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NAVIGATING TALENT MANAGEMENT IN THE DIGITAL AGE: A SYSTEMATIC REVIEW

NAVEGANDO A GESTÃO DE TALENTOS NA ERA DIGITAL: UMA REVISÃO SISTEMÁTICA

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Abstract

The rapid advancement of digital technologies has significantly transformed how organizations manage talent in the contemporary workplace. Despite the growing recognition of the importance of talent management in various sectors, the existing body of literature remains fragmented. The integration of talent management with latest technology is rarely addressed in previous studies eventhough it needs serious attention, as technology has become the core strength of modern organizations. Addressing this gap, this study presents a systematic review of the role of strategic talent management in the digital age. Guided by the PRISMA 2020 framework, 52 empirical studies published between 2021-2025 were systematically identified from Scopus and Web of Science (WoS). Data were analysed using descriptive trend analysis to examine key aspects, emerging trends and strategic practices, major implementation of challenges, and the role of digital tools in supporting talent management to enhance organizational strategies in digital age. The findings indicate that strategic talent management (STM) remains a major factor that significantly influences organizational effectiveness in digital age, particularly through its key aspects and emerging trends. The findings also highlights the importance of addressing challenges and leveraging digital tools to support effective talent management practices various

Resumo

O rápido avanço das tecnologias digitais transformou significativamente a forma como as organizações gerenciam talentos no ambiente de trabalho contemporâneo. Apesar do crescente reconhecimento da importância da gestão de talentos em vários setores, o corpo existente de literatura permanece fragmentado. A integração da gestão de talentos com as mais recentes tecnologias raramente é abordada em estudos anteriores, embora necessite de atenção séria, uma vez que a tecnologia se tornou a força central das organizações modernas. Abordando essa lacuna, este estudo apresenta uma revisão sistemática do papel da gestão estratégica de talentos na era digital. Guiados pelo framework PRISMA 2020, 52 estudos empíricos publicados entre 2021-2025 foram sistematicamente identificados no Scopus e Web of Science (WoS). Os dados foram analisados usando análise de tendência descritiva para examinar aspectos-chave, tendências emergentes e práticas estratégicas, principais desafios de implementação e o papel das ferramentas digitais no apoio à gestão de talentos para aprimorar as estratégias organizacionais na era digital. Os resultados indicam que a gestão estratégica de talentos (STM) continua a ser um fator importante que influencia significativamente a eficácia organizacional na era digital, particularmente através de seus aspectos-chave e tendências emergentes. Os

sectors. The results are categorized into four themes that include (i) key aspects of strategic talent management in digital age, (ii) emerging trends and strategic practices in talent management in digital age, (iii) key challenges in implementing strategic talent management digital age, and (iv) digital tools that support strategic talent management practices to enhance organizational strategies in digital age.

Keywords: Strategic Talent Management. Human Capital. Digital. Prisma. Systematic Review.

resultados também destacam a importância de abordar desafios e aproveitar ferramentas digitais para apoiar práticas eficazes de gestão de talentos em vários setores. Os resultados são categorizados em quatro temas que incluem (i) aspectos-chave da gestão estratégica de talentos na era digital, (ii) tendências emergentes e práticas estratégicas na gestão de talentos na era digital, (iii) principais desafios na implementação da gestão estratégica de talentos na era digital, e (iv) ferramentas digitais que apoiam práticas de gestão estratégica de talentos para aprimorar as estratégias organizacionais na era digital.

Palavras-chave: *Gestão Estratégica de Talentos. Capital Humano. Digital. Prisma. Revisão Sistemática.*

1 INTRODUCTION

One of the most critical factors influencing organizational success is the effective management of human resources. In knowledge-driven organizations, human capital represents the most valuable asset in achieving organizational goals and navigating complex change processes. This is a fundamental impact on organizational strategy due to the ongoing process of digital transformation, which requires a radically different approach to defining talent management practices as a vital strategic change to remain competitive (Kalogera *et al*., 2025). Academic understanding suggests that such digitalization, which is informed by data analytics and artificial intelligence (AI), significantly alters the essence of talent acquisition, development, and retention (Jogarao *et al*., 2024; Martínez-Morán *et al*., 2021), transforming human capital management into a more reactive rather than proactive and data-oriented role (Gaddi *et al*., 2025).

The key to an organizational reaction to such a digitally-driven environment is based on vital internal change, especially the ability to build systematic digital competency models and the foresight of AI-centered capabilities (Al Haziazi, 2023; Al Mandhari *et al*., 2025; Vashishth *et al*., 2024). In turn, the development of a continuous learning culture, which will be enabled by the agile leadership style (Banerjee & Sharma, 2025; Kaplan & Gowindasamy, 2025), is framed as a key facilitator of the improvement in the operational effectiveness and the achievement of a sustainable competitive edge

(Guerra *et al*., 2023; Virmani *et al*., 2025; Zahoor *et al*., 2024).

To begin with, the study assists in the analysis of the key aspects and the main elements that should determine effective talent management in the age of technology and digital transformation. Discuss the new trends and strategic paths that organizations are taking to draw, build, and keep talent in the increasingly competitive digital environment. Explore the major challenges/obstacles facing organizations in their bid to adopt and implement such advanced talent management strategies. Delve into and assess how organizations can effectively use digital tools, platforms, and analytics practically to overcome the barrier to implementation and improve the success of their talent management programs.

In general, this paper provides a significant contribution through the synthesis of recent findings of talent management in most spheres between 2021 and 2025. The current study contributes to the closure of the methodological gap founded on the demographic basis as well, since the analysis was performed in cross globe and cross-cultural views. In the end, it is expected that this study will be very important in promoting the latest discovery related to technology towards strategic talent management literacy.

