

FACTORS THAT AFFECT THE SUCCESS RATE OF DIGITAL TRANSFORMATION CONCERNING THE COMPANY'S PERCEIVED PERFORMANCE ON INDONESIAN CONSTRUCTION STATE COMPANY

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ABSTRACT

Implementation of Digital Transformation lately has become a necessity. However, PT Nindya Karya (one of the Indonesian construction state companies) faced many challenges during its digital transformation process. Its Challenges are not only in terms of technological readiness but also the readiness of its employee and commitment from top-level management. This paper aims to determine what factor significantly affects the digital transformation success rate of PT Nindya Karya. The survey has been distributed using a 5-point Likert scale. The questionnaire received 256 responses from PT Nindya Karya employees. The data were analyzed using Smart-PLS version 3.3.9 and applying PLS-SEM analysis, including inner and outer model testing. The structural model achieved a good fit (SRMR = 0.055, NFI = 0.802). The research findings show that top management commitment, IT capability, work culture change, and human capital capacity significantly affect digital transformation. In addition, the research findings also show that the influence of top management commitment to digital transformation mediated by IT capability, the digital transformation itself, has a significant effect on the company's perceived performance. By knowing the factors that affect digital transformation, company stakeholders can improve the strategies related to digital transformation in their company.

Keywords: *Digital transformation, Top Management Commitment, IT Capability, Work Culture Change, Company Perceived Performance*

1. INTRODUCTION

Digital transformation is the realignment of new investments, technology, business models, and processes to drive new value for customers and employees [1]. However, the construction industry, one of the highest contributors to any country's development index [2], productivity, in general, is largely left behind compared to other industries, such as manufacturing, automotive, and aviation, due to the slow digital Informatics [3]. On the year of 2022, research conducted by Teng found that the critical elements of digital transformation must be related to people (human capital), technology, and strategies (to reach the success of digital transformation) [4].

Digital transformation can only be successful if there is a well-founded strategy and leadership [5]. Transformational changes are required to implement digital transformation related to strategy, leadership and organizational culture [6]. Business practice research has shown that successful digital-based businesses have a clear strategy [7], commitment to senior management with change, motivated employee involvement in the process and focus on changes to customer needs and interests [8]. Gupta, in his research [9], Found several barriers related to digital transformation in companies; those need to be clarified company vision and goal of the transformation. Top Management, Leaders and their Leadership style, project group, organizational set-up and agility, Change and Middle managers needing more expertise, lack of rewards and incentives, fuzzy measurement systems, lack of human resources involvement and a strong Learning culture missing

[9]. PT Nindya Karya started the forerunner of digitizing the construction business process by building a production control information system. The rapid development of technology certainly encourages companies to adapt [10], as one of the adaptations Nindya Karya encourages is digitalization programs.

The challenges in the digital transformation process faced by PT Nindya Karya are not only in terms of technological readiness and capabilities but also the readiness of its employees (employee digital mindset and work culture change) and commitment from top-level management. Most of that relationship with previous work found that human capital is a massive challenge for digital transformation [11]. Furthermore, setting company strategy and prioritization also be a big challenge for company transformation [12]. If the company cannot change this challenge into an opportunity, it will be in danger in the digital transformation process [13]. The next challenge is how digital transformation can encourage a company's perceived performance. According to Constitution Number 18 (1999) concerning Construction Business, it is stated that construction work is the whole or part of a series of planning and implementation activities [14] as well as supervision which includes architectural, civil, mechanical, electrical and environmental works, respectively. Their accessories to realize a building or other physical form [15]. Meanwhile, based on KEP-100/MBU/2002, PT Nindya Karya is included in the category of BUMN in the construction sector (Non-Infrastructure), with measurement parameters for financial aspects including ROE, ROI, cash ratio, current ratio, collection period, inventory turnover, total asset turnover. , the ratio of own capital to assets, while the operational aspect measurement parameters are left to each company, the indicators assessed include the activities considered the most dominant to support the success of operations following the company's vision and mission.

One of the conditions Nindya Karya faces is the unequal digital mindset of employees. It can be seen in the implementation of digital transformation, which is still considered additional work by some employees (for example, using dashboard management by utilizing data analytics. It must be followed by periodic data validation that has been inputted into the application, still considered additional work by some employees).

