

## Adaptation of Employee Development with Artificial Intelligence Virtual Reality in a Power Generation Company

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**Abstract** - Human resource development and training are essential to improve the quality and skill level of employees. The field of artificial intelligence focuses on developing the ability of computers to accomplish tasks that can currently be completed faster than humans can. To meet higher standards, Power Generation Companies are improving the quality of Virtual Reality (VR) images. VR can be used as a training medium. In addition, it can improve student understanding, information retention, and skills, and provide an immersive and deep learning experience. The purpose of this study is to determine the process of adaptation or application of AI VR in human resource development in the workplace, the contribution of development, and its utilization for work productivity, especially in the power plant company PT PLN Indonesia Power Suralaya banten province.. The method used is descriptive qualitative with a phenomenological approach to the adaptation of AI VR application by explaining the utilization, including the use of design, and AI VR procedures so that it can be adapted in the application of HR development effectively. Reputable national and international journals are used as references for the foundation of the development of this article. The adaptation results in different training modules for employees based on individual skills, job levels, job titles, and desired competencies. The AI tool can then match new projects with employees who have completed training together.

Keywords: artificial intelligence, virtual reality, human resource development

### 1. Introduction

Human resources play a critical role in an organization's ability to continue doing well, and they are essential to the goals of every business. An organization can define its accomplishments as those that come from improving the performance of every member of its team. In order to facilitate the easier achievement of organizational goals, human resources are thought to possess the capacity to carry out the duties and responsibilities of employees (Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, 2020). As a result, executives need to be dedicated to seeing the organization through to completion (Gagné, 2018) (Apriliansa & Nawangsari, 2021).

Human resources development and training are critical to raising employee quality and skill levels. With the right training, employees may contribute more to the organization. A strong company culture is also shaped by effective communication. The team as a whole can comprehend and accept information regarding business values, principles, and procedures with ease if management and staff communicate openly and clearly (Van de Vrande, V., De Jong, J. P., Vanhaverbeke, W., & De Rochemont, 2009). This will foster a balanced work environment and increase overall productivity. A competent Human Resources Development can also support you in adjusting to changes in the business environment and obstacles (Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall,

2011). The orientation, training, and development of Human Resources Development is essential for enhancing productivity as well as the company's creativity and competitiveness. Orientation is one of the initial phases in acquainting new hires with the values, policies, and practices of the organization. A well-planned orientation can boost motivation and comfort levels, lower attrition, and hasten the transition of new hires to their new jobs. Training and Human Resources Development are crucial if personnel are to increase their knowledge and abilities. Employees that receive the right training can increase the company's overall productivity, learn new skills that are applicable to their jobs, feel more secure performing their jobs, and contribute more to the company's success. Development of Human Resources and training are more productivity and higher-quality goods and services can be produced by workers who have received proper training. This will boost the company's standing with clients and increase its appeal to prospective workers. One type of long-term investment in the company's future is human resource development. It enables the business to lower external recruitment expenses, establish a desirable working environment, and fill key roles with internal candidates, among other things, by identifying prospective talents within the organization and creating appropriate development programs to maximize those skills. Moreover, HRD can increase employee retention by giving them



opportunities for professional and personal development, inspiring them to stay and contribute as much as possible, and fostering a supportive and cooperative work environment.

Strategic resource planning is the foundation of human resources management, also known as HRM or HR Resource Management. Artificial intelligence (AI) technology aids in decision-making for managers and executives by enabling more thorough implementation of strategic planning (Rajagopal, N. K., Qureshi, N. I., Durga, S., Ramirez Asis, E. H., Huerta Soto, R. M., Gupta, S. K., & Deepak, 2022). Firstly, global data collection and integration with internal and external data requires the use of technologies such as knowledge discovery and data mining. We can forecast, assess, and modify the company's future management after analyzing the facts and comprehending the logic of the current human resource circumstances. With the help of statistical functions and modifications made by the intelligent decision support system, the report was eventually updated with the relevant data. (Jia et al., 2018).

