Smart Recruitment for Workers with Disability: A Systematic Literature Review

Farhan Shahzad¹, Luisa Varriale²* and Marco De Marco³

¹Department of Business and Economics, University of Naples Parthenope, Naples, Italy
²Department of Economics, Law, Cybersecurity and Sports Sciences, University of Naples Parthenope, Naples, Italy
³Department of Economics, Università Telematica Internazionale Uninettuno, Rome, Italy.

Abstract. This paper aims to investigate the role and function of digital and smart technologies, including AI applications, within organizations in making them much more inclusive for people with disability (PWD) at the workplace starting from the recruitment process. Specifically, this conceptual study provides an in-depth analysis of smart recruitment process for creating work environments much more inclusive and sustainable for PWD. In the last three decades, also because of the COVID-19 pandemic, the digital transformation, largely adopting digital and smart technologies, has significantly, both positively and negatively, affected any field and industry in the private and professional life. Indeed, our ways of working and quality of life have been improved by digital and smart technologies which are able to overcome geographical, physical, and social barriers. Likewise, some negative effects are related to this phenomenon, such as digital divide especially for some categories of people, like those with disabilities or special needs. This conceptual paper provides a systematic literature review; indeed, the phenomenon of smart recruitment is investigated providing an overview regarding its insights, challenges, and future developments. A bibliometric analysis is conducted using WoS and Scopus databases with manual selection through the VOSviewer software.

1 Introduction

During the last thirty years, above all in the recent three years due to the COVID-19 pandemic, our lifestyles and working practices have been significantly changing because of rapid technological change, such as computing power, algorithms, and digital and smart technologies [1, 2]. Compared to the previous technological revolutions which “were mainly due to advances in general purpose technologies, namely steam power, electricity, computerization, the current fourth industrial revolution, going to the fifth revolution, involves a shift of paradigms [3] in all disciplines, economies and industries since it challenges what it means to be human and consequently raises important political and ethical issues” [2]. In this direction, algorithms of artificial intelligence (AI) “are trained” to consider big data from the past and embody stereotypes and values of their designers and coders [1, 4]. Hence, innovative technological solutions, specifically algorithms should give the opportunity to face and overcome stereotypes and support human biases especially concerning the most vulnerable individuals, like people with disability (PWD) [1]. For this

*Corresponding author: luisa.varriale@uniparthenope.it
reason, technologies require to be integrated with moral and human values [5]. In fact, considering the working and private life in a scenario where income inequalities between workers tend to increase [6], “the disconnection between the technological and social progress is not sustainable anymore” [2]. In this perspective, it is clear the need to promote the creation of new models and narratives for inclusive prosperity [3]. Unluckily, technological change and thus digital transformation, like a double-edged sword, that is the adoption and diffusion of digital and smart technology, whether hardware (PC or mobile devices) or software (web applications, social networking spaces, chat sites, etc.), and especially emerging technology like augmented reality, virtual reality, and AI, also have negative effects in some domains and on certain categories of people, like those with disabilities (PWD) or special needs [1]. In this case indeed we observe the well-known phenomenon of digital divide which implies the total exclusion of people from the world for some reasons, such as their limited or absent digital skills, or the lack of technological tools or because they have specific forms of disabilities [7-9]. Otherwise, positive and negative effects related to technology for PWD mostly concern the opportunity for them to be involved and included in the work environments going to face numerous challenges, especially concerning the recruitment process supported by digital and smart technologies [10-13].

Starting from these short considerations, such conceptual paper aims to answer one specific research question: What are the current trends in research and practice regarding smart recruitment for workers with disability or special needs? To answer these research question, we conduct a bibliometric analysis, using Web of Science (WoS) and Scopus databases with manual selection through the Visualizing scientific landscapes (VOS) Viewer software able to systematize studies outlining trends and gaps (VOSViewer) [14-16]. Therefore, this research aims to explore the current state of art regarding the role and function of digital and smart technologies, especially AI applications, in the smart recruitment of workers with disability.

2 Digital and smart technologies for the recruitment and inclusion of workers with disabilities within organizations: A short overview

Over the last two decades, the concept of new technological assistance systems for the inclusion of PWD at work was introduced by the fourth industrial revolution [17]. “Technological tools, machines, and devices are now conceived as ‘partners’ that improve and support hard skills, knowledge, and competences of those working in organizations” [1]. All the scenarios related to Industry 4.0 follow the anthropocentric approach, going to build productive processes around an operator, able to receive “support from assistance systems or machines, which enhance humans’ physical, sensorial, and cognitive capabilities: the new workers cooperate with machines and robots” [1, 18, 19].

