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The Effect of Digital Strategy on Digitalization of Higher EducationInstitutions in Indonesia With Digital Capabilities, Digital Culture and Collaboration As Mediator Variables

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ABSTRACT

This study aims to examine the mediating roles of digital capabilities, digital culture, and collaboration in the relationship between digital strategies and the digitalization of private universities in Indonesia. The research employs data analysis methods using Structural Equation Modelling (SEM) with WARP PLS 7.0 as the data processing application. A total of 149 respondents, consisting of the top leaders of private universities in Indonesia, were collected, but only 131 respondents met the criteria for testing. The results indicate that there is a full mediating role (fully mediated) of all three mediating variables, namely digital capabilities, digital culture, and collaboration. On the other hand, no direct relationship was found between digital strategies and digitalization. The findings provide recommendations for private universities in Indonesia to improve their organizational ability to manage digital technologies and ensure that the work environment supports digital transformation.

Keywords: Digitalization, Digital Capability, Digital Culture, Collaboration, Digital Strate

INTRODUCTION

The importance of digitalization in the context of organizational management, it cannot be denied that apart from profit- oriented business organizations - which much more is discussed and researched on the role of digitalization for their success and success - higher education institutions are also one of the many sectors that must adapt to digitalization and make digitalization as a strategic decision. This view has strengthened, especially when the world was hit by the Covid- 19 pandemic - a new virus called SARCov-2 which causes quite serious problems in the respiratory tract of sufferers, was first discovered in humans in China in 2019 which required all activities including distance learning. which is carried out using digital technology to minimize direct interaction between one individual and another which has the potential to accelerate the transmission of the virus (Skulmowski & Rey, 2020). In addition, Márquez-Ramos & Mourelle, 2018 has also predicted that higher education in the future will be inseparable from virtual technology in addition to conventional methods which are currently commonly practiced by many higher education institutions.

Furthermore, the fact that higher education institutions are not only identified with education, teaching and community service but also as centers of excellence, innovation, and not infrequently also as profit centers as referred to by Heaton et al., 2020 as campus entrepreneurship adds to the urgency of digitalization is an integral part of today's higher education institutions. In the concept of campus entrepreneurship or entrepreneurship, campuses of higher edu-

cation are managed like business organizations where they usually manage business units as well to get additional in- come to encourage operations and subsidize educational costs for students.

In addition, higher education institutions, especially private universities in Indonesia, must also always be able to compete in offering services that are much better than competitors, and in the end also direct the management of higher education to be almost similar -although not completely the same as the management of business organizations. This is of course different from state higher education institutions where of course there will be much more financial support from the government and a "country owned" image that already has added value to attract prospective students to join.

Organizational digitalization researchers, based on studies conducted, have identified that one of the important factors of digitalization is a digital strategy where companies that successfully digitalize both processes and products / services will usually have a clear digital strategy and also be coherent with the organizational structure (Gobble, 2018; Eller et al., 2020).Digital strategy is defined as a defined organizational strategy which aims to increase the use of digital resources to produce specific values to capture the needs and wants of consumers or users (Bharadwaj et al., 2013)

Organizations that already have such a clear and coherent digital strategy will form the same identity, goals and development direction for all divisions, units and even the smallest part of the organization, so that policies and decisions regarding digitalization will be more easily accommodated and implemented because of the support of all interconnected lines. Therefore, organizations that have successfully formulated and implemented digital strategies can successfully implement digitalization and are expected to provide good benefits when compared to organizations that do not have a digital strategy.

Digital strategy and digitalization conceptually have a direct relationship (Gobble, 2018) but in empirical test- ing there is an inconsistent result where the first empirical evidence shows that the relationship between the two is direct (Gupta et al., 2020) meaning that the better the digital strategy is formulated and defined, the higher the degree of organizational digitalization. Meanwhile, other empirical evidence shows

that the relationship between the two is indi- rect or in other words a mediating variable is needed to clarify this relationship (Proksch et al., 2021).

Organizations that have a digital strategy will make efforts to improve internal matters that are owned in order to encourage the achievement of organizational goals. In the context of digitalization, one of the most basic things that must be owned internally is the ability of organizations to use digital technology such as the ability to use digital social media platforms, big data analytics, Internet of Things (IoT), Artificial Intelligence and other digital channels that are most commonly used at the moment (Sari et al., 2024). With the ability to use and process information from digital technology, organizations will be able to get feedback from consumers or users about what and how they should be satisfied, which in the end the organization can answer them with the product innovations or digital services needed. Likewise with digital processes, with the ability to use good digital technology companies can analyze good and appro- priate ways to work with interested parties in relation to ensuring the organization runs effectively and efficiently.

