



# Jurnal Riset Akuntansi dan Keuangan

Journal homepage: <https://ejournal.upi.edu/index.php/JRAK/>



## The Impact of Accounting Information Systems and HR Competence on MSMEs' Performance Mediated by E-Commerce

Ali Jufri<sup>1</sup>, Imam Hadiwibowo\*<sup>2</sup>, Nabila Safitri<sup>3</sup>, Vinda Auralia Kesuma Dewi<sup>4</sup>

Fakultas Ekonomi dan Bisnis, Universitas Muhammadiyah Cirebon, Indonesia

\*Correspondence: E-mail: [imam.hadiwibowo@umc.ac.id](mailto:imam.hadiwibowo@umc.ac.id)

### ABSTRACT

The purpose of this study is to investigate the impact of accounting information systems and human resource competencies on the performance of MSMEs in Cirebon City that use e-commerce. The research method employed was descriptive, with a quantitative approach. The sampling technique used was 110 business units and Eviews 12 for data processing. The study's findings revealed that e-commerce and financial literacy had little affect on MSMEs' performance, however accounting information systems and accounting knowledge did. However, simultaneously e-commerce, accounting information systems, accounting knowledge and financial literacy influence the performance of MSMEs. This study makes a contribution by investigating the effects of E-Commerce, accounting information systems, accounting expertise, and financial literacy on the performance of MSMEs in Cirebon City. This study provides an in-depth insight of how e-commerce, accounting information systems, accounting expertise, and financial literacy affect the performance of MSMEs in Cirebon City.

© 2024 Kantor Jurnal dan Publikasi UPI

### INFO ARTIKEL

#### Article History:

Submitted/Received June 15, 2024

First Revised July 15, 2024

Accepted July 31, 2024

First Available online August 14, 2024

Publication Date August 14, 2024

#### Keyword:

Accounting Information Systems, E-Commerce, , Knowledge of Accounting, Financial Literacy, MSME Performance

## 1. INTRODUCTION

Accounting Information Systems (AIS) and HR competencies are identified as key factors as they significantly affect MSMEs performance. AIS provides accurate financial information, which enables better decision-making and improved operational efficiency (Al-Okaily et al., 2023). Meanwhile, high HR competence ensures effective implementation and utilisation of these systems, leading to increased productivity and more effective management. Research shows that the use of cloud-based information systems, for example, has a significant positive impact on MSME performance, especially after the COVID-19 pandemic, by improving the quality of communication and decisions.

Factors such as Accounting Information Systems (AIS) and HR competencies are very influential in improving the performance of MSMEs. Accounting Information Systems provide accurate financial data, assisting MSMEs in better and more efficient decision-making. HR competencies ensure that the technology is utilised to its full potential, improving operational efficiency and productivity. The combination of these two factors supports MSMEs in facing market competition and improving overall business performance.

E-commerce plays an important mediating role in improving the performance of small and medium enterprises (SMEs) by facilitating better market access and increasing operational efficiency. Research shows that e-commerce usage significantly mediates the positive relationship between technology readiness and SME performance. For example, e-commerce platforms enable SMEs to expand their market reach, optimise their cost structure, and increase customer interaction, which in turn positively impacts their performance. (Hussain et al., 2022).

Additionally, the adoption of e-commerce is linked to improved financial and sustainability outcomes for SMEs, especially during challenging times like the COVID-19 pandemic. E-commerce platforms have allowed SMEs to maintain and even boost their financial performance by enabling them to continue operations and engage with customers despite physical restrictions (Gao et al., 2023). Thus, e-commerce serves as a critical bridge between organizational capabilities and market performance, leveraging technological advancements to foster growth and competitiveness among SMEs.

Electronic-based Accounting Information Systems (AIS) or e-accounting is very important in providing accurate data for MSMEs. The use of information technology in AIS allows recording, processing, and storing financial transactions efficiently, accurately, and in a timely manner. This helps companies in managing financial data securely and allows easy access by authorised personnel whenever and wherever they need the information. This reflects how the application of information technology in accounting practices can strengthen the integrity and reliability of financial data generated by MSMEs (Thottoli & Ahmed, 2022).

Accurate data provided by Accounting Information Systems (AIS) greatly supports better decision-making in MSMEs. According to research, the use of an effective accounting system allows companies to access timely and accurate financial reports, which are crucial in improving business performance. This information assists business owners and managers in planning long-term strategies and controlling various operational aspects such as expenses and cash flow. Thus, these systems become crucial in the decision-making process at all levels of organisations, helping them not only survive in a competitive market but also strengthen their productivity and competitiveness in a sustainable manner (Lutfi et al., 2022). Moreover, studies show that data-oriented organisations tend to achieve significant improvements in decision-making. By using accurate and up-to-date data, companies can make more informed and strategic decisions, which in turn can improve financial performance (Chege & Wang, 2020).

High HR competence in using Accounting Information Systems (AIS) is proven to be very effective in improving organisational effectiveness, especially in MSMEs. Studies show that when HR have sufficient expertise in managing and utilising AIS, they can significantly improve management efficiency and cost control. This is because skilled human resources are better able to utilise AIS features to support rational and accurate operational decisions, which in turn strengthen overall organisational performance (Kpurugbara et al., 2016). In addition, other studies have shown that the performance of individuals and work groups in an organisation improves significantly when they can access and use quality information provided by AIS. Good quality information and processes in AIS, which are well utilised by competent HR, contribute directly to improved organisational performance (Al-Okaily, 2024). Investment in improving HR competencies to effectively use AIS is key to maximising the full potential of such systems in supporting the growth and effectiveness of MSMEs.

High HR competencies play a critical role in improving the operational and strategic performance of MSMEs. Studies show that relevant expertise and skills in human resources can enhance the use and implementation of effective HR practices, which in turn improves the overall performance of the organisation. HR managers with high emotional intelligence are able to adopt high-performance HR practices, which directly affect organisational performance positively (Agwu, 2018).

In addition, the role of strong strategic management, including effective planning and implementation of appropriate strategies, is also critical in ensuring successful business performance. Good management practices facilitate SMEs in facing intense competition and enhance their ability to adapt to changing market conditions, thus indirectly improving their operational and strategic performance (Susanto et al., 2023)

E-commerce enables MSMEs to extend their market reach significantly, providing opportunities to access both global and local markets. Through the use of digital platforms, SMEs can overcome traditional geographic limitations and connect with a broader audience. This expansion is facilitated by the internet's ability to provide a platform for continuous interaction and transaction with customers from different parts of the world, enhancing the firm's visibility and reach (Gao et al., 2023).

