

-RESEARCH ARTICLE-

THE IMPACT OF DIGITAL LITERACY AND E-COMMERCE ADOPTION WITH O2O BUSINESS ADOPTION ON THE PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES

Umi Suryani

Management Department, BINUS Business School
Doctor of Research in Management, Bina Nusantara University,
Jakarta, Indonesia 11480.
Email: umi.suryani@binus.ac.id

Mts Arief

Management Department, BINUS Business School
Doctor of Research in Management, Bina Nusantara University,
Jakarta, Indonesia 11480.
Email: chairman_arie@yahoo.com

Sri Bramantoro

Management Department, BINUS Business School
Doctor of Research in Management, Bina Nusantara University,
Jakarta, Indonesia 11480.
Email: sabdinagoro@binus.edu

M. Hamsal

Management Department, BINUS Business School
Doctor of Research in Management, Bina Nusantara University,
Jakarta, Indonesia 11480.
Email: mhamsal@yahoo.com

—Abstract—

This study aims to determine the relationship between digital literacy, e-commerce adoption, and Online-to-Offline (O2O) business adoption and company performance. In this study, the authors attempt to evaluate previous research on the relationship between the theory of technology, organizational, and environmental (TOE) elements and adoption. They uncovered more intriguing participation of other factors in assuring how businesses may optimize the value gained from business analytics and traditional TOE factors, which may have additional implications. This research employs a descriptive quantitative design. Using a four-point Likert scale, a structured study questionnaire was developed. A simple random sample was used for this study, and SEM-PLS was used to evaluate the data from 100 completed questionnaires. This study demonstrates how digital literacy, e-commerce adoption, and O2O channel adoption influence the success of small and medium-sized firms (SMEs).

Keywords: Digital Literacy, E-commerce, O2O, Performance, Business, Small Medium Enterprises

1. INTRODUCTION

SMBs have an essential role in relieving poverty in a nation. The economic report (PPN/Bappenas, 2020) claims that Indonesia's small and medium-sized enterprises (SMEs) play a significant role in the economy and can continue to be expanded to promote national economic growth. According to the most recent data, the development and progress of SMEs as the nation's economic fighters is a source of pride for Indonesia. This is because SMEs are capable of absorbing labor. This information was provided by the Ministry of Cooperatives and SMEs via their official website in 2021. It was stated that more than 64,2 million micro, small, and medium-sized enterprises could absorb up to 97% of the national workforce. Until the substantial increase in the gross domestic product (GDP) reached 61.97 percent, the economy grew slowly. The Ministry of Cooperatives and SMEs also disclosed that the SME contribution to GDP reached 61.07 percent (Indonesia, 2021).

Due to SMEs' significant impact on a nation's economy, it is necessary to increase their performance (Hendrawan et al., 2018). The first thing to understand is the factors that can hinder the performance of SMEs (Kiyabo et al., 2020). Many small and medium-sized businesses are today challenged by the difficulties of acquiring clients, their inability to innovate, and their incapacity to build market strategies (Eze et al., 2021). The pandemic that had struck affected corporate strategy as well. The inability of SMEs to adapt will exacerbate the issue until they are ultimately compelled to close their doors (Nguyen et al., 2021). In Indonesia, SMEs have made significant contributions and played crucial roles, such as expanding employment prospects (Gusman et al., 2021). SMEs are also a safety net for low-income populations to engage in economically beneficial activities (Widnyana et al., 2021). Moreover, in the Industrial Age 4.0, Small,

Micro, and Medium-Sized Enterprises (SMEs) play a significant role in boosting a country's GDP (gross domestic product), particularly Indonesia.

Significant impact on the economy of Indonesia. The coronavirus outbreak has significantly impacted micro, small, and partner firms in various industries (Herlinawati et al., 2020). Reduced sales, capital, declining orders, raw material supply issues, and nonperforming loans (Xuhua et al., 2019). Immediately, the economy collapsed (Nagy et al., 2018). Everything is gradually becoming digital, and the relationship between humans and technology is unavoidable (Eze et al., 2021). All requirements can be met online, from purchasing and selling to services and financial activities. Every industrial revolution is based on the application of technology. Digital technologies are utilized to connect physical machinery and industrial processes as a consequence of the Industrial Revolution 4.0 era (Harini et al., 2020). Technology is a major contributor to the transformation of traditional businesses into digital industries since it can transfer data without human intervention and, with the advent of big data, helps to define the economic direction.

In addition to the food and beverage industry, the creative and agricultural industries have also been severely affected by the COVID-19 epidemic. Even the survey results indicate that businesses have never had difficulties due to the COVID-19 epidemic, with two-thirds temporarily or permanently ceasing operations due to a dramatic decline in sales (Raney, 2020). The COVID-19 epidemic has presented both challenges and opportunities for MSME participants. Since e-commerce will reach \$130 billion by 2020, small and medium-sized enterprises can gain from ICT. During the COVID-19 pandemic, the volume of e-commerce transactions has exploded. Health products increased sales by 90%, hobby support products by 70%, groceries by 350%, and plant-based meals by 200%. (Trimble et al., 2020).

