

Smart Human Resource Management: Theoretical Issues and Practical Applications

Renata Jezkova, NEWTON University, Technicka 2998/19, 612 00 Brno, Czech Republic

Abstract

The rapid digital transformation of organizations has redefined the role of human resources, positioning technology as a strategic enabler of efficiency and competitiveness. This paper explores the theoretical foundations and practical implementations of Smart Human Resource Management (Smart HRM), which integrates artificial intelligence (AI), automation, and data analytics into HR processes.

The main objective of this study is to analyse how Smart HRM principles enhance organizational performance by transforming traditional HR practices into data-driven, technology-enabled systems that support strategic decision-making and workforce sustainability.

A qualitative research approach was employed, combining social network analysis with an extensive review of literature and case studies from international corporations (IBM, Workday, Communicorp UK) and Central European organizations (Smart Solutions, Accace, PwC Slovakia).

The study demonstrates that Smart HRM increases operational efficiency, reduces administrative workload, and enhances employee engagement and retention through AI-based automation and predictive analytics. Implementation examples show significant productivity gains and cost savings.

Smart HRM transforms HR from an administrative function into a strategic, data-informed business partner. While its benefits are substantial, ethical use of AI and responsible workforce adaptation remain critical for long-term success.

Keywords: Smart HRM, Artificial Intelligence, Digital Transformation, HR Analytics, Workforce Sustainability, Case Studies.

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*Corresponding author. Email: renata.jezkova@newton.university

1. Introduction

The importance of human resources for any company is irreplaceable. Human resources (or better to say „human capital“) is one of the greatest assets which enables achieving organizational goals and objectives. Human resource management affects the overall productivity of the organization. „Smart human resource management system can maximize the productivity of an organizational environment using machine learning and blockchain technologies. [1] It reduces human judgement, time in the candidate selection process and predicts employee performance and attraction to motivate current employers to maximize productivity with minimal financial loss in the workplace environment. [63], [38] The aim of the SMART approach in HRM is to improve internal processes and

achieve company goals more effectively. They include strategic planning, data-driven decision making, measurability of goals and results, effective use of technology, flexibility and adaptability, talent development and workforce sustainability, fostering corporate culture and engagement, proactive approach to change management, sustainability and accountability. These smart HRM principles enable HR departments to act as a strategic partner in companies and thus contribute to their success through the management and development of human capital.

The transfer of HR functions to the electronic environment facilitate the work of HR employees and increases the efficiency of their applications, as well as ensuring the active participation of employees in applications, thus increasing employee satisfaction.

2. Evolution of SMART concept in HRM

The concept of human resource management (HRM) was first used by a famous economist, Springer (1817). [45] It is accepted that the integration of the concept as content is realized with the ideas put forward by Taylor (1895) in the field of management. Taylor (1895) made some researches due to the establishment of very large production enterprises as a result of the industrial revolution, the replacement of manual production by machine power, and the emergence of rapid growth with mechanization. This Scientific Management Approach is also known as Taylorism. [45] This approach aimed to find solutions to the management problems experienced in practice and to increase efficiency. While these techniques help increase production, they ignored the human factor, especially job satisfaction. Taylorism sees man as a machine. The First World War also affected the development process of HRM. The search for efficiency during the war has been influential on the development of HRM. In parallel with these personnel management units were established in organizations in the 1920s, first in England and then in America. [9] In the years after the Second World War, records regarding the personnel at the lowest level of the organization began to be kept in personnel management, and a structure that performed routine tasks such as filing, data storage, and payroll emerged. In the 1960s, the issues of union and collective bargaining began to come to the fore in personnel management. Institutionalization on these issues has increased. Lower-level personnel managers have made an effort to solve the daily problems of the organizational personnel. In addition, towards the end of the 1960s, HRM was used for the first time in textbooks. The need for a deeper term on human-related issues in organizations have led to the emergence of the concept of HRM. HRM has emerged as a part of a long-term business system that combines the expectations of employees-managers and is based on employee engagement. In HRM, human was not seen as a cost element. The 1980s recruitment and selection, training and development, performance assessment, career management, salary management were accepted as function of HRM. In addition, the understanding of effective and efficient use of personnel has emerged, and the employee has begun to show great interest. All these developments have made the employee a value of production. [82] In the last decades there have been significant changes in human resource management. Dynamic changes and in AI and digital technologies and advances in coverage have allowed HRM tasks to enter the AI landscape. AI also helped to reveal universal mobile activities within international HR and to strengthen personnel communication. Technology-focused HRM activities support the creation of more effective HR tasks in businesses. AI systems can interpret data quickly and accurately. In HRM, AI technologies alleviate the workload of managers and employees in business, identify suitable employees for the job and support them to develop their skills.

