

The Analysis of Factors Affecting Preparation Level for the Industry 4.0 Era in the COVID-19 Pandemic on Employees in DKI Jakarta

Rianti Setiadi ^{1,*} , and Franky ² 

¹ Department of Statistics, Faculty of Math and Science.

Universitas Indonesia, 16424, Depok, West Java Province, Indonesia

² Department of Management, Postgraduate,

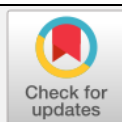
Universitas Prof Dr Moestopo (Beragama), 10270, Jakarta, Indonesia

* Corresponding Author: rianti@sci.ui.ac.id

ARTICLE INFO

Publication Info:

Research Article



How to cite:

Setiadi, R., & Franky, F. (2021). *The Analysis of Factors Affecting Preparation Level for the Industry 4.0 Era in the COVID-19 Pandemic on Employees in DKI Jakarta*. Society, 9(1), 115-123.

DOI: [10.33019/society.v9i1.320](https://doi.org/10.33019/society.v9i1.320)

Copyright © 2021. Owned by Author(s), published by Society



This is an open-access article.

License: Attribution-NonCommercial-ShareAlike (CC BY-NC-SA)

ABSTRACT

This study analyses significant factors affecting the level of preparation for the industry 4.0 era related to anxiety about the COVID-19 pandemic on employees in DKI Jakarta. Apart from being influenced by the anxiety of the COVID-19 pandemic, the level of preparation for the industry 4.0 is also differentiated by gender, age, education, marital status, decreasing income, and loyalty. Therefore, companies can arrange the planning related to preparing the industry 4.0 during the COVID-19 pandemic if those factors have been figured out. This study used a quantitative method, and the population of this study is full-time employees in DKI Jakarta. The sample was selected by using the snowball sampling technique distributed to 12 companies in DKI Jakarta. The distribution was conducted through the WhatsApp application for a month, and it was gained 228 respondents. Snowball sampling technique used in correlation with the implementation of large-scale social restrictions caused by COVID-19 pandemic. The data analysis used a multiple linear regression model. The results show that factors affecting the level of employees' preparation in DKI Jakarta for industry 4.0 related to the anxiety of the COVID-19 pandemic are loyalty and a decrease in income.

Received: March 3, 2021;
Accepted: June 17, 2021;
Published: June 21 2021;

Keywords: *Anxiety; COVID-19; Industry 4.0; Management*

1. Introduction

The fourth industrial revolution, known as Industry 4.0, including its progress and challenges, has penetrated all countries worldwide, including Indonesia. Industry 4.0 is the convergence of information and communication technology with industrial production. In this era, technology becomes a foundation in human life (Hermann et al., 2016). Manufactures, textiles, electronics, and transportations have marked Industry 4.0 in Indonesia (iNews.id, 2020). The fourth industrial revolution in the 21st century has an orientation towards a digital lifestyle, thinking tools, and science research (Trilling & Fadel, 2009). In studying Industry 4.0 on companies, the value chain model can be used as an approach. The value chain model can give specific attention to companies' areas that create customer value (Porter & Porter, 1985). Porter mentioned that in Industry 4.0, the world would face a massive development of technology. Thus, it is obvious that Industry 4.0 brings challenges and prepares employees to have adequate skills in using technology in various fields of work.

The main purpose of Industry 4.0 is to improve industrial automation and the efficiency and the effectivity of the operating system. Therefore employees with adequate technical skills are required (Ślusarczyk, 2018). With technological skills, it is expected to provide savings on products and services to create express, efficient, and effective work time. Furthermore, with the implementation of significant and concrete Industry 4.0, a smart industrialization network will be created for products and processes (Baeur et al., 2014). Bauer mentioned that the preparation required to face Industry 4.0 has technical skills to build a network in every industry and the process of the industry. Therefore, adequate human resources in the use of production technology are required. In addition, the ability to create a business network through the technological application is also necessary. In this case, Industry 4.0 allows metal fabrication operational activities have connected to collaborative technology (Bildstein & Seidelmann, 2016). Therefore, the skills and employees' preparation in Industry 4.0 era must be in the context of adequate skill in terms of technological application, human and machines or machines and machines.