For instance, e-commerce platforms reduce the need for physical presence in multiple locations, allowing SMEs to penetrate international markets more effectively. This capability is particularly vital during times like the COVID-19 pandemic, where digital platforms have played a crucial role in maintaining business operations amid physical restrictions. Additionally, the use of e-commerce can lead to better financial performance and sustainability for SMEs by enabling them to remain competitive and responsive to market demands (Eduardsen, 2018).

Moreover, the digital marketplace supports a variety of business activities, including marketing, sales, and customer service, all integrated within e-commerce ecosystems that provide essential services such as logistics, payment processing, and customer analytics at potentially lower costs. These ecosystems not only support operational efficiency but also enhance the strategic positioning of SMEs in the global marketplace.

Several studies on the performance of MSMEs that are influenced by Accounting Information Systems and Human Resource Competencies such as (Aji et al., 2023; Muqtafi et al., 2022; Ni Made Marta Yani et al., 2021; Sukmantari & Julianto, 2022), then (Ardiansah et al., 2021) found that e-commerce adoption has a significant influence on the organizational performance of MSMEs in Indonesia and accounting information systems. They developed a structural model to investigate the effects of e-commerce and discovered that AIS acts as a mediator between e-commerce and MSMEs' financial and managerial performance. Then

other researchers studied the mediating role of e-commerce use and the moderating influence of entrepreneurial competence on MSME performance (Hussain et al., 2022). The study results show that e-commerce mediates the positive relationship between technological readiness and adoption costs with firm performance, although the role of entrepreneurial competence as a moderator is not proven significant, then (Yang et al., 2023) which highlights the importance of external readiness and e-commerce functionality in improving MSME performance. The results show that business resources and human resources of MSMEs have a strong and direct influence on firm performance, which is also mediated by e-commerce functionality.

This study provides novelty in several aspects related to the utilisation of e-commerce by MSMEs. First, it explores the significant impact of e-commerce adoption on the financial performance and sustainability of MSMEs during the COVID-19 pandemic, a challenging period for many businesses. It shows how digital strategies not only help survive crisis situations but also improve performance in general.

Second, this study integrates an analysis of the influence of e-commerce on MSMEs' international market expansion, highlighting how digitalisation can facilitate the internationalisation process. This provides a new outlook on how MSMEs can utilise digital technology to not only increase local market reach but also to penetrate the global market.

Third, the study also provides insights into how e-commerce helps reduce market research costs and improve operational efficiency, highlighting the role of technology in optimising MSME business operations. It shows how digital platforms contribute to reduced operational costs and increased competitive advantage.

Overall, this study adds to the existing literature by revealing how e-commerce is not only a tool to maintain business continuity during a crisis but also an important catalyst for the growth and international expansion of MSMEs.

## **HYPOTHESIS DEVELOPMENT**

Accounting information systems facilitate business processes by providing accurate and timely data, which is critical for decision-making in the fast-changing e-commerce environment. Improved operational efficiency can include reduced errors in order processing, improved inventory management, and enhanced customer service. Better financial performance can include increased revenue and reduced operating costs (Qatawneh, 2012). This suggests that advanced accounting information systems facilitate better business processes by utilising technological tools, thus having a positive impact on e-commerce operations (Al-Okaily et al., 2023; Ardiansah et al., 2021).

### **H1: Accounting Information Systems affect the the E-Commerce**

The critical role of human resources as a driving force and core source of competitive advantage in e-commerce businesses. It aims to explore how effective human resource strategies contribute to leveraging e-commerce capabilities to achieve improved organisational performance and competitive advantage in the digital market space. (Qatawneh, 2012). (Rezwan, 2020) discusses the important role of human resources as a driving force and source of core competitive advantage in e-commerce businesses. It aims to explore how effective human resource strategies contribute to leveraging e-commerce capabilities to achieve improved organisational performance and competitive advantage in the digital market space.

### **H2: HR Competence affect the E-Commerce**

The study conducted by (Grande-Urquía et al., 2011) examines how AIS affects performance measures in Spanish SMEs. It emphasises the role of AIS in improving financial and operational performance by providing timely and accurate data that supports decision making and strategic planning. (Grande-Urquía et al., 2011) and Research (Lutfi et al., 2022) examines the use of digital accounting systems and their impact on SME performance, specifically highlighting the moderating impact of the COVID-19 pandemic. This study explores how digital accounting systems have supported SMEs in maintaining performance during the crisis by improving information processing and decision-making capabilities.

### **H3: Accounting Information Systems affect the Performance of MSMEs**

Examining how innovative Human Resource Management practices such as employee participation, performance appraisal, rewards and compensation, recruitment and selection, and redeployment training affect the performance of MSMEs (S. Aslam et al., 2021). This study found that the most innovative Human Resource Management practices have a significant positive impact on company performance, with an emphasis on labor productivity, product innovation, process innovation, and marketing innovation. This shows that MSMEs can greatly benefit from implementing advanced Human Resource Management practices to achieve future growth. Research (Wuen et al., 2020) focuses on how various Human Resource Management practices impact the performance of SMEs. This research shows that practices such as training, performance-related pay, and formal performance targets have a significant positive impact on SME performance, thereby improving areas such as employment growth and productivity (Shafeek, 2016).

### **H4: HR Competence affect the Performance of MSMEs**

The adoption of e-commerce can have a positive impact on the performance of MSMEs by opening up access to a wider market, improving operational efficiency, and increasing competitiveness (Hussain et al., 2022). Through e-commerce, MSMEs can reach new customers and reduce operational costs with automation, allowing them to focus on innovation and service improvement. In addition, e-commerce also allows MSMEs to compete with larger companies through effective digital marketing strategies, while enabling product and service diversification that can improve performance. By offering better customer experiences, such as ease of shopping and personalisation, e-commerce can help MSMEs increase customer satisfaction and loyalty. Despite facing challenges such as digital literacy and capital, e-commerce adoption can be key for MSMEs to achieve long-term growth and success. E-commerce provides opportunities for MSMEs to expand through wider market access and lower operational costs. This is in line with research (Andeka & Indrawan, 2022; Hussain et al., 2022; Rahayu & Day, 2017).

