

Advancing Corporate Social Responsibility in AI-Driven Human Resources Management: A Maturity Model Approach

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Abstract: Artificial Intelligence (AI) in the corporate environment has been the subject of several current social debates of many scientific studies in reshaping human resource management (HRM) practices. There is a significant research gap in understanding how artificial intelligence (AI) can be ethically and effectively integrated into human resources management (HRM), particularly in relation to corporate social responsibility (CSR). This study aims to address this gap by proposing a maturity model to assess and guide the responsible implementation of AI in HRM practices. The research goal focuses on how AI can be aligned with CSR principles to ensure ethical, transparent, and socially responsible usage in organizational settings. The methodology includes a comprehensive review of 52 academic papers, employing bibliometrics, network analysis, and thematic content analysis to explore the interplay between AI, CSR, and HRM. These analyses allowed the identification of key ethical concerns and challenges in AI-driven HRM practices, such as bias in AI algorithms, data privacy issues, transparency, and the need for technical proficiency among HR professionals. The findings reveal a five-level AI maturity model, each stage representing progressive alignment with CSR principles. Organizations at lower maturity levels tend to have ad-hoc AI implementations with minimal CSR focus, while those at higher levels demonstrate full integration of ethical AI practices. Additionally, the study highlights the importance of transparency, accountability, and employee empowerment as critical elements for advancing AI maturity in HRM. This research contributes by offering organizations a practical tool to assess and enhance their AI-driven HRM processes through a CSR lens. It also provides a foundation for future research on strategic policy development, ethical AI governance, and continuous improvement in the integration of AI in HRM. Scholars are encouraged to explore these areas further, particularly in understanding how AI can foster not only organizational efficiency but also social responsibility and ethical standards.

Keywords: Artificial intelligence, Maturity model, Human resource management, Corporate social responsibility, Corporate governance, Technology management

1. Introduction

The rapid advancement of artificial intelligence (AI) has significantly transformed the landscape of human resources management (HRM), offering innovative solutions for recruitment, talent management, performance evaluation, and employee engagement. Companies across various industries are increasingly leveraging AI technologies such as machine learning algorithms, natural language processing, and predictive analytics to streamline HRM processes and enhance decision-making (Atanasov et al., 2023). However, the integration of AI in HRM also raises critical ethical and social responsibility concerns, including bias in AI algorithms, data privacy issues, transparency, and the need for technical proficiency among HR professionals (Grishunin et al., 2022; Chang and Ke, 2024; Struensee, 2021).

Recent studies indicate that AI use aids corporate sustainable development since it reduces costs and streamlines processes, generating greater productivity and resource optimization (Lega et al., 2013; Chen et al., 2024). Among the various applications, current research also highlights the increasing importance of the responsible implementation of AI tools, particularly in HRM (Akbarighatar et al., 2023; Chang and Ke, 2024). There is a growing concern that there may be a great dependence on AI in decision-making, which may bring personal harm, such as the degradation of professional capacity in future decision-making (Aitken et al., 2021; Londoño-Cardozo and Pérez de Paz, 2021). This concern is related to the moral and ethical aspects inherent to Corporate Social Responsibility (CSR) actions, but it brings to light the need for regulations in digitalization practices and the implementation of the use of AI tools by companies, defining the guiding principles of Corporate Digital Responsibility (CDR) (D’Cruz et al., 2022; Chang and Ke, 2024; Londoño-Cardozo and Pérez de Paz, 2021; Damoah et al., 2021; Krkač, 2019).

Given these complexities, it is imperative for organizations to not only adopt AI-driven HRM practices but ensure the alignment with CSR principles of positive social impact (Keenan et al., 2019; Atanasov et al., 2023), as well as CDR (D’Cruz et al., 2022; Chang and Ke, 2024; Londoño-Cardozo and Pérez de Paz, 2021; Damoah et al., 2021; Krkač, 2019). Identifying the stage of maturity of AI use in HRM involves evaluating how companies deploy AI technologies, the purposes they serve, the extent of their responsibility and ethical considerations, and the technical skills of their workforce. This is a practical limitation and a theoretical gap to be explored. Thus, this

paper introduces a maturity model approach to assess and enhance CSR practices in AI-driven HRM. The proposed maturity model provides a structured framework to evaluate an organization's current state of AI integration in HRM and to guide the development of more responsible and ethical AI practices within the organization's context.

