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The Impact of Digital Organizational Culture and Digital Capability on Organizational Performance through Digital Innovation Mediation in the COVID-19 Era: A Study on Indonesian Pharmaceutical SOEs

(Kesan Budaya Organisasi Digital dan Keupayaan Digital terhadap Prestasi Organisasi melalui Pengantaraan Inovasi Digital dalam Era COVID-19: Kajian terhadap GLC Farmaseutikal Indonesia)

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ABSTRACT

The COVID-19 pandemic has negatively impacted the performance of pharmaceutical companies and must be addressed appropriately. This study aims to determine how digital organizational culture, digital capability, and digital innovation impact organizational performance. The partial least squares structural equation modeling (PLS-SEM) was utilized to analyze the data obtained from 238 respondents affiliated with Indonesian pharmaceutical state-owned enterprises (SOEs). The results of this study suggest that while digital organizational culture does not directly affect organizational performance, it does so indirectly through digital innovation, which acts as a mediating variable. Second, digital capability affects organizational performance directly as well as indirectly through digital innovation. This study empirically provides confirmation of how organizational performance is achieved in pharmaceutical companies, especially during the COVID-19 era. In addition, the findings show some substantial implications for management by focusing on digital organizational culture and digital capability as fundamental predictors of organizational performance through digital innovation.

Keywords: Digital organizational culture; digital capability; digital innovation; organizational performance; pharmaceutical company

ABSTRAK

Pandemik COVID-19 telah menjejaskan prestasi syarikat farmaseutikal secara negatif dan mesti ditangani dengan sewajarnya. Kajian ini bertujuan untuk menentukan bagaimana budaya organisasi digital, keupayaan digital, dan inovasi digital mempengaruhi prestasi organisasi. Pemodelan persamaan struktur kuasa dua terkecil separa (PLS-SEM) digunakan untuk menganalisis data yang diperoleh daripada 238 responden yang bergabung dengan syarikat berkaitan kerajaan (GLC) farmaseutikal Indonesia. Hasil kajian ini menunjukkan bahawa walaupun budaya organisasi digital tidak secara langsung mempengaruhi prestasi organisasi, ia melakukannya secara tidak langsung melalui inovasi digital, yang bertindak sebagai pembolehubah pengantara. Kedua, keupayaan digital mempengaruhi prestasi organisasi secara langsung dan juga tidak langsung melalui inovasi digital. Kajian ini secara empirikal memberikan pengesahan tentang bagaimana prestasi organisasi dicapai dalam syarikat farmaseutikal, terutamanya semasa era COVID-19. Di samping itu, penemuan menunjukkan beberapa implikasi yang besar untuk pengurusan dengan memberi tumpuan kepada budaya organisasi digital dan keupayaan digital sebagai peramal asas prestasi organisasi melalui inovasi digital.

Kata kunci: Budaya organisasi digital; keupayaan digital; inovasi digital; prestasi organisasi; syarikat farmaseutikal

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INTRODUCTION

The COVID-19 pandemic has not only affected the health sector but also the economy and the performance of many businesses (Nah & Siau 2020; Pandey 2021). According to data from the Indonesia Quarterly Pharma Market Update Q4 2020, published by IQVIA in March 2021, the pharmaceutical market in Indonesia decreased by -7.4% in 2020 compared to the previous year (IQVIA 2021). Similarly, the performance of pharmaceutical state-owned enterprises (SOEs) decreased in 2020 when compared to the previous year.

According to Ayati et al. (2020), the pharmaceutical industry's performance issues stem from regulatory changes, supply shortages, and the use of online digital technology. In addition, people's purchasing power has decreased (Papadopoulos et al. 2021), and patient visits to

health facilities have decreased due to fears that patients will contract COVID-19 (Purwanto & Emilia 2020). Consequently, it is essential to evaluate the performance of pharmaceutical companies during economic downturns caused by public health emergencies.

Numerous studies, particularly those focusing on the application of digital technology, have attempted to propose solutions to performance issues (Amankwah-Amoah et al. 2021; Secundo et al. 2021; Zimmerling & Chen 2021). Pharmaceutical and healthcare businesses are among those rapidly accelerating digital transformation (Arden et al. 2022; Clark et al. 2020). It is believed that digitizing Pharma technology throughout the value chain will boost competitive advantage, productivity, efficiency, product marketing, and industrial expansion (e.g., Kim et al. 2022; Kumar et al. 2020; Reinhardt et al. 2020; Saha et al. 2022).

However, the examined variables do not adequately explain efforts to achieve performance over the COVID-19 era, so it is important to identify the contribution of additional explanatory variables (Ayati et al. 2020; Golubeva 2021; Obrenovic et al. 2020). For instance, organizational culture is a variable that is frequently related to performance, but the results indicate that the association is equivocal (Bani-Hani et al. 2020; Muniroh et al. 2022). Hadi and Baskaran (2021) findings indicate that digital organizational culture (DOC) influences company sustainability performance. Previously, Martinez-Caro et al. (2020) discovered that firms can increase their performance by interpreting the DOC that best supports the digital strategy. In light of these findings and arguments, it is crucial that businesses comprehend how DOC affects organizational performance (OP).

