Artificial Intelligence: A New Era of Human Resource Management for Enhancing Employee Efficiency in The Healthcare Sector

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Abstract

Artificial intelligence plays a crucial role nowadays at a global level, making its presence felt in almost all sectors of human activity due to its complex potential of applicability. The benefits of artificial intelligence can also be observed in the healthcare sector, where the main resource used to provide healthcare services is human resources. The purpose of this study is to highlight the potential impact that artificial intelligence can have in increasing the efficiency of managing human resources within healthcare institutions, by implementing artificial intelligence at the level of various human resource management structures.The results of this study indicated significant correlations between the efficiency of human resource management and employee behavior monitoring, employee stress monitoring, employee evaluation system, and skill development. These findings highlight that the implementation of AI in various work structures of human resource management can increase employee efficiency and, implicitly, employee workplace satisfaction.

Keywords: *human resource managemen, atificial intelligence, employee efficiency, healthcare.*

JEL classification: M12, O15

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1. Introduction

The healthcare sector is one of the areas that shows increased interest from the population due to the important role it has in people's healthcare. Providing quality services is one of the objectives of any healthcare institution, therefore, increased attention is paid to the main resource used to provide healthcare services, the human resource.

Numerous specialized studies have been conducted on the importance and complexity of human resources. In specialized literature, we find numerous indications regarding the role of human resources, one of which is that they are the only ones capable of producing and reproducing the other resources that an institution or organization needs to function and achieve its objectives. These are unique resources from the point of view of their development potential and have a remarkable

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characteristic, that of overcoming their own limits. This human potential must be carefully studied, and, above all, motivated and supported in order to participate as effectively as possible in achieving the objectives of institutions and organizations (Deaconu, 2002).

The human resources department is the department responsible for managing the personnel structure and all its implications, and the implementation of efficient human resource management within healthcare institutions is essential for enhancing high-quality oh health services.

Over time, human resource management has undergone numerous transformations, but nowadays a new era of human resource management begins with the implementation of artificial intelligence within all human resource management structures.

Although the concept of artificial intelligence is relatively new in the healthcare sector, modern specialized literature has been talking about artificial intelligence in healthcare since 1971, both from the point of view of researchers in the field and from the point of view of the healthcare community using computer systems. Artificial intelligence has been seen as an interaction between technological performance and healthcare objectives. In healthcare, artificial intelligence is described as a hybrid between classical healthcare and intelligent systems that can be built by developing a computer language coded for various schemes, with the aim of applying healthcare knowledge acquired over the years in the real world (Coiera, 1996).

Workplace efficiency is a common topic in specialized studies due to the influence it can have in achieving the strategic objectives of organizations, which is why many managers try to capture this energy of employees (Macey & Schneider, 2008).

Artificial intelligence in the healthcare system is constantly evolving, therefore human resource management based on this innovation, artificial intelligence, aims to improve employee efficiency by adopting new strategies for employee motivation, retention, and providing a good work-life balance for employees.

In this study, we will explore the Romanian healthcare system to find the potential for increasing employee efficiency in healthcare institutions using artificial intelligence in human resource management.

In conclusion, this new era of artificial intelligence in human resource management within healthcare institutions in Romania is not only a challenge to the business environment but also an opportunity to increase efficiency. This study aims to contribute by providing a detailed analysis of human resource management practices and their impact on employee efficiency.

2. Literature review

According to studies conducted by the WHO, a decrease of approximately 10 million employees in the healthcare system is estimated by 2030. This process has a strong impact on employee retention and ensuring the necessary healthcare

services for patients, while maintaining the current level of performance and quality (WHO, 2024).

Human resource management in the healthcare sector is facing a human resources crisis every day, as stated above by WHO. This crisis has raised many question marks over time. In numerous specialized studies we find the question of the extent to which artificial intelligence could support the healthcare sector and help mitigate the decrease in the number of healthcare staff and how this can be achieved (WHO, 2024).

In a 2018 study, we find the main questions that have been asked over time regarding how artificial intelligence can support the healthcare system, namely: the extent to which technology can help doctors or replace them, how education could support future doctors with information regarding the use of artificial intelligence, or how artificial intelligence could solve human resource management problems that are so varied. Starting from the hypothesis that some of the influencing factors of the human resources crisis may be the reduced number of doctors globally, the aging of the staff and the level of burnout of doctors, as well as the increased need for healthcare services generated by the deficient implementation of the healthcare prevention system, we can find ways in which artificial intelligence aims to eliminate these gaps (Mesko et al., 2018).

