THE IMPACT OF DIGITAL TRANSFORMATION AND LEADERSHIP ON ORGANIZATIONAL RESILIENCE IN DISTANCE EDUCATION INSTITUTION: HIGHER-ORDER SEM APPROACH

FIRMANSYAH
ORCID: 0000-0002-6281-5470
Biro Administrasi Akademik
Universitas Terbuka
Banten, INDONESIA

Gustriza ERDA
ORCID: 0000-0003-4822-0398
Statistics Study Program
Universitas Riau
Pekanbaru, INDONESIA

Dr. Arie Wibowo KHURNIAWAN
ORCID: 0000-0002-2737-9562
Faculty of Economics and Business
Universitas Terbuka
Banten, INDONESIA

Received: 05/03/2023 **Accepted:** 11/09/2023

ABSTRACT

To overcome the difficulty and unprecedented suspensions due to the COVID-19 pandemic, every organization is required to consider strategic steps to sustain, one of which is by implementing digital transformation and developing leadership capability. This study aims to determine the impact of digital transformation and leadership capability in maintaining the organization, particularly in distance education. This study used questionnaires distributed to 402 students to obtain their opinions on digital transformation, leadership capability, and organizational resilience in Universitas Terbuka, a founder of distance education institutions in Indonesia. Data were analyzed using descriptive and Higher-Order Structural Equation Modeling analysis. Based on the modelling, it is shown that the modelling had a good value of the Goodness of Fit Indicator through a standardized loading factor (SLF) more than the tolerable loading factor limit (>0.50). The Variance Extracted (VE) and Construct Reliability (CR) values also showed that the questions on every indicator used in this study were sufficiently measurable and reliable. The results of hypothesis testing indicated that there was a positive and significant impact of digital transformation and leadership capability on the organizational resilience of Universitas Terbuka.

Keywords: Digital transformation, distance education institution, leadership capability, organizational resiliency, higher-order SEM.

INTRODUCTION

The COVID-19 pandemic caused severe and unprecedented disruption, considered one of humanity's tragedies. This pandemic has had an impact on almost all aspects of life, including education. The necessity to conduct the Covid-19 health protocol, including minimizing outdoor activities, has become a new habit represented in a new governmental regulation to conduct every activity through digital media/online networks during the pandemic.

The COVID-19 pandemic causes organizations to be able to think of strategic steps to sustain in the middle of this uncertain condition. The resilience of an organization becomes an absolute matter to achieve. Resilience is derived from the words resilience and resilient which in Latin means rise back or jump back (Williams et al., 2017) Organizational resilience refers to capability of a firm to effectively absorb, develop situation-specific responses, and ultimately engage in transformative activities to take advantage of disruptive shocks that have the potential to threaten the sustainability of organization (Williams et al., 2017). According to Corrales-Estrada et al (2021); Mokline & ben Abdallah (2021); Sahebjamnia et al., (2018) , organizational resilience is defined as the dynamic capability to respond during times of disruption and crisis, especially in the face of COVID-19 pandemic, organizations need to strengthen its resilience by engaging stakeholders, promoting virtual work, and encouraging customer communication.

According to Velu et al., (2019), digitalization is an effective way for organizations to achieve organizational resilience. The demand to shift to digital media for the sustainability of processes/activities during the pandemic is increasing Hadiono et al (2020). In other words, the pandemic can be interpreted as the door to the transformation of conventional education into digital education. The shift in using teaching media and learning resources toward digitalization makes all education stakeholders willing to change and leave their comfort zone. With the global impact of the pandemic, increasing efficiency, social coordination, and resource allocation as the constituent factors of digitalization are variables that significantly influence organizational recovery.

Universities as institutions of higher education are also required to be responsive to this phenomenon by constantly innovating so that the learning process can be conducted effectively. When the situation changes to a situation that focuses more on the use of digital technology, digital transformation is an inevitable phenomenon.

Digital transformation, in general, can be interpreted as a radical process that occurs in organizations by utilizing technology, human resources, and processes that cause the performance of the organization to change drastically (Boulton, 2021). Digital transformation is a process in which the digital world merges with the physical world (Yoo et al., 2010). The main objective of carrying out digital transformation relates to the digital readiness of the organization to ensure that the organization is ready to enter the digital world and is ready to change as needed (Osmundsen et al., 2018).

The digital transformation of an organization involves integrating internal and external resources through information technology, computing, communication, and connectivity to reshape the vision of the organization, strategy, organizational structure, processes, capabilities, and culture to adapt to the ever-changing digital world (Vial, 2019). Digital transformation relies on the capabilities and digital technology to create or change business processes, operational processes, and customer experiences to create new values (Morakanyane et al., 2017). Rogers (2016) conveyed that besides technology-related issues, digital transformation is also related to a strategy in which leadership or managers must be able to find ways to create an innovation and a new business model and can also optimize customer needs and experience. In line with this opinion, Weller et al (2013) also stated that digital transformation allows organizations to sustain themselves in an era of rapid change; however, this transformation still requires strategic direction from the leader.

On the other hand, leadership is the executive power that enables the organization to sustain itself (Lisdiono et al., 2022). Stakeholder leadership is an important component of a strategic management framework that can drive organizational resilience (Schoemaker et al., 2018). Leaders assist organizations in adapting to their environment by directing, guiding, and supporting their subordinates (Taylor et al., 2014). Based on a study conducted by Shin & Park (2021), it is stated that leadership creates superior resilience performance. Strong leadership is required to execute organizational strategies that promote resilience by rapidly changing entire organizational systems and adaptability.

Dynamic and strategic leadership capabilities are required to be able to cooperate to help organizations sustain the increasingly volatile, complex, and uncertain business environment. According to Khan et al (2019) and Lee et al (2013), leaders should view risk and uncertainty as natural business elements and should prepare for all possible future scenarios aggressively and pre-emptively. With a capable leader, the organization is able to overcome further risks and challenges.

Research related to the digital transformation indicators in Universitas Terbuka has been carried out by Khurniawan et al., (2022). Based on this research, it was found that strategy and institutional governance, curriculum and delivery methods, assessment, staff support and professional development, and infrastructure and resources are indicators of digital transformation that digital transformation is appropriate to measure the digital transformation at the Open University. Therefore, the author aims to develop that research by applying those indicators to examine the impacts of digital transformation and leadership on the resilience of Universitas Terbuka.