Other research indicates that digital capability (DC) influences OP. Duman and Akdemir (2021) discovered that the possibilities of digital industry 4.0 technology impact OP, including boosting profitability, capacity, manufacturing speed, and decreasing expenses. In the meantime, Chinakidzwa and Phiri (2020) research indicates that digital capabilities in terms of strategy creation and execution are associated with market performance as evaluated by sales growth, market share, and profitability.

There are additional findings that contradict the findings of the aforementioned three studies. In the new normal era, Heredia et al. (2022) demonstrate that DC has no significant impact on company performance. Chae et al. (2014) demonstrated much earlier that IT capabilities do not have a direct impact on OP.

The existence of a research gap regarding the relationship between digital technology and OP strengthens the argument of Martinez-Caro et al. (2020), namely, that even though the research topic of OP is well-established, this problem still requires additional research due to the complex interaction between organizational culture and capabilities in the digital age.

According to the Resource-Based View (RBV) theory (Barney 1991), in order to create value and profit, businesses must have access to scarce, valuable, unique, and irreplaceable resources. This study answers the question, "Does the use of DOC and DC impact OP?" to shed light on efforts to improve organizational performance with the right resources.

As it is unclear whether DOC and DC have a significant impact on OP in the COVID-19 era, this study uses digital innovation (DI) as a mediating variable. Understanding the concept of innovation in the healthcare industry is crucial because it influences performance enhancement and business sustainability.

DI is one of the primary outcomes of digital culture and digital capabilities (Hund et al. 2021). The term "digital innovation" refers to product development, process improvement, and the creation of new business models using innovative digital technologies (Wiesbock & Hess 2019). In this study, we hypothesize that DOC and DC support the growth of DI (Zhen et al. 2021), which ultimately influences the enhancement of OP. This study addresses a gap in the literature by demonstrating the connection between DI and OP within the context of digital culture and capabilities.

This study contributes to the development of the RBV theory and to a greater understanding of the effects of DOC and DC on OP via DI. This study extends OP research in terms of both subject matter and methodology.

This study also contributes to practice by elucidating how OP interacts with culture and digital capabilities, particularly in the COVID-19 era. With this knowledge, businesses can enhance their performance through DI, supported by DOC and DC. These findings provide practical solutions and implications for the problem of the declining OP of pharmaceutical SOEs in Indonesia during the pandemic era, specifically the implementation of DOC and DC.

The remainder of this paper is divided into the following sections: literature review, methodology, results, discussion, and implications. The paper concludes with a conclusion that includes the study's limitations as well as future research recommendations.

LITERATURE REVIEW

OP is considered a strategic management center (Schendel & Hofer 1979). This study uses the grand theory resource-based view (RBV) as a basis for understanding the factors that influence OP. This theory explains how a company's value and profits are created based on its resources. Barney (1991:101) explains that "all the assets, capabilities, organizational processes, firm attributes, information, knowledge and other things controlled by the company enable the company to understand and implement strategies to improve efficiency and effectiveness". In this case, in order to create value and profit, companies need to acquire valuable, rare, inimitable, and irreplaceable resources.

With these types of resources, companies can gain a sustainable competitive advantage through digital

technologies (Papadopulos et al. 2020). In addition, the dynamic capabilities view, an extension of RBV theory, allows for the integration of organizational capabilities and resource utilization (Eisenhardt & Martin 2000; Teece & Pisano 1994). At the same time, the concept of organizational culture proposed by Schein (1985; 2010) can be used as a source of support for performance success.

OP defines the achievement of business objectives because of the interaction of strategy, resources, and capabilities, which is measured by comparing the organization with its main competitors and represents the relative strength of the company. Khin and Ho (2018) and Martinez-Caro et al. (2020) show that OP consists of DOC and DC which are hard to imitate.

DIGITAL ORGANIZATIONAL CULTURE AND ORGANIZATIONAL PERFORMANCE

Several studies showed that digital culture attracts the attention of management practitioners (Grover et al. 2022; Schein 2010). All companies must adapt to DOC in a volatile environment because it differs from traditional culture. A shared understanding of how organizations should operate in the digital sphere is known as "DOC." (Duerr et al. 2018). This study defines DOC as a set of organizational structures, shared values, and overall assumptions for using digital resources to create social and economic value.

According to Usai et al. (2020), DI only works for companies that plan to have different cultures, members, and visions. In the context of Pharma 4.0, Kumar et al. (2020) and Reinhardt et al. (2020) showed DOC as a value system. The execution of this system becomes more efficient through the use of technology that requires the collaboration of production processes and quality. The study by Golubeva et al. (2020) and Obrenovic et al. (2020) indicated that COVID-19 raises awareness of the factors affecting OP. Meanwhile, Grover et al. (2022) emphasized how digital culture influences company outputs such as performance and agility. An organization must develop and use digital culture to create value because it affects customer satisfaction, profits, revenue, and others.

