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The role of artificial intelligence in supporting agile human resource management: A study at Zain Iraq telecommunications company

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Abstract
This study aims to analyze the role of artificial intelligence in supporting agile human resource management functions through an applied study at Zain Iraq Telecommunications Company. The study adopted a descriptive-analytical approach, utilizing a questionnaire distributed to a purposive sample of 64 employees at Zain Iraq. Data were analyzed using the SPSS software. Significant relationship was found with artificial intelligence demands and agile human resource practices. Additionally, the research indicated that AI has a substantial effect on HR agility. It also highlighted shortcomings in technological equipment and compensation mechanisms, issues that need to be addressed. The research suggests investment in AI infrastructure, improvement in digital governance, and development of appropriate compensation and incentive mechanism in line with the requirements of agile management, so as to achieve flexible and perishable performance in workplace.

Keywords: Artificial intelligence, agile human resource management, Zain telecommunications company

Introduction

With the fast changes in business environment in modern day, Organisations are eventually forced to keep high pace with the present technological transitions and they may possess to evolve with enhanced strategies and technologies. At the forefront of such tools, is artificial intelligence (AI), which can process big datasets, forecast changes, and assist with decision-making in an effective and fast manner. For this reason, in the novel environment, the managerial agility becomes an important necessity for today's enterprises as the agility means that the system can adapt at high speed to new environmental and technological changes. AI plays a powerful role in supporting this agility, enabling operational efficiency, flexibility of organisational structure and the ability for work teams to deliver the right, information-based decisions at the right time (Shrestha *et al.*, 2019) [14, 17].

With respect to this, the notion of agile human resource management, as a strategic response to support organization to respond rapidly, spur creativity and drive sustainable performance, has been developed. The principles of agility in HR management are flexibility, empowerment, and team & data driven decision making. It is based on self-organizing teams and iterative hiring and training processes with the goal of progressing indefinitely. Table 1 Preconditions This practise aim at to have a dynamic workplace, for men that can work in a constructive way with organizational changes and the achievement of the organization´s strategic objectives and contribute efficiently (Bick *et al.*, 2020) [16].

A digital revolution and accelerated technological shifts have made artificial intelligence central to the transformation of work patterns and HR functions. In this regard, this paper explores artificial intelligence in the support of agile human resource functions (Margherita & Braccini, 2022) [15].

This study can find a suitable ground in Zain Iraq Telecommunications Company to apply the linkage between AI and agile HRM, for the company has a high technology system as well as is proud of its latest administrative and digital strategies. Thus, this content is expected to be relevant when investigating how AI can be integrated to assist agile HRM processes at Zain Iraq.

Previous Studies

The study by Shrestha *et al*. (2019) [14, 17] investigates the impact of adopting AI technologies on firm performance. Its aim is to investigate the link between the adoption of AI for marketing, production and supply chain management (operations) and its influence to increase operational effectiveness, innovations, and economic performance. A study has however showed that organizations that effectively adopted AI recorded significant organisational performance improvement. Nevertheless, it also stressed the significance of organizational oversight and ongoing education in order to achieve success.

The study by Kusiak (2018) [9] examines the application of artificial intelligence in lean manufacturing, for improving efficiency, waste, and production. The research has demonstrated that by linking AI; specifically machine learning and big data analytics into decision-making processes will facilitate the right decisions at lesser time with less errors in the shop-floor. It also adds the proof that AI improves monitoring and forecasting, that leads to a more productive and of a greater quality final product.

The study by Lee *et al*. (2019) [3] studies artificial intelligence for promoting agile management in enterprises, and provides an integrated development model of artificial intelligence and agile management. The study clarifies how AI-based technologies like big-data analytics, machine learning and intelligent decision support-systems helps in quicker decision-making, agility in market response and effectiveness in decision making. It focuses on the benefits of such integration in terms of cost effectiveness and prevention of wastage, and exclusive on overall organizational efficiency and performance.

The study by Margherita & Heikkila (2021) [6] examines artificial intelligence to enhance agile human resource practices through enhancing recruitment, training, performance management, on a more flexible and dynamic system. It also reveals that AI solutions including data analytics, robotic process automation (RPA), and recommendation systems can enhance decision-making efficiency and quality of interactions with employees. It also suggest that AI-based agile management can enhance workforce agility that helps cope with dynamic work environment.

Comparison of Previous Studies with the Current Study

The present research, A Study Entitled: "The Role of Artificial Intelligence in Supporting Agile Human Resource Management Functions: A Study in Zain Iraq Telecommunications Company", is characterized by its specificity as it aims to integrate artificial intelligence and human resource management functions within the context of organizational agility. In contrast, the study by Shrestha *et al*. (2019) [14, 17] focused on the impact of AI in enhancing overall organizational performance without specifically addressing the field of human resources. Kusiak (2018) [9] examined the relationship between AI and lean manufacturing in industrial production settings, while Lee *et al*. (2019) [3] presented a general framework for integrating AI with agile management at the organizational level, without delving into HR functions.

