

The Relationship between Digital Leadership and Digital Culture towards Human Capital Readiness in the Industry 4.0 Era: A Case Study of Talent in Financial State-Owned Enterprise

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ABSTRACT : *In today's digital age, leadership has evolved to become more complex and challenging. Digital leadership refers to the ability of leaders to effectively manage and leverage digital technologies to drive organizational success. Strengthening digital culture is also one of the elements that is considered by this organization in digital transformation agenda. which is now taking place from traditional banking to a champion of financial inclusion. The company's culture has an impact on how well its personnel have readiness in industry 4.0. Human capital readiness in industry 4.0 era can be raised through good implementation of digital leadership and digital culture. SPSS was used to process the quantitative research approach and enriched by discussion to organization's counterparts in this study. The findings indicate a strong relationship between human capital readiness in industry 4.0 with digital leadership and digital culture. The indicator of Hard Skill & Soft Skill stated in the not ready category. It shows how strategic management' readiness for their capacity to adapt to changes made in their organizational environment. It is crucial to increase this dimension. In the analysis, found that the Readiness of Human Capital on the Hard Skill & Soft Skill can be influenced by other components with the lowest average. Despite digital leadership & digital culture scores in a very good result, there are some indicators that put the significant-below averaged score. The indicator is digital supportive behavior from digital leadership variable, and also digital innovative culture & open culture from digital culture variable. It was also confirmed by FGD with management that those factors put some influence on human capital readiness in industry 4.0.*

KEYWORDS - *Digital Culture, Digital Leadership, Leadership, Human Capital Development Human Capital Readiness.*

I. INTRODUCTION

In today's digital age, leadership has evolved to become more complex and challenging. Digital leadership refers to the ability of leaders to effectively manage and leverage digital technologies to drive organizational success. It involves a combination of technical knowledge, strategic thinking, and people skills to navigate the complexities of the digital landscape.

Digital leadership is critical for organizations to remain competitive and relevant in today's digital landscape. It requires leaders to have a deep understanding of emerging technologies, customer behaviours, and market trends, and to be able to leverage them to drive innovation, efficiency, and growth. By embracing digital transformation, organizations can improve their customer experiences, optimize their operations, and create new revenue streams.

As a part of State-Owned Company, every entity should also go with the Ministry's agenda. They order this company to be stay-relevant by involving digital transformation agenda. With AKHLAK core values as foundation, they aim to make this financial SOE more powerful, not only micro-based banking but also extensive to serving Indonesians to other sustainable services. Those agenda need to be brought by a fit leader. Leaders who not only culture fit with AKHLAK, but also competency-fit with their requirement. One of the required competencies is, digital leadership.

Based on initial FGD, digital leadership is one of their focus on development for top management. It considered as future competency for top management (Band-1 & Band-2 Management), information about their agenda in digital transformation. The movement is to internalize the digital culture until the root.

II. LITERATURE REVIEW

II.1 Theoretical Foundation

II.1.1 Leadership in Organization

In order to attain organizational effectiveness, organizations have shifted away from the use of hierarchical structures and individualized jobs, and implemented team-based work structures. Therefore, in

today's complex business world, one of the major concerns of organizations is motivating employees for initiative and cooperation in order to attain effective organizational functioning. The concept of leadership has evolved and developed due to numerous organizational and environmental changes (Alonderiene & Majauskaite, 2016). Several studies have been carried out to assess the effect of leadership on the performance of organization and how organizational variables such as culture, employee effectiveness, satisfaction, performance, retention, and motivation are influenced by various leadership styles. Transformational leaders provide change and movement in an organization. They emphasize new possibilities and promote a compelling vision of the future to minimize resistance to change. Transformational leaders manifest passionate inspiration, and visibly model appropriate behaviors while transformational leaders are briefly referred to as change agents.

II.1.2 Digital Leadership

To put into transformation context, digital transformation of organizations can only be achieved through people, who manage the process of transformation and who can assure the sustainability of organizations (Estensoro, Larrea, Müller & Sisti, 2022). Digital leaders are mostly considered as people who are responsible to carry organizations successfully through digital transformation, but what they mean for the organizations is above this. The definition of digital leadership has changed in line with different stages of digitalization: In the beginning of digitalization, digital leadership meant just leading by using ICT (Information and Communication Technologies) to support existing organizations (Li, Liu, et.al 2016), whereas today digital leadership means leading in a knowledge-based society consisting of digital business models and digital organizations (Oberer & Erkollar, 2018). According to Klein (2020), digital leadership involves both leading the digital transformation of an organization and leading the organization in a digital. Most of the companies are still in the middle of their digital transformation process and leadership plays an important role in the successful adaptation to changes induced by digital transformation (Li et. al, 2016). As the digital transformation of organizations progresses, digital leadership will increasingly mean leading a digital organization. Thus, digital leadership characteristics will have to pay attention to both aspects.

