The Contribution of Artificial Intelligence in Talent Retention

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Abstract

Human Resource Management (HRM) adapts to new trends in Artificial Intelligence (AI) by integrating it into core activities, with a particular focus on its applicability in talent retention processes (Vrontis, et al., 2020). Through a dual methodological framework combining a bibliometric analysis of 64 scientific articles indexed in the Scopus database (2020-2025) with an empirical study based on a customized questionnaire, the article highlights both the opportunities and barriers encountered in the adoption of AI in HR processes. The bibliometric analysis, conducted using VOSviewer software, reveals a weak conceptual link between AI and talent retention, despite the growing interest in both topics. Empirical data collected from 60 validated responses highlights limited adoption of AI in HRM practices and highlights a lack of strategic implementation. The results highlight the need to develop clear organizational policies, intensify digital literacy efforts among HR professionals and systematically integrate AI into sustainable talent retention strategies.

Key words: talent retention, artificial intelligence, human resource management, organizational strategies, employee engagement
J.E.L. classification: J63, M12, O33, J24

1. Introduction

Human resource turnover is a problem that even the largest companies face.

This problem is based on several factors, including changing employee preferences or their vision of a job. While initially work was a source of income to support oneself and one's family, people soon realized that they wanted to earn more money. They wanted more money to support and satisfy not only their lives and families, but also some of their desires. In the third stage, people realized that, in addition to money, they needed other things: time to spend the money they earned, but also time to spend with their families and loved ones. This is confirmed by studies on Generations Y and Z, which emphasize flexibility, autonomy, and wellbeing (Deloitte, 2025) (Dangmei & Pratap Singh, 2016).

The whole process of social development has led to increased dissatisfaction with available jobs and people changing jobs more and more often in an attempt to find the best job. This dissatisfaction has contributed to an increase in professional mobility, which makes it difficult to retain valuable employees in the long term.

To counteract this trend, organizations have begun to adopt complex strategies aimed at reducing staff turnover (Nawaz, Arunachalam, Pathi, & Gajenderan, 2024). Recent analyses show the effectiveness of competitive compensation packages, flexible work programs, and opportunities for continuous professional development (training, coaching, mentoring) (Yudi Kurniawan & Nurulhuda, 2025). At the same time, technological tools such as HR chatbots, sentiment analysis, and AI programs for wellbeing have gained ground, contributing to a reduction in turnover of up to 20-30% in companies that have implemented them (Mohammad, 2018) (PwC, 2017).

In the process of discovering the most effective strategies, bibliometric studies were conducted in (Săcuiu & Micu, 2024) and (Săcuiu & Micu, 2025) that focused on an extensive analysis of the specialized literature. We found that the use of technology in human resources to reduce staff turnover has been little studied. Based on this gap, we set out to analyze in detail the potential that artificial intelligence can bring to human resource management as a strategic tool for retention.