Accordance with the background of this study, problem that can be identified are :

1. What factors that positively affect the digital transformation success implementation?
2. Is there any positive relation between digital transformation and company's operational perceived performance?
3. Is there any positive relation between digital transformation and company's financial perceived performance?

Therefore, this research seeks to address the following question: what factors significantly affect the success rate of digital transformation at PT Nindya Karya and how it relates with company performance?

The Objective of this study can be described as follow:

1. To find out what factor that positively affect the digital transformation success implementation
2. To find out whether digital transformation has positive relation with company's operational perceived performance
3. To find out whether digital transformation has positive relation with company's financial perceived performance

The previous study on Indonesian Small and Medium Enterprises found that technological excellence, IT capability, IT alignment with business, and CEO digital leadership significantly influence digital transformation [16] but does not evaluate the impact of digital transformation on a company's perceived performance. Nwankpa & Roumani have proven that IT capability significantly affects digital transformation, but their study does not elaborate on other variables [17]. Another study on China's Small and Medium Enterprises found that digital transformation positively correlates with company performance [4]. Another study conducted in Vietnam found that human capital significantly affects digital transformation and firm performance. However, there are no previous studies proven on Indonesian state-owned construction companies.

The world of construction in Indonesia is always interesting to follow because of the developments in construction technology in Indonesia which are increasingly advanced and developing rapidly,

especially in the field of digital construction. The construction digitalization era itself is an era in which all construction work will be digitized to facilitate coordination of work. Therefore, this research focuses on evaluating the factors that influence the successful implementation of digital transformation and its relation to the company-perceived performance by combining variables from previous research. In addition, the author also interviewed one of the management levels about his perception of digital transformation challenges in PT Nindya Karya. Other theories taken from the previous study will be included in section 2.

2. LITERATURE REVIEW

2.1 Related Work

A previous study by [16] examines several factors related to digital transformation and business innovation. The research focuses on the correlation of technological excellence, IT capability, IT alignment with business, and CEO digital leadership to digital transformation and business innovation. Another study investigates the correlation between IT capability and digital transformation in the context of a company's perceived performance. The study proposes that IT capability indirectly affects a firm's perceived performance and that digital transformation mediates this relationship [17].

In previous research, Teng has tried to evaluate the relationship between digital transformation and company-perceived performance. Based on those studies, it can be found that digital transformation has a positive relationship with company-perceived performance. They also state specific critical parameters related to perceived financial performance, including sales, return on sales, gross profit, equity, and investment return [4]. In order to learn the relationship between digital transformation and operational perceived performance [18], run statistical tests such T-test (t value = 15.692) and R square ($R^2 = 0.573$), so they found that digital transformation has a positive relation with operational perceived performance.

The previous study by [19] examined the relationship between digital orientation and digital capability with digital transformation and the mediating effect of digital transformation from digital orientation on company revenue. Based on their study, the researcher can find that companies that can improve their digital orientation will

successfully perform digital transformation and fulfill their ultimate revenue goal [19]. Another previous research also can found that human capital significantly affects digital transformation [20]

Most of the previous studies that the author tried to explain above raised case studies on small medium enterprises (SMEs) and were not carried out in Indonesia, no one has tried to review what factors influence the success of digital transformation in the construction industry, especially the existing construction industry. in Indonesia and associated with company performance. Therefore, the author feels the need to do deeper research regarding what factors can influence the successful implementation of digital transformation and how it relates to company performance.

2.2 Hypothesis Development

a. Top Management Commitment and Digital Transformation

Digital transformation has never transformed an organization on its own. What helps an organization to achieve such a transformation or change is its leader's vision and decision-making that links digitalization to an emerging organizational need [5]. MIT Sloan Management Review and Deloitte conducted their fourth annual survey. The survey was held on 4800 business executives, managers and analysts of organizations worldwide to know what opportunities and challenges are associated with using social and digital business [21].