Artificial intelligence (AI) has grown to be a significant aspect of daily life, especially in the corporate world (Makridakis, 2017) (Goralski, M. A., & Tan, 2020), where it is applied to a range of tasks such as human resource management. Artificial Intelligence (AI) holds promise for improving the efficacy and efficiency of human resource management. It can automate recruitment and employee selection procedures, thereby identifying the best candidates for a given role. AI can also be used to evaluate employee performance information and offer suggestions for their professional advancement. By utilizing AI in Human Resources Development management, businesses can reduce the time and effort needed to complete this task manually (Raisch, S., & Krakowski, 2021) (Wamba-Taguimdje, S. L., Fosso Wamba, S., Kala Kamdjoug, J. R., & Tchatchouang Wanko, 2020). AI can also aid in lessening bias in the hiring process by ensuring that choices are made solely on the basis of qualifications and objective competence. Consequently, possess the capacity to establish more inclusive and diverse teams, which can raise the degree of innovation and creativity inside businesses.

Employers can maximize their workforce's potential by implementing AI, which is a creative approach, in employee development. Employers can more effectively evaluate employee data and learn more about each person's advantages and disadvantages by utilizing AI. This makes it possible for businesses to create more specialized and individualized training programs that help workers acquire skills necessary for their jobs. AI may also assist in the decision-making process for job rotation or promotion by objectively evaluating employee performance and ability data. Businesses can use AI to prevent subjective bias and make sure that choices

about post rotation or promotion are made based on relevant and objective criteria (Van Giffen, B., Herhausen, D., & Fahse, 2022). AI can also be used to find untapped potential in employees and make recommendations for professional growth. By doing this, businesses may make the most of their workers' potential and guarantee that promotions and job rotations are handled equitably.

Problem Formula:

1. How can AI VR help orient human resources in the workplace?
2. How does artificial intelligence or AI VR contribute to the design of personalized training programs for employees?
3. In the context of human resources, how can AI determine the needs for employee development?
4. What impact does the use of AI VR in training have on human resource productivity and efficiency?

#### 1.1. Human Resources Management

A planned and ongoing endeavor to raise the skill and capacity of workers inside an organization is referred to as human resource management, or HRM. These initiatives include staff development and training, which aims to enhance workers' short-term skills and get them ready for longer-term assignments. Human Resources Development is crucial to the development and accomplishment of the company's objectives. Consequently, in order to enhance employees' skills and competencies, organizations need to give priority to staff training and development. (Gustiana et al., 2022).

The planning, organizing, directing, and control of human resources within an organizational entity with the goal of accomplishing a predetermined objective is known as human resource management, or HRM.

Here are several popular theories of Human Resources Management:

1. The Theory of Maslow Everybody has five needs, according to this theory: self-actualization, bodily fulfilment, security, social interaction, and admiration. This idea is applied in human resource management to comprehend employee motivation and how to best meet their needs to enable optimal performance;
2. According to Herzberg's theory, two elements influence employee satisfaction: motivating factors (such recognition, responsibility, and ability to develop) and hygiene factors (like wage, working environment, and business policies). This theory is applied in human resource management to design a motivation and incentive system that works;
3. The X and Y Theory, or McGregor Theory: This idea addresses employee behaviour from two distinct angles. While the Y theory contends that workers genuinely enjoy their jobs and would perform better if granted more freedom and

responsibility, the X theory contends that workers are essentially lazy and should be made to work. In order to better understand how to manage and encourage people, this idea is applied in the field of Human Resources Development;

According to McClelland's thesis, power, affiliation, and achievement are the three main demands that everyone possesses.

## 1.2. Training and Human Resource Development

A strategy known as human resource training (HRM) is used to enhance the abilities and skills of employees or employees holding a certain job within an organization or corporation. (Apriliana & Nawangsari, 2021). Training is a deliberate procedure that imparts experience and expertise for efficient performance in order to modify attitudes, knowledge, or behavior. Future-ready skills are developed through training for both individuals and organizations. Dessler states (Gustiana et al., 2022), that training is the process of giving people the knowledge and abilities they need to finish their jobs. The workplace can employ training to increase productivity and achieve organizational objectives (Gustiana et al., 2022). The training's objectives are to: (1) increase performance, which can cover for the absence of former workers; (2) shorten the learning curve, which could aid in the education of new hires and close the skills gap between them; (3) resolve operational issues and advance staff members; and (4) enhance employee proficiency. (Nurhayati & Atmaja, 2021).

