



Research Paper

## Human Resources (HR) Practices and Innovative Work Behavior: The Mediation Role of Employee Engagement in Facing the Industrial Revolution 4.0

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**ABSTRACT :** *The industrial revolution 4.0 is a change effort to combine the world in a network (online) in the industry so that all processes can run automatically using the internet. The need for companies to face industrial revolution 4.0 requires continuous innovation. The innovation depends on the behavior of each employee as the smallest unit of a company. This study aimed to determine the effect of innovative work behavior on HR practices at PT. XYZ. This study uses a quantitative approach with a cross-sectional study design. The number of samples was 218 employees who were selected by convenience sampling. The results of statistical tests show that HR practices have a significant positive effect on innovative work behavior. In addition, employee engagement has also been shown to mediate the influence between HR practices and innovative work behavior. Therefore, it is necessary to increase training and provide rewards to improve HR practices and employee commitment to the company.*

**KEYWORDS:** *Industrial Revolution 4.0; HR Practices; Innovative Work Behavior; Employee Engagement*

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### I. INTRODUCTION

Industrial revolution 4.0 is one of the topics of concern for business people and academics. According to Hermann & Otto (2016), The Industrial Revolution 4.0 is a term for the presence of a completely automatic trend and the latest data exchange in factory technology [1]. The term includes IoT (internet of thing), cyber-psychic systems, cloud computing, and cognitive computing. Brondoni & Zaninotto (2018) explain further that the industrial revolution 4.0 is expected to lead to a paradigm shift in business, with strong effects on manufacturing processes and services, and consequently competitive advantages for companies, industries, and regional or national systems [2].

Currently, the industrial revolution 4.0 is overgrowing. Therefore every company must be able to prepare for the industrial revolution. Every agency and company is required to maximize existing technology and always be up-to-date with the latest developments and create appropriate innovations that can make humans an irreplaceable asset (capital). This is one of the problems in developing countries, especially Indonesia.

The problem of readiness to face the industrial revolution 4.0 in Indonesia is actually in its human resources and the lack of equity in the regions [3]. In addition, there are also other problems with many Indonesians who do not have adequate human resources because it is predicted that the presence of the 4.0 industrial revolution will eliminate or at least reduce large numbers of human resources with low-level competencies, which is likely to increase the number of unemployed in Indonesia.

The demands in creating innovation are needed to provide benefits for the company [4]. It requires individual employees to invest a more significant effort and demands for the creation of ideas, promotion of ideas, and the realization of innovative changes [5]. Innovation is closely related to employees because each phase in innovation and related activities require various behaviors from employees as individuals [6]. Innovation has a close relationship with employee behavior, so an effort is needed to improve employee behavior that creates innovations in the work environment.

Innovation is present in several levels, innovation in a higher scope such as in organizations commonly called an innovative organizational culture. An innovative organizational culture is defined as an adhocracy

culture characterized by entrepreneurship, external focus, flexibility, innovation, creativity, and adaptability [7]. While innovation in a smaller scope or at the individual level is usually called innovative work behavior, which refers to 'daily innovation,' this is very dependent on activities or deliberate efforts by employees to provide new results that are felt to be beneficial. Provide an advantage in the workplace [5].

In this study, the researcher limits the scope of innovation to only the individual level, thus using innovative work behavior as a variable. In addition, because many previous studies have identified employees at the individual level as an essential source of innovation, this has received particular attention, especially from practices related to human resources (HR) in a company. Research by Prieto & Pérez-Santana (2014) confirms that HR practices influence employee attitudes and behavior, especially Innovative Work Behavior [8]. From the three domains in the HR system, it is concluded that ability-enhancing and opportunity enhancing in a career are the most effective HR practices to support Innovative Work Behavior. HR practices are the company's primary means of influencing and shaping the skills and behaviors of individuals to perform their jobs and thereby achieve organizational goals [9] and [10].

To test this theory, this research will be conducted in a company engaged in the automotive industry that is planning a transformation from the HRD department to HCM. From the results of interviews with HR Analyst supervisors, Training supervisors, and HRD managers at PT. At the beginning of its journey, XYZ's HR practice was limited to administrative matters, namely the need for employee recruitment, personnel, and administration for external training. Until 2013 the company made improvements related to its HR function by providing roles related to employee competency development, employee career management, and employee performance appraisals, which also affect salaries and bonuses earned. Therefore, this study aims to determine the effect of HR practices on innovative work behavior. In addition, this study also aims to determine the effect of HR practices on innovative work behavior mediated by employee engagement variables.

