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Challenges and Technology Trends in Implementing a Human Resource Management System: A Systematic Literature Review

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Abstract

Background: Human Resource Management System (HRMS) is an important aspect of managing organizations. However, the successful integration of the system into respective roles is often associated with diverse technological challenges and trends. Some major obstacles identified in recent research include reluctance to change, lack of training, fragmented Human Resource (HR) data, rigid processes, and continuous changes in organizational needs. Exciting technology trends offer promise for next-generation HRMS solutions, including artificial intelligence (AI), machine learning, predictive analytics, and mobile accessibility. This shows the need for a systematic literature review to comprehensively map the challenges and technology trends shaping the implementation of HRMS.
Objective: This research aimed to conduct a comprehensive review of existing literature to identify the main challenges faced during HRMS implementation and the latest technology trends in the space.
Methods: A systematic literature review was adopted through the Kitchenham method with a focus on five databases including Scopus, Emerald, IEEE, Science Direct, and ProQuest.
Results: The result was in the form of a table mapping of the challenges faced by each stakeholder in HRMS, including resistance to change, lack of management support, and limited technology infrastructure. Meanwhile, the most common technology challenges found were system integration issues, data security, and lack of technical capabilities or skills. The potential opportunities from technology trends to address the issues included training and skills development, enhanced cybersecurity, and effective change management methods. These recommendations were designed to support organizations in further optimizing HRMS utilization and leveraging the latest technologies such as AI and blockchain.
Conclusion: The review used a structured method to develop a rich overview through tabular presentations summarizing problem identification and technology trend compilation of HRMS. The systematic exploration aimed to contribute valuable insights into the complexities of HRMS implementation and offer a comprehensive perspective on the emergence of relevant technology trends. The results were expected to contribute to future research directions in this important area at the nexus of Human Resource Management (HRM) and technological innovation.

Keywords: Human Resource Management System, Challenges, Technology Trends, Systematic Literature Review

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I. INTRODUCTION

The wide scope of information and communication technology is causing several changes in different aspects of life for both individuals and organizations. An example of the changes experienced by individuals is the easy access to communication and information exchange in a short time [1]. Moreover, information and communication technology provide new opportunities for finding jobs, sharing important information, and accessing public services online. The changes identified in relation to organizations include the implementation of a more efficient and integrative management system called Human Resource Management System (HRMS). The aspects of overseeing the workforce, hiring and selecting personnel, training and development, benefits and pay, and employee relations ensure HRMS becomes an important part of any organization [2].

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HRMS refers to the software and technology used by organizations to manage employee data, simplify Human Resource (HR) processes, as well as ensure compliance with employment laws and regulations. This is necessary because every company needs to implement a system capable of assisting and facilitating all activities and interests related to employees. Industry 4.0 is expected to bring tremendous changes in different areas of quality management systems but most professionals are still unaware of the effect on working mechanisms [3]. Therefore, the implementation of HRMS in every organization with different conditions has led to several challenges, including adjustments to changes in the business environment and organizational structure [4], [5]. This requires high adaptability and flexibility from managers and employees. Some other challenges found in several previous research include managing large and complex HR data [6], [7], the complexity of decision-making [8], unsatisfactory system usage [9], technostress or technology adaption [7], [10], and more to be collected through this systematic literature review.

At the same time, exciting technology trends offer promise for next-generation HRMS solutions with organizations observed to be progressively using web-based platforms in the present technological environment to enhance productivity, collaboration, and correspondence. Some previous research also showed the adaptation of technology to HRM in an organization such as the application of artificial intelligence (AI) to strengthen management and development capabilities [11], [12], [13], [14]. Other examples include the use of data mining to identify patterns and trends in employee data to aid strategic decision-making [6], the configuration of electronic Human Resource Management (e-HRM) as part of the business digitalization strategy [10], the use of cloud computing for secure data archiving and management [15], as well as the implementation of Human Resource Information System (HRIS) to provide easy-to-use technology, ensures data security and provides communication tools [16].

The trend shows the need for a systematic literature review to comprehensively map the challenges and technology trends shaping the implementation of HRMS. This enabled the identification, evaluation, and synthesis of all relevant literature on the key issues and research gaps in HRMS implementation. Previous research conducted a literature review to capture the current state-of-the-art applications of AI in HRM [17]. Another also attempted to identify the most effective HRM practices to increase innovative work behavior (IWB), comprehend the underlying theoretical mechanisms, and identify moderators and mediators in the relationship between HRM practices and IWB [18]. Therefore, this research aimed to identify the challenges of implementing HRMS faced by organizations and provide recommendations on relevant technology trends to be adopted. The results are expected to contribute to future research directions in this important area at the nexus of HRM and technological innovation.