Apriliana & Nawangsari (2021), that a certified Human Resources Development goes through four steps or training programmes, which are as follows:

1. **Assessment:** This is the most popular technique for determining an SDM's level of competency. It is applied to identify and select workers who may become permanent employees.
2. **Design:** This is a crucial step in making sure management has a well-made training programme that satisfies organizational needs.
3. **Delivery:** The goal of this process is to enable trainers to train by providing them with the ability to allocate materials so they can instruct on a particular subject.
4. **Evaluation:** The process of assessing how well the training programme is doing in relation to the objective.
5. **Employee training** is the process of giving any employee—new or seasoned—the skills or abilities they need to carry out their jobs well. (Effendi et al., 2021). The two most popular forms of training are on-the-job training and off-the-job training. Workplace training refers to instruction provided to potential workers while they are working under the supervision of a coworker or former employee. Furthermore, off-the-job training is a way to teach participants a range of

viewpoints, concepts, or abilities through simulation and presentation. Participants are required to behave in accordance with the real circumstances after accepting the model of a portion of the organization. Relationships, education, work experience, training, and personality assessment are all factors that will undoubtedly prepare you for your next role or employment.

Kurniawati (2015) human resource development is an organization's long-term planned effort to improve human resources competency with the goal of guaranteeing that human resources suitable for the office are available and that the work of those connected to the office is improved. Noe et al., (in Gustiana et al., 2022), define development as the process of imparting knowledge, abilities, and behaviours that enable workers to do a variety of tasks, both new and old, including meeting client requests pertaining to their occupations.

According to McClelland (in Apriliana & Nawangsari, 2021) competence-based HRM development has six competence indicators, including:

1. Skill is the ability or ability to do something well
2. Knowledge is the information that a person possesses or controls in a particular field
3. Social role is the image projected by one to another (external personality).
4. Self-image is the picture that one possesses of himself.
5. A trait is a trait that is relatively consistent in a person's behaviour.
6. With a lot of technology evolving rapidly in today's technology age, one way to increase company productivity is to use technology.

Developing and training employees in this technology can help them thrive in their careers as increased productivity affects jobs, so they work effectively and efficiently. The aim of both development and training is to prepare employees for better positions in the future (Gustiana et al., 2022).

## 2. Research Methods

The method used is descriptive qualitative research, focusing on collecting and analyzing data in depth to understand phenomena or events carefully and in detail (Hadi, 2021)(Sugiyono, 2016). This method is often used in social science, education, and other fields where researchers are interested in explaining the characteristics, context, and complexity of a situation or event (Imron, A., & Taswiyah, 2022), (Saputra et al., 2023) (Imron, 2021).

The following are general steps in descriptive qualitative research methods:

1. **Topic Selection and Research Plan:** Identify the topic you want to research and create a detailed

- research plan, including research objectives, research problems, and data collection efforts.
2. Data Collection: Data collection is done through various qualitative methods such as interviews, observation, and document analysis. What is needed in each socialization/training is implemented through virtual reality. The data collected can be in the form of text, sound, or images.
  3. Data Analysis: Data is analyzed in depth and detail to identify emerging patterns, themes, or trends. Qualitative data analysis involves techniques such as coding, categorization, and interpretation in socializing virtual reality.
  4. Interpretation and Presentation of Results: The results of the analysis are interpreted to explain the characteristics and context of the phenomenon under study. The research results are then presented in the form of descriptive narratives, supported by citations from national, international journals, proceedings or examples of original data.
  5. Verification and Validity: The final step involves verifying the validity of the findings by reconsidering the data, triangulating, or involving participants in the verification process.