The findings of this survey report that primarily, the leader fosters a culture of change and leads the organization to reimagine its business [21] digitally. The report further highlights that in a digitally mature and successful organization, employees are highly assured about their leader's digital Quotient [22]. A high Digital quotient of a leader not only demands mastery of technology and inculcates the benefits of digital technologies for the organization's future.

Commitment is a fundamental foundation in implementing any changes [16]. In the previous case, the company's top management's commitment to digital transformation can be stated as a leader with a good vision and strong understanding of digital transformation, which will determine the success of digital transformation implementation [5]. The commitment of the CEO Leaders in the organization can be measured by their clear vision, ability to manage technology utilization, and their commitment to IT investment [16]. Their previous study state that strong IT capability in term of the use of technology in determining digital transformation must be distinct from IT investment [4]. So, in this study, the researcher proposes the hypothesis below.

H1: Top Management Commitment significantly influences Digital Transformation

H2: IT Capability plays mediating role between Top Management Commitment and Digital Transformation

b. IT Capability and Digital Transformation

IT Capabilities can be described as an ability to assemble and deploy IT-based resources in combination with other companies' resources [23]. IT Capability refers to technological capabilities and all aspects or components within the company [17]. The company has to build a robust IT infrastructure consistent with IT based-resources, knowledge and skill [17]. In addition, [4] describe that IT capability, in cooperation with strategic vision, culture of innovation, strategic alignment and technology asset determine the success of the digital transformation. So, in this study, the researcher proposes the hypothesis below.

H3: IT Capability significantly Influences Digital Transformation

c. Digital Mindset and Digital Transformation

Digital transformation is about technology and people, and processes [21]. Based on the previous study conducted by [24], the organization must develop its employee mindset to succeed in digital transformation. A digital mindset relates to an interest in new technologies, working models or challenging processes that determine the digital transformation [24]. Digital skills must be motivated by a mindset to work together and a mighty assumption that determines digital transformation [24]. Digital skills, according to [19], can be described as competencies and knowledge, which are essential resources that could facilitate successful digital transformation. So, in this study, the researcher proposes the hypothesis below:

H4: Employee Digital Mindset Significantly Influences Digital Transformation

H5: Employee Digital Skills play mediating role between Employee Digital Mindset and Digital Transformation

H6: Employee Digital Skills significantly influence Digital Transformation

d. Work Culture Change and Digital Transformation

The implementation of digital transformation must be kept from changing the team member work culture [25]. According to [26], the employee culture of work must be changed in order to create a successful digital transformation. They also state that organizations with speedy adaptation and development can have a successful digital transformation [26]. The recommended indicator that

determines digital transformation related to employee digital culture based on [26] is application available, easy to access, flexible, and fast at work. So, in this study, the researcher proposes the hypothesis below:

H7: Work Culture Changing significantly influence Digital Transformation

e. Human Capital Capacity and Digital Transformation

Human capital capacity is the ability of a person or individual, an organization (institutional), or a system to carry out its functions or authority to achieve its goals effectively and efficiently [27]. Of course, human capital with qualified digital capacity is needed for digital transformation. In his research, [20] describes the positive relationship between human capital and digital transformation. Based on research conducted by [20], one of a parameter related to human capital that significantly influences digital transformation is human capital capacity. One of Nindya Karya's top management stated that this parameter when researchers conducted preliminary interviews was human capital capacities. So, in this study, the researcher proposes the hypothesis below :

H8: Human Capital Capacity Significantly Influences Digital Transformation

f. Digital Transformation and Company Perceived Performance

Improving the company's perceived performance usually becomes a common goal in digital transformation. According to [18], digital transformation has a positive effect in improving the operational perceived performance of the organization. In addition, [18] states that digital transformation will support the company in growth. The positive impact of digital transformation

related to perceived financial performance based on [4] is the optimization of stock through digital supply chain management, cost reduction by optimum procurement, and also realizing value benefit through quality improvement. So, in this study, the researcher proposes the hypothesis below:

H9: Digital transformation has a positive relation with Company Operational Perceived Performance

H10: Digital transformation has a positive relation with Company Financial Perceived Performance

Structural model hypothetical variables (**Figure 1**) were obtained from previous relevant studies and will be tested based on the questionnaire data.