II. Literature Review

A. Implementation of Human Resource Management System (HRMS)

The implementation of HRMS in organizations has led to different challenges and successes. For example, [11] found that the implementation of Virtual Reality (VR) technology made 80% of employees very satisfied and led to higher participation rates in training compared to traditional methods. HRMS was also reported in [19], [20] to have been applied for the attendance, training, recruitment, recording contracts, and transfer of employees to other departments in an organization. The success was reported to be influenced by several factors, including resistance to change, technostress, lack of Information Technology (IT) expertise, data security, integration with other systems, cost, customization, and user adoption [10].

Another research [21] found that the integration of HR analytics into organizational processes facilitated data-driven decision-making in order to enhance the accuracy and efficacy of HRM. Furthermore, HRMS allowed the identification of trends and patterns in employee feedback which could be used to enhance satisfaction and retention [21]. The concept of gamification often applied to increase motivation in using a system was surprisingly found by [22] not to guarantee an enhancement in employee creativity. This is due to the possibility of the complexity associated with an organization or workplace to present certain challenges for the implementation of HRMS. The trend has led to the recent adoption of AI to improve employee performance and work engagement [23], [24] while others used cloud computing for large data management and storage in HRMS [25].

B. Technology trends in implementing HRMS

HRMS has experienced several changes with advancements in new technological innovations contributing to the efficiency and effectiveness of management. The major trends presently observed are AI and machine learning. For example, [14] combined AI with human assessment and expertise to generate algorithm recommendations capable of influencing top management decisions and assisting in ensuring a balance between humans and intelligent decision support systems. Another research [26] used AI to recruit and select quality employees, increase individual retention rates, and reduce the time required to replace employees. The innovation has also been used as a chatbot to assist in

providing employee support and analyzing data to predict workforce needs [23], [27]. The usage of AI was reported to have a positive influence on employee performance and work engagement in organizations [24]. Meanwhile, [23] discussed the concerns related to the replacement of human workers by AI, data security, and potential biases and discrimination in AI-driven decision-making.

Another important trend identified in HRMS implementation in addition to AI was cloud computing technology. The part of the benefits associated with cloud-based HRMS were greater flexibility and scalability, allowing organizations to manage employee data more effectively and securely [28]. According to [29], this innovation was used in payroll systems to provide significant benefits for companies, but proper feasibility research and attention to critical success factors were necessary for successful system implementation. Some critical factors influencing the success of HRMS implementation include senior management support, project team competence, inter-departmental cooperation, clear goals and objectives, project management, cross-sector communication, vendor support, careful software package selection, and reality simulation [29]. Furthermore, cloud-based technology also positively influenced employee talent management by assisting companies address challenges in successful talent acquisition [25]. The use of cloud computing is also considered beneficial in building HRMS due to its scalability, multi-platform access, resource virtualization, and on-demand service provision capabilities [30].

Mobile technology in HR applications is another important part of HRMS trends. This is due to the ability of mobile HRMS to enable employees to access HR information and services from mobile devices, enhancing accessibility and convenience [10], [31], [32]. This was particularly important in flexible work environments but [33] found a drawback which was the potential reduction in personal interaction opportunities between HR practitioners and employees. The technology trends in HRMS implementation generally include the use of AI, cloud computing, blockchain, and mobile technology which have improved operational efficiency and contribute to increased employee satisfaction and engagement with subsequent influence on the achievement of organizational strategic goals.

C. Related Research

Several previous research have been reviewed to examine HRMS and some discuss increasing innovation through effective HRM practices [18], strengthening management capabilities with AI [17], using data mining [34], and applying cloud computing technology [29], [35]. However, some limitations are identified and explained in Table I.

Adula M. et al. [18] provided valuable insights into the application of HRM to drive innovation in the workplace. Moreover, Qamar Y. et al. [17] studied technology renewal utilization and reported that AI had the potential to enhance the managerial and developmental capabilities of enterprises. Zhao M. et al. [29] and Maqueira Marín J. et al. [35] discussed the use of cloud computing on HR productivity while Jiang, Y. [34] evaluated the use of data mining in decision making.