Descriptive qualitative research methods allow researchers to gain a deep and detailed understanding of the phenomenon under study, so that it can provide valuable insights for understanding and developing theories in various fields. From this method, a scientific article is presented in this journal.

### 3. Results and Discussion

Artificial intelligence (AI) is a field that concentrates on how to develop the ability of computers to accomplish tasks that can currently be completed faster than humans can. AI will affect several sectors, including training and development. Every industry, of course, has a way to increase competence, one of which is by improving skills. Training & Development is one of the best ways to develop employee skills. By using AI to create customized training and development programs for each employee. Offering different training modules to employees based on their individual skills, job levels, job titles and desired competencies. The AI tool can then match new projects with employees who have completed the course to completion, improving skills, making it easier to see the potential in resources internally. There is a lot that can be done with AI in the training and development department.

In utilizing AI as training and developing employee competencies in power generation companies, *Virtual Reality* (VR) can be used as a training medium (Xie, B., Liu, H., Alghofaili, R., Zhang, Y., Jiang, Y., Lobo, F. D., ... & Yu, 2021). By using the layout of the power generation that is entered into the application *installed* in the VR device. This VR is intended as a distance learning media for

operators and maintenance technicians.

This technology allows participants to experience and interact with fully digitized generating equipment. Virtual experience (VR) improves student understanding, information retention, and skills, and provides an immersive, immersive learning experience (Ekstrand, C., Jamal, A., Nguyen, R., Kudryk, A., Mann, J., & Mendez, 2018) (Di Natale, A. F., Repetto, C., Riva, G., & Villani, 2020). By wearing a VR *headset*, trainees can feel as if they are actually in a replicated environment. This can improve information retention and participant engagement.

The usefulness value of the existence of an AI VR in developing employee competencies at the power generation company (Sousa, M. J., & Rocha, 2019):

- With AI VR, you can utilize remote training practices practically and safely
- More efficient / cost efficient to carry out training and education (*diklat*)
- Faster because trainees do not need to travel to the training venue
- More independent and flexible because trainees can attend anytime and anywhere without an instructor.

The challenge of utilizing AI VR in the future to increase usefulness is (Dimitriadou, E., & Lanitis, 2023) (Himeur, Y., Rimal, B., Tiwary, A., & Amira, 2022):

- Improved AI VR Image Quality (Resolution)
- Fixes for potential bugs in the AI VR
- In general, AI VR can be used for introduction and understanding, but to increase competence through the experience provided, it still needs to be accompanied by offline practice
- Initial investment costs are quite high

### 4. Conclusion

Adapting employee development to virtual reality-based artificial intelligence in power generation companies is an innovative step that can improve operational efficiency and safety. Here are some steps that can be taken to facilitate this adaptation 1) Provision of Resources: Companies should ensure that employees have adequate access to the software and hardware required to use artificial intelligence (AI) and virtual reality (VR) technologies. This may involve investing in VR equipment and access to relevant AI platforms. 2) Employee Training: Organize comprehensive training for employees on the use of AI and VR technologies in the context of their work. This may include training on how to use related software and hardware, as well as training on the benefits and applications of these technologies in a power generation environment. 3) Virtual Simulation and Training: Implement virtual simulation and training using VR technology to simulate operational

situations in power plants. This allows employees to practice and develop their skills in a safe and controlled environment. 4) AI System Integration: Integrate AI systems into a company's daily operations to support better decision-making and improve efficiency. For example, using AI to analyze sensor data and predict potential equipment failures can aid in preventive maintenance. 5) Monitoring and Feedback: Establish a monitoring and feedback system to evaluate the effectiveness of these employee development programs. By analyzing data on employee performance before and after the implementation of AI and VR technologies, companies can identify areas where there is improvement or the need for further adjustments. 6) Continuous Commitment to Innovation: Ensure that the company stays involved in the research and development of the latest technologies in the field of AI and VR. This allows companies to continuously improve and update their employee development programs according to the latest developments in technology.

By implementing these measures, power generation companies can improve employee adaptation to AI and VR technologies, thereby improving the efficiency, safety, and overall performance of their operations.

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