

THE INFLUENCE OF THE INDUSTRIAL REVOLUTION 4.0 ON EMPLOYEE PERFORMANCE IN NORTH CENTRAL TIMOR REGENCY WITH COMPETENCE AS A MEDIATION VARIABLE

PENGARUH REVOLUSI INDUSTRI 4.0 TERHADAP KINERJA KARYAWAN DI KABUPATEN TIMOR TENGAH UTARA DENGAN KOMPETENSI SEBAGAI VARIABEL MEDIASI

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Abstract

The purpose of this research is to determine the effect of the industrial revolution 4.0 on employee competence in Timor Tengah Utara Regency, the effect of competence on employee performance in Timor Tengah Utara Regency, the effect of the 4.0 industrial revolution to employee performance in Timor Tengah Utara Regency, and the indirect effect of the 4.0 industrial revolution to employee performance in Timor Tengah Utara Regency through Competence as a mediation variable. The method used in this study is quantitative with structural equation modeling (SEM) techniques. The number of samples used was 349 employees in North Central Timor Regency. The results of this research indicate that the industrial revolution 4.0 has a positive and significant effect on employee competence in Timor Tengah Utara Regency, Competence has a positive and significant effect to employee performance in Timor Tengah Utara Regency, the industrial revolution 4.0 has positive but not a significant effect on employee performance in Timor Tengah Utara Regency, and the industrial revolution 4.0 indirectly has a positive and significant effect to employee performance in Timor Tengah Utara Regency through Competence as a mediation variable.

Keywords: Industrial Revolution 4.0, Competence, Employee Performance.

Abstrak

Tujuan penelitian ini adalah untuk mengetahui pengaruh revolusi industri 4.0 terhadap kompetensi karyawan di Kabupaten Timor Tengah Utara, pengaruh kompetensi terhadap kinerja karyawan di Kabupaten Timor Tengah Utara, pengaruh revolusi industri 4.0 terhadap kinerja karyawan di Kabupaten Timor Tengah Utara, dan pengaruh revolusi industri 4.0 secara tidak langsung terhadap kinerja karyawan di Kabupaten Timor Tengah Utara melalui kompetensi sebagai variabel mediasi. Metode yang digunakan dalam penelitian ini adalah kuantitatif dengan teknik structural equation modeling (SEM). Jumlah sampel yang digunakan adalah sebesar 349 karyawan yang berada di Kabupaten Timor Tengah Utara. Hasil dari penelitian ini menunjukkan bahwa revolusi industri 4.0 berpengaruh positif dan signifikan terhadap kompetensi karyawan di Kabupaten Timor Tengah Utara, kompetensi berpengaruh positif dan signifikan terhadap kinerja karyawan di Kabupaten Timor Tengah Utara, revolusi industri 4.0 berpengaruh positif namun tidak signifikan terhadap kinerja karyawan di Kabupaten Timor Tengah Utara, dan revolusi industri 4.0 secara tidak langsung berpengaruh positif dan signifikan terhadap kinerja karyawan di Kabupaten Timor Tengah Utara melalui kompetensi sebagai variabel mediasi.

Kata Kunci: Revolusi Industri 4.0, Kompetensi, Kinerja.

INTRODUCTION

Technological advances keep pushing for changes in the economic, social, cultural, political, and even military systems. In the history of its development, technological progress has succeeded in revolutionizing several major changes in the industrial world, namely: industrial revolution 1.0, 2.0, 3.0, and now it is taking place in the fourth Industrial World change or better known as the Industrial revolution 4.0. (Annisa, 2021)

The entry of the 4.0 industrial revolution era was marked by the massive connectivity of humans, data, and machines in virtual or cyber-physical form by utilizing Internet of Things (IoT) technology, Cloud Computing, Artificial Intelligence (AI), Big Data, Augmented Reality (AR), System Integration, Cyber Security, Simulation, Autonomous Robot, and Additive Manufacturing to achieve more effective and efficient productivity. (Jamaludin et al., 2022)