This paper is structured to first review the existing literature on CSR in HRM and the current state of AI integration in HRM processes. Then, it introduces the maturity model, detailing the characteristics and assessment criteria for each proposed level. Finally, the paper offers practical recommendations and implications for theory and practice. Through this comprehensive approach, the paper aims to provide a valuable framework for organizations seeking to navigate the evolving landscape of AI in HRM responsibly.

2. Research Design

This literature review departed from the combination of bibliometrics, network analysis, and thematic analysis following the procedures implemented by Ferasso, Tortato and Ikram (2023), Beliaeva et al. (2022), and Ferasso et al. (2020).

2.1 Data Collection

Scopus was selected as the preferred scientific database due to the comprehensive collection of records it possesses related to the Business Management literature (Beliaeva et al., 2022; Ferasso et al., 2020). The Boolean search used the following searching terms: (artificial AND intelligence OR ai) AND (corporate AND social AND responsibility). We restricted the search to the Business, Management, and accounting area, and also limited to article and review documents. Additionally, we selected only the papers published in journals and in English language. No time frame was restricted in order to collect the comprehensive field on the edge of AI and CSR fields. These procedures reported a total of 52 papers considered for analysis. The *.CSV and *.RIS files were stored, containing the metadata from the 52 papers, to proceed with the network analysis procedures.

The bibliometrics used in this research considered the growth of publications per year, the most productive countries, and the main journals that published the sampled papers per year of publication.

2.2 Network Analysis Procedures

For the network analysis, the CiteSpace software was selected due to the comprehensive analysis it provides (Ferasso, Tortato & Ikram, 2023; Beliaeva et al., 2022). After converting the references from the sampled documents, the CiteSpace recognized 3,481 references from which 3,363 (96.6%) were considered valid for calculations and forming the networks. This percentage is in accordance with the valid range references to create a network.

Citespace was programmed to screen the dataset using title, abstract, and author keywords (DE) text processing; the node types considered references and keywords; and the selection criteria considered 100% of the most cited/occurred items from each slice (Top N%). For the Top N, it was set up to 100 levels of most cited/occurred items from each slice, while the time slicing of one year per slice recognized references expanding from January 2015 up to December 2024. Additionally, the following properties were selected for the CiteSpace project: LFR: -1.0; LBY: -1.0; L/N: -1.0; percentage of nodes to label (%): 100.0; TopN={n | f(n)≥e}: 2.0.

2.2.1 Thematic content analysis

After forming the networks, the most addressed topics were inspected according to the related literature, and the contributions were selected for building the AI maturity progression framework (Beliaeva et al., 2022; Ferasso et al., 2020). The results of thematic content analysis are shown in Table 1.

3. Findings and Discussion

3.1 Descriptive Statistics

The following results present the descriptive statistics taken from Scopus metadata information available in the said scientific database.

