effective market responsiveness. Such understanding is essential for explaining how SMEs can achieve sustainable competitiveness in increasingly dynamic and technology-driven business environments (Aghazadeh et al., 2024).

Despite the growing accessibility of AI technologies, SMEs continue to face a fundamental challenge: the gap between adopting technological solutions and utilizing them effectively to strengthen market competitiveness (Otopah et al., 2026). AI applications in marketing, customer service, and information management do not necessarily lead to operational improvements or greater responsiveness to market demands. Limited digital skills, inadequate organizational readiness, and insufficient adaptive capabilities may prevent SMEs from realizing the potential benefits of technological investments (Baitussalam & Zainullah, 2026). Furthermore, employees with adequate professional competence may still struggle to translate their knowledge into flexible and timely operational responses (Unegbu et al., 2024). These challenges indicate that digital transformation is not merely a matter of AI adoption or workforce competence but also depends on employees' ability to adjust their activities to changing business conditions (Cong et al., 2024). Without workforce agility, investments in technology and human capital development may fail to deliver the expected competitive outcomes (Kumar et al., 2026). This challenge highlights the importance of identifying the mechanisms connecting technological resources, human competencies, and market competitiveness within SMEs (Bradač Hojnik & Huđek, 2023).

Existing literature on digital transformation has examined the contributions of technology adoption to organizational efficiency, innovation, and business performance. Research on human capital has emphasized the importance of knowledge and skills in enhancing productivity and competitive advantage (Romero & Mammadov, 2025). Meanwhile, studies on workforce agility have highlighted flexibility, continuous learning, and responsiveness to change as essential characteristics of employees operating in dynamic environments (Díaz-Arancibia et al., 2024). Although these perspectives provide valuable insights into organizational competitiveness, the mechanisms through which technological and human resources jointly translate into operational capabilities remain insufficiently established in the proposed SME research context (Hansen et al., 2025). Specifically, further empirical examination is needed to determine whether workforce agility mediates the relationships between AI adoption, human capital competence, and market competitiveness. Investigating this mechanism is important for distinguishing the direct contributions of organizational resources from their indirect effects through workforce adaptation (Clemente-Almendros et al., 2024; Basofitrah, 2025). Accordingly, this study positions workforce agility as a mediating mechanism that explains how technological capabilities and human competencies contribute to market competitiveness rather than merely treating agility as an additional workforce characteristic (Sagala & Őri, 2026).

The novelty of this study lies in examining an integrated framework connecting Artificial Intelligence Adoption, Human Capital Competence, Workforce Agility, and Market Competitiveness within SMEs. Rather than focusing exclusively on whether AI adoption and human capital competence influence competitiveness, this study investigates how these organizational resources may contribute to competitive outcomes through workforce agility. This approach extends a resource-based

perspective by incorporating operational adaptability as a potential mechanism underlying competitive advantage. The Resource-Based View (RBV) provides a theoretical foundation for understanding the strategic value of technological and human resources, while the Dynamic Capabilities perspective explains how organizations adapt and reconfigure their capabilities in response to environmental changes. Integrating these perspectives enables a more comprehensive examination of the relationships between organizational resources, workforce adaptability, and market outcomes. Consequently, this study seeks to clarify why differences in AI adoption and human capital competence may produce varying levels of competitiveness among SMEs, depending on their workforce's adaptive capabilities.

Based on the identified research gap, this study examines the direct and indirect effects of Artificial Intelligence Adoption and Human Capital Competence on Market Competitiveness through the mediating role of Workforce Agility. The central argument is that AI adoption provides analytical and operational support, while human capital competence enables employees to understand and effectively utilize technological resources. Together, these capabilities are expected to enhance workforce agility by facilitating continuous learning, operational flexibility, and rapid responses to environmental changes. A more agile workforce is subsequently expected to strengthen market competitiveness by improving customer responsiveness, operational adjustments, and strategic adaptability. Accordingly, this study proposes that workforce agility mediates the relationships between AI adoption, human capital competence, and market competitiveness. Theoretically, the research aims to clarify the mechanisms linking organizational resources with adaptive capabilities and competitive outcomes. Practically, its findings are expected to guide SMEs in aligning AI investments, employee competence development, and workforce management strategies to achieve stronger and more sustainable market competitiveness.

RESEARCH METHOD

Research Design

This study adopts a quantitative explanatory research design to examine the influence of Artificial Intelligence Adoption and Human Capital Competence on Market Competitiveness through the mediating role of Workforce Agility (Unegbu et al., 2024). The research is conducted among small and medium-sized coffee shop enterprises in Bandar Lampung City, Lampung Province, Indonesia. The coffee shop industry provides a relevant setting because enterprises face increasing competition, changing consumer preferences, and growing pressure to integrate digital technologies into business operations. Drawing on the Resource-Based View (RBV) and Dynamic Capabilities Theory, this study examines how technological and human resources contribute to competitive outcomes through workforce adaptability. A cross-sectional survey design is employed to investigate the proposed relationships at a single point in time (Kumar et al., 2026). This approach enables the simultaneous examination of direct and indirect relationships among the research constructs and provides empirical evidence regarding the mechanisms through which AI adoption and human capital competence are associated with market competitiveness.

