

The impact of managerial approaches on the implementation of AI in the HRM departments of Moroccan companies

L'impact des approches managériales sur l'implantation de l'IA dans le service de la GRH des entreprises Marocaines.

Auteur 1 : Asmaa BENHMAMA.

Auteur 2 : Yasmina BENNANI BENNIS.

Asmaa BENHMAMA (PhD Student)

Research Laboratory in Development Economics and Organizational Governance

Faculty of Legal, Economic and Social Sciences Ain CHOCK-

University of HASSAN II

Casablanca

Yasmina BENNANI BENNIS (Professor of Higher Education)

Research Laboratory in Development Economics and Organizational Governance

Faculty of Legal, Economic and Social Sciences Ain CHOCK-

University of HASSAN II

Casablanca

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Résumé

L'intégration de l'intelligence artificielle (IA) dans la gestion des ressources humaines (GRH) des entreprises marocaines offre des avantages substantiels, tels que l'automatisation des processus, l'amélioration des décisions stratégiques et la fourniture d'analyses prédictives précieuses. Pour maximiser ces avantages, les entreprises doivent adopter des approches managériales spécifiques. Dans ce travail, nous proposons deux approches managériales ayant pour mission de réussir l'implantation technologique au sein de l'organisation : premièrement, les 3A (Améliorer, Accompagner, Actualiser) pour optimiser les systèmes d'IA, deuxièmement les 4E (Écosystème, Environnement, Établissement, Expertise) pour assurer une intégration durable. Ces cadres stratégiques permettent de réduire les coûts, d'améliorer l'efficacité opérationnelle, et de faciliter la transition technologique, tout en développant les compétences internes nécessaires. En appliquant ces approches, les entreprises marocaines peuvent transformer les pratiques traditionnelles de GRH, améliorer la formation professionnelle, optimiser les processus de recrutement et renforcer leur compétitivité et pérennité dans un environnement en constante évolution.

Mots clés : Intelligence artificielle, Gestion des ressources humaines, Approche managériale, Recrutement, Formation professionnelle

Abstract

The integration of artificial intelligence (AI) into the Human Resource management (HRM) of Moroccan companies provides substantial benefits, such as process automation, improved strategic decision-making, and the provision of valuable predictive analytics. To maximize these benefits, companies must adopt specific managerial approaches. In this study, we propose two managerial approaches aimed at successful technological implementation within the organization: firstly, the ESU (Enhance, Support, Update) to optimize AI systems, and secondly, the 4E (Ecosystem, Environment, Establishment, Expertise) to ensure sustainable integration. These strategic frameworks help reduce costs, improve operational efficiency, and facilitate technological transition while developing the necessary internal skills. By applying these approaches, Moroccan companies can transform traditional HRM practices, enhance professional training, optimize recruitment processes, and strengthen their competitiveness and sustainability in an ever-evolving environment.

Keywords: Artificial intelligence, Human Resource Management, Managerial approach, Recruitment, Professional training.

Introduction

Artificial intelligence (AI) is transforming the landscape of modern businesses, bringing about significant changes across various sectors (Bharadiya, J. P. et al., 2023). This technology, which includes systems capable of learning, adapting, and performing tasks autonomously, promises substantial gains in productivity, efficiency, and innovation. AI encompasses a range of technologies and methodologies (Damiano, 2020), from machine learning algorithms to predictive analytics, as well as speech recognition and computer vision. These technologies enable companies to process and analyze large volumes of data faster and more accurately than ever before (Mattioli & Meyer, 2018). For example, AI systems can identify patterns in customer data to predict purchasing behaviors, optimize supply chains to reduce costs and delays, or personalize customer interactions to enhance satisfaction (Hoummady et al., 2015). However, despite these advantages, the integration of AI also presents significant challenges (Hours, 2019). Companies must not only invest in sophisticated technologies but also ensure that their employees have the necessary skills to use these tools effectively (Besse et al., 2018). Implementing AI raises ethical and legal issues, particularly concerning data privacy, algorithm transparency, and accountability for automated decisions.