LITERATURE REVIEW

Organizational Resilience

Resilience is derived from the words *resilience* and *resilient* which in Latin means rise back or jump back (Williams et al., 2017). According to Holling (1973), resilience can also be understood as a measure of the persistence of a system and adaptability to changes or disturbances while still maintaining the same relationship between population or state variables. Organizational resilience refers to the capability of a firm to effectively absorb, develop situation-specific responses, and ultimately engage in transformative activities to take advantage of disruptive shocks that have the potential to threaten the sustainability of organization (Williams et al., 2017). In relation to organizational resilience as a dynamic capability to respond during suspensions and crises, especially in the face of this COVID-19 pandemic, organizations are required to strengthen their resilience by engaging stakeholders, promoting virtual work, and encouraging customer communication (Corrales-Estrada et al., 2021; Mokline & ben Abdallah, 2021; Sahebjamnia et al., 2018).

There are three characteristics of organizational resilience: perception, integration and coordination, and reorganization (Williams et al., 2017). Based on the perceptual characteristics, it is found that organizational resilience is the capability of the organization to adapt to environmental changes; while companies with higher organizational resilience are good at finding early warning signals in a crisis. While based on integration and coordination, organizational resilience can increase the flexibility of the organization to mobilize internal and external resources to overcome external crises. On the other hand, based on reorganization, organizational resilience allows the organization to reconfigure its resources and capabilities and complete the necessary internal and external transformations.

The characteristics of a resilient organization firstly can be defined as capable of creating and customizing structures. With these characteristics, an organization can perform a precise and timely decision-making process that allows it to operate independently with physical, and digital operating systems. Secondly, a resilient organization can be characterized to be able to ensure security. With security assurance, resilience can be achieved to continuously manage and reduce possible risks during change. Thirdly, emotional-effect management is also a characteristic of a resilient organization. Experiencing constant transformation and change is a factor in producing elevated levels of anxiety, stress, and overwork in teams. Therefore, it can reflect the commitment to leadership-level management and ensure the health and stability of the employees of the organization by advocating for organizational resilience. Fourthly, promoting a diverse and empowered workforce is also a representation of the characteristics of a resilient organization. In this manner, a resilient organization has the power to build a well-connected, collaborative, and creative workforce that works together to develop competitiveness and prosperity. Lastly, a strong organization can be characterized by consistently learning, evolving, and growing. By investing in physical and digital infrastructure, a strong organization can be more adaptable and flexible in the long term.

Organizational resilience has two perspectives which are operational resilience and strategic resilience (Lengnick-Hall et al., 2011). Operational resilience focuses on overcoming crises and bouncing back to previous conditions which are often associated with interpretive and adaptive action capabilities and are also called passive resilience (Somers, 2009). On the other hand, active resilience or strategic resilience can be defined as the capability to quickly transform threats into opportunities then identify unique opportunities and act effectively when they compete (Valikangas & Georges L. Romme, 2012).

Hall & Winn (2010) applied the concept of resilience to education, particularly in open education, arguing that resilience develops engagement, education, empowerment, and encouragement. In terms of higher

education practice, resilience is a representation of leveraging technology to change practice and maintain the fundamental function and identity that existing practice represents. As a sustainable college, it must have the capacity to accommodate students, staff, and wider society to develop resilience since technology offers reach, usability, accessibility, and timely feedback; these are the keys to developing the resilience for higher education.

According to Walker et al., (2004), resilience can be categorized into four aspects: latitude, resistance, precariousness, and panarchy. Latitude can be defined as the maximum amount the system can change before it loses its ability to recover. Jones et al., (2009) summarized based on three main factors: distance or open learning, resources, and systematic support. Resistance can be defined as the ease or difficulty of changing the system. Precariousness relates to how close the current state of the system is to the threshold and how panarchy deals with the influence of external forces at low and high scales. For example, external oppressive politics, invasions, market shifts, or global climate change can trigger local shocks and regime shifts.

The rapid development of digital technologies, such as artificial intelligence, big data, cloud computing, blockchain, and the industrial internet, shifts the traditional economy into a digital and intelligent economy that becomes an important mechanism for organizations to achieve breakthrough innovation and sustainable development (Vial, 2019). Digital transformation has become an important pathway for organizations to increase organizational resilience and has been widely researched, both by academic and business practices (Zhang et al., 2021). Especially in the era of the COVID-19 pandemic, based on the International Data Company Survey, it is estimated that direct investment in digital transformation will exceed USD 6.8 trillion from 2020 to 2023.

Digital Transformation

Digital transformation, in general, can be interpreted as a radical process that occurs in organizations by utilizing technology, human resources, and business processes that cause the business performance of the organization to change drastically (Boulton, 2021). According to Yoo et al., (2010), digital transformation is a process in which the digital world merges with the physical world. Digital transformation is an evolutionary process that relies on capabilities and digital technology to create or change business processes, operational processes, and customer experiences to create new value (Morakanyane et al., 2017). The main purpose of realizing digital transformation by an organization is related to the digital readiness of the organization. In other words, the organization is required to ensure its readiness to enter and adapt to the digital world as demanded (Osmundsen et al., 2018).

Digital transformation is not only about how an organization implements a digital technology, but also about how to combine strategy with today's technology. Rogers (2016) implied that digital transformation is basically about both technology and strategy; therefore, it can also be said that leadership or managers must be able to find ways to utilize and use them to create an innovation and to create a new business model, and can also optimize customer needs and experience. Some fields that have made this transformation such as education with its e-learning, business with e-business, banking with e-banking, government with e-government, and many others, aim to increase the efficiency and effectiveness of work and complementary files by using a database.

Digital transformation is obtained from the use of a combination of digital innovations that result in changes to the structure, values, processes, positions, or ecosystems within the organization and its external environment (Hinings et al., 2018). This process is seen as forcing organizations to cope with change and uncertainty shocks (Scholz et al., 2020). The digital transformation of an organization involves integrating internal and external resources through information technology, computing, communication, and connectivity to reshape the vision of the organization, strategy, structure, processes, capabilities, and culture to adapt to the fast-changing digital world (Vial, 2019). Digital transformation can be used to change the way organizations create value, exchange value, and interact directly with consumers (Yadav & Pavlou, 2014). The impacts that can be seen when digital transformation occurs according to Schwarzmuller et al., (2018) are a) Teleworking and b) employee substitution.