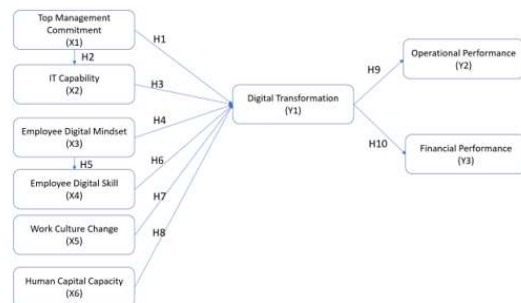


Figure 1: Research Model

3. RESEARCH METHODOLOGY

This research is a causal study with a quantitative approach. Collecting data in this study using Google Form media by distributing questionnaires online. This work takes the form of a case study from PT Nindya Karya (one of the Indonesian construction state companies). Questionnaires were distributed to all Nindya Karya employees (both employees with permanent and non-permanent status). From the results of distributing the questionnaires, it was obtained 256 respondents who participated in filling out the questionnaire.

The population of this research is the employees of PT Nindya Karya (both permanent and non-permanent status), totalling 681 people as of July 2022 (Primary Data Nindya Karya, 2022). The

sample is part of the respondents taken from the population. This research uses a probability sampling technique, namely proportionate stratified random sampling using the slovin formula. The study was conducted in a survey, with data being gathered via the online survey system Google Forms and distributed to PT Nindya Karya'e employees.

In this study, respondents were asked to rate their degree of agreement with the preceding assertions (items) from strongly disagree to agree (Likert's scale of 5 points) strongly. The variables are obtained based on previous research on digital transformation conducted by [17] [4][18][20][16][19], which shows how IT capability, human capital, CEO digital leadership, digital skill and digital strategy influence digital transformation.

According to (Hair Jr et al., 2014), exogenous is a latent with no relationship path pointing at the construct, where endogenous is latent construct that act as a target for other construct or being described by other construct by using structural model relationship. Here is the structural model in this research:

$$Y1 = \beta_{10} + \beta_{11}X1 + \beta_{12}X2 + \beta_{13}X3 + \beta_{14}X4 + \beta_{15}X5 + \beta_{16}X6 + \epsilon_1 \dots \dots \dots (1)$$

$$Y2 = \beta_{20} + \beta_{21}Y1 + \epsilon_2 \dots \dots \dots (2)$$

$$Y3 = \beta_{30} + \beta_{31}Y1 + \epsilon_3 \dots \dots \dots (3)$$

$$X2 = \beta_{40} + \beta_{41}X1 + \epsilon_4 \dots \dots \dots (4)$$

$$X4 = \beta_{50} + \beta_{51}X3 + \epsilon_5 \dots \dots \dots (5)$$

Description as below:

X ₁	Top Management Commitment
X ₂	IT Capability
X ₃	Employee Digital Mindset
X ₄	Employee Digital Skill
X ₅	Work Culture Change
X ₆	Human Capital Capacity
Y ₁	Digital Transformation
Y ₂	Operational Performance
Y ₃	Financial Performance

$\beta_{10}, \beta_{20}, \beta_{30}, \beta_{40}, \beta_{50}$	Intercept
ϵ	Error Factor

After receiving a total of 256 responses, the next step was to test the model using Structural Equation Modelling. It can estimate and test the causal relationship with statistical data and qualitative assumptions. Moreover, the analysis uses the Partial Least Square (PLS) method to test the relationship between variables [28].

Most respondents are male (73.3%), and the work area location is Head Office Working Unit (49%). In addition, the roles of the respondent are pretty varied; most of them are Staff (69.8%), followed by BOD-2 (2 levels under CEO) (26.7%) and BOD-1 (1 level under CEO) (3.5%). The age range of the respondents is 25-25 years old (49.8%), 36-42 years old (18%), 43-50 years old (11.4%), above 50 years old (10.6%), and under 25 years old (10.2%).