AI also presents a major challenge in organizational (Balamurugan et al., 2022). Its introduction can profoundly alter work processes and employee roles (Bernier, 2021). Consequently, managers must guide their teams through this transition, ensuring employees are trained and supported in the use of new technologies (Giraud et al., 2021). This requires a proactive managerial approach focused on employee engagement, open communication, and fostering a culture of innovation.

To maximize AI benefits while minimizing risks, companies need an integrated strategy combining technological advancements with suitable managerial practices. This involves establishing policies and procedures for ethics and compliance, developing a robust and flexible technological infrastructure, and fostering an organizational culture that values continuous learning and innovation (Frimousse & Peretti, 2019).

Currently, AI presents an exceptional opportunity for companies to transform and position themselves favorably in an increasingly competitive business environment (Mokeddem, 2020). However, achieving this transformation successfully requires combining technological advancements with effective managerial approaches. In this article, we propose a guide on best practices and managerial strategies for successfully implementing AI technology in companies. It explores how companies can leverage managerial approaches to maximize AI benefits while minimizing associated risks and challenges. To this end, our research question is structured

around the following: **What managerial approach should Moroccan companies adopt to successfully implement and develop AI tools?**

Our article will be structured as follows: the first section will provide a literature review introducing AI technology, followed by a second section dedicated to the role of AI in companies. Subsequently, a third section will present the managerial approach to implementing AI technology in companies.

1. Introduction to AI: Literature Review

Emerging in the 1950s, artificial intelligence (AI) is a branch of computer science focused on creating systems capable of performing tasks that typically require human intelligence (Brooks, 1999). Academic research often draws an analogy between AI technology and the human brain to describe its functioning. In our analysis, we will support our discussion with a simplified diagram illustrating how learning algorithms operate, based on the principles of the human brain's functioning:

Figure N°1: Simplified Diagram of AI Operation



Source: Authors

This schematic representation delineates the sequential stages involved in the learning and execution process of AI algorithms. The process commences with the acquisition of input data, comprising comprehensive and high-quality data necessary for algorithmic training. Subsequently, data collection ensues, where in raw data is aggregated from diverse sources. These data undergo preprocessing to ensure readiness for algorithmic utilization, encompassing normalization and transformation procedures. The crux of the process resides within the learning algorithms, where in machine learning and deep learning methodologies are employed to analyze data, discern patterns, and formulate predictive models (Bentz, 2019). Execution of these models facilitates the processing of novel data inputs, yielding outputs in the form of predictions, classifications, or recommendations (Zouinar, 2020). Analogous to the functioning of a biological brain, this structured process elucidates the transformation of input data into actionable insights through a series of interrelated stages, each indispensable for maximizing the efficacy of AI applications within business contexts:

Table N°1: The Advantages of AI

Advantages	Development
Automatisation des processus	One of the primary advantages of AI is process automation, which reduces costs and enhances operational efficiency. Additionally, automating repetitive and routine tasks reduces human errors and improves the accuracy and consistency of operations (Mateu & Pluchart, 2019).
Predictive analytics	AI has the capability to provide valuable predictive analytics that assist businesses in anticipating market trends and making informed decisions. Machine learning algorithms can analyze vast sets of historical and current data to identify patterns and correlations that would be impossible to detect manually (Bhupathi, P., 2023).
Improved decision-making	AI assists companies in making faster and more precise decisions. By integrating AI systems into decision-making processes, companies can analyze complex data in real-time and obtain insights that facilitate decision-making (Hadjitchoneva, 2020).

Source: The authors

Although AI offers many significant advantages, several drawbacks have also been experienced during its application.

Table 2: Drawbacks of AI

Drawbacks	Development
Privacy and Data Security Issues.	The use of AI raises significant concerns regarding data privacy and data security. AI systems often deal with sensitive information, exposing companies to risks of data breaches and cyberattacks (Meiller, Y, 2017).
Algorithmic Bias	AI systems have the capability to replicate and amplify biases present in the data on which they are trained. If the training data is biased, decisions made by AI can also be biased, potentially leading to unintentional discrimination (Sedaminou Muratet, F. 2024).
Technological Integration Complexity	The integration of AI into existing systems can be complex and may require substantial modifications to processes and infrastructures (Othmani, I. 2021).

