# Improving the Performance of Human Resources Management Using the Artificial Intelligence

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***Abstract.*** *In this paper, we explored the methods by which artificial intelligence can be used frequently and usefully, even in human resources departments. The work in the field of human resources is increasingly based in the technological area, and the way in which employee data is processed is becoming more and more technological. Even so, errors appear in the methods approached by companies, so the automatic programs are increasingly used, and human intervention is necessary to a lesser extent. The goal is to increase performance, both at the employee and company level. The topic addressed provides the methods in which a new type of technology, namely AI (Artificial Intelligence), can have an impact on the professional performance of employees in a multinational company in the automotive industry in Romania. This study is an exploratory one, the main purpose being to discover the ways in which such technology can help HR (human resources) in improving professional performance. Thus, the answers of HR employees on how they believe that an artificial intelligence system can help them in fulfilling their daily*

*tasks at work are used and analyzed, exploring ways to improve professional performance in the following departments: Recruiting, Learning, HR Systems, Admin. The focus is on automation and on improving employee performance. Through retrospective analysis, the study explores the interaction between social dynamics and the technological environment, highlighting how one influences the other. In the search for efficiency, the study identifies methods to optimize employees' work, from automated systems to artificial intelligence. The latter can provide quick solutions through a database system that efficiently stores and applies the accumulated information.*

***Keywords:*** *artificial intelligence; employee development; employee performance; employee retention; workforce planning.*

## Introduction

This study, being an exploratory one, analyzes the different methods by which AI can interfere with the human resources field and how it could improve the professional performance of HR employees.

Importance of the Theme: In the era of advanced technology, the use of artificial intelligence (AI) is becoming increasingly important to improve the performance of professionals in various fields. In this context, it is important to explore how new AI technologies can contribute to efficiency and innovation in the workplace. Definition of artificial intelligence: According to Russell and Norvig (2016), artificial intelligence refers to "the ability of machines to mimic human cognitive functions, such as learning and problem-solving." This definition highlights the importance of cognitive abilities in the context of artificial intelligence and their association with improved job performance. Thus, the integration of artificial intelligence in professional environments has a significant impact on performance and contributes to streamlining, automating and improving decision-making processes. In the age of digital technology, adapting to these advancements is essential for companies that want to remain competitive and maximize their professional potential.

## Literature review

### *Operationalization of concepts*

The key concepts used in this study are: Professional Performance and Artificial Intelligence. Professional performance is found as "an abstract multidimensional concept, whose measurement depends on a wide variety of factors" (Maldur, 2015). Thus, this is the most important route towards the evolution of work and the way we manage our performance.

### *Professional performance management of human resources*

Professional performance management in the field of human resources is essential for achieving organizational success. This paper explores performance management strategies, supported by innovative technologies and practices and how they can contribute to optimizing professional performance in an organization.

*Skills Development through Continuous Learning.* In the context of rapid changes in the business environment, professional performance management must include strategies for the continuous development of employees' skills. Russell and Norvig (2016, 78) point out that "AI-powered learning platforms can provide personalized resources, adapting to individual needs and development requirements '' (Ghaffari et.al, 2019).

### *Types of AI technologies used in HR*

AI technologies can have a significant impact on human resources, helping to improve employee performance and therefore increase the quality and quantity of work. This can lead to an increase in profit, as "organizations should take advantage of important opportunities to develop human profitability, capital investment by integrating incentive plans with organizational strategy, and improving the value presented to human resources" (Nazri, M., & Salleh, J, 2017). To improve professional performance, an analysis of factors that influence performance, such as organizational engagement and job satisfaction, is necessary. "The impact of organizational engagement on job performance is updated by the impact of job satisfaction on job performance" (Loan, 2020).

In the industry, one of the most popular software for the HR department of companies is "Leena AI". It reduces the workload of an HR specialist, learning how to answer employees' questions and thus solving many minor problems. It can also take care of employee training, repeating and explaining in different ways the tasks that the employee does not know, thus helping to improve professional performance. Due to its learning capacity, this software can also be adapted to other software used by HR staff.

Another notable AI software is "Effy AI", which stores employee data in a single database, accessible through communication with the software. It can generate reports, provide accurate information, and even create Excel documents with reports and PowerPoint presentations. Like "Leena AI", "Effy AI" can handle employee training and onboarding.