Since the 20th century until now, Human Resources (HR) has been proven to have a vital role in supporting the growth of an organization. Jeffrey Pfeffer argues that human resources have competitiveness that can face all challenges and obstacles in realizing company goals. Domination in the use of technology alone is only considered sufficient to achieve company goals if it is supported by the role of human resources who are competent, adaptive, and responsive to technological advances. (Nurmala et al., 2022)

Competence includes behavioral characteristics that can show the difference between high performers, which in this context concerns achievement. (Hayati & Yulianto, 2021) Sudarmanto defines Competence as knowledge, expertise, abilities, or individual personal characteristics directly affecting job performance. In other words, Competence is the ability of individuals to carry out their duties based on their knowledge and skills. (Rohida, 2018)

Performance is the result of work that can be achieved by individuals or groups within an organization, according to their respective authorities and responsibilities, in order to achieve goals. (Etikawati & Udjang, 2016) Evaluation of performance is needed by a leader or manager to get optimal work results. (Sitinjak et al., 2021)

According to (Matompo & Nafri, 2020) and (Sitinjak et al., 2021) the development of the business world in Indonesia is experiencing intense competition. It is increasingly difficult to predict, requiring every company, both private and government, to invent and innovate in the field of human resources so that they can still win the competition in the Era of the industrial revolution 4.0.

Table 1. Gross regional domestic product (GRDP) of business fields in north central Timor Regency

GRDP Business Field	Percentage Distribution of GRDP at Current Prices (ADHB) by Business Field (Percent)				
	2021	2020	2021	2018	2021
Agriculture, Forestry, and Fisheries	40.23	39.82	39.53	39.90	40.73
Mining and excavation	1.32	1.33	1.81	1.75	1.82
Industri Pengolahan	1.08	1.13	1.15	1.14	1.13
Procurement of Electricity and Gas	0.07	0.06	0.05	0.06	0.05
Water Procurement, Waste Management, Waste, and Recycling	0.02	0.02	0.02	0.02	0.02
Building	9.97	9.55	10.42	10.51	10.35
Wholesale and Retail Trade; Car and Motorcycle Repair	5.60	5.51	5.50	5.29	5.20
Transportation and Warehousing	4.97	4.97	5.33	5.40	5.41
Provision of Accommodation and Food and Drink	0.54	0.55	0.61	0.62	0.62

Information & Communication	5.59	5.58	4.89	4.95	5.09
Financial Services and Insurance	2.14	2.07	1.92	1.97	1.98
Real Estate	2.27	2.31	2.39	2.54	2.60
Company Services	0.06	0.07	0.11	0.11	0.11
Government Administration, Defense, and Compulsory Social Security	16.63	17.18	16.77	16.29	15.48
Education Services	7.06	7.41	7.12	7.05	6.92
Health Services and Social Activities	1.69	1.64	1.50	1.51	1.53
Other services	0.76	0.81	0.89	0.91	0.95
Amount	100.00	100.00	100.00	100.00	100.00

The data on the implicit GRDP rate of North Central Timor Regency according to the business field for 2017-2021 shows that there has been business competition over the past 5 (five) years. (BPS Kabupaten TTU, 2022) Based on the background of the abovementioned problems, the researchers determined the primary research study with the theme: The Effect of the Industrial Revolution 4.0 on Employee Performance in North Central Timor Regency with Competence as a Mediating Variable.

The purpose of conducting this research is to find out 1. The direct effect of the industrial revolution 4.0 on employee Competence in North Central Timor Regency, 2. The direct effect of employee Competence on employee performance in North Central Timor Regency, 3. The direct effect of the industrial revolution 4.0 on employee performance in North Central Timor Regency, 4. The influence of the industrial revolution 4.0 indirectly on employee performance in North Central Timor Regency through employee Competence as a mediating variable.

