

Instructions for Preparing Papers for *International Journal of Sustainable Development and Planning*

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Abstract:

Micro, Small, and Medium Enterprises in the creative industry sector are important actors in increasing the workforce and improving the level of the national economy. The main problem of micro, small, and medium enterprises in the creative industry sector is that digital technology is still considered ambiguous and has a significant direct impact on organizational performance. Creative Industry Organizations should be able to optimize the function of digital technology by including open innovation in the organization. Therefore, this study aims to explore the relationship between digital technology and organizational performance and the ability of open innovation to mediate these two variables. The data came from 182 creative industries in Kendari City, Southeast Sulawesi, Indonesia. Data was collected and analyzed for second orders using SMART Partial least squares-4. Novelty of this research shows that digital technology does not have a significant direct influence on organizational performance in the Creative Industry however, when open innovation is included as a mediating variable, the relationship between digital technology and organizational performance becomes very strong. Digital technology is only a tool to help speed up work, the real strength of the creative industry lies in the ability of organizations to create open innovations by using digital technology.

Introduction

The Industrial 4.0 era has been ongoing for several years, with widespread impacts not only on the business and industrial sectors but also on various aspects of life. This era has created opportunities that were

previously difficult to achieve both for companies and customers [1]. Alongside the development of Industry 4.0, the Fifth Industrial Revolution (Industry 5.0) has emerged as a new paradigm in the global life of organizations. Industry 5.0 recognizes that the role of industry is not limited to job creation and economic growth but also encompasses sustainable well-being and respect for environmental boundaries. In this context, worker well-being becomes a primary focus at every stage of production. [2]. This is no exception in Indonesia. Similar demands are also experienced by business organizations such as small and medium enterprises (SMEs), particularly in the creative industry sector. The creative industry is part of Indonesia's SMEs and, along with the changing times, it is also required to achieve superior performance. This industry is based on creativity and innovation, which serve as its main driving forces. Additionally, SMEs are expected to optimize digital technology to support their business processes and improve their performance. In the context of Society 5.0, digital technology becomes a crucial element in strengthening competitiveness and fostering innovation within SMEs. Industry 4.0 and Society 5.0 work in harmony to advance technological development and social transformation. Digital technology and automation are utilized in sectors such as the creative industry to produce more sustainable products and services that are easily accessible to the broader community [3].

Digital technology has proven to help SMEs in developing countries become more resilient and ensure their sustainability in the future. The use of digital technology in business includes the integration of computer-based solutions into operations such as the promotion and sale of goods and services. This helps strengthen the value proposition and competitiveness of organizations. [4]. Organizational performance, which encompasses all activities related to the production of goods and services, is often linked to the achievement of its vision, mission, and strategic goals. [5]. However, not all investments in digital technology yield the same results. It is crucial for companies to continuously invest in research and development (R&D) to maximize the potential of this technology [6]. Research and development can help companies derive greater value from their technology investments, both in terms of efficiency and innovation. [7].

Furthermore, innovation is a key mediator in the relationship between digital technology adoption and organizational performance. When an organization adopts digital technology, it opens up significant opportunities for innovation, enhances operational efficiency, and enables the creation of better products and services [5]. In the era of globalization, open innovation has become increasingly important. The development of new technologies, research through information and communication technology, and the emergence of new organizational models and structures drive this. [8], [9]. Open innovation provides a framework for SMEs to utilize internal and

external knowledge to accelerate the innovation process, both in terms of products and processes [9].

Currently, MSMEs account for 99.99% of the total business actors in Indonesia, making a significant contribution to national employment absorption of around 97%. In 2021, there were approximately 65 million MSME units, including the creative industry sector, which plays a crucial role in Indonesia's economy (Ministry of Cooperatives and SMEs, 2022). This phenomenon clearly shows that MSMEs present a high potential opportunity to improve the economic well-being of society and reduce poverty rates. The government should make greater efforts to digitize Micro, Small, and Medium Enterprises (MSMEs). As of December 2023, 27 million MSMEs have joined the digital ecosystem. The government targets 30 million digital MSMEs by 2024.