## II. METHOD

This study was a conclusive study with a cross-sectional study design. The research was conducted from September to November 2019 at PT XYZ. The company was chosen based on the researcher's considerations because it is one of the companies planning the transformation from the HRD department to HCM. Besides that, PT. XYZ was very concerned about the creation of continuous innovation in every line of business. To increase innovation in the company's environment, the company's management creates a program called Quality Control Circle (QCC). Each employee forms a team, maps problems, and creates innovations to provide solutions to these problems.

The research model used in this study was based on a modification of Prieto & Pérez-Santana (2014) and Kim & Koo (2017) [8] and [11]. Prieto & Pérez-Santana (2014) said that motivation and opportunity are the most influential factors in innovative work behavior [8]. Kim & Koo's research (2017) said that engagement, which consists of work attachment and organizational attachment, significantly influences innovative employee behavior [8]. The research model is shown in Figure 1.

Samples were selected at random and confirmed to participate in the research process by signing informed consent. The researcher used the Slovin formula to determine the number of samples. Based on this formula, the sample size in this study was:

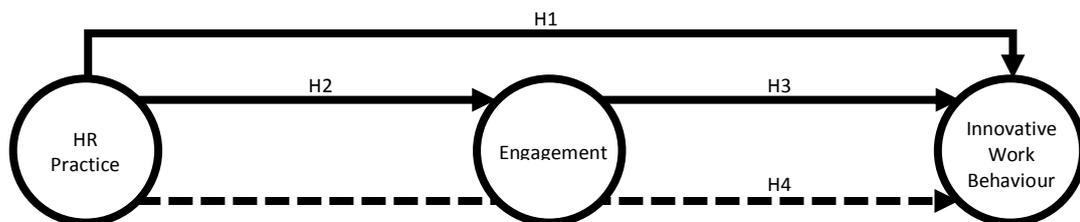
$$n = \frac{N}{1 + N(e)^2} = \frac{480}{1 + 480(0,05)^2} = 218,38 \approx 218 \text{ employee}$$

Keterangan:

n = Number of samples

N = Population

e = Error margin



**Picture 1 Research Model**  
(Source: Modified from Prieto & Pérez-Santana (2014) dan Kim & Koo (2017))

The collected data included the independent variable, namely HR practices, the dependent variable, namely innovative work behavior, and the mediating variable, namely the work environment of employee engagement. The measurement items for HR Practices can be seen in 3 domains: ability enhancing, motivation enhancing, and opportunity enhancing. The three domains were measured by staffing, training, compensation, performance appraisal, job design, and participation, with a total of 29 questions adopted from Prieto & Pérez-Santana (2014) [8]. The measurement item for employee engagement was measured by two types of engagement: work engagement and organizational attachment. The two attachments were obtained with 14 statements developed by Kim & Koo (2017) [11]. The measurement item for Innovative Work Behavior was measured by 14 questions developed by Prieto & Pérez-Santana (2014) [8].

All questions used to measure each variable were combined into an online-based research instrument. The instrument went through 2 stages before data collection. The first step was proofreading from 5 professionals in the field of management. Furthermore, the instrument through the validity and reliability test of 30 respondents by the main research. The research instrument consists of 5 Likert scales based on previous research, each of which had a score of 1-5 (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree).

Software used by researchers to process data includes MS. Excel, SPSS version 23.0, and Smart PLS. Smart PLS was chosen based on several considerations. PLS is a data analysis method based on the assumption that the number of samples is not significant and the residual distribution. PLS can be used for prediction so that it can be used to analyze theories that are classified as weak. In addition, PLS allows algorithms to use ordinary least squares (OLS) series analysis to obtain the efficiency of algorithm calculations. Finally, in the PLS approach, it can be assumed that all measures of variance can be used to explain.

### III. RESULT AND DISCUSSION

#### 3.1 Sample Characteristic

The sample characteristics in this study consisted of gender, age, last education level, years of service, and current position level. The number of samples taken in this study was 480 people with a minimum sample of 218. The following characteristics of the sample are presented in Table 1.