TABLE 1
RELATED PREVIOUS RESEARCH

Reference	Objective	Limitation
Adula M. et al. [18]	Identify the most effective HRM practices for increasing IWB and understand the theoretical mechanisms underlying the relationship between HRM practices and IWB.	Focused only on HRM practices that improved IWB without covering other aspects of HRM.
Qamar Y. et al. [17]	Capture the state-of-the-art AI applications in HRM, including the strengthening of management capabilities and enterprise development.	Limited to the application of AI in HRM without covering other technologies.
Jiang, Y. [34]	Evaluate the use of data mining to identify patterns and trends in employee data to assist in HRM strategic decision-making.	Focused only on data mining in HRM without covering other data analysis methods.
Esangbedo M. et al. [12]	Identify challenges faced by organizations in implementing HRMS, including data security issues, system integration, and adaptation to technological change.	Did not explore possible solutions to overcome the challenges.
Zhao M. et al. [29]	Evaluate the feasibility of implementing a cloud-based HR payroll system and its impact on HR productivity.	Focused on cloud-based payroll systems without covering other aspects of cloud-based HRM.
Maqueira Marín J. et al. [35]	Classifies research on cloud computing in HRM into four groups, including the development of cloud platforms for HRM, the elasticity of human resources, adoption and implementation of cloud platforms for HRM, as well as the impact and implications of cloud platforms for HRM.	Only used scientific articles in two databases, thus possibly not capturing all relevant research.

III. METHODS

Systematic literature review (SLR) proposed by Kitchenham [36] and Kitchenham et al. [37] was used to conduct this research. It is also known as a systematic review and explained to be a methodological process that focuses on planning, implementing, and a complete synthesis of all relevant prior research relating to a particular concept, content knowledge, or phenomenon of implication [37]. Primary research is the individual investigations that contribute to a systematic review which is subsequently classified as secondary research. Both methods are quite similar but [37] provides more comprehensive information related to defining inclusion and exclusion criteria, research quality assessment, usage of tools, and a structured report. Moreover, the combination of both methods can provide more holistic and strong results as well as improve the quality, transparency, and validity of SLR. The details of each phase are explained in the following subsections.

A. Planning

The 2 stages in the planning section include the identification of the need for SLR and the development of a protocol review. At the identification stage, several reasons were explained to determine the purpose of SLR and these had been mentioned in the previous introduction section. The next was to compile a review protocol in the form of criteria and research questions. Therefore, the criteria were formed using Population, Intervention, Comparison, Outcomes, and Context (PICOC) formula as presented in Table II. The point of view results from PICOC formula were used to formulate research questions. Therefore, the questions designed are presented as follows:

RQ1: What are the challenges of implementing HRMS in an organization?

RQ2: What are the technology trends that can be implemented in HRMS of an organization?

TABLE I
PICOC FORMULA

Indicator	Description
Population	Employees both private and state
Intervention	Employee management system, employee management implementation, HRMS
Comparison	-
Outcomes	Lists of challenges and technology trends related to HRMS implementation
Context	HRMS web and mobile application

B. Implementation

The implementation section has 5 stages, including identification of research, selection, quality assessment, data extraction, and data synthesis. These stages are comprehensively explained in the following subsections.

1) Identification of Research

The stage focused on searching relevant articles from different databases such as Scopus, Science Direct, Emerald Insight, ProQuest, and IEEE Xplore. The search was conducted using specific Boolean strings considered appropriate and relevant to this research. The keywords used were ("challenges" OR "problems" OR "solution" OR "difficulty") AND ("employee management system" OR "human resource management system") with a limit on articles published in the last 5 years, starting from 2019-2023, including research and conference articles/proceedings articles. The inclusion and exclusion criteria applied are presented in Table III and Mendeley software is used to collect the results.

TABLE II
INCLUSION AND EXCLUSION CRITERIA

Steps	Inclusion Criteria	Exclusion Criteria
Initiation Phase	The article is written in English The article matches keywords or Boolean string searches Publication is in the last 5 years The type of article is research and conference journal	The article is not written in English Publication is not in the last 5 years
First phase: Selection of Title and abstract	Discuss the context of an employee management system, HRMS, or HRIS	Outside the context of employee management systems, HRMS, or HRIS Duplicate articles
Second phase: Selection of full-text	Discussing trends, challenges, or solutions when implementing technology in HRMS Accessible article	Does not discuss trends, challenges, or solutions when implementing technology in HRMS The article cannot be accessed

2) Selection

Several steps were conducted in this stage and each was required to fulfill the inclusion and exclusion criteria presented in Table II. The first step, initiation, which was focused on searching for articles according to specific

keywords produced 1283 articles from 5 databases. The second step, title and abstract selection, produced 220 articles and the last step, full-text selection, reduced the number to 71 as presented in Fig. 1.