The current study aligns more closely with the work of Margherita & Heikkila (2021) [6], which explored how AI can enhance agile HR practices. However, our study is distinct in its empirical application within an Iraqi telecommunications company (Zain Iraq), offering a localized practical dimension not present in previous research. Therefore, this study represents a scientific contribution by focusing on a specific Arab context and by providing a detailed examination of agile human resource functions through the strategic implementation of artificial intelligence.

Study Methodology

Research Problem

In light of rapid technological advancements, artificial intelligence has become one of the most important tools for enhancing the efficiency of human resource management, particularly when adopting agile management practices that require flexibility, rapid responsiveness, and continuous adaptation to change. However, many Iraqi institutions, including telecommunications companies, continue to face challenges in optimally utilizing AI technologies to support HR functions such as recruitment, training, performance management, and skill development.

Accordingly, the research problem is formulated as the following main question

What is the role of artificial intelligence in supporting agile human resource management functions at Zain Iraq Telecommunications Company?

Significance of the Study

1. This study contributes to filling a research gap related to linking artificial intelligence with agile human resource management in an Arab context, particularly within the telecommunications sector.
2. It provides a contemporary applied model that other organizations can benefit from to improve their managerial agility through the use of AI technologies.
3. It supports decision-makers at Zain Iraq by offering scientific data on the effectiveness of adopting AI in HR functions.

Objectives of the Study

The primary objective of this study is to determine the extent to which Zain Iraq adopts artificial intelligence technologies in human resource management functions. From this objective, the following sub-goals are derived:

1. To analyze the relationship between artificial intelligence and the effectiveness of implementing agility in human resource management.
2. To identify the impact of artificial intelligence on enhancing functions such as recruitment, training, performance management, and employee motivation.
3. To provide practical recommendations for developing agile human resource strategies using artificial intelligence.

Research Hypotheses

Hypothesis 1: There is a statistically significant correlation between artificial intelligence and agile human resource management at Zain Iraq Telecommunications Company.

Hypothesis 2: There is a statistically significant impact of artificial intelligence on agile human resource management at Zain Iraq Telecommunications Company.

Methodology and Study Population
The study employs the descriptive-analytical method, which combines describing the phenomenon with analyzing the relationships between variables. The population consists of employees working in the Human Resources Department and relevant administrative units at Zain Iraq Telecommunications Company. A purposive sample of 64 employees, who are either users of AI technologies or involved in HR functions, has been selected.

Study Instrument
A closed-ended questionnaire is used, consisting of two main dimensions
The artificial intelligence dimension, which includes (technological infrastructure, data, human competencies, organizational culture, legal and ethical requirements, governance, investment cost).
The agile human resource management functions dimension, which includes (planning, recruitment, training, performance evaluation, and compensation).
The questionnaire is designed using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Theoretical Framework
First: Artificial Intelligence
One such definition of AI is given by Bughin *et al*. (2018) [7], are defined as systems that mimic human behavior, functions and activities by using the advanced technologies that enable learning, reasoning and decision making in order to achieve operational efficiency, provide decision support, and enhance customer experience and support business strategy. The successful deployment of AI comprises several key ingredients:

1. **Technological Infrastructure:** With regards to business enterprises, technological infrastructure is defined as the ensemble of organizational systems and technical elements that enable an efficient deployment and use of AI systems. That's everything from hardware and networks to databases, software, and cloud computing (Davenport *et al*., 2020) [10].
2. **Data:** Information is fundamental and primary element to any AI application. It's used for model training and improving predictions, for decision support and strategic insights that drive organization efficiency (Davenport & Ronanki, 2018) [4].
3. **Human Competence:** This describes the ability of business organizations' employees to interact with, use, and control AI, in order to meet business goals. It includes cognitive, technical and managerial capabilities needed for digital transformation and artificial intelligence (Bughin *et al*., 2018) [7].
4. **Organizational Culture:** Organizational culture consists of the values, beliefs, and behaviors that influence how AI technologies are adopted, accepted, and utilized within an organization. It also affects how AI adoption impacts performance and innovation (Huang & Rust, 2021) [8].
5. **Legal and Ethical Requirements:** These include the set of rules and standards that must be followed to ensure the legal, responsible, and safe use of AI, respecting individual rights and fostering trust between the organization, its customers, and society (Jobin *et al*., 2019) [19].
6. **Governance:** Governance refers to the organizational and structural framework that ensures the responsible, transparent, and compliant management and deployment of AI technologies, aiming to achieve organizational goals while minimizing associated risks (Winfield & Jirotka, 2018) [5].
7. **Investment Cost:** This represents the total financial and time resources required for the development, implementation, and maintenance of AI systems and technologies to improve performance and productivity. Investment costs include all expenses related to infrastructure, software, licenses, training, and continuous updates (Davenport & Ronanki, 2018) [4].

