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An Empirical Study of Emerging Digital Culture and Digital Attitudes in an Established Company

Tubagus Arief Fahmi[1,2], Jann Hidajat Tjakraatmadja[1], Henndy Ginting[1]

[1]*Bandung Institute of Technology (Indonesia)*
[2]*Telkom Indonesia (Indonesia)*

tubagus_fahmi@sbm-itb.ac.id, jannhidajat@sbm-itb.ac.id, henndy.ginting@sbm-itb.ac.id

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Abstract:

Purpose: This study intends to uncover factors that can accelerate digital transformation in established companies. This study examines the relationship between generic culture, digital culture, digital literacy, attitudes to change, and perceived performance in digital transformation.

Design/methodology/approach: A cross-sectional survey was conducted using a questionnaire with 383 employees. The data were analyzed using Structural Equation Modeling (SEM).

Findings: This study shows that digital culture, legacy culture, and digital literacy significantly influence employee attitudes toward digital transformation and perceived performance. Additionally, digital literacy mediates the relationship between digital culture and employee attitudes toward digital transformation. Furthermore, employee attitudes toward digital transformation significantly impact their perceived performance.

Research limitations/implications: Generalizability may be necessary given the case study approach's small sample size. Hence, more research is required to collect more representative samples.

Practical implications: This study contributes to the literature by providing empirical evidence on the importance of digital culture, legacy culture, and digital literacy for successful attitudes toward digital transformation. The findings of this study can be used to develop strategies for organizations undergoing digital transformation. A well-defined business culture supporting digital transformation is critical. Organizations should encourage employees to adapt and become accustomed to an innovative environment to boost performance. Accelerating digital transformation can also be done by enhancing digital technology competence and refining employees' attitudes toward digital transformation in the internalization process.

Originality/value: Most studies have neglected the dynamic role of corporate culture in accomplishing the digital transformation. This study thus intends to fill this gap by uncovering how culture and the employees' readiness can drive digital transformation.

Keywords: digital transformation, digital culture, digital literacy, attitudes, behavior

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1. Introduction

Rapid technology innovation has resulted in a new trend called digital transformation. It utilizes cutting-edge technology to boost corporate effectiveness and efficiency in the digital age (Mergel, Edelmann & Haug, 2019). While beneficial, digital transformation remains a significant issue for many established organizations since it requires changes in their traditional internal processes, relationships, consumer expectations, behavior, and value creation (Zaoui & Souissi, 2020). Consequently, a greater understanding of such impediments is required to determine how established organizations may better manage their digital transformation. Several examples of companies that have succeeded are General Electric (GE), Coca-Cola, and Procter & Gamble; they have embraced digital transformation in the consumer goods industry using data analytics and customer insights.

When companies fail to implement digital transformation successfully, it can lead to a range of negative consequences, including decreased competitiveness, loss of market share, reduced revenue, and decreased employee morale and productivity. Employees may feel frustrated or disengaged if they perceive that the company is not adequately investing in digital technology, which may lead to resistance or reluctance to adopt new technologies or ways of working. One example is the case of Blockbuster, a video rental company that failed to adapt to the digital age and ultimately went bankrupt. Blockbuster was slow to adopt digital technologies such as online streaming and failed to see the shift in consumer preferences toward digital content. Another example is Kodak, a company once a film and camera industry leader but failed to adapt to the digital age. Kodak was slow to embrace digital photography and instead focused on maintaining its existing business model, which relied on film sales, Christensen (2013).

Telecommunications (Telco) companies are among the most obviously impacted established companies by digital transformation and disruption, which has significant implications for their business operations and revenue streams. The rise of digital technologies and services has disrupted the traditional Telco business model, with customers increasingly using digital channels and platforms for communication and data exchange, for example, WhatsApp, Telegram, and Zoom. This change has led to declining revenue from traditional Telco services such as voice calls and SMS messages. On the other hand, they face new opportunities to create and deliver new services, such as cloud computing, high-speed internet, and IoT (Internet of Things). Telco companies must adapt and restructure their business practices to remain competitive in the digital age. The success of a Telco company's digital transformation strategy is heavily dependent upon the attitudes of its employees. Employees must be positive toward new digital tools and processes to integrate them properly into their everyday work routines. Therefore, understanding the change in employee attitudes toward digital transformation is an important field of research for Telco companies.

There are similarities in company's conditions faced by Telco companies and other established companies in terms of organization as a system. These similarities are because this study is based on fundamental factors in digital transformation, such as culture, digital literacy, employee attitudes, and performance. These factors are also relevant for other companies undergoing digital transformation. Therefore, these findings can be applied to companies experiencing digital transformation in general. The role of human resources in digital transformation has been extensively examined. Sivaraman (2020) demonstrated employees' preferences for making a business digitally ready. In the meantime, Kozanoglu and Abedin (2020) discovered that employee digital literacy substantially impacts the success of digital transformation.

While previous studies have concentrated mainly on technology and human resources, this research leads to two research questions: What culture will support a digital transformation? And how digital culture, legacy culture, and digital literacy can influence the employee's attitude to change and performance? To address these questions, we review the literature to identify the key factors supporting digital transformation. We then developed a conceptual framework that links cultural factors to employee attitudes to change and performance. We also use this conceptual model to develop a set of hypotheses about the relationships between digital culture, legacy culture, digital literacy, employee attitudes to change, and performance. We use quantitative and qualitative research methods to build and test this framework and gain a more nuanced understanding of the relationships between these variables in the digital transformation context.

This study will investigate digital transformation from a corporate culture perspective that may affect the technology's utilization and the employees' readiness to face digital transformation. In this study, we examine how PT Telkom Indonesia (hereafter referred to as Telkom), an established state-owned company in Indonesia, uses its corporate culture to deal with digital transformation and quantitatively tests several hypotheses to determine the link between the variables. This study examines how culture, digital literacy, and attitudes to change can accelerate digital transformation performance. Comprehensive measurements of changes in mindsets and behaviors are needed to assess whether a new culture is developing due to digital transformation. Examining digital transformation from the corporate culture perspective is essential because strong corporate cultures can support businesses in overcoming obstacles and finding solutions to digital transformation-related issues (Tidor & Morar, 2022). Moreover, companies must consider various creative techniques and engage in rigorous experimentation (Lim, Lee, Sonthikorn & Vongbunyong, 2021).

2. Literature Review

2.1. Digital Transformation

This section presents a general view of the existing literature regarding digital transformation. Vial (2019), in his review of digital transformation, identified 28 sources offering 23 unique definitions of digital transformation. Westerman, Calméjane, Bonnet, Ferraris and McAfee (2011) defined digital transformation as the use of technology to improve enterprises' performance radically. Meanwhile, Li, Su, Zhang and Mao (2017) said Digital transformation highlights the impact of IT on organizational structure, routines, information flow, and organizational capabilities to accommodate and adapt to IT. In this sense, digital transformation emphasizes the technological root of IT and the alignment between IT and businesses. Perkin and Abraham (2017), in their book Building the agile business through digital transformation, defined it as the transformation and reinvention of a company's resources, priorities, and processes to be fit for purpose in a digitally empowered world.