Next, we examine the relationship between the evolution of technology and the field of HR. Here is the visual representation of the Smart Human Resource Management (Smart HRM) Framework. The graph illustrates the evolution from Traditional HRM (low digitalization and automation) to Digitized HRM (moderate digitalization) and finally to Smart HRM (high automation and efficiency). Each HR function - recruitment, training, performance management, employee engagement, and retention moves up this scale as organizations adopt more technology, leading to higher efficiency, better decision-making, and improved employee experience.

The numbers on the Y-axis indicate:

1. *Traditional HRM* (low digitalization and automation, low efficiency) based on manual, paper-based processes, basic data entry without analytics, face-to-face or phone-based recruitment and standardized and non-personalized training, manual hiring and evaluations and generic training programs.
2. *Emerging digital HRM* (basic digital tools introduced) characterised by spreadsheets and basic HR software for tracking employees, online job postings but still manual hiring decisions and e-learning platforms for generic training modules.
3. *Digitized HRM* (moderate automation and analytics, growing efficiency) using HR software for performance tracking, automated reports, standardized e-learning modules, learning management systems (e.g. LMS, ATS) for employee training and digital performance reviews and feedback tools.
4. *AI-driven HRM* (high automation and advanced analytics) with AI-based recruitment & predictive hiring, personalized career development plans using data analytics, chatbots for employee support and employee engagement tracked via smart tools.
5. *Smart HRM* (high digitalization, high efficiency, fully integrated AI and data-driven HRM) using AI-driven decision-making in hiring, training and retention, personalized employee development using big data, real-time feedback and engagement monitoring, fully automated HR workflows (e.g., onboarding, compliance, chatbots, virtual HR assistants) and predictive HR analytics for workforce planning.

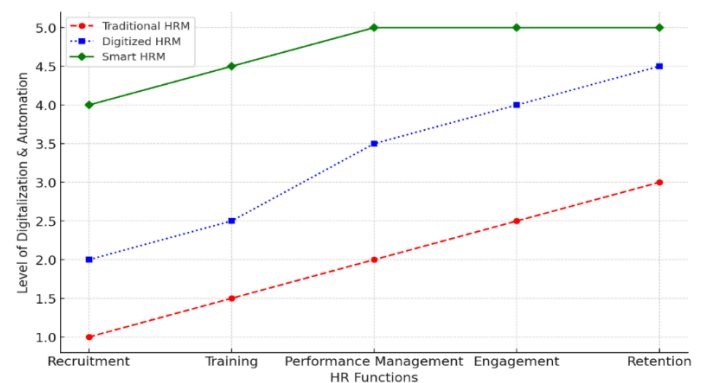


Figure 1. Evolution of Smart HRM: From Traditional to Smart HRM

3. Principles of SMART HRM and their practical applications

In order to operate effectively and "SMART", the human resources department (HRM) should implement strategies and processes that are specific, measurable, achievable, relevant and time-bound. By implementing these steps, the HR department is able to work effectively and strategically and make a significant contribution to the achievement of the business goals of the company. The principles of "Smart HRM" are an approach to human resource management that is based on effective, strategic and data-driven talent management in the enterprise. This approach helps HR departments not only improve internal processes, but also contribute to the achievement of the organization's goals. [31] [32] These Smart HRM principles enable the HR department to act as a strategic partner to the business and contribute to its success through the management and development of human capital.