Figure 1. AI implementation through different areas of human resource management
Source: own processing

Artificial intelligence has been implemented in many sectors of activity, including human resources. The purpose of implementing AI in human resource management is to provide the possibility of increasing human resources efficiency, to optimize recruitment strategies, as well as employee retention; and can also be used as a employee evaluation tool and help determine compensation. Other uses may also be found. Artificial intelligence is a technological engine that is constantly evolving and the combination of the internet and "big data" offers the possibility of

shaping a new revolutionary era that has AI solutions at the forefront. human resource management is one area that can take advantage of the benefits of AI to automate tasks specific to the human resources department with the aim of reducing routine administrative activities, as well as provide the necessary support in decision-making, based on solid data patterns (Jishu, 2023).

The Generative AI tool comes to the aid of human resource management by requiring the establishment of clear sets of priorities through which the implementation of artificial intelligence can be achieved while ethical standards, transparency and information security are not affected (Umasankar et al., 2023).

Human resource management can use Generative AI to establish development plans for human resources, to improve the balance between personal and professional life, to monitor employee stress at work in order to achieve an improvement in the quality of life of employees and also obtain a more engaged workforce. The steps needed for implementing Generative AI are: identifying core capabilities, establishing an AI implementation plan, and preparing the department for its impact on human resources functions (Zang & Wang, 2006).

Another way in which artificial intelligence can be used in human resource management is to develop human resources after their employment. Specifically, AI-based applications can use predictive analyses of the emotional state of employees with the aim of improving human resources key performance indicators, such as the turnover rate, namely the ratio between the number of "leavers" and average number of employees, or to improve employee engagement (Chakraborty et al., 2019).

Human resource management can prioritize the implementation of artificial intelligence to improve its decision-making system, to preserve recruitment experiences, to outline employee development plans, to develop learning tools for employees that aim at individual growth of employees and also to achieve the objectives of the organization or institution. Another important task in which AI can be implemented within the human resource management department is to identify employees who have high potential, such as those with high leadership skills or who have other important skills for the organization. Artificial intelligence can also create a personal development plan for these employees and can provide special training to facilitate the transformation of human resource management (Albert, 2019).

3. Research methodology

This empirical study is carried out in the field of healthcare services, more specifically, on healthcare institutions in Romania.

This research combines both quantitative and qualitative techniques in order to obtain a better picture of the possible impact that the implementation of human resource management, based on artificial intelligence, can have on the efficiency of employees of healthcare institutions.

Regarding the quantitative analysis, for data collection, were used the questionnaire method, which was distributed among healthcare staff working in healthcare institutions in Romania. For the qualitative method, it was used the

interview, conducted with selected employees from the healthcare institution sample. The purpose of the interview was to explore in depth the participants perspectives regarding the impact of implementing artificial intelligence within the structure of human resource management in order to improve employee efficiency.

The subject group was made of 97 employees of healthcare institutions in Romania, and the eligibility condition was that the respondents must be permanent employees of the respective healthcare institution. The condition was met 100%, therefore it was not necessary to eliminate any respondent from the database.

The scales designed in this questionnaire are the following: employee behavior monitoring, employee stress monitoring, employee evaluation system, and employee skill development.

The scales were Likert type, with values ranging from 1 to 5, where 1 means total disagreement and 5 means total agreement.

After applying the questionnaires to the subjects in the study group, the following dependent variable resulted: employee efficiency; and the independent variables were employee behavior monitoring, employee stress monitoring, employee evaluation system, employee skill development.

Regarding the quantitative analysis, the tool used for the statistical analysis is the Statistical Package for the Social Sciences, in order to verify the validity of the measurement instrument and to determine the relationship between dependent variable and independent variables. In the statistical calculation, a margin of error of 5% and a confidence interval of 95% were taken into account.

In order to highlight the influence of the independent variables on the dependent variable, multiple regressions were used and the calculation formula was the following:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \ldots + \beta nXn + \varepsilon$

Where:

- Y: dependent variable;
- X1,X2…Xn: independent variable;
- $\beta 0$,$\beta 1$ ...βn: regression coefficients
- ε: residual error.

Descriptive results

Table 1

Variable	Mean	Median	Mode	Standard Deviation
employee behavior monitoring	2.7	3	3	0.85
employee stress monitoring	3.2	3	3	0.75
employee evaluation system	2.9	3	3	0.80

Variable	Mean	Median	Mode	Standard Deviation
employee skill development	3.1	3	4	0.65

Source: SPSS data

After analyzing the normality of the distribution of all four dependent variables, the data collected from the studied group were analyzed using the statistical tool and the Pearson Correlation test was applied between the analyzed variables, in pairs. The Pearson correlation is a statistical test that evaluates the degree of association between at least two variables, aiming to highlight the intensity and direction of the simultaneous variation of the values of one variable in relation to the other. Two variables correlate with each other when the values of one of them have a direct, increasing, or on the contrary, inverse, decreasing direction compared to the values of the other variable.

