

## Industrial Revolution Ideas 4.0 for Professional Development

Anizira<sup>1</sup>, Chevy Herli Sumerli A<sup>2</sup>, Rizki Alfadillah Nasution<sup>3</sup>, Zarkasi<sup>4</sup>, Arief Yanto Rukmana<sup>5</sup>

Universias Serang Raya<sup>1</sup>, Universitas Pasundan<sup>2</sup>, STIKOM Tunas Bangsa<sup>3</sup>, IAIN Pontianak<sup>4</sup>, Sekolah Tinggi Ilmu Ekonomi STAN IM<sup>5</sup>

[anizira@yahoo.co.id](mailto:anizira@yahoo.co.id)<sup>1</sup>, [chevy.herlys@unpas.ac.id](mailto:chevy.herlys@unpas.ac.id)<sup>2</sup>,  
[rizkialfadillahnst@amiktunasbangsa.ac.id](mailto:rizkialfadillahnst@amiktunasbangsa.ac.id)<sup>3</sup>, [zarkasime@gmail.com](mailto:zarkasime@gmail.com)<sup>4</sup>,  
[ariefyantorukmana@gmail.com](mailto:ariefyantorukmana@gmail.com)<sup>5</sup>

Author correspondence : [anizira@yahoo.co.id](mailto:anizira@yahoo.co.id)

**Abstract.** *The company strives to achieve the development of human resources and employee work abilities in the era of the industrial revolution 4.0 in order to achieve appropriate employee work efficiency. The achievement of employee work efficiency is seen based on what kind of employee development takes place. how the company places employees in positions that match what the employee has. By using brainstorming variables using a quantitative approach method with data in the form of primary and secondary data, the sample used was 76 employees. Based on the results of direct and indirect hypothesis testing, there is development of human resources and employee work abilities in the era of the 4th industrial revolution.*

**Keywords:** Human Resource Development, Work Ability, Work Effectiveness

**Abstrak.** Perusahaan berupaya untuk mencapai pengembangan sumber daya manusia dan kemampuan kerja karyawan di era revolusi industri 4.0 guna mencapai efisiensi kerja karyawan yang sesuai. Pencapaian efisiensi kerja karyawan dilihat berdasarkan seperti apa perkembangan karyawan yang berlangsung. Bagaimana perusahaan menempatkan karyawan pada posisi yang sesuai dengan apa yang dimiliki karyawan. Dengan menggunakan variabel brainstorming menggunakan metode pendekatan kuantitatif dengan data berupa data primer dan sekunder, sampel yang digunakan adalah 76 karyawan. Berdasarkan hasil pengujian hipotesis langsung dan tidak langsung, terdapat pengembangan sumber daya manusia dan kemampuan kerja karyawan di era revolusi industri ke-4.

**Kata kunci:** Pengembangan Sumber Daya Manusia, Kemampuan Kerja, Efektivitas Kerja

### 1. INTRODUCTION

This is the Industrial Revolution 4.0, when technology and machines have mostly superseded the modifications that businesses first implemented. The production method was sophisticatedly facilitated by technological development, which also helped to speed up the process and make it more effective and efficient. However, there are also adverse effects that result in unemployment, environmental harm from industry exposure, and the simplicity of information dissemination. In the era of Industrial Revolution 4.0, the phenomenon of human digital usage is rapidly expanding (Yusuf & Saepudin, 2022). It may be found in many aspects of modern society, from computer digital technology to digital games, the use of digital media, and the quick rise of digitally based movies. The most likely course of action in connection with the drop in corporate turnover is to increase work efficiency using electronic media. Given

the effectiveness of labor and the development of information technology, employee productivity is still achievable everywhere and at any time. The year is 2022 (Yusuf, Saepudin, and Kushendar). Employee tardiness, subpar performance, diminished employee initiative in carrying out their duties, and a decline in employee work spirit can all be barriers to efficiency. The company's leadership must provide incentives, such as additional gifts that can be money, commodities, or other items, to stabilize it since employees have specific goals like wanting to produce more than ever before. (Kurhayadi & Saepudin, 2022). It goes without saying that strong interpersonal communication inside a firm is necessary to achieve the best results from an effective and efficient team of workers. His methods for getting the team's results needed to be improved in order to be more effective. The results of the company's work will be ineffective or late if there is weak cooperation between the two. (Yusuf, 2022). Brainstorming is a technique used to quickly generate many ideas from a group of people. Human groups will not only complement one another's rich experiences but also provide an intellectual dialogue and fill each other full. These thoughts will eventually inspire others' thoughts, leading to a genuine flow of thoughts. in 2023 (Razali and Yusuf). In group talks, the brainstorming paradigm is applied to find group or individual solutions to challenges. The relationship between brainstorming and the auditor's decision-making about fraud is examined in order to test such relationships by creating a quality measure of brainstorming. The findings showed that reliable evidence strengthens the relationship between fraud risk indicators and evaluation.