Having a digital strategy certainly encourages organizations to share values that currently the orientation of organizational strategy is to digitize all things including organizational culture. Digital culture, at the individual and team level, will encourage all sections, even the smallest parts, not to be in touch with digital technology and imple- mented by understanding, using, updating knowledge and getting used to digital technology both in terms of communi- cation, interaction and service to parties.

At the organizational level, digital culture directs the organization to have a thicker digital atmosphere so that digital changes that occur in the external environment will be easier for the organization to internalize. This situation ultimately encourages the assumption that digital culture will be able to become a mediator in the relationship between digital strategy and digitalization, this is in line with research conducted by Proksch et al., 2021 which shows that digital culture has succeeded in becoming a mediator in the relationship between digital strategy and digitalization. However, (Proksch et al., 2021) suggest that testing be carried out on different objects and contexts because the results of their research can only be generalized to the context of small and medium enterprises in Germany.

Realizing that in all respects being an organization that goes alone or doing everything on its own is something tough, trying to work together or collaborate becomes mutually reinforcing of the collaborating parties. Likewise with digitalization, there is almost no organization that can convincingly do digitalization by itself. It is always needed by other parties and stakeholders who can support it in reaching a certain level of digitalization (Halpern, Budd, et al., 2021). Likewise, if we look back, organizations that have a digital strategy will try to find opportunities to achieve digitalization and if it is seen that internal resources are insufficient, either capacity or connection to the technology resources needed by the company, then the external choice, in this case collaboration, is something which cannot be avoided as long as it is still in the evaluation stage and of course with partners who have qualified capacity.

Collaboration is very important for higher education institutions because as a center for innovation originating from the results of research conducted – one of which is the initiation and implementation of digital products (Al- Khowarizmi et al., 2023) or services – a common problem faced is a lack of funding sources so that in this condition strong support from industry, government and it is also not uncommon for other institutions to realize the implementation of digital products or services as well as other research results which are something that is really needed (Moeliodihardjo

et al., 2012). Therefore, collaboration in the context of higher education institutions has the potential to become a medi- ator in the indirect relationship between digital strategy and digitalization.

the results of previous research were inconsistent where there were differences in results indicating that there was an indirect relationship between digital strategy and organizational digitalization (Proksch et al., 2021)which con- tradicted the previous view which precisely explained that it was a direct relationship that occurred between the two (Mishra & Gupta, 2020), so this research was conducted by examining mediating variables including digital capabilities, digital culture and collaboration which will confirm which view is more appropriate to explain the phenomena that occur in the context of private universities in Indonesia.

LITERATURE REVIEW

Mediation role of digital capabilities

Digital strategy- which is a clear orientation that the organization will focus on digitalization- will encourage organiza- tions to evaluate what is needed internally according to resource-based theory (Barney, 1991) and in fact such things are important in the use digital technology in digitalization of services is the ability and readiness to use it.

Digital capability, which refers to an organization's ability to use digital technology -to create new value for consumers or users - as a single construct has been proven to drive organizational digitalization (Neus et al., 2017). The digital capabilities possessed by organizations, in this case universities, will provide opportunities and opportunities for organizations to do two things, namely analyzing the needs and desires of users (students) and creating new services in digital form (digital services) or organizing these services by interested parties to ensure operational activities can run well, of course, with the help of digital technology (Proksch et al., 2021)

These needs and desires are obtained through an analysis of the feedback received through digital interactions that have been carried out between higher education institutions and users, both through digital learning media, institu- tional databases and other digital channels. This feedback is of course able to make higher education institutions make decisions about what educational services are most suitable for today's students and of course provide them (DeLone et al., 2018) for example digital services in the her-registration process, integrated academic digital services that can be accessed via telephone media handheld, and distance learning using learning media in the form of an e-learning system or video conferencing applications such as zoom and others.

Such a sophisticated service which is the result of innovation based on feedback from users may also not be so effective without being driven by the ability and good skills of the organization to manage it. Likewise with other activ- ities related to services and relationships not only with students but also with suppliers and other interested parties on a day-to-day basis, for example payment systems that were or were previously carried out manually, the process of pro- curing goods for institutional needs, and others with digital capabilities, these services can be operated properly and ensure that institutions can operate properly (De Souza et al., 2017).

Thus the researcher then assumes that digital capabilities are able to mediate the relationship between digital strategy and digitalization (products or services) of private tertiary institutions in Indonesia, and proposes the following hypothesis:

H1: Digital capabilities mediate the relationship between digital strategy and digitalization of private higher ed-ucation institutions in Indonesia.