Goswami and Schuurmans (2022), in their meta-review of digital transformation, said the qualitative development of the terminology surrounding digital transformation has lagged behind the pace of technological changes. Two key terms that have emerged significantly during this hubbub are digitization and digitalization. These terms are often used interchangeably, but there is a difference in their respective meanings. Collins Dictionary (2022) on Goswami and Schuurmans (2022) defines digitization as turning information into a form that a computer can easily read. It can also mean converting a manual process into a digital one, like changing a paper form to an online version. The much-talked-about and ever-elusive "paperless office" is the pinnacle of digitization (Gobble, 2018 on Goswami & Schuurmans, 2022).

On the other hand, digitalization means utilizing digitized data to work more simply and efficiently. In a business context, it can also mean using digital technologies to alter the status quo of processes and practices (Accenture, 2021 on Goswami & Schuurmans, 2022). Digitalization is not the irruption of a new revolution but the pervasive synergy of digital innovations in the economy and society (Perez, 2015 on Goswami & Schuurmans, 2022). For instance, digitization can mean installing sensors in a machine operating in a manufacturing plant. But the operator can utilize the data collected to check for machine efficiency. The floor manager can monitor the data flow to predict upcoming maintenance schedules. The operations manager can use the same information to calculate production capacities and plan subsequent purchase orders. This utilization is what digitalization can offer to a business.

Reis and Melão (2023), in their meta-review of digital transformation, identified the most relevant thematic areas using the Scopus database. The research agenda focused on six dimensions, namely: 1) business models; 2) digital business; 3) technologies; 4) sustainability; 5) human resources; 6) smart cities. Similar to Rudito and Sinaga (2017), who said digital transformation is not simply chasing shiny new technology. They explain lessons contained in research conducted by Capgemini (2017). They said most companies were active with digital initiatives, but only a few had positioned themselves to capture real business benefits.

2.2. Organization Capabilities

Organizations and employees are encouraged to have remarkable capabilities in the digital era. However, as cited in Schreyögg and Kliesch-Eberl (2007), Collis (1994) remarked that the conception of capabilities has often been vague. This vague might be due to the absence of a definitive consensus regarding its meaning, specifically on

organizational capabilities. Some studies have claimed it as a form of 'core competence', while others claimed it as 'collective skills', 'best practices', or 'complex routines'. Nevertheless, many agree that the origin of organizational capabilities is derived from across the organization. It involves complex organizational processes that become a critical and strategic success factor.

Organizational capabilities can be induced by social interaction as a standard problem-solving method (Cyert & March, 1963, as cited in Schreyögg & Kliesch-Eberl, 2007), with the latter defined as "a sequence of generating complex combinations of cognitive and habitual acts" (Dosi, Hobday & Marengo 2003, as cited in Schreyögg & Kliesch-Eberl, 2007). In organizations, capabilities are synonymous with recognized and appreciated performances (Gherardi & Nicolini, 2002; Weinert, 2001, as cited in Schreyögg & Kliesch-Eberl, 2007). Capability is also explained as a system element as part of a complex enterprise system (McNaughton, 2022), as seen in Figure 1, which could be established in a different field and on varied organizational activity levels, such as departmental, divisional, or corporate levels (Cyert & March, 1963, as cited in Schreyögg & Kliesch-Eberl, 2007).

While McNaughton defined capability as an object's ability to realize an output that will fulfill that output's requirements through the interaction of the system elements, namely technology, process, and human (Figure 1), we believe that when the organization is changed through digital transformation, the people components becomes the center of the change itself. People are assigned to carry out processes and activities or make decisions using information systems and technology to deliver results. Along with performance which is an indicator of the success of digital transformation and digital ways of working, we propose attitudes the extension of people into attitudes to change, digital literacy, and digital culture that emerges amidst the existing corporate work culture become the variables of the proposed model.

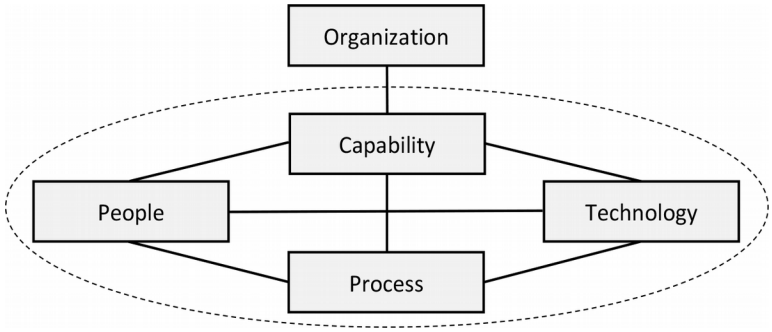

Figure 1. Organization capability as a system

3. Methodology

3.1. Research Design

This study aims to build and test the researchers' hypothesis about digital transformation. To address research questions and objectives, we use a mixed method using quantitative and qualitative approaches. A case study was conducted on Telkom, a state-owned technology-based company in Indonesia undergoing digital transformation. Telkom has four business functions: marketing, operation, business support, and R&D. There are 23.024 employees in the Telkom group. This case study employed a cross-sectional research approach by gathering data simultaneously and creating a "snapshot" of the digital transformation process in Telkom to examine a particular phenomenon. This study used a grounded theory approach to investigate the dimensions of digital transformation. The research design in detail is written in Figure 2.

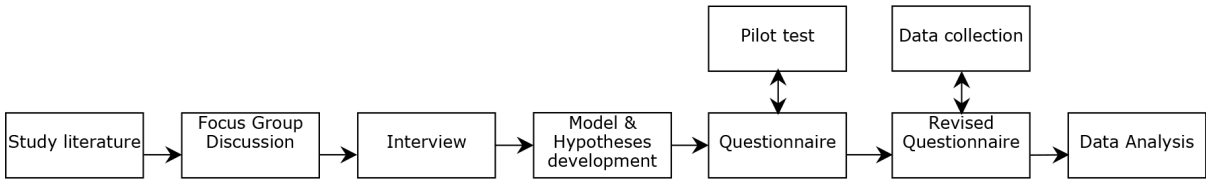

Figure 2. Research Design

3.2. Focus Group Discussions

The qualitative study was initiated in the form of exploratory focus group discussions to identify shareholder aspirations regarding the urgency of digital transformation and associates' perspectives on corporate transformation. During data collection, the researchers became observers. Participants invited by the shareholder came from 32 organizations with different roles: shareholder representative, commissioner, directors, and department head. Thus, 116 people participated in focus group discussions (Table 1). The FGD was divided into three sections.