### **H5: E-Commerce Affect Performance of MSMEs**

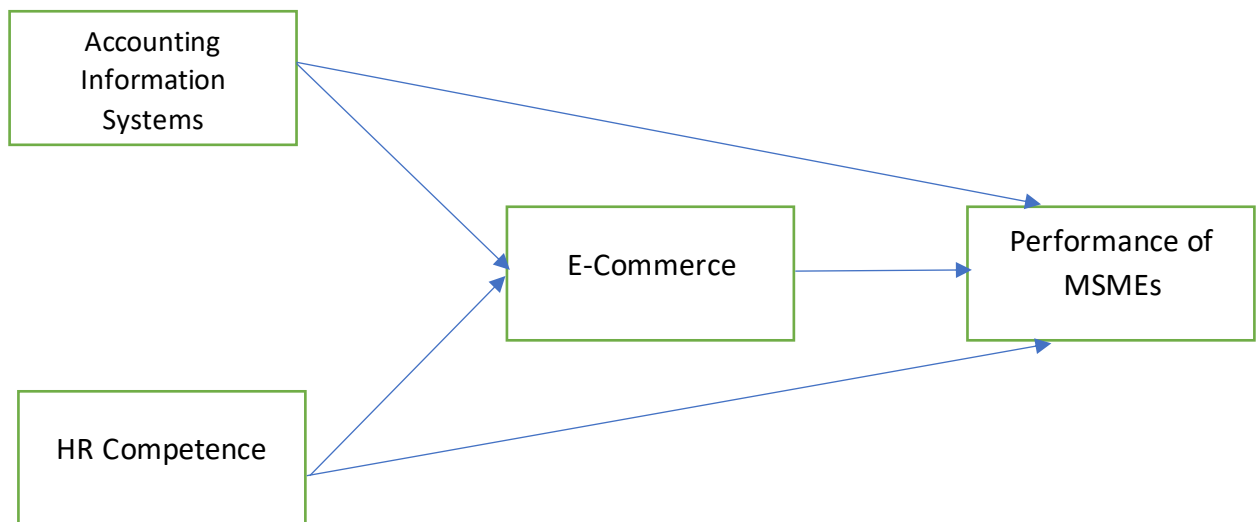
Accounting information systems (AIS) and e-commerce are two important elements that can affect the performance of MSMEs. In this context, AIS can be considered as the foundation that enables MSMEs to manage and track their financial transactions more efficiently and accurately. By having a good AIS, MSMEs can obtain better financial data and support more effective decision making (Ardiansah et al., 2021). An efficient and reliable AIS can help MSMEs in optimising their e-commerce activities. As a mediator, e-commerce allows MSMEs to reach a wider market and increase their sales. By integrating AIS with e-commerce, MSMEs can efficiently track and manage transactions, and optimise their operations. E-commerce provides MSMEs with opportunities to grow their business, while AIS helps them maintain control over financial aspects. Thus, the combination of a robust AIS and an effective e-commerce strategy can result in better performance of MSMEs. This integration can

improve efficiency, provide better insights for decision-making, and enable MSMEs to respond quickly to market changes.

**H6: Accounting Information Systems influence the performance of MSMEs mediated by E-Commerce**

Human resource (HR) competencies play an important role in influencing the performance of micro, small and medium enterprises (MSMEs). When utilised effectively, HR competencies can be an important factor in improving MSME performance, especially when mediated by e-commerce (Wuen et al., 2020). HR competencies cover a wide range of skills and attributes, such as problem solving, technical knowledge, communication, and adaptability. These competencies are important for managing day-to-day operations and strategic planning in MSMEs. Skilled HR can increase efficiency and innovation in organisations, which in turn improves performance. E-commerce acts as a mediator that leverages HR competencies to achieve better business outcomes. When MSMEs adopt e-commerce, they open up new markets, increase customer reach, and increase sales opportunities. However, to capitalise on these benefits, MSMEs need competent HR to manage online platforms, develop digital marketing strategies, and provide customer support (Kiplangat et al., 2015). The interaction between HR competencies and e-commerce can greatly impact MSME performance. For example, skilled HR can better manage the technical aspects of e-commerce platforms, adapt quickly to changing online trends, and effectively analyse customer data to improve products and services. This synergy between HR competencies and e-commerce can lead to improved customer satisfaction, increased sales, and overall business growth (de Vos & Willemse, 2011; Suhara et al., 2022).

**H7: HR Competence influence the performance of MSMEs mediated by E-Commerce**



**Figure 1 Conceptual Framework**

**2. RESEARCH METHODOLOGY**

The method used in this research is a quantitative method. Quantitative research according to Sekaran (2017) is a scientific method whose data is in the form of numbers or numbers that can be processed and analyzed using mathematical or statistical calculations. The quantitative method is in line with this research because it uses observation instruments, interviews and questionnaires which will be carried out on MSMEs registered with the Cirebon City Department of Cooperatives, Small and Medium Enterprises Trade and Industry. The population in this research are MSMEs in the culinary sector that are registered with the Trade and Industry Cooperatives Service, Cirebon City Small and Medium Enterprises Service and have utilized e-commerce in 2023. The sampling technique used is total sampling or



saturated sampling. So the sample used in this research was 110 MSMEs. The data analysis methods used are descriptive statistics, classical assumption test, coefficient of determination, path analysis and Sobel test.

### 3. RESULTS AND DISCUSSION

Descriptive statistical tests were carried out to determine the value of each variable in this study. Descriptive tests in this research include the minimum value, maximum value, mean and standard deviation for the Accounting Information System, HR Competency, e-commerce and MSME performance variables.

**Table 1. Descriptive Statistic**

	X1	X2	Z	Y
Mean	2.477.273	3.522.727	3.238.182	3.500.909
Median	2.500.000	3.500.000	3.300.000	3.500.000
Maximum	2.800.000	4.000.000	3.600.000	4.000.000
Minimum	2.000.000	2.600.000	2.600.000	2.800.000
Std. Dev.	2.337.014	3.420.551	2.650.885	2.878.250
	-	-	-	-
Skewness	0.148607	0.168530	0.549912	0.118131
Kurtosis	1.992.986	2.284.002	2.482.963	2.640.573
Jarque-Bera	5.052.725	2.870.371	6.769.314	0.847952
Probability	0.079949	0.238071	0.033889	0.654440
Sum	2.725.000	3.875.000	3.562.000	3.851.000
Sum Sq. Dev.	5.953.182	1.275.318	7.659.636	9.029.909
Observations	110	110	110	110

Source: Data Process, 2024

The questionnaire used to measure a notion is then tested for validity. A questionnaire is considered valid if its question items can explain what is being measured. The outcomes of the validity test in this study are as follows.