Industry 4.0 is actualization from industrial digitization. It has several scenarios of industrial design principles (Hermann et al., 2016; Hamdan, 2018). The preparation and skills needed by employees in the Industry 4.0 era can digitize all business processes series in marketing and sales, production, research, utilization of human resources, and decision-making processes. Several companies in Indonesia prepare their employees by providing them with training and facilitating them with tools used during work. In addition, with the developing digital system, employees are trained to have a wider network. However, the level of employees' preparation in the Industry 4.0 era needs to be continuously improved, especially for employees in DKI Jakarta.

When Indonesia was focused on preparing for Industry 4.0, the world was shaken by the COVID-19 pandemic. COVID-19 is a contagious disease caused by a newly discovered virus. This disease first appeared in Wuhan, Tiongkok, in December 2019 and started plaguing worldwide in 2020. The COVID-19 pandemic has caused many losses that impact changes to employees' preparation in facing the Industry 4.0 era. The Indonesian government was forced to issue a policy of physical distancing and or Large-Scale Social Distancing (LSSD) in various regions, temporarily closing schools and universities, banning worship in churches and

mosques, and also work from home for employees of the company, which certainly affect companies' performance (Turambi & Wuryaningrat, 2020). An employee who usually uses work equipment in the office must adjust to working from home. This is proven that the COVID-19 pandemic has significantly reduced the preparation to face Industry 4.0 era.

The number of people and the number of deaths infected by COVID-19 were reported massively through various print media, electronic, and social media. This raises anxiety for the community, especially for employees, the anxiety of infected risk and the anxiety of occupation, which disrupts their economy, because the certainty of COVID-19 pandemic disappearance is unpredictable. It cannot be denied that uncertainty does not always stand side by side with preparation. This happened when people feel comfortable and accustomed to the conditions around them. Health, close relationship, and sufficient economy resulting in the neglect that circumstances such as the COVID-19 pandemic can happen at any time, so the comfort turns into prolonged anxiety and stress (Putri, 2020). In addition, anxiety can make employees more focused on personal needs than the preparation for Industry 4.0.

Men and women generally have different levels of preparation in facing the Industry 4.0 era, especially after the COVID-19 pandemic. In addition, age also becomes a factor influencing the preparation for Industry 4.0 era. The youth generation generally is more prepared in facing the Industry 4.0 era, rather than older people who are not familiar with the digital age, and they certainly need more time to adjust to using digital devices. With the COVID-9 pandemic, marital status, the decreasing of income, and loyalty are possible in affecting the level of preparation for Industry 4.0. Suppose the factors affecting the level of preparation for the Industry 4.0 era related to anxiety about the COVID-19 pandemic are figured out. In that case, companies can make an effort to keep the preparation of employees in facing the Industry 4.0 era. This becomes the purpose of this study to find out what factors which significantly affect the level of employees' preparation in DKI Jakarta for Industry 4.0 era during the COVID-19 pandemic, and then analyzing the factors affecting the level of employees' preparation in DKI Jakarta for Industry 4.0 era during COVID-19 pandemic.

The variables involved in this study were the level of preparation for the Industry 4.0 era during the COVID-19 pandemic according to gender, age, level of education, marital status, decreasing income, and loyalty.

1) Level of preparation in facing Industry 4.0 era

The preparation for Industry 4.0 era is a measurement to see what extent company's employee in DKI Jakarta has made the preparation. This variable is a latent variable measured by using the Likert scale, which indicators as follow:

- a. I am ready to work on the new system of the Industry 4.0 era.
- b. I am ready to work by using digital facilities.
- c. The use of computer in working is bothering me (-)
- d. 4.0 industrial era makes me stressed out (-)
- e. I am capable of working by using digital facilities
- f. My salary is quite enough to live in Industry 4.0 era.
- g. I can do good teamwork with other employees.

2) The anxiety on COVID-19

COVID-19 pandemic gives multiple stress on community's lives, such as the anxiety of infected risk, the anxiety of death, losing families and relation, and getting stress caused by the termination of employment and decreasing income. On the other hand, anxiety can lead

to preventive measures such as washing hands frequently, wearing a mask, avoiding talking to a person, insomnia, and changing food habits. The anxiety variables can be measured by using the Likert scale, which indicators as follows:

- a. I am worried about getting infected by COVID-19
- b. I wash my hands in every 30 minutes
- c. I buy a lot of masks
- d. I use hand sanitizer often
- e. I avoid talking to people who are coughing even though I wear a mask
- f. I change my food habits during the COVID-19 pandemic
- g. I suffer from insomnia during the COVID-19 pandemic
- h. I feel unhealthy during the COVID-19 pandemic
- i. I do not dare to leave the house during the COVID-19 pandemic