Digital leaders must have the ability to develop new business models, to set external customer focus and have ecosystem-centric and end-to-end business understanding (Durmuş, 2019). The balance between new and old must be maintained during digital transformation. That's why one of the characteristics of digital leadership is ambidexterity. The digital leader ambidexter strikes a balance between new and existing business areas, between modern trends and past traditions, and between innovation and integration (Klein, 2020). Digital transformation projects involve multiple employees, external partners and customers. The characteristic of digital leadership that is needed to balance in such a diverse social group is social intelligence. Social intelligence is the ability to listen, anticipate, dialogue, integrate, care and work with others. That is, digital leaders must be user-centric and treat employees and customers with empathy. The digital world can be characterized by transparency, because all kinds of information are available anytime and anywhere. To adapt to this situation, another digital leadership characteristic that is needed is openness. Transparency means having transparency in any communication. Digital leaders must ensure to establish an open and transparent atmosphere in the company between employees and outside the company with partners and customers (Vayre, 2022). Besides, digital leaders bring companies keep lasting competitive advantages and profitability in the competition, and realize the coordinated development of economic, environmental, and social benefits through the improvement of resource utilization and the strengthening of ecological efficiency with concern of sustainability.

II.1.3 Digital Culture

Sustainable digital transformation cannot work without the right business environment to support rapidly changing projects. All change practices and processes should have certain building blocks and motives to succeed. To integrate it, there is the great importance in the digital transformation processes with two arms, both technological and managerial, to be implemented successfully. This requires a change in organizational culture norms and a more flexible and flexible adaptation to change (Abdallah 2022). Digital culture explains technology and the internet are responsible to how we interact, behave, think and communicate as humans in society. With the support of digital culture in the company, it can help the company to change their paradigm towards a mindset that works effectively, and it is one of the most important factor in digital transformation. A study shows that the level of success of companies in carrying out digital transformation is driven by digital culture and the existence of digital maturity level (Clarke, 2018).

II.1.4. Human Capital Readiness on Industry 4.0

Based on Hendarman et al., (2020), the study reveal that industry companies improve their employees' knowledge and skills related to Industry 4.0. Knowledge, skills, and values that can be applied to gain competitive advantage constitute human capital. Human capital's ability to implement organizational plans

determines its value. The success of a company's performance is greatly influenced by the readiness of its human resources. Human capital readiness refers to the ability of employees to support internal business processes to implement corporate strategy. (HRCI Kaplan and Norton, 2020). The first step in preparing your human resources is to determine the skills employees need to complete each critical internal process on your organization's strategic map.

II.2. Conceptual Framework

Conceptual framework gives the author ideas coherence, making it simple to explain how and why the authors ideas are important in relation to other existing bodies of knowledge in the research domain. In order to define the emphasis and direction of the research, the conceptual framework lays out the important concepts in the investigation. The basic concepts used in this study come from theory & literature (Shikalepo, 2020). In this research, a conceptual framework is built by study literature process in chapter 2.

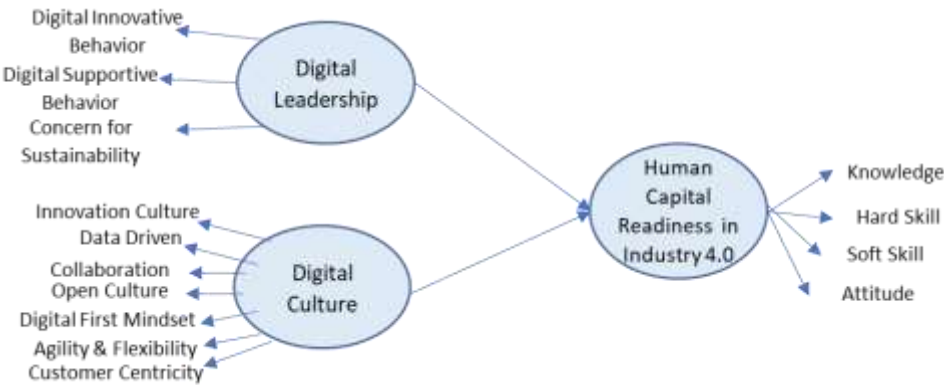


Figure II.1 Conceptual Framework (Author, 2023)