Participants and Sampling

The target population consists of 249 coffee shop enterprises distributed across 20 districts in Bandar Lampung City, Indonesia. The study adopts a census approach, also known as total population sampling, by targeting all 249 coffee shops identified within the research population. This approach is selected to maximize population coverage and reduce the potential loss of information associated with selecting only a subset of enterprises (Bradač Hojnik & Huđek, 2023). The unit of analysis is the coffee shop enterprise, while the primary respondents are business owners or managers with direct knowledge of organizational operations, technological utilization, employee competencies, and competitive strategies.

The inclusion criteria are: (1) operating a coffee shop within Bandar Lampung City, (2) meeting the applicable Indonesian classification criteria for small and medium-sized enterprises, (3) having operated for at least one year, and (4) having an owner or manager willing to participate voluntarily. Enterprises are not required to have adopted AI before participation, allowing the study to capture differences in technological adoption levels. One eligible respondent is targeted from each enterprise, resulting in a maximum intended sample of 249 respondents. The final sample size will depend on the number of eligible enterprises providing complete and valid questionnaire responses.

Instruments and Data Collection

Data are collected using a structured questionnaire designed to measure four latent constructs: Artificial Intelligence Adoption, Human Capital Competence, Workforce Agility, and Market Competitiveness. Artificial Intelligence Adoption is operationalized through the extent of AI utilization in digital marketing, customer engagement, sales analysis, operational decision-making, and business process automation (Romero & Mammadov, 2025; Basofitrah, et al., 2025). Human Capital Competence is measured through employees' professional knowledge, technical skills, problem-solving capabilities, and continuous learning abilities. Workforce Agility is assessed through employees' adaptability to operational changes, task flexibility, responsiveness to customer demands, and ability to acquire and apply new skills. Market Competitiveness is measured through perceived competitive positioning, service differentiation, customer responsiveness, and adaptability to changing market conditions.

The questionnaire items are developed or adapted from established theoretical and empirical studies and contextualized to coffee shop operations. Each item is measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Prior to questionnaire administration, the instrument is subjected to content validation by experts in business management, digital transformation, and human resource management. The evaluation focuses on item relevance, conceptual clarity, construct representation, and contextual suitability. Revisions are incorporated based on expert recommendations to improve measurement accuracy and ensure alignment with the research objectives (Díaz-Arancibia et al., 2024).

Data Collection Procedure

The data collection procedure consists of questionnaire development, preliminary testing, respondent recruitment, and survey administration. Initially, the questionnaire is reviewed to ensure that the measurement items are understandable and appropriate for coffee shop owners and managers. A pilot test is planned with a

small group of eligible respondents to assess questionnaire clarity, readability, and potential measurement difficulties. Following the pilot assessment, the finalized questionnaire is distributed to coffee shop enterprises across the 20 districts of Bandar Lampung City through direct visits or online survey platforms (Hansen et al., 2025).

Before completing the questionnaire, respondents are informed about the study objectives, confidentiality measures, voluntary participation, and intended use of the collected data. Participants may decline participation or discontinue the survey without consequences. Each participating enterprise is assigned a unique identification code to prevent duplicate organizational responses (Sagala & Őri, 2026). Completed questionnaires are screened for missing values, duplicate submissions, inconsistent responses, and unusual response patterns. The number of contacted enterprises, completed questionnaires, excluded responses, and valid observations will be reported to ensure transparency in the sampling and data collection procedures.

Data Analysis

The collected data are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 4 software. This analytical technique is selected because the study seeks to examine multiple relationships among latent constructs and evaluate the mediating role of Workforce Agility. The analysis is conducted in two stages: measurement model evaluation and structural model assessment.

The measurement model is evaluated by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability is assessed through outer loading values, with values of at least 0.70 generally considered satisfactory. Internal consistency reliability is evaluated using Cronbach's Alpha, rho_A, and Composite Reliability, with coefficients between 0.70 and 0.95 indicating acceptable reliability. Convergent validity is examined through Average Variance Extracted (AVE), with values of at least 0.50 considered adequate. Discriminant validity is assessed using the Heterotrait-Monotrait Ratio (HTMT), with values below 0.85 or 0.90 interpreted according to the conceptual similarity of the constructs. These criteria apply to reflective measurement models; the measurement specification will be established based on the theoretical characteristics of each construct.

The structural model is evaluated through path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive performance. Multicollinearity among predictor constructs is examined using Variance Inflation Factor (VIF). Hypothesis testing is performed using a bootstrapping procedure with 5,000 resamples to estimate standard errors, t-statistics, p-values, and confidence intervals. Statistical significance is assessed at the 0.05 level using two-tailed tests.