1. The first section comprised a briefing attended by all respondents. The objective was to capture the shareholders' expectations and the broader perception of the importance of the company's transformation.
2. In the second section, the respondents were divided into five discussion groups. Three groups investigated the current situation of human capital in state-owned businesses. The other two groups examined the generational divide and digital transformation's future human capital state.
3. The third section, the panel discussion, featured representatives from each group explaining the conversation's outcomes.

Records and pointers were created for all group discussions. The essential keywords were encoded using Microsoft Excel and triangulated by auxiliary data analysis from scientific articles, company archives, and online news.

Roles	Number of participants
Shareholder representative	3
Commissioner member	29
CEO/HC Director/Transformation Director	56
VP/Department Head/ Corporate Secretary	28

Table 1. Focus group discussion participants

3.3. In-depth Interviews

As a continuation of data retrieval, the researchers conducted face-to-face in-depth interviews to validate and uncover more detailed information from the group discussions regarding cultural transformation and digital activity implementation. The interviewees (Table 2) were chosen experts who are recognized to have a high-level grasp of the issue and represent relevant business portfolios. The digital department represents the digital policy driver in the organization, the mobile director represents the highest revenue performance, and the consumer department represents the legacy business portfolio owner. The questions in the interview guideline were derived from the existing literature and group discussion result. Additional questions were added if they helped answer the overall research question. The guidelines included the following themes:

1. General questions about the interviewees' background to understand their expert status.
2. Questions about digital transformation strategy. Additional questions focused on what digital transformation means to them, their current digital transformation status, and how to build digital talent readiness.
3. Questions on how culture can accelerate digital transformation.

Recordings, pointers, and transcripts were produced for each in-depth interview. The essential keywords were then encoded using Microsoft Excel and triangulated using auxiliary data analysis from scholarly journals, company records, and online news.

Roles	Number of participants
Director	1
Head of the digital department	1
Head of the consumer department	1

Table 2. In-depth interview participants

3.4. Questionnaire

The questionnaire consists of 63 multiple-choice questions measured on a five-point Likert-type scale, where 1 = "strongly disagree" and 5 = "strongly agree." Included in the questionnaire were general and digital culture questions constructed by operationalizing each variable's conceptual aspects found in the qualitative studies. Meanwhile, digital literacy, attitudes toward change, and perceived performance were initially developed in English and translated into Indonesian. A back-translation approach was used to convert the questionnaire's measures from English to Indonesian and back to English to ensure that the measurement interpretation remained the same after the translations were done (Brislin 1980). A random sampling method was used to collect data from 383 respondents (Table 3).

Roles	Number of participants
VP/Head of Department	5
Senior/General Manager	26
Manager	27
Assistant Manager	15
Officer	310

Table 3. Questionnaire respondents

3.5. Data Collection and Analysis

The final research model consisted of four variables: digital culture, general culture, digital literacy, employee attitudes toward digital transformation, and perceived performance. We use this research model to develop a set of hypotheses about the relationships among four variables. The questionnaire also was developed by operationalizing these variables, which underwent validity and reliability tests and classical assumption tests to ensure its suitability for the study context. The quantitative study was next carried out to verify the hypothesis further, using data collected from questionnaires obtained from 383 participants. A random sampling method was used to collect data from 383 respondents. The data were analyzed using Structural Equation Modeling (SEM) to test the research hypotheses. The analysis was conducted using SPSS and LISREL software.

The validity of the questionnaire was tested using the Pearson product-moment correlation technique. Pearson correlation measures the strength of the linear relationship between two variables. In this study, the Pearson correlation coefficient was used to determine the correlation between the items on the questionnaire and the overall construct of each section.

The reliability of the questionnaire was tested using Cronbach's alpha coefficient. Cronbach's alpha measures the internal consistency of a set of items in a questionnaire. In this study, Cronbach's alpha was used to determine the reliability of each section of the questionnaire.

Ethical considerations were considered in the study, and informed consent was obtained from all participants. Data confidentiality and anonymity were also ensured throughout the study.

3.6. Research Model and Hypotheses

This study conducts a literature review for sub-variables supporting digital transformation to address research questions. The definition filtering from previous studies is grouped, validated, and confirmed by some professionals' judgments in a Focus Group Discussion (FGD) and in-depth interviews. We summarized the sub-variables representing relevant capabilities in digital transformation, and related definitions for each capability are as explained below:

1. Solid is the mental attitude to act based on a feeling, one mind or nation, and one action or body to accomplish common objectives built upon synergy, shared vision, and trust (Fahmi, Tjakraatmadja & Ginting, 2020).
2. Smart refers to the mental attitude to act intelligently to complete all work or assignments to achieve proud results. The behaviors that exemplify this value are understanding goals, setting priorities, and discovering new creative and innovative ways (Fahmi et al., 2020).
3. Competent is about continuous learning to develop capability. The behaviors demonstrating this value are improving self-competence to respond to the ever-changing challenge, assisting others in their development, and accomplishing duties with excellent quality (Ruzickova & Novak, 2010).
4. Loyal is being dedicated and prioritizing national interest. The behaviors that characterize this value are maintaining a good reputation with fellow employees, leaders, the company, and the nation, being willing to sacrifice to achieve a higher goal, and being obedient to the leader as long as it is not against the law and ethics (Pangastuti, Sondakh & Gunawan, 2020).
5. Learning agility is striving for self-development and improvement to understand and master new knowledge. Learns easily and quickly, is open-minded, and recognizes the strengths of others in their field. The behaviors representing this value are being a fast learner, adapting, agile, and receiving good feedback. Reflect and learn from mistakes (Lombardo & Eichinger on Bedford, 2011).
6. Visionary is the individual capability to produce original ideas about the future. The behaviors representing this value are visioning something new, pathfinding, and jumping into the unknown (Conger & Kanungo, 1994).
7. Willingness to take risks is the willingness to engage in potential risks at work (Wan, Ong & Lee, 2005).
8. Passion for trial and error is a strong personal motivation to open breakthroughs by finding the best way to achieve the expected results or the right solution by experimenting in one or more methods and by recording and discarding errors or causes of failure as well as experiments or one or more things to achieve success (Shirahada & Hamazaki, 2013).
9. Collaboration is a process in which two or more individuals share resources and skills to solve problems to achieve one or more goals jointly. It develops good relationships and models the importance of working together in a joint effort built upon teamwork, together, and cross-team (Boughzala & de Vreede, 2015).
10. Empowerment is the degree to which an individual has the authority, initiative, and ability to manage their work (Denison, 1990 on Çakar & Ertürk, 2010).
11. Operational proficiencies are skills in using digital technologies related to various types of content and activities using digital technology itself (Van Deursen, Helsper & Eynon, 2016).
12. Information navigation proficiencies refer to the formal and informational skill items developed when seeking information (Van Deursen et al., 2016).
13. Social proficiencies are defined as skills to socialize and communicate in activities through digital technology (Van Deursen et al., 2016).
14. Creative proficiencies are the skills to create acceptable content to be published online (Van Deursen et al., 2016).
15. Mobile proficiencies refer to unique skills related to mobile technologies (Van Deursen et al., 2016).
16. Cognitive refers to attitudes to respond to change based on one's awareness of digital transformation (Vakola, Tsaousis & Nikolaou, 2004, Dunham et al., 1989).