Previous studies indicated that digital culture influences OP (Hadi & Baskaran 2021; Martinez-Caro et al. 2020; Upadhyay & Kumar 2020). Therefore, the following hypothesis is proposed:

H_1 DOC has a significant effect on OP

DIGITAL CAPABILITY AND ORGANIZATIONAL PERFORMANCE

Dynamic capability theory as a continuation of the RBV theory states that DC helps to create new procedures in a dynamic environment (Zhang et al. 2020). This capability affects process development, customer relationships, company performance, and operational and strategic areas. This study defines DC as a company's ability to align digital technology with customer needs and wants, thereby enhancing the success of the digital transformation.

COVID-19 increases the use of digital technology because it causes major changes in healthcare (Secundo et al. 2021). This technology helps to achieve a competitive advantage such as value creation, strategic initiatives, and corporate agility (Cohen et al. 2021).

DC affects OP, according to prior studies by (Aydiner et al. 2019; Chinakidzwa & Phiri 2020; Duman & Akdemir 2021). This indicates that technology ownership, responsiveness, ecosystems, and governance influence the company's performance. Based on these arguments, we hypothesized that:

H_2 DC has a significant effect on OP

DIGITAL ORGANIZATIONAL CULTURE AND DIGITAL INNOVATION

In a volatile environment, DOC differs extensively from traditional culture (Grover et al. 2022). Also, it becomes an integrated part of a company's life (Taherdoost 2018). That reveals DOC is about organizational functioning in the digital domain (Duerr et al. 2018).

In the technological era, issues regarding digital culture are identified as an integral part of organizations (Muller et al. 2019). The study by Elia et al. (2020) and Ferreira et al. (2019) explained that DI is closely related to creativity. The study also illustrates how it characterizes creative behavior and applies novel techniques to address pressing issues. Moreover, DI becomes a construction that arises in a company due to the presence of digital technology. According to Hund et al. (2021), it is the development, adoption, and exploitation of goods, services, procedures, or business models using digital technology. This research defines DI as developing products or services, improving business processes, and developing new business models using innovative digital technologies.

Previous studies have shown that digital culture has impact on DI (Muller et al. 2019; Zhen et al. 2021). Cohen et al. (2021) pointed out that DOC enables organizations to exhibit high DI. Also, in developing the hypothesis, the resource-based view (RBV) assumes that a firm's sustainable competitive advantage is based on its valuable, rare, inimitable, and non-substitutable resources. The RBV is a model that sees resources as the key to a company's success. This leads to the following hypothesis.

H_3 DOC has a significant effect on DI

DIGITAL CAPABILITY AND DIGITAL INNOVATION

Technology resources are transformed, integrated, and used through a "DC" mechanism. DC becomes important because it integrates technology with professionals

(Levallet & Chan 2018). Therefore, DC increases DI and is crucial (Hund et al. 2021).

Previous studies showed that DC affects DI (Kin & Ho 2018; Nasiri et al. 2020; Zhen et al. 2021). In line with this, we propose the hypothesis that:

H_4 DC has a significant effect on ID

DIGITAL INNOVATION AND ORGANIZATIONAL PERFORMANCE

OP is the goals and success achieved after a specific time. In Industry 4.0, OP combines financial and non-financial criteria, including profitability, costs, sales, total production per capita, capacity, speed, and quality (Duman & Akdemir 2021). Several studies showed that DI affects OP and results because it changes business models, expands markets, and attracts new customers (Kurilova & Antipov 2020; Sethibe & Steyn 2016). Furthermore, Wiesbock and Hess (2019) explained that utilizing digital technology, DI frequently leads to significant changes in a company's processes, business strategies, or goods and services.

Clark et al. (2021) emphasized that healthcare companies must develop new and innovative business models to address long-term challenges, including the aftermath of the pandemic. Moreover, it is necessary for the pharmaceutical industry to adopt more innovative digital technologies. According to Furtner et al. (2021), in order to lead numerous partnerships and collaborations across the healthcare ecosystem successfully, the medical field must exhibit specific DI.

Previous studies showed that DI significantly affects OP (Chege et al. 2019; Hanelt et al. 2021; Singhal et al. 2020). Therefore, we hypothesized that:

H_5 DI has a significant effect on OP

MEDIATING ROLE OF DIGITAL INNOVATION

In this study, DI was used as a mediating variable for DOC and OP digital capabilities, based on the researcher's insights from Barney's (1991) RBV theoretical synthesis, which is widely used in the DI literature to explain how companies can benefit. competitive advantage and superior performance. The principle of this theory is that the high performance of a company depends on its unique resources and skills, which are rare and difficult for competitors to imitate. Based on the RBV theory, the literature suggests that companies with a high technology orientation achieve higher DI levels because they are more visionary and committed to using new technologies to develop innovative products (Khin & Ho 2018).

The negative impact on performance is due to the incorporation of digital technology into the company's operations (Usai et al. 2021). At the same time, the organization continues to use existing human resources and technology to improve its operations. A company's ability to integrate and utilize these digital resources positively affects performance outcomes (Grover et al. 2022). Therefore, DI is a valuable tool to achieve OP (Hund et al. 2021; Wiesbock & Hess 2019).