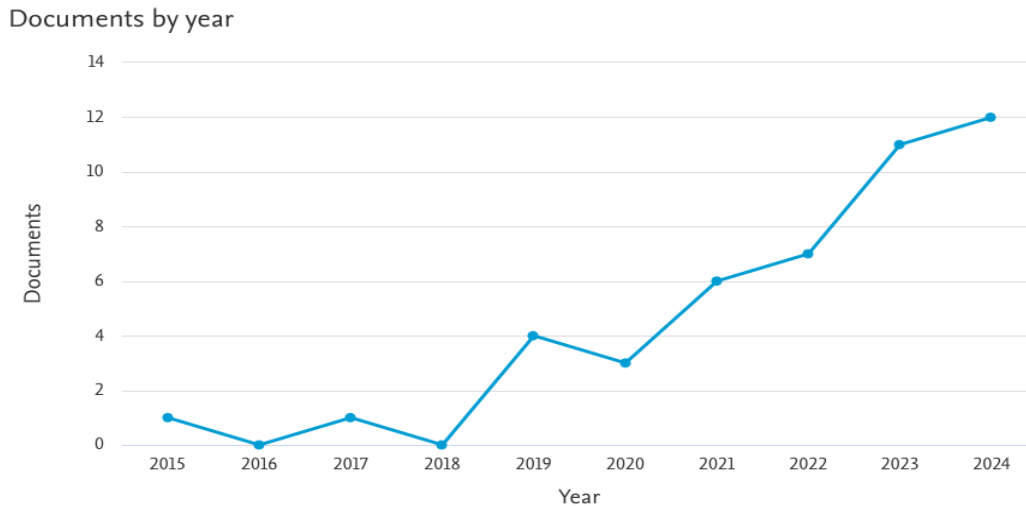


Figure 1: Publications evolution by year of paper published (Source: Scopus metadata)

The results shown in Figure 1 evidence that the interest started in 2015, but it was in 2019, with the publication of 4 documents, that the field grew. Since 2020, the total number of papers published in a constant way, evidencing that the field is gaining momentum. Despite the growing number of papers, the maximum number of papers published in 2024 was only 12 papers, which is explained by the expansion of AI studies in the Business Management literature. Therefore, the field of AI and CSR proved to be an interesting research area to be covered in future studies.

The most productive countries (Figure 2) addressing AI and CSR are the United States, with 12 documents published, followed by the United Kingdom with 8, and China with 7. These countries are on the edge of the North America-Europe-Asia axis of scientific production. Germany stands out with 4 publications. Australia, Canada, France, India, and Taiwan are the remaining countries with 3 publications each, and the Netherlands with only 2. Despite the top 3 countries belonging to the North America-Europe-Asia axis, it is interesting to note that studies are popping up from different countries worldwide, which underlines the curiosity of international scholars.

Documents by country or territory

Compare the document counts for up to 15 countries/territories.

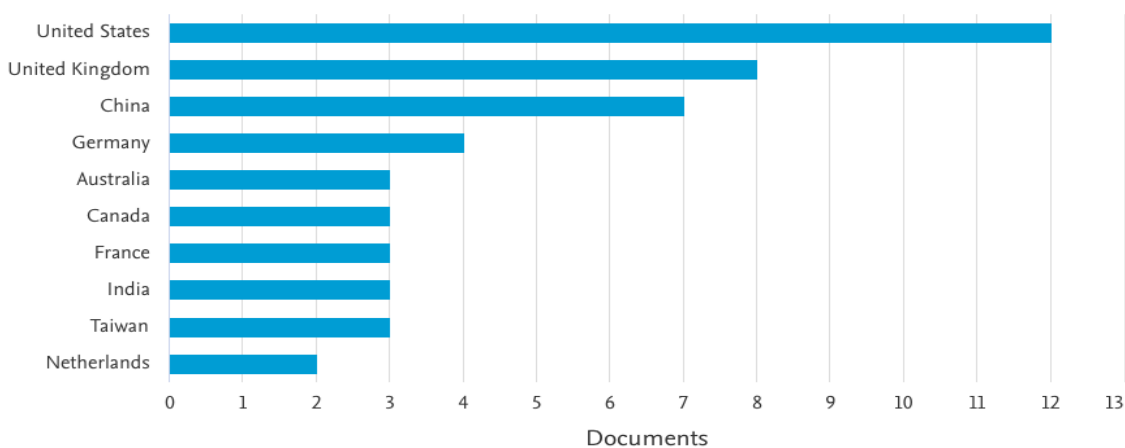


Figure 2: Most productive countries by number of publications (Source: Scopus metadata.)