17. Affective refers to attitudes to respond to changes based on awareness of a person's reactive attitude that involves emotional feelings toward digital transformation (Vakola et al., 2004, Dunham, Grube, Gardner, Cummings & Pierce, 1989).
18. Conative refers to attitudes to respond to change based on a person's behavioral tendencies toward digital transformation (Vakola et al., 2004, Dunham et al., 1989).
19. Perceived individual performance is a subjective perception of an individual's performance based on the suitability of the requirements of a job to be carried out and its relationship to the company's activities (Salminen, Vanhala & Heilmann, 2017).
20. Perceived team performance is a subjective perception of a team performance based on the suitability of the requirements of a job to be carried out and its relationship to the company's activities (Salminen et al., 2017).
21. Perceived organization performance is a subjective perception of organizational performance based on the suitability of the requirements of a job to be carried out and its relationship to the company's activities (Salminen et al., 2017).

Afterward, we categorize the values based on the definition from the literature review. General culture represents the organizational culture as a fundamental aspect of established organizations (Schein, 2017), regardless of whether the organization's condition leads to digital transformation. Shein defined it as the original corporate culture built by a statement formulated as a way of working that appears in work behavior and impacts services, products, and performance. "Solid", "smart", "competent", and "loyal" are in this category. The existence of this culture is a legacy that is not only still needed but also supports the emergence of other cultures (Westerman, Soule & Eswaran, 2019).

Çetin-Gürkan and Çiftci (2020) state that organizations create a digital culture by adapting their culture to the new format to succeed during this challenging process. Culture is the essential element for the continuation of the core values and the participation of the employees with the least resistance. Thus, our research proposed the component of digital culture that is identified as being specific culture to respond to digital transformation (Ulusoy, 2020; Perkin & Abraham, 2017). These behaviors bind group members to work in organizational culture and become the same work pattern in undergoing digital transformation (Westerman et al., 2019). "Learning agility", "visionary", "willingness to take risks", "passion for trial and error", "empowerment", and "collaborative" are in this category. Digital transformation in the context of organizational change should be reflected in every individual member.

Digital transformation demands digital literacy from everyone. Digital systems and technologies vary in the appearance of user interface and user experience, functionality, and application, depending on the users and their needs. Thus, they are developed to drive the human intention to use the application. All these technologies are similar to being mobile and connected to the internet. Therefore, the authors brought up the digital literacy construct on the initial conceptual framework, which will look at various aspects of employee digital literacy using internet technology. Van Deursen et al. (2016) explained that the level of availability could be seen in the usage of internet technology, namely particular proficiencies such as "operational", "information navigation", "social", "creative", and "mobile".

Behaviors of employees in responding to organizational changes toward digital transformation become crucial. Choi (2011) explained constructs representing employees' attitudinal reactions specific to organizational change are readiness for change, commitment to change, openness to a difference, and cynicism about an organizational change. In another study, the authors found that Dunham et al. (1989) study specifically made instruments that directly measure attitudes toward organizational change. Dunham et al. (1989) defined attitudes to change as the support reaction of every member of an organization and measured with "cognitive", "affective", and "conative" in this category.

Measuring the performance of any organization is a difficult task. Traditionally, for performance evaluation, it is preferable to use objective measurements (Kim, 2005 on Pinho, Rodrigues & Dibb, 2014). However, when these are not available, the use of subjective measurements is also valid. Indeed, several authors prefer to use subjective or perceived performance measures due to the multi-dimensional nature of the construct (Venkatraman & Ramanujam, 1987 on Pinho et al., 2014). Based on the relevance to research objectives, the clarity factor in defining, and the easiness to measure, this research will refer to Salminen et al. (2017) definition and instrument, which aims

to see employees' subjective perceptions of performance at the individual, unit, and organization levels. The instrument developed by Salminen et al. (2017) consists of 3 dimensions which measure the "perceived individual performance", "perceived team performance", and "perceived organization performance". Elaborating on the empirical evidence and the definition of digital capabilities from some previous studies, the proposed variables and the sub-variables (indicators) of the conceptual model are:

1. Digital culture consists of learning agility, visionary, willingness to take risks, passion for trial and error, empowerment, and collaboration.
2. General culture consists of solid, smart, competent, and loyal.
3. Digital literacy consists of operational, information navigation, social, creative, and mobile.
4. Attitudes to change consists of cognitive, affective, and conative.
5. The perceived performance consists of perceived individual, team, and organization performance.

We conducted in-depth interviews with the ex-Directors and Vice President to confirm our argument and find that the variable general culture, digital culture, and digital literacy is needed to support attitudes to change toward digital transformation to get better-perceived performance. Based on those elaboration and confirmation activities, the new concept constructed from the selective variables is mapped in our proposed model, as shown in Figure 3.

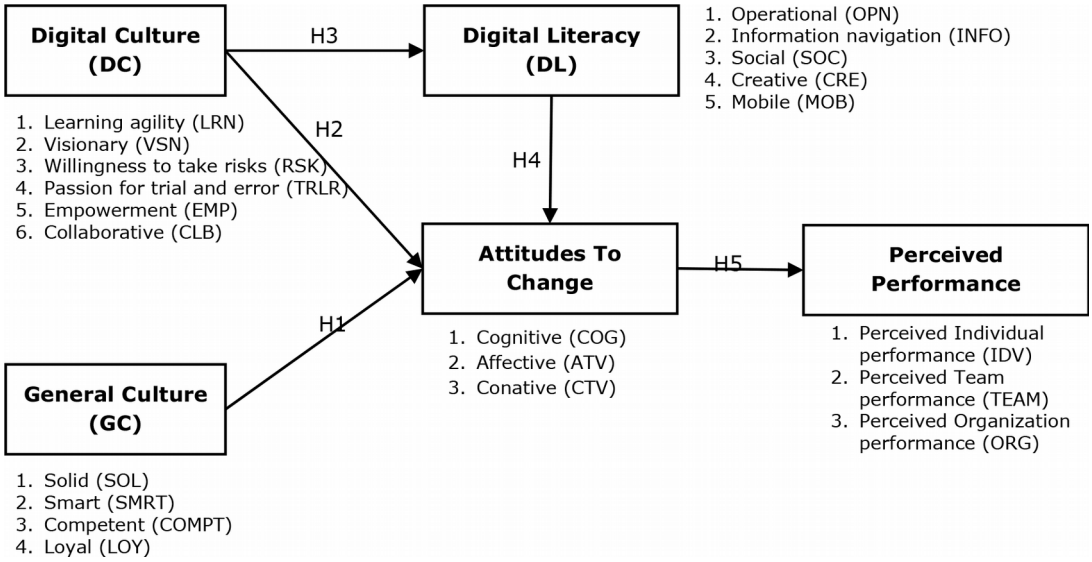

Figure 3. Digital Transformation Research Model

Figure 2 shows the digital transformation paradigm based on recent discoveries. Digital transformation is defined by Perkin and Abraham (2017) as the transformation and reinvention of a business's resources, priorities, and procedures to make them suitable for a digitally empowered world. The model in Figure 2 places changes in employee attitudes at the center of how organizational capabilities are changing due to the human capital aspect of the company's digital transformation. Several essential components of the digital transformation paradigm were identified by categorizing group discussions, interviews, and literature study data. The main factors are general culture, digital culture, digital literacy, attitudes toward digital transformation, and perceived performance. The details can be seen in Table 4.