In order to bridge organizational culture and performance, DI is crucial (Hogan & Coote 2014; Naranjo-Valencia et al. 2016; Wang 2019). This logic helps to explain and justify the mediating function of DI between DOC and OP. DOC provides a set of shared structures, standard values, and assumptions to improve OP. In line with the above assumptions, we formulated the hypothesis:

H_6 DI mediates the effect of DOC on OP

As previously discussed, DC positively predicts DI (Khin & Ho 2018). According to Chege et al. (2019), DI significantly affects OP. Therefore, DC influences OP through DI. DC helps to create new processes in a volatile environment to improve OP (Zhang et al. 2020). Khin and Ho (2018) suggested that DC companies can satisfy customers with innovative offerings better, boosting sales and financial returns. Therefore, we build the hypothesis that:

H_7 DI mediates the effect of DC on OP

CONCEPTUAL FRAMEWORK

The independent, mediator and dependent variables in this study are the four constructs of DOC, DC, DI, and OP. The details are shown in Figure 1.

METHODOLOGY

DATA COLLECTION AND RESPONDENTS

A quantitative approach with a survey method was used in this research. This research is an explanatory research and theory test that examines the relationship between variables that can be measured using survey instruments and the data consists of numbers that can be analyzed based on statistical procedures (Cresswell 2008). The goal is to prove the truth of the particular theory under study by identifying general predictions.

The field of study is the performance of pharmaceutical companies which includes DOC and DC as independent variables, as well as DI as mediating variables. Field study data were collected through normal procedures, accepted procedures, and valid instruments. This study makes the organization at the division/unit level the unit of analysis. A total of 238 general managers/managers from the pharmaceutical SOEs were selected using a saturated or census technique. Initially, the questionnaires were distributed to 240 unit/division leaders.

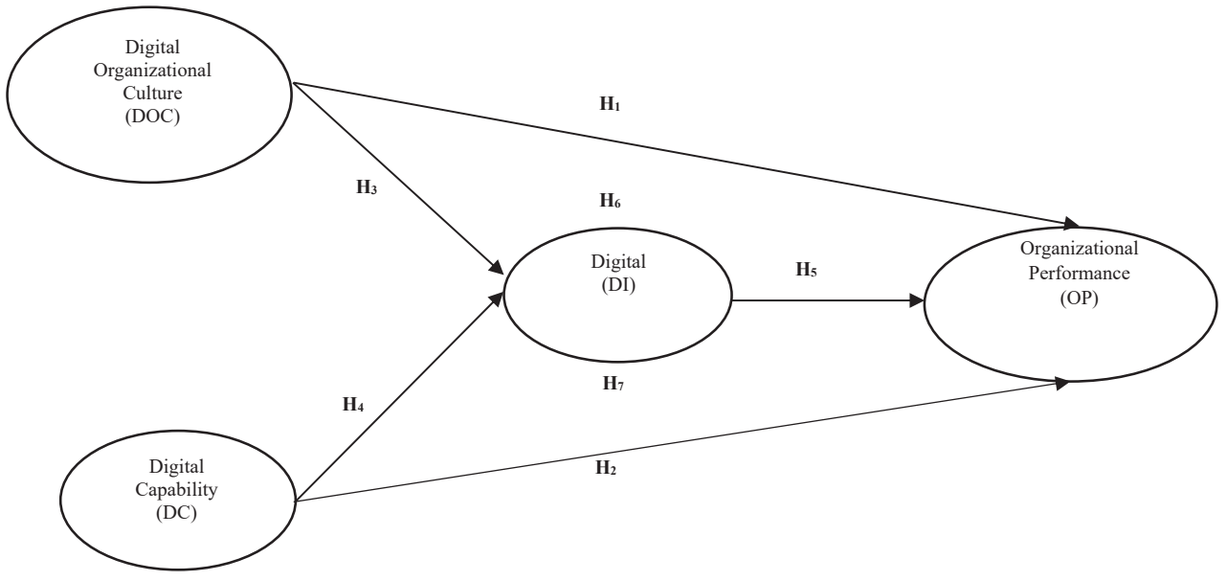

FIGURE 1. Study concept framework

Table 1 shows that only 238 respondents provided their responses during the data-gathering procedure. Meanwhile, to check the instrument's clarity, suitability, and relevance, a pretesting with 30 participants was first carried out.

MEASUREMENT

Appendix A shows that respondents provided information on DOC, DC, DI, and OP through a structured questionnaire. The survey instrument was adapted from previous works (e.g., Khin & Ho 2018; Martinez-Caro et al. 2020; Wiesbock & Hess 2019). All measurements in this study used a five-point Likert scale ranging from 1 "Strongly Disagree" to 5 "Strongly Agree".

The Partial Least Squares Structural Equation Modeling (PLS-SEM) method was used for data analysis in this study. The main considerations are: First, the purpose of the study is to test a complex structural model with multiple constructs, indicators, and/or model correlations, as well as to conduct analyzes related to testing theoretical frameworks in a predictive manner. Second, the causal-predictive nature of PLS-SEM makes it suitable for use in field research aimed at making recommendations about management practices/effects (Hair et al. 2019).

RESULTS

Table 1 shows the profile of the respondents. Demographic data shows that the majority of respondents are male (81.09%); aged between 31-40 (46.64%); with undergraduate education level (79.83%); manager positions (39.50%); from the operations division (42.86%); and work experience of more than 15 years (43.70%).