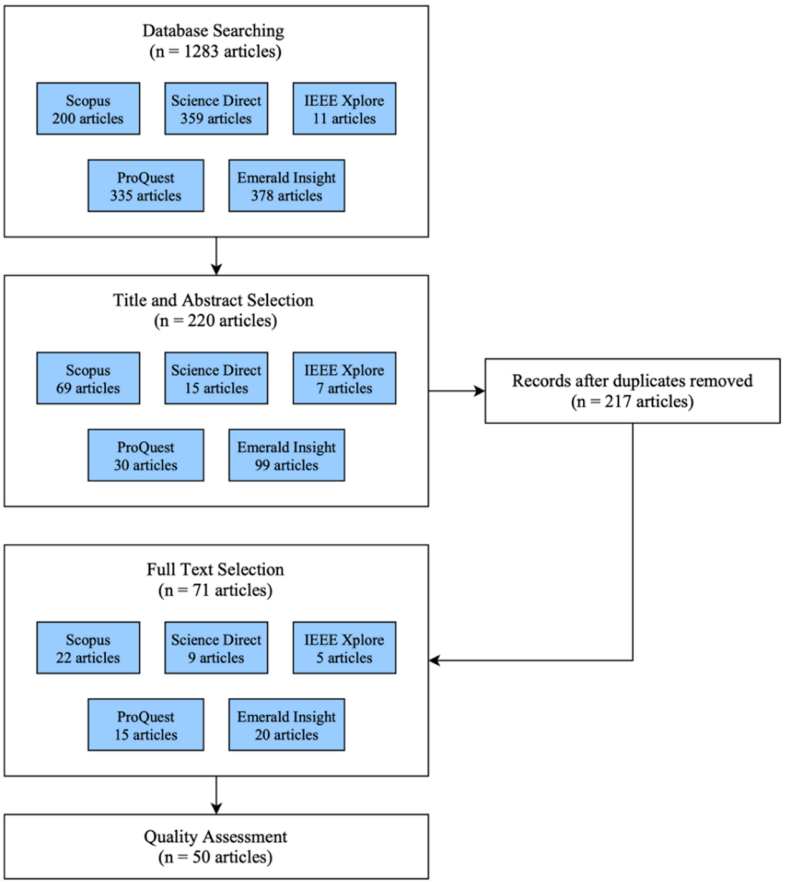

Fig. 1 Selection of Research Articles

3) Quality Assessment

The "quality" of the primary research was required to be assessed to provide more detailed inclusion and exclusion criteria [36]. At this stage, several questions were presented to be answered in the process of fulfilling the quality assessment of the selected articles [38]. The list of questions for assessment is presented in Table IV.

The “Yes” statement was set at 1, “No” was 0, Q1/Q2/Q3/Q4 was 1, and unindexed was worth 0. The result of the first question (QA1) showed that 83% of the articles provided a clear explanation of the research purpose in the abstract or introduction. In the second question (QA2), 92% provided a comprehensive discussion of the background, literature, and context of research, thereby strengthening the foundations. The third question (QA3) on the incorporation of previous research as a contribution to the inquiry showed that 73% satisfied the inclusion criteria. It was observed from the fourth question (QA4) that 87% of articles provided a detailed explanation of the methodology or proposed architecture used. Moreover, the results for the fifth and sixth questions (QA5 and QA6) were identical with 94% reported to have clarity and completeness of the results and ensured relevance to the questions proposed. The seventh question (QA7) evaluated the incorporation of recommendations for future research and 65% suggested improvement in the discussion or conclusion section. The final question (QA8) showed that 92% of the articles were indexed. All the results of the quality assessment are presented in Fig. 2.

The next stage was to evaluate the quality of the primary research using 3 ranking levels, including high, medium, and low [39]. The criterion was that a score higher than 7 represented high quality, 4-6 was considered medium standard, and lower than 4 was categorized as low standard. The results showed that 50 out of the 71 journals selected were of high quality, 17 were moderate, and 4 were low. Therefore, only 50 articles were considered to be qualified as the primary research to be used for SLR.