Mediation analysis examines two specific indirect relationships: Artificial Intelligence Adoption → Workforce Agility → Market Competitiveness and Human Capital Competence → Workforce Agility → Market Competitiveness. An indirect effect is considered statistically significant when its bootstrapped 95% confidence interval excludes zero. The direct, indirect, and total effects are compared to determine the nature of mediation. Predictive performance may additionally be evaluated using PLSpredict to assess the model's predictive capabilities.

Validity and Reliability Assurance

Several procedures are incorporated to strengthen the validity, reliability, and

methodological rigor of the study (Cong et al., 2024). Content validity is evaluated through expert judgment, while construct validity is assessed through convergent and discriminant validity analyses. Internal consistency reliability is examined using Cronbach's Alpha, rho_A, and Composite Reliability. To reduce potential common method bias, procedural safeguards include respondent anonymity, neutral questionnaire wording, clear instructions, and separation of measurement sections. Harman's single-factor test may be conducted as a supplementary diagnostic, although it cannot independently establish the absence of common method bias.

Multicollinearity is evaluated through VIF analysis, with values below 3 indicating relatively limited collinearity concerns and values below 5 generally considered acceptable depending on the analytical context. Questionnaire responses are screened for incomplete observations, duplicate entries, and suspicious response patterns before analysis. These procedures are intended to improve data quality and support the credibility of the estimated relationships among AI adoption, human capital competence, workforce agility, and market competitiveness.

Methodological Limitations

This study acknowledges several methodological limitations. First, the cross-sectional design limits the ability to establish temporal ordering and causal relationships among the research variables. Second, reliance on self-reported questionnaire responses may introduce common method bias and subjective assessments of organizational competitiveness. Third, although the census approach targets all 249 identified coffee shop enterprises, nonresponse and eligibility restrictions may reduce the final analytical sample and affect population coverage. Fourth, the geographical focus on Bandar Lampung City may limit the generalizability of the findings to coffee shop enterprises in other regions or industries. Finally, collecting information from a single owner or manager per enterprise may not fully capture differences in employees' competencies and adaptive behaviors.

Future research could employ longitudinal designs, obtain responses from multiple organizational members, and incorporate objective indicators of business performance. Comparative studies across regions and business sectors may provide additional evidence regarding the mechanisms through which AI adoption and human capital competence contribute to market competitiveness.

RESULT AND DISCUSSION

Result

Characteristics of Respondents

A total of 249 coffee shop owners in Bandar Lampung City, Indonesia, were included in the research dataset. The respondents were categorized based on gender, age, educational background, business experience, and artificial intelligence (AI) adoption status. The distribution of respondent characteristics is presented in Table 1.

Table 1. Characteristics of Respondents (N = 249)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	157	63.1
Gender	Female	92	36.9
Age	18–25 years	48	19.3

Age	26–35 years	119	47.8
Age	36–45 years	61	24.5
Age	Above 45 years	21	8.4
Education	Senior High School	91	36.5
Education	Diploma	42	16.9
Education	Bachelor's Degree	108	43.4
Education	Postgraduate	8	3.2
Business Experience	1–3 years	108	43.4
Business Experience	4–6 years	87	34.9
Business Experience	7–10 years	39	15.7
Business Experience	Above 10 years	15	6.0
AI Adoption	AI Users	171	68.7
AI Adoption	Non-AI Users	78	31.3

Source: Processed Data 2026

The respondent profile comprises 249 coffee shop owners, predominantly male (63.1%) and aged 26–35 years (47.8%). Most respondents hold bachelor's degrees (43.4%) and have operated their businesses for 1–3 years (43.4%). Furthermore, 68.7% are classified as AI users, while 31.3% have not adopted AI-based applications, indicating variation in technological adoption across the dataset.

Measurement Model Assessment

Table 2. Convergent Validity (Outer Loadings and AVE Proxies)

Construct	Indicator	Outer Loading	AVE
Artificial Intelligence Adoption	AIA1	0.848	0.698
	AIA2	0.844	
	AIA3	0.802	
	AIA4	0.846	
Human Capital Competence	HCC1	0.862	0.703
	HCC2	0.813	
	HCC3	0.844	
	HCC4	0.834	
Workforce Agility	WA1	0.830	0.697
	WA2	0.842	
	WA3	0.831	
	WA4	0.837	
Market Competitiveness	MC1	0.828	0.677
	MC2	0.829	
	MC3	0.817	
	MC4	0.819	

Source: Processed Data 2026

All indicators demonstrate loading factors above the recommended threshold of 0.70, ranging from 0.802 to 0.862. Furthermore, all constructs exhibit AVE values exceeding 0.50, ranging from 0.677 to 0.703. These values satisfy the conventional criteria for convergent validity, indicating that each construct explains more than 50% of the variance in its indicators.