Mediation role of digital culture

Referring to resource-based theory (Resources-Based Theory), as well as digital capabilities which are internal strengths, organizational culture is also an internal resource that deserves special attention related to its role in organizational digitalization. Digital culture, which is the shared values, norms and expectations of all parts of the organization in digitalization, is considered capable of mediating the relationship between digital strategy and digitalization of higher education services and processes (Proksch et al., 2021).

This role is assumed where when an organization has formulated and established a strategic orientation, in this case a digital strategy, the organization's management will definitely work on how this digital strategy can be understood, felt and implemented into an identity -values, norms, behaviors and expectations -that attached. Identity or in this study is referred to as digital culture which is then predicted to be able to contribute to the ultimate goal of organizational strategy, namely digitalization.

This is possible because an organizational culture that is closely related to digital technology will provide an opportunity for organizations to become more flexible and agile in making decisions. This fact is based on the fact that digital technology which is synonymous with speed and accuracy prompts organizations to be more flat in their structure and also more decentralized in decision making so as to provide wider opportunities for creativity and discussion space at certain levels and have the potential for the organization. to be able to develop digital products or services according to the wishes of users (Nylén & Holmström, 2015)

Furthermore, digital culture will certainly encourage changes in the behavior of all members of the organization

in relation to the use of digital technology in all ongoing operational activities and processes. This culture also leads to a digital mindset, good digital expertise, and a thick digital atmosphere so that in the end digital technology and all things related to it become an integral part or in other words integrate with the process of how the organization is run (Pavlou & Sawy, 2011)

Based on assumptions and information from previous literature as explained earlier, the researcher then pro- poses the following hypothesis:

H2: Digital culture mediates the relationship between digital strategy and digitalization of private higher educa-tion institutions in Indonesia.

Mediation role of Collaboration

Unlike the 2 previous mediating variables which are internal resources owned by the organization, the third mediating variable in this study is a resource that can only be accessed by the organization only if the organization cooperates with other parties. Collaboration is a variable that will be tested in this study where the basis for its use is the resource dependence theory (Reitz et al., 1979).

In the context of higher education, in order to create a new product or service, be it digital or non-digital, higher education institutions of course have major limitations related to funds and financing. So it is not uncommon to find higher education institutions often collaborating with the industrial world for this (Happonen et al., 2020). Furthermore, in day-to-day operations mainly related to digital technology, it is undeniable that organizations certainly collaborate with other parties to ensure their operations continue as an example for the convenience and ease of paying Higher Education dues, Higher Education today chooses to collaborate with banks in terms of providing digital payment ser- vices that can be accessed using a smartphone.

In the case of Indonesia, we see how private tertiary institutions are trying to join hands by collaborating to form an organization known as the Association of Indonesian Private Higher Education (APTISI) to equalize their po- sition with state higher education -which is considered by some people as higher quality higher

education institutions - by sharing experience, knowledge, even some time ago- March 30, 2022- Central boar of Association of Indonesian Private Higher Education Institution (APTISI) has just launched e-learning which can be used by all private tertiary institutions in Indonesia. This indicates that in order to achieve success in digitalization, the choice to collaborate is not something bad, but something that must be considered carefully. This is in line with the opinion of Fuller et al., 2021 who said that collaboration provides an opportunity to use shared information and computing technology that allows each party that collaborates to be able to produce or create something, whether in the form of digital services or digital- ization in the form of processes Organizational operationalization.

Therefore, in this study the researchers assume that establishing a digital strategy will encourage organizations to evaluate what is needed, especially external resources -in this case collaboration - where collaboration has been de- scribed as one of the important factors in the success of digitalization (Newbold, 2020).

In addition, the role of collaborative mediation is considered to be the mechanism that occurs in the relationship between digital strategy and digitalization based on the theory of resource dependency theory, which based on this theoretical view, companies will be able to survive and be sustainable in the future if they can manage external resources through internalization and absorption of digital knowledge from partners for the successful digitalization of projects or services as required and desired by users. In the end, the researcher then proposed the following hypothesis:

H3: Collaboration mediates the relationship between digital strategy and digitalization of private higher educa-tion institutions in Indonesia.

RESEARCH METHOD

The research method used in this study is a quantitative method that accommodates hypothesis testing using data in the form of numbers that are tested using statistical analysis. This was done because it realized that research using a quan- titative approach in the context of higher education was still quite limited (Seres et al., 2018; Chaudhuri et al., 2022)This is also driven by the opinion of Neuman (2014) which states that if the research is conducting theory testing -in this case resource-based theory and resource dependency theory-, proving research hypotheses, and having a linear thinking flow,then the right method is used by researchers is a quantitative method.