**Table 2. Validity Test**

Variabel	Item	r Value	r Table	Description
E-Commerce	Z1.1	0,523	0,1874	Valid
	Z1.2	0,61		Valid
	Z1.3	0,689		Valid
	Z1.4	0,52		Valid
	Z1.5	0,677		Valid
	Z1.6	0,525		Valid
	Z1.7	0,601		Valid
	Z1.8	0,647		Valid
	Z1.9	0,621		Valid
Accounting Information System	X1.1	0,699	0,1874	Valid
	X1.2	0,565		Valid
	X1.3	0,659		Valid
	X1.4	0,694		Valid
	X1.5	0,725		Valid
	X1.6	0,544		Valid
	X1.7	0,641		Valid
HR Competence	X2.1	0,61	0,1874	Valid
	X2.2	0,686		Valid
	X2.3	0,67		Valid
	X2.4	0,677		Valid
	X2.5	0,722		Valid
	X2.6	0,623		Valid
	X2.7	0,679		Valid
	X2.8	0,704		Valid
	X2.9	0,701		Valid
	X2.10	0,727		Valid
MSME Performance	Y1.1	0,531	0,1874	Valid
	Y1.2	0,576		Valid
	Y1.3	0,348		Valid
	Y1.4	0,472		Valid
	Y1.5	0,597		Valid
	Y1.6	0,412		Valid
	Y1.7	0,587		Valid
	Y1.8	0,563		Valid
	Y1.9	0,596		Valid
	Y1.10	0,519		Valid

Source: Data Process, 2024

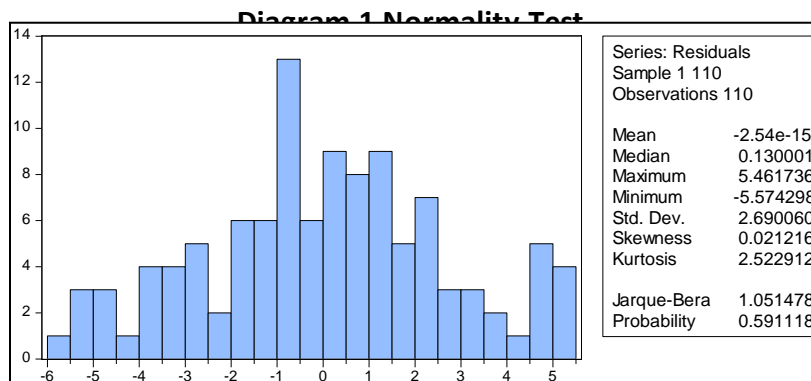
Based on the validity test results in table 2, it can be concluded that all question items on the variables e-commerce, accounting information system, accounting knowledge, financial literacy and MSME performance are declared valid, because they have a calculated r value. > r table 0.1874.

**Table 3. Reability Test**

Variabel	CA Value	Result
E-Commerce (Z)	0,78	Reliabel
AIS (X1)	0,769	Reliabel
HR Competence (X2)	0,871	Reliabel
MSME Performance (Y)	0,692	Reliabel

Source: Data Process, 2024

Reliability tests are carried out to measure the consistency of respondents' answers to questions given from time to time. Based on the reliability test results in table 3, it can be concluded that all question items on the variables e-commerce, accounting information system, accounting knowledge, financial literacy and MSME performance are classified as reliable. This is indicated by a Cronbach's Alpha value greater than 0.60. The data normality test was carried out with the aim of testing whether the research results had a normal distribution or not. Normally distributed if the line (point) that describes the actual data follows or approaches the diagonal line. From the test results above, it can be seen that the Jarque Berra probability value is 0.5911 > 0.05, meaning that the remaining research data is normally distributed.



Source: Data Process, 2024

The multicollinearity test aims to test whether the regression model forms a high or perfect correlation between independent variables. If there is a high correlation between the 9 independent variables, it can be stated that there are multicorlinear symptoms in the study. Interpretation of the results from Table 4 below the multicollinearity test results, can be seen in the Centered VIF column table. And for each Variance Inflating Factor (VIF) value <10, there is no multicollinearity.

**Table 4. Multicollinearity Test**

Variabel Independen	Tolerance	VIF	Decription
E-Commerce	0,776	1,288	No multicollinearity
Accounting Information System	0,768	1,302	No multicollinearity
HR Competence	0,852	1,173	No multicollinearity
MSME Performace	0,915	1,093	No multicollinearity

Source: Data Process, 2024



**Table 5. Heteroscedasticity Test**

<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>			
F-statistic	2.276.497	Prob. F(3,106)	0.0840
Obs*R-squared	6.658.225	Prob. Chi-Square(3)	0.0836
Scaled explained SS	4.707.927	Prob. Chi-Square(3)	0.1945

Source: Data Process, 2024

Table 5: The heteroscedasticity test determines whether there is an inequality of variance between the residuals of one observation and another in the regression model. If the variance of residuals from one observation to another. The regression model requires the absence of heteroscedasticity symptoms. A prob value < 0.05 indicates heteroscedasticity in the study model, whereas a prob value > 0.05 indicates no heteroscedasticity at all. The prob value for the heteroscedasticity test using the white technique is 0.0836, which is more than 0.05, indicating that there are no indications of heteroscedasticity in the study model.

**Table 6. The t-test of X1 and X2 against Z**

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	1.678.697	2.966.114	5.659.584	0.0000
Accounting Information System	0.455036	0.100722	4.517.722	0.0000
HR Competence	0.122699	0.068816	1.782.995	0.0774

Source: Data Process, 2024

The t test is designed to demonstrate the independent variable's partial effect on the dependent variable. The t test table 6 yielded the following results:

- The accounting information system has a coefficient of 0.455036 and a probability of 0.0000, which is less than 0.05. We may conclude that the accounting information system has a substantial impact on e-commerce. Therefore, the first hypothesis (H1) is accepted in this investigation.
- HR competence has a coefficient of 0.122699 and a probability of 0.0774, which is greater than 0.05. We can conclude that accounting expertise has no substantial impact on e-commerce. Thus, the second hypothesis (H2) is rejected in this investigation.

**Table 7. The t-test of X1 and X2 against Y**

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	2.260.695	3.439.774	6.572.220	0.0000
Accounting Information System	0.204863	0.116807	1.753.857	0.0823
HR Competence	0.207996	0.079806	2.606.282	0.0105

Source: Data Process, 2024

Based on the t test table 7, the following outputs are obtained:

- The accounting information system has a coefficient of 0.204863 and a probability of 0.0823, which is greater than 0.05. It may be stated that the accounting information system has no substantial impact on the performance of MSMEs. Thus, the initial hypothesis (H3) is rejected in this investigation.
- HR competence has a coefficient of 0.207996 and a probability of 0.0105, which is less than 0.05. Accounting expertise has a substantial impact on the success of MSMEs. Thus, the second hypothesis (H4) is accepted in this investigation.