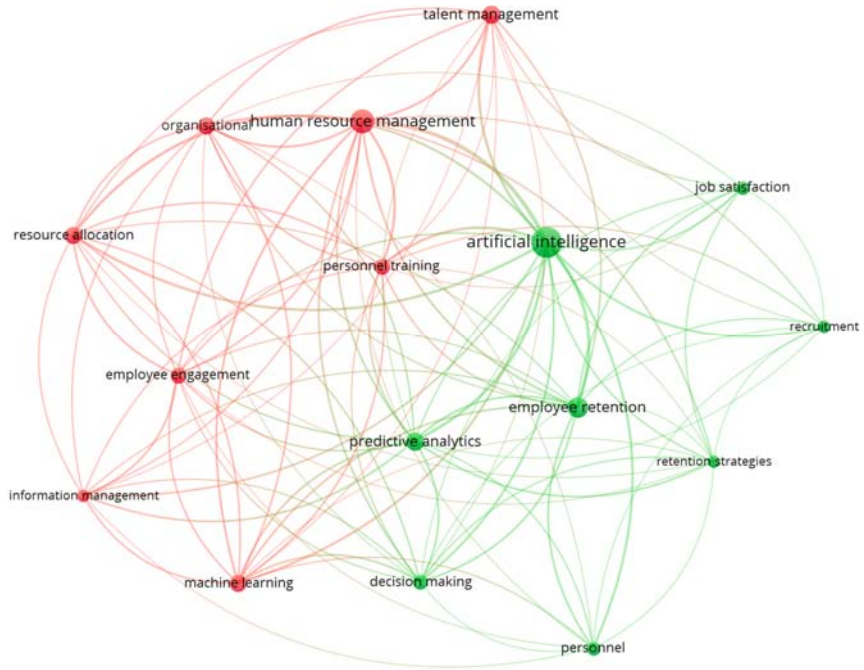
2. Literature review

The use of AI in talent retention must be understood within the broader context of the digital transformation of HR. According to Colbert, Yee, and George (2016), workforce digitization is not only a technological process but also a profound change in organizational culture and leadership model (Colbert, Yee, & George, 2016). In this context, artificial intelligence is seen as a tool for augmenting human capabilities, not as a substitute (Raisch & Krakowski, 2020).

The theoretical foundations of employee retention include Herzberg's motivation theory, social exchange theory (SET), and employee-organization compatibility theory. Herzberg (1959) suggests that satisfaction and motivation result from intrinsic factors such as professional development and recognition (Herzberg, Mausner, & Snyderman, 1959), while SET (Cropanzano & Mitchell, 2005) highlights the importance of reciprocity in work relationships. AI can be seen as a facilitator of these factors by personalizing the employee experience, analyzing feedback, and predicting the risk of turnover. AI can also support employee-role compatibility through matching algorithms in recruitment and tailored career plans. This conceptual framework supports the use of AI not only in transactional functions but also in data-driven retention strategies (Chamorro-Premuzic, Akhtar, Winsborough, & Sherman, 2017).

To understand the current state of knowledge on the integration of AI into talent retention strategies, we performed a bibliometric analysis using VOSviewer on a selection of 64 articles indexed in the Scopus database (Figure 1). These articles, published between 2020 and 2025, were filtered using the keywords "artificial intelligence" and "talent retention." We set a minimum threshold of 5 occurrences for the inclusion of terms in the network, resulting in 16 relevant keywords that were pre-cleaned (Table 1). This approach is aligned with Van Eck & Waltman's recommendations on term co-occurrence analysis (Van Eck & Waltman, 2010).

Figure no. 1. Network vizualization of co-occurrence based on all keywords



Sources: VOSviewer

The analysis identified two main thematic groups. The first group, marked in red, focuses on traditional human resource management topics such as employee engagement, resource allocation, and workforce planning. The second group, marked in green, includes concepts directly related to AI technologies such as machine learning, predictive analytics, and algorithmic recruitment tools. This visible thematic separation suggests a compartmentalized approach to the literature, in which technology and retention are treated in isolation.

Despite the emergence of linking terms such as decision support, digital transformation, and human resources automation, the direct conceptual link between AI and employee retention was particularly weak.

Table 1 shows that the most frequent terms are "artificial intelligence" (31 occurrences, link strength = 101), "HRM" (19, LS = 71), and "employee retention" (13, LS = 52). However, the direct link between these terms is not as strong as the intra-cluster links. For example, "predictive analytics" (11, LS = 51) and "machine learning" (9, LS = 42) form a technological core, while terms such as "personal training" (8, LS = 40), "employee engagement" (8, LS = 32), and "job satisfaction" (6, LS = 16) appear in the traditional retention area.

Table no. 1 Keywords and links

No.	Keyword	Occurences	Total link strength
1	Artificial intelligence	31	101
2	HRM	19	71
3	Employee retention	13	52
4	Predictive analytics	11	51
5	Talent management	11	33
6	Machine learning	9	42
7	Organisational	9	35
8	Resource allocation	10	42
9	Employee engagement	8	32
10	Personnel training	8	40
11	Decision making	7	37
12	Personnel	6	21
13	Job satisfaction	6	16
14	Information management	5	29
15	Strategies retention	5	21
16	Recruitment	5	17

Sources: VOSviewer

This distribution confirms that although AI is frequently mentioned in HRM literature, its specific connection with employee retention is weak and fragmented. Terms such as "retention strategies" (5, LS = 21) or "recruitment" (5, LS = 17) have low frequencies and are located on the periphery of the network. This supports the hypothesis that the application of AI in talent retention is still emerging, being treated on an ad hoc basis rather than integrated into the strategic framework.