On April 10, 2020, the DKI Jakarta province administration implemented a two-week PSBB (major social restriction) in Jakarta. However, health experts estimate that it will take one month to stop the spread of COVID-19. DKI Jakarta Governor indicated and affirmed that the 14-day validity period beginning on April 10, 2020, may be extended if necessary following the Governor's Regulations on the Implementation of Mass Social Restriction (PSBB) in Governor's Decree No. 33 of 2020. In addition, they are renewed from April 24 to May 22, 2020. This conforms to Governor's Order No. 489 of 2020, issued on May 19, 2020 (kepgub), which imposes wide social limitations. With the increasing expansion of Covid-19, the domestic economy is beginning to feel the repercussions of the global economic slump. Numerous SME participants have laid off workers or even temporarily stopped their businesses. A contributing factor is a fall in sales revenue. Working from home, or WFH for short, affected the sales decline. Due to the adoption of physical separation and the introduction of large-scale social limitations (PSBB), the revenue of participants in the SME sector has decreased dramatically.

Community activity restrictions affect company activity, which in turn affects the economy.

Cooperating with e-commerce companies to provide MSME players with digital marketing training and education is one of the government's attempts to assist the growth of small and medium-sized enterprises. According to data from (Kemenparekraf, 2021), the number of micro, small, and medium-sized businesses (SMEs) connected to digital platforms has reached just 10.25 million, meaning that only 16% of SMEs can conduct business online, an increase from the previous year. Consequently, training and education are deemed essential. In addition to promoting the growth of SMEs, the purpose of this training and education is to enhance the skills of the human resources supporting SMEs (Koperasi, 2020).

Through this training, it is envisaged that the participating SMEs will have basic technical skills in operating computers and utilizing the internet network, as well as critical thinking skills and the ability to analyze promotional digital media, often known as digital literacy (Reddy et al., 2020). Sulistyowati (2021)'s research indicates that digital literacy can enhance the performance of micro and medium-sized business owners. According to Ollerenshaw's study from 2021, digital literacy can be improved with high-speed broadband connectivity. Based on past research indicating a considerable impact on business success, digital literacy is an essential independent variable to investigate in this study.

With digital literacy, E-commerce is currently the main platform that may be leveraged to attract clients. E-commerce increases market share locally, nationally, and internationally by facilitating access. Expanding market share drives SMBs to boost their performance with rising consumer demand. This is supported by research conducted by (Andonov et al., 2021), in which the author explains that, in terms of business performance, it has been determined that companies can significantly increase their level of commission due to a larger market, better growth opportunities, lower operating costs, fewer investment requirements, less risk, and more. The researcher feels that the e-commerce variable can affect the success of the operating firm. Hence it is included as an independent variable. This belief is supported by prior research.

As a performance enhancement, O2O business adaptation is necessary if a company wants to implement e-commerce and apply digital literacy knowledge (Ollerenshaw et al., 2021). O2O should not be viewed as a rival to e-commerce or online businesses but as a supplement. O2O's operating idea is to entice online shoppers or website users to visit brick-and-mortar establishments (Ramanathan et al., 2017). The online-to-offline method discovers online customers through advertising, email, and other media before luring them into physical stores. Some of the techniques employed are providing pick-up services for online-purchased goods or allowing clients to conduct online transactions while at a real store. Thus, the objective of O2O is to attract the type of customer who

would prefer to visit a physical store than wait for a shipment. [Suryani et al. \(2022\)](#) did research on SME O2O adaption. In this study, Suryani asserted that the business O2O model, as a moderating variable, might enhance the performance of SMEs.

Several studies have been undertaken to assess whether digital literacy, e-commerce adoption, and O2O business adoption can influence the success of an organization. First, a survey conducted by [Abebe \(2014\)](#) indicates that E-commerce adoption contributes to the improvement of SME performance in Indonesia. In addition, [Ershova et al. \(2020\)](#) noted that digital literacy could enhance the performance of a business. Thirdly, [Mustafa et al. \(2018\)](#) demonstrate that technological innovation can improve the performance of a corporation. Consequently, there appears to be a correlation between adoption and corporate implementation, moderated by the extent of adoption. According to a prior study, new research designs should contain a business adoption parameter against which to assess outcomes. Several studies show a substantial relationship between innovation and technology adoption difficulties and corporate performance ([Mustafa et al., 2018](#)). In addition, earlier research with comparable characteristics, such as the study by Suryani et al. titled "Impact of Digital Literacy and Market Orientation through E-Commerce Adoption on the Performance of Micro, Small, and Medium-Sized Enterprises, Modulated by O2O Business Adoption" However, in the previous study, the O2O business served as a moderating variable. In contrast, in this study, it serves as a mediating variable.

Consequently, the research gap of this study is that the authors support previous research on the business impact of e-commerce adoption, which examined the relationship between digital literacy and e-commerce adoption and how it affects firm performance, notably in the retail sector. The authors studied SMEs in the online-to-offline Mitra e-commerce industry, one of which had previously only sold in a non-digital manner. In research conducted in Indonesia's developing nation, the authors examined the adoption of e-commerce and business-to-consumer transactions. The authors analyzed prior research on the relationship between TOE elements and adoption. They identified more intriguing participation of other factors in ensuring how firms may optimize value generated from business analytics and traditional TOE factors, which may have additional consequences.