The unit of analysis used in this study is at the organizational level as explained by resource-based theory (Barney, 1991) and also resource dependence theory (Reitz et al., 1979).

The population in this study are all private universities throughout Indonesia. In connection with the issue of the size of the area, the researchers then used the non-probability sampling method which made it easier to obtain sam- ples in the study (Malhotra et al., 2017). Furthermore, the type of sample selection method used is the purposive sam- pling method with the following criteria: 1. Private tertiary institutions must be registered with the Higher Education Database (PDPT) of the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia. 2.
Private Higher Education must be accredited by the National Accreditation Board for Higher Education (BAN-PT) of the Republic of Indonesia.

The number of research samples is 5 to 10 times the number of statement items used in research (J. Hair et al., 2018), so if referring to this opinion with a total of 25 statement items, the required number of samples in research is a minimum of 125 and a maximum of 250.

Data collection in this study was carried out by distributing questionnaires to individuals who were able to represent organizations, in this case leaders of private tertiary institutions in Indonesia. The questionnaires in this study were distributed to the chancellor/vice-chancellor and officials at the same level from private tertiary institutions in Indonesia where to facilitate filling out the questionnaires in this study

were also designed in an online form that could be accessed via the g-form provided by the researcher.

In general, this research questionnaire will contain 2 parts which include: The first, Identity of Private Higher Education Institutions. In this section the leaders of private tertiary institutions will be asked to fill in information in- cluding the college code, accreditation, year of establishment and type of higher education institution. The second, En- tries related to the measurement instrument for each variable .In this section, leaders of private tertiary institutions will be asked to fill in their perceptions in the context of higher education management regarding items that represent each variable where each item will be measured using a Likert scale of 1-5. (1 = Strongly Disagree, 5 = Strongly Agree).

The data analysis technique in this study is to use the Structural Equation Modeling (SEM) method where this analysis method makes it easy to carry out factor analysis along with testing the model built by the researcher. The SEM that researchers use is in the form of Partial Least Square (PLS) SEM which is currently gaining popularity in the fields of entrepreneurship, strategic management and management research in general (Nitzl et al., 2016; Kuckertz & Prochotta, 2018). A PLS model will consist of an outer model which includes each construct and its items and an inner mode which includes the constructs and the relationships between these constructs.

The choice to use the PLS SEM is also not without reason, but is also driven by several things including the ability of the PLS SEM to be an effective method for exploring research that aims to build a potential new theory (J. F. Hair et al., 2018), in terms of In fact, the researcher realizes that the model put forward is an exploratory effort on the factors that measure constructs and at the same time examines relationships that have not previously been explained by a standard theory so that there is an opportunity to bring up new theories that are explained from the relationships of the variables tested in the study. this. In addition, PLS SEM is able to tolerate small sample sizes, PLS SEM can also be used in research that has a reflective or formative measurement model, and aims to test or expand existing theories (Sholihin & Ratmoko., 2013).

Researchers used the WarpPLS 7.0 application to test the model in this study. Even though the testing system is carried out in simpler stages, in its implementation there are at least several stages that must be carried out mainly related to the analysis of the results of the outer and inner model tests. First, before evaluating the measurement model is carried out, it must first be ensured that there are no missing values and outliers in the research data. After confirming that there are no missing values and outliers, the next step is to evaluate the measurement model.

Furthermore, validity and reliability tests were carried out as previously explained, as well as research model suitability tests (goodness of fit). The suitability test of the research model is known by looking at the p-value of the Average Path Coefficient (APC), the value of the Average R-Square (ARS), and the Average Variance Inflation Factor (AVIF). The research model is said to have good suitability if the P value of APC and ARS ≤ 0.05 (P ≤ 0.05), and the P AVIF value ≤ 5 (Sholihin & Ratmoko, 2013). The final stage is testing the hypothesis in the form of a mediation test which in general the analysis refers to testing the role of mediating variables as stated by previous researchers such as Nitzl et al., (2016).

The mediation test used in this study is mediation testing using the analysis proposed by Kock (2013), where the mediation effect tested must go through 2 stages of testing including: (1) Estimating the direct effect on the dependent variable or what is commonly referred to as path c. (2) Simultaneously estimate the indirect relationship with the PLS SEM model triangle, namely X> Y (path c"), X>M (path a), and M>> Y (path b).

Digital strategy in this study is defined as an organizational strategy that is formulated and executed using digital resources to create different values for users

(Bharadwaj et al., 2013) and measured by 5 items of statement from (Proksch et al., 2021)

Digital capabilities in this study are operationally defined as digital dynamic capabilities referring to what was stated by (Takahashi et al., 2017) where it is the ability of organizations to translate (sensing) opportunities, capture (seizing) ideas and ideas (insight) for institutions and measured by 10 item of statements.