While AI is an increasingly discussed tool in the context of recruitment and data-driven decision-making, its strategic application in promoting long-term employee engagement and retention is still underdeveloped (Ransbotham, Kiron, Gerbert, & Reeves, 2017). The present research aims to fill this gap through an empirical analysis of the current level of AI use and its perceived potential within the HR function.

3. Research methodology

For this study, we conducted a survey using the open-source platform LimeSurvey, known for its ability to manage advanced logical branching in questionnaire design. It was distributed to a wide audience in the field of human resources, including managers, specialists, and consultants. The survey reached 112 people via email, social media, and other channels. The total number of respondents was 66, and after data cleaning, 60 valid questionnaires were retained.

The low level of participation in such a study can be considered an indirect indicator of the early stage of AI involvement in human resources management.

The questionnaire was divided into six sections, which included demographic data, current use of AI, perceived obstacles, areas of application, specific feedback on tools, and openness to future AI integration. The questionnaire structure was logically branched, offering different sets of questions for AI users and non-users to capture nuances in perception and practice based on experience.

The modest response rate is in itself an important indicator. It may reflect both the limited diffusion of AI tools in HRM and the ambiguity that professionals face in recognizing these tools. The strength of the methodology lies in exploring this ambiguity through both objective metrics and self-reported information.

The survey begins with a section that identifies the respondent, specifically the type of company they work for, its size, the environment in which the company operates, as well as the respondent's professional experience, age, gender, etc.

In the second section, the survey determines whether the respondent has already worked with AI in human resources or not. Depending on the answer to this question, the respondent is directed to different sections of the survey.

Those who have not yet worked with AI will be asked questions to outline their attitude towards AI and to understand how they think AI can be involved.

Those who have worked with AI will be asked questions to determine where and how they have used AI.

Finally, all respondents were asked to leave their contact details, if they wished, so that they could be contacted to continue this study.

4. Findings

The survey results provide a relevant picture of AI adoption in human resource management, with a particular focus on talent retention.

From the first section, we learn that 78% of participants are women and 22% are men, with the majority (54 participants) living in urban areas and aged between 25 and 54. Professionally, 27 are human resources specialists, 22 are human resources managers, and 11 are external consultants. They came from different backgrounds, with 28 people from SMEs, 17 from public institutions, and 15 from corporations, but there were no respondents from NGOs or start-ups interested in answering the questionnaire. The demographic distribution of respondents is presented in Table 2.

Table no. 2 Keywords and links

Characteristic	Category	No. of respondents	Percentage (%)
Gender	Women	47	78%
	Men	13	22%
Age	25-34 years old	15	25%
	35-44 years old	28	47%
	45-54 years old	17	28%
Professional role	HR Specialist	27	45%
	HR Manager	22	37%
	HR Consultant	11	18%
Type of organization	SME	28	47%
	Public institution	17	28%

Characteristic	Category	No. of respondents	Percentage (%)
	Corporation	15	25%
	NGO / Start-up	0	0%

Sources: VOSviewer

Of the 60 respondents, 24 acknowledged that they use AI tools in their human resources practices, while 31 indicated that they do not use them and 5 were unsure. This distribution indicates a relatively low level of familiarity and confidence in the applicability of AI in the field of human resources.

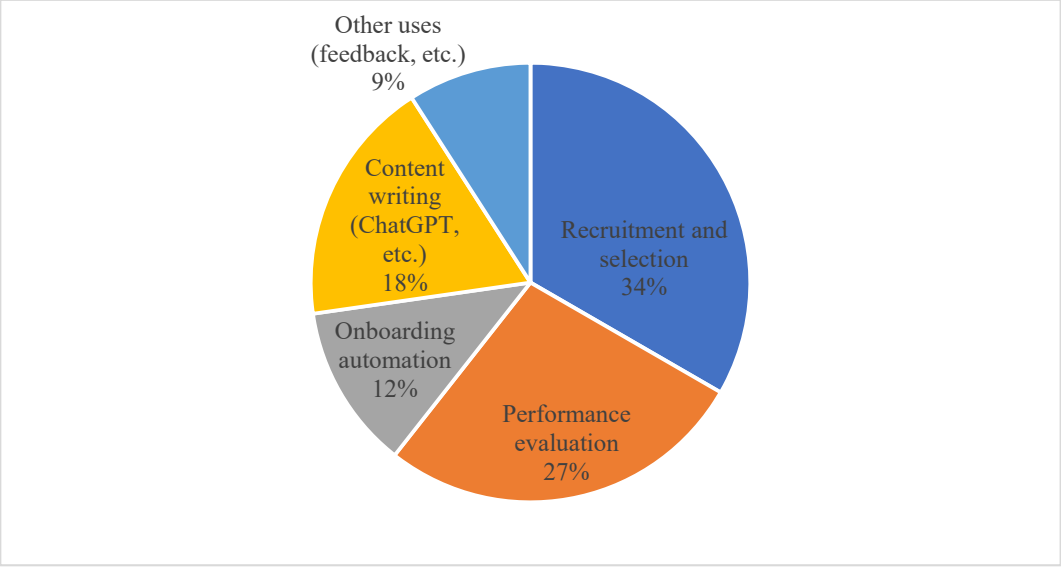
The distribution of responses confirms the study's premise: AI is still insufficiently integrated into HR strategies.