Leadership

Leadership is the executive power that enables the organization to sustain itself (Lisdiono et al., 2022). Leaders are the first line to initiate an idea among other stakeholders (Fiksel et al., 2015). Stakeholder leadership is an important component of a strategic management framework that can drive organizational resilience (Schoemaker et al., 2018).

Leaders assist organizations in adapting to their environment by directing, guiding, supporting, and providing support to their subordinates (Taylor et al., 2014). A study conducted by Shin & Park, (2021) addressed that leadership creates superior resilience performance. Strong leadership is required to execute organizational strategies that promote resilience by simultaneously changing entire organizational systems and adapting to change. In addition to leadership, dynamic and strategic leadership capabilities are also required to be able to cooperate in assisting organizational sustainability against business challenges, complexity, and uncertainties. According to Khan et al., (2019) and Lee et al., (2013), leaders should view risk and uncertainty as natural business elements and should prepare for all possible further scenarios aggressively and pre-emptively. With a capable leader, the organization is believed capable of facing the crisis while maintaining its sustainability.

An effective leader is represented as a leader who uses an integrated transformational and transactional leadership style (Bass, 1985). A leader is required to implement strategic resilience to anticipate and prevent crises and continue to make changes with or without crises. Leadership capabilities can assist in ensuring the resilience of the organization (Lisdiono et al., 2022). According to Lengnick-Hall et al., (2011) and Morales et al., (2019), organizational resilience depends on a strong leadership style that encourages a united and interdependent team to work together. Leaders must be able to detect challenging situations during difficult times as early as possible. They define and decide their performance, coordinate vertically and horizontally, and provide understanding and guidance to the team with clear and effective communication; at the same time, they create, develop and increase the resilience of the team.

A leader is required to possess at least 3 (three) leadership abilities: (1) technical ability, (2) social ability, and (3) conceptual ability. Technical ability is the ability of the leader to use the knowledge, methods, and equipment needed to execute certain tasks that are obtained through education, experience, and training. Theoretically, a leader must have the abilities as described; however, it is seen that the facts and data from the research show that the recruitment of officials to be appointed to a certain position or job does not meet the education, experience, and training standards possessed by the relevant position and job. This condition is caused by the fact that the leader who is authorized to select talents to occupy a position or job does not recruit talents based on the job requirements but based on personal interests (likes and dislikes) although the appointed talents do not have the capacity for the position or job.

Social ability is an ability possessed by a leader to supervise which includes an understanding of motivation and the application of effective leadership. This kind of ability requires a separate understanding by each leader in encouraging subordinates. Conceptual ability is the ability of a leader to understand the complexity of the organization. This ability is also used in adapting the field of work of the work unit into the entire operational field of the organization. Therefore, every leader must fully understand the movements of their respective work units in executing their main tasks and functions.

METHOD

The data used in this study were categorized into two types of data: secondary data and primary data. Secondary data were obtained by reviewing literature studies such as literature and references related to other sources outside the organization that could support the research. Primary data were obtained by distributing online questionnaires to students of Universitas Terbuka.

Participants

The sample of this study were 402 participants from 5 faculties of Universitas Terbuka: Faculty of Economics (FE); Faculty of Law, Social and Political Sciences (FLSP); Faculty of Teacher Training and Education (FTTE); Faculty of Science and Technology (FST), and Post-graduate Program (PP). All participants were chosen based on their active status in the Open University randomly. The participants then were asked to fill out the questionnaire.

Instrument and Procedures

The instrument consists of 57 questions of which 11 questions were related to respondent characteristics and the other 46 questions were to measure digital transformation (X1) and leadership capability (X2) variables, as exogenous latent variables, and organizational resilience (X3), as endogenous latent variables. Additionally, every question had four options to choose from: 1) completely disagree, 2) disagree, 3) agree, and 4) completely agree.

The research was conducted in several stages, starting with formulating research problems, selecting research objectives, finding reference sources, determining variables, forming research models, collecting data, analyzing data, formulating research results, and recommending research through managerial implications.

Data Analysis

The data analysis technique used is descriptive analysis and structural equation modeling (SEM) analysis. Descriptive analysis was used to determine the characteristics of the students as the research respondents. Meanwhile, higher order SEM analysis was used to examine the effect of digital transformation that was in a higher level of abstraction including several subcomponents and the effect of organizational leadership on organizational resilience as proposed in the model as shown below.

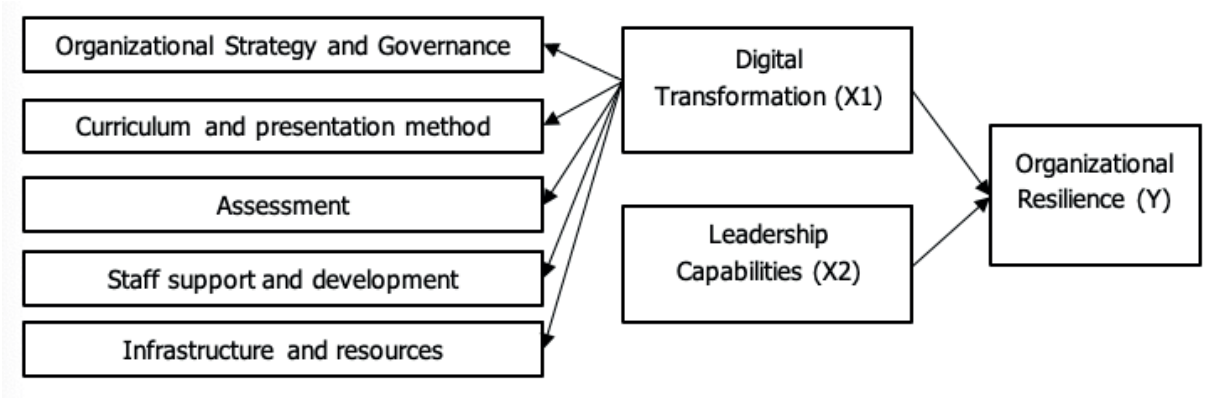

Figure 1. Model the relationship between digital transformation and digital capabilities on organizational resilience

FINDINGS

Descriptive Analysis

This study involved 401 students from 5 faculties: 35.57% from FTTE, 33.08% from FLSP, 25.87% from FE, 4.23% from FST, and 1.24% from PP taken from 31 provinces in Indonesia as shown in Table 1. Based on gender, most respondents were female respondents of 64.68%, and only 35.32% were male students. The age range of respondents was quite diverse. Respondents were dominated by students aged >26 years of 66.92%, followed by students aged 23-24 years of 22.14%.