Many MSMEs that have adopted digital technology still experience performance stagnation. [NO_PRINTED_FORM] [10] revealed that the challenges faced by the creative industry vary across regions, depending on local and global factors. However, three main issues frequently arise. First, entrepreneurs' awareness and willingness to apply appropriate knowledge and technology remain low—second, limited capital constraints technological improvements. Third, access to information about technology sources and knowledge remains restricted. These issues make it difficult for creative industry players to adapt to global developments.

Specifically in Kendari City, Phradiansah [11] explained that the main challenge faced by creative industry players is the lack of access to information relevant to business needs, including information about available resources. One of the causes is the lack of exploration and utilization of digital technology, which could provide broader access to information and opportunities. This hinders innovation and the potential growth of the creative industry.

Literature Review

The theoretical foundation of this research is the Resource-Based View (RBV) Theory, which describes how a company can achieve competitive advantage by leveraging its resources, enabling it to sustain long-term success [12]. These resources may include **physical assets, employee skills, technology**, brand, and others. This overall concept helps companies build a sustainable competitive advantage. In this approach, digital technology is considered a resource that must be combined with other organizational capabilities to create a competitive edge. Technology is merely a tool, and its impact depends on how individuals, organizations, and society utilize it within a specific context. Without the right strategy and innovation, technology alone will not have a significant impact on a company's performance..

Organizational Performance

Organizational performance refers to the achievement of an organization in utilizing financial and non-financial resources to achieve its goals [13]. Additionally, organizational performance also pertains to the implementation of the organization's vision, mission, objectives, and activities [14]. Thus, performance can be described as the output of a process carried out by all organizational components using the inputs provided, with the expected outputs aligning with the organization's objectives. In an organization, performance is evaluated by estimating the value of qualitative and quantitative performance indicators (e.g., profits, number of clients, costs). Measuring and analyzing performance is crucial for guiding the organization toward achieving its strategic and operational goals. [15].

Digital Technology

Digital technology is a set of tools, platforms, and infrastructures that enable humans to connect, interact, collaborate, and innovate digitally. This includes the internet, mobile devices, computers, social networks, big data, artificial intelligence, and related technologies that facilitate the exchange of information and knowledge worldwide [16]. In the industrial sector, the use of digital technology has permeated the social domain. Various digital technology environments are widely utilized for five general social needs, such as social media platforms like Facebook, WhatsApp, Instagram, and others [17]. The application of digital technology refers to the extent to which computer-based solutions are integrated into operational processes, such as promoting and selling goods and services. This enhances an organization's value proposition and competitive advantage [18]. Moreover, the availability of a workforce with the necessary technological skills can help recognize new technological opportunities in the market. Developing countries, in particular, require innovation and information technology to boost business success [19]

Open Innovation

Open innovation suggests that organizations can and should leverage ideas, resources, and technologies from outside the organization to support and enhance their internal innovation processes. Chesbrough highlights the importance of knowledge sharing, collaboration with external partners, and utilizing a broader innovation ecosystem. Open innovation involves using and externalizing both internal and external organizational resources to enhance innovation capabilities and create value by taking advantage of the free flow of ideas both into and out of the organization [20]

Open innovation encompasses knowledge flows within the organization, both inbound and outbound, which are utilized to accelerate