Examples of "Smart HRM" are most often seen in modern companies and corporations that use a data-driven and technologically advanced approach to human resource management. The transfer of HR functions to the electronic environment facilitates the work of HR employees and increases the efficiency of their applications, as well as insuring the active participation of employees in applications, thus increasing employee satisfaction. [12], [35] With the emergence of AI and digital technologies, e-HRM and its functions have been replaced by these tools. These tools also opened the door to transformation in HRM. Here are some of the areas and examples where Smart HRM is most commonly implemented:

Recruitment and selection of employees. In electronic recruitment, employees are recruited online. [38] Most organizations incorporate electronic recruitment technologies through recruitment sites of HR pages on corporate websites. Procedures, such as job interviews and application evaluation can be carried out online. After the applications of the candidates are submitted, it is time for the candidates to be eliminated manually or by searching for keywords. After elimination of candidates, the remaining candidates will be considered. Online tests are conducted to assess basic skills. Evaluation are made through face-to-face interviews. As for electronic ones, after the candidates are evaluated and re-screened, the remaining references are checked. After the reference check, job offers are made to candidates. Packages with tools that automatically generate letters sent electronically to offer a job and track respondents are used in electronic recruitment. [54] Smart HRM in recruitment means using AI and analytics tools to predict candidate success. Modern companies use tools that analyse resumes, simulate job tasks or use psychometric tests. AI filters job applicants according to criteria predetermined by HR managers and

creates candidate lists. In video interviews, candidates' tones, behaviours and reactions are examined, information is collected and a conclusion is reached. It can also make some evaluations about the character of the candidate. [51]

Performance reviews and feedback. Electronic performance management (e-performance management) can be expressed as the use of electronic tools such as audio, video and computer systems to collect, store, analyse and report employee performance data. [57], [70] In the e-performance evaluation system, performance data can be accessed from the computer or from the database in the organization. Accessed information is presented to users on the screen. Individuals can access the evaluation results online whenever they want, and the database with performance data can be constantly updated. [10] E-HRM allows performance evaluation to be done online. Managers and employees can submit performance evaluation data to the HR department with online forms. These systems are often supported by technology and data that provide objective performance metrics. [58] As for AI technologies, they are an effective resource for evaluating performance. It scans the employee in a short time and evaluates their performance objectively. Thanks to advanced software and data analytics, AI can evaluate and analyse employee performance on advanced software and data analytics, AI can evaluate and analyse employee performance on a daily basis.

Talent management and career development. Talent development is a process that enables a company's employees to demonstrate their potential, pursue a satisfying career path, and assist the company's development. It is extremely important for companies since it brings operational success. Thanks to electronic career (e-career) management the organization and employees can communicate with each other online via e-mail and video meeting. Organizations can provide e-career counselling to their employees via the institution's website. AI technologies also help employees their skills. AI supported talent development platforms identify the skills that the company and its employees will need in the future, and help innovative changes occur. [18] These platforms make sense of data to reveal the qualities that the company and its employees will need in the future. They also identify high-potential talent and create personalized career paths. They use technology to track employee development needs and design individual learning plans that support long-term career growth.

Training and development. Electronic learning, has transformed learning into distance and electronic form with the development of television and communication technologies. E-learning can be seen as an innovative approach that uses a variety of smart technological resources and features along with other forms of learning materials that are open and flexible to provide a well-designed, interactive and facilitated learning environment. [48] E-learning is a learning that takes place predominantly using computers. This process in organizations takes place online and offline. [65] E-learning offers advantages such

as providing continuous training to all employees of organizations, updating the content of training when necessary, and providing employees with the opportunity to control their learning process more. [21] AI systems can deliver trainings effectively due to ever-changing agenda. With AI training platforms the training needs of the employee are determined and personalized trainings are offered to them. Also feedback is given very quickly to determine whether the training is effective or not. It can better be seen whether or not the staff has improved.