Variables	Definition	Reference
General culture	The original corporate culture built by a statement formulated as a way of working appears in work behavior and impacts services, products, and performance.	Schein (2017)
Digital culture	A type of culture separates an organization from others and helps execute digital transformation.	Ulusoy (2020)
Digital literacy	The ability to use technology and know when and how to use it.	Ribble (2015)
Attitudes to change	An individual's tendency to feel, think or behave positively or negatively toward digital transformation.	Vakola et al. (2004)
Perceived performance	Subjective performance assessment based on a job's requirements and the company's activity suitability.	Salminen et al. (2017)

Table 4. Definition of variables

Additionally, Kane (2019) argues that most organizations that initiate their digital transformation by emphasizing technologies would often underperform. As part of their digital transformation, businesses that prioritize attitude shifts, employee behavior, and organizational processes experience a positive impact on their performance. Numerous business scholars, such as Rudito and Sinaga (2017), Capgemini (2017), Dery, Sebastian and Meulen (2017), and Hemerling, Kilmann, Danoesastro, Stutts and Ahern (2018), argue that people's behavior and culture are crucial success factors for digital transformation.

The research hypotheses from the Figure 3 model are formulated into six statements to prove our argumentations:

H1: There is a significant relationship between general culture and attitudes to change.
H2: There is a significant relationship between digital culture and attitudes to change.
H3: The influence of digital culture on attitudes to change is mediated by digital literacy.
H4: There is a significant relationship between digital literacy and attitudes to change.
H5: There is a significant relationship between attitudes to change and perceived performance.

The significance of these hypotheses will be proven in this research.

4. Result

This study uses 383 primary data. The study used the Structural Equation Modeling (SEM) method to get optimal accuracy and show details of the interrelationships between variables. By utilizing SEM, not only the causality relationship (direct and indirect) to the observed variables or constructs can be detected, but the magnitude of the components that contribute to the formation of the construct itself can be determined. Thus, the causal relationship between variables becomes more informative, complete, and accurate (Bollen & Bauldry, 2010). In this study, Lisrel 8 software was used to perform SEM testing.

The validity score of an instrument shows the magnitude of the collected data deviation from the described variables in the question list. The validity test is carried out concerning the accuracy of the measuring instrument so that it measures what it is supposed to measure. The instrument validity test in this study uses the Pearson Product Moment Correlation to determine the correlation between the scores of each item and the total score measured (Arikunto, 2010). According to the results, all validity scores are above 0.265 for the degree of freedom in 53 data samples of the pilot test and 0.113 for the degree of freedom in 383 in the actual data test. This condition means that all Pearson Scores are above alpha 1%, and all questions are relevant to this test.

Additionally, the scores from Cronbach Alpha Reliability Test (Heale & Twycross, 2015) are 0.813-0.958 in the pilot test (n=54) and 0.75-0.866 in the actual data test (n=383), depicting very high reliability ($0.6<coef\leq1.0$) for each question in this questionnaire and potentially receiving a similar response from each respondent.

In the actual test, the respondents have dominated employees in Operation Business Unit with level staff aged 26-30 years and have worked for 0 – 5 years, as shown in Table 5, in line with the composition of the population. This sample's figure represents the individual profiles in all process stages of the organization.

Demography		Number of Respondents	% Number of Respondents
Business Unit	Marketing	10	3.0%
	Operation	238	62.0%
	Business Support	70	18.0%
	Research and Development	65	17.0%
Job Level	Senior VP	5	1.3%
	General Manager / VP	26	6.8%
	Manager	27	7.0%
	Supervisor	15	3.9%
	Staff	310	80.9%
Age Range	21 - 25 years	126	32.9%
	26 - 30 years	160	41.8%
	31 - 35 years	24	6.3%
	36 - 40 years	21	5.5%
	41 - 45 years	11	2.9%
	46 - 50 years	17	4.4%
	>50 years	24	6.3%
Working Experience	0 - 5 years	302	78.9%
	6 - 10 years	12	3.1%
	11 - 15 years	23	6.0%
	16 - 20 years	9	2.3%
	>20 years	37	9,7%