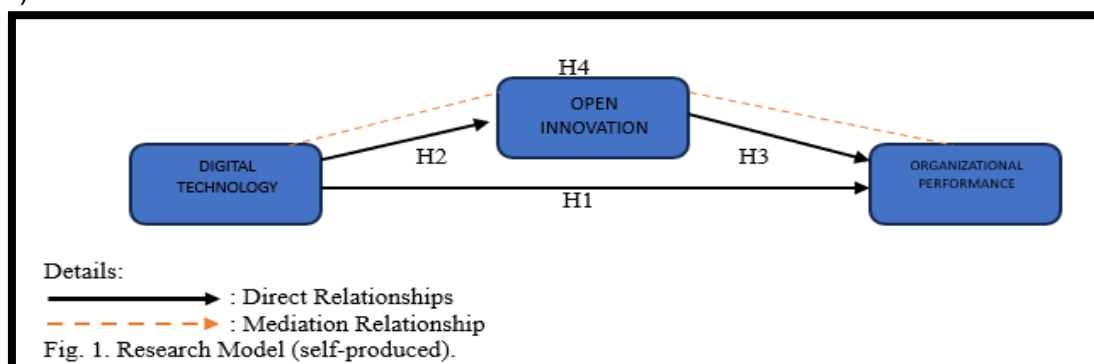
internal innovation, expand markets, and generate external innovation for other organizations [13]. Perusahaan dapat berbagi risiko dan mengkompensasi kekurangan sumber daya internal dengan berkolaborasi dengan pelanggan, pemasok, dan perusahaan lain.[21]

A distributed innovation process based on intentionally managed knowledge flows across organizational boundaries, utilizing financial and non-financial mechanisms in alignment with the organization's business mode. [22]

Hypothesis

Digital technology is considered a resource that must be combined with other organizational capabilities to create a competitive advantage. Therefore, we incorporate Open Innovation as a mediator to strengthen the value of Digital Technology in generating strong organizational performance.

The diagram below constructs the direct relationship between Digital Technology and Organizational Performance (H1), followed by the direct relationship between Digital Technology and Open Innovation (H2), then the direct relationship between Open Innovation and Organizational Performance (H3), and finally, the mediating role of Open Innovation in the relationship between Digital Technology and Organizational Performance (H4).



H1: Digital Technology significantly affects the direct relationship with Organizational Performance.

H2: Digital Technology has a significant influence on Open Innovation.

H3: Open Innovation has a significant effect on Organizational Performance

H4: Open Innovation mediates the relationship between Digital Technology and Organizational Performance

Methods

This study examines the causal relationship between Digital Technology and organizational performance through open innovation, focusing on the creative industry sector in Kendari City, Southeast Sulawesi, Indonesia. The research employs a quantitative methodology and

a deductive research approach as outlined by Creswell [38]. In line with the above, the type of research used is "Explanatory Research," which emphasizes explaining the relationships between research variables by testing hypotheses. While the explanation includes descriptive elements, the primary focus is on the relationships between variables. To analyze the data, this study utilizes the Smart Partial Least Squares 4 (PLS4) software package. This model is a set of statistical techniques that enable the testing of relatively complex relationships[39], [40]. The population of this study consists of all creative industry players in Kendari City, totaling 182 businesses. Given that the number of creative industries is relatively manageable, this study employs a total sampling technique, also known as a census sampling method. Total sampling is a sampling technique that includes all members of the population as the sample. It is also known as census sampling or saturated sampling. Total sampling is a non-probability sampling technique, meaning that not every member of the population has an equal chance of being selected as a sample [41]. The sample selection in this study refers to business owners in the creative industry as respondents, based on the consideration that they have the most comprehensive understanding of their businesses. Out of 182 distributed questionnaires, 154 were returned, resulting in a response rate of 84.62%.

Results

Convergent validity and Composite Reliability

The testing of the outer model (measurement model) evaluates the reliability and validity of the research variables. There are two main criteria for assessing the outer model: convergent validity and composite reliability.