Automation of administrative processes. Electronic payroll system (e-payroll) is an approach that express the organization's collection, storage, processing, analysis, use and distribution of data and information regarding charging over networks. [23] With e-payroll managers can effectively design, manage and report salary programs using web-based software tools. By using the Internet and web browsers, employees can access salary software, databases and analytical tools electronically from anywhere. A report can be prepared on the distribution of salaries according to degree, age and length of service. Differences between employees can be calculated, salary negotiations managed, and interview funds prepared. This frees up HR team time for strategic tasks. Changes in tasks with the effectiveness of AI technologies have also affected payroll systems. AI quickly removed all paper-related office work. It has ensured that payroll transactions and salary calculations are followed on a regular basis. Organization should also establish an order to perform these functions by using AI technologies.

These examples show how Smart HRM can improve all key areas of human resource management, leading to more efficient business operations, higher employee satisfaction and overall company competitiveness.

3.1 Good Smart HRM Practices

The smart human resource management practices from companies in Europe and USA, where they successfully applied smart HRM, share several common themes:

Use of AI and automation in HR processes. Data-driven HR decision-making. This tools allows HR professionals to focus more on strategic decision making and less on administrative tasks. Data analytics is widely used for decision-making in recruitment, performance management, and retention. A study from the International Journal of Research and Review (2024) shows that AI/ML can predict fluctuations, personalize career development, and intervene with "at-risk" employees. It also includes ethical and privacy aspects of use. [13] Another paper [49] states that a finely/tuned GPT-3.5 model can predict employee turnover with high accuracy (F1-score 0.92), surpassing traditional ML methods.

Workday, a US company, specializing in human resource and financial management, has integrated advanced AI-driven tools – four AI agents – Recruiter, Expenses, Succession, and Workday Optimize into its HR processes in September 2024, as part of the Workday

Illumination platform, aimed at automating HR and finance and increasing productivity. These agents accelerate routine tasks and allow users to focus on strategic work. The Recruiter Agent automates the creation of job descriptions, candidate sourcing, and interview scheduling, leading to a 25% increase in recruiter capacity. Generative AI speeds up content creation, such as job descriptions, contracts, and internal documents' provides real-time assistance' orchestrates complex business processes across HR and finance (auto-filling, anomaly detection). [14] In May 2025, Workday introduced a new generation of Illuminate Agents, which further accelerate recruitment and improve the experience of workers in frontline positions through a responsible approach to AI. The company integrates AI to provide HR teams with actionable insights for better talent management. In March 2025, the integration of the Recruiting Agent with Randstad's talent network began; the technology increased recruitment capacity by 54% in 2024. Workday repeatedly emphasizes that AI is a supportive tool, not a replacement for human decision-making; final decisions remain in human hands. [16], [22], [56], [59], [74], [79], [80], [81].

IBM, a US company, has been a pioneer in integrating AI into its HR practices. IBM offers Watsonx and other agentic AI that automate routine tasks, provide predictive analytics for recruitment, employee retention, and talent management, and support strategic decision-making. [26], [37], [43], IBM's AI systems predict employees at risk of leaving with up to 95% accuracy; as a result, the company saved up to \$300 million in retention costs and employee engagement increased by 20%. The company cut turnover by 30% using smart predictions. [19], [26], [72]. This data-driven approach allows IBM to make informed decisions that align with both employee needs and organizational goals. [40], [42] According to the Talent Management Institute (February 2025), IBM has shifted „from transactions to transformations“, utilizing AI for personalized learning, career guidance, mentoring programs, chat assistants, well-being, and inclusion. [55] On May 2025 Forbes reports that AI has taken over 94% of routine HR tasks at IBM, leading to the replacement of hundreds of workers. [40], [55], [73].

Communicorp, a UK company, provides its clients with a full range of marketing services with a focus on delivering a strong ROI. The company has significantly reduced its administrative workload by implementing an AI-powered payroll platform from Employment Hero by its Director of People at Communicorp, Grace Orr. Previously, payroll would consume one to two days each month, but now it takes just an hour. This AI system also enhances other HR functions like hiring, onboarding, and employee check-ins, leading to improved consistency, structure and engagement. AI allows HR professionals to focus on deeper, more impactful tasks rather than logistical ones. Despite initial concerns about AI's biases and potential job displacement, the company emphasizes clear communication, training, and senior leadership engagement to foster acceptance and maximize the technology's benefits. The successful AI implementation

has led to positive feedback and a more efficient HR department, gearing up to use AI even further in recruitment processes. Orr plans to utilize Employment Hero's features for talent matching in recruitment in 2025. [20], [47], [64].