Inspecting the top 5 journals (Figure 3) that published papers on AI and CSR, it is curious to notice that the Journal of Cleaner Production published two papers in 2021 on these topics, while the Journal of Business Ethics published the other two papers in 2023. All the other journals (Intelligent Systems in Accounting, Finance and

Management; Technology in Society; Asia Pacific Journal of Marketing and Logistics) published only one paper per year in selected years. These results prove that the AI and CSR field is at its birth stage.

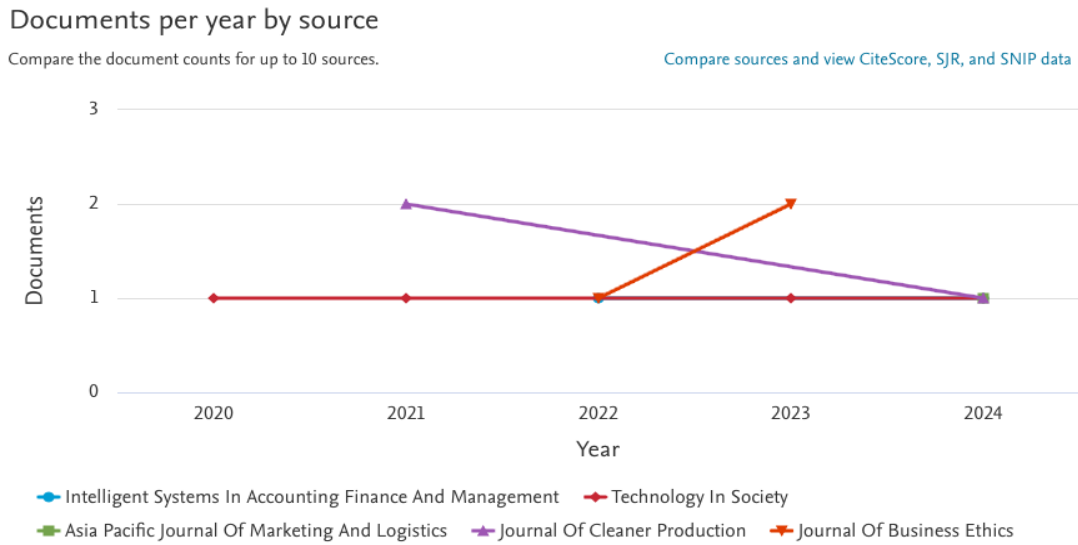


Figure 3: Published papers per academic journal per year (Source: Scopus metadata)

3.2 Network Analysis

Three different data analyses were chosen to form the networks for this study. The first is the co-citation network, in which the references are shown according to the citing and cited references formed in a comprehensive network. It is possible to notice the most cited references in the sampled documents, as shown in Figure 4. The thematic clusters were also formed based on the co-citation network (Figure 5), evidencing the grouped references according to specific topics that served as the basis for the thematic analysis. Lastly, the timeline view presents the same network in different layers formed by the identified clusters and distributes the references and keywords in one graph (Figure 6), which allows the identification of relationships not only among the references but also among references and keywords.