According to the description of the prior study, three independent variables, namely digital literacy, e-commerce, and O2O adaptability, can influence the performance of SMEs. However, no research combines these three elements to determine how SME performance might be improved. This is what eventually made this research unique. This finding is essential since SMEs play a major role in reducing a nation's poverty rate. Innovations given by online marketing and adjustments made to attract clients can greatly impact a country's economy through enhanced marketing strategy performance. Thus, this study aims to develop a conceptual model that establishes a link between digital literacy and firm performance, as well as digital literacy and e-commerce

adoption and O2O adoption and firm implementation. In developing nations such as Indonesia, this has been implemented.

2. THEORETICAL FRAMEWORK

2.1 Digital Literacy and Firm Performance

Digital economic literacy is the ability to use financial information through information technology. There are four components to digital economic literacy: a). The ability to recognize when information is needed; b). The ability to find the required information files; c). The ability to evaluate the suitability of the obtained data; and d). The ability to use the required information effectively and appropriately. Technological improvements have altered the practical scope of digital economic literacy due to the capacity to read and analyze digital texts (Erstad, 2006). According to earlier research, digital literacy affects the performance of small and medium-sized enterprises (SMEs), as stated by (Van Laar et al., 2019), which states that digital skills of the twenty-first century are important and essential for SMEs to acquire. Similarly, Oluwakemi (2019) demonstrates that digital literacy highly affects small business owners' entrepreneurial return.

According to (Ershova et al., 2020), incorporating ideas into the digital internet has become a trend in daily activities. According to (Ollerenshaw et al., 2021), individuals' interests, attitudes, and abilities to effectively use digital technology and communication tools in accessing, managing, integrating, and evaluating information as new knowledge in the process of communicating with others are also effective. Digital economic literacy is ICT literacy, whose dimensions are increasingly examined in studies of companies' digital economy literacy (Tomczyk, 2020). SMEs can increase their precision in technological development, increasing their added value. According to Sariwulan et al. (2020), digital literacy has a substantial and positive effect on the performance of small and medium-sized enterprises (SMEs), suggesting that the larger one's digital literacy knowledge, the better one's SMEs' performance.

The presence of digital literacy applied by the organization can assist businesses in taking advantage of internet SMBs due to their usability and efficient operations. According to Feriady et al. (2021), digital economic literacy is the capacity to access and utilize economic information backed by critical thinking abilities in applying information technology. This indicates that the more the digital economy literacy, the greater the number of businesses aware of its benefits and operations. Consequently, there is a correlation between digital economic literacy factors and judgments of usability.

According to Erlanitasari et al. (2020), digital literacy has a favorable and direct effect on business performance. This remark is confirmed by research undertaken by (Ollerenshaw et al., 2021), who found that the greater a company's employees' digital literacy, the greater its performance. Individuals who find it difficult to adapt to new

tools may find it difficult or feel imprisoned utilizing a system they don't like. However, firms with greater capacities to embrace new devices can use them if they meet the individual's demands or are more favored. Due to the constant change and development of e-learning technology, it is important to investigate the impact of digital literacy on e-learning applications. Digital literacy encompasses more complex cognitive, emotional, and sociocultural skills that users require to function effectively in digital environments.

H1: Digital Literacy Has a Positive Direct Effect on SME Performance

2.2 Digital Literacy and E-commerce Adoption

E-commerce is sometimes referred to as market-making due to its ability to directly create a market in cyberspace that may unite suppliers and customers worldwide via internet connection. The Environmental Organizational Technical Framework was established by (Tian et al., 2018). (TOE). This framework is comparable to the DOI framework and contains three sections: the technological context; (ii) the features of the internal and external technology linked with the organization; and (iii) the business context (Macchion et al., 2017) (iii) organizational context: descriptive measures, e.g., organizational size, capital, etc.; TOE is prevalent because the Innovation Framework is consistently disseminated. Electronic commerce (EC) uses the internet and intranets to purchase, sell, transfer, or trade information, goods, or services. In other words, the aspects of e-commerce, namely: 1) Trade via the internet and intranets; 2) Trade using web facilities on the internet, and 3) Trade via data exchange systems.

Digital literacy is the ability to adapt, discover, and understand digital technology to positively impact one's life, community, and environment (Eisenberg et al., 2002). According to SMEs in Ecuador's Tungurahua province, e-commerce adoption in this industry is hindered by the dominance of micro-businesses, age, low levels of education, and digital illiteracy (Margalina et al., 2020). In addition, Gibbs et al. (2003) found that in numerous developing nations where SMEs dominate the economy, computer and internet usage was low, resulting in characteristics that serve as a barrier to e-commerce because these SMEs lack the resources to implement ICT. According to another study, digital literacy can increase productivity through technology to boost productivity. Digital literacy can boost internet access for timely decision-making for information availability. Thus, it can be claimed that e-commerce is a means of growing business opportunities and that digital literacy can aid in expanding business opportunities and productivity via e-commerce (Siddike, 2010).

H2: Digital Literacy Has a Positive Direct Effect on E-commerce Adoption

2.3 E-commerce Adoption and Firm Performance

Other organizational elements, such as corporate size and public programs, explain performance. Other organizational factors will impact the performance of MSME e-

commerce adoption rates. ICT-based activities will affect e-commerce adoption and business performance (Ariansyah et al., 2021). This study investigates which businesses are utilizing e-commerce to accomplish particular performance enhancements. To demonstrate this point, we anticipate that a company that uses the internet for sales and marketing, purchasing, and coordinating and sharing information with suppliers and consumers will experience a bigger performance impact than a business that hosts a marketing information website. If this is true, there should be a direct correlation between the amount of adoption and the company's efficiency improvements, sales, and market position.