MEASUREMENT MODEL

The measuring model is employed to examine the accuracy and reliability of the data with the smartPLS version 3.0 software. According to Sekaran and Bougie (2013), the validity test showed the instrument's accuracy. The increase in the level of validity tends to make the measuring tool more accurate. In contrast, the reliability test assesses if the instrument can provide the same results while carried out repeatedly. Table 2 shows the construct validity that represents the actual coefficients.

In terms of convergent validity, a construct's quantifiers, known as the manifest variables, must be highly correlated (Setiaman 2022). An indicator tends to provide a high level of validity if it has a loading factor > 0.70 (Hair et al. 2019). Table 2 demonstrates that the measurement model complies with convergent validity standards. Internal consistency testing revealed that the alpha values for the composite reliability fluctuated from 0.918 to 0.951 and 0.893 to 0.943, respectively. These numbers confirm that each variable has composite reliability and Cronbach's alpha value > 0.7 (Hair et al. 2019). Therefore, the measurement model met the criteria of composite reliability and Cronbach's alpha.

Convergent validity testing uses the Average Variance Extracted (AVE). The AVE is good if it has a value > 0.50 (Hair et al. 2019). Table 2 shows that the value of Average Variance Extracted for all variables is > 0.5. Therefore, the measurement model is valid because the AVE meets the criteria for further testing. The R2 value for the innovation, explained by the digital culture and capability, is 0.622 or 62.2%. Meanwhile, the R2

value for OP, which tends to be explained by the digital culture, capability, and innovation, is 0.488 or 48.8%. The overall structural model is validated using an index of goodness-of-fit (GoF), which aims to test whether the model fits the data. The calculation result of GoF shows a value of 0.557. Based on these results, it can be concluded that the overall performance of the combined measurement model (external model) and structural model (internal model) is good because the GoF value is above 0.36 (medium scale).

TABLE 1. Profile of respondents

Respondents' profile	Frequency	Percentage (%)
Gender		
Male	193	81.09
Female	45	18.91
Total	238	100
Age		
< 30 years	14	5.88
31-40 years	111	46.64
41-50 years	71	29.83
> 51 years	42	17.65
Total	238	100
Education		
Bachelor's degree	190	79.83
Master's degree	47	19.75
Doctoral Degree	1	0.42
Total	238	100
Position		
Manager	94	39.50
Area Manager	31	13.03
Branch Manager	93	39.07
General Manager	20	8.40
Total	238	100
Division/Unit		
Operation	102	42.86
Property	4	1.68
Supply Chain	8	3.36
Marketing & Sales	46	19.33
Procurement	3	1.26
Corporate Secretary	6	2.52
Finance	12	5.04
Internal Control	4	1.68
Human Capital	20	8.40
Manufacture	18	7.56
Business Development	7	2.95
Research & Development	4	1.68
Information Technology	4	1.68
Total	238	100
Length of work		
< 5 years	20	8.40
5-10 years	62	26.05
10,1-15 years	52	21.85
> 15 years	104	43.70
Total	238	100

In this research, hypothesis testing is done utilizing the bootstrap resampling method. Figure 2 shows that the hypothesis is calculated using SmartPLS 3.2.9. Also, it indicates the relationship between variables by comparing the numbers in the statistics column with the required statistical limit of 1.970 and 0.05 (two tailed) as t-table and alpha (α), respectively. In accordance with applicable regulations, if the t-statistic number > t-table and the p number <α, then it indicates that it meets the requirements so that the hypothesis can be accepted. Table 3 shows the study's hypothesis testing.

The t-statistic value for table 3's DOC is 1.794 < 1.970, and the p-value for H_1 is 0.073 > 0.05, which both show that this influence is minimal. The findings indicate that DOC has little effect on OP. This means H_1 is rejected.

A significant relationship between DC and OP is shown in Table 3 according to t-statistic value 3.177 > 1.970 and p value 0.002 < 0.05 on H_2. Research shows that DC has a positive effect on OP (path coefficient 0.292). This means that H_2 is accepted.

It is clear from Table 3 that there is a significant relationship between DOC and DI as defined by the t-statistic value of 3.439 > 1.970 and the p-value of H_3 at 0.001 < 0.05. The results show how DOC positively affects DI (path coefficient 0.174). This means that H_3 is accepted.

Indicated by a t-statistic of 15.731 > 1.970 and a p-value of 0.000< 0.05 in H_4, Table 3 shows a significant correlation between DC and DI. The results demonstrate how positively DC affects DI (path coefficient 0.701). This means that H_4 is accepted.

A significant relationship between DI and OP is shown in Table 3 based on t-statistic value 3.569 > 1.970 and p value 0.000 < 0.05 on H_5. The findings show that DI has a positive effect on OP (path coefficient 0.385). This means that H_5 is accepted.

Table 3 clearly shows how DI emphasizes the impact of DOC on OP, with t-statistics of 2.305 > 1.970 and p-value of 0.022 <0.05 in H_6. The results indicate that the effect of DOC on OP is mediated by DI. This means that H_6 is accepted.

Table 3 clearly shows how DI mediates the effect of DC on OP with t-statistic 3.532 > 1.970 and p-value 0.000 <0.05 on H_7. In conclusion, DI mediates the effect of DC on OP. This means that H_7 is accepted.