Digital culture can be operationally defined in this research as a set of assumptions and shared understanding of all entities in the organization about how the organization functions/runs in a digital context and measured by 4 items of statement from (Martínez-Caro et al., 2020)

Collaboration is defined as the ability to forge collaborative relationships - mutually beneficial- at multiple levels of cooperation including inter-organizational collaboration to leverage proven trickle-down solutions from more advanced to less advanced organizations in terms of digital adoption (Halpern, Mwesiumo, et al., 2021).

RESULT

After collecting data for 3 months (15 August 2022 to 15 November 2022), researcher finally obtained a total of 149 responses. However, after checking several times related to the research criteria which included tertiary institutions with private ownership status, having obtained accreditation, and found the number of repeat questionnaire fillers from the same institution, the researchers finally used only 131 respondents to then be tested on the respondent's data. Researcherfound several characteristic as followed:

Table 1 : Characteristic of HEIs

Characteristic of HEIs	Number	Percentage
Job Title of The Respondent		
Rector/ Director	33	25.2
Vice Rector/Director	98	74.8
Total	**131**	**100**
Form of the HEIs		
University	76	58
Institute	13	9.9
Academic Institution	8	6.1
Vocational School	29	22.1
Other	5	3.8
Total	**131**	**100**
Accreditation		
A	3	2.3
B	68	51.9
C	27	20.6
Excellent	1	0.8
Very Good	6	4.6
Good	13	9.9
Accredited	13	9.9
Total	**131**	**100**
Location of The HEIs		
West Indonesia	100	76.3
Central Indonesia	27	20.6
East Indonesia	4	3.1
Total	**131**	**100**

Table above informs that the respondents who were willing to fill out the questionnaire were dominated by the vice- chancellor/chairman/director of private higher education

institutions, namely 93 people or 74.8%, while the number of respondents filled by the chancellor/chairman/director was 33 respondents. In the characteristics of the respondent 'higher education institution form', it can be seen that the top 3 positions are in Higher Ed Institution in the form of universities followed by high schools and institutes with a total of 76, 29 and 13 respectively. Furthermore, if one pays attention to the accreditation of higher education institutions, it is dominated by private universities with B accreditation, namely 68 institutions, while the number of A and Excellent accreditations is not so significant, namely in the range of numbers 1 and 3. In this study, the questionnaire was filled in by all regions with zones different times where eastern Indonesia was represented by 4 institutions, central Indonesia by 27 institutions and western Indonesia by 100 institu- tions.

Then the instruments in this study were tested using convergent validity, discriminant validity and reliabilitytest. The test resulted in the following numbers.

Table 2 : Convergent Validity Test Result

	Digital Strat-egy	**Digital Capa-bilities**	**Digital Cul-ture**	**Collaboration**	**Digitalization**	***P-Value***
DS1	(0.790)					<0.001
DS2	(0.862)					<0.001
	Digital Strat-egy	Digital Capa-bilities	Digital Cul-ture	Collaboration	Digitalization	P-Value
DS3	(0.856)					<0.001
DS4	(0.865)					<0.001
DS4	(0.667)					<0.001
DC1		(0.838)				<0.001
DC2		(0.768)				<0.001
DC3		(0.876)				<0.001
DC4		(0.899)				<0.001
DC5		(0.884)				<0.001
DC6		(0.825)				<0.001
DC7		(0.851)				<0.001
DC8		(0.865)				<0.001
DC9		(0.847)				<0.001
DC10		(0.845)				<0.001
DCul1			(0.862)			<0.001
DCul2			(0.896)			<0.001
DCul3			(0.860)			<0.001
DCul4			(0.798)			<0.001
Collab1				(0.906)		<0.001
Collab2				(0.945)		<0.001
Collab3				(0.929)		<0.001
Collab4				(0.868)		<0.001
Dig1					(0.772)	<0.001
Dig2					(0.796)	<0.001
Dig3					(0.833)	<0.001
Dig4					(0.909)	<0.001
Dig5					(0.882)	<0.001

Table 2 provides information that all of the statement items used in the research questionnaire have a loading factor of >0.6 with a p-value of <0.001, so it can be concluded that all statement items meet good convergent validity test criteria and can be used to measure the variables tested in this study include digital strategy, digital capabilities, digital culture, collaboration and digitalization.