New information technologies are anticipated to increase corporate performance by reducing transaction costs and coordinating economic activity among business partners more closely. By automating online transactions, e-commerce (particularly B2B) is stated to lower coordination or trade costs and boost productivity and efficiency (Kamalul Ariffin et al., 2018). E-commerce is also said to allow entry into new markets or the extension of existing ones (Laub, 1999; Robbins, 2015) and stronger system integration with suppliers and customers (Laub, 1999; Robbins, 2015).

In developing nations, research on the adoption of e-commerce and its effect on the performance of SMBs has been done. Abebe (2014) states that e-commerce adoption is associated with SME performance. Alderete (2019) uses a logistic regression model to evaluate the likelihood of e-commerce in the Murcia Region of Spain. Additionally, recent research in Argentina has examined the elements that influence the adoption of e-commerce (Xuhua et al., 2019). Alderete (2019) demonstrates through his study that e-commerce adoption has a positive and significant impact on SME sales, which is facilitated by the use of

ICT.H3: E-commerce Adoption Has a Positive Direct Effect on SME Performance

2.4 Digital Literacy and Firm Performance Moderated by O2O Business Adoption

The O2O business concept is implemented with an e-commerce platform showcasing products/services offline and satisfying consumers' impromptu online requirements (Hwang et al., 2018). O2O adoption is also being driven by intra-organizational factors, such as the impact of digital technology on market trends and competition. As stated previously, SMBs can increase the precision of their inventions through the use of technology, hence enhancing the company's added value. According to Sariwulan et al. (2020), digital literacy has a considerable and positive impact on the performance of small and medium-sized enterprises (SMEs), suggesting that the larger one's understanding of digital literacy, the better one's SMEs' performance. Four subdimensions should be used to quantify digital literacy: 1) access to digital technologies, 2) digital proficiency, 3) digital expertise, and 4) digital information awareness.

Further, [Gui et al. \(2011\)](#) suggest that digital literacy should involve skills in certain dimensions and the ability to adapt to a highly dynamic environment continuously. [Hinrichsen et al. \(2013\)](#) assert that digital literacy requires comprehending information, seeking meaning, and assessing the hazards associated with personal data in the online world. The growing macro environmental dynamics are crucial in a company's decision to embrace O2O. ([Ram et al., 2019](#)). Therefore, it is anticipated that O2O business adoption will mitigate the association between digital literacy and SME success.

H4: Digital Literacy Has a Positive Direct Effect on SME Performance Moderated by O2O Business Adoption

3. METHODOLOGY

3.1 Research Design

This research makes use of a quantitative survey methodology. According to ([Yanni et al., 2018](#)), research procedures are essentially scientific features for obtaining data with a defined goal and utility. Survey quantitative research is a quantitative method in which a researcher asks a planned series of questions to an entire group or sample of individuals, often in written form.

3.2 Respondent

Most O2O Mitra E-commerce stores (92%) were based in Java, while only 8% were located outside Java. We identified and categorized possible SMEs as research units using the Indonesian government's definition of SMEs, as specified by Law Number 20 of 2008 on SMEs, for this study. Small and medium-sized enterprises (SMEs) are defined by law as companies with annual sales of less than Rp2.5 billion. The authors studied SMEs in the online-to-offline Mitra e-commerce industry, one of which had previously only sold in a non-digital manner. In research conducted in Indonesia's developing nation, the authors examined the adoption of e-commerce and business-to-consumer transactions. This study focused on small and medium-sized enterprises (SMEs) selling airtime cellular refill pulsa via the O2O Mitra e-commerce platform in Central Java, Yogyakarta, and NTB, all in Indonesia. Participants in the survey were owners, heads or shift leaders, individuals who held positions at the store-head or shift-leader level, and owners' trusted associates. Finally, after eliminating all incomplete responses, the authors reviewed 100 responses. Respondents were invited to complete a survey monkey questionnaire, from which these results were derived. The authors collected the answers using a simple random sampling approach.

3.3 Measurements

The study's questionnaire consisted of four scales. The concept of digital literacy was assessed with a two-item scale. Similarly, E-Commerce Adoption was examined using a three-item scale. Likewise, a 5-item scale was utilized to evaluate O2O Business.

Lastly, a 5-item scale was used to assess the MSME Performance construct. The authors employed a 4-point scale known as the Likert scale to obtain responses from respondents. This scale went from 1 to 4, with 1 representing "strongly disagree" and 4 denoting "strongly agree."

3.4 Data Collection

Two months of survey results were collected from January to February 2022. The content and face validity of the questionnaire were evaluated in a pilot study with some doctoral students and five owners/managers of SMEs. Based on the feedback, the wording and order of the questions were modified. To verify construct reliability and discriminant validity, partial least squares structural equation modeling was used to evaluate the empirical validation instrument (PLS-SEM). To analyze the data, SmartPLS software with PLS-SEM was utilized. Due to its advantages, PLS-SEM was chosen over covariance-based modeling for a small sample size (Hair et al., 2017). The model was put to the test in terms of structural analysis, measurement, and hypothesis testing.