Respondents who were student representatives from semester 1 to semester 15 where most of the respondents were students in semester 15. There was 1 of 4 students who was a respondent as a semester-15 student. Then followed by students in semester 8, which was around 15 %. On the other hand, about 2 out of 3 students were students who study while working, with the majority of private employees (60.38%), civil servants (11.64%), self-employed (5.66%), and others (22.32%). On average, these employed respondents had worked for 4-6 years (31.45%), >10 years (26.42%), and 1-3 years (23.90%).

Table 1. Descriptive Statistics of Respondents

Variables	Category	Number	Percentage (%)
Faculty	FE	104	25.87%
	FLSP	133	33.08%
	FTTE	143	35.57%
	FST	17	4.23%
	PP	5	1.24%
Gender	Male	142	35.32%
	Female	260	64.68%
Age	<19 Years Old	3	0.75%
	19-22 Years Old	41	10.20%
	23-26 Years Old	89	22.14%
	>26 Years Old	269	66.92%
Semester	1	5	1.24%
	2	30	7.46%
	3	40	9.95%
	4	19	4.73%
	5	9	2.24%
	6	24	5.97%
	7	38	9.45%
	8	63	15.67%
	9	33	8.21%
	10	7	1.74%
	11	1	0.25%
	13	10	2.49%
	14	26	6.47%
	15	97	24.13%
Occupational Status	Unemployed	84	20.90%
	Employed	318	79.10%
Types of Occupation	Unemployed	83	20.65%
	Others	72	17.91%
	Civil Servant	37	9.20%
	Private Employee	192	47.76%
	Self-employed	18	4.48%

Higher-order SEM Analysis

The analysis used in this study was Structural Equation Modeling (SEM). According to Ferdinand (2002), SEM is a type of multivariate analysis in social science that can simultaneously test complex research models and analyze variables that cannot be directly measured. SEM analysis allows researchers to analyze the relationship between many independent variables with one or more dependent variables. SEM allows the pattern of attachment and causality to become one pattern. SEM also allows analysis between several dependent and independent variables directly.

According to Ghozali & Latan (2012), SEM can be defined as a combination of two separate statistical methods which are factor analysis developed in psychology and psychometry and simultaneous equation modeling developed in econometrics. SEM can also be seen as a second-generation multivariate analysis technique that combines factor analysis and path analysis to enable researchers to simultaneously test and

estimate causal relationships between multiple exogenous and endogenous variables with multiple indicators. In addition, SEM is appropriate for researchers to confirm the research model and empirical evidence in the field with research results supported by a detailed explanation of the forming variables and the relationship of one variable to other variables.

Overall Model Fit Test is conducted by analyzing the goodness of fit indicators shown in Table 3. RMSEA is an index that can be used to compensate for chi-square statistics in large samples (Baumgartner & Homburg, 1996). The RMSEA value indicates the expected goodness of fit when the model is estimated in the population (Hair et al., 2010). RMSEA value that is smaller than or equal to 0.08 is a condition for acceptance of the model which shows the criteria for good fit; it can be said that the model is based on the degree of freedom (Browne & Cudeck, 1993). Based on the calculation results, the RMSEA value was 0.08, which means that the model was acceptable and had the good fit category. Likewise, RMR was 0.025 which means the model was a good fit as well. Based on the obtained values, it can be concluded that the entire model built had the appropriate value (goodness of fit statistics) and the structural model had met the specified criteria so that the model built could explain empirical information based on the data collected.

GFI (Goodness of Fit Index) is a non-statistical measure that has a range of values between 0 (poor fit) to 1.00 (good fit). A high value in this index indicates the model is a better fit. Based on the results of the analysis, the GFI value was 0.71; therefore, the model in this study was categorized in the almost good fit rating. AGFI (Adjusted Goodness of Fit Index) shows the recommended level of acceptance if it has a value equal to or greater than 0.90 (Hair et al., 2010). GFI and AGFI are criteria that consider the weighted proportion of variance in a sample covariance matrix (Ferdinand, 2002). A value of 0.95 can be interpreted as a good level. Based on the calculation results, the AGFI value was 0.68, which means the model could be accepted at a good level and was categorized in the almost good fit rating.

Table 2. Result of Overall Model Fit Testing

Goodness of Fit Indicators	Cut-off-Value	Test Result	Fit Rating
Root Mean Residual (RMR)	≤ 0.1	0.025	Good fit
Root Mean Square Error of Approximation (RMSEA)	≤ 0.08	0.08	Good fit
Normed Fit Index (NFI)	≥ 0.90	0.93	Good fit
Non Normed Fit Index (TLI or NNFI)	≥ 0.90	0.95	Good Fit
Comparative Fit Index (CFI)	≥ 0.90	0.95	Good fit
Incremental Fit Index (IFI)	≥ 0.90	0.95	Good fit
Relative Fit Index (RFI)	≥ 0.90	0.93	Good fit
Goodness of Fit Index (GFI)	≥ 0.90	0.71	Almost Good fit
Adjusted Goodness of Fit Index (AGFI)	≥ 0.90	0.68	Almost Good fit

Measurement Model Fit Test with validity and reliability tests. Validity concerns the level of accuracy achieved by an indicator of an assessment (Ferdinand, 2002). An indicator variable is said to be valid when it has a Standardized Loading Factor (SLF) value that is more than the tolerable limit of the loading factor or 0.50 and has a t-value above 1.96. The suitability test for the initial measurement model can be seen in Figure 2.