Employee well-being and support. Flexibility and hybrid work models. Companies prioritize employee well-being, mental health, and work-life balance to increase satisfaction and productivity. Flexible work arrangements (hybrid, remote, flexible schedules) are becoming a standard HR strategy to improve job satisfaction and attract top talent. Google, a US company, has implemented extensive comprehensive Employee Assistance Programs (EAPs) for mental health and well-being that provide free access to therapists and proactive outreach initiatives encouraging employees to seek help when needed. These programs are particularly effective in high-stress industries such as finance, healthcare, and IT, where the risk of burnout and absenteeism is elevated. Google and many U.S. tech companies offer hybrid or remote work opportunities. [33] European Commission has introduced a new human resource strategy aimed at creating an inclusive, sustainable, and flexible work environment with family-friendly working conditions. [17], [25]. This strategy focuses on talent management, simplifying appraisal processes and supporting management in cases of underperformance. By defining approaches to identify and reward talent early through performance data and reviewing appraisal reports, the Commission aims to reward excellence and promote job satisfaction among its staff by supporting remote work and flexible schedules. [27]

Focus on employee engagement and retention. Employee retention is a key focus, with companies using personalized HR approaches to keep employees satisfied and motivated. Google prioritizes engagement through wellness programs and employee perks. Communicorp UK improved engagement through structured HR processes and AI-enhanced onboarding. IBM uses predictive analytics to reduce employee turnover and improve retention. [20], [42], [69]

In the Czech Republic and Slovakia, organizations have been progressively adopting smart Human Resource Management practices to enhance efficiency and align with modern workforce demands. These practices reflect a broader commitment in both countries to modernize HRM, emphasizing strategic alignment, efficient resource utilization, and the development of human capital to drive organizational success. Notable trends and practices include:

Adoption of the HR Business Partner (HRBP) Model. Organizations in both countries are increasingly implementing the HRBP model, which emphasizes strategic partnership between HR and business units. This model focuses on aligning HR functions with organizational goals, supporting change management, and enhancing employee engagement. [75], [76] The shift towards this model reflects a move from traditional

administrative roles to more strategic contributions within organizations. [62] The study “Designing HR Organizational Structured in terms of the HR Business Partner Model Principles from the Perspective of Czech Organizations” by Stříteský & Quigley published in the Central European Business Review in 2014 [71], explores the transformation of HR structures in Czech companies according to the HRBP model. The study combines both quantitative and qualitative data (n = 97 organizations) and shows benefits – higher quality HR services, strategic involvement in corporate strategy, efficiency, standardization, more strategic contribution, and support for line managers. It also includes a case study of a company from the chemical industry and an analysis of cost-effectiveness per FTE concerning the HRBP model. Another study [78] points to empirical benefits of the HR BP model in connecting HR to strategy and increasing the return on investment in human capital. A 2021 study by Hronová [41] in the MDI journal “Economies” presents a model for analysing and auditing sustainable HRM practices and their reporting (e.g., according to GRI standards). It proposes a harmonized tool for academics and practitioners to increase employee motivation, employer branding, and responsible workforce management.