4. RESULTS

4.1 Descriptive Statistics

Out of a total of 120 questionnaires, 100 surveys were gathered and analyzed for completeness. One hundred respondents qualified for further examination. There were 51% females and 46% males among the 100 respondents. All of them were from Java and surrounding areas. The owners accounted for 62% of the total, with business managers making up the remainder. According to estimates, most business owners were in their early twenties. 90% of the participants were less than 45 years old. Only 10% of the participants were over 45 years old. Only 36% of the participants possess a college degree. 60% of the population had a high school diploma, while the remaining 40% had varied primary and secondary education levels.

All the companies utilized the Mitra O2O e-commerce platform. In 94% of instances, there were five or fewer workers. Only 1% of businesses employed more than 11 people, whereas 5% employed between 6 and 15 individuals. The majority (98%) were small and medium-sized enterprises with annual sales of less than Rp1 billion; only 2% had annual sales of more than Rp1 billion. Ninety percent of the companies were comparatively new. Table 1 displays the descriptive analysis of the four factors examined in this study. OA1 and MP1 obtained the lowest marks, 3.01, while EA2 received the highest, 3.54. Each variable had a mean score greater than 3. This shows that the responders accepted the indications. Nonetheless, the score was below 3,6, indicating that each indication and variable may be enhanced.

4.2 Measurement Model

Table 2 displays the examination of the outer model. All indicators have loading factors of more than 0.7, indicating that they are valid for evaluating the variable in issue, as shown by the analysis results. For each indicator, the AVE score was greater than 0.5, and the CR score was greater than 0.7; hence, the indicators are reliable for measuring the relevant variable. The majority of indicators have the highest loading to the indicated all variable, indicating that the majority of indicators have good discriminant validity, as determined by discriminant validity tests. According to the Fornell Lacker Criterion test, the root-square AVE of each variable was greater than the inter-variable correlation (table 3). This contributes to robust discriminant validity.

Table 1. Descriptive Analysis of Indicators

Variable	Indicators	Likert's Scale				Avg Score
		1	2	3	4	
Digital Literacy	DL1	2	13	40	45	3.28
	DL2	4	5	41	50	3.37
	Digital literacy					3.3
E-Commerce Adoption	EA1	1	2	40	57	3.53
	EA2	0	4	38	58	3.54
	EA3	2	15	42	41	3.22
	E-commerce adoption					3.43
O2O Business	OA1	3	25	40	32	3.01
	OA2	2	26	40	32	3.02
	OA3	2	19	49	30	3.07
	OA4	3	24	39	34	3.04
	OA5	2	13	50	35	3.18
	O2O Business adoption					3.06
MSME Performance	MP1	4	23	41	32	3.01
	MP2	3	19	45	33	3.08
	MP3	4	20	42	34	3.06
	MP4	2	17	32	49	3.28
	MP5	4	5	36	55	3.42
	MSME Performance					3.17

4.3 Predictive Relevance and Coefficient of Determination

The structural model was evaluated utilizing predictive relevance and the coefficient of determination (R square). The Goodness of Fit of the structural model was evaluated using predictive relevance. Two models were evaluated to determine the existence of the

moderating effect. Table 4 demonstrates that Q2 of the model is bigger than 0. It indicates the predictive nature of the model.

To test the hypothesis, the R-square test was conducted. Table 5 demonstrates that model 1's R2 coefficient for E-commerce adoption was 1. This indicates that digital literacy influenced e-commerce adoption by 53,4 percentage points. The R2 coefficient for the firm's performance was 0.577. This suggests that digital literacy and e-commerce adoption have a 57.7 percent impact on business performance. According to the path analysis, Digital Literacy had the biggest effect on e-commerce adoption with a path coefficient of 0.428, followed by e-commerce adoption with a path coefficient of 0.388.

Table 2. Convergent and Reliability Test

Latent Variable	Indicator	Convergent Validity			Internal Consistency Reliability	Conclusion
		Loadings	Indicator Reliability	AVE	Composite Reliability	
		>0.7	>0.5	>0.5	>0.7	
Digital Literacy				0.693	0.819	Reliable
	DL1	0.786	0.618			Valid
	DL2	0.877	0.769			Valid
E-commerce Adoption				0.743	0.896	Reliable
	EA1	0.911	0.830			Valid
	EA2	0.912	0.832			Valid
	EA3	0.752	0.566			Valid
O2O Business Adoption				0.626	0.893	Reliable
	OA1	0.708	0.501			Valid
	OA2	0.764	0.584			Valid
	OA3	0.780	0.608			Valid
	OA4	0.862	0.743			Valid
	OA5	0.844	0.712			Valid
MSME Performance				0.674	0.912	Reliable
	MP1	0.810	0.656			Valid
	MP2	0.813	0.661			Valid
	MP3	0.841	0.707			Valid
	MP4	0.870	0.757			Valid
	MP5	0.765	0.585			Valid

In model 2 (moderation), digital literacy had an R2 of 0.34, influencing e-commerce adoption by 34%. The firm's performance R2 was 0.772%. This indicates that digital

literacy, e-commerce adoption, and O2O business adoption, which is digital literacy moderated by e-commerce adoption, had a 77.72% impact on firm performance.