A comparison of the path coefficients of the indirect effects revealed the type of mediation for Hypotheses 6 and 7 (Hair et al. 2021; Zhao et al. 2010). Statistics suggest that the role of DI in DCO is fully mediated. Table 3 shows that the independent effect of DOC on OP was small. At the same time, DOC and DI interactions

TABLE 2. The output of the measurement model

Construct	Factor Loading	Composite Reliability	Cronbach's Alpha	AVE	R2
Digital Organizational Culture (DOC)					
DOC1	0.734	0.922	0.905	0.567	
DOC2	0.742				
DOC3	0.768				
DOC4	0.773				
DOC5	0.750				
DOC6	0.711				
DOC7	0.800				
DOC8	0.758				
DOC9	0.738				
Digital Capability (DC)					
DC1	0.840	0.951	0.943	0.662	
DC2	0.788				
DC3	0.842				
DC4	0.827				
DC5	0.806				
DC6	0.843				
DC7	0.899				
DC8	0.750				
DC9	0.773				
DC10	0.758				
Digital Innovation (DI)					
DI1	0.786	0.940	0.927	0.663	0.622
DI2	0.816				
DI3	0.821				
DI4	0.854				
DI5	0.809				
DI6	0.798				
DI7	0.761				
DI8	0.864				
Organizational Performance (OP)					
OP1	0.783	0.918	0.893	0.651	0.488
OP2	0.812				
OP3	0.795				
OP4	0.810				
OP5	0.826				
OP6	0.816				

TABLE 3. Hypothesis testing the effect between variables

Effects	Hypothesis test		Path coefficients	t- statistic	P-value	Results
Direct	H_1	DOC -> OP	0.115	1.794	0.073	Not significant (Rejected)
	H_2	DC -> OP	0.292	3.177	0.002	Significant (Accepted)
	H_3	DOC -> DI	0.174	3.439	0.001	Significant (Accepted)
	H_4	DC -> DI	0.701	15.731	0.000	Significant (Accepted)
	H_5	DI -> OP	0.385	3.569	0.000	Significant (Accepted)
Indirect	H_6	DOC -> DI -> OP	0.067	2.305	0.022	Significant (Accepted)
	H_7	DC -> DI -> OP	0.270	3.532	0.000	Significant (Accepted)

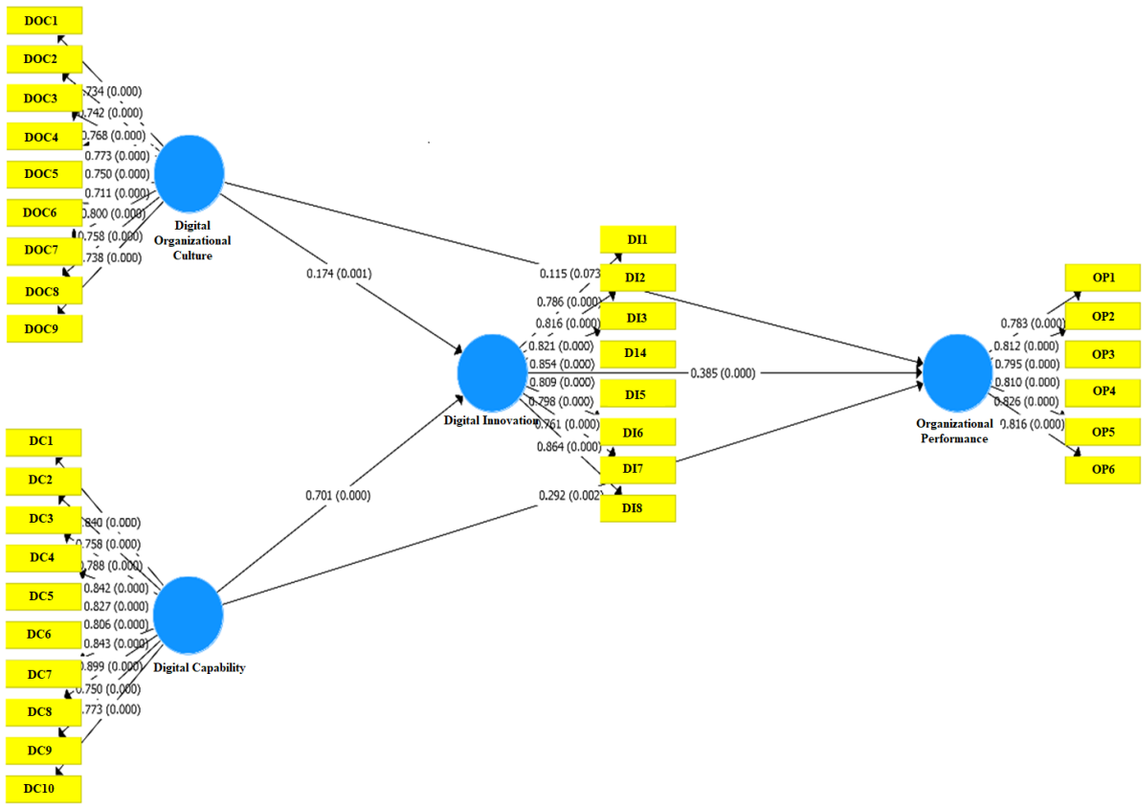

FIGURE 2. Coefficient path analysis of hypothesis testing results

have a major effect on OP. When DC and DI interact, OP is significantly affected, indicating partial mediation between the function of DI on DC. In addition, the effectiveness of organizations is greatly influenced by their digital capabilities.