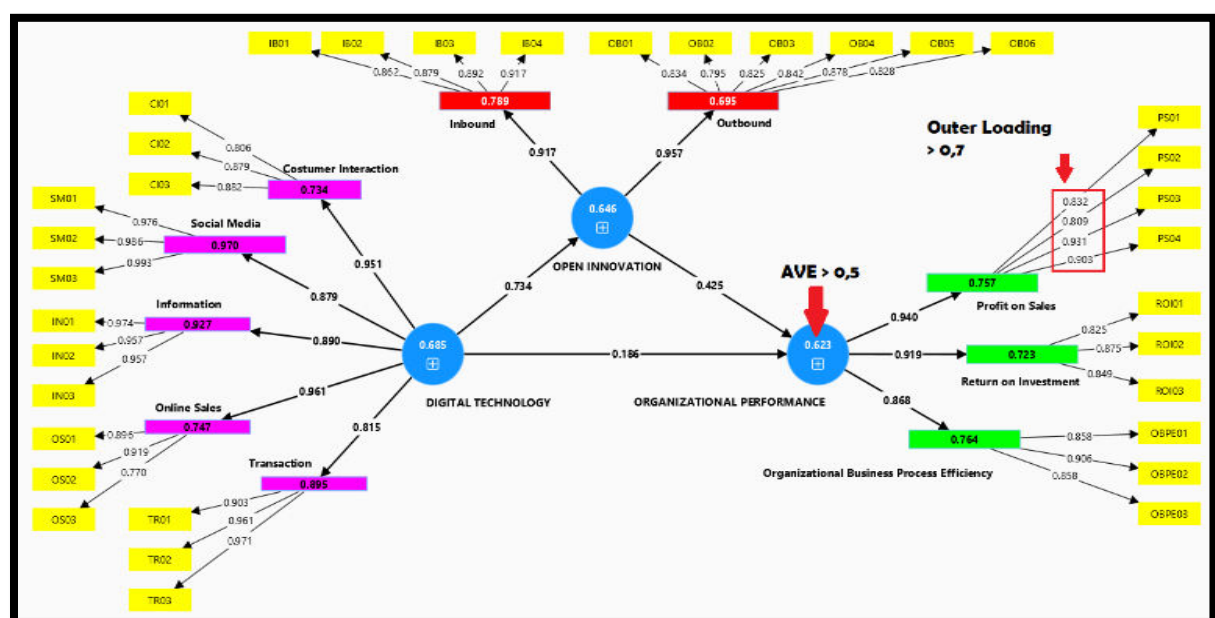


Figure 2. Convergent Validity

The convergent validity test, based on the Outer Loading values, shows results > 0.7 , which indicates that the validity requirements are met. Therefore, all constructs in the model are declared valid based on their loading values, and there is no need for re-estimation by removing any indicators. Additionally, the convergent validity test involves evaluating the Average Variance Extracted (AVE). AVE measures the proportion of variance captured by a construct compared to the variance due to error. In this study, the AVE values are > 0.5 , which means that more than half of the total variance of the indicators can be explained by the respective constructs. These results confirm that the constructs are valid and reliable based on the criteria for convergent validity.

Table 1. Construct Reliability and Validity

Variabels	Cronbach's alpha	Composite reliability	AVE
Digital Technology	0.967	0.970	0.685
Open Innovation	0.939	0.948	0.646
Organizational Performance	0.932	0.943	0.623

The results of the reliability and validity tests indicate that all variables in this study meet the required criteria. The Cronbach's Alpha values for Digital Technology (0.967), Open Innovation (0.939), and Organizational Performance (0.932) demonstrate a very high level of internal consistency. Similarly, the Composite Reliability (CR) values for all constructs exceed the threshold of 0.7, confirming strong reliability.

R-Square

The structural model testing, or Inner Model evaluation, begins with the goodness of fit assessment. This test ensures that the PLS model to be estimated for examining the relationships between research variables fits the data analyzed, allowing the sample to accurately represent the population. The goodness of fit for the PLS model can be evaluated using the R-square value and the Standardized Root Mean Square Residual (SRMR). The R-squared value indicates the model's strength in predicting dependent variables, while the SRMR reflects the level of the model's goodness of fit. [46] An R-Square value > 0.67 signifies that the PLS model is strong in predicting endogenous variables. An R-square between 0.33 -0.67 indicates

the model is moderately strong, while an R-square between 0.19 - 0.33 indicates that the PLS model is weak in predicting endogenous variables.