**Table 8 The t-test of Z against Y**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.627.412	3.287.985	7.990.949	0.0000
E-Commerce	0.269749	0.101203	2.665.441	0.0089

Source: Data Process, 2024

Based on the results from table 8, the coefficient value is 0.269749 and the probability value is 0.0089 <0.05. So it can be concluded that e-commerce has a significant effect on the performance of MSMEs. Thus the fifth hypothesis (H5) in the study is accepted.

**Table 9 R Square Test X1, X2 Against Y**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.260.695	3.439.774	6.572.220	0.0000
Accounting Information System	0.204863	0.116807	1.753.857	0.0823
HR Competence	0.207996	0.079806	2.606.282	0.0105
R-squared	0.111579	Mean dependent var		3.500.909
Adjusted R-squared	0.094973	S.D. dependent var		2.878.250
S,E, of regression	2.738.163	Akaike info criterion		4.879.346
Sum squared resid	8.022.365	Schwarz criterion		4.952.995
Log likelihood	-2.653.640	Hannan-Quinn criter.		4.909.218
F-statistic	6.719.167	Durbin-Watson stat		2.102.589
Prob(F-statistic)	0.001783			

Source: Data Process, 2024

Based on table 9, the coefficient of determination test yielded an Adjusted R squared value of 0.094973, or 9.49%, indicating that the accounting information system variable and HR competence can explain the MSME performance variable by 9.49%. The remaining 90.51% is explained by variables outside of this study.

**Table 10 R Square Test X1, X2 Against Z**

Variable	Coefficient	Std, Error	t-Statistic	Prob,
C	1.678.697	2.966.114	5.659.584	0.0000
Accounting Information System	0.455036	0.100722	4.517.722	0.0000
HR Competence	0.122699	0.068816	1.782.995	0.0774
R-squared	0.221228	Mean dependent var		3.238.182
Adjusted R-squared	0.206672	S.D. dependent var		2.650.885
S,E, of regression	2.361.116	Akaike info criterion		4.583.040
Sum squared resid	5.965.108	Schwarz criterion		4.656.689
Log likelihood	-2.490.672	Hannan-Quinn criter.		4.612.912
F-statistic	1.519.792	Durbin-Watson stat		1.907.633
Prob(F-statistic)	0.000002			

Source: Data Process, 2024

Based on table 10, the coefficient of determination test yielded an Adjusted R squared value of 0.202571, or 20.67%, indicating that the information system variable and the HR competency variable can explain the e-commerce variable by 20.67%. The remaining 79.37% is explained by other factors.

**Table 11 R Square Test X1, X2, Z Against Y**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.008.470	3.906.220	5.141.723	0.0000
Accounting Information System	0.136493	0.126982	1.074.904	0.2849
HR Competence	0.189560	0.080678	2.349.596	0.0206
E-Commerce	0.150251	0.111690	1345251	0.1814
R-squared	0.126492	Mean dependent var		3.500.909
Adjusted R-squared	0.101770	S.D. dependent var		2.878.250
S.E. of regression	2.727.861	Akaike info criterion		4.880.599
Sum squared resid	7.887.701	Schwarz criterion		4.978.798
Log likelihood	-2.644.329	Hannan-Quinn criter.		4.920.429
F-statistic	5.116.576	Durbin-Watson stat		2.100.255
Prob(F-statistic)	0.002406			

Source: Data Process, 2024

The sobel test aims to test the significance of mediating variables in a study. Based on table 11, the results of the coefficient of determination test obtained an Adjusted R squared value of 0.101770 or 10.18%, explaining that the accounting information system variable, HR competence, and e-commerce are able to explain the MSME performance variable by 18.07%. While the remaining 89.82% is explained by other variables

**Table 12 Sobel Test X1 on Y through Z**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.678.697	2.966.114	5.659.584	0.0000
Accounting Information System	0.455036	0.100722	4.517.722	0.0000
HR Competence	0.122699	0.068816	1.782.995	0.0774
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.008.470	3.906.220	5.141.723	0.0000
Accounting Information System	0.136493	0.126982	1.074.904	0.2849
HR Competence	0.189560	0.080678	2.349.596	0.0206
E-Commerce	0.150251	0.111690	1345251	0.1814

Source: Data Process, 2024

$$z = \frac{ab}{\sqrt{(b^2 SE_a^2) + (a^2 SE_b^2)}}$$

$$z = \frac{0,455036 \times 0,150251}{\sqrt{(0,150251^2 \times 0,100722^2) + (0,455036^2 \times 0,111690^2)}}$$

$$z = \frac{0,068369}{\sqrt{0,00281}}$$

$$z = \frac{0,068369}{0,05300}$$

$$z = 1,290$$

Using a significance level of 0.05, the sobel test computation above yielded a z value of 1.290. E-commerce cannot mediate the impact of accounting information systems on MSME performance, as indicated by the z value of 1.290 < 1.982. Thus, hypothesis 6 (H6) is found to be false.

**Table 13 Sobel Test X2 on Y through Z**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.678.697	2.966.114	5.659.584	0.0000
Accounting Information System	0.455036	0.100722	4.517.722	0.0000
HR Competence	0.122699	0.068816	1.782.995	0.0774
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.008.470	3.906.220	5.141.723	0.0000
Accounting Information System	0.136493	0.126982	1.074.904	0.2849
HR Competence	0.189560	0.080678	2.349.596	0.0206
E-Commerce	0.150251	0.111690	1345251	0.1814

Source: Data Process, 2024

$$z = \frac{ab}{\sqrt{(b^2 SE_a^2) + (a^2 SE_b^2)}}$$

$$z = \frac{0,122699 \times 0,150251}{\sqrt{(0,150251^2 \times 0,068816^2) + (0,122699^2 \times 0,111690^2)}}$$

$$z = \frac{0,018436}{\sqrt{0,000295}}$$

$$z = \frac{0,018436}{0,017176}$$

$$z = 1,073$$

With a significance level of 0.05, the sobel test calculation yielded a z value of 1.073. The estimated z value of 1.073 < 1.982 indicates that e-commerce is not a significant mediating factor for the impact of HR competence on MSME performance. Thus, it can be said that hypothesis 7 (H7) is not supported.