4.4 Structural Model

Table 6 and figure 1 below present the findings of bootstrap analysis performed as a part of PLS-SEM. The results of testing the first hypothesis of digital literacy on SME performance obtained a positive beta score of 0.216 with a t-statistic of 2.612 and p-values <0.05. Similarly, the results of testing the second hypothesis of digital literacy on e-commerce adoption obtained a significant and positive beta score of 0.731 with a t-statistic of 10.420 and p-values <0.05. Likewise, the results of testing the third hypothesis of e-commerce adoption on SME performance obtained a positive beta score of 0.191 with a t-statistic of 2.164 and p-values <0.05. Finally, testing the third hypothesis of digital performance on SME performance moderated by O2O business adoption obtained a negative beta score of -0.147 with a t-statistic of 2.130 and p-values p <0.05). Thus, all hypotheses of the study are accepted.

Table 3. Discriminant Validity Test (Fornell Lacker Criterion)

	Digital Literacy	E-commerce Adoption	O2O Business Adoption	MSME Performance
Digital Literacy	0.833			
E-commerce Adoption	0.731	0.862		
O2O Business Adoption	0.579	0.595	0.791	
MSME Performance	0.705	0.696	0.792	0.821

Table 4. Predictive Relevance (Q2)

		SSO	SSE	Q ² (=1-SSE/SSO)	Remark
Model 1	Digital Literacy	200	171.815	0.141	Predictive Relevance
	E-commerce Adoption	300	157.717	0.474	Predictive Relevance
	MSME Performance	500	251.233	0.498	Predictive Relevance
Model 2	Digital Literacy	200	171.822	0.141	Predictive Relevance
	E-commerce Adoption	300	157.905	0.474	Predictive Relevance
	MSME Performance	500	250.289	0.499	Predictive Relevance

5. DISCUSSION

5.1 Digital Literacy Has a Positive Direct Effect on SME Performance

The study discovered a significant positive correlation between digital literacy and SME success. The more the digital literacy of a company's personnel, the higher the company's performance.

Table 5. Path Co-efficient and R2

Relationship		Path	T-Statistics	P-Values	R-Square
Model 1	Digital Literacy -> E-commerce Adoption	0.731	0.731	10.545	0.534
	Digital Literacy -> MSME Performance	0.428	0.428	2.792	0.577
	E-commerce Adoption -> MSME Performance	0.388	0.388	2.393	
Model 2	Digital Literacy -> E-commerce Adoption	0.731	0.388	10.420	0.340
	Digital Literacy -> MSME Performance	0.216	2.731	2.612	0.722
	E-commerce Adoption -> MSME Performance	0.191	2.164	2.164	
	O2O Business Adoption -> MSME Performance	0.504	8.237	8.237	
	Moderating Effect DL_OA -> MSME Performance	-0.147	2.130	2.139	

This word signifies acceptance of the initial hypothesis. Digital literacy is frequently recognized as crucial for economic and social progress. According to studies, digital literacy is one of the most critical factors for a business's survival, growth, and long-term competitive advantage (Bawden, 2001). To remain competitive, all businesses, regardless of size, must be digitally literate (Spargo et al., 2021).

Table 6. Hypothesis Test

Hypothesis	Path	T-Statistics	P-Values	Hypothesis Test Conclusion
Digital Literacy -> MSME Performance	0.216	2.612	0.009	H1 Accepted
Digital Literacy -> E-commerce Adoption	0.731	10.420	0.000	H2 Accepted
E-commerce Adoption -> MSME Performance	0.191	2.164	0.031	H3 Accepted
Moderating Effect DL_OA -> MSME Performance	-0.147	2.130	0.033	H4 Accepted