The range of variation of the Pearson intensity coefficient, denoted by the letter r, can include two types: perfect negative correlation, when r is -1, or perfect positive correlation, when r is +1 (Popa, 2006).

The obtained results are presented below.

Pearson Coefficient Values

Tabel 2

Variable	Correlation coefficient - r	p - value
Monitoring employee behavior	0.571	<0.01
Monitoring employee stress levels	0.677	<0.01
Employee evaluation system	0.670	<0.01
Employee skill development	0.688	<0.01

Source: results obtained through SPSS program

The results revealed a significand positive correlation between employee efficiency and innovative human resource management processes, suggesting that if the AI is implemented in the human resource management structure the employee efficiency increases (Table 2). This approach enabled the evaluation of the impact of independent practices —namely, employee behavior monitoring, employee stress monitoring, employee evaluation system, employee skill development —on the dependent variable, represented by the employee efficiency. The results of the regression analysis revealed that each of these practices exerted a statistically significant positive effect on employee efficiency, with a correlation coefficient of 0.571 for monitoring employee behavior, 0677 for monitoring employee stress levels, 0.670 for employee evaluation system and 0.688 for employee skill development.

4. Results and discussions

The present study aims to establish a correlation between employee efficiency and employee behavior monitoring, employee stress monitoring, employee evaluation system, and employee skill development.

The obtained results show that:

- There is a statistically significant correlation (p = 0.000) between employee behavior monitoring and the level of employee efficiency within the studied group. The correlation is positive and has good intensity (r = 0.571).
- There is a statistically significant correlation (p = 0.000) between employee stress monitoring and the level of employee efficiency within the studied group. The correlation is positive and has high intensity (r = 0.677).
- There is a statistically significant correlation (p = 0.000) between the employee evaluation system and the level of employee efficiency perceived within the studied group. The correlation is positive and has high intensity (r = 0.670).
- There is a statistically significant correlation (p = 0.000) between employee skill development and the level of employee efficiency within the studied group. The correlation is positive and has high intensity (r = 0.688).

The results obtained from the application of the Pearson Correlation test between the analyzed variables, paired, demonstrated that the hypothesis was fully validated and that there is a correlation between employee behavior monitoring, employee stress monitoring, the employee evaluation system, and employee skill development, and perceived employee efficiency within the studied sample, consisting of employees of healthcare institutions in Romania.

The existence of a statistically significant positive correlation and of good intensity between employee behavior monitoring and employee efficiency was highlighted. Specifically, when the institution has an employee behavior evaluation system, it can determine in advance employee behavior and can intervene early with the help of artificial intelligence in order to ensure staff retention and a high level of employee efficiency.

It also highlighted the existence of a correlation with positive statistical significance and good intensity between the employee evaluation system and the level of employee efficiency. When the employee is evaluated accurately in relation to his tasks, it can be assigned an adequate reward package, which will generate increased employee motivation and efficiency.

Another correlation with positive statistical significance and good intensity was identified between employee skill development and employee efficiency. This indicates that when the employee is helped to progress professionally, through various employee learning tools or other systems used for identifying high-potential employees, we can observe an increase in the level of employee efficiency.

This study highlighted that the implementation of artificial intelligence in human resource management requires a strategic adaptation on the part of healthcare institutions that can result in improving the efficiency of their employees.

5.Conclusion

This study emphasized the crucial role of implementing the artificial intelligence within the specific practices of human resource management in healthcare institutions in Romania. This study demonstrates that the use of AI can positively influence the efficiency of employees in the healthcare sector. One key finding that must be highlighted is the notable influence that employee behavior monitoring, employee stress monitoring, the employee evaluation system, and employee skill development have over employee efficiency.

Secondly, the study emphasizes the importance of artificial intelligence in the human resources department due to its predictive analytical capacity, helping management in making the right strategic decisions needed to meet the specific objectives of the healthcare institution.

In conclusion, the Romanian healthcare system can benefit from improving human resource management practices by adopting a system that combines artificial intelligence with current regulatory policies and practices. This revolutionary era of human resource management in the healthcare industry has highlighted the major benefits that artificial intelligence can provide to the system in order to improve employee efficiency and patient satisfaction.

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