In conclusion, AI technology can help increase employee satisfaction through automated analysis systems of various actions in the environment in which it is involved. It can identify factors that can improve human work, thus creating organizational engagement that can increase employee satisfaction and, therefore, their performance.

### *Professional Performance Management*

In the ever-evolving digital age, modern organizations are facing increasing challenges in terms of employee development and retention. In this context, AI systems offer innovative tools and solutions for the detailed analysis of the factors that contribute to employee development, engagement, and retention. Many companies rely on AI with machine learning and application systems, which can predict employee retention and classify valuable employees from ordinary ones (Alshehhi et.al, 2021). These systems can act quickly to prevent valuable employees from leaving the company.

In terms of employee development, the new generations require innovative methods that attract them to get more involved in professional development. Financial benefits remain an important factor, but for some areas they are not enough, and for other

companies they can be too expensive. In this context, AI technology based on learning through analytics comes to the rescue, offering personalized solutions for employee development. It leads to increased employee satisfaction and promotes productivity, which leads, in turn, to personal and professional performance and development (Ramachandran et. al, 2022). This technology is also appreciated for the statistics it generates, making it easier for supervisors to assess employee capacity and performance and make informed decisions.

### *AI-assisted mentoring and coaching programs*

Currently, artificial intelligence technology, similar to that used in applications such as Siri or ChatGPT, is used to mentor and coach employees. These AI-powered mentoring and coaching programs not only adapt to the needs of employees, but also generate fast and accurate reports, compared to a regular employee. They eliminate subjectivism and offer dynamic approach methods, adaptable to the way each employee understands and shapes.

### *Human Resource Administration and Workforce Planning*

AI technologies can be used to manage data by continuously analyzing it in training and learning modules. AI can be trained to understand how the process of storing, repairing and processing data should work in each company, to know the procedures for correcting them and to make reports and analyses based on what emerges from the reports, thus helping the HR department and managers in decision-making and data storage.

Artificial intelligence is currently used by some companies to select employees, for example in the recruitment process. The AI, using the information in the resumé, finds the most suitable people for the position according to what is preset by the company as desirable. This process is called data mining, as AI basically uses CV *(curriculum vitae)* data to select the most suitable people for the interview (Jia et al., 2018). Using the same process, reporting on the need for the workforce in the future can also be considered. The analyses made by AI are based on both internal and external resources. Through the analyses carried out, a simulation of the necessary future work can be made.

### *Workforce development strategies based on data analytics and AI*

This paper explores how data and artificial intelligence can be used to improve workforce development. It examines how these technologies can be used to identify and attract talent, optimize recruitment and selection processes, improve employee training and development programs, and anticipate future work market demands.

## Methodologies

### *Development and adaptation of the research tool*

The research method used in this paper is the questionnaire-based sociological survey, which was created and adapted according to the purpose and objectives of this research. The questionnaire consists of 22 questions, out of which 19 are multiple-choice quizzes, 4 are scaling questions, each scale being different. The first scale has as answer variants

from 1 to 5, where 1 is "Very Clear" and 5 is "Not Clear At All", the second scale has variants also from 1 to 5, where 1 is "Very Small Measure" and 5 is "Very Large Measure", and the last scale has values from 1 to 5 where 1 is "Very Worried" and 5 is "Not Worried At All". These questions encompass several important aspects for the chosen topic, such as "What Are AI Technologies", "Types of AI Technologies Used in HR", "Ethical Implications of Using AI Technologies in HR", "Data Protection and Information Security", "Employee Development and Retention".

***Theoretical objectives of the research***

*The theoretical objective no. 1:* To identify AI technologies that could be used in the automotive company within the Human Resources department.

*The theoretical objective no. 2:* To study the possibilities of adapting AI technologies in the Human Resources activity of the multinational automotive company.

***Practical objectives of the research***

*The practical objective no. 1:* To analyze the availability and adaptation of the employees in the human resources department of the multinational automotive company in terms of the use of artificial intelligence in the workplace.

*The practical objective no. 2:* To study the ways in which AI technologies can be implemented in the Human Resources department of the automotive company to increase work performance.

