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Mediate of digital organizational culture: Digital leadership on organizational performance

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Abstract

This study aims to examine and explain the effect of digital leadership on organizational performance with digital culture as a mediating variable. Respondents in this study were 111 LPD heads throughout Badung Regency using the PLS-SEM method with the help of the SmartPLS 4.1 application. The results showed that the digital leadership relationship has a positive and significant effect on organizational performance, where the digital culture variable can be able to mediate the effect of digital leadership on organizational performance through two paths, namely directly and indirectly through the formation of digital culture. The implication of this research is that organizations need to prioritize the development of digital competencies of their leaders, given the positive influence of digital leadership on organizational performance, by improving the digital skills of leaders and strengthening digital culture.

Keywords: Digital Leadership; Digital Organizational Culture; Organizational Performance; Leaders

1. Introduction

The digital transformation that occurs causes changes in consumer behavior, which puts great pressure on traditional companies to change their business strategies to adapt to existing technological developments (Verhoef et al., 2021). This happens because digital transformation can improve the competitive performance of organizations thanks to the flexibility of products and services supported by technology, such as the production of goods or services that are more efficient with consumer needs, accelerate the innovation process, and enable companies to create certain digital ecosystems. On the other hand, digital transformation offers various kinds of conveniences such as ease of transactions for financial institutions, be it private financial institutions to local government financial institutions. One of the local government financial institutions that has utilized the convenience of digital transformation is the village credit institution (LPD).

From the in-depth interviews conducted, interesting facts were found in relation to the financial perspective. Seven LPD administrators responded that the current financial condition is not too worrying, but the condition is not as good as in the years before Covid-19. Two informants stated that the LPDs they lead are 'trying to recover' from the economic impact of Covid 19. Another informant from an LPD with a fairly healthy financial category answered that lending in the post-Covid period was not as good as in the pre-Covid-19 period.

Financial problems are a problem that needs to be considered by LPDs. LPDs themselves are not profit-oriented. However, good finances are certainly one of the factors that support LPDs to carry out their main functions in a village. In order to improve the financial condition of LPDs, there are several things that need to be considered by an LPD chairman, one of which is good leadership. Based on the results of interviews from 9 LPDs, only one interviewee said there was training on employee digital transformation, which was held by one of the national technology companies.

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The training was not only for employees but also for LPD employees. Lack of training related to skills can be a determinant of poor performance of LPDs, especially the leaders themselves.

Leadership according to Robbins & Judge, (2023:399) is the ability to influence groups through the achievement of a predetermined vision. Organizations require strong leadership and management, in order to achieve optimal effectiveness. Leaders have a very important role in organizations, due to their ability to select, train, and influence their followers. However, leadership in the digital era as it is now, requires new abilities or capabilities, to ensure sustainability where technology continues to bring changes to the organization (Erhan et al., 2022). Leaders who are able to keep up with technological developments will be able to direct the organization to adapt along with the development of digitalization.

According to the Coordinating Ministry for Economic Affairs of the Republic of Indonesia, the adoption of digital technology provides many benefits, including helping product marketing, simplifying financial transactions and records through the use of digital payment platforms and increasing market access. Digital transformation requires organizations to be able to adapt to technological advances, which requires human resources who have competence in digital technology. On the other hand, digital transformation opens up opportunities for innovation for organizations, starting from how the organization works, the services provided, the technology platforms used, how work is managed, and where employees can work (Zulu & Khosrowshahi, 2021). This is evidenced by research conducted by Araujo et al. (2021) where as many as 70% of organizations led by digital executives have increased organizational productivity. The digital executives referred to above are leaders who have digital competencies, these executives have a leadership style called digital leadership.

Digital organizational culture, is the assumptions, understanding and practice values about business organizations in a digital context. Digital organizational culture is based on the concept of organizational culture, which is defined as a collection of values, practices, and beliefs about how an organization conducts its business. This concept is combined with technological advances perceived by each individual in the organization (Martínez-Caro et al., 2020; Zhen et al., 2021).

Digital leaders are expected to create a digital culture in the context of an organization or company. Leaders need to establish relationships with various stakeholders. The success of digital transformation in the long term depends on the fit between the overall goals of the organization and the need to adopt new digital tools or instruments (Cortellazzo et al., 2019). Digital organizational culture, which is defined as a collection of practices of how people can interact with each other connected in one network, when viewed in the context of a company, the people referred to here are the employees who work in the company, which means that every employee in the company must have the ability to use technology, in order to create the digital culture expected by digital leaders.