III. RESEARCH METHODOLOGY

III.1 Quantitative Approach: Questionnaire

To bring a better comprehension of Company's effectiveness as an organization and in attaining their goals, the author employs the quantitative method research technique. It also offers company the alternative choice to support them in digital transformation agenda. Because this study used primary data, there are several issues and commercial constraints that cannot be fully described. The Sampling Method was used to conduct a survey in order to obtain the data. The sampling technique is the process used to get samples from people who will serve as responders or study participants. The benefit of utilizing this sample technique is to lessen the possibility of systematic mistake and sampling bias (Datta, 2018). Because there are several genuine populations in company Top Managerial Talent, probability sampling is used in this study to obtain a sample that is representative of the entire population. The number employees of company who were considered as Top Managerial Talent 2023 (level VP up) is Fifty Three (53) individuals as a whole made up the population for this research survey. The Slovin Formula is employed by the author to obtain an accurate population sample. The questionnaire to measure digital leadership, digital culture, and human capital readiness in industry 4.0 with the questionnaire statement using six (6) points Likert. Scale 1 means strongly disagree whereas scale 6 means strongly agree. The question emphasized as below:

No	Indicator	Code	Question
1	Digital Innovative Behavior	IN1	Has an innovative vision.
		IN2	Has the ability to build and coordinate teams quickly.
		IN3	Has up-to-date knowledge and skills about digital technologies and digital transformation.
		IN4	Acts proactively in the digital transformation process in the organization.

		IN5	Balances new and existing business areas, modern trends and past traditions, and innovation and integration.
		IN6	Finds ways to attract new digital talent to organization
2	Digital Supportive Behavior	SU1	Encourages employees when encountering difficulties in the digital transformation process.
		SU2	Acts as a guide and role model for those who work in the digital transformation process.
		SU3	Focuses on employees' wellbeing during digital transformation.
3	Concern for Corporate Sustainability	SB1	understand the development direction of the company
		SB2	understand how to build a digital framework, have digital strategic ideas, and formulate appropriate enterprise systems with a digital transformation background.
		SB3	am able to use communication technology and digital technology to upload and release information and data.
		SB4	am able to use communication technology, digital technology to build, motivate and maintain the digital capabilities of the team.
		SB5	am able to use visual data to carry out a detailed analysis of the capabilities of the company's team, to leverage the team's potential and continuous development capabilities in a targeted way.
		SB6	am able to use communication technology and digital technology to improve management efficiency, improve work patterns, and improve production technology.
		SB7	use digital technology to monitor the company's operations in real-time, observe the internal situation of the company, understand the progress of work tasks, and track the flow of personnel and products.
		SB8	have direct dialogue to provide feedback to the employee team for development purposes.
		SB9	ensure communication between employees to ensure the prompt exchange of ideas, thereby increasing their enthusiasm for innovation.

		SB10	maintain the conduciveness of the team by absorbing members who have cultural backgrounds using a digital approach.
		SB11	carry out control and real time detection for teamwork in order to maintain the reputation of my unit and company.
		SB12	use technology to help understand the financial status of companies.
		SB13	use technology to help gather internal & external information (industry, society, etc.) to further the company's agenda.

Table III.1. Digital Leadership Question
reference: Klein (2020) & Liu (2022)

No	Dimension	Code	Question
1	Innovation Culture	IC1	has shown a quick response to changes
		IC2	already have the mindset to continue to produce innovation
		IC3	has the ability to generate innovation in his work
		IC4	Dare to realize the creative ideas of thoughts.
2	Data Driven Decision Making	DD1	has understood the data security policy
		DD2	has been accustomed to complying with data security policies.
		DD3	has demonstrated responsibility for the data it manages.
		DD4	Accustomed to making objective decision-making based on data
		DD5	accustomed to using the cloud for data transparency by paying attention to access security.
3	Collaboration	C1	already has an awareness that the work in the unit is related to many other units.
		C2	has been accustomed to building various opportunities for cooperation with external parties.
		C3 is	already accustomed to utilizing technology that facilitates collaboration without space and time limits