“Machines and robots have ushered in a great process of inclusion for PWD and aging operators, transforming their work into comfortable and efficient tasks, and facilitating collaborative interaction with new generations: workers with special needs can be supported by technological systems in an adaptive, intelligent, and dynamic way. Context-aware supporting systems have been successfully introduced into smartphones and cars, and in several cases into working contexts. PWD and elderly people need context-sensitive support in production facilities to control work results, not only trusting in their personal expertise and skills” [1, 20].

After the beginning of the third industrial revolution in late 1900s and through the numerous changes occurred in the next decades thanks to technology, in 2010s, digital transformation started to characterize the industry and the overall society, “which emphasized
on the cross functional efforts to rethink the internal operations i.e., digital platforms, processes, & people management and customer expectations to drive new business or revenue streams. Each digital era affected business managers to rethink about their way of doing business i.e., earlier business activities were carried out offline but later high-speed internet provided opportunities of online platforms, which triggered business manager to rethink about the way they do conduct business; the introduction of social media revolutionized the way how people communicate and share information, which triggered business managers to rethink understanding the customer expectations; similarly employees raise their voice if they have issues with supervisors, health & safety conditions, physical and mental wellbeing, limited learning and growth opportunities or any other unjustifiable treatments, which employees may share over digital platforms, if it go unaddressed may be posted on social media” [21].

Starting from the 21st century, new technologies were exponentially growing and the boundary between physical, digital, and biological spheres have been significantly reduced [22]. Indeed, the way human live, work, and relate fundamentally changed. These emerging technologies include AI/VAR, IoT, cloud computing, autonomous robots, and big data analytics and have positively contributed to individual and industrial growth. Both individuals and industries benefited from technologies in different ways trying to search for continuous and innovative technological solutions.

Digital transformation deeply changed work environments especially impacting on human resource management processes. “Human resource function has great influence on people i.e., how they work & collaborate, and how they develop and grow in their careers. Nowadays, HR leaders use digital tools to understand the insights of labor market i.e., the use of digital tools aligned with big data analytics—to understand how individuals (i.e., millennials or post-millennials) want to be hired; how they want to work and climb in the career ladder. Therefore, HR leaders actively engaged in chasing the path of digital transformation because it develops a system that is more like ‘employee centric’. Such digital tools focus on recruiting & onboarding, learning & development, performance & reward management, HR operations, and much more. However, every technological change brings some reluctance among employees. So, in order implement it smoothly, HR leaders engage relevant employees at the starting phase of ideation, so they feel part of it and may be willing to adopt it” [21].

During Covid-19 pandemic because of the social distancing and other requirements many HRM processes have been completely revisited mostly adopting technologies to be effectively managed, such as learning and training processes. Numerous online platforms were developed and implemented, such as Learning management systems (LMS), learning experience platforms (LXP), digital adoption platforms (DAP), video training software, knowledge-sharing tools, LinkedIn learning, Webinars, and online course providers and so forth [23]. Likewise, the performance management function adopted several tools having customized features related to mutual goal setting, monitoring performance, reviewing & rating performance, scheduling calibration meetings and recommending future development needs if any; there are several examples of digital performance management platforms such as Workday, PerformanceYard, BambooHR, Engagedly, Reviewsnap, Trackstar, Namely, Lattice, Synergita, Motivasya and Paycor (Shahzad & Varriale, 2023), also electronic performance monitoring (EPM) through email monitoring, tracking computer activities & usage time, video monitoring and GPS tracking and so forth [24].

Another HRM function dramatically affected by the digital transformation concerns the recruitment function, which is the first step in building organization’s human capital. “Electronic recruitment is one of the outcomes of this transformation, e-recruitment is broad term often named as online recruitment or digital recruitment. It is defined as method that uses technology or web-based tools for sourcing, attracting, tracking, screening, and hiring
suitable candidates” [21, 25]. In the traditional recruitment process human action at every step is necessary compared to digital recruitment where human action is required only at key steps i.e., screening, or final decision. The higher pool of candidates increases the workload for a traditional recruiter, but in digital recruitment software does it in seconds. “Similarly traditional recruiters interact with candidates to address their queries, manually screen resumes & rate each candidate and setting and communicating interviewing schedules using mailbox or phone calls, whereas in digital recruitment AI tools i.e., Chatbots to answer queries, screening software—to review resume using content analysis and for scheduling—online meeting planner or calendars [21, 26]. In addition, the recruiters are also responsible for their performance checked through HR dashboards [27].