Second: Agile Human Resource Management
Agile Human Resource Management was defined by Stol & Fitzgerald (2016) [12, 18] as a modern approach to HRM that is based on the principles and philosophy of agility, focusing on flexibility, rapid adaptability, collaborative work, and effective responsiveness to changes in the work environment. This management approach aims to empower individuals and teams, encourage innovation, and achieve sustainable outcomes through flexible and non-traditional processes.

1. **Agile Human Resource Planning:** A flexible strategic approach that aims to align the capabilities of the workforce with evolving business objectives through iterative processes that allow for rapid adaptation to changing organizational needs (Hellstrom & Dank, 2020).
2. **Agile Human Resource Selection refers to the identification of employees with the competencies that meet the criteria of an agile working environment:** Fast adaptability, teamwork and innovativeness. It will also promote the optimization of organizational performance and the efficient and flexible realization of institutional objectives, thus supporting the effectiveness of agile management in the organization (Al-Shammari, 2023).
3. **Agile Human Resource Training:** The procedure following which HR staff will be educated for using agile methods in HRM processes such as recruitment, performance, learning and development and strategic HR planning. The intended result is to boost both employee responsiveness to change, as well as employee satisfaction, organization performance (Bujak, 2020) [11].
4. **Agile HR Assessment:** A methodical process to check the capability of the HR function to practice the agile concepts and practices and to understand the strengths and the areas to further develop in today's fast changing work environment (Stol *et al*., 2016) [12, 18].
5. **Agile HR Compensation:** A flexible and dynamic compensation system used in agile methodology organizations. Its goal is to drive both team and individual performance through value, speed and collaboration as opposed to traditional reward systems based solely on tenure or hierarchal progressions (Rump, 2020) [13].

Field Framework
First: Analysis of the Results of Artificial Intelligence Application Requirements
In Table (1) we examine a number of highly important

requirements for future artificial intelligence. To assess if and how important respondents' views were an ordinal response scale was used to assess the statistical criteria to establish the ranking of respondents expressed opinions. The overall mean of these variables was 3.898, which is high, with a standard deviation of 0.954, response rate equal to 0.682 and gap 0.317. This indicates a positive view regarding the AI needs in general, although some specific difficult aspects exist.

Governance received the highest relative importance of 0.158, with a mean response of 3.882 and a relatively low standard deviation of 0.889, indicating strong consensus among participants on its critical role in AI application, accompanied by the lowest gap value (0.242).

In contrast, technological infrastructure ranked lowest in terms of relative importance (0.125). Despite having a relatively good mean (3.671), it showed the highest standard deviation (1.012) and a high gap value (0.399), which indicates significant variation in opinions regarding the availability of such infrastructure.

Table 1: Results of Artificial Intelligence Application Requirements

Artificial Intelligence Requirements	Response Scale					
	3.882	Standard Deviation	Response Rate	Gap Percentage	Relative Importance	Importance Ranking
Technological Infrastructure	3.671	1.012	0.600	0.399	0.125	7
Data	3.898	0.899	0.753	0.246	0.157	2
Human Competence	3.062	0.979	0.666	0.333	0.139	4
Organizational Culture	3.6134	0.989	0.664	0.335	0.139	5
Legal and Ethical Requirements	3.554	0.91	0.732	0.267	0.153	3
Governance	3.882	0.889	0.757	0.242	0.158	1
Investment Cost	3.671	1.001	0.604	0.395	0.126	6
Average	3.898	0.954	0.682	0.317		

Second: Analysis of the Results of Agile Human Resource Management Functions: Table 2 presents the evaluation of five core functions of agile human resource management, which were statistically measured using a response scale to determine their importance and availability from the perspective of the respondents. The overall mean was 3.613, indicating a relatively positive evaluation of agile HR functions in general. However, the presence of a relative gap of about 0.277 highlights the need to further develop some functions, especially regarding compensation and planning.

The evaluation of agile human resource planning ranked first in terms of relative importance (0.215), with a high mean response of 3.898, the highest among all functions, and a standard deviation of 0.869, indicating relatively good availability of this function and a strong agreement among participants on its importance. Meanwhile, agile human resource compensation ranked last with the lowest relative importance of 0.169 and a mean response of 3.062, reflecting a relative weakness in the activation of this function. Additionally, there was a relatively high gap ratio of 0.387, indicating a clear deficiency in compensation and reward systems that support agility.