Based on the results of the first loading factor test, it was found that there were two variable items (ITC1 and ITC2) that had a loading factor value below 0.7, so they had to be removed from the item list first. This was because, according to [29], the minimum loading factor value accepted is 0.7. After iteration, the results of the loading factor test were obtained, with all variable items having a value of > 0.7. In order to measure validity and reliability, besides the loading factor. The author also measures Cronbach's Alpha with an overall result > 0.6 and the AVE test with an overall result > 0.5 (Table 1)

Table 1: Validity and Reliability Final Test Result

Variable	Item Code	Outer Loading	Cronbach's Alpha	Average Variance Extracted (AVE)
Top Management Commitment (TMC)	TMC1	0.870	0.895	0.761
	TMC2	0.885		
	TMC3	0.858		
	TMC4	0.875		
IT Capability (ITC)	ITC3	0.776	0.938	0.641
	ITC4	0.767		
	ITC5	0.830		

Variable	Item Code	Outer Loading	Cronbach's Alpha	Average Variance Extracted (AVE)
	ITC6	0.762		
	ITC7	0.776		
	ITC8	0.848		
	ITC9	0.830		
	ITC10	0.814		
	ITC11	0.776		
Employee Digital Mindset (EDM)	EDM1	0.876	0.906	0.728
	EDM2	0.873		
	EDM3	0.807		
	EDM4	0.878		
	EDM5	0.830		
Employee Digital Skill (EDS)	EDS1	0.755	0.861	0.642
	EDS2	0.787		
	EDS3	0.789		
	EDS4	0.837		
	EDS5	0.836		
Work Culture Change (WCC)	WCC1	0.802	0.881	0.739
	WCC2	0.841		
	WCC3	0.885		
	WCC4	0.906		
Human Capital Capacity (HCC)	HCC1	0.827	0.912	0.793
	HCC2	0.898		
	HCC3	0.920		
	HCC4	0.914		
Digital Transformation (DT)	DT1	0.856	0.885	0.743
	DT2	0.856		
	DT3	0.883		
	DT4	0.853		
Operational Perceived Performance (OPP)	OPP1	0.903	0.920	0.807
	OPP2	0.904		
	OPP3	0.884		
	OPP4	0.902		
Financial Perceived Performance (FPP)	FPP1	0.917	0.942	0.851
	FPP2	0.932		
	FPP3	0.926		
	FPP4	0.913		

Source: Authors' analysis

4. RESULT AND DISCUSSION

In assessing the structural model, the P-value and Path Coefficient are used to conclude the causal relationship of the model. As shown in **Figure 2**, the digital transformation variable has an R^2 value of 0.734, with the structural model achieving a good fit (SRMR = 0.055, NFI = 0.802) [29].

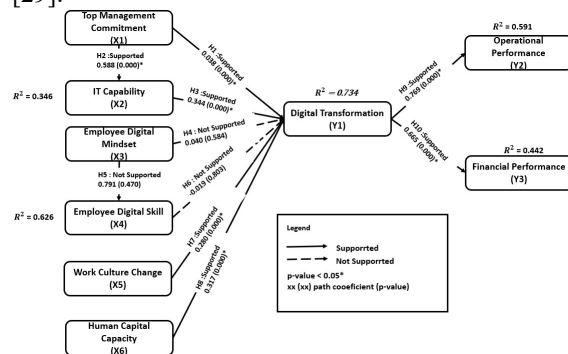


Figure 2: Measurement Model

Furthermore, to assess whether the hypothesis is accepted or not, it can be seen from the value of T-Statistics and p-value. A hypothesis can be accepted if the p-value < 0.05 and the T-Statistics > 1.96 [29]. This study uses hypothesis model testing using the Bootstrapping algorithm.

The model shows that top management commitment ($p < 0.05$ and path coefficient = 0.038), IT capability ($p < 0.05$ and path coefficient = 0.344), work culture change ($p < 0.05$ and path coefficient = 0.280), and human capital capacity ($p < 0.05$ and path coefficient = 0.317) significantly affect digital transformation. Also, from the model, the author found that IT capability is proven to mediate the influence of top management on digital transformation ($p < 0.05$ and path coefficient = 0.588). Not only proven as mediating variable, but IT capability has also proven as the most significant variable that affects digital transformation (Tstat = 9.796). Mediating variable theoretically affects the relationship between the independent and dependent variables into an indirect relationship and cannot be observed and measured [30] [31]. Thus, Hypothesis **H1**, **H2**, **H3**, **H7**, and **H8** are **accepted**. Also, from this study, commitment from top management to manage IT utilization by setting sufficient investment in I & T has proven to support the successful implementation of digital transformation. Furthermore, improving employees' awareness of

digital transformation and creating digital work culture are also found to support digital transformation.