This study is conducted to address the following research questions:

i. What are the key aspects of strategic talent management in the digital age?
ii. What are the emerging trends in talent management strategies in the digital
iii. age?
iv. What are the key challenges in implementing strategic talent management
v. in the digital age?
vi. How can organizations leverage digital tools for effective talent
vii. management strategies?

The aim of this study is to review and critically assess the most important dimensions of strategic talent management (STM) in relation to the digital age. This study also aimed at explaining how organizations can successfully go through the talent management strategies in the digital era to ensure a competitive edge. Collectively, the discovery of this study will be a significant source of discussion on strategic talent management in the digital era. This review also fills considerable gaps in the literature through a systematic analysis of the major points, trends, and challenges of strategic talent management in various situations. Finally, this paper aims to present a distinct guideline

on the interconnection of digitalization and talent strategy and give future research agenda on how organizations can evolve to keep up with the competition.

2 LITERATURE REVIEW

The widespread adoption of digital technologies is radically changing the way organizations are functioning and is forcing them to redefine talent management. This change leaves not only beneficial but also a necessity to survive in the modern competitive environment (Kalogera *et al*., 2025). The studies show that digital transformation has a significant effect on the fundamental set of strategies concerning talent acquisition, development, and retention, and it requires a different focus than the previous models (Jogarao *et al*., 2024; Martínez-Morán *et al*., 2021). With the increasing scholarly interest in this intersection, such critical themes as the development of digital skills, organizational change, and innovation have taken center stage as a growing research agenda suggests the alignment of talent strategies and highly complex digital environments (Murtianingsih & Udin, 2026).

The use of advanced technologies is a major driving force in this development. When combined, data analytics, artificial intelligence (AI), and machine learning (ML) enable companies to make data-driven and informed decisions and forecast trends in the workforce (Jogarao *et al*., 2024). The opportunities of business intelligence (BI) and digital capabilities, such as transformability and reproducibility, are utilised to shift the management of human capital towards reactive administration instead of active empowerment (Kalogera *et al*., 2025). In particular, AI is being used to automate and streamline human resource (HR) functions, including resume screening, interview scheduling, and performance reviews, whereas cloud-based platforms are more scalable and flexible than on premises based systems (Gaddi *et al*., 2025).

The talent acquisition process has especially changed. Such new technologies as AI, blockchain, and virtual reality are facilitating the process of hiring, improving the experience of a candidate, and making it possible to hire people based on data (Badouch & Boutaounte, 2025). The traditional models of hiring are transformed by this technological integration, with the emphasis being placed on individualization. Research, including one by the Spanish market conducted by (Martínez-Morán *et al*., 2021),

indicates a high rate of growth in the number and types of digital means and social networks to acquire talent. Digital Human Resource Management (DHRM) automates recruitment activities, which enables professionals to make improved decisions based on real-time data (Virmani *et al*., 2025).

This digital transformation has placed immediate pressure on employees in terms of new skills. The high pace of AI development, such as that of AI, requires organizations to future-proof their talent management strategies by predicting the development of AI-oriented talent (Vashishth *et al*., 2024). Companies are creating end-to-end corporate digital competency models to match their employees with the requirements of a digital environment (Al Mandhari *et al*., 2025). A study in the Sultanate of Oman proves that the digital skills, HR analytics, and employee wellbeing are all in a positive relationship to support the talent management mechanisms (Al Haziazi, 2023).

As a result, life-long learning and leadership have taken a primary focus. The technologies of Industry 4.0 allow employees to utilize creative and digital expertise and become the culture of lifelong learning (Banerjee & Sharma, 2025). The future of talent management in the age of the digital era depends on leadership and agility, where agile leadership is considered to be a radical driver to attract, develop, and retain digital talent (Kaplan & Gowindasamy, 2025). This needs to focus on active upskilling and reskilling. The most important competence to create the new digital leader is learning agility, including mental agility, self-awareness, and change agility (Sun, 2024).

Outside abilities and management, organizational culture, and the experience of the employees are important. According to a study by (Teresa & Fantinelli, 2025) on Italian learning organizations, it is evident that the culture of a learning organization is something necessary in drawing and maintaining the best talent, and digital learning is required to ensure the competitiveness of the workforce. Corporate culture, engagement, and performance management are also being changed with the introduction of the digital age into the employee experience management (EXM) (Figueiredo *et al*., 2025). This can be evidenced by the results that an anthropocentric culture is a highly correlated phenomenon with talent management (Al Haziazi, 2023).

These adaptations have a strategic goal of improving organizational outcomes. Using digital technologies in manufacturing SMEs in the emerging markets was identified to mediate the operational effectiveness via talent management and employee

engagement (Zahoor *et al*., 2024). DHRM, with its simplification of HR activities, eventually contributes towards the achievement of sustainable competitive advantage (Virmani *et al*., 2025). In the same manner, digital transformation changes in organizations affect talent attraction, as well as retention, which are essential in sustainable growth (Guerra *et al*., 2023).

Although there are possibilities, major ethical issues and concerns arise. These are the fear of loss of data privacy, the possibility of bias in AI and analytics, the threat of losing jobs to automation, and the effect on the welfare of the employees (Arora *et al*., 2024; Jogarao *et al*., 2024). It is a delicate path to walk between strategic technological progress and operational requirements and human elements (Griffiths & Fletcher, 2025). Although systematic reviews and case studies, including the case of succession planning at PTTEP (Taechasapasith & Silakorn, 2023), are very helpful, there are drawbacks. Bibliometric analyses, for instance, may be restricted by single-database searches, indicating a need for upcoming research employing more comprehensive search approaches and examining industry-specific implementations of digital talent management (Murtianingsih & Udin, 2026).