Source: The authors

The integration of AI has yielded numerous substantial benefits in terms of speed and operational efficiency. However, it also presents notable challenges, including the risk of errors stemming from algorithmic biases, concerns regarding data privacy, and the complexities

associated with integrating AI into certain antiquated (e.g., governmental organizations) or intricate (e.g., network organizations). In the ensuing section, we will scrutinize the advantages and drawbacks of AI within the business domain, concentrating our analysis on a singular facet: the human resources (HR) department

2. AI in HRM of Companies: Advantages and Disadvantages

2.1. Process Automation :

According to Rathore, S. P. S. (2023), one of the key advantages of AI in HRM lies in process automation. This automation not only reduces costs but also enhances operational efficiency (Richter, L. et al., 2022). Mariani, K., et al. (2023) conducted a study revealing that repetitive tasks such as candidate sorting, interview scheduling, and leave management can be effectively automated using AI algorithms. Similarly, Paigude, S., et al. (2023) emphasize that AI implementation can mitigate human errors, thereby improving the precision and consistency of operations. By streamlining these tasks, HR professionals are afforded the opportunity to allocate resources towards higher-value activities such as talent development and strategic planning.

2.2. Predictive Analysis:

According to Prasanth, A., et al. (2023), AI possesses the capability to offer invaluable predictive analyses, aiding businesses in foreseeing market trends and making well-informed decisions. In the realm of HRM, machine learning algorithms can sift through extensive sets of historical and current data, identifying patterns and correlations that would be otherwise undetectable manually (Fukui, S., et al., 2023). Pandey, S. (2022), asserts that predictive analyses can assist in forecasting recruitment needs, pinpointing turnover factors, and evaluating employee performance. Such insights enable HR managers to strategize effectively and make proactive decisions aimed at enhancing employee retention and satisfaction.

2.3. Enhancing Decision – Making:

According to Rasmuss, J., et al. (2022), AI assists companies in making faster and more accurate decisions. Through the integration of AI systems into decision-making processes, HR departments can analyze complex data in real-time, gaining valuable insights that facilitate decision-making (Mariani, K., et al., 2023). Huang, X., et al. (2023), suggest that AI systems can objectively assess job applications, considering multiple criteria to select the most suitable candidates. Moreover, findings from Agustono, D., et al. (2023), indicate that AI can offer recommendations on employee training based on their skills and anticipated future business

needs. This capacity for data-driven decision-making optimizes talent management and enhances organizational efficiency.

Overall, the integration of AI into HRM provides substantial advantages, from streamlining processes to making more informed decisions through predictive analytics. By reducing repetitive tasks, providing valuable insights, and enabling informed decision-making, AI transforms HRM into a more efficient, precise, and strategic domain. These benefits empower HR professionals to better address employee needs and significantly contribute to the overall success of the organization. In the following section, we will delve into the managerial fundamentals necessary for successful AI implementation within the company, focusing primarily on HR, particularly in recruitment and professional training.

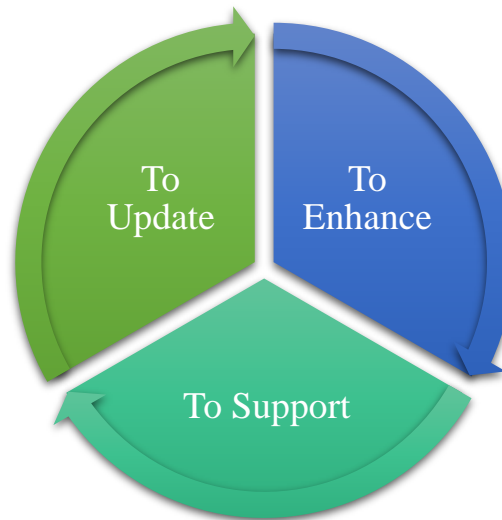
3. The Managerial Approach to Implementing AI Technology in Businesses