3) Gender

4) Age

5) Education, the recent education finished by respondents which the category is Bachelor degree and below Bachelor degree

6) Marital status, which the category is single, married, and divorce

7) The decreasing of income during the pandemic

8) According to the Great Dictionary of Bahasa, loyalty is obedience or fidelity' Loyalty in a job is the tendency of employees not to move to other companies (Siagian, 2010). This variable is measure by using the Likert scale, which indicators as follow:

- a. I stay working in this company even though my salary is reduced
- b. I do not have a plan to work in another company
- c. I work with all my heart for the company I work for now
- d. I already fit into this company
- e. I can say that I found no weakness in my workplace now

2. Research Methodology

This study used a quantitative method in which the population is full-time employees in companies in DKI Jakarta. The sample was taken by using snowball sampling, distributed questionnaires to employees in 12 companies. The distribution was conducted through the WhatsApp application for a month and gained 228 employees. WhatsApp application was chosen as a media for questionnaire distribution because of large-scale social restrictions implementation due to the COVID-19 pandemic.

Data analysis was conducted by using multiple linear regression models. The examination of reliability and validity of data from latent variables resulted that for the preparation variable for Industry 4.0 era, the Cronbach Alpha coefficient was 0,788 and the items used are valid. For the preparation variable, the Cronbach Alpha coefficient is 0.658, and the items used are valid. For the loyalty variable, the Cronbach Alpha coefficient is 0,667, and the items used are valid.

Multiple linear regression models analysis:

The level of preparation = $b_0 + b_1 \text{ gender} + b_2 \text{ age} + b_3 \text{ education} + b_4 \text{ marital status} + b_5 \text{ the decreasing of income} + b_6 \text{ anxiety} + b_7 \text{ loyalty}$.

From the formula, the result of estimation and testing of the regression coefficient parameters as follows:

Table 1. First regression model coefficient

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	22.869	2.310		.000
	Gender	.265	.487	.035	.587
	Age	-.002	.001	-.086	.180
	Education	.356	.499	.047	.477
	MaritalStatus	.289	.501	.038	.565
	DecreasedIncome	-1.737	.504	-.226	.001
	Anxiety	-.066	.053	-.080	.208
	ALoyalty	.344	.082	.271	.000

a. Dependent Variable: AReadiness

Table 1 above, with a significant level of 0.1 genders, age, education, marital status, and anxiety, does not affect the preparation level in facing the Industry 4.0 era. After the variable was issued, the model is presented below:

Table 2. Regression testing Anova

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	334.375	2	167.188	12.834	.000 ^b
	Residual	2931.041	225	13.027		
	Total	3265.417	227			

a. Dependent Variable: AReadiness

b. Predictors: (Constant), ALoyalty, DecreasedIncome

Table 3. Best model regression coefficient

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	22.180	1.285		17.264	.000		
	DecreasedIncome	-1.624	.491	-.211	-3.310	.001	.982	1.018
	ALoyalty	.342	.081	.270	4.241	.000	.982	1.018

a. Dependent Variable: AReadiness

Table 3 indicates that the decreasing income and loyalty during the COVID-19 pandemic affect preparation levels for the Industry 4.0 era.