2. Literature Review and Hypothesis Development

Digital leadership is a type of leadership that combines a person's leadership abilities and digital skills, which aims to improve organizational performance by optimizing digital technology (Amelda et al., 2021). This type of leadership is a combination of transformational leadership and the ability to use technology (Al-Husban et al., 2021). The development of technology in today's digital era causes organizations to be able to adapt to technological advances in order to increase productivity. Therefore, the role of digital leadership is indispensable. This is supported by research conducted by (Shin et al., 2023) where digital leadership has a positive and significant effect on organizational performance.

Similar research was conducted (Al-Husban et al., 2021) which examined the effect of digital leadership on organizational performance, that digital leadership has a positive and significant effect on organizational performance. Tulungen et al., (2022) in his research on digital leadership in improving organizational performance, showed the results that digital leadership has a positive effect on organizational performance. The adoption of digital processes by organizational or company leaders can contribute positively to the company's competitive advantage. The better the company can adapt to digital transformation, the better the sustainable innovation and competitive advantage of the company (Ferreira et al., 2019).

Research conducted by Okunlola et al. (2024) in the form of a systematic review of digital leadership that emerged in the era of the industrial revolution 4.0 and the impact of the co-19 pandemic found that digital leadership affects organizational performance. Different results were obtained (Amelda et al., 2021) where digital leadership has no effect on company performance. Similar results were also obtained by Muniroh et al., (2022) where digital leadership has no significant effect on employee performance. Research conducted by Gunawan et al., (2023) which examines the effect of digital leadership on does not have a significant effect on organizational performance.

- H1: Digital leadership has a positive and significant effect on organizational performance.

Research conducted by Wang et al., (2022) which examines the relationship between digital leadership and exploratory innovation mediated by digital organizational culture, where the results show that digital leadership has a positive effect on digital organizational culture. The results of the study also mentioned that digital leadership plays an important role in digital organizational culture, which means that when improving organizational performance, it is necessary to pay attention to digital leadership.

Research conducted by Abbas et al., (2024), which examines the effect of digital leadership on innovative work behavior mediated by digital entrepreneurial orientation and digital organizational culture shows the results that the effect of digital leadership on digital organizational culture shows a significant effect. These findings illustrate that a strong digital organizational culture (DOC), characterized by values, norms, and practices that support digital transformation, creates an environment conducive to innovation. Digital leaders play an important role in shaping and maintaining this culture by encouraging collaboration, experimentation, and continuous learning.

- H2: Digital leadership has a positive and significant effect on digital organizational culture.

Digital Organizational Culture can be an essential factor in improving organizational performance, where digital culture can produce better performance, especially in environments that are accustomed to digital technology (Pradana et al., 2022). A similar opinion was expressed by Martínez-Caro et al. (2020) that digital organizational culture is an antecedent to the success of digital technology, business digitization, and support for technological value development in improving company performance. In his research, it is also stated that digital technology can be a stepping stone in increasing company value, if it has the right digital culture. Shen et al. (2022) in their research on the digital environment and organizational performance, stated that the digital environment has a positive influence on organizational performance, which means that the better the company's digital environment, the better the organization's performance. The digital environment in the company will lead to a digital culture (digital organizational culture). A similar opinion was expressed by Zhen et al., (2021) which states that digital organizational culture has a positive influence on organizational readiness in facing the digital industry.

- H3: Digital organizational culture has a positive and significant effect on organizational performance.

Research conducted by Wang et al. (2022), examines the effect of digital leadership on exploratory innovation, with digital organizational culture and digital entrepreneurship orientation as mediating variables. The results showed that the effect of digital leadership on exploratory innovation mediated by digital organizational culture showed a positive and significant effect both directly and indirectly. This emphasizes that if companies want to increase exploratory innovation, they need to strengthen the digital leadership of their leaders, and digital organizational culture.

Research conducted by Pangarso et al. (2022), related to the role of digital organizational culture variables in mediating the influence of empowering leadership on employee performance, stated that digital organizational culture variables can partially mediate the influence of empowering leadership on employee performance. This indicates that digital organizational culture complements the influence of empowering leadership on employee performance, which means that the stronger the empowering leadership, the higher the employee performance, but employee performance can be improved by the strength of digital organizational culture.

- H4: Digital organizational culture mediates the influence of digital leadership and organizational performance.