**Table 1 Sample Characteristic**

	<b>Characteristic</b>	<b>Amount</b>	<b>%</b>
Gender	Male	126	57.80
	Female	92	42.20
	Total	218	100.00
Age	<25 years	26	11.93
	25-35 years	129	59.17
	36-45 years	53	24.31
	>45 years	10	4.59
Last Education	High School	73	33.49
	Diploma	20	9.17
	Bachelor	115	52.75
	Master	10	4.59
	Total	218	100.00
Years of Service	<3 years	88	40.37
	3-8 years	73	33.49
	9-15 years	32	14.68
	>15 years	25	11.47
	Total	218	100.00
Job Level	Contract	36	16.51
	Staff	69	31.65
	Officer	69	31.65
	Supervisor	39	17.89
	Manager	5	2.29
	Total	218	100.00

In Table 1, it can be seen that the gender of the sample in this study was more male than female. The age of the majority of the research samples was in group 2, namely the age of 25-35 years, while the minor age was group 4. The education level of the respondents was dominated by 156 high school/vocational high school graduates, followed by 133 undergraduate graduates. The most working period <3 years amounted to 139 people and followed by 4-8 years totaling 120 people. Position level was dominated by staff level, 133 people and followed by officer level, 83 people.

### 3.2 Overview of Human Resources Practices

This study's human resource practice was divided into six dimensions, namely staffing, training, compensation, performance appraisal, job design, and participation. Based on the results of the category table that has been made, the researcher calculated the average of each questionnaire item to produce the figures presented below (Table 2).

**Table 2 Overview of Human Resources Practices**

Dimensions	Item	Mean Item	Mean Dimensions	Mean HR Practice
Staffing	S1	4,15	4,27	
	S2	4,15		
	S3	3,98		
	S4	4,17		
	S5	4,27		
Training	T1	4,37	4,20	
	T2	4,15		
	T3	4,20		
	T4	4,25		
	T5	4,20		
Compensation	C1	4,04	4,18	4,08
	C2	4,18		
	C3	4,08		
	C4	4,17		
Performance Appraisal	PA1	4,00	4,13	
	PA2	4,14		
	PA3	4,14		
	PA4	4,09		
	PA5	4,22		
Job Design	JD1	4,06	4,15	
	JD2	4,06		
	JD3	4,08		
	JD4	4,08		
Participation	P1	3,88	3,98	
	P2	3,93		
	P3	3,95		
	P4	3,81		
	P5	3,91		
	P6	4,00		

Based on Table 2, HR Practices can influence and shape employee skills in the organization of a company. This can be seen from the high mean value of HR Practices of 4.08. The average value of the resulting measurement dimensions has a value of > 4.00, except for the participation dimension. When viewed from the mean of each dimension, the highest mean value is found in the Training dimension with item T1, which reads "Employees will usually go through an ongoing training program,." and the lowest item value was in the participation dimension with item P4 which reads "Employees are invited to participate in problem solving and decisions." Although it was the lowest in the variable, it was still relatively high for the acquisition of the mean value that the item gets.

### 3.3 Overview of Engagement

Table 3 shows that the average employee of PT. XYZ has a pretty good influence on the work and organization in his company. This was evidenced by the fact that the mean value of each dimension is relatively high even though the value of the work engagement dimension is 4.13, which is greater than the mean of the organizational engagement dimension.

**Table 3 Overview of Engagement**

Dimensions	Item	Mean Item	Mean Dimensions	Mean Employee Engagement
Job Engagement	JD1	3,94	4,13	3,83
	JD2	3,99		
	JD3	3,65		
	JD4	4,01		
	JD5	3,98		
	JD6	4,04		
	JD7	4,01		
	JD8	3,93		
Organizational Engagement	OE1	3,85	3,83	
	OE2	3,80		
	OE3	3,68		
	OE4	3,76		
	OE5	3,80		
	OE6	3,55		

**3.4 Overview of Innovative Work Behavior**

Table 4 showed that the mean value of the variables obtained was relatively high, which means that employees at PT. XYZ was an employee who has a positive impact on his company because of most of the employees of PT. XYZ was always looking for ways to get the job done. This can be seen from the highest mean value of the other four items, namely the IWB1 item with a mean value of 3.97, which reads, "Employees try to solve problems in various ways."