4	Open Culture	OC1	openly accepts new ideas and thoughts.
		OC2	is accustomed to analyzing various information from various points of view in making decisions
		OC3	has demonstrated open behavior towards dissent
		OC4	Don't hesitate to give your opinion to your superiors
		OC5	Accustomed to building open, honest and two-way communication between employees.
5	Digital First Mindset	DF1	is accustomed to using the latest technology.
		DF2	Demonstrate the behavior to take smart risks.
		DF3	is accustomed to continuing to learn by sharing knowledge with colleagues.
		DF4	Accustomed to accessing various knowledge needed to support work.
		DF5	is accustomed to accessing various learning materials by utilizing online platforms.
		DF6	have been accustomed to implementing learning outcomes to change old ways of working.
		DF7	given authority in accordance with their responsibilities.
		DF8	is accustomed to participating in various activities in the company by implementing digital technology.
6	Flexibility & Agile	F1	has been optimally empowered in supporting the achievement of company goals
		F2	shows high motivation to produce better than current achievements
		F3	makes stakeholder feedback as evaluation material for continuous improvement
		F4	has been accustomed to evaluating his work for improvement in the next future

		F5	has been accustomed to documenting his work for improvement in the future
		F6	accustomed to being involved in a continuous improvement process
		F7	has shown an attitude that is open in accepting criticism for improvement
7	Customer Centricity	CC1	have been accustomed to focusing on having a positive impact from the results of their work, to other people who receive the results of their work.
		CC2	has strived to be able to proactively provide solutions to other employees as internal customers
		CC3	accustomed to making decisions by considering feedback from customers
		CC4	has been able to provide services beyond what customers expect
		CC5	has demonstrated behavior to prioritize stakeholder satisfaction
		CC6 is	accustomed to utilizing various digital applications in accelerating services and fulfilling commitments to customers

Table III.2. Digital Culture Question
reference : Buvat et.al 2017

No	Indicators	Code	Question
1	Knowledge	K1	I understand the definition of the Industrial Revolution 4.0
		K2	I know the various factors And existing technology in Industry 4.0
		K3	I know the various factors inside Industrial Automation
		K4	I know why the Internet of Things is important to implement in today's industrial era
		K5	I know the definition or have understanding of Cybersecurity
		K6	I know why Cybersecurity is important to implement in today's industrial era.
		K7	I know the definition or have understanding of Additive Manufacturing
		K8	I know how to use additive manufacturing
		K9	I know the definition or have understanding of Augmented Reality

		K10	I know the definition or have understanding of Cloud Computing
		K11	I know why Cloud Computing is important to implement in today's industrial era
		K12	I know how to use Cloud Computing
		K13	I know why Autonomous Robot is important to be applied in the industrial era.
		K14	I know the definition or have an understanding of Simulation.
2	Hard Skills	HS1	I can carry out business activities such as researching market needs and marketing the product or production and logistics processes or conducting training and recruiting employees.
		HS2	When making decisions I always think logically using easily accessible data on my computer or device.
		HS3	I always prioritize data and facts on the ground and in my tools to make decisions.
		HS4	I am able to solve problems by analyzing existing data or making prototypes so that they are easy to understand.
		HS5	I know the relationship between my company and other companies in the eyes of the market because of integrated and easily accessible data.
		HS6	I am always focused on one problem and pay attention to important or big things and solve them quickly and easily because there is data integration related to that problem.
		HS7	I can easily manage knowledge and data obtained by storing it in my team's or company's data storage application.
		HS8	I have my own initiative or will to lead or take over the work when implementing Industry 4.0
3	Soft Skills	SS1	I can adapt quickly when using new technology
		SS2	I can always deal with the stress I experience when adapting to new technology
		SS3	I've prepared myself for the challenge of implementing Industry 4.0.
		SS4	I always want to learn new things that can improve my performance, especially learning new technologies
		SS5	I can take responsibility for implementing industry 4.0 even though it is a very new thing for me.
		SS6	I am able to manage resources within my company in meeting opportunities to implement industry 4.0.