***General hypotheses of the research***

*The general hypothesis no. 1:* Employees' attitudes towards AI technologies in the field of human resources are influenced by the degree of familiarity with the basic concepts of Artificial Intelligence, the level of education and training in the field, as well as concerns about data security and information privacy.

*The general hypothesis no. 2:* The use of artificial intelligence in the context of the professional environment can lead to improved individual and organizational performance by optimizing work processes, providing support in decision-making, anticipating needs and providing personalized solutions, which leads to increasing efficiency and results.

***Working hypotheses of the research***

*The working hypothesis no. 1:* There is an association between the perception of the major changes brought by the technological evolution in HR work and the predisposition of employees in the HR department to work with this type of AI technologies.

*The working hypothesis no. 2:* The higher the level of knowledge about artificial intelligence of employees in the human resources department, the greater the perception that its implementation can improve employees' professional performance.

*The working hypothesis no. 3:* The higher the level of knowledge about AI technologies of employees in the Human Resources department, the more they will believe that these technologies bring an improvement in their level of engagement.

*The working hypothesis no.4:* The more knowledge employees have about AI technologies, the more increasing is their interest in the ethical implications of using these technologies.

*The working hypothesis no. 5:* The level of concern about potential security vulnerabilities regarding the use of AI technologies within the HR department correlates with the level of understanding of how employees use artificial intelligence within HR departments.

*The working hypothesis no. 6:* There are significant age-specific differences in HR in the belief that personalizing the employee experience with AI can help increase employee retention.

*The working hypothesis no. 7:* The higher the level of basic knowledge of respondents about artificial intelligence within the HR department, the more they believe that artificial intelligence could help them perform professional tasks in a more efficient manner.

***Choice of study population***

The target group for this study is represented by all employees of the human resources department of the multinational automotive company from all countries and, in particular, from Romania. The people selected in this target group know best what are the factors that favor and influence the use of AI technologies in the daily HR work of the multinational automotive company.

***Sampling method used***

The sampling method used for data collection was non-probabilistic, the questionnaire being carried out and distributed in an online format, its completion through this method being done by the subjects voluntarily. This quantitative approach is based on a development of questionnaires in the virtual environment through an application within the company called “HR Instruments”, because this application was timesaving, both in sending the questionnaire to the respondents and in completing it by the chosen group of respondents. These respondents are the global employees of the company’s Human Resources Department.

***How data was collected***

This questionnaire was distributed online, on the respondents’ work e-mail, through the “HR Instruments” app, which offered the possibility for this questionnaire to be officially seen as of higher importance for the company. This lead, at the end of the process, to collect a number of 106 responses out of a maximum number of 109 potential respondents.

***The time period in which the data was collected***

The data collection period was during August 2024. The respondents being from several countries, this period was chosen being the most feasible for everyone. The questionnaire was completed by employees of the multinational automotive company from 10 countries, namely: Canada, China, Taiwan, France, India, Japan, Mexico, Romania, Hungary and the USA.

***Limits of research***

In Germany, the legal regulations did not allow us to send the questionnaire with certain questions that would have helped us to carry out statistical analyses. If the questionnaire would have been also sent to Germany, the number of respondents would have been higher. Unfortunately, we had to take Germany out from this study, because of the Workers' Council in that country.

**Results and discussions**

***The working hypothesis no. 1***

To verify the validity of this hypothesis, a variable association analysis (cross-tabulation) was performed. According to the Chi2 test, this association is validated, its asymptotic significance threshold being less than 0.05 ($p=0.000 < 0.05$). Given the value of Phi and Cramer's V (both 1,000) it is shown that this association is a very strong one, as it could be seen in the Table 1.

***Table 1. Symmetric measures for working hypothesis no. 1***

| **Symmetric Measures** | | |
|---|---|---|
| | Value | Approximate Significance |
| Phi | 1.000 | .000 |
| Cramer's V | 1.000 | .000 |

According to the analysis, there is a statistically significant association between the level of perception regarding the major changes brought about by the evolution in HR work and their predisposition to work with AI technologies.

***The working hypothesis no. 2***

To verify this hypothesis, a correlation analysis was performed. According to the results of the analysis, the Average for Clarity of Basic Concepts of Artificial Intelligence ($M = 2.03$) suggests that respondents generally consider that they have a moderate understanding of basic concepts of AI in the context of human resources. The standard deviation of 1.108 indicates a relatively large variation in responses, as in the Table 2.