**Table 4 Overview of Innovative Work Behavior**

Dimensions	Item	Mean Item	Mean Innovative Work Behavior
Innovative Work Behavior	IWB1	3,97	3,84
	IWB2	3,88	
	IWB3	3,73	
	IWB4	3,84	
	IWB5	3,81	

**3.3 Direct Influence**

**3.3.1 The Influence of HR Practices on Innovative Work Behavior and Job Engagement**

Table 5 presents the p-value of the influence of the HR practice variable and innovative work behavior of 0.018, so it can be concluded that the HR Practice variable had a significant positive effect on the Innovative Work Behavior variable.

**Table 5 The Influence of HR Practices on Innovative Work Behavior and Job Engagement**

Model	Mean	SD	p-value
HR Practice -> Innovative Work Behavior	0,139	0,061	0,018
HR Practice -> Engagement	0,797	0,026	0,000

HR practices in previous studies were stated as one of the variables that influenced employees' innovative behavior. Prieto & Pérez-Santana (2014), in their research, concluded that HR practices had a significant positive effect on innovative work behavior [8]. The results of this study also showed that the influence of HR practices has a significant positive effect on innovative work behavior. HR practices were the primary means when a company can influence and shape the skills and behavior of individuals to do their jobs, thereby achieving organizational goals [9] and [10]. HR practice was an approach that emphasizes the company's role to make policies that can provide value to the company and provide value to its employees. There were six dimensions of HR practice used in this study that can influence employee innovative behavior. Starting from staffing (staffing), HR practices can select new employees who are deemed to have competencies that were by their position through detailed selection stages. Then the company can also encourage employees to learn and develop with the company and adhere to the same values as the company.

Furthermore, there was often no innovation in terms of training due to the lack of knowledge and skills of a person. Companies that try to provide training according to the needs of their employees can trigger employees to be more broad-minded, open-minded, and critical, and also dare to appear. Because without the courage to convey, innovation will only be buried in the mind. By the stages of innovative work behavior, Scott & Bruce (1994), Janssen (2000), innovation begins with the creation of ideas (idea generation). It then continues with the delivery of ideas (idea promotion), and finally, the realization of ideas (idea realization) [12] and [13].

Compensation and employee appraisal also affected the innovative work behavior of employees through the motivation domain. Because with the compensation by the work done, employees will be more

enthusiastic in working. If the company cannot provide compensation for employees' work, let alone create innovations, work according to operational standards is also reluctant to do. Likewise, with performance appraisals, performance appraisals can motivate employees to improve their performance further because this was measurable, and employees know how to improve their performance to get better compensation and rewards.

The latter was in career opportunities, where job arrangements and responsibilities, and opportunities to participate can influence employees' innovative work behavior. Employees will feel more valued and needed to spurs employees to play a more role in the company, which can also make employees try to create innovation.

In addition, Table 5 also showed a p-value of 0.000 for the influence of the HR practice and engagement variables, which means that it can be concluded that the HR practice variable has a significant positive effect on the engagement variable. Human resource practices can help companies improve organizational behavior such as employee commitment, competence, and flexibility, which leads to an increase in staff performance, as stated by (Koch & McGrath, 1996) [14]. In their study, Meyer & Smith (2000) concluded that there is an influence between HR practices and innovative work behavior, where the influence can occur mediated by certain factors [15]. Paul & Anantharaman (2004) showed that HR practices significantly positively affect innovative work behavior [16]. Saks (2006) also suggested that human resource practices are seen as factors that influence employee engagement and innovative work behavior [17].

Analysis of the influence of HR practices on employee engagement in this study obtained the same results as previous studies. The results obtained indicate that the influence between HR practices and employee engagement is significantly positive. This shows that when HR practices were improved, the level of engagement of employees will also increase. This was by the existing theory; the results showed that the influence between HR practices and employee engagement was positive.

### 3.3.2 The Influence of Engagement on Innovative Work Behavior

Table 6 shows a p-value of 0.000. This figure can be interpreted that the engagement variable has a significant positive effect on the innovative work behavior variable.