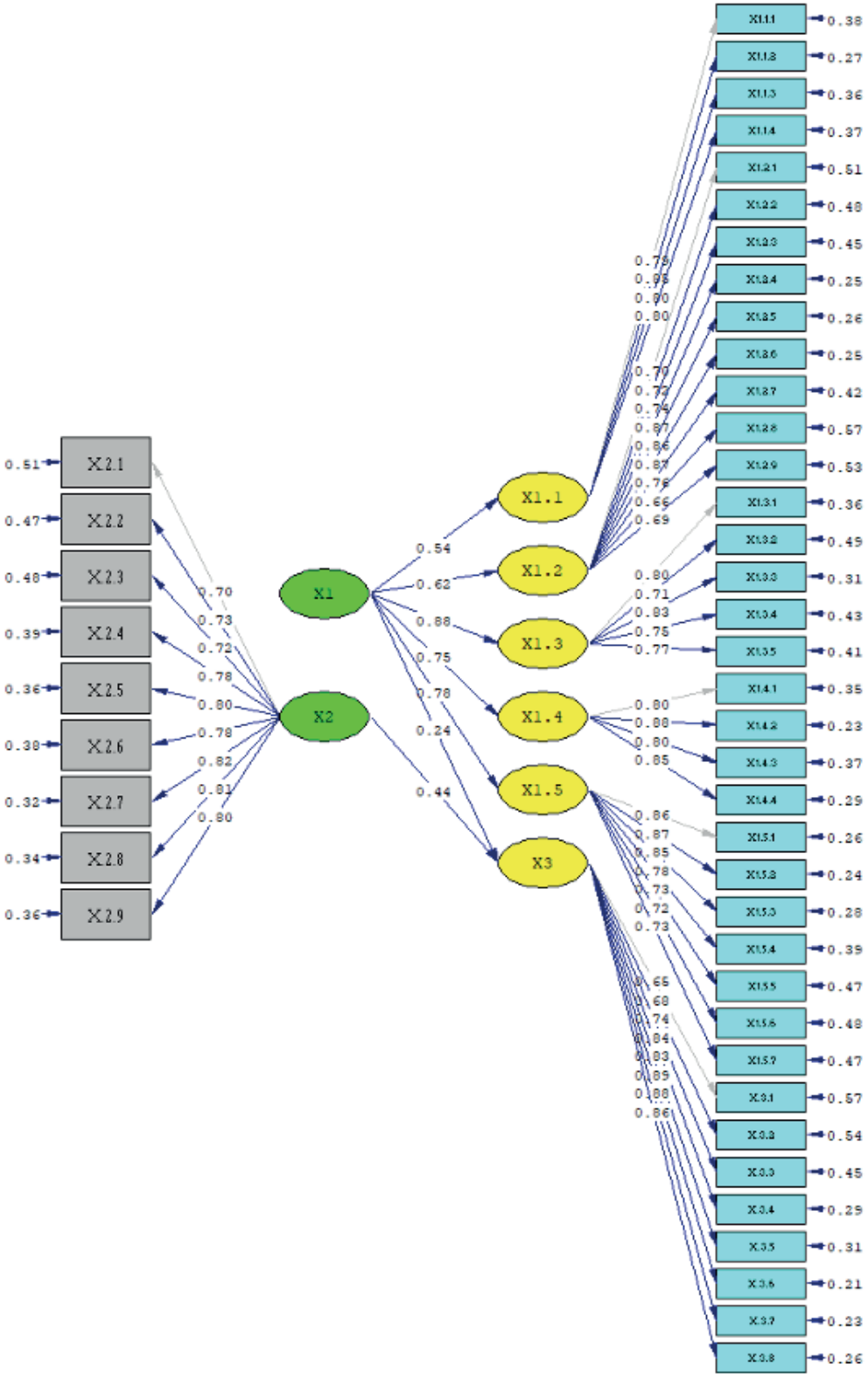

Figure 2. the standardized loading factor of higher order SEM

Based on Figure 2 and Table 3, it is found that all indicators had SLF > 0.5 and t-value > 1.96. This indicates that every constituent indicator had been able to measure its respective dimensions and variables.

Table 3. Results of Measurement Model Fit Test

Latent Variables	Indicator	Loading factor	T-Value	Status
X1.1	X1.1.1	0.79	-	Valid
	X1.1.2	0.85	17.98	Valid
	X1.1.3	0.80	16.68	Valid
	X1.1.4	0.80	16.65	Valid
X1.2	X1.2.1	0.70	-	Valid
	X1.2.2	0.72	13.79	Valid
	X1.2.3	0.74	14.18	Valid
	X1.2.4	0.87	16.54	Valid
	X1.2.5	0.86	16.39	Valid
	X1.2.6	0.87	16.52	Valid
	X1.2.7	0.76	14.53	Valid
	X1.2.8	0.66	12.64	Valid
	X1.2.9	0.69	13.22	Valid
X1.3	X1.3.1	0.80	-	Valid
	X1.3.2	0.71	15.07	Valid
	X1.3.3	0.83	18.29	Valid
	X1.3.4	0.75	16.22	Valid
	X1.3.5	0.77	16.61	Valid
X1.4	X1.4.1	0.80	-	Valid
	X1.4.2	0.88	20.05	Valid
	X1.4.3	0.80	17.64	Valid
	X1.4.4	0.85	19.07	Valid
X1.5	X1.5.1	0.86	-	Valid
	X1.5.2	0.87	23.15	Valid
	X1.5.3	0.85	22.10	Valid
	X1.5.4	0.78	19.27	Valid
	X1.5.5	0.73	17.28	Valid
	X1.5.6	0.72	17.07	Valid
	X1.5.7	0.73	17.19	Valid
X1	X1.1	0.54	9.50	Valid
	X1.2	0.62	10.48	Valid
	X1.3	0.88	15.76	Valid
	X1.4	0.75	13.47	Valid
	X1.5	0.78	15.05	Valid
X2	X.2.1	0.70	-	Valid
	X.2.2	0.73	13.95	Valid
	X.2.3	0.72	13.78	Valid
	X.2.4	0.78	14.97	Valid
	X.2.5	0.80	15.28	Valid
	X.2.6	0.78	14.98	Valid
	X.2.7	0.82	15.69	Valid
	X.2.8	0.81	15.44	Valid
	X.2.9	0.80	15.28	Valid
X3	X.3.1	0.65	-	Valid
	X.3.2	0.68	12.19	Valid
	X.3.3	0.74	13.2	Valid
	X.3.4	0.84	14.6	Valid
	X.3.5	0.83	14.46	Valid
	X.3.6	0.89	15.27	Valid
	X.3.7	0.88	15.13	Valid
	X.3.8	0.86	14.88	Valid

Furthermore, the suitability test of the discriminant validity measurement model and the reliability test were determined based on the Variance Extracted (VE) and Construct Reliability (CR) values. If the value of VE is 0.5 then the variable is declared valid and if CR is 0.7 then the variable is declared reliable. Based on the results of manual calculations of CR and VE values as shown in Table 4, it was found that all indicators had VE and CR values of 0.5 and 0.7 respectively, which means that the questions and dimensions used in this study were valid and reliable. Therefore, it can be concluded that the questions on each of the indicators used in this study are sufficiently measurable and reliable.