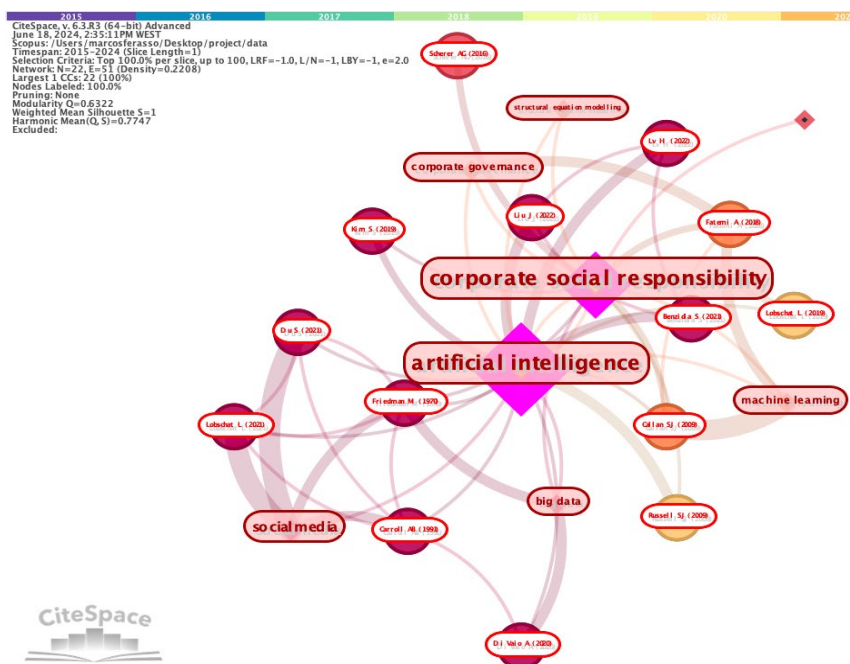


Figure 4: Co-citation networks and keyword network from sampled documents (Source: Scopus metadata)

Interestingly, machine learning, social media, and corporate governance are the keywords identified in association with AI and CSR.

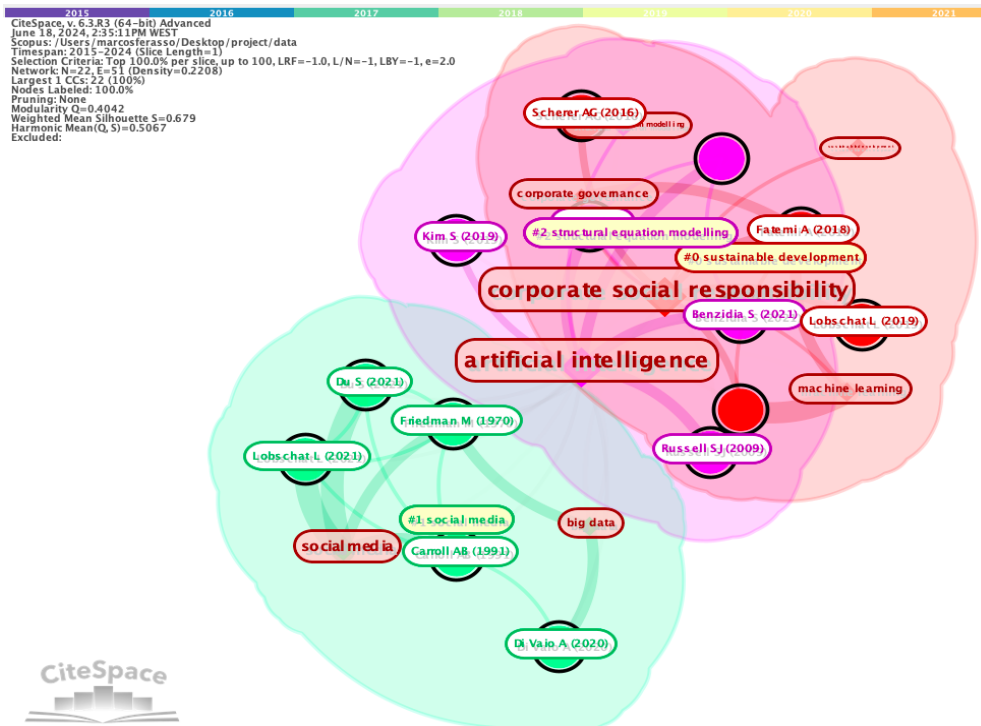


Figure 5: Thematic clusters of references and keywords from sampled documents (Source: Scopus metadata)
 The findings allowed the identification of three thematic clusters of well-defined groups of scholarly contributions at the edges of AI and CSR.