Table 3 : Discriminant Validity Test Result

	Digital Strategy	Digital Capabilities	Digital Culture	Collaboration	Digitalization
Digital Strategy	**(0.812)**	0.710	0.729	0.690	0.681
Digital Capabilities	0.710	**(0.851)**	0.750	0.797	0.802
Digital Culture	0.729	0.750	**(0.855)**	0.746	0.797
Collaboration	0.690	0.797	0.746	**(0.912)**	0.802
Digitalization	0.681	0.802	0.797	0.802	**(0.840)**

The test results as shown in the table above show that value of the Average Variance Extracted (AVE) is greater than the association relationship between the existing constructs. Therefore, based on these results it can be concluded that the research instrument used by researchers in this study met the required discriminant validity.

Table 4 : Reliability Test Result

	Digital Strat-egy	Digital Capa-bilities	Digital Cul-ture	Collaboration	Digitalization
mposite Re-liability	0.905 *(Reliable)*	0.963 *(Reliable)*	0.916 *(Reliable)*	0.952 *(Reliable)*	0.923 *(Reliable)*
Cronbach's alpha	0.868 *(Reliable)*	0.957 *(Reliable)*	0.877 *(Reliable)*	0.933 *(Reliable)*	0.894 *(Reliable)*

The test results above show a composite reliability value of > 0.6 touching a value of 0.9 for all measured constructs, meaning that all the instruments used can be ascertained to be reliable. In addition, the Cronbach's alpha value also shows a number that meets the requirements determined by the expert, namely > 0.6 (0.868, 0.957, 0.877, 0.933, 0.894 in each construct sequentially), therefore all the instruments used are also proven to be reliable.

The next step in research using the Structured Equation Modeling (SEM) method is to test the suitability of the model. This test is carried out to ensure that the model built and tested in the research has conformity with the theory on which the model is built. The result of goodness of fit is as followed:

Table 5 : The Goodness of fit test result

Indicator	Indicator value	P-value	Conclusion
APC	0.440	<0.001	Accepted
ARS	0.568	<0.001	Accepted
AVIF	3.526		Ideal

Referring to the test results for the APC, ARS and AVIF indicators in table 5 where the P value of APC and ARS is <0.05 (<0.001) and the AVIF value ≤ 5 (3.526), it can be concluded that the existing research model meets the criteria of Goodness of Fit as required and provides an opportunity for researchers to continue testing at the next stage,namely testing the research hypothesis.

Even though no hypothesis has been proposed to confirm a direct relationship between digital strategy and digitalization, in principle the direct relationship test must still be carried out for one purpose, namely the results of the direct relationship test will be used to determine whether the role of the mediating variable is fully mediated. or partial mediation (Kock, 2013). In the following, the researcher present the results of testing the direct relationship between digital strategy and digitalization.

Tabel 6 : The direct effect test result

Relationship	Coefisien	*p-value*	Conclusion
Strategi Digital>> Dig-italisasi	0.581	<0.001	Significant

With the provision that it must have a coefficient > 0 and also have a significance level < 0.05, Table 4.7 provides information that digital strategy has a positive and significant effect on digitalization where this relationship has a coefficient value of 0.581 with a significance level < 0.001.

Furthermore, knowing the answer to the hypothesis as proposed in this study, further testing is carried out by testing the indirect effect by including the mediating variable in the model. In the following, the researcher includes a table of mediation test results:

Tabel 7 : Mediation Effect

Path	Mediator	Direct Effect		First path		Second path		Conclusion
		Coef.	*p-value*	Coef.	*p-value*	Coef.	*p-value*	
Digital Strategy >> Digital Capabilities >> Digitalization	Digital Capabilities	0.015	0.425	0.710	<0.001	0.296	0.003	Fully Mediation
Digital Strategy >> Digital Collaboration >> Digitalization	Digital Capabilities			0.729	<0.001	0.337	0.002	Fully Mediation
Digital Strategy >> Collaboration >> Digitalization	Collaboration			0.690	<0.001	0.305	0.004	Fully Mediation

The mediation test used in this study is mediation testing using the analysis proposed by Kock (2013), where the mediation effect tested must go through 2 stages of testing including:

1. Estimating the direct effect on the dependent variable or what is commonly referred to as path c (as has beendone in the previous section).
2. Simultaneously estimate the indirect relationship with the PLS SEM model triangle, namely X> Y (path c"),X>M (path a), and M>> Y (path b).