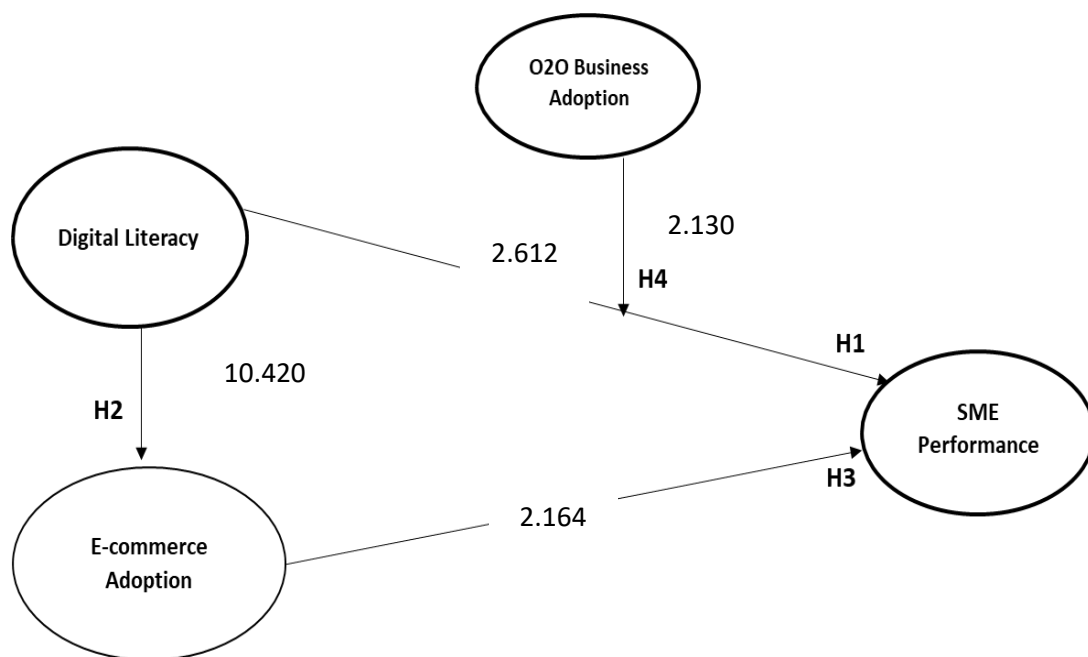


Figure 1. Structural Model

Aside from that, digital technologies significantly affect business performance since they enable a vast network among businesses. Automating business processes increases productivity, and the smooth flow of information facilitates correct decision-making. Small and medium-sized enterprises (SMEs) must expand and develop digital literacy to improve their performance. Digital technologies support innovation, research and development, and decentralized decision-making by fostering a collaborative environment. As a result, they promote visionary leadership development in firms that

seek to enhance their economic performance. This study is consistent with previous research (Sariwulan et al., 2020), which concluded that digital literacy has the greatest direct and indirect impact on the performance of SME entrepreneurs, highlighting its crucial role in the creation of business and marketing networks.

Simply expressed, digital literacy positively impacts the level of critical thinking regarding possible improvements and methods that might be developed. Thus, the company's performance can increase with the management team's enhanced ability to think critically. The collected results can then recommend that MSME business players study more literature on business enhancement. This literature can be accessed via the internet, and market research can be conducted using tools such as Google Ads. This drive to continue exploring and learning is essential to ensuring that the firm is not left behind and can remain highly competitive. This conclusion has significant ramifications for designing methods to facilitate business actors' acquisition of digital literacy.

5.2 Digital Literacy Has a Positive Direct Effect on E-commerce Adoption

The preceding analysis demonstrates a significant positive correlation between digital literacy and e-commerce adoption. The more the digital literacy of SME employees, the greater the adoption of e-commerce. This word suggests acceptance of the second hypothesis. Digital literacy comprises three levels: digital competence at level 1, digital usage at level 2, and digital transformation at level 3. Digital competence, which consists of skills, knowledge, attitude, and awareness of digital technology, serves as the foundation for all levels. The second level, digital usage, is determined by a person's digital proficiency or literacy. This includes employing digital skills to search for and process information and seek a solution to a problem using the right digital tools. Through digital consumption, digital transformation has reached the highest level. Individuals create new knowledge, activities, and innovations using digital means (Reddy et al., 2020).

As technology such as computers and cell phones have entered and merged into everyday life, it has become crucial to understand how to use various applications, operate portable devices, and configure them to meet business requirements. As current computers and software may optimize several operations and attract more customers, all business owners must be well-versed in the latest technology. This is the definition of digital literacy. Along with the rapid development of technology, advancements have been made in various fields, including nanotechnology, biotechnology, and internet technology, which have impacted human existence and economic growth. The usage of buying and selling transaction media, often known as e-commerce, is one of them. In the age of the Industrial Revolution, digital literacy is essential. 4.0 because digital literacy skills contribute significantly to the success of the Fourth Industrial Revolution. Understanding digital literacy can make individuals more adept at utilizing and gaining access to technology. Consequently, e-commerce programs like Shopee, Lazada,

Tokopedia, etc., can be used to implement digital literacy skills during the Fourth Industrial Revolution.

Moreover, the use of e-commerce by SME entrepreneurs in Indonesia is not novel. Several studies indicate that e-commerce can help small and medium-sized enterprises flourish. However, e-commerce implementation in SMBs still faces several challenges. Digital literacy is one of the primary challenges to the adoption and exploitation of e-commerce by SMBs. The lack of digital literacy among SMBs can result in suboptimal adoption of e-commerce. According to the findings of this study, digital literacy affects the adoption of e-commerce. The consequence that can be drawn from the results of this study is that business actors must have strong digital literacy skills to embrace e-commerce platforms for selling swiftly in the future. Future studies must identify instructional strategies that inspire corporate actors to embrace digital learning.

5.3 E-commerce Adoption Has a Positive Direct Effect on SME Performance

According to the study, e-commerce adoption and SME performance have a significant positive relationship. The more the adoption of e-commerce, the greater the improvement in SME performance. This word suggests acceptance of the third hypothesis. Information interchange, technological use, buy-sell transactions, monetary transactions, and competitiveness are the five pillars of e-commerce. E-commerce is defined as the electronic capture, processing, storage, communication, and distribution of data using information and communication technology when it comes to sharing information (Sergi, 2019).

In the study of drivers for new technology diffusion, theories or frameworks addressing the internal, external, and technological characteristics of the organization include the innovation diffusion theory (IDT) (Roger, 1995) and the technology-organization-environment (TOE) model (Tornatzky et al., 1990). Even though most individuals are still reluctant to use it, e-commerce positively impacts people's lives. Moreover, in the business sector, the world of e-commerce is ripe with opportunities for MSMEs to grow their sales. SMEs are indirectly compelled to adapt how they transact, which was formerly offline but has since shifted online due to the epidemic. E-commerce is expected to boost the sales and performance of SME actors.