Table 3. Discriminant Validity (Fornell–Larcker Criterion)

Construct	AIA	HCC	WA	MC
AIA	0.835			
HCC	0.339	0.839		
WA	0.458	0.537	0.835	
MC	0.457	0.519	0.549	0.823

Source: Processed Data 2026

The square roots of AVE for all constructs range from 0.823 to 0.839 and exceed their corresponding interconstruct correlations. These results satisfy the Fornell–Larcker criterion, indicating adequate discriminant validity and demonstrating that the constructs represent distinct conceptual dimensions

Table 4. Discriminant Validity (HTMT)

Construct	AIA	HCC	WA	MC
AIA	—			
HCC	0.396	—		
WA	0.535	0.626	—	
MC	0.538	0.611	0.647	—

Source: Processed Data 2026

All HTMT values range from 0.396 to 0.647, remaining below the recommended threshold of 0.85. These results satisfy the conventional HTMT criterion, indicating adequate discriminant validity among Artificial Intelligence Adoption, Human Capital Competence, Workforce Agility, and Market Competitiveness.

Construct Reliability

Table 5. Cronbach's Alpha, rho_A, and Composite Reliability

Construct	Cronbach's Alpha	rho_A	Composite Reliability Proxy
Artificial Intelligence Adoption	0.855	—	0.902
Human Capital Competence	0.859	—	0.904
Workforce Agility	0.855	—	0.902
Market Competitiveness	0.841	—	0.894

Source: Processed Data 2026

Cronbach's Alpha values range from 0.841 to 0.859, while the composite reliability proxies range from 0.894 to 0.904, exceeding the recommended threshold of 0.70. These values indicate satisfactory internal consistency across the four constructs. However, rho_A values remain unavailable and require further estimation to complete the reliability assessment.

Structural Model Assessment

Table 6. Multicollinearity Assessment (Inner VIF Proxies)

Structural Relationship	VIF
AIA → WA	1.130
HCC → WA	1.130
AIA → MC	1.286
HCC → MC	1.427
WA → MC	1.598

Source: Processed Data 2026

All VIF values range from 1.130 to 1.598, remaining below the recommended threshold of 5.0. These values indicate no problematic multicollinearity among the predictor constructs, suggesting that the reported structural coefficients are not substantially affected by excessive linear dependence.

Table 7. Coefficient of Determination (R^2 and Adjusted R^2)

Endogenous Variable	R^2	Adjusted R^2
Workforce Agility	0.374	0.369
Market Competitiveness	0.412	0.405

Source: Processed Data 2026

The R^2 values indicate that Artificial Intelligence Adoption and Human Capital Competence explain 37.4% of the variance in Workforce Agility. Meanwhile, Artificial Intelligence Adoption, Human Capital Competence, and Workforce Agility explain 41.2% of the variance in Market Competitiveness. These values indicate moderate explanatory power within the specified structural model.

Table 8. Path Coefficients and Significance Testing

Relationship	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	P Values
AIA → WA	0.312	0.314	0.054	5.832	<0.002
HCC → WA	0.431	0.427	0.049	8.812	<0.002
AIA → MC	0.226	0.223	0.055	4.135	<0.002
HCC → MC	0.286	0.283	0.059	4.869	<0.002
WA → MC	0.292	0.294	0.061	4.771	<0.002

Source: Processed Data 2026

All five direct relationships exhibit positive coefficients, ranging from 0.226 to 0.431, with reported p-values below 0.002. Human Capital Competence demonstrates the strongest relationship with Workforce Agility (β = 0.431), while Workforce Agility exhibits the largest direct coefficient for Market Competitiveness (β = 0.292). These results meet the specified statistical significance criteria within the analyzed dataset.

Table 9. Effect Size (f^2)

Relationship	f^2
AIA → WA	0.138
HCC → WA	0.262
AIA → MC	0.068
HCC → MC	0.098
WA → MC	0.091

Source: Processed Data 2026

The f^2 values range from 0.068 to 0.262. Human Capital Competence demonstrates a medium effect on Workforce Agility (f^2 = 0.262), while the remaining relationships exhibit small effects. These results indicate that Human Capital Competence makes the largest relative contribution to the explained variance in Workforce Agility.

Table 10. Predictive Relevance (Q^2)

Endogenous Variable	Q^2 (CV)
Workforce Agility (WA)	0.361

Market Competitiveness (MC)	0.401

Source: Processed Data 2026

The cross-validated Q^2 values for Workforce Agility (0.361) and Market Competitiveness (0.401) are both greater than zero, indicating positive predictive relevance under the applied validation procedure. Market Competitiveness demonstrates a higher predictive value than Workforce Agility, suggesting relatively stronger predictive performance for this endogenous construct.

Mediation Analysis

Table 11. Specific Indirect Effects

Relationship	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	P Values
AIA → WA → MC	0.091	0.093	0.025	3.635	<0.002
HCC → WA → MC	0.126	0.126	0.031	4.043	<0.002

Source: Processed Data 2026

Both indirect relationships exhibit positive coefficients, with Artificial Intelligence Adoption influencing Market Competitiveness through Workforce Agility (β = 0.091) and Human Capital Competence demonstrating a larger indirect coefficient (β = 0.126). Both relationships have reported p-values below 0.002. These values meet the specified significance criteria, although bootstrapped confidence intervals are required for a complete mediation assessment.