DISCUSSION

The rapid development of digital technology is bringing about major changes in the way organizations work, interact with their environment, and how people and organizations adapt and grow in this new era. The COVID-19 pandemic has dramatically increased the adaptability of digital technologies in healthcare. The use of digital technologies in the pharmaceutical industry, known as Pharma 4.0, aims to gain a competitive advantage by simplifying and increasing efficiency in each of the pharmaceutical value chains (Arden et al. 2021; Kim et al. 2022). However, research on how to use this new technology to determine performance-enhancing benefits remains limited.

This study responds to the need to better understand the implications of developing digital initiatives for performance, particularly during the COVID-19 pandemic. In the pharmaceutical industry, organizational culture is considered a factor influencing the successful implementation of digital Pharma 4.0 technologies (Reinhardt et al. 2020). A DOC implementation that supports digital organizational transformation to achieve the company's digital goals has been implemented in pharmaceutical SOEs. DOC is an overall organizational structure, shared values, and assumptions for using digital resources to create value. This more specific concept focuses on the assumptions and understandings of organizational functioning in the digital environment that are perceived by organizational members. However, H_1 shows that DOC does not have a significant effect on OP. The results of the analysis are inconsistent with previous studies showing a significant effect of DOC (Hadi & Baskaran 2021; Upadhyay & Kumar 2020). This finding is the uniqueness of this study. This is because, during the COVID-19 condition, there was an acceleration of digitalization throughout the company's business chain. However, organizational agility in digital transformation is still an emerging challenge. Managers need to be more adaptive and agile in running their business as part of the important basic assumptions that must be owned by company leaders.

On the other hand, these results support previous studies showing that organizational culture has no effect on performance (e.g., Muniroh et al. 2021; Zhao et al. 2018) and can be extrapolated to a digital context. Based on the results of the correlation analysis between the two variables, it can be interpreted that the implementation of DOC did not have a direct effect on increasing OP. A

suitable mediator is needed to manage the relationship between DOC and OP with less significant findings.

The second hypothesis demonstrated a connection between DC and OP. The outcomes showed that DC and OP have a positive relationship. Also, it showed that OP was highly dependent on DC in pharmaceutical sectors during COVID-19. In particular, digital ecosystem capabilities, namely companies are able to encapsulate information through multi-channel ecosystem connectivity and communicate effectively with stakeholders as well as how resources can be configured to take advantage of digital opportunities.

Furthermore, H_3 showed that DOC is significantly related to innovation. These results indicated that DOC positively contributes to DI by involving cross-functional teams and developing technological platforms with strategic partners. Therefore, H_3 is consistent with the study of Muller et al. (2019) and Zhen et al. (2021).

H_4 showed a positive correlation between DC and innovation. Nasiri et al. (2019) and Zhen et al. (2021) suggested a substantial connection between DC and DI. Hund et al. (2021) indicated that DI requires DC that aligns with the new logic.

Moreover, H_5 showed that DI and OP are positively correlated. This statement is consistent with the claim of Hanelt et al. (2021) that DI in the digital world enhances operating and capital market performance. According to Clark et al. (2021), healthcare professionals tend to develop new and innovative business models to create value in the face of long-term challenges, including pandemics.

This research establishes a link between OP and digital culture has a mediating effect played by innovation. DOC enhances OP with DI, so H_6 is accepted. H_7 demonstrated how DI could help organizations perform better using their digital capabilities.

THEORETICAL IMPLICATION

This study provides theoretical implications to enrich and complete the repertoire of knowledge concerning digital culture and the capability to determine OP which is a derivative of the Theory of Resource Based View / RBV. Several studies explained the mechanism of how DOC and DC improve OP. The results showed a significant and insignificant effect. Based on the results of this study, it is known that OP does not directly affect the effect of DOC, but DI is an indirect mediating variable. Digital capabilities have a direct effect on OP, as well as indirectly through DI affect OP. The results of this study have implications for the development of an OP theory based on the Resource Base View (RBV) theory, where different research objects and different conditions (COVID-19 pandemic) can provide different findings.

Secondly, DI development is achieved through digital culture and capability, showing that DOC and DC significantly affect DI. These outcomes align with the DI concept of Hund et al. (2021) that DC development is necessary for DI. A high degree of openness is another attribute of an organizational form that enables practical cooperation and coordination across technological platforms, ecosystems, or DI networks. Digital identity and culture are seen as shared standards, ideals, and principles that DI to succeed.

The third implication is that DI can mediate DOC and DC within the OP. These findings empirically support Wiesbock and Hess (2019) about the role of DI in the digital era by embedding digital solutions and digital business concepts in organizations and making significant changes to the products, services, business processes, or business models of the organization can realize and create value as well as support performance. The findings of this study provide implications for theoretical developments regarding the role of DI in mediating DOC and DC variables in OP.