E-commerce permits businesses to extend their reach. Global market access is one of the primary benefits of e-commerce (Haryanti et al., 2020). E-commerce eliminates geographical constraints for those businesses that seek to engage in global trade. Internet-based interactive media and database technologies can afford businesses promotional options for their products and services (Xu et al., 2020). This enhances the company's potential to attract new clients, expanding its market and boosting its overall profitability (Fedorko et al., 2018). Kumar et al. (2020) found that the intention to search for information online is influenced by the practical value of looking for information

online, the value of searching for information online's popularity, and the perceived benefits of shopping online.

Yu et al. (2021) discovered a significant positive link between e-commerce and firm performance, specifically an increase in company performance with the rise of e-commerce. E-commerce has a favorable and significant effect on individual performance in increasing the firm's marketing, leading to the growth of company performance and the acquisition of local and international buyers (Andry et al., 2019). In addition, the benefits generated from the deployment of e-commerce can result in faster and less expensive contact between business owners and consumers. They can significantly contribute to enhancing corporate performance. E-commerce can also improve information speed and precision, reducing operating expenses (Kartiwi et al., 2018). The research of Hussain et al. (2020) indicates that e-commerce has a favorable and significant impact on SMEs because the benefits provided by e-commerce can enhance MSME performance. The relevance of this research is that by utilizing the e-commerce platform effectively, SMBs can raise their performance and generate substantial cash, bolstering economic conditions.

5.4 Digital Literacy Has a Positive Direct Effect on SME Performance Moderated by O2O Business Adoption

In conclusion, the study's findings demonstrated a significant favorable relationship between e-commerce adoption and SME success. This word signifies acceptance of the fourth hypothesis. Online-to-offline (O2O) is one of the best e-commerce business models since it combines the advantages of both online and offline modes to assist businesses in improving their clientele, market share, and marketing capabilities, among other things (Shang et al., 2015). It is characterized as "e-commerce that integrates online product research and booking with in-store purchase and consumption" (Wan et al., 2019). Baesens et al. (2016), When online information services and transaction capabilities are integrated with a physical business presence, and associated resources, a more efficient transactional model is created that is advantageous for both firms and customers. The benefits of O2O include reduced marketing costs, increased access to potential customers, and broader distribution of marketing initiatives (Pan et al., 2019).

Aside from this, O2O business model acceptability refers to consumers' intent to engage in O2O shopping. A good example of "online to offline" is Groupon (Groupon.com), which uses a website or mobile marketing to persuade consumers to purchase a real establishment by offering discounts for venues such as restaurants and theater tickets. In contrast, one example of "offline to online" would be consumers' usage of Facebook in physical businesses to broadcast product information to social group members, attracting customers to that store. Shopkick's (Shopkick.com) shopping app gives discounts and rewards to in-store customers through partnerships with major merchants and brands. In the store, consumers can collect points (kicks) for entering, scanning things, and making purchases, which they can then redeem for their chosen gift cards.

The combination of E-commerce adoption and O2O business adoption ultimately results in an improvement in SME performance. The adoption of e-commerce should mitigate the direct effect of digital literacy on the performance of SMEs. This study reveals that when e-commerce adoption is combined with O2O business adoption, the performance of SMEs is enhanced even further. The greater the pursuit of O2O business adoption, the greater the company's success.

Literacy has been a component of human life and growth from prehistoric times to the present digital era. The evolution of technology, knowledge, and communication in the digital age has had varied effects on people's daily lives. Digital literacy uses technology, information, and communication devices to access, create, and disseminate information.

The combination of digital literacy and O2O adaptation makes it simpler for business actors to maximize performance. By utilizing an online purchasing application, clients can save time when making a purchase, which is significant because the application is accessible at any time and from any location. The availability of convenience has a considerable impact on the demand for goods, enhancing a corporation's sales performance. For business actors to have strong digital literacy skills and the ability to adapt to technology is an essential implication of this research.

6. CONCLUSION

Using the O2O model, this study's goal was to understand better the variables that determine digital literacy and how they impact e-commerce adoption and business performance in SME Mitra e-commerce. It was founded on the TOE (technology, organizational, and environmental) theory and innovation dissemination (DOI). A recent study in the retail business indicated that e-commerce adoption has a considerable impact on firm success, which is supported by empirical data. This analysis validates previous Deloitte research showing that SMEs in Indonesia can increase their revenue by up to 80% by utilizing digital technologies. In addition, the results indicate that digital literacy has a positive effect on e-commerce adoption. This second study confirms earlier findings that digital literacy impacts e-commerce adoption, which is offset by O2O business adoption and the performance of SMEs.

7. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study focused on small- and medium-sized enterprises (SMEs), with a limited sample size from the Mitra e-commerce in Java and a small amount from beyond Java. The authors anticipate that future research will not be limited to SMEs but include other industries. Additional research should be undertaken in other sectors (not just Mitra e-commerce), bigger sample sizes, and many cities. This study focuses on digital literacy in enterprises as a whole, but it is anticipated that future research will expand to include radical and incremental digital literacy. The relationship between business performance and e-commerce adoption was studied. According to the statistics, these two elements

have a positive relationship. The adoption of e-commerce may result in short-term losses, but it has the potential to boost long-term production, markets, and financial success. However, 50 percent of the 100 replies came from businesses that have been in operation for between 2 and 4 years instead of 0 to 2 years (short-term innovation).

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