Table 2. R-Square

Variabels	R-square
Open Innovation	0.539
Organizational Performance	0.331

Open Innovation (OI) has an R-Square value of 0.539, meaning the independent variables in the model explain 53.9% of the variation in Open Innovation. Based on these R-Square values, which fall within the range of 0.33–0.67, the PLS model used in this study is categorized as moderate in predicting the analyzed endogenous variables.

Organizational Performance (OP) has an R-Square value of 0.331, indicating that the independent variables explain 33.1 % of the variation in Organizational Performance. Based on these R-Square values, which fall within the range of 0.19 - 0.33, the PLS model used in this study is categorized as weak in predicting the analyzed endogenous variables.

Standardized Root Mean Square (SRMR)

Next, the Model Fit measurement is based on the Standardized Root Mean Square Residual (SRMR) value. The SRMR of a model relates to the sample's ability to represent the population. For the model to meet the model fit criteria, the SRMR value should range between 0.08 and 0.10.[47]. In this study, the SRMR value is 0.9, indicating that the research model is a good fit.

Table 3. SRMR

	Saturated model	Estimated model
SRMR	0.096	0.103

Multikolinearitas Test

Hair et al [48] Multicollinearity testing can be assessed based on the Variance Inflation Factor (VIF) values. A good multicollinearity analysis yields VIF values not exceeding 5. If the VIF value is greater than 5, it indicates a correlation between the independent variables within the regression model. Based on the multicollinearity analysis conducted, it is concluded that no multicollinearity occurs between the independent variables in this study, as the obtained VIF values meet the requirements, with all values being less than 5.

Table 4. Variance Inflation Factor

Corelations	VIF
Digital Technology → Open Innovation	1.000
Digital Technology → Organizational Performance	2.170
Open Innovation → Organizational Performance	2.170

f-Square Test

According to Hair et al [48] Effect size (f^2) is observed as the impact of removing an exogenous construct from the model on the substantive endogenous construct. The guidelines for f^2 values indicate that 0.02–0.15 represents a small effect, 0.15–0.35 represents a medium effect, and >0.35 represents a large effect of the exogenous construct. If the f^2 value is below or less than 0.02, it indicates no influence. [48]. The f^2 results in this study's model indicate that the effect size of Digital Technology on Open Innovation has the largest effect size. Meanwhile, the effect size of Open Innovation on Organizational Performance falls within the small category. On the other hand, the effect size of the relationship between Digital Technology and Organizational Performance is categorized as small.

Table 5. F-Square

	f-square
Digital Technology → Open Innovation	1.170
Digital Technology → Organizational Performance	0.024
Open Innovation → Organizational Performance	0.124

Structural Model Evaluation

The structural model evaluation begins with hypothesis testing by observing the t-statistic value at a 95% significance level ($\alpha = 0.05$). The t-table value at a 95% significance level is 1.96. If the p-value obtained for the relationship between variables is < 0.05 and the t-statistic > 1.96, it is concluded that the exogenous variable significantly affects the endogenous variable, with the direction of the effect following the sign of the path coefficient. Conversely, if the p-value obtained is > 0.05 and the t-statistic < 1.96, it is concluded that the exogenous variable does not significantly affect the endogenous variable [48]. To facilitate analysis in this study, a path diagram is constructed to visually represent the complex reciprocal

relationships between variables and organizational performance.