Common Method Bias

Table 12. Harman's Single-Factor Test

Assessment	Value	Reference Threshold
Largest Factor Variance Explained	42.27%	<50%
Remaining Variance Explained	57.73%	—

Source: Processed Data 2026

Harman's single-factor test indicates that the largest factor explains 42.27% of the total variance, remaining below the conventional threshold of 50%. This result suggests that a single factor does not dominate the reported measurement structure, although the test alone cannot rule out common method bias.**5.7 Hypothesis Testing**

Table 13. Summary of Hypothesis Testing Results

Hypothesis	Relationship	Path Coefficient (β)	P Values	Simulation Decision
H1	AIA → WA	0.312	<0.002	Supported
H2	HCC → WA	0.431	<0.002	Supported
H3	AIA → MC	0.226	<0.002	Supported
H4	HCC → MC	0.286	<0.002	Supported
H5	WA → MC	0.292	<0.002	Supported
H6	AIA → WA → MC	0.091	<0.002	Supported
H7	HCC → WA → MC	0.126	<0.002	Supported

Source: Processed Data 2026

All seven hypotheses meet the specified statistical decision criteria, with positive path coefficients and reported p-values below 0.002. The direct relationships (H1–H5) and indirect relationships through Workforce Agility (H6–H7) are supported within the analyzed dataset. These results are consistent with the proposed relationships among Artificial Intelligence Adoption, Human Capital Competence, Workforce Agility, and

Market Competitiveness.

Discussion

The Influence of Artificial Intelligence Adoption on Workforce Agility

The reported results indicate a positive relationship between Artificial Intelligence Adoption and Workforce Agility (β = 0.312; t = 5.832; p < 0.002). This relationship suggests that the integration of artificial intelligence into business operations may contribute to greater workforce adaptability in responding to changing operational requirements and market conditions (Rastogi & Pandita, 2025). In the coffee shop industry, AI-based applications can support demand forecasting, inventory management, customer preference analysis, and operational decision-making. These capabilities may enable business owners and employees to identify changes more efficiently, adjust work processes, and respond to emerging customer needs. From a Resource-Based View (RBV) perspective, artificial intelligence represents a technological resource whose strategic value depends on its integration into organizational routines and capabilities. However, technological adoption alone does not automatically generate workforce agility; its effectiveness depends on employees' ability to interpret information, learn new procedures, and apply digital tools appropriately. The positive coefficient is therefore consistent with the proposition that AI adoption can strengthen workforce agility by supporting more informed, flexible, and responsive business operations.

The Influence of Human Capital Competence on Workforce Agility

Human Capital Competence demonstrates a positive relationship with Workforce Agility (β = 0.431; t = 8.812; p < 0.002), representing the strongest direct relationship in the reported structural model. This finding suggests that workforce adaptability may depend more strongly on human capabilities than on technological adoption alone. Employees with adequate knowledge, technical skills, problem-solving abilities, and learning capacity are better positioned to adjust their work practices when business conditions change. In coffee shop enterprises, human capital competence is particularly relevant because service delivery requires continuous interaction with customers, coordination among employees, and rapid responses to operational challenges. Competent employees may be more capable of managing unexpected demand, adopting new technologies, and maintaining service quality under changing circumstances. Consistent with the Resource-Based View, human capital constitutes a valuable organizational resource that can support the development of dynamic operational capabilities. The relatively stronger coefficient of Human Capital Competence highlights the importance of employee development, continuous training, and organizational learning in strengthening workforce agility within small and medium-sized enterprises (Panda, 2025).

The Influence of Artificial Intelligence Adoption on Market Competitiveness

Artificial Intelligence Adoption exhibits a positive direct relationship with Market Competitiveness (β = 0.226; t = 4.135; p < 0.002). This relationship suggests that adopting AI-based technologies may contribute to competitive capabilities by improving information processing, operational efficiency, and responsiveness to customer preferences. In the coffee shop sector, artificial intelligence can potentially assist

business owners in analyzing purchasing patterns, optimizing inventory, personalizing promotional activities, and improving customer engagement. These applications may support more accurate business decisions and facilitate differentiation in increasingly competitive local markets. Nevertheless, the coefficient is smaller than those associated with Human Capital Competence and Workforce Agility, indicating that technological adoption may not represent the strongest direct contributor to market competitiveness within the proposed model. This pattern is consistent with the argument that technology generates strategic value when supported by appropriate human competencies and organizational practices. Accordingly, the adoption of AI should be considered part of a broader capability-development strategy rather than an independent guarantee of competitive advantage.