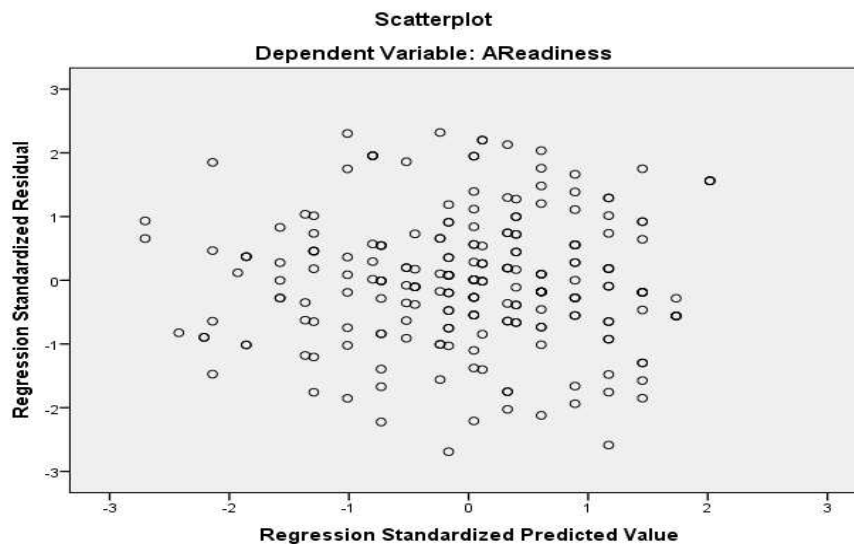


Figure 1. ZPredict vs. ZResidual

Table 4. R square and Durbin Watson

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.320 ^a	.102	.094	3.60927	1.961

a. Predictors: (Constant), ALoyalty, DecreasedIncome

b. Dependent Variable: AReadiness

From the VIF value in **Table 3**, which is less than 10, Durbin Watson's value on **Table 4** is close to 2, while from **Figure 1** above, the assumption from the regression model is completed even though the R square value is not strong enough. Regression equation from **Table 3** as follows:

The level of preparation = $22.180 - 1.624 \text{ decreased income} + 0.342 \text{ loyalty}$.

3. Results and Discussion

From the equation above, it can be concluded that loyalty has a significant positive effect on the preparation level for the Industry 4.0 era. The higher employees' loyalty to their company, the higher the preparation level in facing the Industry 4.0 era. In addition, it can be concluded that the decreasing income has a negative effect on the level of preparation for Industry 4.0, which means employees who have low income during the COVID-19 pandemic will also have a low level of preparation for the Industry 4.0 era. However, the value from the regression coefficient is difficult to interpret because the level of preparation variable in facing the 4.0 industrial era is latent.

The loyalty of workers to their expertise in a long period is an investment in developing their competence and skill in facing every change. Therefore, the investment of time work will impact readiness to face the changes for individuals or even organizations.

[Sima et al. \(2020\)](#) emphasized several key aspects of human resource development in the Industry 4.0 revolution decade: technological skill, training, education, and innovation. On the

other side, there are three factors which give a contribution to human resource development in industry 4.0 revolution, 1) reducing the number of workers allocating for labor, 2) allocating workers to another region which produces higher value, and 3) increasing the demand of workers who have skill and competence related to new technology. However, the article did not mention specifically the correlation between workers' loyalty and the readiness to face the development of skill and competence in the Industry 4.0 era.

However, the article implied that experience in a long time is necessary to face and anticipate work activity changes in the industrial 4.0 era. One of the key factors in the effort of human resource development is a technological skill. As we know, the development of technology will impact the changes in any industrial line. Thus, workers' loyalty significantly influences the readiness to face the Industry 4.0 revolution era.

The second conclusion is the decreased income factor, which negatively impacts the level of preparation in facing the industrial 4.0 era. The phenomenon indicates that workers experiencing the decreased income level will have a low level of preparation in facing the Industry 4.0 era compared with the workers who do not experience the decreased income during the COVID-19 pandemic.

It cannot be denied that the COVID-19 pandemic has devastated various sectors of human life, such as economic, business, politics, art, and education. Moreover, the COVID-19 pandemic has changed various business platforms significantly. Therefore, every business person must adopt the business process of their company with all those changes of the challenges faced by business persons in COVID-19 pandemic is remuneration.

COVID-19 pandemic causes the decrease in purchasing public interest, which also impacts the decreasing company sales level. This condition placed the company in a dilemma, among others 1) keeping the workers but providing them full remuneration, 2) keeping the workers, but providing them half of the remuneration, 3) giving layoff on some workers, and 4) closing the business. This condition will prove the resilience of a business company facing force majeure, which was never expected to impact the economic sector. Therefore, the expectation is that companies will stay afloat in any disadvantaged situation and try to keep their workers. However, with the decreasing of income, it can be ascertained that companies will give their workers full remuneration.

This study mentioned that the decreasing of income variable would have a negative impact on the level of preparation in facing the Industry 4.0 era. This is because workers will decrease work motivation due to the less remuneration they receive. This condition impacts every worker's performance behavior, which will become an obstacle in facing the preparation of the Industry 4.0 era.