3. Methods

The location of this research was conducted at Village Credit Institutions spread throughout Badung Regency. The sample of this research was taken using non-probability sampling with saturated sampling technique. This sampling was carried out with the consideration that the people who best understood the leadership and organizational performance were the heads of the local Village Credit Institutions. Therefore, the respondents of this study were the heads of Village Credit Institutions spread across Badung Regency. During the data collection process, starting from September 9, 2024 to November 4, 2024, the data used were 111 Village Credit Institutions. The data collection method used in this study was a survey by distributing questionnaires. This study uses Partial Least Square Structural Equation Modeling (PLS-SEM) analysis, where calculations are carried out with SmartPLS 4.1 software.

4. Results and discussion

4.1. Evaluation of the Measurement Model (Outer Model)

The measurement model in PLS is designed to determine whether the measured indicators are valid and reliable. Evaluation of the measurement model includes three stages of testing, the first is testing convergent validity, the second is testing discriminant validity, the last is testing composite reliability.

4.2. Convergent Validity

Convergent validity testing can be seen by comparing the correlation value between the indicator score and the outer loading value. Indicators are considered valid if they have a correlation value above 0.70, but for new research that is relatively newly developed, a correlation value above 0.60 is considered sufficient (Ghozali, 2014: 43). The outer loading value of the first stage of testing is presented in table 1 as follows:

Table 1 First Stage Outer Loading Value

Variable	Indicator	Outer Loading	Result
Digital Leadership (X)	X1	0.768	Valid
	X2	0.723	Valid
	X3	0.682	Valid
	X4	0.613	Valid
	X5	0.547	Invalid
	X6	0.687	Valid
	X7	0.752	Valid
Digital Organizational Culture (Z)	Z1	0.668	Valid
	Z2	0.707	Valid
	Z3	0.751	Valid
	Z4	0.493	Invalid
	Z5	0.671	Valid
	Z6	0.617	Valid
	Z7	0.614	Valid
Organizational Performance (Z)	Y1	0.654	Valid
	Y2	0.692	Valid
	Y3	0.667	Valid
	Y4	0.692	Valid
	Y5	0.607	Valid
	Y6	0.528	Invalid
	Y7	0.718	Valid
	Y8	0.644	Valid
	Y9	0.699	Valid
	Y10	0.697	Valid
	Y11	0.608	Valid
	Y12	0.514	Invalid

Primary Data, 2024

Based on the results of testing the outer model in table 1, it can be seen that each variable has indicators with a correlation value or outer loading value below 0.60. The indicator is located in the digital leadership variable in the deep knowledge dimension, indicator X5, the digital organizational culture variable in the perceived needs for digital skills dimension, indicator Z4, and in the organizational performance variable, in the growth and learning perspective dimension, indicator Y6 and the financial perspective dimension, indicator Y12. All outer loading values below the value of 0.60 will be eliminated, this step aims to increase construct validity and reliability. The analysis process is carried out until the outer loading value has a minimum value of 0.60. The test results can show that all outer loading values of indicators on this research variable have a value greater than 0.60, thus it can be concluded that all indicators have met the requirements and are declared valid. The outer loading values are summarized in table 2. as follows:

Table 2 Outer Loading Value After Elimination (Second Stage)

Variable	Indicator	Outer Loading	Result
Digital Leadership (X)	X1	0.783	Valid
	X2	0.729	Valid
	X3	0.697	Valid
	X4	0.618	Valid
	X6	0.692	Valid
	X7	0.756	Valid
Digital Organizational Culture (Z)	Z2	0.754	Valid
	Z3	0.792	Valid
	Z5	0.740	Valid
	Z6	0.680	Valid
Organizational Performance (Y)	Y1	0.682	Valid
	Y2	0.717	Valid
	Y3	0.729	Valid
	Y4	0.718	Valid
	Y7	0.735	Valid
	Y8	0.680	Valid
	Y9	0.728	Valid
	Y10	0.740	Valid

Primary Data, 2024

Testing convergent validity can also be done by looking at the average variance extracted (AVE) value of each variable. If the average variance extracted (AVE) of the latent variable is greater than 0.50 the instrument is considered empirically valid.

Table 3 Table of Average Variance Extracted (AVE) Values

Variable	Average variance extracted (AVE)	Result
Digital Leadership (X)	0.791	Valid
Digital Organizational Culture (Z)	0.684	Valid
Organizational Performance (Y)	0.510	Valid

Primary Data, 2024

Based on the AVE value summarized in Table 3, it shows that each of the variables in this study has an AVE value greater than 0.50 so that it is declared valid, so it can be concluded that this study has met the criteria for convergent validity.

4.3. Discriminant validity

This test is carried out by checking the cross loading with the latent variable. If the cross loading value of each indicator on the variable concerned is greater than the cross loading on other latent variables, then the indicator is declared valid. Indicators are considered valid if they have a cross loading value greater than 0.50. The results of the discriminant validity test using cross loading are presented in Table 4.