The continuous development of AI technology is essential to ensure the competitiveness and sustainability of businesses in an ever-evolving environment (Dauvergne, P., 2020). By investing in research and development in AI, companies can fully harness the potential of this technology to automate processes, enhance operational efficiency, and provide innovative solutions tailored to the specific needs of their industry (Makar, K. Š., 2023, May). By anticipating future trends and adopting a proactive approach, businesses can strategically position themselves to leverage the competitive advantages offered by AI in the years to come (Cadelon, F., 2022).

3.1.Short and Medium-Term Strategy: The ESU Approach

In addition to technological implementation, the effective integration of AI into the business demands a strategic and adaptable managerial approach (Alet, J., 2023). Managers hold pivotal roles in this process, serving as catalysts to optimize AI benefits while managing associated risks (Kelly-Lyth, A., 2023). We advocate for this management strategy to accompany managerial efforts during AI implementation:

Figure 2: The ESU Managerial Approach



Source: Authors

The ESU approach, which stands for (Enhance, Support, and Update), is a managerial strategy designed for short-term actions aimed at expediting technological implementation within organizations:

- ❖ **Enhance:** Managers must continually strive to enhance AI systems by identifying areas for optimization. This involves incorporating user and operational feedback to bolster the performance and efficiency of AI within the company. For instance, this may entail refining algorithms for greater accuracy, expanding data processing capabilities, or integrating new, relevant data sources.
- ❖ **Support:** It is essential for managers to accompany and support employees throughout the AI adoption process. This includes providing comprehensive training to develop the skills necessary for AI utilization. Moreover, managers should foster a culture of innovation and adaptability to embrace the technological changes brought about by AI. This facilitates a seamless transition to incorporating AI into the company's everyday operations.
- ❖ **Update:** Managers must continuously update the company's strategies and objectives in light of the rapid advancements in AI. This involves staying abreast of new technologies and emerging trends in the AI landscape. Additionally, managers should explore novel opportunities for effectively applying AI across various functional areas of the company, identifying innovative use cases that can deliver tangible value.

By adhering to the principles of the ESU approach, managers can optimize the adoption and utilization of AI within the organization, thereby driving digital transformation and bolstering

the company's competitiveness in the marketplace. This conceptual framework offers a strategic and adaptable approach to fully leveraging the potential of AI while addressing the evolving challenges and opportunities in today's business landscape.

✚ **The integration of Artificial Intelligence (AI) into recruitment processes:**

The integration of Artificial Intelligence (AI) into recruitment processes stands as a pivotal element for companies aiming to optimize their human resources management practices (Horodyski, P.2023). AI offers advanced data analysis and decision-making capabilities, streamlining application filtering, talent identification, and enhancing accuracy in forecasting personnel needs (Fomude, A. H., 2023). Employing machine learning algorithms, AI also aids in mitigating human biases during candidate selection, fostering diversity and equity within the recruitment process (Harris, C. 2023). This transformative technology empowers companies to optimize resource utilization, expedite recruitment, and elevate the quality of new hires (Hmoud, B., & Laszlo, V. 2019).

The ESU approach assumes a pivotal role in the algorithmic digitization process of recruitment, as AI increasingly permeates selection and hiring procedures:

- ✓ **Enhance:** Advancing recruitment processes through AI entails the ongoing optimization of algorithms and AI systems utilized for application screening, skills assessment, and candidate suitability prediction. Collaboration between HR managers, specialists, developers, and data scientists is crucial to identifying system deficiencies and effecting enhancements aimed at bolstering recruitment process efficiency and equity.
- ✓ **Support:** Nurturing the integration of AI into recruitment processes involves providing training and support to HR professionals in adopting new technologies. Managers must organize training sessions focusing on AI tool proficiency, instill awareness of best practices in AI-driven candidate evaluation, and foster a culture of innovation and adaptability amidst technological shifts.
- ✓ **Update:** In the context of algorithmic digitization of recruitment, updating mandates continual adaptation of strategies and methodologies in response to technological advancements and shifting labor market dynamics. Staying abreast of the latest AI developments, exploring novel techniques and technologies, and aligning recruitment processes accordingly are imperative for sustaining competitiveness in the market.