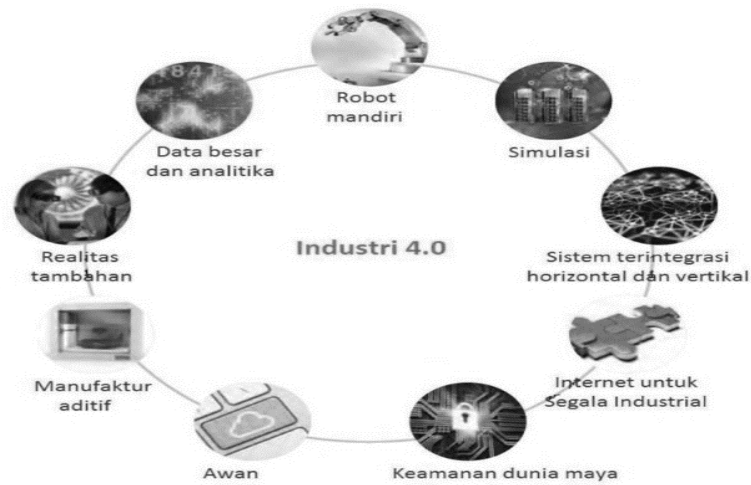
In the Big Indonesian Dictionary (KBBI) Industrial Revolution consists of 2 (two) syllables, namely, revolution means swift changes, while the industry is the business of carrying out production processes. Friedrich Engels and Louis-Auguste Blanqui introduced the term industrial revolution in the mid-19th century. (Fonna, 2019)

In the 21st century, the industrial revolution entered the fourth phase, 4.0, with the name industrial revolution 4.0 or four point zero (FPZ), introduced by the German Industry Science Research Alliance in 2011. (Annisa, 2021) This phase is characterized by digitalization and automation, the fusion of the internet with manufacturing. (Fonna, 2019)

The definition of industrial revolution 4.0, according to Wijoyo Nitisastro, is a complete transformation process from traditional life with good (pre-modern) technology in the sense of social organization for economic and political patterns. (Ramayanti, 2021) Angela Merkel argues that Industry 4.0 is a comprehensive transformation of all aspects of production in the industry through the merger of digital and internet technology with conventional industries. (Prasetyo & Sutopo, 2018) While a more technical understanding, according to Kagermann that industry 4.0 is the integration of the Cyber-Physical System (CPS) and the Internet of Things and Services into manufacturing and logistics processes and other processes. (Kagermann et al., 2011)

In the Era of the industrial revolution, there were at least 9 (nine) technologies that became the main pillars in developing a digitally ready industry, namely: autonomous robots, simulation, internet for all industries, cyber security, cloud computing, additive manufacturing, augmented reality, big data, and analytics. (Fonna, 2019)

Figure 1. 9 Technologies in the Era of the industrial revolution 4.0



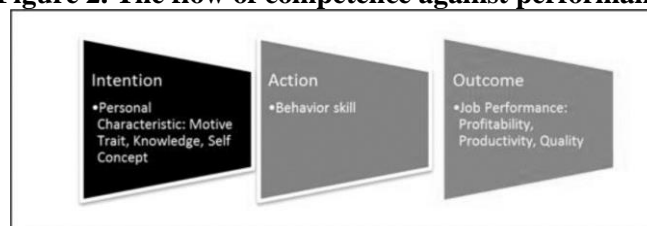
Source: Nyoto, (2019)

According to Robbins, Competence is the ability or capacity of a person to carry out various tasks in a job. This ability is determined by 2 (two) factors, namely intellectual ability and physical ability. (Robbins, 2006) Meanwhile, according to Becker and Ulrich, Competence contains the aspects of knowledge, skills, and abilities or personality characteristics that affect performance. (Nyoto, 2019) Another definition of Competence, according to Setiadiputra, is the workability of every human resource, which includes knowledge, skills, and work attitudes necessary in carrying out their duties. (Setiadiputra, 2017)

There are 6 (six) dimensions contained in the concept of Competence according to Gordon, namely: 1. Understanding or understanding, 2. Skills or abilities, 3. Knowledge or knowledge, 4. Interests or interests, 5. Attitudes or attitudes, and 6. Value or value. (Adiawaty, 2019)

The real benefit of using Competence by companies is to improve company performance. The following is Spencer's model in explaining the relationship between competency and performance.