**Table 6 The Influence of engagement on innovative work behavior**

Model	Mean Sampel	Standard Deviation (SD)	p-value
Engagement -> Innovative Work Behavior	0,543	0,083	0,000

Employee engagement had been considered a significant attribute for creating a favorable work climate and outcomes such as innovative behavior [18]. Rich et al. (2010) mention that employee engagement was a much broader construct than intrinsic motivation, as it accompanies the investment of emotional, cognitive and physical energy into work roles [19]. The extent to which employee engagement implies a more significant influence on the employee's job role increases the perception of the job role as including innovative behavior and increased work performance [20]. In this study, employee engagement had a positive and significant effect on innovative work behavior.

## 3.4 Indirect Influence

### 3.4.1 The influence of HR practices on innovative work behavior mediated by engagement variables

To assess the significance of the predictive model for the indirect effect of structural model testing, it can be seen from the t-statistic value between the independent variables to the dependent variable in the table Specific Indirect Effects on the SmartPLS output below:

**Table 7 Indirect Influence**

Model	Mean	SD	p-value
HR Practice -> Engagement -> Innovative Work Behavior	0,433	0,068	0,000

The table above showed that the Original Sample (O) value is 0.427 with a significant value or P-Value of 0.000, which is smaller than 0.05. The T Statistics value of 6.269 was greater than the t-table value of 1.971, so it can be concluded that the HR Practice variable through Engagement significant positive effect on the Innovative Work Behavior variable.

Furthermore, the analysis of R Square (R2) or the Coefficient of Determination was used to determine how big the percentage contribution of the influence of the independent variables together on the dependent variable.

**Table 8 R Square (R<sup>2</sup>)**

	<i>R<sup>2</sup></i>	<i>R<sup>2</sup> Adjusted</i>
Engagement	0,629	0,627
Innovative Work Behavior	0,842	0,840

Based on the table above, it can be seen that the R<sup>2</sup> value of the attachment variable is 0.629. This means that the influence of the independent variable of HR practice on the engagement variable in this study is 62.9%. In comparison, the remaining 37.1% is influenced by other factors not examined in this study.

The R<sup>2</sup> value of the supportive work environment variable was 0.673. This means that the influence of the independent variables of HR practices on the supporting work environment variables in this study amounted to 67.3%. In comparison, the remaining 32.7% was influenced by other factors not examined in this study.

The R<sup>2</sup> value of the influence of innovative work behavior as the dependent variable was 0.842. This means that the influence of HR practice variables, employee engagement, and a supportive work environment on innovative work behavior in this study amounted to 84.2%. In comparison, the remaining 15.8% was influenced by other factors not examined in this study.

The mediation role must meet three requirements stated by (Baron, R. M., & Kenny, 1986 in Saks, 2006) [17]. The results of hypothesis testing in this study indicate that the first and second requirements are met. The third condition was to look at the role of employee engagement by looking at the indirect and direct values of the influence between innovative work behavior and HR practices. The results showed that the third condition is also fulfilled from the previous hypothesis test. This showed that HR practices, besides being able to affect innovative work behavior at PT directly. XYZ can also be mediated by employee engagement itself.

Then, for the mediating role of employee engagement on the influence of human resource practices with innovative work behavior, it was accepted because the previous hypothesis regarding the influence between HR practices and innovative work behavior shows that the more challenging the characteristics of the job, the commitment of employees to the organization will be. Continue to increase.

This proves that employee engagement mediated the influence between HR practices and innovative work behavior. HR practices were included in the antecedent, and innovative work behavior was included in the consequence. In Kim & Koo's research (2017), employee engagement was divided into two separate parts: work engagement and organizational engagement [11].

### **3.5 Managerial Implication**

Looking at the results of the research described previously showed that PT. XYZ is actually on the right track regarding managing HR practices in its company if it wants to improve innovative work behavior. In general, the innovative work behavior of PT. XYZ is already relatively high, with an average value that is in the high category. However, HR practices still need further improvement in creating innovative work behaviors if through employee engagement. PT. XYZ need to further increase employee engagement through its HR practices which, in the end, high employee engagement can significantly impact employees' innovative work behavior.