3 METHODOLOGY

3.1 Identification

The systematic review procedure was followed in three basic steps to obtain significant articles from the chosen databases. The initial phase is to find some keywords and seek some similar terms keywords in encyclopedias, dictionaries, as well as past studies. The creation concerning the search strings of the WoS as well as Scopus occurs after all the related phrases are selected, as shown in Table 1. Both databases contained 1031 publications that related to the current study of the systematic review in its initial stage of the procedure.

Table 1

Search keywords used according to database.

Scopus	TITLE-ABS-KEY (("talent management" OR "human resource" OR "employee development") AND ("digital" OR "technology" OR "online" OR "virtual") AND ("engagement" OR "retention" OR "attraction")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024) OR LIMIT-TO (PUBYEAR , 2025))
WoS	(("talent management" OR "human resource" OR "employee development") AND ("digital" OR "technology" OR "online" OR "virtual") AND ("engagement" OR "retention" OR "attraction")) (Topic) and 2021 or 2022 or 2023 or 2024 or 2025 (Publication Years)

3.2 Screening

The preliminary screening stage involved checking for duplicate records, resulting in no duplicate papers being identified. In the next phase, 168 papers were filtered against a host of exclusion and inclusion criteria that the researcher designed; in the first phase, there were none. The main eligibility requirement was that sources be empirical research articles, as this offered applicable and actionable insights. Consequently, publications such as narrative reviews, systematic reviews, meta-syntheses, meta-analyses, book chapters, books, as well as conference papers were excluded. The review was also limited to the articles that were published in the English language. Moreover, some terms are restricted to pertinent article searches only. It is important to highlight that the chosen timeline for the study was in recent five years (2021–2025). Based on these selection standards, a total of 863 records were removed.

3.3 Eligibility

In the third phase, known as the eligibility evaluation, 156 articles were assembled as shown in Table 2. In this step, the titles and main content of each article were carefully reviewed to ensure consistency with the inclusion criteria and relevance to the study's research aims (Paul & Criado, 2020). As a result of this assessment, 104 articles were removed because they fell outside the study's scope, had titles or abstracts that did not sufficiently address the research objectives, or lacked accessible full texts based on

empirical evidence. Consequently, 52 articles were retained for the final review stage.

Table 2

The searching selection criterion.

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2021 – 2025	< 2021
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press

3.4 Data abstraction and analysis

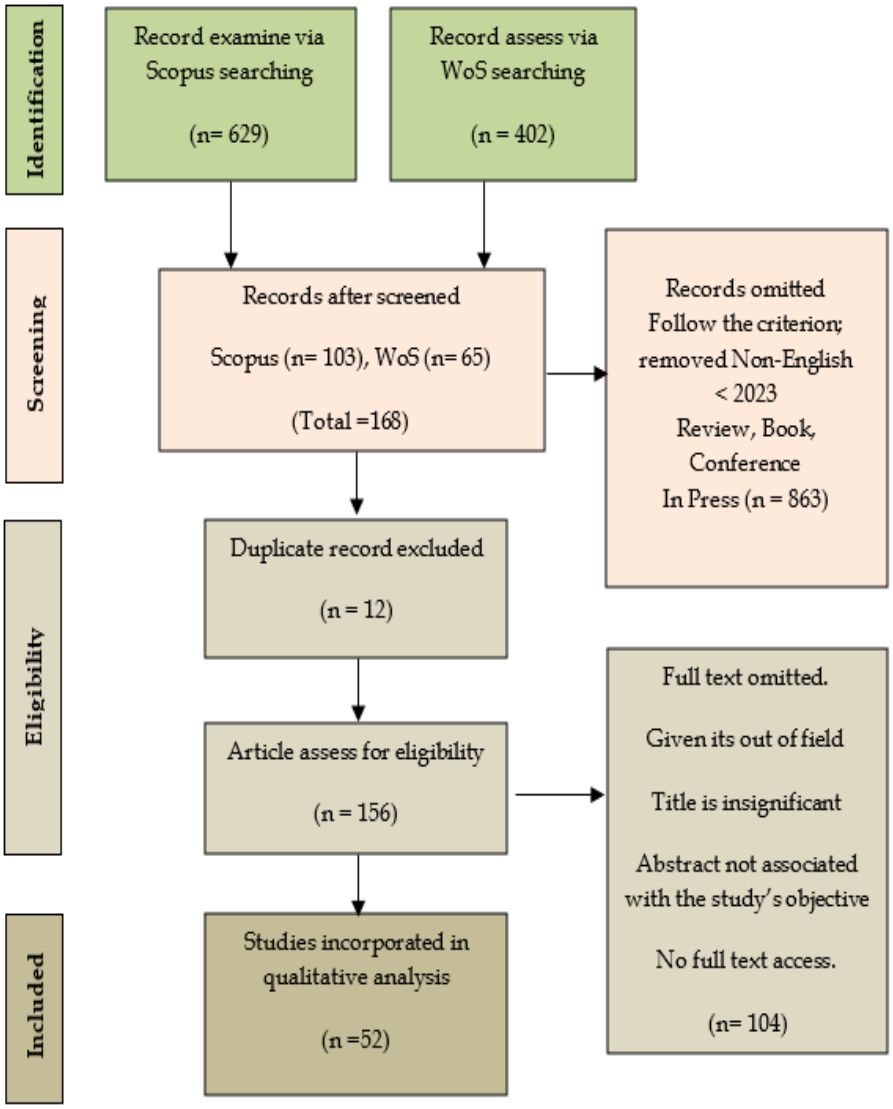
This study employed an integrative approach as part of its analytical framework to evaluate and consolidate findings from diverse research methodologies (van Riel & Snyder, 2024). The primary objective of this approach was to uncover key themes and subthemes. The initial phase of theme development began with the systematic collection of data. Figure 1 shows a compilation of 52 publications for assertions or material relevant to the topics of the current study meticulously analysed. The authors then evaluated the current significant studies related to talent management in various sectors. The methodology used in all studies, as well as the research results, are being investigated.