The results of this study show the relationship between the variables and digital transformation and whether there is a positive relationship between digital transformation and company-perceived performance. Based on the results of hypothesis testing, the author finds that digital transformation has a significant effect on operational perceived performance ($p < 0.05$ and path coefficient = 0.769) and perceived financial performance ($p < 0.05$ and path coefficient = 0.665), thus Hypothesis **H9** and **H10** are **accepted**. From this study, the respondent agreed that digital transformation could improve the perceived quality of products and services, production process, and new customer attraction and significantly affect the perception of financial performance, such as liquidity, profitability and solvability.

However, for employee digital mindset ($p > 0.05$ and path coefficient = 0.040) and employee digital skill ($p > 0.05$ and path coefficient = -0.019), the model shows that both variables do not have a significant effect on digital transformation. This result also **rejects** the hypothesis of employee digital skill as a mediating variable between employee digital mindset and digital transformation ($p > 0.05$ and path coefficient = 0.791). Thus, hypothesis **H4**, **H5**, and **H6** are **rejected**. It has been unable to demonstrate that digital mindset and skill significantly impact digital transformation [4][24]. Digital transformation proved to have a powerful influence on operational perceived performance with Tstat result = 23.878. All results of the hypothesis test can be seen in **Table 2**.

Table 2: Hypothesis Test Result

Hypothesis		Path Coefficient	Standard Deviation (STDEV)	P Values	Result
H1	TMC -> DT	0.038	0.053	0.000	Significant
H2	TMC -> ITC	0.588	0.060	0.000	Significant
H3	ITC -> DT	0.344	0.068	0.000	Significant
H4	EDM -> DT	0.040	0.073	0.584	Insignificant
H5	EDM -> EDS	0.791	0.033	0.470	Insignificant
H6	EDS -> DT	-0.019	0.077	0.803	Insignificant
H7	WCC -> DT	0.280	0.066	0.000	Significant
H8	HCC -> DT	0.317	0.073	0.000	Significant
H9	DT -> OPP	0.769	0.032	0.000	Significant
H10	DT -> FPP	0.665	0.044	0.000	Significant

Source: Authors' analysis

4.1 Managerial Implication

The results of this study indicate that digital transformation is influenced by top management commitment. Top management commitment includes a clear vision, IT utilization management, empowering human resources on IT utilization, and the commitment to investing in IT use [16]. At the management level, either in the construction sector or other industries can be an opportunity to invest in IT and OT, especially those directly impacting the company's business operations.

Improving IT capabilities through application portfolio condition, IT facilities condition, IT strategic planning, maximizing the value of IT investment, and adopting new technology related based on study results can support the successful implementation of digital transformation. This is in line with previous research conducted by [16][17].

Work culture change through the use of the digital application in daily work, facilitation access for digital-based work, and digital flexibility [26] can be elaborated by the management level through an approach to millennials. This study proved that the

work culture change study significantly influences digital transformation and is supported by the age distribution of respondents aged 25-35. Furthermore, the management level must also build qualified human capital capacity through awareness of digital transformation, developing digital talent, and improving creative talent [20] to boost digital transformation's success rate. Considering the study's results, human capital capacity proved to be a variable that can support the implementation of digital transformation.

Perceptions of employees regarding operational and financial performance influenced by digital transformation are an opportunity for Top level management to increase employee involvement in the success of the company's digital transformation. Employee involvement, in this case, can be carried out through awareness regarding the calculation of tangible and intangible values obtained by the company through digitization which is closely related to the company's perceived performance. Operational performance indicators can be the perceived quality of products or services, perceived operational productivity, perceived attraction of new products, and perceived customization of products [18]. In contrast, indicators of perceived financial performance can be perceived profitability, solvability, perceived liquidity, and perceived public company financial health [4]. Finally, this study assists the general reader in gaining information and understanding about the determinants of a company's digital transformation success.