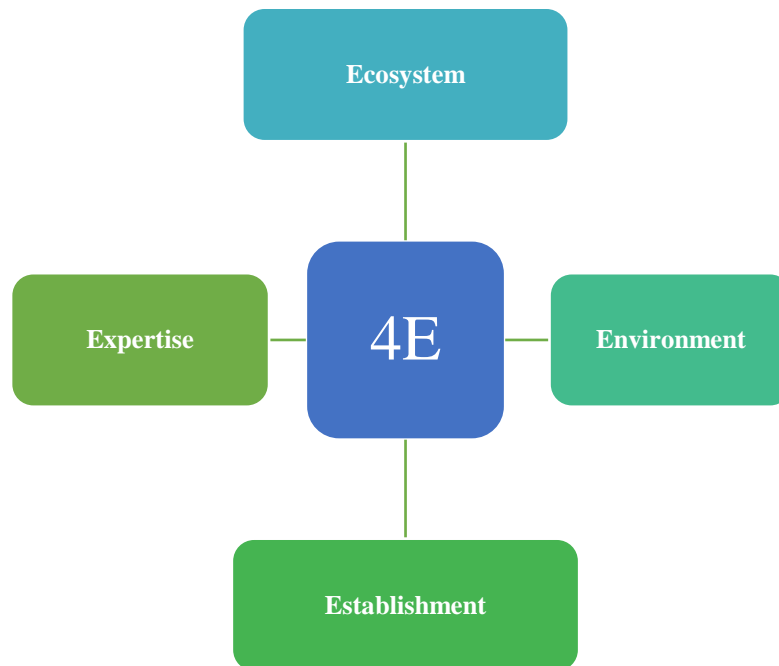
By embracing the ESU approach within the algorithmic digitization process of recruitment, companies can optimize their ability to identify and recruit top talents effectively, equitably, and innovatively. This approach facilitates strategic alignment between organizational

objectives and emergent technologies, ensuring proactive and evolutionary human resources management amidst the digital transformation era.

3.2. A Long-Term Evolutionary Management Approach: The 4Es

From a long-term standpoint, artificial intelligence (AI) stands as a pivotal element in business evolution (Bharadiya, J. et al. 2023). As evidenced, AI offers advanced capabilities in data analysis, prediction, and automation, empowering organizations to make informed decisions and effectively tackle market challenges. By integrating AI into their operations, companies can enhance operational efficiency, cut costs, tailor customer experiences, and foster innovation in products and services. Moreover, AI unlocks fresh avenues in talent management by pinpointing key skills and streamlining recruitment and professional development processes (Faqihi, A., et al. 2022).

Figure 3: The 4E management Approach



Source: The authors

In the face of the ever-evolving commercial landscape, we propose a novel managerial approach to facilitate the effective integration of AI within enterprises. Termed the 4E approach – Ecosystem, Environment, Establishment, and Expertise – it offers a conceptual framework to navigate this transition and ensure adaptability to evolving circumstances over time:

- ❖ **Ecosystem:** This pertains to the broader environment in which AI operates, encompassing business partners, technology suppliers, regulators, and other key stakeholders. Cultivating and nurturing a robust ecosystem is pivotal to fostering innovation and aligning AI initiatives with the constantly shifting external dynamics.

- ❖ **Environment:** Referring to both external and internal factors influencing AI adoption and utilization, the environment encompasses regulatory frameworks, organizational policies, corporate cultures, and stakeholder expectations. Vigilant monitoring of the environment enables companies to fine-tune AI strategies in response to contextual changes.
- ❖ **Establishment:** This dimension concerns the architectural and infrastructural foundations laid down to support AI deployment within the enterprise. It encompasses IT systems, hardware and software resources, as well as operational processes. A resilient and scalable establishment is imperative to underpin the reliability and adaptability of AI solutions.
- ❖ **Expertise:** Denoting the requisite skills and knowledge essential for proficient AI development, deployment, and utilization, expertise necessitates investments in upskilling the workforce. Continuous training and fostering the acquisition of specialized knowledge are indispensable for maximizing the potential of AI technologies.