Next, the researcher collaborated with co-researcher to develop themes based on the evidence in this study's context. A log was kept throughout the data analysis process to record any analyses, viewpoints, riddles, and other observations relevant to interpreting the data. In the final stage, the researcher reviewed and compared the results to identify any inconsistencies in the theme development process. The researcher also compared the findings to resolve any variances in the theme construction. It is crucial to highlight, that in the presence of disagreements between the concepts as well as findings, the authors discuss them among themselves.

Lastly, themes developed were refined so as to give them consistency. The theme of produce was refined to make it coherent. Two management professionals were engaged to ensure the rigor of the analysis. The expert review stage contributed to establishing domain validity by confirming the clarity, relevance, as well as sufficiency of each subtheme. Revisions were subsequently implemented at the author's discretion in response to the experts' feedback and recommendations.

Figure 1

PRISMA Model of Methodolology Process Framework.



Source: Wan Azani, 2020.

4 RESULTS AND DISCUSSIONS

This section observes the findings from 52 reliable articles from Scopus and Web of Science executed from 2021 to 2025 via systematic literature review (SLR). It is significant to highlight that this research finfing examined from across the globe. This clasification helps to identify regional trends (Noel & Sharma, 2024) in navigating talent

management in the age of digital as proving that this topic remains vital and growing rapidly in recent years (Noel & Sharma, 2024; Patra *et al*., 2023).

All findings were summarized as shown in Table 3-6 and followed by discussion based on four themes; key aspects of strategic talent management in the digital age, emerging trends in talent management approaches in the digital age, key challenges in implementing strategic talent management in digitally driven contexts, and the ways organizations leverage on digital tools for effective talent management strategies.

Table 3

Key finding analysis of theme 1.

Aspect	Authors
Theme 1: Key aspects of strategic talent management in the digital age	
1. Agile Leadership and Continuous Learning	Vashishth *et al*., (2024)
	Al Haziazi, (2023)
	Banerjee & Sharma, (2025)
	Teresa & Fantinelli, (2025)
	(Kalogera *et al*., (2025)
	Ul Ain *et al*., (2024); Zahrani, (2024)
2. Integration of Technology in Talent Management	Jogarao *et al*., (2024)
	Gaddi *et al*., (2025)
	Virmani *et al*., (2025)
	Badouch & Boutaounte, (2025)
	Martínez-Morán *et al*., (2021)
3. Employee Experience Management (EXM)	Santos *et al*., (2025)
	Al Haziazi, (2023)
	Arora *et al*., (2024).
	Gaddi *et al*., (2025)
	Badouch & Boutaounte, (2025)
4. Strategic Approaches and Frameworks	Vashishth *et al*., (2024)
	Kalogera *et al*., (2025)
	Banerjee & Sharma, (2025)
	Zahrani, (2024)
	Guerra *et al*., (2023)
	Arora *et al*., (2024)
	Teresa & Fantinelli, (2025)

Table 4

Key finding analysis of theme 2.

Aspect	Authors
Theme 2: Emerging trends in talent management strategies in the digital age	
1. Integration of advanced technologies	Mann & Mann, (2025)
	Carol & Rodriguez-Garcia, (2025)
	Antoniuk *et al*., (2025)
	Yorks *et al*., (2022b)

	Thakurta, (2025)
	Prasad & De, (2024)
	Madanchian & Taherdoost, (2025)
2. Focus on digital skills development	Mann & Mann, (2025)
	Yorks *et al*., (2022b)
	Gagnon, (2022)
	Antoniuk *et al*., (2025)
3. Proactive and data-driven talent management	Mann & Mann, (2025)
	Carol & Rodriguez-Garcia, (2025)
	Antoniuk *et al*., (2025)
	Madanchian & Taherdoost, (2025)
	Hua *et al*., (2025)
4. Ethical and human considerations	Mann & Mann, (2025)
	Atay *et al*., (2025)
	Carol & Rodriguez-Garcia, (2025)
	Antoniuk *et al*., (2025)
	Prasad & De, (2024)
	Madanchian & Taherdoost, (2025)
5. Collaborative and sustainable practices	Mann & Mann, (2025)
	Lin & Wang, (2022)
	Bermúdez-González *et al*., (2024)
	Atay *et al*., (2025)
	Griggs *et al*., (2025)
	Montero Guerra & Danvila-Del Valle, (2024)

Table 5

Key finding analysis of theme 3.

Aspect	Authors
Theme 3: Key challenges in implementing strategic talent management in the digital age	
1. Technological challenges	Al Mandhari *et al*., (2025); Griffiths & Fletcher, (2025)
	Kaplan & Gowindasamy, (2025)
	Madanchian & Taherdoost, (2025)
	Konovalova *et al*., (2022)
	Teresa & Fantinelli, (2025)
	Zahrani, (2024)
2. Organizational challenges	Madanchian & Taherdoost, (2025)
	Figueiredo *et al*., (2025); Madanchian & Taherdoost, (2025); Zahrani, (2024)
	Al Mandhari *et al*., (2025) Teresa & Fantinelli, (2025)
	Griffiths & Fletcher, (2025)
	Griffiths & Fletcher, (2025)
	Lin & Wang, (2022)
	Kaplan & Gowindasamy, (2025)

3. Human factors	(Lin & Wang, (2022), Griffiths & Fletcher, (2025), Figueiredo *et al*., (2025)
	Griffiths & Fletcher, (2025); Kaplan & Gowindasamy, (2025); Madanchian & Taherdoost, (2025)
	Griffiths & Fletcher, (2025); Kaplan & Gowindasamy, (2025)
	Lin & Wang, (2022)
	Figueiredo *et al*., (2025)
	Bermúdez-González *et al*., (2024)
	(Kaplan & Gowindasamy, (2025); Konovalova *et al*., (2022); Madanchian & Taherdoost, (2025)
	Noerman *et al*., (2025)
4. Strategic approaches	Kaplan & Gowindasamy, 2025)
	Taechasapasith & Silakorn, (2023)
	Al Mandhari *et al*., (2025)
	Al Mandhari *et al*., (2025); Griffiths & Fletcher, (2025); Griggs *et al*., (2025);Teresa & Fantinelli, (2025)
	Griffiths & Fletcher, (2025)
	Figueiredo *et al*., (2025)
	Lin & Wang, (2022)
	Madanchian & Taherdoost, (2025)
	Zahrani, (2024)

Table 6

Key finding analysis of theme 4.