Table 2: Results of Agile Human Resource Management Functions

Agile Human Resource Management Functions	Response Scale					
	Mean	Standard Deviation	Response Rate	Gap Ratio	Relative Importance	Importance Ranking
Agile Human Resource Planning	3.554	0.931	0.710	0.289	0.196	4
Agile Human Resource Selection	3.882	0.879	0.776	0.223	0.214	2
Agile Human Resource Training	3.671	0.901	0.734	0.265	0.203	3
Agile Human Resource Evaluation	3.898	0.869	0.779	0.220	0.215	1
Agile Human Resource Compensation	3.062	0.999	0.612	0.387	0.169	5
Average	3.613	0.915	0.722	0.277		

Third: Hypotheses Testing: Based on the results of testing the hypotheses related to the impact of artificial intelligence requirements on agile human resource management, the values presented in Table 3 can be interpreted as follows:

1. The correlation coefficient reached 0.788, indicating a strong and positive correlation between artificial intelligence requirements and agile human resource management. This means that an increase in the level of artificial intelligence requirements is often associated with an improvement in the agility of human resource management. On this basis, the first hypothesis is accepted.
2. The coefficient of determination (R^2) was 0.622, which explains the proportion of variance in the dependent variable (agile human resource management) that can be attributed to the independent variable (artificial intelligence requirements). Thus, 62.2% of the variations in agile human resource management can be explained by artificial intelligence requirements, indicating a significant and effective impact.
3. The effect coefficient (β) reached 0.386, indicating that for each unit increase in artificial intelligence requirements, agile human resource management increases by 0.386 units. This reflects a direct and positive effect of artificial intelligence requirements on agile human resource management. This value is statistically significant, as indicated by an F-value of 41.5 at a significance level of 0.05, meaning that the statistical model used to explain the relationship between the two variables is significant. Therefore, the second hypothesis is accepted.

Table 3: Results of Hypotheses Testing

Variables	Agile Human Resource Management					
	R	R^2	β	F	P	N
Artificial Intelligence Requirements	0.788	0.622	0.386	41.5	0.05	64

Conclusions and Recommendations

First: Conclusions

The study reached the following conclusions:

1. The results indicate a good awareness of the importance of artificial intelligence requirements, especially governance, as a critical factor for successful implementation. However, the weak technological infrastructure constitutes a major obstacle that may hinder the proper implementation of artificial intelligence, requiring strategic attention to improve this aspect and narrow the performance gap.
2. The analysis of agile human resource management functions showed a relatively positive evaluation; however, the performance gap (0.277) highlighted the need to develop certain functions, especially the compensation function, which received the lowest rating, reflecting a clear deficiency in incentive systems that must be addressed to achieve organizational agility.
3. The results showed a strong positive correlation between artificial intelligence requirements and agile human resource management, with a correlation coefficient of 0.788, indicating that increased focus on AI requirements is associated with improved levels of agile HR management.
4. The analysis results demonstrated that 62.2% of the variations in agile human resource management can be explained by artificial intelligence requirements, and the direct effect reached 0.386, a significant impact confirming that artificial intelligence effectively contributes to improving the performance of agile human resource management.

Second: Recommendations

Based on these conclusions, the following recommendations can be proposed

1. It is necessary to establish a national plan to modernize and develop the technological infrastructure in institutions, including communication networks, processing systems, and data security. Financial and human resources should be allocated to close technical gaps through partnerships with the private sector and research centers, ensuring a work environment ready to efficiently and sustainably adopt artificial intelligence technologies.
2. The study recommends reviewing and updating current incentive systems to align with the requirements of a dynamic environment by adopting flexible and fair compensation systems linked to actual performance and innovation, enhancing employee satisfaction and supporting rapid adaptation to changes, which is the essence of organizational agility.
3. Institutional efforts should be intensified to enhance the integration of artificial intelligence technologies with human resource processes by developing intelligent tools in recruitment, performance evaluation, and training, thereby enhancing organizational responsiveness, reducing bureaucracy, and maximizing the benefits of artificial intelligence capabilities.
4. Adopt digital transformation strategies that rely on artificial intelligence as a key lever to improve human resource practices, with an emphasis on qualifying administrative cadres and raising their awareness of the role of artificial intelligence in enhancing institutional performance effectiveness to ensure sustainable results and achieve real competitive advantage.
5. Integrate artificial intelligence technologies into human resource practices due to their significant impact on enhancing adaptation speed and achieving efficiency, affirming that artificial intelligence is an influential factor in improving agile human resource management performance, necessitating investment in digital transformation and building institutional and leadership capacities to ensure continuous development and sustainable competitive advantage.

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