		SS7	I am able to innovate (the process of developing knowledge or pre-existing products) and develop in industry 4.0 because it maximizes the use of data storage.
		SS8	I am able to accept the organizational culture of companies that are new to implementing industry 4.0 (for example: maximizing the use of digital tools when working compared to using paper etc.)
		SS9	I was given the opportunity to attend training or conferences about Industry 4.0
		SS10	I believe that the use of machines and technology really helps my job
4	Attitude	A1	I accept the use of technology and machines in my daily work
		A2	I believe that communicating or exchanging data using a computer, software, or using the internet is an easy thing to do.
		A3	I always use computers, software, and the internet to communicate and exchange data
		A4	I make regular checks on the technology I use every day

Table III.3. HCR 4.0 Questionnaire
Reference: Hendarman et al (2020)

III.2 Qualitative Approach: Focus Group Discussion

Data from quantitative approach then analysed and confirmed through conduct a FGD with Human Capital Development Division & HCBP. It will bring deeper information & further strategy about the future implementation in human capital development & culture strategy. Beside interviewing HCD & HCBP, author also conduct FGD to Corporate University to get insight about competency development with structured method. The result of qualitative approach also will answer the reason the implementation plan that cannot be answered from closed-ended questions via quantitative approach.

IV. FINDINGS & BUSINESS SOLUTION

IV.1 Digital Leadership Analysis

This following table shows the three (3) indicators from the digital leadership survey that have been calculated as below:

Variable	Indicator	Average Value	Score (%)	Remarks
Digital Leadership	Digital Innovative Behavior	5.11	85.32%	Very High
	Digital Supportive Behavior	4.99	83.22%	Very High
	Concern for Corporate Sustainability	5.08	84.61%	Very High
Subtotal		5.06	84.38%	Very High

Table IV.1 Digital Leadership Score

The digital leadership table above shows the average score for each indicator in the digital leadership variable in a very high category. All indicators have scores of more than 80%. This variable has a score range between 83.22 percent to 85.32 percent. The indicator of Digital innovative behavior receives the highest score,

followed by the indicator of concern for corporate sustainability. The digital supportive behavior indicator has the lowest score, although it still has in the very high category. The average digital leadership score is very high, according to this table. The outcomes demonstrate that the company leaders have good awareness in implementing digital leadership.

IV.2. Digital Culture Analysis

This following table shows the seven (7) indicators from the digital culture that have been calculated as below:

Variable	Indicator	Average Value	Score (%)	Remarks
Digital Culture	Innovation Culture	4.89	81.60%	Very High
	Data Driven Decision Making	5.10	84.98%	Very High
	Collaboration	4.98	83.01%	Very High
	Open Culture	4.95	82.49%	Very High
	Digital First Mindset	5.28	88.05%	Very High
	Agility & Flexibility	5.01	83.58%	Very High
	Customer Centricity	5.49	91.50%	Very High
Subtotal		5.10	85.03%	Very High

Table IV.2 Digital Culture Score

The digital culture table above shows the average score for each indicator in the digital culture variable in a very high category. All indicators also have scores of more than 80%. This variable has a score range between 81.60 percent to 91.50 percent. The indicator of Customer Centricity has the highest average score, followed by the indicator of digital first mindset. The innovation culture & the open culture indicator is the bottom-two lowest score, although it still has in the very high category. The average digital culture score is also considered very high, according to this table. The outcomes demonstrate that the company has already implemented well the digital culture at least in point of view of the Leaders. This finding reveals that, for the leader population represented by Top Management Talent 2023, company as an organization has been very successful in implementing digital culture in the company based on the survey, each indicator score in digital culture variable has been implemented and well reflected in their everyday work behavior.

IV.3. Human Capital Readiness in Industry 4.0 Analysis

Each component of the indicator will be determined using the Human Development Index. The future analysis will reduce its emphasis to the variable and concentrate exclusively on the final HDI level indicated by the HCR 4.0 Gap result. Only the final gap score will be used to establish the computation's minimum and maximum values. In this design, the knowledge indicator has a minimum GAP value of 0.05, while the hard skill variable has a maximum GAP value of 0.23.