4. Conclusion

This study concludes that the factors affecting the level of preparation for the Industry 4.0 era on employees in DKI Jakarta during the COVID-19 pandemic are loyalty and decreasing income. Therefore, the problem of loyalty and decreasing income should be given more attention by companies and increasing employees' welfare during the pandemic, which also increases the company's performance. The high loyalty of workers will have a better impact on preparing to face the Industry 4.0 era and can be actualized by providing better remuneration.

One of the strategies that the company can do is to reduce the percentage of profit gained to provide full remuneration. This strategy is certainly not applied in the long term. When vaccination programs conducted by the government reduces the COVID-19 pandemic, economic conditions will be stable, and companies can increase their profit. Companies that are

disposed to reduce the percentage of their profit for the welfare of their workers will get support and loyalty. This will certainly improve the workers' performance at a better level, so preparing to face the industrial 4.0 era can be actualized well.

5. Acknowledgement

The authors are grateful to express gratitude to those who have had the pleasure to cooperate during this study.

6. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning the study, authorship, and/or publication of this article.

References

- Bauer, W., Schlund, S., Marrenbach, D., & Ganschar, O. (2014). *Industrie 4.0 – Volkswirtschaftliches Potenzial für Deutschland*. Retrieved from <https://www.produktionsarbeit.de/content/dam/produktionsarbeit/de/documents/Studie-Industrie-4-0-Volkswirtschaftliches-Potential-fuer-Deutschland.pdf>
- Bildstein A., & Seidelmann J. (2014). Industrie 4.0-Readiness: Migration zur Industrie 4.0-Fertigung. In *Industrie 4.0 in Produktion, Automatisierung und Logistik*. Springer Vieweg, Wiesbaden. https://doi.org/10.1007/978-3-658-04682-8_30
- Hamdan, H. (2018). Industri 4.0: Pengaruh Revolusi Industri Pada Kewirausahaan Demi Kemandirian Ekonomi. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, 3(2), 1-8. <https://doi.org/10.29407/nusamba.v3i2.12142>
- Hermann, M., Pentek, T., & Otto, B. (2016). Design Principles for Industrie 4.0 Scenarios. 2016 49th Hawaii International Conference on System Sciences (HICSS). Published. <https://doi.org/10.1109/hicss.2016.488>
- iNews.id. (2020, June 28). New Normal Jadi Tantangan Revolusi Industri 4.0 Indonesia. Retrieved October 16, 2020, from <https://www.inews.id/finance/makro/new-normal-jadi-tantangan-revolusi-industri-40-indonesia>
- Porter, M., & Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York, United States: Free Press.
- Putri, K. R. (2020, November 13). Mengelola Stres Pegawai di Tengah Pandemi Covid-19. Retrieved from <https://www.djkn.kemenkeu.go.id/artikel/baca/13486/Mengelola-Stres-Pegawai-di-Tengah-Pandemi-Covid-19.html>
- Ślusarczyk, B. (2018). Industry 4.0 – Are We Ready? *Polish Journal of Management Studies*, 17(1), 232–248. <https://doi.org/10.17512/pjms.2018.17.1.19>
- Siagian, S. P. (2010). *Manajemen Sumber Daya Manusia*. Jakarta, Indonesia: Bumi Aksara.
- Sima, V., Gheorghe, I. G., Subić, J., & Nancu, D. (2020). Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behavior: A Systematic Review. *Sustainability*, 12(10), 4035. <https://doi.org/10.3390/su12104035>
- Trilling, B., & Fadel, C. (2009). *21st-century skills: Learning for Life in our times*. New Jersey, United States: John Wiley and Sons.
- Turambi, R. D., & Wuryaningrat, N. F. (2020). Panic Buying Perception in Walian Satu Sub-District, Tomohon City. *International Journal of Applied Business and International Management*, 1–7. <https://doi.org/10.32535/ijabim.v0i0.870>

About the Authors

1. **Rianti Setiadi** obtained her Master's degree from Universitas Indonesia in 1984. The author is an Assistant Professor at the Department of Statistics, Faculty of Math and Science, Universitas Indonesia.
E-Mail: rianti@sci.ui.ac.id
2. **Franky** obtained his Doctoral degree in Education Management from Universitas Negeri Jakarta, Indonesia, in 2016. The author is an Assistant Professor at the Department of Management, Postgraduate, Universitas Prof Dr Moestopo (Beragama), Indonesia.
E-Mail: franky@dsn.moestopo.ac.id