4.2 Theoretical Implication

Based on the hypothesis test, the result found that digital skills had no significant effect on digital transformation in Indonesian construction state companies. This differs from the evaluation result conducted in China Small Medium Enterprise, which proved that digital skills significantly affected digital transformation [4]. This study also found that a digital mindset had no significant effect on digital transformation in Indonesian construction state companies. This differs from the previous theory, which states that organizations must develop their employee mindset to succeed in digital transformation [24]. Furthermore, the author also found that digital skills could not be a mediating variable between employee digital mindset and digital transformation in the Indonesian construction

company state. This is different from the previous theory, which states that Digital skills must be motivated by a mindset to work together and robust assumptions that determine digital transformation [24]. Based on the result comparison between this study and the previous study, a variable that influences digital transformation in one industrial sector does not affect another.

5. LIMITATIONS AND FURTHER RESEARCH

The author realizes that there are some limitations to this study. First, the author recognizes that this study has limited respondents, only employees of one Indonesian construction state company. There may be different conditions if more than one Indonesian construction state company involves several state companies with different industries. However, this is quite interesting to be developed into further research to examine whether there are any fundamental differences regarding the factors that influence digital transformation for state companies with different industries. Lastly, this study was conducted in one country (Indonesia), limiting the characteristics and influences of the implementation of digital transformation.

6. CONCLUSION

This research intends to highlight factors that affect the implementation of digital transformation in one state company by applying PLS-SEM analysis using Smart-PLS on 256 respondents, including inner and outer model testing.

The study results concluded that digital transformation is influenced by top management commitment, IT capability, work culture change, and human capital capacity, with IT capability that has the most significant influence. It means that the company must pay more attention to maximizing the capabilities of IT in order to support digital transformation. Moreover, the model result also shows that digital transformation has a significant effect on operational perceived performance and financial perceived performance.

However, digital mindset and digital skills were insignificant for digital transformation. It indicates that to support digital transformation; employees can perform a qualified digital mindset and digital skills as long as top management is

highly committed to improving IT capabilities, building changes in work culture, and supporting human capital capacity building. Finally, this paper offers information on the factors that affect digital transformation concerning the company's (operational and financial) perceived performance.

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Appendix:

Table 3: List of Variable Items

Variable	Indicator	Statement	Reference
Top Management Commitment (TMC)	Clear Vision form Top Management (TMC1)	Top management has set a clear vision regarding the use of IT in supporting business operations	[16]
	Manage IT Utilization (TMC2)	Top management commits to managing IT utilization well	[16]
	Empowering Right Human Resources for IT Utilization (TMC3)	Top management has formulated the concept of empowering the right human resources to improve IT utilization.	[16]
	Investment in IT Use (TMC4)	Top management has set sufficient investments to increase the effectiveness of IT use.	[16]
IT Capability (ITC)	Data Management (ITC1)	Company data management is excellent (database, data availability, data accessibility, data sharing, etc.)	[16][17]
	Communication Channel (ITC2)	Communication channels within the company run well (network services, connectivity, etc.)	[16][17]
	Application Portfolio Condition (ITC3)	Application portfolio & services in good condition (ERP & supporting apps, software engineering, etc.)	[16][17]
	IT Facilities Condition (ITC4)	IT facilities operation/services in good condition (CCTV, ICT, hardware related to engineering, etc.)	[16][17]
	Vision regarding IT Contribution (ITC5)	The company has been developing a clear vision of how IT contributes to business value.	[16][17]
	Alignment of Strategic Planning and IT Planning (ITC6)	The company has been Integrating strategic business planning and IT planning.	[16][17]
	Understanding the Value of IT Investment (ITC7)	The company has been enabling functional areas and general management's ability to understand the value of IT investment.	[16][17]
	Effective and Flexible IT Planning (ITC8)	The company has been establishing an effective and flexible IT planning process and developing robust IT planning.	[16][17]
	Keeping up with New Technology (ITC9)	The company constantly keeps current with new information technology	[16][17]
	New Technology Adoption (ITC10)	The company is always capable and continues experimenting with new information and technology.	[16][17]