Table 4. Variance Extracted (VE)

Latent Variable	VE	CR
Digital Transformation (X1)	0.75	0.99
Organizational Strategy and Governance (X1.1)	0.78	0.93
Curriculum and presentation method (X1.2)	0.71	0.96
Assessment (X1.3)	0.72	0.93
Staff support and development (X1.4)	0.81	0.94
Infrastructure and resources (X1.5)	0.75	0.95
Leadership Capabilities (X2)	0.72	0.96
Organizational Resilience (Y)	0.76	0.96

Hypothesis testing through path coefficient testing on the structural equation model. If the value of t-value > 1.96 or t-value < -1.96 then the influence of certain variables is included in the significant category. Based on the empirical model proposed in this study, it is possible to test the hypothesis by testing the path coefficient on the structural equation model. If the value of t-value > 1.96 or t-value < -1.96, the influence of certain variables is then categorized in the significant category. The test results show that the digital transformation latent variable (X_1) had a t-value value of 3.82. This value was greater than 1.96 which indicated that there was a positive and significant effect between digital transformation (X_1) and organizational resilience (Y). Likewise, the latent variable of leadership ability (X_2) had a t-value value of 6.57. This value was greater than 1.96 which indicated that there was a positive and significant influence between leadership ability (X_2) and organizational resilience (Y).

Table 5. Result of SEM Model Estimation

Variable Impacts	Coefficient Path	t-value	Significance	Status
H1: Digital Transformation (X1) ♋ Organizational Resilience (Y)	0.09	3.82	Significant	H1 Accepted
H2: Leadership Ability (X2) ♋ Organizational Resilience (Y)	0.40	6.57	Significant	H2 Accepted

DISCUSSIONS AND CONCLUSION

In nutshell, based on the results of the research, it is shown that digital transformation variables and leadership abilities had a significant and positive effect on organizational resilience at Universitas Terbuka. It can also be seen that the variable of leadership capability provided the highest significance.

The coefficient path of digital transformation and organizational resilience was 0.09 with a t-value of 3.82. It means that the digital transformation variable had a positive and significant effect on organizational resilience. Thus, this study supports the first hypothesis which states that digital transformation has a significant impact on organizational resilience. This result is in line with the research conducted by Zhang et al., (2021) which stated that digital transformation can increase an innovation capability which in turn can

increase organizational resilience. This is also aligned with research from Bustinza et al., (2019) which states that through the qualitative comparison and analysis of fuzzy sets. It is also found that digital transformation is a significant antecedent condition of two high organizational resilience configurations which further explains that implementing digital transformation has a significant guarantee for organizations to achieve high organizational resilience.

Digital transformation is the process of using technology to transform the way a company operates and significantly increase the value of the company. Three essential leadership qualities—mindset, skill, and toolset (equipment/technology)—must be combined for the digital transformation to be implemented successfully.

Mindset;

- Adopt a digital mentality: Organizations should cultivate a mindset that is receptive to change and innovation. They must realize the importance of digital transformation and recognize that technological change is an essential component of organizational development.
- Customer orientation: Organizations should prioritize their customers. They must understand their consumers' requirements and preferences and leverage digital technologies to create a better experience and enhance customer engagement.
- Culture of innovation: Organizations should foster an environment that encourages experimentation, new ideas, and continual learning. They must minimize employees' fear of failure and encourage them to share innovative ideas.

Skillset;

- Technology skills: Organizations should ensure that employees have the necessary skills to adopt and manage digital technologies. This includes an understanding of relevant technologies and the ability to use digital tools effectively.
- Analytical capabilities: Data and analytics play a critical role in digital transformation. Employees need to have analytical skills to collect, analyze, and understand data to make data-supported decisions.
- Collaboration skills: good collaboration and communication skills are essential in a work environment powered by digital technologies. Employees must be able to collaborate effectively with other team members and departments, using digital collaboration tools.

Toolset ;

- Technology infrastructure: Organizations must have a strong technology infrastructure to support digital transformation. This includes a fast and reliable network, necessary hardware and relevant software.
- Digital tools: Organizations need to adopt and integrate relevant digital tools to support operations and innovation. For example, project management tools, collaboration platforms, data analytics, artificial intelligence and internal communication platforms.

Meanwhile, the coefficient path of the digital transformation and organizational resilience was 0.40 with a t-value of 6.57. It can be explained that the variable of leadership ability had a positive and significant impact on organizational resilience. Thus, this study supports the second hypothesis which states that leadership ability has a significant impact on organizational resilience. These results are in line with previous research by (Lengnick-Hall et al., 2011) and Lisdiono et al., (2022). It can be seen that based on the structural equation modeling analysis and based on the findings, leadership capabilities play a role in developing resilience. Leadership is the executive power that enables an organization to be resilient. The result indicated that a good professional leader with strong and complete capabilities enabled an organization to navigate prudently and triumphantly to the ultimate objective of organization.

Organizational leaders play a key role in facilitating the successful implementation of digital transformation and strengthening organizational resilience. Some actions that leaders can do include:

1. Leadership oriented towards long-term thinking: Leaders must have foresight and encourage organizations to think strategically about technological developments and how they will affect business in the future.