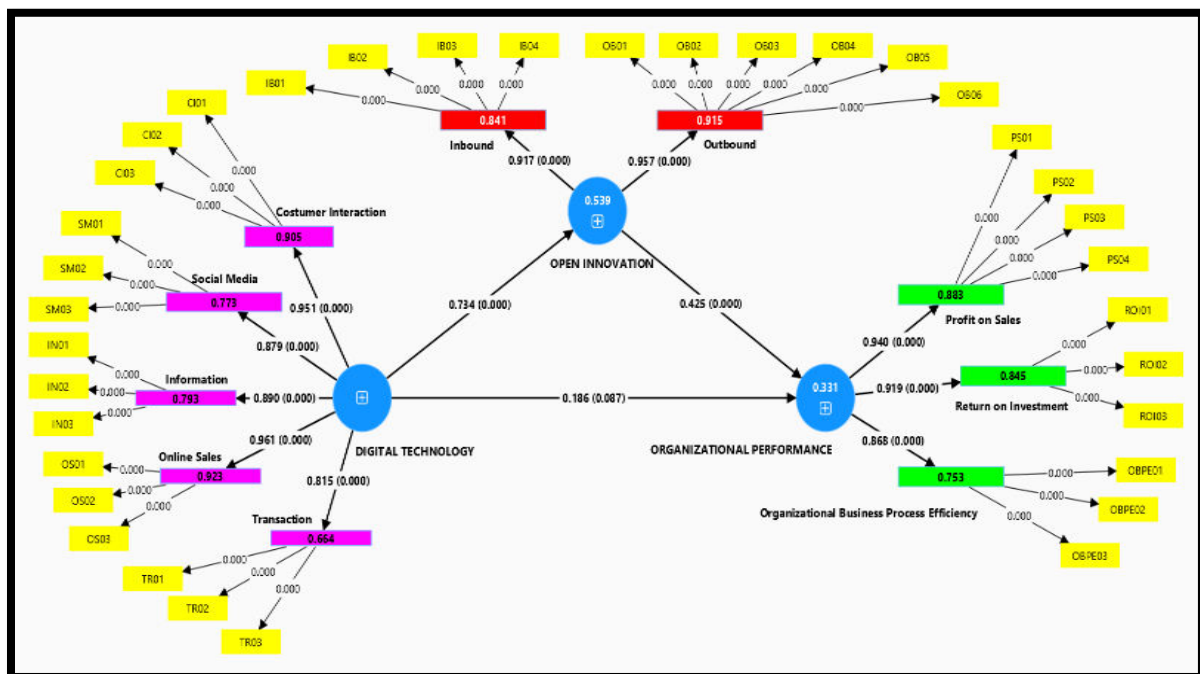


Figure 3. Overview Bootstrapping Partial Least Squares Diagram Path

Based on the given path diagram, the hypothesis explanation can be derived as follows: First, the relationship between Digital Technology (DT) and Organizational Performance (OP) indicates that Digital Technology (DT) does not have a significant impact on Organizational Performance (OP). This is demonstrated by the path coefficient value of 0.186 and a P-value of 0.087, greater than the significance threshold of 0.05. Therefore, the hypothesis that Digital Technology (DT) significantly influences Organizational Performance (OP) is **rejected**.

Second, the relationship between Digital Technology (DT) and Open Innovation (OI) shows a highly significant influence, with a path coefficient value of 0.734 and a P-value of 0.000, less than the significance threshold of 0.05. This indicates that the effective use of digital technology can drive open innovation within organizations. Hence, the hypothesis that Digital Technology (DT) significantly influences Open Innovation (OI) is **accepted**.

Third, the relationship between Open Innovation (OI) and Organizational Performance (OP) also shows a significant influence. With a path coefficient value of 0.425 and a P-value of 0.000, which is less than the significance threshold of 0.05, these results indicate that open innovation positively impacts organizational performance. Therefore, the hypothesis that Open Innovation (OI) significantly influences Organizational Performance (OP) is **accepted**.

Lastly, testing the mediating effect of open innovation on the influence of digital technology on organizational performance revealed that the indirect relationship Digital Technology (DT) → Open Innovation (OI) →

Organizational Performance (OP) has a path coefficient value of 0.312 and a P-value of 0.000 (<0.05). This suggests that Open Innovation (OI) mediates the impact of Digital Technology (DT) on Organizational Performance (OP). Based on this, the hypothesis is **accepted**.