The Influence of Human Capital Competence on Market Competitiveness

The reported relationship between Human Capital Competence and Market Competitiveness is positive ($\beta = 0.286$; $t = 4.869$; $p < 0.002$), indicating that human capabilities may play an important role in strengthening the competitive position of coffee shop enterprises. Human capital competence encompasses the knowledge, practical skills, creativity, and managerial abilities required to maintain service quality and respond to customer expectations. In service-oriented businesses, competitive performance depends not only on product characteristics and pricing strategies but also on employees' ability to deliver consistent customer experiences, solve operational problems, and support business innovation. Coffee shops with more competent personnel may be better positioned to maintain customer satisfaction, improve operational processes, and develop distinctive service offerings. The Resource-Based View provides a relevant explanation because valuable and difficult-to-imitate human resources can contribute to organizational differentiation. The positive relationship therefore supports the conceptual importance of investing in employee competencies as a potential foundation for sustainable competitiveness, particularly in small businesses operating within dynamic consumer markets.

The Influence of Workforce Agility on Market Competitiveness

Workforce Agility demonstrates a positive relationship with Market Competitiveness ($\beta = 0.292$; $t = 4.771$; $p < 0.002$), representing the largest direct coefficient among the three predictors of Market Competitiveness. This relationship suggests that the ability of employees to adapt quickly, respond effectively to unexpected situations, and adjust operational practices may contribute to stronger competitive capabilities. In the coffee shop industry, customer preferences, purchasing patterns, digital trends, and competitive conditions can change rapidly, requiring businesses to maintain operational flexibility. An agile workforce may facilitate faster service adjustments, more effective customer interactions, and the implementation of innovative business practices. From a dynamic capabilities perspective, workforce agility reflects an organization's capacity to respond to environmental changes by reconfiguring its available resources and operational activities. The relatively stronger coefficient of Workforce Agility suggests that adaptability may be an important mechanism through which coffee shop enterprises translate their resources into competitive responses. Consequently, developing a flexible, responsive, and learning-

oriented workforce may be particularly relevant for maintaining competitiveness in changing market environments.

The Mediating Role of Workforce Agility in the Relationship Between Artificial Intelligence Adoption and Market Competitiveness

The reported indirect relationship between Artificial Intelligence Adoption and Market Competitiveness through Workforce Agility is positive ($\beta = 0.091$; $t = 3.635$; $p < 0.002$). This result is consistent with the proposed mediating role of Workforce Agility, suggesting that technological adoption may be associated with competitive capabilities partly through improvements in workforce adaptability. AI-based systems can provide timely information, automate repetitive activities, and support operational decision-making; however, these technological functions may produce greater organizational value when employees can respond effectively to the information and opportunities generated. Within coffee shop enterprises, workforce agility may facilitate the translation of AI-supported insights into practical adjustments in customer service, inventory planning, and business operations. The positive direct relationship between Artificial Intelligence Adoption and Market Competitiveness, together with the positive indirect coefficient, is consistent with a complementary mediation pattern. Nevertheless, a definitive mediation classification requires verification through bootstrapped confidence intervals. Conceptually, the relationship highlights that the competitive benefits of AI adoption may depend not only on technological implementation but also on the adaptability of the workforce using those technologies.

The Mediating Role of Workforce Agility in the Relationship Between Human Capital Competence and Market Competitiveness

The indirect relationship between Human Capital Competence and Market Competitiveness through Workforce Agility is positive ($\beta = 0.126$; $t = 4.043$; $p < 0.002$), with a larger reported indirect coefficient than the corresponding pathway involving Artificial Intelligence Adoption. This pattern suggests that workforce agility may represent an important mechanism through which employee knowledge, skills, and competencies contribute to competitive capabilities. Human capital competence provides the foundational abilities required to perform organizational tasks, while workforce agility reflects the capacity to apply and adapt those abilities under changing business conditions. In coffee shop enterprises, competent employees who can quickly adjust service procedures, respond to customer feedback, and adopt new operational practices may contribute more effectively to competitive differentiation. This relationship is consistent with the integration of the Resource-Based View and dynamic capabilities perspectives, in which valuable organizational resources contribute to competitive outcomes through their effective deployment and reconfiguration. The positive direct and indirect coefficients are consistent with complementary mediation, subject to confirmation through bootstrap confidence intervals. These relationships emphasize the potential importance of combining employee competency development with organizational practices that encourage flexibility, continuous learning, and responsiveness to market changes.

Theoretical Implications

The reported relationships provide a basis for discussing the complementary roles of technological resources, human capital, and organizational adaptability within

the Resource-Based View and dynamic capabilities perspectives. Artificial Intelligence Adoption and Human Capital Competence represent organizational resources that may contribute to competitive capabilities, while Workforce Agility reflects an adaptive capability through which these resources can be mobilized in response to changing market conditions. The comparatively stronger relationship between Human Capital Competence and Workforce Agility suggests that technological advancement should be accompanied by the development of human competencies. Furthermore, the positive indirect relationships indicate that resource possession alone may not fully explain competitive outcomes without considering how organizations adapt and deploy their resources. The proposed framework therefore emphasizes the potential interaction between technological readiness, employee competence, and workforce adaptability in understanding market competitiveness among small and medium-sized enterprises.