2. Supporting cultural change: Leaders must play a role in building an organizational culture that is innovative, adaptive, and open to change. They must communicate the values and beliefs that support digital transformation, and encourage the active participation of all members of the organization.
3. Drive learning and development: Leaders must facilitate employee learning and development in the context of digital transformation. They can provide training, workshops, and relevant resources to enhance employees' digital understanding and skills.
4. Build a diverse team: Leaders should ensure that teams involved in digital transformation have diverse expertise and a holistic understanding of technology, business and customers. This will assist organizations in dealing with complex challenges and building innovative solutions.
5. Measuring and managing performance: Leaders should establish relevant performance indicators to measure the progress of digital transformation and manage the change. This can involve monitoring the rate of technology adoption, customer satisfaction, increased operational efficiency, and the resulting business results.
6. Communicate effectively: Leaders must be effective communicators and be able to articulate the vision, strategy and benefits of digital transformation to all stakeholders. They must inspire, motivate and engage team members on the digital transformation journey.
7. Flexibility and adaptability: Leaders need to be able to deal with change and overcome obstacles that may arise during digital transformation. They must be able to adapt quickly, change direction when necessary, and drive continuous innovation.

By combining a positive mindset, relevant content, and effective digital tools, as well as strong leadership, organizations can improve their resilience to the challenges of transformation and disruption brought on by the digital era. Data research revealed that digital transformation and leadership have a favorable and significant impact on organizational resilience. This suggests that the greater the digital transformation of Universitas Terbuka, the better the resilience of Universitas Terbuka. In line with this, the greater the leadership demonstrated by university officials, the more resilient the of Universitas Terbuka will be. By knowing the effect of digital transformation and leadership on organizational resilience, Universitas Terbuka will continue to strive to improve digital transformation and also leadership to ensure that the organization can survive, under any conditions, including the political crisis or economic recession due to COVID-19.

On the other hand, this research still focuses on student responses regarding the influence of digital transformation and leadership on organizational resilience. In the future, research can be developed by involving respondents from other parties, such as campus staff and parents. In the final section, it can compare the similarity of responses from the three groups regarding organizational resilience in Universitas Terbuka. In addition, it is necessary to conduct research related to the influence of digital transformation leadership on organizational performance. This is necessary in order to see the relationship between leadership style in the context of digital transformation and its impact on organizational performance. This study can identify the most effective leadership characteristics in directing digital transformation and determine the extent to which leadership contributes to the resulting business results. With more research in this area, we may gain a deeper understanding of the leadership role in digital transformation and build better strategies to drive effective and sustainable digital transformation.

BIODATA and CONTACT ADDRESSES of AUTHORS

FIRMANSYAH is the Director of Academic Administration and Graduation at Universitas Terbuka (Open University of Indonesia) for the period of 2023-2028. He graduated with a Master of Management degree in 2001 and has actively participated in various professional management organizations. With experience in database design and the design of distance university academic information systems, he possesses 21 years of experience in developing Universitas Terbuka's academic information systems. His expertise extends across critical areas including admission and online registration systems, Recognition of Prior Learning (RPL) processes, online tutorial platforms, and the issuance of graduation documents such as Certificates of Graduation, Academic Transcripts, and Diploma Supplements. His academic interests lie in e-commerce, artificial intelligence (AI), Big Data, and Human Resource Management (HRM).

FIRMANSYAH
Biro Administrasi Akademik
Address: Universitas Terbuka, 15418, South Tangerang, Indonesia
Phone: +62 81574337143
E-mail: mansyah@ecampus.ut.ac.id

Gustriza ERDA serves as an Assistant Professor at the Statistics Study Program, Universitas Riau. She completed her Master's degree in Statistics from the Statistics Department at IPB University in August 2018. Her academic interests encompass spatial analysis, data analysis, modeling, data visualization, data mining, machine learning, big data, regression, and data science. With a focus on rigorous research, she has significantly contributed to the field with 10 published journal articles, two of which are indexed by Scopus. Additionally, she has authored one book chapter and has several papers under review for presentation at international seminars.

Gustriza ERDA
Statistics, Mathematics and Natural Science
Address: Universitas Riau, 28293, Pekanbaru, Indonesia
Phone: +6382324451348
E-mail: gustrizaerda@lecturer.unri.ac.id

Dr. Arie Wibowo KHURNIAWAN is an Assistant Professor of Human Resources Development at the Faculty of Economics and Business, Universitas Terbuka (Open University of Indonesia). He completed his Ph.D. in the School of Business at IPB University. He is a member of the Indonesian Distance Education Professional Association. His academic interest areas include Organizational Development, Learning & Development, Digital Transformation of HR, People Analytics, Talent Management, Compensation & Benefits, and Development Vocational Education. He has almost 20 years of experience in developing Vocational Education at the Indonesian Ministry of Education and Culture.

Arie Wibowo KHURNIAWAN
Faculty of Economics and Business
Address: Universitas Terbuka, 15418, South Tangerang, Indonesia
Phone: +62 81211360350,
E-mail: ariewk@ecampus.ut.ac.id

REFERENCES

Bass, B. M. (1985). Leadership: Good, better, best. *Organizational Dynamics*, *13*(3), 26–40. https://doi.org/10.1016/0090-2616(85)90028-2

Baumgartner, H., & Homburg, C. (1996). Applications of structural equation modeling in marketing and consumer research: a review. *International Journal of Research in Marketing*, *13*, 39–61.

Boulton, C. (2021). *What is digital transformation? A necessary disruption*. Https://Www.Cio.Com/Article/230425/What-Is-Digital-Transformation-a-Necessary-Disruption.Html.

Browne, M., & Cudeck, R. (1993). *Alternative ways of assessing model fit*. CA.

Bustinza, O., Vendrell-Herrero, F., & Perez-Arostegui, M. (2019). Technological Capabilities, Resilience Capabilities and Organizational Effectiveness. *Int. J. Hum. Resour. Manag*, *30*, 1370–1392.

Corrales-Estrada, A. M., Gomez-Santos, L. L., Bernal-Torres, C. A., & Rodriguez-Lopez, J. E. (2021). Sustainability and resilience organizational capabilities to enhance business continuity management: A literature review. *Sustainability (Switzerland)*, *13*(15). https://doi.org/10.3390/su13158196

Ferdinand. (2002). *Structural Equation Modelling dalam Penelitian Manajemen*. Badan Penerbit UNDIP.

Ghozali, & Latan, H. (2012). *Partial Least Squares Konsep, Teknik, dan Aplikasi*.

Hadiono, K., Candra, R., & Santi, N. (2020). Menyongsong Transformasi Digital. *Proceeding SENDIU*, 81–84.

Hair, J., Black, J., Babin, W., & Anderson, R. (2010). *Multivariate Data Analysis* (7th ed.). Pearson Prenctice Hall.