Table 4 Cross Loading Value (Discriminant Validity Test Results)

	Digital Leadership	Digital Organizational Culture	Organizational Performance	Result
X1	0.783	0.631	0.710	
X2	0.729	0.589	0.664	
X3	0.697	0.623	0.661	Valid
X4	0.618	0.588	0.494	
X6	0.692	0.580	0.579	
X7	0.756	0.638	0.681	
Z2	0.638	0.754	0.673	
Z3	0.707	0.792	0.729	Valid
Z5	0.611	0.740	0.537	
Z6	0.560	0.680	0.481	
Y1	0.597	0.531	0.682	
Y2	0.608	0.652	0.717	
Y3	0.653	0.572	0.729	
Y4	0.627	0.560	0.718	Valid
Y7	0.688	0.607	0.735	
Y8	0.628	0.576	0.680	
Y9	0.630	0.609	0.728	
Y10	0.661	0.629	0.740	

Primary Data, 2024

Based on Table 4, all cross-loading values of each indicator on each variable are greater than 0.50. Thus, it can be stated that the data in the study are valid, meaning that all constructs have met the criteria for discriminant validity.

4.4. Composite Reliability

This composite reliability test can be seen from the Cronbach's Alpha value or the composite reliability value itself. The variable is declared to have good composite reliability if it has a Cronbach's alpha value greater than 0.70. The composite reliability test results are summarized in Table 5 as follows:

Table 5 Cronbach's Alpha and Composite Reliability Values

	Cronbach's Alpha	Composite Reliability	Result
Digital Leadership (X)	0.807	0.862	Reliable
Digital Organization Culture (Z)	0.730	0.831	Reliable

Organizational Performance (Y)	0.864	0.894	Reliable
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Primary Data, 2024

The results shown in Table 5 show that all variables have a Cronbach's alpha value and a composite reliability value above 0.70, so all variables are declared reliable.

4.5. Structural Model Evaluation (Inner Model)

Inner model testing is done by looking at the R-square value which is a goodness of fit model test. The R-square of the PLS model can be evaluated by looking at the R-square predictive relevance for the variable model. R-square measures how well the observed value is generated by the model and also the parameter estimate. In assessing the structural model with structural PLS, it can be seen from the Q-square value for each endogenous latent variable as the predictive power and structural model. However, if the calculation results show a Q-square value of more than zero, then the model is declared feasible and has a relevant predictive value.

4.6. Coefficient of Determination (R-square)

The R-square value is used to determine how much (percent) the influence of exogenous variables on endogenous variables, the range of R-square values is 0 - 1, if the R-square value is close to 0, the weaker the influence of exogenous variables on endogenous variables on the contrary, if it is close to 1, the stronger the influence of exogenous variables on endogenous variables. The criteria for the R-square value according to Hair et al. (2014) the R-square value ≥ 0.75 indicates that the model is in the strong (substantial) category, 0.5 is in the moderate category, 0.25 is in the weak category. The variable R-square value can be seen in Table 6 as follows:

Tabel 6 R-square

	R Square	R Square Adjusted
Digital Organizational Culture (Z)	0.725	0.722
Organizational Performance (Y)	0.809	0.805

Primary Data, 2024

Table 6 shows that the R-square value for the digital organizational culture variable is 0.725, which means that this research model is in the moderate category or 72.5 percent of the digital organizational culture variable is influenced by digital leadership and the remaining 27.5 percent is influenced by constructs outside the model.

The R-square value of the organizational performance variable is 0.809, which means that this research model is in the strong category or 80.9 percent of the organizational performance variable is influenced by digital organizational culture and digital leadership, and the remaining 19.1 percent is influenced by other constructs that are not included in the model.

4.7. Predictive-Relevance (Q²)

Inner model testing is done by looking at the Q-square value which is a goodness of fit model test, if the Q-square value is greater than zero (> 0), it shows that the model has a good predictive relevance value, while the Q-square is smaller than zero (< 0), indicating that the model has less or no relationship. The calculation of the Q-square value can be seen in the following equation:

$$Q2 = 1 - (1 - R^2)(1 - R^2)$$

$$Q2 = 1 - (1 - 0.725)(1 - 0.809)$$

$$Q2 = 0.947$$

The Q2 value obtained in this study is 0.947, thus it can be concluded that the model in this study has relevant information because it can explain the information in this study by 94.7%.