Variable	Indicator	Statement	Reference
	Conducive Climate for Good Information and Technology (ITC11)	The company has a conducive climate that supports the trial of new information and technology.	[16][17]
	Effectiveness of IT use (ITC12)	The company always enhances the effectiveness of IT use	[16][17]
Employee Digital Mindset (EDM)	Continuous Learn (EDM1)	I am Willing to continuously learn with the new information technology	[24]
	Embracing diversity, sharing, and collaborating utilizing digital tools and new information technology (EDM2)	I embrace diversity, sharing and collaborating by utilizing digital tools and new information technology.	[24]
	Disruptive thinking, proactive and risk taker (EDM3)	I have disruptive thinking, proactive and risk taker	[24]
	Willingness to incorporate digital technology in daily work processes (EDM4)	I am willing to incorporate digital technology into daily work processes	[24]
	apply digital solutions to improve customer experience (EDM5)	The company usually applies digital solutions to improve customer experience.	[24]
Employee Digital Skill (EDS)	Continuous learning in digital technologies (EDS1)	I am always learning about digital technologies	[4]
	The balance between general digital skills and specialized digital roles is adequate. (EDS2)	I have both general digital skills, and a specialized digital role is adequate.	[4]
	Assemble teams with the right mix of skills in every digital project (EDS3)	I always assemble teams with the right skill mix in every digital project.	[4]
	Understand both business and digitalization (EDS4)	I Understand both business and digitalization	[4]

Variable	Indicator	Statement	Reference
	Opportunities to acquire digital skills for digital transformation (EDS5)	The organization gives opportunities to acquire digital skills for digital transformation.	[4]
Work Culture Changing (WCC)	Use of digital applications in daily work (WCC1)	I use digital applications in daily work	[26]
	The output of work easy to access from a digital application (WCC2)	The output of my work is easier to access from a digital application	[26]
	The digital application makes flexibility to work (WCC3)	The digital application makes flexibility to work	[26]
	The digital application makes the employee work faster (WCC4)	The digital application makes me work faster	[26]
Human Capital Capacities (HCC)	Improve awareness of the digital transformation (HCC1)	The organization always tries to improve awareness of digital transformation for employees.	[20]
	Develop Digital Capacity (HCC2)	The organization always develops employee capacity through digital training.	[20]
	Develop Digital Capability (HCC3)	Organizations always try to develop digital capabilities for employees	[20]
	Improve employee's creative and intellectual capacity (HCC4)	Organizations always try to improve employees' creative and intellectual capacity in digital technology.	[20]
Digital Transformation (DT)	Driving new business processes to build on technologies such as big data analytics, cloud computing, mobile technologies etc (DT1)	The organization is driving new business processes to build on technologies such as big data analytics, cloud computing, and mobile technologies.	[17]
	Integrating digital technologies to drive change (DT2)	Organizations use and integrate digital technologies to drive change	[18]

Variable	Indicator	Statement	Reference
	Continually develop and produce new products and services based on technology development. (DT3)	The organization continually develop and produce new product and services based on technology development.	[18]
	Organizations widely use technology to support decision making (DT4)	Organizations utilize digital technology to support decision making	[4]
Operational Perceived Performance (OPP)	Improve the quality of products and services (OPP1)	In My Perception, Digital Information Can Improve the quality of products and services.	[18]
	Improve production process (OPP2)	In My Perception, Digital Transformation Can Improve the production process.	[18]
	Attract more new customer (OPP3)	In My Perception, Digital Transformation can attract more new customer	[18]
	Easily modify products with specific requests or customer needs (OPP4)	In My Perception, Digital Transformation can easily modify products with a specific request or customer need.	[18]
Financial Perceived Performance (FPP)	Increase Company Liquidity (FPP1)	In My Perception, Digital Transformation can help a company increase Liquidity.	[4]
	Increase Company Profitability (FPP2)	In My Perception, Digital Transformation can help a company increase Profitability.	[4]
	Increase Company Solvability (FPP3)	In My Perception, Digital Transformation can help a company increase Solvability.	[4]
	improve the company's financial health condition in general (FPP4)	In My Perception, Digital Transformation can improve a company's financial health.	[4]