According to the research that Deni has done in Ayu (2023), this industrial revolution 4.0 is happening very quickly with the use of digital machines and the Internet. From here, employees are asked to be able to do all kinds of work in the presence of this intelligent technology that works once and for all to enhance human resources. This artificial intelligence that has been created can help humans train and sharpen their abilities. Which would use qualitative descriptive methods. The expected outcome and conclusion are to be able to know about the power of artificial intelligence that exists to enhance human resources.

Further with the research by Yusuf (2018), entitled "The Impact of the Era of the Industrial Revolution 4.0 on Human Resource Competence," this research has found industries that need human resources that have competence in the use of digital technology. This competence is to realize smart factories by opening up opportunities that require expertise in line with the latest technological developments. Requirements for improvement or updating of skills based on what is urgently needed in the industry in terms of human resources are all important factors for the success of Industry 4.0 with participatory qualitative research methods. Which obtained data through literature studies, interviews, and practical efforts in preparing and mapping

human resources competencies in the era of the industrial revolution 4.0 and in creating competent human resources.

## **2. LITERATURE REVIEW**

### **Human Resource Development**

Companies engage in human resource development to ensure that employees' knowledge, skills, and abilities match the requirements of the jobs they hold. By enhancing employees' knowledge of human resources, companies also enable them to better understand the work that will be done in the future (Kurhayadi, 2018). putting human resource development into practice to boost employee output and meet business objectives.

### **Work ability**

Ability is the capacity of an individual to perform various tasks in a job. Capabilities can be in the form of talents and interests possessed by employees, with the abilities they have employees can carry out and complete tasks properly with maximum results (Kurniawati, & Lesmana, 2022). It is very important for companies to know the work capabilities of their employees so that it makes it easier for companies to complete planning well company and fit for purpose.

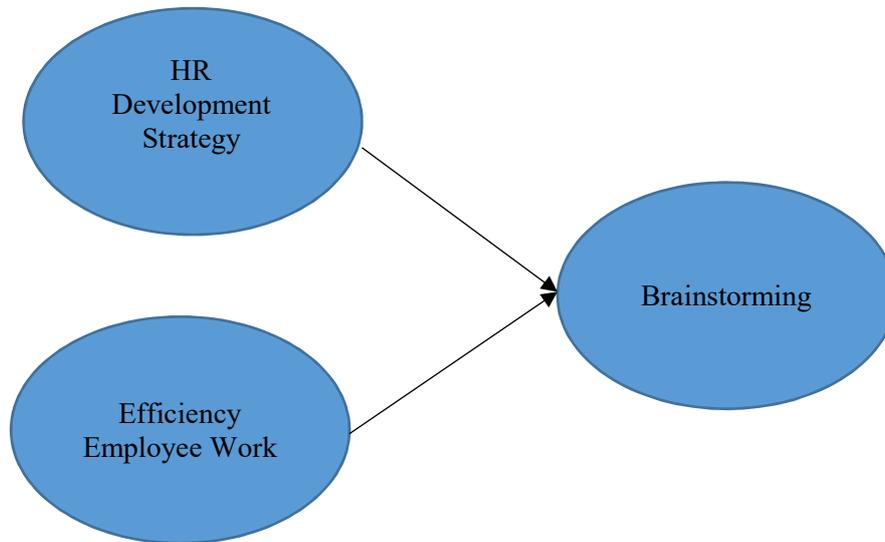
### **Work Efficiency**

According to Yusuf, Saepudin, & Kushendar (2022), work efficiency is a basic principle for carrying out every activity of an organization with the aim of obtaining the desired results with the minimum possible effort in accordance with existing standards. Working with efficiency is working with as little movement, effort, time and fatigue as possible. By using simple ways of working, using tools that can help speed up task completion and save movement and energy, a person can be said to work efficiently and obtain satisfactory results. Work efficiency in a company is very important because it shortens the specified time with appropriate solutions and new ways of good quality work.

### **Brainstorming**

According to Razali & Yusuf (2022), brainstorming is able to help work teams solve problems with innovative solutions, benefit from various other people's ideas that develop or build relationships between students and assess views between teams. In a company, brainstorming is very important because in every company there are always obstacles or new things to be carried out that must be completed properly and maturely so that it will make it easier for the company to achieve the goals that have been set.

The research conceptual framework is presented in Figure 1 below:



**Figure 1. Research Conceptual Framework**

A research hypothesis is referred to as a temporary estimate of the relationship between variables

Before carrying out the research. From the conceptual framework that has been made, several hypotheses are obtained, among others.