Participation in HR practices was the highest compared to other dimensions of HR practices. Especially in indicator P1, "Employees in this company were allowed to make decisions." By further empowering employee participation, especially in providing flexibility for employees to make decisions while still in the realm of their position, it was expected to provide a significant change considering the strong influence of HR practices on employee engagement. More frequent involvement of employees in meetings can be one way to increase participation. In addition, it can also improve Work Design which gets the lowest score compared to other dimensions of HR practice, especially in the JD2 indicator "Our company transfers various tasks and responsibilities to employees." By encouraging companies to transfer tasks and responsibilities to employees further, HR practices' influence on innovative work behavior will be even more substantial.

Support from colleagues in a supportive work environment was higher than management support. Especially on the CS1 indicator, "Employees in this organization had a relationship based on mutual trust and confidence." Empowering good employee relations can be an excellent option to increase the impact of a supportive work environment. In addition, the MS1 indicator "Employees in this organization find it easy to approach their superiors." Received the lowest score in the management support dimension. This showed that if the company can encourage superiors to be more approachable to their subordinates, it can increase the influence of a supportive work environment on innovative work behavior.

Job engagement in employee engagement was higher than organizational engagement. Especially on the JE8 indicator, "When I wake up in the morning, I really want to go to work." By maintaining and empowering employee morale like this, companies can optimize employee engagement to influence innovative work behavior. In addition, the OE5 indicator (Table 3) "I am very involved in this organization." Got the lowest score in the organizational engagement dimension. This showed that the company still has not made

employees feel involved with the company. By encouraging employees to be more involved with company events, it can increase the influence of employee engagement on innovative work behavior.

Due to the number of millennials at PT. XYZ was above 70%, this was also a consideration regarding the form of policy on staffing regulations that must be applied, and the entry of Gen-Z into the company also requires adjustments related to the work environment. The form of management support for employees also need many adjustments in the face of changes in the current era of the industrial revolution 4.0. For example, if five years ago new employees received PC facilities to complete their tasks in the office, for the current millennial generation, especially the new Gen-Z, management support like this is not appropriate. Because the current millennial generation and gen-Z tend to be more mobile in doing tasks anywhere-anytime, laptops can be a more appropriate choice to facilitate them at work.

In addition, changing the values held by the company by starting to make employees company assets can also have a significant impact on the plan of the HRD department in 2023, which was discussed earlier. By making employees company assets, it will undoubtedly make employees more valued. Both from the value of compensation obtained, the facilities provided, a conducive work environment, the increase in the prestige felt by employees when bearing the company's name, to the presence of colleagues who always support each other both in work and in daily interactions. These things were interesting to do, considering that there were already pretty several startups and long-established companies, private companies, and state-owned companies that have implemented policies that seem more "relaxed," such as flexy hours, workspaces that are not partitioned. Gym and coffee corner facilities that can be accessed even during working hours and regular monthly hangouts. The goal was to meet the needs of employees so that employees can enjoy their work more and were also proud of the office where they work. With this, it was expected to improve employee performance and also increased innovative work behavior.

#### **IV. CONCLUSION**

Based on this research, several conclusions were obtained. HR practices had a significant positive effect on innovative work behavior. When HR practices were improved, these employees will be more innovative in PT. XYZ. Employee engagement is significantly affected by HR practices. HR practices positively affect employee engagement; this showed that the more varied and challenging a job is, the more employees will feel attached to their work. Employee engagement had a significant positive effect on innovative work behavior. Employee engagement positively affects innovative work behavior; this showed that the higher the level of employee engagement, the innovative work behavior will increase. Employee engagement mediates the positive influence between HR practices and innovative work behavior—the influence between innovative work behavior and HR practices at PT. XYZ can not only directly influence but can also be mediated by employee engagement. The results obtained from the study indicate that the mediating role of employee engagement on the influence of HR practices and innovative work behavior is acceptable.

Further research can evaluate questionnaires that have negative sentences so that the results obtained will be better. The use of sentences after the translation of the original questionnaire also need to be considered so that there are no differences in understanding from the respondents. Research using more significant research subjects was also needed so that the description of the research will be broader. However, it can also prove the characteristics of work in similar research subjects. In addition, other research can also be done by adding a qualitative approach to be able to explore further and confirm the information that has been obtained from data collection and analysis results.

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