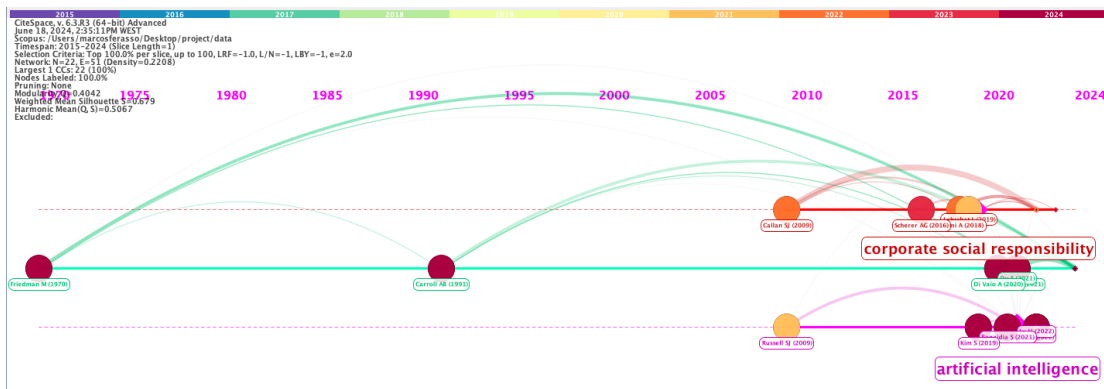


Figure 6: Timeline view of references and keywords, per year and per cluster, from sampled documents (Source: Scopus metadata)

3.3 Thematic Analysis

After identifying the key literature, some papers that addressed specific topics were selected for more detailed qualitative analysis using N-Vivo software. Three categories, defined by the sample of network analysis, were explored in a cross-analysis of the 52 selected articles. This analysis allows a deeper understanding of the categories (1) CSR, (2) AI, and (3) Social Media (SM), and helps to identify the main stage of development and maturity use of AI in the corporate environment. The results point out some patterns and concerns common to different authors when addressing these specific topics, as highlighted in Table 1.

Table 1: Thematic analysis from the sampled documents

Research topic	Contributions	Suggested readings
Corporate Social Responsibility (CSR)	<p>Authors address the importance of ethical aspects and the responsible use of AI, especially on data privacy.</p> <p>Approach on the relationship between AI and corporate social responsibility, suggesting that AI can be less socially irresponsible than humans.</p> <p>Call for humanistic HRM and recruitment which can increase reliability in the processes.</p>	<p><i>Du and Chie, 2021</i></p> <p><i>Krkač, 2019</i></p> <p><i>Ligeiro et al., 2024</i></p> <p><i>McBride et al., 2022</i></p> <p><i>Rab-Kettler and Lehnervp, 2019</i></p>
Artificial Intelligence (AI)	<p>Using digital technologies and AI to reduce corporate risk, increase the efficiency and impact of their CSR activities.</p> <p>AI promotes corporate sustainable development.</p> <p>Provide status of Innovative companies.</p> <p>Lack of regulations in AI use.</p>	<p><i>Atanasov et al., 2023</i></p> <p><i>Chen et al., 2024</i></p> <p><i>Grishunin et al., 2023</i></p> <p><i>Hemphill, 2020</i></p> <p><i>Londoño-Cardozo and Pérez de Paz, 2021</i></p> <p><i>Tseng and Lin, 2024</i></p>
Social Media (SM)	<p>Main approach on social media responsibility, addressing privacy concerns with AI-driven social media technologies.</p> <p>Need to establish rules for responsible AI governance with deep democratic debate.</p> <p>Need to increase the information disclosure and transparency to increase trustworthiness.</p>	<p><i>Buhmann and Fieseler, 2023</i></p> <p><i>Nave and Lane, 2023</i></p> <p><i>Walker and Milne, 2024</i></p> <p><i>Wu et al., 2024</i></p> <p><i>Xie et al., 2023</i></p>