Table 5. Profile of respondents

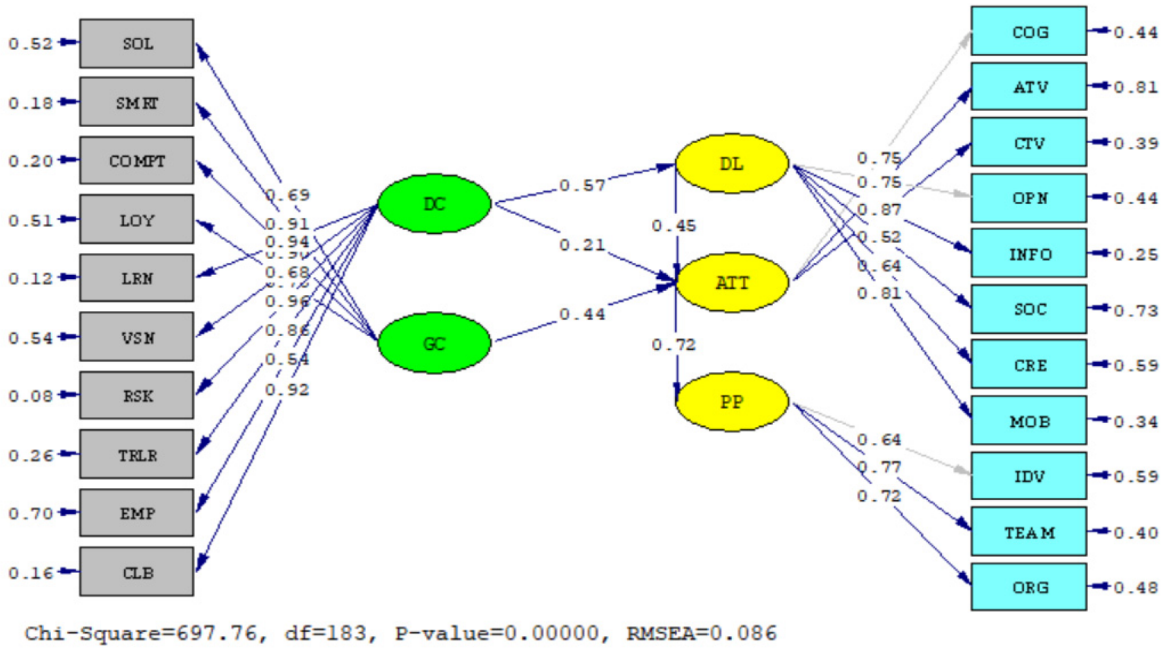

Figure 4. Structural Equation Modelling

Goodness of index	Cut Off Value	Questionnaire	
		Estimation Results	Model Evaluation
Chi-Square /(df=608)	< 215.56	697.76	Not Fulfilled
Probability	> 0.05	0	Not Fulfilled
CMIN/DF	< 2.00 pm	3.81	Not Fulfilled
GFI	> 0.93	0.85	Not Fulfilled
RMSEA	≤ 0.08	0.08	Fulfilled
AGFI	> 0.90	0.81	Not Fulfilled
CFI	> 0.90	0.96	Fulfilled
NFI	> 0.90	0.95	Fulfilled

Table 6. The Goodness of Fit Result

Hypothesis	Influence	Coefficient	t-value	Conclusion
		Questionnaire		
H1	GC - ATT	0.44	4.98	Support
H2	DC - ATT	0.21	8.19	Support
H3	DC - DL	0.57	9.89	Support
H4	DL - ATT	0.45	779	Support
H5	ATT - PP	0.72	9.28	Support
H6	DC – DL - ATT		6.12	Support

Table 7. Significance test result

SEM is the appropriate technique to ensure the model obtains an acceptable level on the specified criteria (Hair, Black, Babin, Anderson & Tatham, 2014). Several models of SEM with different configurations have gone through simulations using the Lisrel. The model illustrated in Figure 4, which represents the proposed conceptual model in Figure 3, is proven to be the most superior among other models, as it has a GFI value of .85, RMSEA value of .08, AGFI value of .81, CFI value of .96, and NFI value of .95. In general, the model is good enough because 3 of 8 criteria were following the condition for the goodness of fit (Ghozali, 2008; Suryani, 2015) which is detailed in Table 6. Finally, as shown in Table 7, the results yield that H1, H2, H3, H4, H5, and H6 are supported.

This study also used a web-based, automated version of the Sobel exam to examine the effect of mediating variables on some connections between variables. The test aims to identify whether a mediator influences the impact of an independent variable on a dependent variable (Sobel, 1982). To detect meaningful mediation, the t-value of Sobel must be sufficiently significant with a p-value less than 0.05. The mediating effect that occurred in this investigation is the variable DL which mediates the relationship between independent factors DC and the dependent variable ATT. The Sobel test results showed that DL fully mediates the relationship between DC and ATT ($t=6.754$; $p<.05$), which occurred when the calculation involved GC.

5. Discussion

This study examines how general culture, digital culture, and digital literacy can affect employees' attitudes toward change and improve perceived performance in a company undertaking digital transformation. First, there is a significant positive relationship between general culture and changes in attitudes toward digital transformation. A general culture that supports change and innovation can influence employees to be more open to digital organizational changes. Second, a significant positive relationship exists between digital culture and changing attitudes. This relationship shows that organizations with a digital-oriented culture encourage employees to adapt and be open to digital changes. Third, the influence of digital culture on changing attitudes towards digital

transformation is mediated by digital literacy. This relationship means digital literacy is essential in connecting digital culture with employee attitudes toward digital transformation. Fourth, there is a significant positive relationship between digital literacy and changes in attitudes toward digital transformation. This relationship shows that employees with higher digital literacy tend to be more open and ready to face digital changes in the organization. Fifth, a significant positive relationship exists between changes in attitudes toward digital transformation and employees' perceived performance. This relationship shows that a positive employee attitude toward digital transformation can improve organizational performance. These findings suggest that general culture, digital culture, digital literacy, and employee attitudes are vital in shaping employee attitudes and readiness to deal with digital change in organizations. Therefore, organizations must address and manage these factors effectively to succeed in digital transformation.

Employee perceptions of the digital transformation in the organization are the first step in forming a new organizational culture. Employee perceptions can be influenced by various factors such as knowledge, behavior from the work environment, previous work experience, and personal values. After understanding the changes, employees form a mindset toward these changes. Then the mindset creates employee beliefs and expectations as the digital transformation results. Mindset can then influence employee behavior in dealing with digital transformation. Employees with a positive mindset will likely exhibit proactive behavior and adapt quickly to digital transformation. Conversely, employees with a negative mindset will probably show passive behavior or reject digital transformation.

Employee behavior with digital values and skills can then form digital attitudes, which are employee evaluations or assessments of digital transformation. A positive attitude can increase the likelihood of successful change, while a negative attitude can hinder change. The formation of attitudes can then affect the cognitive components of employees, namely their knowledge and understanding of digital transformation and its goals. Employees who have a positive attitude will likely have a better understanding of digital transformation and its goals. The conative component or action tendency emerges when employees respond to digital transformation based on their knowledge and attitudes. Employee action tendencies can form consistent behaviors and attitudes in digital transformation. The affective or emotional component arises when employees respond to digital transformation with certain feelings such as excitement, anxiety, or confusion. Emotions can influence employee perceptions, attitudes, and behavior in dealing with digital transformation.

When all these components are well formed, employees can develop an organizational culture oriented towards change and innovation. A strong and even organizational culture will help employees improve their performance and face challenges and take opportunities that arise in the transformation process.

According to the survey, 93% of respondents aspired to work for a professional, adaptable, and flexible organization. Few individuals consider jobs that are characterized by extensive bureaucracy and rigid rules. Moreover, 63% of the respondents admitted that they felt like working in a private company rather than an SOE. This working atmosphere might be caused by the enforced changes in work behavior and culture due to digital transformation, which contradicts the expected corporate culture of SOEs. Moreover, SOE managers are prone to being bureaucratic and rule-abiding because of their frequent interactions with the government, claimed Wong (2006). The discrepancy between reality and the findings of earlier studies is attributable to changes in employee behavior and workplace culture.

Interestingly, digital culture was shown to have little influence on attitudes toward change (Sig. >.05). However, when the calculation involves general culture, digital literacy fully mediates it ($p<.05$). The solid digital proficiency of employees also supports this finding. Additionally, on average, workers in our sample have a minimum score of 4.3 for all components of digital literacy in technology. This research indicates that digital culture can only impact a person's attitudes toward digital transformation if IT is followed by digital literacy. If digital capabilities and technology utilization follow suit, the culture-shifting brought about by the new digital transformation will impact performance.