Tabel 6. Significance of Structure Relationship

	T statistics	P values	Conclusion
Digital Technology → Organizational Performance	1.714	0.087	Rejected
Digital Technology → Open Innovation	19.515	0.000	Accept **
Open Innovation → Organizational Performance	3.869	0.000	Accept **
Digital Technology → Open Innovation → Organizational Performance	3.742	0.000	Accept **

Discussion

Main result

This study found highly phenomenal results, where Digital Technology does not correlate with Organizational Performance in the Creative Industry of Kendari City. The high adoption of Digital Technology in Kendari's Creative Industry does not necessarily significantly improve Organizational Performance. The application of Digital Technology, which includes Customer Interaction, Social Media, Information, Sales, and Transactions, has not been sufficient to drive better Organizational Performance. This condition is suspected to be because the creative industry is more influenced by other factors, such as creativity, innovation, or professional networks, rather than the adoption of digital technology. Employees or management may exhibit resistance to implementing new technology, which can hinder the effectiveness of digital technology in improving organizational performance. Even though, in theory, digital technology has the potential to bring positive impacts, in this study involving creative industry entrepreneurs, digital technology tends to be perceived merely as a secondary resource rather than a primary driver of business performance improvement. Digital technology is seen as an additional tool rather than the core of the work process, making its impact on organizational

performance minimal.

Additionally, the capital capacity of the Creative Industry to meet the demands of advanced technology is very limited, especially at the Micro, Small, and Medium Enterprises (MSME) level, which faces significant challenges in fulfilling technology investment needs. Investing in technology to support Organizational Performance is perceived as costly. Available capital is often only sufficient to sustain daily operations, leaving no room for strategic investments in technology. As a result, the creative industry can only use basic technology or resort to manual work processes. This is also a strong reason why the creative industry does not rely on digital technology and only considers it a tool to speed up work. The true strength of the Creative Industry lies in its ability to innovate business processes or creatively utilize Digital Technology.

Digital technology has significantly changed the business world, particularly in driving open innovation. Open innovation is a process where companies or organizations collaborate with external parties, such as customers, business partners, or communities, to generate new ideas and develop products or services. Based on research conducted on the creative industry in Kendari City, it was found that digital technology has a positive and significant influence on open innovation. With digital technology, physical and geographical boundaries are increasingly blurred, creating greater opportunities for the Creative Industry in Kendari City to collaborate and innovate. This allows creative industry companies that adopt digital technology not only to survive in competition but also to become leaders in creating impactful innovations.

Open innovation has become an increasingly accepted strategy across various industry sectors, including the creative industry in Kendari City. In this context, open innovation refers to a collaborative approach in which creative organizations in Kendari do not solely rely on internal resources but also leverage ideas, knowledge, and technology from external sources, such as partners, communities, and customers. The findings of this study indicate that the application of open innovation has a significant positive impact on the organizational performance of the creative industry in Kendari City. In other words, the more open an organization is to external ideas, the better its performance. Open innovation enables companies to adapt more quickly to changing market trends and customer needs, while also enhancing competitiveness by offering more creative and innovative products and services. The relationship between open innovation and organizational performance is not only theoretical but is also empirically proven through collected data. Organizations that implement open innovation tend to have superior performance compared to those that do not, in terms of productivity, operational efficiency, and product innovation.

In the relationship between digital technology and organizational

performance, open innovation acts as a highly potential mediating factor. Our research found that open innovation strengthens the influence of digital technology on organizational performance. When digital technology is integrated with an open innovation approach, organizations are not only able to innovate faster but also remain more relevant to market needs. Open innovation allows organizations to utilize digital technology more effectively, enhance creativity, and ultimately improve overall performance. In other words, without open innovation, the impact of digital technology on organizational performance in the Creative Industry of Kendari City may not be as significant as expected.

In conclusion, this study emphasizes that to maximize the impact of digital technology on performance, organizations in the creative industry of Kendari City must promote and facilitate open innovation. By combining digital technology with open innovation, organizations can achieve optimal performance and remain competitive in an ever-evolving market.