TABLE III
RESEARCH QUALITY ASSESSMENT

No	Questions	Answer
1	Does the article comprehensively explain the research objectives?	Yes / No
2	Does the article contain a literature review, research context, and background information?	Yes / No
3	Does the article mention relevant prior research to demonstrate the primary contribution?	Yes / No
4	Does the article define the proposed architecture or methodology?	Yes / No
5	Does the article contain results from research?	Yes / No
6	Are the results in the article relevant to the research problems?	Yes / No
7	Does the article propose any suggestions for future improvements or further work?	Yes / No
8	Scopus indexed	(Q1/Q2/Q3/Q4/unindexed)

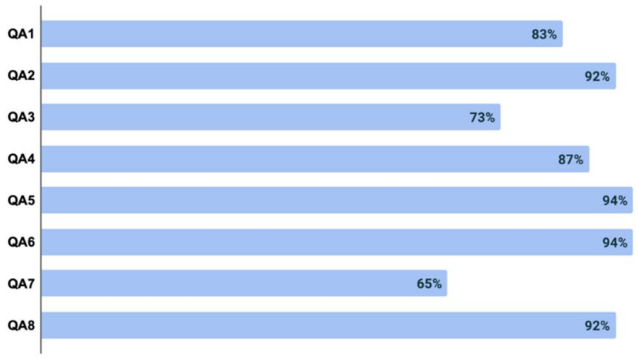

Fig. 2 Quality Assessment Result [38]

4) Data Extraction

The purpose of this stage was to design a data extraction form to accurately record the information obtained from the articles. This was expected to collect an exhaustive array of information based on the quality requirements and research objectives. The form designed is presented in Table V consisting of the data extracted and the description.

TABLE IV
DATA EXTRACTION FORM

Extracted Data	Description
Title	The name of the article
Author	Names of all authors
Scopus indexed	Quartile 1, Quartile 2, Quartile 3, Quartile 4
Main purpose	The objective of the article
Methodology	Research design and methods used in the article
Research result	Results of the article
Challenges of HRMS implementation	Answering the first research question (RQ1)
Technology trends in HRMS implementation	Answering the second research question (RQ2)

5) Data Synthesis

The next stage was the synthesis of the extracted data through manual meta-analysis in the form of table mapping. This was achieved by compiling and summarizing the results of the primary research included to provide quantitative, descriptive, or a combination of both. The results obtained from the stage were presented in the form of tables used to answer the research questions.

IV. RESULTS

A. RQ1: What are the challenges of implementing HRMS in an organization?

The literature review showed several challenges encountered by different stakeholders during the implementation of HRMS in organizations. The 8 key stakeholders identified to be significantly affected by the system are presented in Fig. 3.

Fig. 3 Stakeholders of HRMS

A total of 50 articles reviewed showed that each stakeholder had different problems during the implementation process. Therefore, the answers to RQ1 showed the challenges faced by each and the research references as shown in Table VI. The results showed that successful HRMS implementation required addressing both technological and organizational challenges. This was necessary due to the possibility of stakeholders at different levels in an organization encountering difficulties in adapting to and adopting new HRM platform. For example, managers and supervisors were frequently faced with problems relating to employee satisfaction and productivity [41], [42]. There were also some other challenges believed to be mostly experienced by regular employees [48], [60]. Another research showed that the issues in IT department could influence the general functionality and security of HRMS [43]. The problems in the legal and compliance department were associated with the adaptation to changes related to regulations and legal obligations [46], [47], [48]. On the finance department side, the focus was on the cost-effectiveness and financial management of HRMS [50], [51], [52]. Similar to the legal and compliance department, external consultants or vendors also encountered difficulties in adapting to the changing needs associated with the system [51], [53]. Meanwhile, the challenges identified in strategic roles such as director included the need to ensure HRMS was balanced with business objectives [16], [56]. Equally important were the issues faced by HR department with subsequent impact on the general success of HRMS implementation [57], [58]. The trend showed that each stakeholder was considered important in the process of overcoming the challenges associated with the integration of HRMS into an organization. Therefore, there is a need for collaboration to ensure the integration process is smooth and successful.

TABLE V
HRMS CHALLENGES

Stakeholder	HRMS Challenge	References
Managers/Supervisors	Balancing work demands and employee well-being	[17], [22]
	Motivating and engaging teams using HRMS	[40]
	Objectively evaluating employee performance	[41], [42]
IT Department	Managing data security and employee privacy	[43]
	Providing seamless integration between HRMS and other systems	[29], [40]
	Coping with rapid technological changes and the need for continuous innovation	[23], [33], [44]
Legal/Compliance Department	Ensuring system compliance with data privacy regulations	[45]
	Handling changes in labor regulations and ensuring compliance	[46], [47], [48]
Finance Department	Ensuring accuracy in payroll calculations and managing employee costs	[29]
	Budgeting according to HRM system needs	[43], [49]
	Measuring ROI from investments in HRMS	[50], [51], [52]
External Consultants/Vendors	Providing customizable solutions for each company's unique needs	[51], [53]
	Understanding internal company dynamics and specific needs	[7], [29], [54]
Strategic Position (Board of Directors)	Designing organization-wide strategies integrated with employee management	[40], [55]
	Assessing the impact of HRM systems on long-term business goals	[16], [56]
Human Resource Department	Increasing acceptance and usage of HRM systems in the organization	[57], [58]
	Building a positive work culture with technological assistance	[5], [13], [25]
	Formulating effective employee management policies	[9], [25]
Regular Employee	Adapting to changes introduced by HRM systems	[20], [59]
	Providing feedback on performance and personal needs	[48], [60]
	Fear of human worker replacement by AI	[23], [54]
	Understanding and using new features on HRM platform	[7]