Hall, R., & Winn, J. (2010). The relationships between technology and open education in the development of a resilient higher education. *Barcelona Open Ed*, 1–12.

Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization*, *28*(1), 52–61. https://doi.org/10.1016/j.infoandorg.2018.02.004

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, *4*(1), 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245

Jones, C., Aoki, K., Rusman, E., & Schlusmans. (2009). A comparison of three Open Universities and their acceptance of Internet Technologies. *23rd ICDE World Conference on Open Learning and Distance Education*.

Khan, T. Z. A., Farooq, W., & Rasheed, H. (2019). Organizational Resilience: A Dynamic Capability of Complex Systems. *Journal of Management and Research*, *6*(1), 1–26.

Khurniawan, A. W., Irmawaty, & Erda, G. (2022). A Second Order Confirmatory Factor Analysis of the Digital Transformation for a Distance Education Institution. *International Journal of Education and Practice*, *10*(4), 381–392. https://doi.org/10.18488/61.v10i4.3224

Lee, A. v., Vargo, J., & Seville, E. (2013). Developing a Tool to Measure and Compare Organizations' Resilience. *Natural Hazards Review*, *14*(1), 29–41. https://doi.org/10.1061/(ASCE)NH.1527-6996.0000075

Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall, M. L. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, *21*(3), 243–255. https://doi.org/10.1016/j.hrmr.2010.07.001

Lisdiono, P., Said, J., Yusoff, H., & Hermawan, A. A. (2022). Examining Leadership Capabilities, Risk Management Practices, and Organizational Resilience: The Case of State-Owned Enterprises in Indonesia. *Sustainability*, *14*(10), 6268. https://doi.org/10.3390/su14106268

Mokline, B., & ben Abdallah, M. A. (2021). Individual Resilience in the Organization in the Face of Crisis: Study of the Concept in the Context of COVID-19. *Global Journal of Flexible Systems Management*, *22*(3), 219–231. https://doi.org/10.1007/s40171-021-00273-x

Morakanyane, R., Grace, A., & O'Reilly, P. (2017). Conceptualizing Digital Transformation in Business Organizations: A Systematic Review of Literature. *Digital Transformation – From Connecting Things to Transforming Our Lives*, 427–443. https://doi.org/10.18690/978-961-286-043-1.30

Morales, S. N., Martinez, L. R., Gomez, J. A. H., Lopez, R. R., & Torres-Arguelles, V. (2019). Predictors of organizational resilience by factorial analysis. *International Journal of Engineering Business Management*, *11*, 184797901983704. https://doi.org/10.1177/1847979019837046

Osmundsen, K., Iden, J., & Bygstad, B. (2018). Digital Transformation: Drivers, Success Factor, and Implications. *He12th Mediterranean Conference on Information Systems(MCIS)*, 1–15. https://www.researchgate.net/publication/330397210

Rogers, D. (2016). *The Digital Transformation Playbook: Rethink Your Business for the Digital Age*.

Sahebjamnia, N., Torabi, S. A., & Mansouri, S. A. (2018). Building organizational resilience in the face of multiple disruptions. *International Journal of Production Economics*, *197*, 63–83. https://doi.org/10.1016/j.ijpe.2017.12.009

Schoemaker, P. J. H., Heaton, S., & Teece, D. (2018). Innovation, Dynamic Capabilities, and Leadership. *California Management Review*, *61*(1), 15–42. https://doi.org/10.1177/0008125618790246

Scholz, R. W., Czichos, R., Parycek, P., & Lampoltshammer, T. J. (2020). Organizational vulnerability of digital threats: A first validation of an assessment method. *European Journal of Operational Research*, *282*(2), 627–643. https://doi.org/10.1016/j.ejor.2019.09.020

Schwarzmuller, T., Brosi, P., Duman, D., & Welpe, I. M. (2018). How Does the Digital Transformation Affect Organizations? Key Themes of Change in Work Design and Leadership. *Management Revu*, *29*(2), 114–138. https://doi.org/10.5771/0935-9915-2018-2-114

Shin, N., & Park, S. (2021). Supply chain leadership driven strategic resilience capabilities management: A leader-member exchange perspective. *Journal of Business Research*, *122*, 1–13. https://doi.org/10.1016/j.jbusres.2020.08.056

Somers, S. (2009). Measuring Resilience Potential: An Adaptive Strategy for Organizational Crisis Planning. *Journal of Contingencies and Crisis Management*, *17*(1), 12–23. https://doi.org/10.1111/j.1468-5973.2009.00558.x

Taylor, C., J. Cornelius, C., & Colvin, K. (2014). Visionary leadership and its relationship to organizational effectiveness. *Leadership & Organization Development Journal*, *35*(6), 566–583. https://doi.org/10.1108/LODJ-10-2012-0130

Valikangas, L., & Georges L. Romme, A. (2012). Building resilience capabilities at "Big Brown Box, Inc." *Strategy & Leadership*, *40*(4), 43–45. https://doi.org/10.1108/10878571211242948

Velu, S. R., al Mamun, A., Kanesan, T., Hayat, N., & Gopinathan, S. (2019). Effect of information system artifacts on organizational resilience: A study among Malaysian SMEs. *Sustainability (Switzerland)*, *11*(11). https://doi.org/10.3390/su11113177

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, *28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Walker, B., Holling, C., Carpenter, S. R., & Kinzig, A. (2004). Resilience, Adaptability and Transformability in Social–ecological Systems. *Ecology and Society* , *9*(2).

Weller, M., Anderson, T., & Weller martin, M. (2013). *Digital Resilience in Higher Education*. www.open.ac.uk.

Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of Management Annals*, *11*(2), 733–769. https://doi.org/10.5465/annals.2015.0134

Yadav, M. S., & Pavlou, P. A. (2014). Marketing in Computer-Mediated Environments: Research Synthesis and New Directions. *Journal of Marketing*, *78*(1), 20–40. https://doi.org/10.1509/jm.12.0020

Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research*, *21*(4), 724–735. https://doi.org/10.1287/isre.1100.0322

Zhang, J., Long, J., & von Schaewen, A. M. E. (2021). How does digital transformation improve organizational resilience?findings from pls-sem and fsqca. *Sustainability (Switzerland)*, *13*(20). https://doi.org/10.3390/su132011487