Theoretical Implications

This research model is able to explain the complexity of the mediation between two construct variables—Open Innovation and Organizational Creativity—which mediate the influence of Digital Technology on the Organizational Performance of the Creative Industry in Kendari City. Meanwhile, the direct influence of Digital Technology on the Organizational Performance of the Creative Industry in Kendari City is not significant. This expands the body of knowledge from previous studies that examined the impact of Digital Technology.

These findings challenge the assumption that Digital Technology automatically improves Organizational Performance directly. Instead, they support the theory that Digital Technology alone does not directly enhance Organizational Performance. Digital Technology requires supporting mechanisms such as Open Innovation to generate positive impacts on performance. This aligns with innovation diffusion theory and creativity theory, which emphasize the importance of adaptation and innovation in responding to technological changes. These findings also reinforce the idea that digital technology does not directly enhance the organizational performance of the creative industry in Kendari City. However, by leveraging digital technology, open innovation can be stimulated, enabling organizations to improve their performance significantly. Therefore, theories regarding the role of digital technology in organizations should be expanded to include the mediating role of innovation constructs.

This study demonstrates that theories focusing solely on the adoption of digital technology as the primary factor for improving organizational performance may not be comprehensive. There is a gap in the literature that needs to be addressed, particularly the essential role of open innovation as

a mediator in the context of the creative industry. Organizational performance improvement strategies cannot rely solely on digital technology but must also consider how organizations utilize the technology to drive innovation.

The long-term implications of these findings highlight the need for organizations to shift their approach to digital technology. Organizations should focus on how digital technology can be used to facilitate innovation and creativity, rather than merely relying on technology as a performance-enhancing tool. This insight could influence how creative industry organizations in Kendari and beyond design their future technology strategies.

Practical implications

This study found that the mediating role of open innovation in the relationship between digital technology and organizational performance is positive and significant. The practical implications of these findings provide a broader reference for creative industry entrepreneurs and SMEs. To achieve better business performance, Digital Technology and Open Innovation become crucial elements to be implemented in the business environment [49]. In creative industry organizations in Kendari City, adopting digital technology may not immediately lead to improved performance. However, when this technology is used to develop new creative ideas or to adopt an open innovation model that involves collaboration with external parties, these organizations begin to see improvements in their performance.

Governments and local financial institutions should seek solutions to overcome capital limitations. Collaborative approaches, such as creative financing, strategic partnerships, and government support in the form of incentives or subsidies, should be considered to ensure that the creative industry does not lag in the digital transformation wave. Only through such measures can the creative industry continue to grow and contribute significantly to the national economy.

Additionally, the government can implement mentoring programs, training, or human resource development initiatives within the Creative Industry sector to ensure that financial assistance is effectively allocated and reaches its intended targets.

Limitations and future lines of investigation

This study cannot be deeply generalized as it was conducted solely within the Creative Industry of Kendari City with a limited sample of business owners. Therefore, the generalization of these findings to the broader population of MSMEs may be restricted. Further research with a more representative sample is needed to validate these findings across

different contexts and specific sectors.

The research method used in this study has certain limitations, such as data collection through a survey-based questionnaire technique, which is constrained by the cross-sectional analysis approach. As a result, changes occurring after data collection cannot be controlled. To identify these changes, follow-up studies are necessary to re-examine whether the relationships between variables have shifted.

Future research should consider incorporating specific variables such as Fintech, Artificial Intelligence, or Organizational Creativity as mediators.

Conclusion

The findings of this study indicate that Digital Technology does not directly improve Organizational Performance but plays an important role in enhancing Open Innovation and Organizational Creativity. Better use of Digital Technology leads to higher innovation and creativity within organizations. Open Innovation and Organizational Creativity are proven to significantly increase Organizational Performance and act as mediating factors between Digital Technology and performance outcomes. Therefore, organizational performance can be optimized when the use of Digital Technology is supported by the development of Open Innovation and the enhancement of Organizational Creativity.

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