B. RQ2: What are the technology trends that can be implemented in HRMS of an organization?

The technology trends identified were related to increased digitalization, the use of analytics, as well as a focus on security and privacy despite the challenges reported. This showed the need to orient the trends to the internal context and culture of each organization to ensure smooth adoption. Moreover, effective change management was shown to be important to the process of unlocking the full potential of HRMS as presented in the answers provided to RQ2 in Table VII on technology trends recommended to be adapted.

TABLE VI
TECHNOLOGY TRENDS OF HRMS

Trends in technology	Description	References
Virtual Reality and Artificial Intelligence	Integration of Intelligent Technology in Human Resource Management	[5], [8], [11], [13], [17], [25], [44]
Chatbot as Virtual Assistant	Providing prompt responses, collecting feedback, and automating tasks	[17], [27]
Utilization of Data for Decision-Making in HRM	Data Mining and Big Data Analysis in HRM	[6], [12], [14], [19], [52], [55], [57], [61]
	Business Intelligence	[49]
	HR Information Systems Evaluation	[14], [55]
	Impact of AI Decision Systems	[24]
	Internet of Things (IoT) Integration with HRM utilizes big data	[12], [19]
Digital Transformation, Cloud Computing, and Security in HRM	Cloud-based enterprise resource planning system	[5], [29]
	Security and privacy in HRM	[43]
	Intellectual Capital Management through Cloud Computing	[53]
	Cloud-Based Payroll Management System in ERP System	[29]
Blockchain Technology in HRM	Application of Technology in Recruitment and Talent Management	[48], [58], [60]
	Verify employee details in real-time	[62]
Development of Models and Algorithms for HRM	Fuzzy Control-Based Matching Models	[4], [10]
	Intelligent Decision Support Systems	[8]
	Application Analysis of Combining BP Neural Network and Logistic Regression in HRM System	[7]
Application of Technology in Specific Industry Sectors	HRM in Manufacturing Companies	[45]
	HRM in Military Environments	[7], [9]
	HRM in the Ministry of Sports and Youth	[63]
Time and Attendance Management	Face Recognition Technology GPS (Global Positioning System) Tracking	[20]
Develop and Train the Skills and Performances of Employees	Learning Management System	[48]
	Gamification game-design	[22]

New technologies such as AI, cloud computing, and blockchain offer promising opportunities to improve recruitment, training, performance evaluation, and other key HR activities. This shows the need to ensure the right balance between automation and HRM needs. For example, the integration of smart technologies such as AI and VR [5], [8], [11], [13], [17], [25], [44] can enhance training and development programs, improve recruitment processes, and provide better employee engagement tools. The use of chatbot [17], [27] can also automate routine tasks, provide quick responses, ensure feedback needed to increase the efficiency of HR operations, reduce response times, and improve the employee experience. Moreover, the use of data mining, big data analytics [6], [12], [14], [19], [52], [55], [57], [61] and business intelligence [49] can facilitate data-driven decision making, identify trends, and support strategic planning. To ensure secure data management, cloud-based [43] and blockchain [48], [58], [60] can be used. HR strategic planning can also be supported through the application of AI and machine learning [8]. The user-centric technology trends identified include the use of technologies such as facial recognition and GPS [20] for accurate attendance tracking, and the implementation of Learning Management System (LMS) [48]. Furthermore, gamification methods [22] are considered efficient in enhancing employee learning and development as well as improving engagement and performance.

V. DISCUSSION

A. RQ1: What are the challenges of implementing HRMS in an organization?

Several challenges are faced by key stakeholders during the implementation of HRMS in organization. These include the difficulty for managers and supervisors to balance work demands and employee well-being [22] as well as the generation and maintenance of team motivation and engagement in using HRMS [40]. Managers also have potential difficulties in objectively evaluating employee performance [41], [42].