## DISCUSSION

### The Influence of Accounting Information Systems on E-Commerce

The study's data analysis indicates that the Accounting Information System's (AIS) impact on e-commerce is noteworthy. The findings of the t-test demonstrate a positive coefficient of 0.455036 with an extremely low p-value (0.0000), suggesting that there is a statistically significant and positive relationship between AIS and e-commerce. This suggests that AIS is crucial to raising the efficacy and efficiency of e-commerce activities. According to Venkatesh et al. (2012), a successful application of AIS guarantees improved financial management, transaction automation, and data accuracy—all essential elements of prosperous e-commerce operations (Venkatesh et al., 2012). Furthermore, the integration of AIS with other systems such as customer relationship management (CRM) and supply chain management (SCM) also enhances operational synergies, allowing e-commerce to operate more smoothly and responsively to market needs. Therefore, improvements in accounting information systems directly contribute to improved e-commerce business performance (Al-Okaily et al., 2023; Ardiansah et al., 2021).

### The Influence of Human Resource Competency on E-Commerce

From the data analysis in the articles studied, the influence of human resource (HR) competence on e-commerce has no effect. The t-test results show a positive coefficient of 0.122699 with a p-value of 0.0774 indicating that the influence of Human Resources has no effect on e-commerce. Although human resource (HR) competency is often considered an important factor in e-commerce success, there is an argument that HR competency may not always have a significant influence on e-commerce performance. Automation and technology have reduced dependence on HR competence in several aspects of e-commerce operations (Rahayu & Day, 2017). For example, the use of automated inventory management software, chatbots for customer service, and algorithms for data can replace humans in certain tasks, indicating that HR competency is not always the primary determinant in the success of e-commerce operations. Additionally, many modern e-commerce platforms are designed to be easy to use even by individuals who do not have high technical skills. Platforms like Tokopedia, Bukalapak, and Sirclo offer all-in-one solutions that take the process out of creating and managing an online store, which can reduce the impact of HR competency on e-commerce performance as these tools provide extensive guidance and support (Rezwan, 2020; Venkatesh et al., 2012).

### **The Influence of Accounting Information Systems on MSME Performance**

It was established through data analysis in the examined publications that there is no relationship between the Accounting Information System (AIS) and MSME performance. The Accounting Information System (AIS) has no effect on the performance of MSMEs, according to the t-test results, which reveal a positive coefficient of 0.204863 with a p-value of 0.0823. A common belief is that Accounting Information Systems (AIS) hold the key to enhancing the efficacy and efficiency of corporate operations, particularly those conducted by MSMEs. However, there are reasons why the Accounting Information System (AIS) has no effect on the performance of MSMEs (Thong, 1999). The use of traditional and manual accounting methods among MSMEs is still common because they are considered more appropriate to the complexity and limited resources of MSMEs. Lack of knowledge and skills in operating Accounting Information Systems (AIS) is one of the main obstacles for MSMEs. This can result in suboptimal use of AIS so that the benefits provided to MSMEs are not optimal (Loukis, 2009; Salehi et al., 2010).

### **The Influence of Human Resource Competency on MSME Performance**

From the data analysis in the articles studied, the influence of human resource (HR) competence on MSME performance is proven to be influential. The t-test results show a positive coefficient of 0.207996 with a p-value of 0.0105 indicating that the influence of human resource (HR) competency has a positive effect on the performance of MSMEs. Human resource (HR) competency is a fundamental pillar in the success and progress of MSMEs because the better the HR competency, the better the MSME performance. Competent human resources are able to manage operations efficiently and effectively which ultimately produces a positive impact on MSME performance (Shafeek, 2016). One thing that can be done to improve HR competency is training. The benefits of training for HR competency include being able to contribute to improving the performance of MSMEs (M. Aslam et al., 2023; Wuen et al., 2020). HR competency is a determining factor in various aspects, starting from increasing productivity, maintaining product and service quality, and increasing competitiveness amidst intense market competition.

### **The Influence of E-Commerce on MSME Performance**

The impact of e-commerce on MSME performance has been demonstrated by the data analysis in the examined papers. According to the t-test results, e-commerce improves MSMEs' performance, with a positive coefficient of 0.269749 and a p-value of 0.0089. MSMEs can increase their market share by strategically utilizing e-commerce. A larger market is accessible with this digital platform. The key to business growth and development, which positively affects the performance of MSMEs, is understanding technology and how business actors use social media, such as e-commerce, in sales and marketing. E-commerce allows MSMEs to build brand awareness and increase customer satisfaction. This digital platform provides space for MSMEs to build a positive brand image, provide better customer service, and build closer relationships with customers. Through e-commerce, MSMEs can reach global markets, increase sales exponentially, and generate significant profitability (Maghfiroh & Biduri, 2022). Adoption of e-commerce helps MSMEs save operational costs, increase product competitiveness and maximize profits (Hussain et al., 2022; Rahayu & Day, 2017).

### **The influence of Accounting Information Systems on MSME Performance is mediated by E-Commerce**

E-commerce is unable to mitigate the impact of accounting information systems (AIS) on MSMEs' performance, according to the data analysis in the publications under review. The Sobel test findings indicate that a significance threshold of 0.05 was used to produce the z value of 1.290. E-commerce cannot mediate the impact of accounting information systems on MSME performance, as indicated by the z value of  $1.290 < 1.982$ . Put differently, the performance of MSMEs cannot be enhanced by accounting information systems (AIS) facilitated by e-commerce. Achieving optimal e-commerce requires solid integration between systems, such as accounting information systems (AIS), inventory management, and online sales platforms (Venkatesh et al., 2012). SIA integration with e-commerce systems often presents technical obstacles and limited resources for MSMEs (Ibrahim et al., 2020). Integration that is not smooth means that accounting information system (AIS) data cannot be utilized optimally to support e-commerce operations, thereby hampering the achievement of improving MSME performance.

### **The influence of Human Resource Competency on MSME Performance is mediated by E-Commerce**

Based on the data analysis in the examined publications, it is not possible for e-commerce to mitigate the impact of human resource (HR) competence on the performance of MSME's. At a significance level of 0.05, the Sobel test findings indicate that the z value is 1.073. E-commerce cannot mediate the influence of HR competence on MSME performance, as evidenced by the derived z value of  $1.073 < 1.982$ . Effective corporate management heavily relies on HR competency, which encompasses aptitude, expertise, and knowledge. Although competent HR can utilize e-commerce platforms to expand business reach, these platforms cannot overcome the limited competencies that HR may have. The success of e-commerce depends on good integration between technology and business strategy. This integration will not be optimal without adequate human resource (HR) competence (Thong & Yap, 1995). E-commerce also requires a deep understanding of digital marketing, inventory management, and customer data analysis, all of which require specialized HR skills (Bharati & Chaudhury, 2006). If HR does not have these skills then the benefits of e-commerce cannot be maximized and this will impact the performance of MSMEs. Limited human resources to manage e-commerce optimally within MSME circles is also a common obstacle that is often faced so that even though e-commerce is used, the impact on MSME performance is not felt (Chen & McQueen, 2008; Grandon & Pearson, 2004; Levenburg et al., 2006).