The perception of increasing performance by implementing AI in HR has a very low mean ($M = 1.05$) and a low standard deviation ($SD = 0.213$), suggesting that the majority

of respondents agree that implementing AI could increase their performance, but with minimal variation between responses. The correlation is positive (r = 0.196) between the clarity of the basic concepts of AI and the perception of increasing performance through the implementation of AI in HR is statistically significant (p = 0.044 < 0.05), in the Table 3. This indicates a weak positive relationship, suggesting that as respondents have a clearer understanding of AI concepts, they tend to perceive an increase in performance due to the implementation of AI in HR.

***Table 2. Descriptive statistics for working hypothesis no. 2***

| **Descriptive Statistics** | | | |
|---|---|---|---|
| | Mean | Std. Deviation | N |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | 2.03 | 1.108 | 106 |
| Do you think that implementing artificial intelligence in the company's HR department could increase your performance, considering your current knowledge about AI? | 1.05 | .213 | 106 |

***Table 3. Correlations for working hypothesis no. 2***

| **Correlations** | | |
|---|---|---|
| | | Do you think that implementing artificial intelligence in the company's HR department could increase your performance, considering your currnet knowledge about AI? |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | Pearson Correlation | .196* |
| | Sig. (2-tailed) | .044 |
| | N | 106 |

Considering the obtained results, the hypothesis is validated, proving that the level of knowledge about artificial intelligence of employees in the human resources department being higher, also increases the perception that its implementation can improve the professional performance of employees.

***The working hypothesis no. 3***

This hypothesis was verified by a correlation analysis. The results showed that there is a moderate and statistically significant positive correlation between the clarity of the basic concepts of artificial intelligence and the perception of the use of artificial intelligence technologies in improving engagement in personal development processes,

since the correlation coefficient is r = 0.411, which indicates that this correlation is moderate, and the materiality threshold is less than 0.05 (p = 0.000 < .005), which shows that there is a statistical correlation between these two variables (Table 4).

***Table 4. Correlations for working hypothesis no. 3***

| Correlations | | |
|---|---|---|
| | | Do you think that the use of artificial intelligence technologies would bring an improvement of the level of commitment in personal development processes? |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | Pearson Correlation | .411** |
| | Sig. (2-tailed) | .000 |
| | N | 106 |

To support the correlation, a regression was also performed to show that 16% of the total variation in the influence of the idea that the use of artificial intelligence technologies could bring an improvement in engagement in personal development processes is influenced by the level of clarity that the employees of the automotive multinational in the human resources department have about AI. Considering these results, the hypothesis is validated.

***The working hypothesis no. 4***

This hypothesis was verified by means of statistical correlation analysis. To examine the relationship between the clarity of the basic concepts of AI and the frequency of consideration of ethical implications, a correlation analysis was performed where the correlation coefficient r(106) = 0.219 demonstrated that this correlation is moderate and positive, and the materiality threshold is p = 0.024 < 0.05 demonstrated that this correlation is statistically significant (Table 5).

***Table 5. Correlations for working hypothesis no. 4***

| Correlations | | |
|---|---|---|
| | | How often do you take into consideration the ethics of using AI technologies in HR decision-making processes? |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | Pearson Correlation | .219* |
| | Sig. (2-tailed) | .024 |
| | N | 106 |

Concluding these results, the hypothesis is validated, with a statistically significant correlation between the level of knowledge that employees have about AI and the frequency of considering ethical implications in the use of these technologies.

***The working hypothesis no. 5***

A statistical correlation analysis was performed to verify this hypothesis. A significant negative correlation was identified between the clarity of the basic concepts of AI and the degree of concern about security vulnerabilities, according to the correlation coefficient r(106) = -0.576, which is negative. Given the materiality threshold, it confirms that this correlation is statistically significant (p = 0.000 < 0.05), in the Table 6.

***Table 6. Correlations for working hypothesis no. 5***

| **Correlations** | | |
|---|---|---|
| | | How concerned are you about the potential security risks associated with the use of AI within the HR department? |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | Pearson Correlation | -.576** |
| | Sig. (2-tailed) | .000 |
| | N | 106 |

According to the obtained results, the hypothesis is validated. It is demonstrated that the level of concern about potential security vulnerabilities regarding the use of AI technologies within the human resources department correlates with the level of lacking understanding of the use of artificial intelligence of employees within HR departments.