IT department requires the consideration of some challenges during the implementation of HRMS and the management of data security and employee privacy is identified by [43] as the most important aspect. Research [29], [40] also reported the need to provide flexible integration between HRM and other systems. Moreover, in the face of rapid technological change and the need for continuous innovation, IT department needs to continuously adapt to maintain system quality [23], [33], [44].

The legal and compliance departments are faced with equally important challenges related to HRMS implementation. Research [45] identified that ensuring system compliance with data privacy regulations was part of the challenges to be continuously assessed. There is also the need to address changes in labor regulations and ensure proper compliance [46], [47], [48]. These challenges show that the legal and compliance departments have a complex role in the implementation of the system.

The finance department is required to ensure the success of HRMS and the important aspects to be focused on have been reported in several research. For example, [29] emphasized the importance of ensuring the accuracy of salary calculation and management of employee costs. [43], [49] further showed that the finance department was required to develop a budget under the needs of HRMS. The department is also responsible for measuring the ROI from the system to maintain healthy finances and meet the needs of the company [50], [51], [52].

External consultants and vendors are considered important in improving HRMS by offering customized solutions to the unique needs of each company [51], [53]. The experts are required to have an in-depth understanding of the internal dynamics and specific needs of companies to design and implement employee management strategies in line with organizational goals [29], [54], [64]. Moreover, the expertise is useful in developing effective and efficient HRMS, overcoming challenges, and fostering a positive work environment. The attention placed on the intricacies of internal dynamics associated with a company allows these consultants to ensure the solutions provided are relevant and adaptable to the evolving needs of the workforce. This collaborative method facilitates the establishment of a comprehensive HRMS that maximizes productivity, employee satisfaction, and overall organizational success.

Strategic leaders, particularly the board of directors, are responsible for designing organizational strategies to be integrated into the management of the people. Meanwhile, [40], [55] reported some challenges in assessing the long-term impact of HRMS on the overall business objectives of companies. In the face of dynamic external and internal organizational changes, strategic leaders need to develop strategies that meet current needs and are flexible to possible future changes.

HR department has the most massive role in increasing the adoption of HRMS in organization. For example, [57], [58] reported the efforts of the department in increasing HRMS adoption and others [5], [13], [25] showed the attempt made to develop a positive work culture through technology implementation. The development of effective employee management policies is another important focus [9], [25] in addition to the central role of the department in ensuring smooth and successful integration of HRMS across all levels of organization.

Regular employees are faced with several challenges due to the changes introduced by HRMS. Research [20], [59] identified the need to adapt to these changes and [48], [60] showed the importance of feedback on performance and personal needs. There are also concerns about the replacement of human workers by AI, a fear that has been discussed several times by some employees [23], [54]. Moreover, each employee has different capacities and resistance to using new features in HRM [7], [41]. This shows that regular employees, as the main object of HRMS, have a massive role in the successful implementation and need to have sufficient support and understanding of the changes.

B. RQ2: What are the technology trends that can be implemented in HRMS of an organization?

The leading trend in the world of HRMS is the shift from traditional practices to the latest technologies. The example observed to have been most massively developed is AI in HRMS [5], [8], [11], [13], [17], [25], [44], leading to several innovations such as VR [11]. Previous research showed that HRMS developed on VR technology increased employee happiness, restored training and learning efficiency, and reduced management costs [11]. Moreover, the role of chatbot as virtual assistant in HRwas reported to be significantly important in providing timely responses to questions, collecting valuable feedback from employees, and automating routine tasks, leading to the streamlining of HR processes [27].

Data-driven decisions are becoming a dominant subject in HR due to the implementation of some relevant innovations such as data mining, big data analysis, business intelligence, and HRIS evaluation [6], [12], [14], [19], [24], [49], [52], [55], [57], [61]. This trend shows the transformational power of data in guiding strategic HR decisions, as well as improving the overall efficiency and effectiveness of relevant practices. The digital transformation in HR continuously being used as performance support for data-driven systems is closely related to cloud computing and the technology often implemented by large companies is cloud-based enterprise resource planning systems or cloud-based ERP systems [5], [29], [43], [53]. This shift towards cloud solutions ensures flexibility and scalability, addresses the important aspects of security and privacy, as well as certainly protects sensitive information.

Blockchain technology is entering HRMS world with some significant adoptions, specifically in employee recruitment and talent management [48], [58], [60], [62]. It also has the power to ensure real-time verification of detailed employee information for direct and transparent verification purposes. Moreover, the enhanced reliability in HRM is related to the decentralized structure of blockchain that reduces the risk of data manipulation or fraud. The implementation of this technology has led to significant progress in the development of models and algorithms [4], [7], [8], [10]. An outstanding innovation is the fuzzy control-based matching model which uses AI to match employee characteristics with the needs of a particular job or project. This system can work more accurately and efficiently in assessing employee potential and providing recommendations that are more in line with organizational needs.