Figure 2. The flow of competence against performance



Fonna, (2019)

Performance can be interpreted as work performance from implementing a predetermined work plan by an organization or company. According to Armstrong and Baron, performance results from work that has a strong relationship with organizational strategic objectives, customer satisfaction, and economic contribution. (Armstrong & Baron, 1998) Meanwhile, according to Moeheriono, performance or performance is defined as a description of the level of achievement of the implementation of a program of activities or policies in realizing the goals, objectives, vision,

and mission of the organization as outlined through an organization's strategic planning. (Abdullah, 2014)

According to Abdullah, employees are human resources or residents who work in government and private (business) organizations. (Abdullah, 2014) Meanwhile, according to Werther and Davis, employees are "the people who are ready, willing, and able to contribute to organizational goals." Based on the opinion of Werther and Davis, it can be interpreted that employees are people who are ready, willing, and able to contribute to efforts to achieve organizational goals. (Benny, 2005)

From the results of research conducted by Leni Rohida with the title "The Effect of the 4.0 Industrial Revolution Era on Human Resource Competence" that the revolution has a very close relationship with employee competence. (Rohida, 2018), besides that Resmawa & Mutaroh also stated that the industrial revolution 4.0 had affected Competence. (Resmawa & Mutaroh, 2019)

H₁: The industrial revolution 4.0 directly had a positive and significant effect on the Competence of employees in North Central Timor Regency.

Competence and performance have a very close relationship. Competence results in practical and superior performance. A person with good Competence and skill in his field will ensure that his performance is also excellent and optimal. (Rohida, 2018)

H₂: Employee competence directly positively and significantly affects employee performance in North Central Timor Regency.

Ramayanti has conducted research titled: "The Influence of the industrial revolution in the 4.0 Era and organizational culture on the Performance of Employees of PT. Primandiri Pratama Teknik" The research results show the value that there is a direct or indirect effect of the industrial revolution era 4.0 on employee performance at PT. Primandiri Pratama Teknik. (Ramayanti, 2021)

H₃: The industrial revolution 4.0 directly positively and significantly affected employee performance in North Central Timor Regency.

Ramayanti, in his research, stated that there was an indirect influence of the industrial revolution 4.0 on performance. Various macro indicators show Indonesia's socio-economic performance in the Industrial Revolution 4.0 era, including experiencing improvements or improvements. With stable economic growth of around 5%, the labor force, working population, and the Human Development Index (IPM) has increased significantly in the last nine years. In addition, there has been a consistent decline in the poverty rate in the last nine years, and for the first time in recent years, the percentage of poverty in Indonesia is in the single digits. (Ilyas et al., 2019)

H₄: The industrial revolution 4.0 indirectly has a positive and significant effect on employee performance in North Central Timor Regency through employee Competence as a mediating variable.

METHODS

The method used to test the hypothesis in this study is a quantitative method with structural equation modeling (SEM).

The data used in this research is primary data which the researcher obtained directly from the main source/research subject through distributing questionnaires. Then the data was tested using the Partial Least Square (PLS) method with the help of the SmartPLS 4.0.7.6 program.

The population used is all North Central Timor Regency employees whose exact number is unknown. The sampling technique in this study was incidental random sampling; anyone who met the researcher by chance and met the criteria as a data source could be used as a sample. Meanwhile, for determining the number of samples from a population that is not known with

certainty, the researchers are guided by the Isaac and Michael tables with an error rate of 5%, equal to 349 employees. (Sugiyono, 2019)

RESULTS AND DISCUSSION

I tested the validity of the data in this study using the SmartPLS 4.0.7.6 program. The research instrument can be declared valid if the Average Variance Extracted (AVE) value equals 0.5 or > 0.5. (Wong, 2013) Moreover, declared to have good reliability if the composite reliability value is 0.6–0.7. (Sarstedt et al., 2021) Moreover, the expected Cronbach's alpha value is > 0.7. (Ghozali & Latan, 2015)

Table 2. Construct reliability and validity

	Cronbach's alpha	rho_A	Composite reliability	The average variance extracted (AVE)
Employee performance	0.85	0.85	0.89	0.57
Competence	0.85	0.86	0.89	0.58
Industrial Revolution 4.0	0.88	0.88	0.91	0.64

Form Table 2 shows that all the Average variance extracted (AVE) outputs from the Industrial Revolution 4.0 construct, Competency, and Employee Performance > 0.5, meaning each construct has a good validity value.