Aspect	Authors
Theme 4: Organizations leverage on digital tools for effective talent management strategies	
1. Streamlining hr processes	Lakshmi *et al*., (2024)
	Antoniuk *et al*., (2025); Bastida *et al*., (2025)
	Wider *et al*., (2025)
	McLean & de Zárate, (2024)
	Nicolás-Agustín *et al*., (2022)
	Sakka *et al*., (2022)
2. Data-driven decision making	Alexandro, (2025)
	McLean & de Zárate, (2024)
	Wider *et al*., (2025)
	Prasad & De, (2024)
3. Enhancing employee engagement and development	Antoniuk *et al*., (2025); Konovalova *et al*., (2022)
	McLean & de Zárate, (2024)
	Teresa & Fantinelli, (2025)
	Xie *et al*., (2023)

	Jimoh & Kee, (2022)
	Cahyadi *et al*., (2024)
4. Improving recruitment and retention	Sakka *et al*., (2022)
	Lakshmi *et al*., (2024)
	Alexandro, (2025)
	Ebnezer & Priya, (2022)
	Teresa & Fantinelli, (2025)
	McLean & de Zárate, (2024)
5. Addressing ethical and human considerations	Antoniuk *et al*., (2025); Bastida *et al*., (2025)
	Konovalova *et al*., (2022)
	Bastida *et al*., (2025)
	Prasad & De, (2024)
	Ebnezer & Priya, (2022)
6. Future-proofing talent management	Lakshmi *et al*., (2024)
	Nicolás-Agustín *et al*., (2022)
	Cahyadi *et al*., (2024)
	Alexandro, (2025)
7. Enhancing organizational efficiency	Alexandro, (2025); Prasad & De, (2024)
	Antoniuk *et al*., (2025)
	Wider *et al*., (2025)
	Ebnezer & Priya, (2022)
	Sakka *et al*., (2022)
	McLean & de Zárate, (2024)

4.1 Key aspects of strategic talent management in the digital age

The digital environment presupposes agile leadership and ongoing learning. The accelerated technological change, especially artificial intelligence, requires a workforce that possesses new AI-driven skills, as pointed out in (Vashishth *et al*., 2024). To develop these skills, organizations will need to change talent development programs. The study conducted by (Al Haziazi, 2023) supports the fact that there is a strong positive correlation between digital skills and effective talent management. This setting requires a change of leadership. According to (Banerjee & Sharma, 2025), Industry 4.0 technologies will enable employees as they will have a continuous learning process, and the human resource managers will become coaches to encourage them to acquire skills. This is a joint venture that drives the digitalization of talent. Learning is one of the main aspects that (Teresa & Fantinelli, 2025) recognize, where digital learning plays a key role in the competitiveness of the workforce, and the HR specialists themselves need to receive more specialized training on digital technologies. This action-oriented philosophy of skill education conforms to the principles of proactive empowerment and self-renewal that are

highlighted by (Kalogera *et al*., 2025). The use of digital leadership to mobilize resources and performance is discussed by Ul Ain *et al*., (2024) and Zahrani, (2024).

The use of technology in managing talent is a key theme that has automated and transformed human resource functions. According to Jogarao *et al*., (2024), the convergence of data analytics, artificial intelligence, and machine learning enables organizations to make correct decisions and predict workforce trends. According to Gaddi *et al*., (2025), AI is already being applied to automate tasks, including screening of resumes, scheduling of interviews, and performance reviews, and a move towards cloud-based solutions. This Digital Human Resource Management (DHRM) facilitation contributes to automation and simplification of such processes as recruitment, training, and appraisal, as Virmani *et al*., (2025) define transformative areas as AI, machine learning, blockchain, and virtual reality, which allow talent acquisition to be data-driven (Badouch & Boutaounte, 2025). Nonetheless, it is not even implemented. In the Spanish market, the study by Martínez-Morán *et al*., (2021) identified a fast rate of the use of digital tools in the process of talent acquisition, especially in social networks, but identified the relatively low utilization of digital tools in the talent development and retention process.

Employee Experience Management (EXM) has become an urgent concern in terms of talent retention during the era of the digital world. The study by Santos *et al*., (2025) is in direct connection with the necessity to enhance talent retention in the sphere of IT professionals to create and validate a measurement tool to assess employee experience. Their contributions suggest artefacts to control key phases of the employee lifecycle, including onboarding, monitoring, and offboarding. The relevance of such a focus is justified with the help of Al Haziazi, (2023), whose results indicate that successful talent management is positively correlated with a human-centric culture and employee wellbeing significantly. The other ethical and human concerns that Arora *et al*., (2024) include in the course of digital transformation are engaging employees, retaining them, and their overall well-being. Technology has been frequently placed as an enabler of EXM. According to Gaddi *et al*., (2025), AI may be instrumental in creating more engaging employee experiences, whereas Badouch & Boutaounte, (2025) explain that new technologies can be used to improve the experience of the candidate, as well as enable a higher level of personalization in the hiring process.