Strategic vs. operational HR focus. The Smerek (2020) study compares HR processes in the Czech Republic and Slovakia. [68] The research indicates a divergence in HR practices between the two countries: In the Czech Republic companies tend to focus more on strategic HR processes, such as strategy creation, workforce planning, job analysis, employee adaptation, and talent management. This strategic orientation aims to align HR initiatives with long-term organizational objectives. In Slovakia organizations are more engaged in operational HR activities, including recruitment, termination processes, and personnel administration. This approach addresses immediate HR needs and day-to-day operations. The difference is supported by statistical analysis from more than 1,500 companies. These differences highlight varying priorities in HRM approaches within the two countries. [68]

Expansion of HR Department. Over the past decade, Slovak organizations have been expanding their HR departments, indicating a growing recognition of the importance of dedicated HR functions. This trend suggests an increased investment in human capital and a commitment to more structured HR practices. [44]

Utilization of HR outsourcing services. In the Czech Republic, companies like Smart Solutions offer comprehensive HR services, including recruitment, outstaffing, and personnel outsourcing. These services enable organizations to manage HR functions more efficiently, allowing them to focus on core business activities while leveraging external expertise for HR management. Smart Solutions is a leading provider of HR outsourcing in the Czech Republic since 2009, offering comprehensive services in recruitment, outstaffing, and personnel outsourcing. It is listed among the 5,000 fastest-

growing companies in Europe, with more than 300 experts and serves clients in Central and Eastern Europe. [67] By leveraging advanced HR technologies and methodologies, they streamline the hiring process, manage workforce deployment efficiently, and handle personnel management tasks effectively. Their approach allows client companies to focus on core business activities while ensuring that HR functions are managed proficiently. [67]

Accace is a prominent provider of comprehensive end-to-end payroll and HR services in Slovakia. [5] They utilize advanced payroll systems and HR administration tools to ensure compliance, security, and efficiency. Their services include data collection, payroll processing, payroll calculation, benefits administration, payslip distribution, statutory reporting, onboarding, management reporting, and legal advice according to Slovak legislation. [8] By integrating technology into their HR processes, Accace optimizes business operations for their clients. [2], [7] A cloud platform is used for oversight and control of HR processes. Accace operates a modern cloud payroll & HR platform that centralizes routine administration (onboarding, absences, documentation, performance evaluation) and replaces manual administration with intelligent workflows. [3] [4] As for giving legal advice according to Slovak legislation, except for others, it published the article „How to implement pay transparency in Slovakia in practice“ [6] discusses EU Directive 2023/970 on pay transparency and its impacts on Slovak employees. It contains practical steps for job advertising, uncovering salary ranges, and setting fair HR policies. The company has a network of over 800 experts, serves around 2,000 clients in more than 60 locations, and processes up to 800,000 pay slips monthly. [2], [7]

PwC Slovakia offers an HR Academy program designed to enhance HR knowledge and skills by teaching and applying the latest trends in HR management. This program focuses on developing strategic HR capabilities, understanding modern HR tools, and implementing best practices in talent management. By investing in HR education, organizations can foster a more knowledgeable and effective HR department. [61]

4. Conclusion

Today, innovative technologies such as AI are dynamically reinventing the HRM environment on a global scale. With the accelerated development and broad application of AI and other breakthrough technologies, the automation of administrative components of HRM activities and tasks is intensifying. Contemporary developments increasingly offer alternatives to human resources in functions that traditionally require human interaction and communication. Thus, both organizational structures and the nature of work are changing. For example, humanoid service robots and AI bots are attracting industry attention. These smart „assets“ can revolutionize traditional human resource functions, provide increased powers and potentials for HRM, as well as introduce business-specific

challenges. At the same time, these smart technologies are especially beneficial for business operating across borders, as they can promote more efficient coordination and collaboration. [15]

AI and digital technologies have enabled significant transformations in the way people work and thus in organizational forms, routines and functions. These technologies not only bring a new lexicon to the HRM discourse, but are also changing the HRM profession. Especially AI applications can provide a significant benefit in HRM for educational purposes since AI can provide a high degree of interaction with employees and improve learning opportunities. At the same time, AI is an important tool in developing employee skills and delivering good performance while interacting in strategic and negotiation environments. These technologies allow HR employees to background check job applications and develop compensation packages for certain positions. They are less biased and more objective than humans. AI can predict possible behaviours in terms of job suitability and performance. [46] The successful HR strategies in both Europe and the U.S. revolve around AI-driven efficiency, employee well-being, data-based decision-making, flexibility, and engagement-focused retention strategies. The companies that implement these successfully create a competitive advantage in talent management and workforce productivity.

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