The reliability test results in this study can be explained by the value of Composite reliability > 0.7 and Cronbach's alpha > 0.7; thus, it can be stated that all research constructs have good reliability values.

After the estimated model meets the outer model criteria, the inner model/hypothesis is tested. The following is the R-square value in the construct:

Table 3. R-Square

	R-square	R-square adjusted
Employee performance	0.98	0.98
Competence	0.94	0.94

From the results of the R-square test in Table 3. It can be explained that the R-square value for the competency construct is 0.94, which means that the industrial revolution 4.0 can explain the competence variance of 94%. At the same time, the R-square value of employee performance is 0.98, which means that the industrial revolution 4.0 can explain the variance of employee performance by 98%.

Table 4. Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Competence -> Employee performance	0.89	0.89	0.06	15.21	0.00
Industrial Revolution 4.0 -> Employee performance	0.11	0.11	0.06	1.79	0.07
Industrial Revolution 4.0 -> Industrial Revolution 4.0	0.97	0.97	0.01	173.78	0.00

Competence

The results of the analysis are in Table 4. Path coefficients can be explained that the 4.0 industrial revolution directly has a positive and significant effect on Competence with a P value of $0.00 < 0.05$. Likewise, the competency construct on employee performance has a positive and significant influence with a P value of $0.00 < 0.05$. Meanwhile, the industrial revolution 4.0 construct has a positive but insignificant effect on employee performance because the P value is $0.07 > 0.05$.

Table 5. Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Industrial Revolution 4.0 -> Competence -> Employee performance	0.86	0.86	0.05	15.73	0.00

The results of the analysis are in Table 5. Specific indirect effects can be explained that the industrial revolution 4.0 indirectly has a positive and significant effect on employee performance through Competence with a P value of $0.00 < 0.05$.

Based on some of the results of the analysis above, the following hypotheses can be tested:

H₁: The industrial revolution 4.0 directly positively and significantly affected the Competence of employees in North Central Timor Regency. Acceptable means that the industrial revolution 4.0 directly had a positive and significant effect on the Competence of employees in North Central Timor Regency.

H₂: Employee competence directly positively and significantly affects employee performance in North Central Timor Regency. Accepted means that employee competence directly has a positive and significant effect on employee performance in North Central Timor Regency.

H₃: The industrial revolution 4.0 directly had a positive and significant effect on the performance of employees in North Central Timor Regency. This is unacceptable because the industrial revolution 4.0 did not directly have a significant effect on the performance of employees in North Central Timor Regency.

H₄: The industrial revolution 4.0 indirectly positively and significantly affects employee performance in North Central Timor District through Employee Competence as a mediating variable. Acceptable means that the industrial revolution 4.0 indirectly positively and significantly affects employee performance in North Central Timor Regency through Competence as a mediating variable.

CONCLUSION

The industrial revolution 4.0 did not directly have a significant effect on the performance of employees in North Central Timor Regency. A mediating variable of employee competency is needed so that the industrial revolution 4.0 can positively and significantly affect employee performance in North Central Timor Regency. Thus it can be concluded that the industrial revolution 4.0 will not have a significant impact without being accompanied by an increase in employee competence.

The results of this study indicate that domination in the use of technology alone is not considered sufficient to achieve company goals in case it is not supported by the role of human

resources who are competent, adaptive, and responsive to technological advances. Therefore it is highly recommended for entrepreneurs, managers/leaders of a company or organization to always develop human resources/employees.

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