## **4. CONCLUSION**

The present study has effectively determined that e-commerce is greatly impacted by Accounting Information Systems. E-commerce demonstrates its ability to enhance MSMEs' performance. Conversely, while having little effect on e-commerce, HR competency is essential for improving the performance of MSMEs. The measurement instruments' validity and reliability results attest to the accuracy of the data used in the study. The regression model was found to be stable upon further examination, as there was no evidence of heteroscedasticity or multicollinearity. In particular, e-commerce was unable to mediate the effect of Accounting Information Systems and HR Competencies on MSME performance, indicating that the two variables have a more significant direct effect. These findings underscore the importance of implementing effective information systems and developing



HR competencies as keys to improving MSME performance, as well as integrating e-commerce as an effective business strategy.

## 5. REFERENCE

- Agwu, M. E. (2018). Analysis of the impact of strategic management on the business performance of SMEs in Nigeria. *Academy of Strategic Management Journal*, 17(1), 1–20.
- Aji, G., Wahid, U. K. H. A., Karimah, A., Indriyani, D., Fitriani, P., Amaliya, I., & Abdurrahman Wahid, U. K. H. (2023). Pengaruh Strategi Pemasaran, Kompetensi SDM, Pengelolaan Keuangan dan Sistem Informasi Akuntansi Dalam Meningkatkan Kinerja UMKM. *Jurnal Penelitian Ekonomi Manajemen Dan Bisnis (JEKOMBIS)*, 2(2), 184–193.
- Al-Okaily, M. (2024). Assessing the effectiveness of accounting information systems in the era of COVID-19 pandemic. *VINE Journal of Information and Knowledge Management Systems*, 54(1), 157–175. <https://doi.org/10.1108/VJIKMS-08-2021-0148>
- Al-Okaily, M., Alkhwaldi, A. F., Abdulmuhsin, A. A., Alqudah, H., & Al-Okaily, A. (2023). Cloud-based accounting information systems usage and its impact on Jordanian SMEs' performance: the post-COVID-19 perspective. *Journal of Financial Reporting and Accounting*, 21(1), 126–155. <https://doi.org/10.1108/JFRA-12-2021-0476>
- Andeka, Z. N. P., & Indrawan, B. (2022). The Role of E-Commerce in the Success of Small and Medium Enterprises. *Journal of Business and Behavioural Entrepreneurship*, 5(2), 13–19. <https://doi.org/10.21009/jobbe.005.2.03>
- Ardiansah, M. N., Chariri, A., & Raharja, S. (2021). Does E-Commerce Impact on Accounting Information System and Organizations Performance? *Proceedings of the 2nd Annual Conference on Blended Learning, Educational Technology and Innovation (ACBLETI 2020)*, 560(Acbleti 2020), 476–481. <https://doi.org/10.2991/assehr.k.210615.090>
- Aslam, M., Shafi, I., Ahmed, J., de Marin, M. S. G., Flores, E. S., Gutiérrez, M. A. R., & Ashraf, I. (2023). Impact of Innovation-Oriented Human Resource on Small and Medium Enterprises' Performance. *Sustainability (Switzerland)*, 15(7), 1–23. <https://doi.org/10.3390/su15076273>
- Aslam, S., Elmagrhi, M. H., Rehman, R. U., & Ntim, C. G. (2021). Environmental management practices and financial performance using data envelopment analysis in Japan: The mediating role of environmental performance. *Business Strategy and the Environment*, 30(4), 1655–1673. <https://doi.org/10.1002/bse.2700>
- Bharati, P., & Chaudhury, A. (2006). Studying the current status of technology adoption. *Communications of the ACM*, 49(10), 88–93. <https://doi.org/10.1145/1164394.1164400>
- Chege, S. M., & Wang, D. (2020). The influence of technology innovation on SME performance through environmental sustainability practices in Kenya. *Technology in Society*, 60. <https://doi.org/10.1016/j.techsoc.2019.101210>
- Chen, J., & McQueen, R. J. (2008). Factors affecting e-commerce stages of growth in small Chinese firms in New Zealand: An analysis of adoption motivators and inhibitors. *Journal of Global Information Management*, 16(1), 26–60. <https://doi.org/10.4018/jgim.2008010102>
- De Vos, A., & Willemse, I. (2011). Leveraging Training Skills Development in SMEs. *OECD Working Paper Series*, 50. [www.oecd.org/cfe/leed.%0D](http://www.oecd.org/cfe/leed.%0D)