***The working hypothesis no. 6***

An ANOVA statistical analysis was used to verify this hypothesis. The results showed significant differences between the age groups, F(5, 100) = 4.800, p = 0.001 < 0.05, indicating that there are significant variations according to age in terms of this perception, which is why the analysis continued with a post-hoc test. To be specific, the post-hoc Games-Howell analysis was performed because of the lack of homogeneity of the variances between groups (p = 0.001 < 0.05), as seen in the Table 7.

Multiple comparisons revealed several significant differences between age groups. For example, participants aged 20-25 years had a significantly different perception compared to those aged 40-45 years (MD = -.533, SE = .124, p = 0.001 < 0.05), the same significant difference being observed between those of 35-40 years old and those of 40–45 years old (MD = -0.598, SE = 0.139, p = 0.002 < 0.05). Also, significant differences were identified between the older groups (45-50 years old and 50-55 years old) compared to the 40-45 years old age group (MD = 0.708, SE = 0.154, p = 0.004 < 0.05 in both cases), according to data in the Table 8.

***Table 7. The Levene test for working hypothesis no. 6***

| | | Levene Statistic | Mr. |
|---|---|---|---|
| Do you think that the use of artificial intelligence technologies would bring an improvement of the level of commitment in personal development processes? | Based on Mean | 4.800 | .001 |
| | Based on Median | 1.312 | .265 |
| | Based on Median | 1.312 | .265 |
| | Based on trimmed mean | 4.800 | .001 |

***Table 8. The Games-Howell test for working hypothesis no. 6***

| (I) Age | (J) Age | Mean Difference (I-J) | Std. Error | Mr. |
|---|---|---|---|---|
| 20-25 | 40-45 | -.533* | .124 | .001 |
| 35-40 | 40-45 | -.598* | .139 | .002 |
| 40-45 | 20-25 | .533* | .124 | .001 |
| | 35-40 | .598* | .139 | .002 |
| | 45-50 | .708* | .154 | .004 |
| | 50-55 | .708* | .154 | .004 |
| 45-50 | 40-45 | -.708* | .154 | .004 |
| 50-55 | 40-45 | -.708* | .154 | .004 |

The stated hypothesis is validated, proving that there are significant differences depending on the age of HR employees in terms of the belief that personalizing the employee experience with the help of AI can contribute to increasing employee retention.

***The working hypothesis no. 7***

Statistical correlation analysis was used to verify this hypothesis. The results indicated a significant, moderate positive correlation between the two variables, given the correlation coefficient $r = 0.207$ and the significance threshold demonstrating that this correlation is statistically significant $p = 0.033 < 0.05$ (Table 9).

The stated hypothesis is validated, which demonstrates that a higher level of basic knowledge about AI in HR leads to employees' consideration that this technology would help them perform their professional tasks in a more efficient manner.

***Table 9. Correlations for working hypothesis no. 7***

| Correlations | | | |
|---|---|---|---|
| | | | Do you think that artificial intelligence has the possibility to help you perform your tasks at work more efficiently? |
| How clear do you think the basic concepts of Artificial Intelligence are for the field of human resources? | Pearson Correlation | 1 | .207* |
| | Sig. (2-tailed) | | .033 |
| | N | 106 | 106 |

## Conclusions

Considering the dynamics of the way employees perceive the implementation of AI in their professional activity and following the results obtained, it emerged that there is an association between the perception of the major changes brought by the technological evolution in the HR field and the employees' desire to use AI in their professional activity which, in turn, shows the willingness to adapt and change within the employees' workspace. These findings underscore that employees who have a better understanding of the benefits and applications of AI are keener to adopt these technologies.

A positive aspect is that the high level of knowledge about artificial intelligence among employees in the human resources department was correlated with a positive perception of the impact of AI on professional performance. This indicates that better information and education of employees about AI can lead to a more effective use and acceptance of these technologies in professional practice.

Conclusively, most of the hypotheses stated have been validated and in the future we will conduct a new research on the policies for implementing AI in the HR departments of multinationals in the automotive industry of various countries in the European Union.

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