Digital transformation does not only require technology usage as a technical skill but also as a soft skill to acquire. Technical skills include adapted processes, procedures, digital technologies, and operational skills for assisting workers across all business units. In the meantime, soft skills are also necessary to maintain market competitiveness.

Burchardt and Maisch (2019) advise enterprises to dismantle organizational silos and coordinate among groups through open communication and collaboration. The new digital and open platform may simplify early and ongoing customer interaction, exchange, and testing. Ipinazar, Zarrabeitia, Belver and Alegría (2021) also recommend that organizations instigate open communication within teams to ensure better performance in cultural change management.

Increased innovation pace and open communication with the essential digital transformation process stakeholders can also help to strengthen attitudes to change. Due to the growing significance of digitalization, the pressure of global competition, and the dynamic changes, businesses must become more customer-centric and utilize technology more effectively to accelerate internal operations and new product development. Companies adapt their working practices to stay competitive and change their tools, methods, and processes to implement their new strategies. This new way of working, mindset, values, and behavior shape the digital culture. It is reinforced by employees' attitudes towards digital transformation, with an average score above 4 in cognitive, affective, and conative aspects.

Although there are numerous perspectives on digital culture, employees are not accustomed to experimenting in their daily work. This supposition is supported by the average degree of conformance (2.6) among 383 responders to trial-and-error instruments. Employee survey respondents generally lacked the personal drive to carry out tests for ground-breaking inventions. This discovery may present a challenge for an organization undergoing digital transformation. Due to the increasing demand for innovation, employees must be confident enough to take the initiative and use innovative strategies to address business difficulties impacting employee performance.

The above hypotheses are proven empirically in Telkom with the business functions of marketing, operations, business support, and R&D. These findings can be generalized to companies in general. These findings are based on fundamental factors in digital transformation, such as culture, digital literacy, and employee attitudes. These factors are also relevant for other companies undergoing digital transformation. Therefore, these findings can be applied to companies experiencing digital transformation in general. However, each company has a unique context and characteristics, so these findings need to be adapted to the context and characteristics of a particular company. In addition, companies wishing to implement these findings must assess these factors and adopt them effectively to ensure success in digital transformation.

As part of the managerial implications of this research, practitioners can accelerate digital transformation by enhancing employee competence to use digital technology and changing attitudes toward digital transformation in the internalization process. Collaboration-based applications and other technologies can facilitate a digital culture in daily professional activities. Another example of technology that can cover the hidden aspects of behavior changes is machine learning. Additionally, having a well-defined business culture that supports digital transformation is critical. Managers should also increase their tolerance for mistakes to encourage employees to adapt and become accustomed to trial-and-error in experimenting with developing an innovative environment to boost performance.

6. Conclusion

Overall, the findings of this study support the importance of digital literacy and the values of the culture in shaping employee digital attitudes towards digital transformation initiatives, as well as the positive impact of employee behavior on company performance. Employee behavior with digital values and skills can then form digital attitudes. Those attitudes can be leveraged effectively to advance digital transformation or provide resistance. Our results indicate that employees with higher levels of digital literacy are more likely to embrace digital transformation initiatives. Positive attitudes toward digital transformation can be fostered through a culture change that promotes digital values. As such, digital culture might be another shifting corporate culture dimension that has become part of employee mindsets and behaviors. Additionally, we found that emotions such as fear, anxiety, and confusion can negatively impact employee attitudes toward digital transformation, highlighting the importance of addressing emotional concerns when implementing digital transformation initiatives.

In terms of contributions to theory, this study adds to the growing body of literature on digital transformation by highlighting the important role of digital literacy and organizational culture in shaping employee attitudes toward digital transformation initiatives. Our findings also support that employee digital behavior can improve company performance in the digital transformation era.

Regarding managerial contributions, our findings suggest that organizations should invest in digital literacy training to improve employee attitudes toward digital transformation and foster innovation and experimentation to create a positive environment for digital transformation initiatives. Additionally, organizations should address emotional concerns such as fear, anxiety, and confusion to implement digital transformation initiatives successfully.

One limitation of this study is that it focused only on the context of Telkom Indonesia. Further research is needed to determine if our findings are generalizable to other industries or contexts. Additionally, our study relied on self-reported employee data, which may be subject to bias or social desirability effects.

For future research, we suggest further exploration of the emotional aspects of digital transformation, such as how emotional intelligence may influence employee attitudes toward digital transformation initiatives. Additionally, it may be useful to investigate using subconscious measurements of employees' mindsets and behaviors to get results that may be free from bias. Finally, longitudinal studies could be conducted to determine the long-term impact of digital transformation on company performance.

One company that has successfully undergone a digital transformation in the manufacturing industry is Siemens. Siemens has implemented various digital technologies, such as automation, artificial intelligence, and the Internet of Things (IoT), to optimize production processes, increase productivity, and improve customer experience. Siemens' success in digital transformation can be attributed to its focus on digitalization, culture, and employee behavior. The company has invested in employee digital literacy training, creating a culture that values innovation and experimentation and encouraging employee adoption of digital technologies. These activities include shifting from the current culture to a more digital, entrepreneurial one, dealing with a lack of digital talent, working in cross-functional teams where silos have been the norm, meeting accelerated timelines due to higher customer expectations, and accepting evolving target states instead of fixed goals (Sailer, Stutzmann & Kobold, 2019). This business case highlights the importance of digital transformation in the manufacturing industry and how companies can successfully navigate the challenges and opportunities presented by digital disruption.