The results are analyzed separately for the two categories of respondents (AI users vs. non-users).

Among those who have not implemented AI, the most frequently mentioned obstacles were lack of technical expertise (14 mentions), high implementation costs (9), legal and ethical concerns (6), distrust in the reliability of AI results (5), and organizational deprioritization (2). One person added in the free field that we do not use advanced recruitment platforms or we use them without knowing that they are AI, which suggests that the operator works with software at a minimum operational level, without being interested in how that software actually works, which could lead to potential problems/security breaches.

On the other hand, of the 24 respondents who said they use AI, most applied it in recruitment and selection processes (11 mentions), performance evaluation (9), and automation of the integration process (4) (Figure 2). It is noteworthy that these applications are predominantly transactional and operational rather than strategic.

Figure no. 2. Purpose of AI use



Source: Own contribution

The most commonly used tools were LinkedIn Recruiter, Talent Insights, and various algorithmic matching systems. Interestingly, some respondents also added the use of generative AI tools, such as ChatGPT and Perplexity, for content writing or communication automation. These uses, while innovative, suggest a highly individualized and experimental adoption of AI, rather than one integrated into organizational policy. There continues to be a lack of knowledge of both the tools that can be used and the scenarios in which they can be used.

Respondents who used AI in recruitment rated its effectiveness at an average of 4 out of 5, proving that where it is involved, AI contributes to the efficiency of HR processes. The reason why AI did not receive a 5 rating may be found in the answers to the next question regarding the ethical challenges or risks encountered.

In the open-ended question about the ethical risks associated with using AI in recruitment, respondents mentioned two main areas of concern. The first concerns the lack of accuracy of CV matching algorithms, which can lead to inaccurate selections and raises questions about the fairness of the automated recruitment process. The second observation concerns the way in which algorithms filter results considered relevant, highlighting a possible lack of transparency and human control over selection criteria, with the potential to exclude qualified candidates. These issues indicate the need for clear regulations on the application of AI in human resources decision-making processes, as well as the importance of maintaining a balance between algorithmic efficiency and ethical fairness.

Those who checked onboarding mentioned the use of personalized learning platforms, AI assistance for frequently asked questions, and automatic sending of materials and tasks. The responses highlight some of the simplest and most useful integrations of AI into the onboarding process. These automated solutions can not only save time, but also improve the new employee's experience. This response also indicates the great potential of AI in this area, as it is a safe field for expanding its use without major risks. In terms of efficiency, the score received was 3, which is a median score from which we cannot draw significant conclusions based on this score.

When evaluating performance, participants indicated two directions: objective analysis of results and, in the "others" category, suggestions for discussions in addition to the classic evaluation forms. This type of response indicates an interest in diversifying evaluation methods, but also limited use, geared more toward supplementation than replacement.

The score for performance evaluation efficiency was also 3. A score of 3 suggests a balanced perception, neither positive nor negative, which may reflect a lack of experience or uncertainty about the real benefits. We cannot draw definite conclusions, but an important question for future research emerges: does this neutrality stem from a lack of direct experience, mistrust of technology, or uncertainty about how the AI system works?