PRACTICAL IMPLICATION

During the COVID-19 period, the pharmaceutical industry became an important sector for strengthening health resilience and national economic recovery. In this case, Pharmaceutical SOEs play an important role by continuing to operate not only by producing essential medicines but also how to reach patients amidst the limitations that exist with other healthcare ecosystems. Therefore, this study provides implications for leaders to improve OP through digital culture, capability, and innovation.

The results showed that DOC is not enough to develop OP. Also, it indicated that DI becomes important for implementing activities related to performance achievement (Chege et al. 2019; Hanelt et al. 2021). Currently, innovation in business models, processes, and products is a significant contributor to OP's growth. The result relates to how companies use DOC and DC in the ecosystem (Duman & Akdemir 2021; Martinez-Caro et al. 2020).

Improving performance during the COVID-19 period is therefore only possible if an organization innovates business models, processes, and products using digital technology, which is supported by the application of DOC and DC.

CONCLUSION

This study intends to investigate the impact of DOC, DC, and DI on OP. The study's findings indicate that DOC has no direct effect on OP. Instead, DI serves as an intermediary between DOC and OP. Moreover, DC influences OP both directly and indirectly via DI. Overall, these results indicate that the implementation of DOC, DC, and DI can improve OP during the era of COVID-19.

Theoretically, this study supports Barney's (1991) resource-based view, which states that firms can gain

a competitive advantage and superior performance by utilizing scarce and difficult-to-imitate company-specific resources and skills. The results indicate that having the appropriate DOC and enhancing DC can increase DI and, ultimately, help an organization's performance.

From a practical standpoint, these results provide pharmaceutical companies with a reason to innovate, especially in their digital business models through digital marketing and pharmaceutical omnichannel, in order to improve their financial and non-financial organizational performance.

It is recommended that managers involved in achieving performance consider bolstering the implementation of DOC, particularly regarding organizational agility in digital transformation. This study contributes to organizational culture practices by demonstrating the significance of DOC in providing benefits that enhance OP.

In the context of pharmaceutical SOEs in Indonesia, where company performance was under pressure during the COVID-19 pandemic, these findings demonstrate that organizational performance is closely linked to a DOC that promotes the emergence of DI. The research findings demonstrate how DOC and DC can be utilized to enhance an organization's performance.

Further studies need to consider the following limitations. First, this literature is only conducted on one of the state-owned pharmaceutical companies. For instance, healthcare sectors such as technology or food need to be involved for better understanding. Second, the analysis only comprised the respondents in general manager/manager positions. Further studies need to consider responses from other employees to have a broader vision. Third, DOC and DC are considered antecedent variables. Other variables need to be included because they tend to affect OP using technology. For instance, digital leadership or readiness could be an antecedent variable influencing OP.

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APPENDIX A

Construct (Indicator)	Source
Digital Organizational Culture (DOC) During the COVID-19 pandemic:	Duer et al. 2018; Martinez-Caro et al. 2020; Grover et al. 2022
DOC1. In my company, leaders determine the right digitalization strategy for the company's business ecosystem	
DOC2. My company engages cross-functional teams in digital transformation initiatives	
DOC3. My company is collaborating to develop digital platforms with strategic partners	
DOC4. My company supports new ideas to solve customer problems	
DOC5. My company supports a culture of taking risks	
DOC6. My company makes quicker decisions	
DOC7. My company has agility in its digital transformation	
DOC8. In my company, managers have adequate digital skills	
DOC9. My company has customers in an increasingly demanding digital age	
Digital Capability (DC) During the COVID-19 pandemic:	Freitas Junior et al. 2016; Khin and Ho 2018; Duman and Akdemir 2021
DC1. My company has digital technology that supports the entire business chain	
DC2. My company master's digital technologies relevant to the healthcare industry	
DC3. My company responds to digital transformation	
DC4. My company develops DI	
DC5. My company develops an integrated IT system	
DC6. My company can build effective communication with stakeholders	
DC7. My company encapsulated information through multi-channel ecosystem connectivity	
DC8. My company identified a new digital opportunity	
DC9. My company manages connected data in real-time	
DC10. My company manages the exponential growth of big data	
Digital Innovation (DI) During the COVID-19 pandemic:	Lyytinen et al. 2016; Wiesbock and Hess 2019; Duman and Akdemir 2021
DI1. My company develops innovative digital service products based on customer data	
DI2. My company uses innovative digital technology to produce new products	
DI3. My company uses digital technology in its customer relationship management practices	
DI4. My company increases automation in the production process	
DI5. My company uses the Internet of Things (IoT) in logistics activities	
DI6. My company uses innovative digital technology to improve service quality	
DI7. My company is expanding its business model portfolio through the pharmaceutical omnichannel	
DI8. My company is developing a new revenue model through pharmaceutical digital marketing	
Organizational Performance (OP) During the COVID-19 pandemic:	Hung et al. 2010; Duman and Akdemir 2021
OP1. In my company, sales growth has increased significantly	
OP2. In my company, profits have developed significantly	
OP3. In my company, costs have decreased significantly	
OP4. In my company, competitive advantage performance is relatively better than competitors	
OP5. In my company, the company's market share is relatively better compared to competitors	
OP6. In my company, productivity is relatively better compared to competitors	