The main results from this analysis evidenced that: (1) Ethical issues are a constant topic in all papers that deal with the three categories, although there are no conclusive results on this topic; an active and in-depth discussion by society is still needed to find a consensus bias. (2) There is a consensus that the use of AI tools increases productivity, reduces operational risks and negative impacts (social and environmental), and generates a certain trust from the user's perspective. However, there is still a gap in the regulation of their use and concerns about the boundaries of using these tools without dehumanizing operations. (3) Transparency and reliability are still unresolved topics, with many gaps to be addressed, especially in users' data protection. Paradoxically, in some survey results, especially with social media users, the feeling is of transparency in corporate operations. Finally, (4) there is also a consensus among the various authors on the need for governance policies on the use of AI tools in HRM, as it is undeniable that these tools have positive aspects, and managers may leverage them to improve human resources performance. However, it is also unanimous that close and careful attention to ethical and moral issues is needed, as well as promoting social well-being. These are also the principles of CSR.

This analysis points out some important issues that can be used to identify the stage at which companies are using AI and the concerns that are still in the spotlight, such as the ethical implications of AI decision-making, the adequacy of data governance practices and the integration of CSR into AI strategies, as well as the professional qualification for responsible action in this technological environment.

3.4 Maturity Model

Maturity is usually related to the quality, competency, or level of sophistication of objects or processes. Maturity Models have been developed across different fields to qualitatively assess the maturity of a specific domain or progress toward a particular objective. Each maturity level marks a distinct phase of development along a desired or typical evolutionary trajectory (Becker et al., 2009). These levels are characterized by a set of widely accepted, generalizable criteria, by a set of indicators. The lowest level signifies the initial stage of development, while the highest level represents full maturity and high performance. This structure makes maturity models useful for comparing and identifying areas for improvement (de Bruin et al., 2005). Consequently, in this study, maturity and performance are viewed as closely related, with higher maturity reflecting higher commitment to CSR.

Maturity Models in AI use in the context of CSR and HR lack of studies, as no papers were found related to this topic in the Scopus database. Meanwhile, there is a model of AI maturity developed by the Argos Multilingual

(2024), which indicates means to assess the path of digital transformation in companies and it is used as a basis for defining the maturity levels of the proposed model, with proper adequacy to the main theme of the study.

4. The AI Maturity Progression Framework Proposition

The proposed maturity model encompasses multifaceted dimensions addressed in the literature, including but not limited to algorithmic fairness, transparency, accountability, privacy protection, and employee empowerment. Moreover, this paper examines the practical implications of adopting the maturity model approach in real-world organizational settings. It highlights the significance of leadership commitment, organizational culture, and stakeholder engagement in driving CSR-oriented AI initiatives in HRM. Furthermore, it underscores the importance of collaboration between HR professionals, data scientists, ethicists, and other relevant stakeholders to ensure the ethical design, deployment, and governance of AI systems.

4.1 The Relevant Outcomes From the Analyzed Literature

The proposed maturity model, shown in Figure 7, encompasses five levels, from Beginner, ad-hoc implementations of AI with minimal CSR focus to advanced stages, Leader, where CSR principles are fully integrated into AI-driven HRM processes. At each maturity level, organizations can identify specific criteria related to policy implementation, stakeholder involvement, transparency, and the ethical use of AI. By using this maturity model, companies can systematically advance their CSR practices, ensuring that their use of AI in HRM is not only effective but also socially responsible and aligned with broader organizational values.

By identifying the intensity of AI use, technical knowledge, usability, and the extent of responsibility for the use, it is also possible to identify the stage at which companies are in terms of digital maturity. AI implementation and use practices are strongly linked to actions regarding moral and ethical aspects, as they affect both the internal environment of organizations and local communities and throughout the supply chain in relationships with suppliers in all stages of production process. In this sense, responsible and democratic use can bring benefits.

It is important to emphasize that, given the changes that digital transformation brings to companies, current business models also undergo changes and must be rethought, paving the way for innovation and organizational entrepreneurship. The higher the level of digital maturity of companies, the greater the transformation and innovation in business models, also bringing new challenges for CSR, towards a CDR.

Furthermore, the assessment of the maturity level requires a set of indicators and a process of continuous evaluation, with identification of areas for improvement. This is a proposal for future research, which can be considered as Digital Function Deployment (DFD) and can assist in the step-by-step identification and assessment of the company's level of maturity, as well as its evolution over time.