Indicator	Actual Value	Expected Value	GAP	HDI	Summary
Knowledge	5.52	5.57	0.05	0	OPTIMAL
Hard Skill	5.37	5.60	0.23	1.00	NOT READY
Soft Skill	5.29	5.50	0.21	0.89	NOT READY
Attitude	5.34	5.42	0.08	0.17	OPTIMAL

Table IV.3 Gap Analysis with HDI Levels

The analysis of all indicator gap scores converted to HDI levels using the HDI formula can be seen in the table. Based on that, hard skill and soft skill indicator have been considered as 'not ready' index. These findings suggest that this variable has to work on applying hard skills & soft skills of the leaders to cope with the modern world. In contrast, even though the knowledge and attitude factors had a higher index level than them, it also demonstrated far better conditions for implementing or coping with the industrial age 4.0 than hard skills & soft skills. If we dig down into the items, then we can see the cause of it. In the hard-skill indicator, there are four (4) sub-indicators that have bigger gap (HS1, HS2, HS3, & HS8). While from soft-skill indicator, there are three (3) sub-indicators that have bigger gap (SS1, SS2, & SS6).

IV.4. Regression Model Analysis

The author use SPSS to generate the acquired data. Some analysis of ANOVA and coefficient tables, as well as a model summary, will be included in the SPSS results output. The regression model and multiple linear

regression’s central equation will be elaborated in this section. Based on the analysis, the regression model identified as below:

Model	Unstandardized β	Coefficients Std. Error	Standardized Coefficients Beta	t	sig
1 (Constant)	2.299	.728		3.158	.003
Digital Leadership (X1)	.206	.079	.315	2.601	.012
Digital Culture (X ₂)	.394	.120	.398	3.280	.002

Table IV.4. Regression Model

Based on that model, the equation regression model will be presented as follows:

$$Y = 2.299 + 0.206X_1 + 0.394X_2$$

The two variables are considered important and have a positive relationship to individual invention, as presented from the equation above. Human Capital Readiness in Industry 4.0 at work is predicted to grow by 0.206 for a given contribution of digital leadership, and by 0.394 from digital culture. The interval deployed in testing the designed hypotheses agrees with the p-value (.sig) of 0.05.

To identify whether the variables are significant or not, the analysis for this case will use a p-value approach, therefore the main consideration will be seen based on the t (t) value and p (.sig) value. The numbers that appear in the cells in Figure 4.1 are meant to represent each indicator of digital leadership and digital culture to the dependent variable (Y variable), which is Human Capital Readiness in Industry 4.0. T-table with an alpha level of 5% will be 2.007 for this sample size (DF = 51). Next, author examine the hypothesis as below:

1. Examining the impact of Digital Leadership to Human Capital Readiness in Industry 4.0 under Hypothesis H1. The variable’s T value is 2.601 with a p-value of 0.012, as shown in the above table. This hypothesis (H1: There is a significant link between the digital leadership to Human Capital Readiness 4.0) yields **accepted** or Hypothesis is accepted as it shown that Tcount (2.601) > Ttable (2.007) with p-value (0.012) in p-sig 0.05.
2. Examining the impact of Digital Culture to Human Capital Readiness in Industry 4.0 under Hypothesis H2. The variable’s T value is 3.280 with a p-value of 0.002, as shown in the above table. This hypothesis (H2: There is a significant link between the digital culture to Human Capital Readiness 4.0) yields **accepted** or Hypothesis is accepted as it shown that Tcount (3.280) > Ttable (2.007) with p-value (0.002) in p-sig 0.05.

V. CONCLUSION

As a leading state-owned enterprise, this company must ensure their human capital supports their organizational agenda. They have a clear mission stated as “professional human resources with a performance-driven culture, reliable information technology and future ready, as well as productive conventional and digital network by adhering the operational principle and risk management excellence”. With that mission, company has the urgency to assure their human capital to be ready to cover all organization challenges, including digital transformation agenda. Authors has opportunity to evaluate their Top Management Talent 2023 which consist of 53 strategic managers level (with corporate band VP Up) with the digital leadership, digital culture, and human capital readiness in industry 4.0 in order to support digital transformation agenda.

There’s some issues that arise in Top Management Talent 2023. The indicator of Hard Skill & Soft Skill stated in the NOT READY category with a value gap more than 0.2 and HDI Gap more than 0.8. It show how strategic management readiness for their capacity to adapt to changes made in their organizational environment. It is crucial to increase this dimension. In the analysis, author find that the Readiness of Human Capital on the Hard Skill & Soft Skill can be influenced by other component with the lowest average. Despite digital leadership scored 84.38% and digital culture scored 85.03%, which already in a very good result, there are some indicators that put the significant-below averaged score. There are digital supportive behavior from digital leadership variable, and also digital innovative culture & open culture from digital culture variable. It

have been also confirmed by FGD with COMPANY management that those factors put some influence on human capital readiness in industry 4.0.

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