The strategic management and frameworks are being restructured to make talent management in line with the requirements of digital transformation. Conventional models do not always suffice, and organizations have to make their strategies "future-proof" by predicting how the required competencies will evolve (Vashishth *et al*., 2024). Kalogera *et al*., (2025) support using the concept of implementing digital properties as a part of fundamental talent policies to break the chain of organizations that have been managed reactively to organizations that are actively empowered. A number of researchers have given new conceptual frameworks. Banerjee & Sharma, (2025) present a systematic literature review to suggest a framework for a cooperative relationship between the employees and the HR managers. Zahrani, (2024) also forms a model based on a combination of technology, leadership, and HR practices. This is a strategic change, which will focus on the total life cycle of employees. Guerra *et al*., (2023) examine the effect of organizational changes on both variables of talent attraction and retention. Among the strategic elements that should be considered in relation to this new landscape are process reengineering, innovation, and agility (Arora *et al*., 2024) and the establishment of a learning organization culture, which, according to Teresa and Fantinelli, (2025), can be regarded as one of the most important strategies to attract, select and retain the top talent.

4.2 Emerging trends in talent management strategies in the digital age

One of the trends is the profound incorporation of the latest technologies into the Human Resource Development (HRD) processes, substituting the traditional ones (Mann & Mann, 2025). Companies are becoming more and more active in an environment that is facilitated by artificial intelligence (AI), automation, and the analysis of big data (Mann & Mann, 2025). In the field of talent acquisition, AI can be particularly noticeable in such applications as AI-based hiring (Mann & Mann, 2025), automated candidate screening, and turnover risk prediction (Carol & Rodriguez-Garcia, 2025). The introduction of AI is observed to streamline the recruitment processes and provide real-time feedback on performance (Antoniuk *et al*., 2025). In addition to AI, other digital learning facilitators are Learning Management Systems (LMS), gamification, and microlearning (Mann & Mann, 2025). There is also research into the effect that generative AI has on HRM (Prasad

& De, 2024) and sociotechnical systems to characterize these practices, which are technology-driven (Thakurta, 2025). The major technological facilitators in this adoption are the development of machine learning and natural language processing (Madanchian & Taherdoost, 2025).

The changing needs in the industry also require a keen interest in on-going digital skills acquisition (Mann & Mann, 2025). One of the key approaches includes developing the culture of lifelong learning, as well as specific upskilling and reskilling programs to bring the workforce in line with new requirements (Mann & Mann, 2025). This reskilling is marked as one of the major modern talent management tasks (Yorks *et al*., 2022a). Moreover, the digital reality requires the emergence of new leadership practices; the project leader, in particular, should be able to develop the skills that are hybrid in nature and include both business and technological skills (Gagnon, 2022). The practices of talent management are therefore demanded to train managers on the acquisition of such digital leadership competencies (Gagnon, 2022). Technology, in its turn, helps the latter trend, and AI systems are presently being used to develop individualized learning paths for employees (Antoniuk *et al*., 2025).

Talent management practices are moving towards proactive and data-driven practices. Big data and digital performance tracking are used in organizations to make decisions (Mann & Mann, 2025). The use of AI is more effective in improving the quality of decisions made by the HRM (Madanchian & Taherdoost, 2025) and allows making predictive analytics, including forecasting turnover risks (Carol & Rodriguez-Garcia, 2025). These will help to plan a strategic workforce more effectively (Carol & Rodriguez-Garcia, 2025). The AI systems also allow real-time assessment of performance and a culture of active career growth (Antoniuk *et al*., 2025). Such a data-driven strategy also applies to the macro level, with the research being based on a quasi-experimental design to estimate the impact of governmental talent attraction policies on the digital transformation of enterprises (Hua *et al*., 2025).

There are serious ethical and humanistic concerns with the further implementation of digitalization and AI. Among the outstanding issues are data protection, data privacy and security, algorithmic bias, and probable technology resistance (Carol & Rodriguez-Garcia, 2025; Madanchian & Taherdoost, 2025; Mann & Mann, 2025). The people-first style of leadership is promoted to address these threats (Mann & Mann, 2025). It is similar

to the concept of the "Society 5.0" that is based on a more human-focused approach and creation of flexible, ethical, and human-oriented solutions (Atay *et al*., 2025). This is aimed at making sure that technology integration is dealt with in an ethical and sustainable manner that will deal with biases to realize fairer and more efficient organizations (Antoniuk *et al*., 2025; Carol & Rodriguez-Garcia, 2025). One of the key mediating variables is trust; user trust in AI systems is a determinant of organizational commitment, and this determines engagement and performance (Prasad & De, 2024).

New approaches focus on sustainable and responsive talent partnerships and sustainability in order to address new forms of organizations. Aggressive and flexible talent management is needed in remote work and the gig economy (Mann & Mann, 2025). This has a relation to the "Work 4.0" concept, based on long-term employment relationships (Lin & Wang, 2022). Autonomy, digitalization, and flexible working arrangements are more important, especially to newer generations (Lin & Wang, 2022). In the environment of involuntary remote work, like the post-COVID era, job satisfaction and work-family balance are the key factors to retaining talent (Bermúdez-González *et al*., 2024). It is necessary to approach it with organizational culture modifications (Montero Guerra & Danvila-Del Valle, 2024) and transform the business and focus on managing change in small, incremental cycles, instead of large-scale projects (Griggs *et al*., 2025). Such attempts are undertaken to come up with sustainable and effective long-term success strategies (Atay *et al*., 2025).