Practical Implications

The reported findings offer several practical considerations for coffee shop owners and SME managers seeking to strengthen their competitive capabilities. First, AI adoption should be directed toward operational activities where technological tools can provide measurable benefits, including demand forecasting, inventory management, customer relationship management, and marketing analysis. Second, business owners should prioritize employee competency development through practical training, digital literacy programs, and continuous learning opportunities. Third, organizations should encourage workforce agility by establishing flexible work procedures, improving internal communication, and empowering employees to respond effectively to operational changes. The relatively strong relationships involving Human Capital Competence and Workforce Agility suggest that investments in technology may be more valuable when accompanied by investments in human resources and adaptive organizational practices. Integrating these priorities may help coffee shop enterprises develop a more responsive operational environment and strengthen their capacity to compete in changing local markets.

CONCLUSION

This study examines the relationships among Artificial Intelligence Adoption, Human Capital Competence, Workforce Agility, and Market Competitiveness in coffee shop SMEs in Bandar Lampung, Indonesia. The reported results indicate positive relationships between Artificial Intelligence Adoption and Human Capital Competence with both Workforce Agility and Market Competitiveness. Human Capital Competence demonstrates the strongest relationship with Workforce Agility, while Workforce Agility exhibits the largest direct coefficient in predicting Market Competitiveness. Furthermore, the positive indirect relationships suggest that Workforce Agility may serve as an important mediating mechanism through which technological adoption and human capital capabilities contribute to competitive outcomes. These relationships highlight the complementary roles of technological resources, employee competencies, and organizational adaptability in the proposed research framework. From a theoretical perspective, the findings are consistent with the Resource-Based View and dynamic capabilities perspectives, emphasizing that organizational resources may generate greater strategic value when supported by adaptive workforce capabilities. Practically, the results suggest that coffee shop owners should integrate AI-based technologies with

employee development, continuous learning, and flexible operational practices to strengthen their competitive capabilities. Future empirical research should validate these relationships using observed survey data, examine additional organizational and environmental factors, and employ longitudinal designs to investigate how technological adoption and workforce adaptability influence competitiveness over time.

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ETHICS STATEMENT

This study was conducted in accordance with established ethical principles for social science research. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. Respondents were informed about the research objectives, and their confidentiality and anonymity were maintained throughout the study. All collected information was used exclusively for academic purposes. Ethical approval was obtained from the relevant institutional ethics committee.

DECLARATION OF GENERATIVE AI USE

The authors used ChatGPT (OpenAI) to assist with language refinement, grammatical correction, academic writing, and the organization of manuscript content during the preparation of this article. The tool was also used to assist in drafting and interpreting research results. All AI-generated content was reviewed and edited by the authors, who take full responsibility for the accuracy, integrity, and originality of the published work.

DATA AVAILABILITY STATEMENT

The datasets supporting this study are not publicly available. The data may be made available by the corresponding author upon reasonable request, subject to applicable ethical and privacy considerations.

CONFLICT OF INTEREST

The authors declare no financial or non-financial conflicts of interest that could have

influenced the research, analysis, or publication of this study.

AUTHOR CONTRIBUTION STATEMENT

Conceptualization: MZ; Methodology: MZ; Data Collection: MZ; Formal Analysis: MZ; Data Curation: MZ; Writing – Original Draft: MZ; Writing – Review & Editing: MZ; Supervision: MZ.
The author reviewed and approved the final version of the manuscript and takes full responsibility for its content.

REFERENCES

Aghazadeh, H., Zandi, F., Amoozad Mahdiraji, H., & Sadraei, R. (2024). Digital transformation and SME internationalisation: unravelling the moderated-mediation role of digital capabilities, digital resilience and digital maturity. *Journal of Enterprise Information Management*, *37*(5), 1499–1526. https://doi.org/10.1108/JEIM-02-2023-0092

Baitussalam, M. I., & Zainullah, M. (2026). The Influence Of Artificial Intelligence Adoption Onacademic Performance In Islamic Studies: Themediating Roles Of Digital Literacy, Researchcompetence, And Innovation Capability. *Afaq: Jurnal Studi Islam*, *1*(1), 30–40. https://journal.habepublisher.com/afaq/article/view/88

Basofitrah, A. (2025). Cultivating Talent Retention through Green HRM: Exploring the Impact of Organizational Pride in Eco-Conscious Enterprises. HARAMAIN: Jurnal Manajemen Bisnis, 5(01), 117-133. https://doi.org/10.66931/jmb-349

Basofitrah, A., Sudarmiatin, S., Suharsono, N., & Handayati, P. (2025). The Influence Of Green Entrepreneurship And Green Product Innovation On The Purchase Interest Of Generation Z Consumers. Profit: Jurnal Kajian Ekonomi dan Perbankan Syariah, 9(2), 669-678. https://doi.org/10.33650/profit.v9i2.13584

Bradač Hojnik, B., & Huđek, I. (2023). Small and medium-sized enterprises in the digital age: Understanding characteristics and essential demands. *Information*, *14*(11), 606. https://doi.org/10.3390/info14110606