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Appendix. Survey result

Indicators	Items	Percentage of Response per Question				
		5	4	3	2	1
Solid	Colleagues in my division and I are happy to complete a new assignment.	56.7%	35.8%	6.8%	0.8%	0.0%
	I have the same vision as my colleagues in initiating business change.	46.7%	45.2%	6.0%	2.1%	0.0%
	My colleagues and I are implementing changes based on the same goal.	51.2%	43.9%	3.7%	1.3%	0.0%
Smart	I can quickly find new business opportunities through digitization initiatives in my unit.	38.1%	48.3%	12.3%	1.0%	0.3%
	I prioritize completing more critical and urgent tasks when several tasks must be completed simultaneously.	69.7%	27.4%	2.6%	0.3%	0.0%
	I work according to the habit even though I am in a condition of accelerating the achievement of targets. (R)	11.0%	43.6%	12.5%	17.8%	15.1%
Competent	I am trying to pass certification to better answer new business challenges.	67.1%	31.3%	1.6%	0.0%	0.0%
	To speed up the completion of teamwork. I take over the work of slow-working subordinates. (R)	4.7%	26.1%	25.1%	31.3%	12.8%
	I improvise my efforts to achieve the target set in the Management Contract.	41.5%	48.0%	8.6%	1.3%	0.5%
Loyal	I will try to straighten out when friends post negative information about the company.	49.1%	43.6%	6.0%	0.5%	0.8%
	I will re-share information on national digital literacy activities on my social media.	34.7%	44.1%	18.0%	2.9%	0.3%
	I would not ask for overtime if I was in a position to work with a vendor late into the night.	33.9%	31.6%	24.3%	8.6%	1.6%
Learning Agility	I look for new information/knowledge and learn it when a task is outside my expertise.	61.4%	36.6%	1.6%	0.5%	0.0%
	I am fixing how I work when the monthly target is not achieved.	59.0%	38.9%	1.8%	0.3%	0.0%
	I ask for feedback from superiors to correct my mistakes.	58.2%	38.1%	3.4%	0.3%	0.0%
Visionary	During sharing sessions, I confidently share ideas that have a long-term impact.	43.9%	43.6%	12.0%	0.5%	0.0%
	I often mention new business opportunities for the company in every discussion with colleagues.	35.2%	46.2%	16.7%	1.6%	0.3%
	I consistently develop breakthrough ideas as part of the unit's work plan.	36.8%	45.4%	17.0%	0.8%	0.0%
Willingness To Take Risks	I refuse to change my business process from offline to online if the customer is not ready to accept the change. (R)	9.4%	38.4%	27.9%	16.7%	7.6%
	To create a climate of innovation, I tolerate unintentional co-workers' mistakes, even though they risk reducing the team's overall performance.	13.1%	43.9%	22.5%	15.7%	5.0%
	I do not worry about being considered a failure when trying to innovate in my work.	38.9%	46.5%	10.2%	2.6%	1.8%

Indicators	Items	Percentage of Response per Question				
Passion For Trial And Error	I'm still looking for alternative causes of a problem, even though it takes longer.	36.6%	54.6%	6.3%	2.6%	0.0%
	Despite repeated failures, I often continue to analyze the causes of these failures without hesitation (R)	0.0%	0.8%	4.4%	49.1%	45.7%
	Despite the deadline, I'm deeply considering implementing an idea I've tried before. (R)	1.8%	12.3%	15.9%	46.0%	24.0%
Empowerment	I'm allowed to make decisions in critical situations even though I'm not the leader	20.1%	45.4%	21.1%	11.5%	1.8%
	I am empowered to make decisions because I have information	18.0%	40.7%	28.2%	11.7%	1.3%
	I can be involved in long-term planning even though it is not my obligation.	24.3%	53.3%	18.8%	2.9%	0.8%
Collaborative	I encourage teams to work across fields (multi perspectives) when completing new projects.	42.0%	47.5%	7.6%	2.3%	0.5%
	I take the initiative to build relationships to collaborate between divisions when I get a new assignment	53.5%	43.6%	2.6%	0.3%	0.0%
	I will allow two parties with different opinions to find their common ground as a learning process for both (R)	1.0%	3.7%	7.3%	48.3%	39.7%
Cognitive	I think digital-themed ideas can help a unit's work program succeed.	56.4%	37.6%	5.5%	0.3%	0.3%
	Digital technology can improve the quality of work, although it takes time to learn and implement.	62.1%	36.0%	1.6%	0.3%	0.0%
	I think the digitization process can increase job satisfaction.	67.6%	30.0%	1.8%	0.5%	0.0%
Affective	I am excited when companies implement business process digitization in my work environment.	67.9%	29.2%	2.6%	0.0%	0.3%
	I find my job more difficult when companies carry out digital transformation. (R)	44.1%	32.1%	7.8%	8.1%	7.8%
	I feel left out in an environment that is undergoing digital transformation. (R)	51.7%	32.1%	4.4%	7.0%	4.7%
Conative	I am trying some new digital-based applications to support my recent work.	55.9%	41.0%	2.9%	0.0%	0.3%
	I immediately tried and took advantage of the company's new application.	54.8%	41.5%	3.4%	0.3%	0.0%
	I share my skills in operating new applications with other co-workers.	54.6%	41.5%	3.7%	0.3%	0.0%
Operational	I can use shortcuts (hot keys) when operating my laptop/computer (e.g., F1/F2 keys).	54.8%	34.5%	9.1%	1.3%	0.3%
	I can bookmark (bookmark) a website that is opened on my computer.	73.9%	21.4%	3.7%	0.8%	0.3%
	I can change the privacy setting in the browser application of my computing device.	58.0%	30.3%	7.8%	3.7%	0.3%
Information Navigation	I can choose the appropriate keywords when searching for information online.	73.6%	24.8%	1.3%	0.3%	0.0%
	I can find data/information quickly and accurately online.	68.4%	28.5%	3.1%	0.0%	0.0%
	I can compare data/information obtained from various search engine results (search engines)	63.4%	29.8%	6.0%	0.5%	0.3%

Indicators	Items	Percentage of Response per Question				
Social	I can set social media settings on who is allowed to see my posts.	77.5%	19.8%	1.8%	0.8%	0.0%
	I do not filter my comments on a post on social media (R)	43.3%	21.9%	9.1%	11.7%	13.8%
	I sort out the information worth posting on social media	78.1%	20.1%	1.8%	0.0%	0.0%
Creative	I can create content (writing/image/video/sound) resulting from my ideas to be published on the internet.	54.8%	31.9%	12.0%	1.3%	0.0%
	I can modify the content (text/image/video/sound) that I get on the internet.	46.5%	34.7%	14.9%	3.7%	0.3%
	I use several applications in creating content (text/image/video/sound).	58.0%	33.7%	6.5%	1.8%	0.0%
Mobile	I can install the apps I need on my phone independently	81.2%	17.8%	1.0%	0.0%	0.0%
	I can adjust the display settings of the mobile phone screen according to my wishes	82.0%	17.0%	0.8%	0.3%	0.0%
	I can synchronize my account into several applications/programs on my mobile phone independently	74.2%	20.9%	3.7%	1.3%	0.0%
Perceived Individual Performance	I am satisfied with my performance in dealing with new assignments.	48.0%	41.0%	9.1%	1.3%	0.5%
	I am satisfied with the new ideas that I shared in the meeting.	40.5%	42.0%	16.2%	1.0%	0.3%
	I am satisfied with my performance being able to complete tasks faster than co-workers.	43.1%	39.9%	15.9%	0.8%	0.3%
Perceived Team Performance	I think the people in my work environment successfully achieve their goals.	42.0%	48.3%	8.6%	1.0%	0.0%
	I think the people in my work environment successfully open up new business opportunities.	33.7%	50.7%	13.6%	2.1%	0.0%
	I think the people in my work environment successfully capture consumers' future needs.	38.9%	49.3%	10.4%	1.3%	0.0%
Perceived Organization Performance	I am proud of the company's quality of service to customers.	40.7%	43.6%	13.1%	2.1%	0.5%
	I am satisfied with the company's policy of rewarding outstanding employees.	46.0%	39.2%	10.2%	3.9%	0.8%
	I am proud of the company's product development.	54.0%	37.6%	7.0%	1.3%	0.0%

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