4.3 Key challenges in implementing strategic talent management in the digital age

One of the key issues is that technology is changing at a rapid pace and continuously (Al Mandhari *et al*., 2025; Griggs *et al*., 2025). Organizations are finding it difficult to keep abreast with such developments (Griggs *et al*., 2025). There are certain challenges that are associated with the implementation of Artificial Intelligence (AI) and automation (Kaplan & Gowindasamy, 2025). Some of the barriers to the implementation of AI are the high costs of integration and the severe issue of data security (Madanchian & Taherdoost, 2025). In addition, the incorporation of certain technologies, such as automation and cloud computing, poses a challenge in implementation (Zahrani, 2024). Although digital technologies can be perceived as a supportive tool, like gamification,

there is often a gap, as even the HR specialists might not receive particular training about the new technologies (Teresa & Fantinelli, 2025). The risk of dehumanisation related to the use of AI in human resources is also mentioned (Konovalova *et al*., 2022).

The challenges in an organization are substantial and may need some basic structural changes, which Kaplan & Gowindasamy, (2025) refer to as an organizational revolution. Organizational change aversion is one of the major obstacles to the adoption of new technologies (Madanchian & Taherdoost, 2025). This opposition often is intertwined with the current corporate culture (Figueiredo *et al*., 2025; Madanchian & Taherdoost, 2025; Zahrani, 2024). To retain talent, organizations should thus create more receptive organizational structures (Griggs *et al*., 2025) and actively promote a culture of a learning organization (Al Mandhari *et al*., 2025; Teresa & Fantinelli, 2025). This change is needed because the old bureaucracies have become a source of frustration among the new generations of talent (Lin & Wang, 2022). One of the challenges has always been how to find a balance between strategic technological changes and operational requirements (Griffiths & Fletcher, 2025).

The issue of human factors is complicated, and it starts with leadership. It has been mentioned in the literature that agile (Kaplan & Gowindasamy, 2025) and digital leadership (Griffiths & Fletcher, 2025) are required, which are capable of addressing the digital transformation (Griffiths & Fletcher, 2025). The issue of talent retention is still a pressing challenge in the digital era (Figueiredo *et al*., 2025; Griffiths & Fletcher, 2025; Lin & Wang, 2022). The matter is further complicated by the generational aspect; more recent generations are now more focused on independence and the ability to work independently (Lin & Wang, 2022). Retention depends on the experience of the employees, their engagement, and motivation (Figueiredo *et al*., 2025). Professional isolation has a detrimental effect on organizational commitment in remote work settings, but work-family balance has a positive effect (Bermúdez-González *et al*., 2024). Moreover, the major human factors include diversity and inclusion management (Griffiths & Fletcher, 2025; Kaplan & Gowindasamy, 2025), ethical considerations, particularly, the possible AI bias or dehumanisation (Konovalova *et al*., 2022; Madanchian & Taherdoost, 2025).

To move through the digital environment, there is a need to employ strategic approaches. The first approach, which is mentioned, is the active upskilling and reskilling

of the workforce, particularly in the face of AI and automation (Kaplan & Gowindasamy, 2025). This is achieved by defining and assessing the required competencies, which may be achieved with the help of an integrated corporate digital competency model (Al Mandhari *et al*., 2025). Another important strategy is the Systematic Succession Planning, which guarantees that critical positions will not be vacated due to the recruitment of talent within the company (Taechasapasith & Silakorn, 2023). Individual Development Plans (IDPs), career rotation, and mentoring are some of the tools that support this (Taechasapasith & Silakorn, 2023). Efficient strategies usually rely on the culture of constant education (Al Mandhari *et al*., 2025; Griffiths & Fletcher, 2025). The other strategies are the focus on the Employee Experience (Figueiredo *et al*., 2025), implementation through certain methods such as a "zoom out, zoom in" strategy, and the division of extensive transformations into manageable projects (Griffiths & Fletcher, 2025). Strategic plans are also to be adjusted to the preferences of various generations (Lin & Wang, 2022) and have to include ethical frameworks, specifically, implementing AI (Madanchian & Taherdoost, 2025). It is also suggested to adopt a holistic method of combining technology, leadership, and HR practices (Zahrani, 2024).

4.4 Organizations leverage on digital tools for effective talent management strategies

Digital technologies are altering the basic human resource (HR) functions. This transformation focuses on the incorporation of the notions of artificial intelligence (AI) and automation, which will be integrated into the everyday operation of organizations (Lakshmi *et al*., 2024). Studies indicate that AI can be used to improve certain functions. An example is the research by Antoniuk *et al*., (2025 and Bastida *et al*., (2025) that pinpoint some improvements in the process of recruiting and evaluating performance. McLean & de Zárate, (2024) also include performance management and coaching as some of the areas of application. Wider *et al*., (2025) found that operational efficiency is the most crucial variable contributing to the adoption of AI in HRM in the Malaysian hotel industry. This change is also accompanied by a change in work modes; (Nicolás-Agustín *et al*., 2022) discovered that teleworking and teamwork are other practices that are a necessity in the digital transformation process. Sakka *et al*., (2022) also developed

an examination of the specific effect of online talent management systems on personnel recruiting.

By using digital tools, it is possible to transition to a data-oriented approach to talent management. An article by Alexandro, (2025) on Malaysian MSMEs and start-ups discovered that the application of HR Analytics and AI positively influenced the productivity of the workforce and the performance of the organization significantly. This underscores the need to have data-driven systems to achieve a competitive advantage. On the same note, McLean & de Zárate, (2024) found the use of analytic metrics to be an essential application area of digitalization in human resource development (HRD). Wider *et al*., (2025) also cited workforce planning as one of the most data-intensive functions of the hotel industry, with the Malaysian hotel industry having a high-priority dimension regarding the use of AI. Adoption of these tools also matters, (Prasad & De, 2024) discovered that the level of trust is related to the user perception of generative AI, including its usefulness, and the further the outcome of an organization.