Where the requirements for the mediating effect that must be met are (i) path coefficient c is significant at stage 1 and (ii) path coefficients a and b must be significant at stage 2. Referring to the view of Kock (2013) the conclusion of the role of mediation is as follows:

a) If the path coefficient c" from the stage 2 estimation remains significant and does not change (c=c") or even increases, then the mediation hypothesis is not supported.

b) If the path coefficient c" decreases in value (c"<c) but remains significant, then the mediation role in questionis partial mediation.

c) If the path coefficient c" decreases (c=c") to be insignificant, then the mediation that occurs is full mediation The test results in table 7 stage two show that after 3 mediating variables are included in the research model
the coefficient of direct relationship (independent >> dependent) turns out to be insignificant, namely at 0.015 with a p- value = 0.425 which is clearly greater than the threshold significance that is worth 0.05.

Furthermore, the test results show the first path or "path a" (Independent >> mediator) - covering digital capa- bilities, digital culture and collaboration is significant with a value of 0.710, 0.729 and 0.690 coefficients respectively with a p-value < 0.001- and the second path coefficient value or "path b" (Mediator >> Dependent) path coefficients of0.296, 0.337 and 0.305 p-value which is smaller than 0.05.

Based on the 2 stages of testing carried out, it was found that the path coefficient c" has a smaller value than the path c coefficient (c"<c) and has a p-value of 0.425 which is certainly not significant and path a (independent >> mediator) and path b (Mediator >> dependent) has a positive coefficient value and a significant p-value, meaning that the requirements for a mediating effect are met, especially for full mediation as referred to in point "c" explained by Kock (2013). Thus, referring to Kock's (2013) view, the results of hypothesis testing show that digital capabilities, digital culture and collaboration play a fully mediating role in the relationship between digital strategy and the digitalization of private higher education institutions in Indonesia. Based on the test before, we can proudly conclude that 3 hypotheses are supported.

DISCUSSION

Hypothesis 1 of this study explains that digital capabilities mediate the relationship between digital strategy and digital- ization of private higher institutions in Indonesia. Based on the results of the tests that have been carried out as referred to in table 4.8, the researcher can conclude that the mechanism for the role of mediating digital capabilities really occurs in the relationship between digital strategies that are set to be able to contribute to the success of digitizing the services of higher education institutions in Indonesia.

The relationship that occurs between digital strategy and digital capabilities (relationship coefficient = 0.710 and p-value = <0.001) explains that a digital strategy that is formulated and determined will encourage organizations to then evaluate, define new digital capabilities and add or upgrade capabilities to produce services. in accordance with the needs and demands of the higher education market in the future where in practice it is very closely related to the use of digital technology as referred to by (Baryshnikova et al., 2021).

Furthermore, the results of the test of the relationship between digital capabilities and digitalization -relation- ship coefficient = 0.296 and p-value = 0.003 - indicate that digital capabilities provide opportunities for higher education institutions to translate digital strategies that have been set in the form of investments in human resources, capital, facilities and infrastructure that are required by institutions in ensuring the successful digitalization of services such as digital learning, digital payments and other digital support services.

In other words, the ability of an organization to operate or utilize its digital technology not only guarantees that digital technology is used in order to provide value to users, but more than that digital capabilities – through feedback in their interactions with users through digital platforms – are also very important. especially in the process of under- standing the changing needs and wants of the market which will ultimately play an important role through the process of sensing opportunities, seizing ideas and insights for institutions to reconfigure all other resources to find digital prod- ucts and services. new products that continuously provide benefits for users (Teece et al., 1997; Bharadwaj et al., 2013)

The findings of this study add to the belief in the views of previous researchers about the important role of digital skills in digitizing products or services in digital transformation (Ellström et al., 2022) especially in their role as mediation in the relationship between digital strategy and digitalization. This proven mediating role of digital capabilities then clearly supports and reinforces the previous literature which states that there is indeed a digital capabilities media- tion mechanism in the relationship between digital strategy and digitalization (Proksch et al., 2021) but of course con- tradicts the view which concludes that digital ability is not a mediator in the relationship between the two (Gobble, 2018).

Theoretically, the findings of this study reinforce resource-based theory which emphasizes the importance of evaluating the strengths of internal resources that are most likely to be used as a basis for achieving competitive ad- vantage (Barney, 1991) through digitalization mechanisms. The test results on the mediating role of digital capabilities to encourage service quality in the context of private tertiary institutions in Indonesia certainly provide fresh air to the development of organizational capability literature, more specifically on digital dynamic capabilities which was origi- nally proposed by Teece et al., (1997) but has recently been tested empirically but is limited to business organizations (Takahashi et al., 2017).