4.8. Direct Effect

Testing the direct effect hypothesis using Partial Least Square (PLS) will show four hypotheses. Hypothesis testing aims to determine how much influence the independent variable has on the dependent variable. The significance value can be obtained using the bootstrapping technique. Figure 5.3 is the result of the bootstrapping test using smartPLS 4.1 software. The results of testing the direct effect with bootstrapping from PLS analysis can be seen in Table 7 as follows:

Table 7 Results of Path Coefficients

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Leadership -> Digital Organization Culture	0.851	0.023	37.327	0.000
Digital Leadership -> Organizational Performance	0.673	0.081	8.332	0.000
Digital Organization Culture -> Kinerja Organisasi	0.254	0.084	3.039	0.001

Primary Data, 2024

Hypothesis testing on the influence of digital leadership on organizational performance produces a coefficient value of 0.673, and a P-Value of 0.000, indicating that the value is lower than 0.05, and a t-statistics value of 8.332 is greater than 1.96 so that H1 is accepted.

These data show that digital leadership has a positive and significant effect on organizational performance, which means that the stronger the influence of digital leadership, the higher the performance of the LPD organization. Hypothesis testing on the influence of digital leadership on digital organizational culture produces a coefficient value of 0.851, and a P-Value of 0.001, indicating that the value is lower than 0.05 and a t-statistics value of 37.327 is greater than 1.96 so that H2 is accepted.

These data show that digital leadership has a positive and significant effect on digital organizational culture, which means that the stronger the digital leadership, the stronger the digital organizational culture in the internal scope of LPD. Hypothesis testing on the influence of digital organizational culture on organizational performance produces a coefficient value of 0.254 with a t-statistic value of 3.039 which is greater than 1.96, and a P-Value value of 0.000 which indicates that the value is lower than 0.05 and the t-statistic value of 3.039 is greater than 1.96 so that H3 is accepted.

These data indicate that digital organizational culture has a positive and significant effect on organizational performance, which means that the stronger the digital organizational culture, the higher the performance of the LPD organization.

4.9. Indirect Effect

Testing of mediation variables can be seen from the level of significance <0.05 at the p-value and the t-statistic value ≥ 1.96 indirect influence of digital leadership variables on organizational performance through digital organizational culture is summarized in Table 8 as follows:

Table 8 Indirect Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Leadership -> Digital Organizational Culture -> Organizational Performance	0.216	0.217	0.072	3.020	0.001

Primary Data, 2024

Based on the results of the indirect effect test in Table 8, it shows that the digital organizational culture variable in mediating the effect of digital leadership on organizational performance has a coefficient value, t-statistic of 3.020

greater than 1.96, and a p-value of 0.001 less than 0.05 which indicates that H4 is accepted. This shows that digital organizational culture can mediate the effect of digital leadership on organizational performance. The results of the hypothesis test with PLS-SEM analysis show that the fourth hypothesis, both the direct influence test and the indirect influence of the mediating variables are positive and significant, so that it can be stated that mediating digital organizational culture influences digital leadership on organizational performance is partially complementary (partial complementary mediation).

5. Conclusion

The finding that digital leadership has a positive effect on organizational performance strengthens contemporary leadership theories that emphasize the importance of digital competence in the era of digital transformation. The strong relationship between digital organizational culture and organizational performance supports organizational culture theory, suggesting that a digitally oriented culture is a key factor in enhancing organizational effectiveness in the digital era.

The influence of digital leadership on digital organizational culture provides new insights into the role of leaders in shaping organizational culture, especially in the context of digitalization. Furthermore, the finding that digital organizational culture acts as a partial mediator between digital leadership and organizational performance enriches the understanding of digital leadership and organizational performance. Overall, this study extends the strategic management literature by highlighting the interactions between leadership, culture, and performance in the context of digital transformation.

5.1. Managerial Implication

First, organizations need to prioritize the development of their leaders' digital competencies, given the positive impact of digital leadership on organizational performance. This can involve dedicated training programs and mentoring to enhance leaders' digital skills. Second, focusing on the formation and strengthening of the organization's digital culture is crucial, given its significant role in improving organizational performance. Organizations can consider implementing a comprehensive culture change program, including employee training, work process changes, and reward systems that support digital innovation. Third, leaders must recognize their role as change agents in shaping the organization's digital culture. Leaders need to be role models in technology adoption and encourage a digital mindset across all levels of the organization. Finally, an approach that combines digital leadership development with organizational culture transformation is needed to achieve optimal performance improvements. This will involve an integrated strategy between leadership initiatives, change management, and digital transformation.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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