The digital tools provide great opportunities to enhance employee development and engagement. A number of articles focus on personalized learning Antoniuk *et al*., (2025) and (Konovalova *et al*., 2022), both specify the way AI may develop individual training courses. Personalization, continuous learning, or development of soft skills are also among the applications listed by McLean & de Zárate, (2024) as well. As noted by Teresa & Fantinelli, (2025), digital gamification is used in talent procedures in Italian learning organizations. Digital technology training is also reported as one of the strategies of retaining older workers, particularly in situations where the training is perceived to be useful, as exhibited by Xie *et al*., (2023). In addition, technology promotes interaction. Jimoh & Kee, (2022) discovered that work engagement is an intermediate between talent development and task performance. Other researchers suggest that digital human resource policies, generative artificial intelligence, and workplace technology are capable of improving employee engagement, satisfaction, and experience. This emphasis on interaction and technology adjustment is also useful in establishing employee resilience.

Digital technologies are widely applied to promote talent acquisition and retention. Online talent management systems are depicted as having potential in the area of personnel recruiting, attraction, and retention. An effective talent acquisition strategy with the help of technology is essential to enhance the process of recruitment and

retention, which is one of the key concerns in the post-pandemic world. A study by Alexandro, (2025) particularly established that recruitment and retention through innovation as an aspect of digital HRM strategy has significant and positive effects on the performance of an organization. In artificial intelligence, it stands out as it has been observed that it is capable of streamlining recruitment. Retention is supported digitally, too. As an illustration, the intention to stay among the older workers can be facilitated by providing them with digital technology training. Overall, digitalization has been perceived to enhance employee satisfaction and employee retention as well as, creation of a digital learning culture is considered key in attracting and retaining the best talents. Attrition reduction is also a goal of digitalization in HRD, as named by McLean & de Zárate, (2024).

Digital integration, in particular AI, is associated with substantial ethical and human challenges. One of the issues is the bias of the algorithms. Both (Bastida *et al*., 2025) and (Antoniuk *et al*., 2025) point to the threats of bias in artificial intelligence-driven HR procedures, as well as such aspects as technostress and change resistance. Konovalova *et al*., (2022) specifically refer to the threat of dehumanisation of personnel management. On the other hand, such technologies can also provide prospects for the humanisation concept. According to (Konovalova *et al*., 2022), AI has the potential to minimize human bias when choosing personnel and address worker wellbeing. Bastida *et al*., 2025) is one of the research works that suggest mitigation strategies to reduce bias and enhance transparency in dealing with these complexities. It is also important to establish trust. According to (Prasad & De, 2024), the relationship between user perception of generative AI and organizational commitment has a mediation factor of trust. Another point is that digitization does not eliminate humans, as it is simply a technological aid.

The future proofing of talent management in the face of a changing labour market requires the use of digital tools. The changes that organizations encounter after the pandemic are significant, such as the change in the attitude to remote work, managing virtual teams, and the number of employees in the gig economy. Here, HR practices should be in line with the strategy to ensure digital transformation. The most important aspect of future-proofing is to create workforce resilience. According to research conducted by (Cahyadi *et al*., 2024), high-involvement HRM practices, coupled with the

technology-adaptability of employees, have a positive impact on the resiliency of employees in the post-COVID-19 period. This is in line with the perspective of digital HRM as a strategic resource to form dynamic capabilities and enable firms to innovate their human capital based on the ongoing digital transformation.

One of the major reasons that prompts the use of digital tools in talent management is the improvement of the overall organizational performance and efficiency. It has been demonstrated that online talent management systems are promising in enhancing the overall performance of the company. The research specifically associates the usage of HR analytics, AI, and generative AI with a substantial positive effect on workforce productivity and organizational performance. Digitalization is perceived to enhance the productivity of employees as well as assist in meeting organizational goals. The studies carried out by (Antoniuk *et al*., 2025) affirm the fact that the application of AI can improve the performance of HR practices within a company and aid in reducing operational risks. This is also reinforced by Wider *et al*., (2025), who state that operational efficiency had the top position on the list of factors that affected the adoption of AI in the Malaysian hotel business. Digitalization also plays a role through such applications as analysis and continuous improvement through robotics.

5 CONCLUSION

To sum up, to ease the shift toward being digital, organizations have to apply the concept of agile leadership and lifelong learning to overcome any technological changes. The application of AI and data analytics in HR practices increases recruitment and talent management processes, but their uneven usage remains. Paying attention to the well-being of staff and human-centered culture is a major talent retention factor. In order to remain competitive, businesses must synchronize the leadership, technology, and human capital and develop a learning-based environment, which will eventually promote a strong workforce that is capable of facing the challenges in the future.

With current technology, whereby data-driven processes have become the order of the day in improving efficiency and strategic decision-making for talent management process. Such innovations enhance recruiting, performance appraisals, and learning, which bring about continuous flexibility. Nevertheless, such ethical issues as data privacy

and algorithmic bias require a people-centered leadership style. With the increasing number of remote work and flexible employment options, there is a need to have sustainable talent management strategies. Balancing technology with ethical responsibility, lifelong learning, and sustainable practices will be the key to the future of HRD and the creation of dynamic and equitable organizations.

Companies also have to adopt a holistic strategy regarding digital transformation that cuts across technological adaptation. Leaders can integrate technology and human resources by developing a learning culture, inclusivity, and an ethical governance culture. This balance plays an essential role in overcoming the natural problems of the rapid change in technology, employee engagement, and making sure that innovation is taken responsibly. Finally, the combination of these factors will enable organizations to flourish in the environment of the emerging digital world of difficulties.

Digitization of human resource management not only improves efficiency in operation and strategic decision-making but also creates a dynamic and participative workforce. Even though AI and automation have enormous potential advantages, organizations should embrace these technologies with ethics to overcome possible prejudices and implications on humans. With an ever-changing HR position in the ever-flexible nature of the setting, the importance of balancing technology with listening leadership will be vital in developing resilient and sustainable organizational practices. The success of HR transformation initiatives will eventually be based on the ability to balance innovation with ethical standards.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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