H1: Analysis of human resource development has a positive effect on Brainstoming

H2: Human resource development analysispositive effect on efficiencyemployee work

### 3. Method

#### 3.1 Types of research

This study employs an explanatory quantitative methodology. According to the demands of the research, information is needed to examine the effects of a number of X variables, such as human resource development plans and employee job skills, on Y, or employee productivity. To see if it has a favorable association that is mediated by variable Z, or brainstorming.

#### 3.2 Research sites

The location of this research was conducted at PT. Administrative Development Bandung, West Java, Indonesia. The researcher's consideration in choosing this location is because the company wants to know employees who have the potential to have knowledge of the latest technology in the digital era that we will face in the era of industrial revolution 4.0 so

that they have different advantages as superior employees in this research.

### 3.3 Population and Research Sample

#### 3.3.1 Population

The population is from the generalization area which consists of objects/subjects that have qualities and characteristics that are applied to the research and the conclusions drawn from it. The population of this study was 325 employees of PT. Build most of the administration. The target is the use of technology that is currently occurring and is needed for the company's development, such as excellence or superior abilities possessed by employees.

#### 3.3.2 Sample

This study used the proportional random sample approach as its sampling strategy. is a method of sampling in which the same individuals, representing both large and small populations, are all sampled. In this study, the Taro Yamane formula was used to evaluate if the sample considered representative. In this study, 76 samples will be used to compute the sample size using the Taro Yamane method. Since no precise demographic information was gathered for this investigation, the sample size was calculated using the Taro Yamane formula. The equation reads as follows:

$$n = \frac{N}{Nd^2 + 1}$$

Information:

N : sample size

N : Total population = 325 d

: *sampling error* = 10%

To fulfill these requirements, in determining the number of samples, researchers used the Taro Yamane calculation formula. Determining the number of samples in this study used the Taro Yamane formula, as follows:

$$n = \frac{325}{325 + 1}$$

$$n = \frac{325}{4 + 1} = 76$$

### 3.4 Data Types and Sources

#### 3.4.1 Data Type

In this study the authors took quantitative data types, because this research the data to be taken was like numbers, the numbers taken would be analyzed using data analysis.

#### 3.4.2 Data source

Data sources are collected through primary and secondary data. That is, the data is self-generated and will be used by the researcher to solve the problem being handled. The data collected itself uses a questionnaire sent directly to employees. While secondary data is data that has been collected in order to solve existing problems in research, The existence of this research, which will become a secondary source, is a collection of journals or websites on the internet that are related to this research.

#### 3.4.3. Data collection technique

Data collection techniques in this research using a questionnaire or questionnaire. This technique is carried out by distributing several questions to respondents online and using a Google form, respondents can answer from the options available on the questionnaire. The test plan includes variables that are measured using a measurement scale expressed in numbers so that accuracy, efficiency and communicative results are produced. The measurement scale that is in accordance with this research is the Likert scale, through which this scale will be measured and translated into variable indicators which are also used as benchmarks in the preparation of several instrument items in the form of statements or questions. The following is a Likert scale indicator table:

**Table 2**  
**Variable Measurement Scale**

Question	Evaluatio n
Strongly Agree (SS)	5
Agree (S)	4
Neutral (N)	3
Disagree (TS)	2
Strongly Disagree (STS)	1

### 3.5 Data analysis technique

This study uses the Partial Least Square (PLS) method and uses SmartPLS tools. PLS is an alternative method of SEM (structural equation modeling) that is used to solve problems in relationships. In the PLS program there are two evaluation models, namely the measurement model evaluation (outer model) and structural evaluation (inner model).

### 3.6 Validity test

Validity test is a test used to show the extent to which the measuring instrument used in a measure measures what is being measured. Measurement using a questionnaire was carried out on question items through a validity test. The validity calculation for PLS can be seen from the loading factor or AVE value below

## 4. Results of Analysis and Discussion

### 4.1 Outer Model Testing Results

The Outer Model for data analysis in this study uses a partial least square. The outer test begins by estimating or estimating parameters, namely by carrying out PLS algorithm calculations in the image below. From the results of the analysis, it can then be evaluated using a measurement model (outer model), namely by conducting convergent validity, discriminant validity and reliability tests. The following is a picture pattern for the inner and outer model:

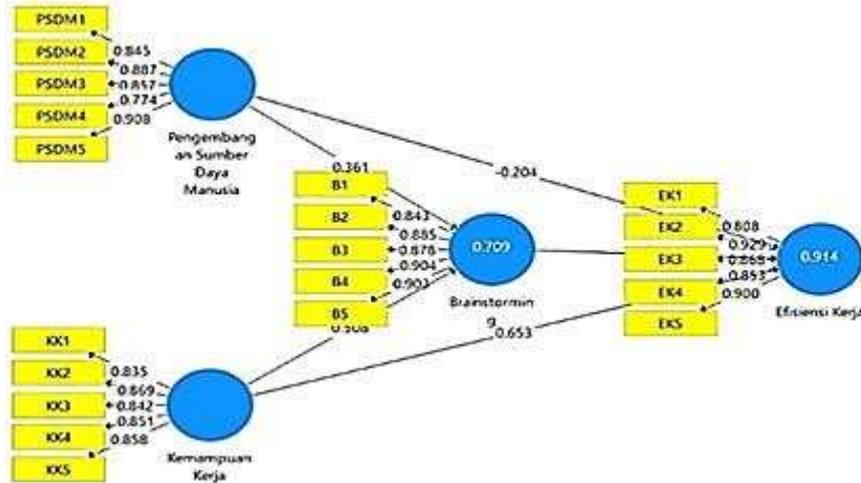


Figure 1. Inner Model

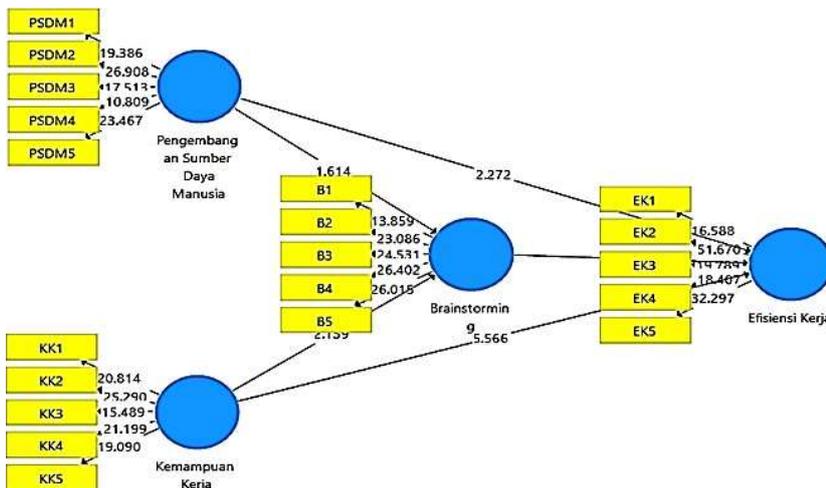


Figure 2. Outer Model

## 4.2 Convergent Validity Test Results

*Convergent Validity* (Convergent Validity) of measurement model by using reflective indicator based on loading factor. A loading factor value above 0.7 is stated as an ideal or valid measure as an indicator in measuring constructs, a value of 0.5 to 0.6 is still acceptable while those below 0.5 must be excluded from the model.

It can also be interpreted that the development of human resources is not very helpful in developing the process of increasing the capabilities, skills and knowledge of an employee from an economic point of view, this can be said to be the accumulation of human capital and its effective investment in more advanced economic development. Thus, brainstorming was used to examine how it affects the auditor's decision-making process. The evidence that high-quality brainstorming enhances the associations between fraud risk

factors and fraud risk assessments. The quality described includes three components in brainstorming quality. Attendance in the brainstorming process and the communication that occurs is a very important factor in the brainstorming process. Sessions, will lead to broader thinking and more information collected. This should increase overall output and response rates to fraud.

## **5. Conclusion Limitations and Suggestions**

The goal of this study is to learn how to improve human resources and employee work skills in the era of Industrial Revolution 4.0 in order to achieve employee work efficiency, which is aided by variable Z, namely brainstorming for the company. The study will draw conclusions based on its findings using the SmartPLS 3.0 program and discussions from earlier chapters. Demonstrates that factors that have a direct impact on human resource development have no substantial or adverse effects on brainstorming. Employee work efficiency is positively and significantly impacted by human resource development. Brainstorming is positively and significantly impacted by employee job abilities. Employee work efficiency is significantly and favorably impacted by employee work ability. Brainstorming, which has a favorable and large impact on employee job efficiency, is the variable with the last direct influence. The indirect variable's results, specifically the ability of employees to go from the variable of brainstorming to the variable of employee job efficiency, are both favorable and significant. The human resource development factors, which go via brainstorming, and the employee work efficiency variables, which have a positive and significant impact, are additional variables that do not have an indirect influence. The only variable that has a negative impact is one, so all company employees can succeed in the Industrial Revolution 4.0 by inspiring and educating them so that employee work efficiency is also aided by the brainstorming variable. It can be said that all variables are positive, but there is only one that has a negative impact. This study makes recommendations for future studies, preferably with a different firm sample. can expand this research by swapping out or including additional variables that are predicted to have an impact on the aforementioned variables. According to the theory, a firm can never place an employee in the wrong position. However, if a company has issues with employee abilities, it must be mindful to carefully select candidates for open positions. Employees must still avoid any issues that can result in a reduction in their position, and if they believe they are not in the proper position, they must apply to the appropriate division in order to do their duties.

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