By embracing the 4E approach, companies can gain deeper insights into the multifaceted challenges associated with AI integration and tailor their strategies in tandem with the evolving environmental dynamics. This proactive approach not only mitigates risks but also capitalizes on the long-term opportunities presented by AI, facilitating sustainable transformation in an ever-changing business landscape.

🚦 **Leveraging the 4E Framework for Algorithmic Digitalization in Professional Training:**

In the realm of AI-supported professional development, each facet of the 4E model (Ecosystem, Environment, Establishment, Expertise) plays a pivotal role in crafting and implementing cutting-edge, efficacious learning solutions. Here's a breakdown of how each dimension is specifically applied in AI-facilitated professional training:

- ✓ **Ecosystem:** The ecosystem of AI-enhanced professional training encompasses a diverse network of stakeholders, including training partners, educational technology providers, client organizations, and regulatory bodies. A robust ecosystem fosters collaboration among these entities to design, develop, and implement AI-driven learning solutions tailored to the dynamic demands of the job market and learners.
- ✓ **Environment:** The environment of digitized professional training encompasses governmental regulations, organizational policies, learning culture, and learner expectations. Understanding this multifaceted environment empowers training

providers to tailor their programs and technologies to ensure regulatory compliance, cultural relevance, and pedagogical efficacy of AI-driven learning solutions.

- ✓ **Establishment:** Establishment pertains to the technological and pedagogical infrastructure established to support the digital transformation of training. This includes online learning platforms, augmented reality (AR) and virtual reality (VR) environments, AI-enabled content adaptation tools, and technical support structures. A robust, adaptable establishment is indispensable for delivering immersive, personalized learning experiences to learners.
- ✓ **Expertise:** Expertise denotes the proficiency and knowledge required to design, develop, and deliver AI-infused digital training programs. Trainers and instructional designers must possess deep expertise in advanced educational technologies to fully harness the potential of AI in professional training. This encompasses adeptly integrating AR, VR technologies, intelligent interactions, and adaptive systems to craft engaging, effective learning experiences.

By integrating these dimensions of the 4E framework into the algorithmic digitalization process of professional training, training providers can cultivate innovative, adaptive programs that cater to the evolving needs of the workforce and learners. This approach facilitates proactive management of challenges associated with AI integration in education while capitalizing on the opportunities presented by advanced educational technologies to enhance learning and professional growth.

Conclusion

The integration of artificial intelligence into human resource management offers substantial benefits, such as process automation and enhanced strategic decision-making through predictive analytics. By reducing repetitive tasks and providing valuable insights, AI transforms HR into a more efficient, accurate, and strategic domain. This enables HR professionals to better address employee needs and contribute significantly to the overall success of the organization. To maximize these benefits, companies must adopt a strategic and evolving managerial approach. The ESU approach is essential for optimizing AI implementation. Managers must continually seek to improve AI systems, support employees in adopting these technologies, and update strategies to stay aligned with technological advancements. This proactive approach facilitates a smooth transition to effective AI utilization.

Furthermore, for a long-term perspective, the 4E approach is crucial. It enables companies to adapt to constant market changes by building a strong ecosystem, monitoring the environment, establishing robust infrastructure, and developing necessary skills. This strategy ensures successful and sustainable AI integration, fostering innovation and operational efficiency.

By applying these managerial approaches, companies can navigate the challenges of AI adoption and fully leverage its benefits. Whether optimizing recruitment processes or enhancing professional training, AI offers significant opportunities to transform traditional practices. By investing in these strategic frameworks, organizations can ensure proactive and evolving management of human resources in the era of digital transformation.

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