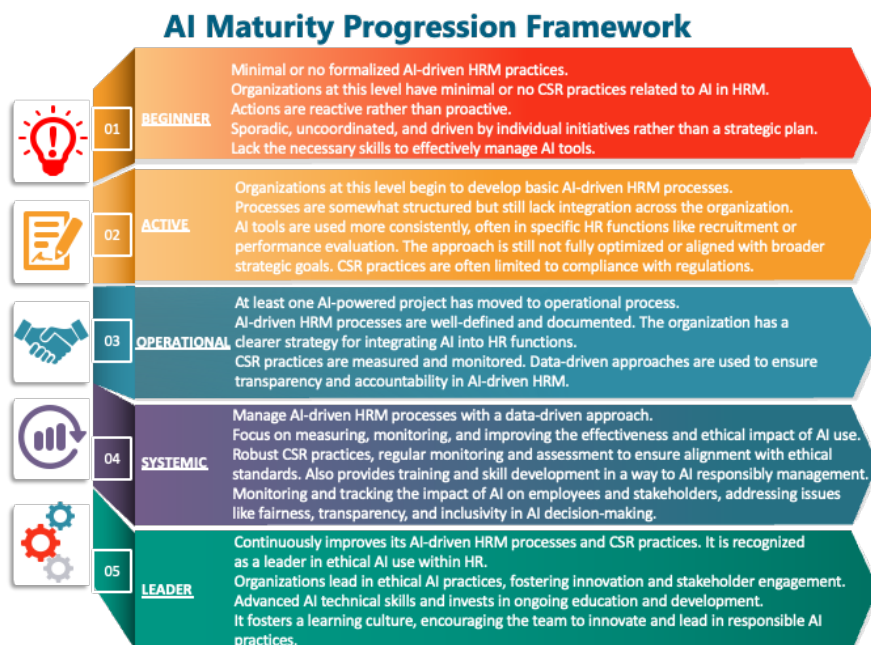


Figure 7: The AI Maturity Progression Framework (Source: Own elaboration)

5. Conclusion

This research addressed the gap between AI and CSR by exploring the literature on this edge and proposed a maturity framework to evaluate an organization's current state of AI integration in HRM practices. This framework also intends to guide the development of more responsible and ethical AI practices within the organizations' contexts. Among the findings, it was observed some interesting facts. The literature on the use of AI in HRM practices is still scarce, both from the perspective of companies and from the candidates' perception of the professional opportunities offered (Ligeiro et al., 2024). Many companies have made efforts toward the digital transition; however, the impacts of these changes are not yet known and raise questions about the humanization of recruitment and people management processes (Paul et al., 2024; Rab-Kettler and Lehnervp, 2019).

This research has multiple contributions. For organizations, this research sheds light on an emerging topic that is related to how AI is affecting recruitment through the lens of HRM. through the lens of HRM. For scholars, this research provides extensive suggestions for further research in the field of HRM and CSR, and how academia can help organizations foster CSR implementation in the light of AI. Additionally, this research highlights the ethical issues related to HRM and CSR due to the extensive spread in daily organizational activities. This paper is of interest to conference participants because it provides some highlights into the AI and CSR in the frame of HRM. It also provides to the attendees with actionable knowledge to foster AI and CSR within organizations, based on the importance of the skills needed.

Suggestions for future research can also be additionally addressed. Researchers can advance our knowledge about how to implement CSR practices in AI-driven HRM through different lenses like strategic orientation, policy development, training and employee development, stakeholder engagement, and continuous improvement at organizational levels. As a limitation, this research can present different results if simultaneous databases are summed to the results presented. This was due to the need for the input file to be from one source for CiteSpace calculations. Additionally, interpretations of qualitative analyses were made according to the authors' knowledge, which can vary from others' expertise. We hope this research encourages more scholars to explore the proposed gaps and advance the knowledge in these fields.

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