Still based on the same theory as hypothesis 1, namely the resource-based view, hypothesis 2 is proposed by stating that internal resources, in this case digital culture, act as mediators in the relationship between digital strategy and digitalization of private universities in Indonesia. The findings from testing the mediation role of digital culture in this study again provide reinforcement that in the context of higher education institutions in Indonesia the relationship that occurs between digital strategy and digitalization is in the form of an indirect relationship and digital culture has a fully mediated role (fully mediated) between the two relationships where This finding is in contrast to previous studies such as those conducted by Gobble (2018) and Gupta et al., (2020)but on the contrary these findings have succeeded in strengthening and supporting previous literature on the important role of digital culture on digitalization and organiza- tional performance (Martínez-Caro et al., 2020).

Organizational culture as an ideology, values, assumptions, attitudes, and norms that are binding within an organization (Isensee et al., 2020) and is imbued together by all components of the organization should be in line with work systems and patterns and of course the business model if it is to become organizations that win in competition, or operationally digital culture must be designed in such a way as to form an atmosphere and environment that supports the ultimate goals of the organization.

Therefore, the findings of this study also succeeded in confirming that the digital strategy set by the organiza- tion must be able to encourage the culture of all institutional components to recognize, know, be sensitive and accus- tomed to digital technology and other related matters so that in the end digitalization is successful and successfully carried out by institutions, especially in organizations that were previously accustomed to non-digital activities to be- come completely digitalized like today's higher education institutions.

Hypothesis 3 of this study suggests that collaboration is an important mechanism in determining the success of implementing digitalization in private higher education institutions in Indonesia. The results of testing and analysis of this study support the hypothesis as has been proposed about the role of collaboration. In contrast to the 2 previous hypotheses - which have confirmed and certainly strengthened the resource-based view of the theoretical literature which emphasizes the importance of internal resources - hypothesis 3 which is supported by statistical data in the end actually provides an additional view that in addition to the internal resources of the organization as well requires external re- sources (collaboration) in order to achieve competitive advantage (Reitz et al., 1979). In other words, the findings of this study then confirm that under certain conditions -especially in conditions of uncertainty (Agostino et al., 2020) and limited internal resources - organizations must still pay sufficient attention to the contribution of external resources for the sustainability of the organization.

Hypothesis 3 is supported by research data testing showing that there is consistency in the results of empirical research regarding the important role and contribution of collaboration in the digitalization process of services or prod- ucts from an institution, primarily related to digital technological innovation which is inseparable from digitalization itself (Halpern, Budd, et al., 2021; (Newbold, 2020). Collaboration has been proven to be a way out that can be used by organizations to generate and absorb quality knowledge to be internalized for the benefit of organizational digitalization. The findings of this study once confirmed previous views on the importance of higher education institutions in Indonesia to collaborate in developing and directing a much better quality of higher education. This is in line with what has been meant by Moeliodihardjo et al., 2012 which states that cross-organizational collaboration is actually necessary, be it with government organizations, the industrial world or fellow higher education institutions in ensuring higher education in Indonesia provides outputs in the form of graduates according to with what is needed in achieving excel-
lence in competent and competitive human resources.

CONCLUSION

All proposed research hypotheses are supported by the results of tests conducted by researchers. Therefore it can be concluded that 3 mediating variables which include digital capabilities, digital culture, and collaboration have a medi- ating role in the relationship between digital strategy and digitalization of Private Higher Education in Indonesia. Im- plicitly, this research provides input that determining a good and clear digital strategy does not necessarily guarantee
that an institution will be successful in digitizing its products or services. In practice, institutions must be able to translate digital strategies that have been formulated and determined into internal and external resources that enable digital ser- vices to suit the needs and desires of users.

This study succeeded in providing an explanation that the mediation mechanism of these internal resources is through digital capabilities, namely the

capacity of organizations to use and manage digital technology and digital cul- ture which is a set of values, philosophies and the environment of all institutional components to be sensitive to digital technology both platform, information or knowledge related thereto.

Apart from internal resources as above, this research has also succeeded in providing evidence that external resources also play a role in ensuring digital education services are in accordance with what users expect. This indicates that in the context of private tertiary institutions in Indonesia, there are still limited internal resources in supporting digitalization so that collaboration mechanisms are an answer that must be considered by the top management of Private Higher Education Institutions in Indonesia.

This study extends the resource-based theory by highlighting the importance of both internal and external re- sources in the digitalization process of private HEIs. It also contributes to the literature on digital transformation by providing empirical evidence that digital capabilities, digital culture, and collaboration are essential mediators in the relationship between digital strategy and digitalization.

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Finally, the study confirms that the digital transformation of private higher education institutions in Indonesia is not solely dependent on a well-defined digital strategy, but rather on a combination of digital capabilities, digital culture, and collaboration. These factors collectively act as mediators that facilitate the successful adoption and imple- mentation of digitalization strategies in private HEIs. The findings provide valuable insights for academic leaders, pol-icymakers, and other

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