Table no. 2 Average AI performance score in each activity

Domein	**Average score (1-5)**	**Comments**
Recruitment and selection	4.0	Rated as useful and effective
Onboarding	3.0	Neutral, useful for simple tasks
Performance evaluation	3.0	Partially used; lack of trust

Source: Own contribution

We have no additional information from participants regarding personalized career plans and staff turnover analysis. However, this allows us to develop new strategies for talent retention, based on integrating the following possible scenarios into HR activities: personalized SMART objectives, possible promotions, relevant training courses, predictions regarding the risk of departure, analysis of critical factors, etc.

Overall, the results show a fragmented and predominantly tactical use of AI in HRM, dominated by transactional applications such as recruitment. The responses indicate a modest level of technological literacy and a lack of clear organizational policies. These findings confirm the need for strategic integration of AI in talent retention, highlighting future opportunities for research and intervention.

5. Limitations

This study has a number of methodological limitations that should be considered when interpreting the results.

First, although the survey was widely distributed, the final number of valid responses (60) significantly limits the possibility of extending the conclusions to the entire target population.

Second, the study captures self-reported perceptions and behaviors at a specific point in time, without longitudinal data that would allow for analysis of developments or dynamics over time of the phenomenon under investigation.

Thirdly, certain segments of the professional population, such as representatives of NGOs, start-ups, or companies with a strong technological component, are underrepresented in the sample analyzed, which may affect the diversity of perspectives analyzed. These groups may exhibit different attitudes or practices in relation to the use of artificial intelligence. Finally, there is an inherent bias in how respondents interpret AI: some may unknowingly use AI tools without recognizing them as such, while others may overestimate their impact.

Despite these limitations, the research provides valuable insights into the current state of AI adoption in human resources and highlights critical areas for development and strategic alignment.

6. Conclusions

In this article, we set out to investigate the degree of use of artificial intelligence in the field of human resource management, with a particular focus on its applicability in talent retention strategies. In order to obtain an accurate picture of the organizational reality, we developed and applied a structured questionnaire, which was sent to 112 human resources specialists.

This resulted in 66 responses, but only 60 were valid. The participants came from diverse organizational backgrounds (SMEs, corporations, public institutions), with significant professional experience and a clear interest in HR innovation processes. However, even among this targeted audience, AI adoption remains modest, and the reported uses are fragmented and predominantly tactical.

The AI tools mentioned, such as LinkedIn Recruiter, automatic matching algorithms, ChatGPT, or Perplexity, are mainly used at the individual level, outside of a formalized institutional strategy. Among those who do not use AI, there were consistent concerns about unfamiliarity with the benefits, uncertainties about data security, and legal difficulties. However, a significant proportion of respondents expressed openness to learning about the applicability of AI in HR.

This research confirms the relatively low but growing interest in using artificial intelligence for talent retention in human resource management. Although AI is beginning to shape certain operational tasks, such as recruitment and onboarding, its strategic potential remains untapped. The barriers identified, including lack of knowledge, high costs, and ethical uncertainties, can be overcome with targeted interventions and leadership commitment.

To fully leverage the potential of AI in retaining top talent, organizations must move beyond isolated use cases and develop comprehensive, ethical, and data-driven human resource strategies (Colbert, Yee, & George, 2016). Such a transformation will depend not only on technological readiness but also on cultivating an organizational culture that embraces innovation and continuous learning.

Therefore, the main conclusion is that the lack of structured information and the proliferation of myths about AI contribute to uncertainty and reluctance to adopt these technologies as a strategic tool in HR. The real integration of these technologies requires not only access to technical solutions, but also the development of an organizational culture open to innovation, supported by leadership and clear policies.

Based on the findings presented, future research should explore how AI could be used by companies as a talent retention strategy, but also how real information about AI can be obtained for companies.

7. Further research

Based on the conclusions of this study, several promising directions for future research emerge.

1. Sectoral analyses - Investigating differences in AI adoption between corporations, public institutions, and start-ups can highlight specific patterns and challenges.
2. Longitudinal studies - Research is needed to monitor over time how the use of AI in HRM is changing and how it influences organizational strategy.
3. The impact of AI literacy programs - Future studies should evaluate the effectiveness of training initiatives in increasing adoption and reducing reluctance.

4. International comparative studies - Cross-cultural and cross-state analyses can provide relevant insights into the influence of regulations and culture on the integration of AI into retention strategies.

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