- Eduardsen, J. (2018). Internationalisation Through Digitalisation: the Impact of E-Commerce Usage on Internationalisation in Small- and Medium-Sized Firms. In R. van Tulder, A. Verbeke, & L. Piscitello (Eds.), *International Business in the Information and Digital Age* (Vol. 13, pp. 159–186). Emerald Publishing Limited. <https://doi.org/10.1108/S1745-886220180000013008>
- Gao, J., Siddik, A. B., Khawar Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. S. (2023). Impact of E-Commerce and Digital Marketing Adoption on the Financial and Sustainability Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study. *Sustainability (Switzerland)*, *15*(2). <https://doi.org/10.3390/su15021594>
- Grande-Urquía, E., Pérez-Estébanez, R., & Muñoz-Colomina, C. (2011). The Impact of Accounting Information Systems ( AIS ) on Performance Measures. *The International Journal of Digital Accounting Research*, *11*(February), 25–43. <https://doi.org/10.4192/1577-8517-v11>
- Grandon, E. E., & Pearson, J. M. (2004). Electronic commerce adoption: An empirical study of small and medium US businesses. *Information and Management*, *42*(1), 197–216. <https://doi.org/10.1016/j.im.2003.12.010>
- Hussain, A., Hussain, R., Akbar, M., Shahzad, A., Poulouva, P., & Akbar, A. (2022). E-Commerce and SME Performance: The Moderating Influence of Entrepreneurial Competencies. *Administrative Sciences*, *12*(13). <https://doi.org/10.3390/admsci1201001>
- Ibrahim, F., Ali, D. N. H., & Besar, N. S. A. (2020). Accounting information systems (AIS) in SMEs: Towards an integrated framework. *International Journal of Asian Business and Information Management*, *11*(2), 51–67. <https://doi.org/10.4018/IJABIM.2020040104>
- Kiplangat, B. J., Shisia, A., & Cherotich Asienga, I. (2015). EFFECTS OF HUMAN COMPETENCIES IN THE ADOPTION OF E-COMMERCE STRATEGIES AMONG SMEs IN KENYA. *International Journal of Economics, Commerce and Management United Kingdom*, *III*(10), 846–863. <http://ijecm.co.uk/>
- Kpurugbara, N., Akpos, Y. E., & Nwiduuduu, V. G. (2016). Impact of Accounting Information System on Organizational Effectiveness: A Study of Selected Small and Medium Scale Enterprises in Woji, Portharcourt. *International Journal of Research*, *3*(01), 1.
- Levenburg, N., Magal, S., & Kosalge, P. (2006). An Exploratory Investigation of Organizational Factors and e-Business Motivations Among SMFOEs in the US. *Electronic Markets*, *16*(1), 70–84. <https://doi.org/10.1080/10196780500491402>
- Loukis, E. (2009). The Effect of Information and Communication Technologies Investments and Strategic Alignment on Greek Firms ' Performance. *Journal of Money, Investment and Banking*, *9*(9), 80–94.
- Lutfi, A., Alkelani, S. N., Al-Khasawneh, M. A., Alshira'h, A. F., Alshirah, M. H., Almaiah, M. A., Alrawad, M., Alsyuf, A., Saad, M., & Ibrahim, N. (2022). Influence of Digital Accounting System Usage on SMEs Performance: The Moderating Effect of COVID-19. *Sustainability (Switzerland)*, *14*(22), 1–23. <https://doi.org/10.3390/su142215048>
- Maghfiroh, L., & Biduri, S. (2022). Adopsi E-Commerce Memediasi Hubungan Kesiapan Teknologi, Lingkungan Eksternal dan Literasi Keuangan Terhadap Kinerja Keuangan UMKM. *E-Jurnal Akuntansi*, *32*(8), 2118. <https://doi.org/10.24843/eja.2022.v32.i08.p12>
- Muqtafi, A. Z., Kuntadi, C., & Pramukty, R. (2022). Pengaruh Pemberian Kredit, Sistem Informasi Akuntansi Dan Kompetensi Sumber Daya Manusia Terhadap Kinerja Umkm. *Madani: Jurnal Ilmiah Multidisiplin*, *8*(1), 45–56. <https://doi.org/10.37303/embeji.v8i1.150>

- Ni Made Marta Yani, N. M. M. Y., Agus Khazin Fauzi, & Ni Nyoman Yuliaty. (2021). Pengaruh Pemanfaatan Teknologi Informasi, Penggunaan Informasi Akuntansi Dan Pelatihan Terhadap Kinerja Umkm Di Kecamatan Mataram. *Jurnal Akuntansi Dan Keuangan Syariah - ALIANSI*, 6(1), 13–24. <https://doi.org/10.54712/aliansi.v6i1.188>
- Qatawneh, A. M. (2012). The Effect of Electronic Commerce on the Accounting Information System of Jordanian Banks. *International Business Research*, 5(5), 158–163. <https://doi.org/10.5539/ibr.v5n5p158>
- Rahayu, R., & Day, J. (2017). E-commerce adoption by SMEs in developing countries: evidence from Indonesia. *Eurasian Business Review*, 7(1), 25–41. <https://doi.org/10.1007/s40821-016-0044-6>
- Rezwan, R. B. (2020). *Managing Human Resources in E-Commerce*. 229–256. <https://doi.org/10.4018/978-1-7998-5823-2.ch010>
- Salehi, M., Rostami, V., & Mogadam, A. (2010). Usefulness of Accounting Information System in Emerging Economy: Empirical Evidence of Iran. *International Journal of Economics and Finance*, 2(2), 186–195. <https://doi.org/10.5539/ijef.v2n2p186>
- Shafeek, H. (2016). the Impact of Human Resources Management Practices in Smes. *Annals of the Faculty of Engineering Hunedoara-International Journal of Engineering*, 14(4), 91–102. <http://annals.fih.upt.ro/pdf-full/2016/ANNALS-2016-4-13.pdf>
- Suhara, T., Husin, & Bangun, C. S. (2022). Human Resource Competence And Innovation Of Small And Medium Micro Enterprises (UMKM) Tangerang Regency. *APTISI Transactions on Management (ATM)*, 6(2), 181–190. <https://doi.org/10.33050/atm.v6i2.1741>
- Sukmantari, N. K. Y., & Julianto, I. P. (2022). Pengaruh Penerapan Sistem Informasi Akuntansi, Kualitas Sumber Daya Manusia, dan Pemanfaatan E-commerce Terhadap Kinerja UMKM Pengrajin Batu Padas di .... *Jurnal Akuntansi Profesi*, 13, 777–786. <https://ejournal.undiksha.ac.id/index.php/JAP/article/view/37501%0Ahttps://ejournal.undiksha.ac.id/index.php/JAP/article/download/37501/24217>
- Susanto, P., Hoque, M. E., Shah, N. U., Candra, A. H., Hashim, N. M. H. N., & Abdullah, N. L. (2023). Entrepreneurial orientation and performance of SMEs: the roles of marketing capabilities and social media usage. *Journal of Entrepreneurship in Emerging Economies*, 15(2), 379–403. <https://doi.org/10.1108/JEEE-03-2021-0090>
- Thong, J. Y. L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187–214. <https://doi.org/10.1080/07421222.1999.11518227>
- Thong, J. Y. L., & Yap, C. S. (1995). CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega*, 23(4), 429–442. [https://doi.org/10.1016/0305-0483\(95\)00017-1](https://doi.org/10.1016/0305-0483(95)00017-1)
- Thottoli, M. M., & Ahmed, E. R. (2022). Information technology and E-accounting: some determinants among SMEs. *Journal of Money and Business*, 2(1), 1–15. <https://doi.org/10.1108/jmb-05-2021-0018>
- Venkatesh, V., Thong, J. y. ., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology by Viswanath Venkatesh, James Y.L. Thong, Xin Xu :: SSRN. *MIS Quarterly*, 36(1), 157–178. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2002388](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2002388)
- Wuen, C. H., Ibrahim, F., & Ringim, K. J. (2020). The impact of human resource management practices on SMEs performance: An exploratory study in Brunei Darussalam. *International Journal of Asian Business and Information Management*, 11(2), 68–87. <https://doi.org/10.4018/IJABIM.2020040105>

Yang, X., Ma, Y., & Han, J. (2023). Product information the more the better? A moderated mediation model to explain consumer purchasing intention in cross-border e-commerce. *Asia Pacific Journal of Marketing and Logistics*, 35(11), 2601–2620. <https://doi.org/10.1108/APJML-08-2022-0723>