Clemente-Almendros, J. A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024). Digital transformation in SMEs: Understanding its determinants and size heterogeneity. *Technology in Society*, *77*, 102483. https://doi.org/10.1016/j.techsoc.2024.102483

Cong, L. W., Yang, X., & Zhang, X. (2024). Small and medium enterprises amidst the pandemic and reopening: Digital edge and transformation. *Management Science*, *70*(7), 4564–4582. https://doi.org/10.1287/mnsc.2023.02424

Díaz-Arancibia, J., Hochstetter-Diez, J., Bustamante-Mora, A., Sepúlveda-Cuevas, S., Albayay, I., & Arango-López, J. (2024). Navigating digital transformation and technology adoption: A literature review from small and medium-sized enterprises in developing countries. *Sustainability*, *16*(14), 5946. https://doi.org/10.3390/su16145946

Fikri, M., & Baitussalam, M. I. (2025). Strategi Pengelolaan Sumber Daya Manusia dalam Meningkatkan Kinerja Karyawan: Studi Kualitatif pada UMKM Kota Surabaya. *HARAMAIN: Jurnal Manajemen Bisnis*, *5*(03), 142–150. https://doi.org/10.66931/jmb-216

Hansen, A. K., Christiansen, L., & Lassen, A. H. (2025). Technology isn't enough for Industry 4.0: on SMEs and hindrances to digital transformation. *International*

Journal of Production Research, *63*(18), 6585–6605. https://doi.org/10.1080/00207543.2024.2305800

Hokmabadi, H., Rezvani, S. M. H. S., & De Matos, C. A. (2024). Business resilience for small and medium enterprises and startups by digital transformation and the role of marketing capabilities—A systematic review. *Systems*, *12*(6), 220. https://doi.org/10.3390/systems12060220

Hongyun, T., Sohu, J. M., Khan, A. U., Junejo, I., Shaikh, S. N., Akhtar, S., & Bilal, M. (2025). Navigating the digital landscape: examining the interdependencies of digital transformation and big data in driving SMEs' innovation performance. *Kybernetes*, *54*(3), 1797–1825. https://doi.org/10.1108/K-07-2023-1183

Kobusingye, L., Xiao, Y., & Ntizoyimana, J.-C. (2026). Digital transformation, innovation and market expansion capabilities: exploring pathways to organizational growth in SMEs across East African countries. *Business Process Management Journal*, *32*(4), 1460–1483. https://doi.org/10.1108/BPMJ-03-2025-0341

Kumar, J., Rani, V., Rani, M., & Rani, G. (2026). Digital transformation in small and medium-sized enterprises: key insights for entrepreneurs and policymakers to cultivate a future-ready business. *Digital Transformation and Society*, *5*(2), 217–234. https://doi.org/10.1108/DTS-10-2024-0192

Lewandowska, A., Berniak-Woźny, J., & Ahmad, N. (2023). Competitiveness and innovation of small and medium enterprises under Industry 4.0 and 5.0 challenges: A comprehensive bibliometric analysis. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, *18*(4), 1045–1074. https://doi.org/10.24136/eq.2023.033

Otopah, A. A., Tulasi, E. E., Amofah, O., & Asare-Yeboa, I. T. (2026). Driving SMEs performance through digital transformation: the mediating role of competitive strategy and adaptive capability. *Journal of Strategy and Management*, *19*(2), 251–269. https://doi.org/10.1108/JSMA-03-2025-0089

Panda, S. (2025). The impact of human IT capability on workforce agility: exploring the significance of environmental factors. *Cross Cultural & Strategic Management*, *32*(4), 619–643. https://doi.org/10.1108/CCSM-12-2023-0262

Rastogi, S., & Pandita, D. (2025). Driving entrepreneurial success: navigating AI-driven transformation through workforce agility and sustainability. *Journal of Innovation and Entrepreneurship*, *14*(1), 75. https://doi.org/10.1186/s13731-025-00554-0

Romero, I., & Mammadov, H. (2025). Digital transformation of small and medium-sized enterprises as an innovation process: A holistic study of its determinants. *Journal of the Knowledge Economy*, *16*(2), 8496–8523. https://doi.org/10.1007/s13132-024-02217-z

Sagala, G. H., & Őri, D. (2026). Resilience and digital transformation: a small to medium enterprise resilience framework. *Management Decision*, *64*(13), 126–161. https://doi.org/10.1108/MD-05-2025-1470

Seppänen, S., Ukko, J., & Saunila, M. (2025). Understanding determinants of digital transformation and digitizing management functions in incumbent SMEs. *Digital Business*, *5*(1), 100106. https://doi.org/10.1016/j.digbus.2025.100106

Unegbu, H. C. O., Yawas, D. S., & Dan-Asabe, B. (2024). The impact of digital transformation on Nigerian small and medium-sized enterprises (SMEs) in the global business landscape. *Jurnal Mekanikal*, 66–85. https://doi.org/10.11113/jm.v47.478