Beyond general technology trends, certain industry sectors are developing specialized applications of HR technology [7], [9], [45], [63]. These are observed in manufacturing companies, military environments, or even the Ministry of Sports and Youth, where technology is strategically applied to address different HR challenges. Advanced time and attendance management systems in the form of technologies such as facial recognition and GPS tracking have also become an integral component of modern HR in these sectors [20]. Finally, the role of technology in developing and training employee skills is emphasized through the implementation of LMS and the integration of gamification in HR [22], [48]. These initiatives reflect a holistic method of nurturing the growth of employees in the digital age.

C. Recommendations

HRMS can be implemented differently in each organization due to several factors, including organization size, available resources, special requirements, technology infrastructure, culture, and habits [65]. The technology trends identified as solutions are also probably not universally applicable to the problems observed during the implementation of HRMS. However, the trends are capable of providing insight for each organization to select and adopt the best technology considered suitable. As a case in point, organization experiencing difficulties in managing data security and employee privacy [43] can use blockchain solutions [48], [58], [62] to provide an immutable and encrypted record, thereby guaranteeing the security and transparency of the data. Organization experiencing the problems of integrating HRMS into other systems [29], [40] such as financial and project management needs Application Programming Interfaces (APIs) and middleware solutions [53]. This is due to the ability of APIs to facilitate the communication and exchange of data between disparate systems as well as the capacity of middleware to connect different applications and services without any issues.

The implementation of HRMS to manage large amounts of data can be improved by data mining and big data analytics [6], [12], [14], [19], [52], [55], [57], [61], IoT [12], [19] and cloud computing [29] in order to provide flexible and scalable infrastructure for data storage and processing. Moreover, the difficulty in monitoring employee performance and providing timely feedback [48], [60] are capable of being addressed by using AI and machine learning tools [17], [27] to provide real-time performance analysis and personalized feedback. AI is also capable of supporting collaboration in building a positive work culture [5], [8], [11], [13], [17], [25], [44]. The design of business strategies was reported to be a significant challenge in the implementation of HRMS [40], [55]. This could be addressed by integrating business intelligence (BI) [49] and predictive analysis [7] to provide data-driven insights needed to support strategic decision-making processes.

The major challenges identified during the implementation were the lack of motivation and team participation in using the platform [40] as well as the absence of skill and knowledge to use the new technology [7]. These problems can be overcome with gamification concepts [22] and learning management systems [48]. The concept of gamification is efficient in enhancing the motivation of each worker by incorporating game elements such as rewards and badges. Meanwhile, the learning management system has the ability to facilitate the development of the skills needed by employees effectively.

D. Limitations

This research identified some challenges in HRMS implementation and technology trends relevant to HRM field. However, there was no direct mapping of the technology trends as solutions or ways to overcome the challenges found. The exclusion and inclusion criteria were also focused on limiting the database sources to 5, articles published between 2019 – 2023, and only in the English language which could exempt relevant research due to access or language limitations. The method used to assess the quality of research can also be subject to bias. This shows the need for future research to adopt a more comprehensive and inclusive method to address the limitations identified.

VI. CONCLUSIONS

In conclusion, HRMS implementation in organization was found to be associated with complex challenges such as balancing work demands and employee well-being, performance evaluation, data security, and regulatory changes.

This showed the need for active handling methods by all relevant parties, specifically key stakeholders, to achieve a successful implementation. Some of the factors identified included collaboration and effective communication between stakeholders to ensure positive and sustainable changes. Moreover, technology trends such as VR, AI, cloud computing, and blockchain provided significant opportunities to improve the quality of employee management. The integration of these technologies allowed organizations to optimize decision-making related to employee management by utilizing more accurate data and comprehensive data processing methods. This research could be used as practical implications in achieving successful HRMS implementation in the future through a holistic method including all stakeholders, as well as awareness of the dynamics and uniqueness of each sector. Furthermore, technology integration in HRM could provide optimal benefits in line with the demands of the present digital era.

Future research is required to map solutions as either technology or non-technology to overcome challenges in HRM field comprehensively. The organizational change factors influencing the adoption of HRMS also need to be explored. Moreover, the continuous and rapid evolution of technology shows the need for research to track the innovations capable of providing the most impact on HRM and methods of integration into existing systems and workflows.

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