To understand the digital recruitment area some [28] scholars consider algorithmic HR, digital HR and suggest future directions in the HRM field [29-31]. Anyhow, this conceptual paper aims to focus on smart recruitment insights, challenges, and future developments in the specific area defining its connection to inclusion and workers with disability. According to previous studies [21, 28, 32], we conduct a bibliometric analysis to primarily investigate the phenomenon of smart recruitment providing an overview regarding publication trends in the field of smart recruitment and disability and social/work inclusion over the past eighteen years (2004-2022) in terms of publication growth, author’s contribution, most impactful authors and papers, key themes, field’s intellectual and social structures.

3 Methodology

This conceptual paper aims to conduct content analysis using bibliometric analysis through mapping tools. The research methodology is divided into two parts: (a) extracting documents based on defined search query and (b) conducting bibliometric analysis using biblioshiny function. The early part is further sub-divided into data base selection and choosing mapping tools, search criteria and defining inclusion parameters. Whereas second part focuses on analysis and results.

3.1 Database selection and mapping tools

According to [33], [34] and [35], we also conducted bibliometric analysis to draw inferences from 539 articles extracted from Web of Sciences database under the category of Business and Management. The selected articles between the 2004 to 2022 period. We followed the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) to identify, screen and include articles for the analysis.

<table>
<thead>
<tr>
<th>1. Identify</th>
<th>Articles identified from WOS= 938</th>
<th>Articles remove due to duplication= 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Screen</td>
<td>Articles Screening= 920</td>
<td>Authors removed articles due to no full text available = 67</td>
</tr>
<tr>
<td>3. Eligible</td>
<td>Full text articles available= 853</td>
<td>Authors identified and removed articles not aligned with i.e., employee recruitment = 314</td>
</tr>
<tr>
<td>4. Inclusion</td>
<td>Articles Available for bibliometric analysis= 539</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: PRISMA Guideline—Inclusion of articles for bibliometric analysis
3.2 Search Query--Keywords

The authors defined set query after discussions with fellow academicians and practitioners working in the domain of human resource management area. The following query was used for the analysis: “(((((((TS=(e-recruit*)) AND TS=(disability)) AND TS=(inclusion)) AND TS=(AI)) OR TS=(artificial intelligence )) AND TS=(Employee)) OR TS=(digital recruit*)) OR TS=(online recruit*)) OR TS=(Smart recruit*)”.

3.3 Inclusion and exclusion criteria

Authors considered web of science (WoS) database, which generated total 938 articles published in the period of 2004 to 2022 under the category of Business and Management. A spreadsheet was generated to identify the objectives, theoretical frameworks, research design/methods, data collection instruments, and analysis techniques used by the veteran researchers. Furthermore, authors draw inferences from 539 articles adhering to inclusion and exclusion criteria, which helped in removing the redundant and unrelated articles by reading the abstracts and in some case complete papers (See Table 1). The strict scrutiny eliminated 399 articles keeping in view the goals of this study.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Research Question</td>
<td>What are the current trends in research and practice regarding smart recruitment for workers with disability or special needs?</td>
</tr>
<tr>
<td>2. Databases</td>
<td>Web of Science (WoS)</td>
</tr>
<tr>
<td>3. Search fields</td>
<td>Title, Abstracts and, Keywords</td>
</tr>
<tr>
<td>4. Scientific Area</td>
<td>Business and Management</td>
</tr>
<tr>
<td>5. Publication</td>
<td>2004 to 2022</td>
</tr>
<tr>
<td>6. Keywords</td>
<td>“(((((((TS=(e-recruit*)) AND TS=(disability)) AND TS=(inclusion)) AND TS=(AI)) OR TS=(artificial intelligence )) AND TS=(Employee)) OR TS=(digital recruit*)) OR TS=(online recruit*)) OR TS=(Smart recruit*)”.</td>
</tr>
<tr>
<td>7. Inclusion criteria</td>
<td>a. Language &amp; journals: English and Peer reviewed journals</td>
</tr>
</tbody>
</table>

3.4 Analysis

The bibliometrix::biblioshiny() function in bibliometrix package was used to generate the growth in publication, author’s contribution, impactful authors and articles, key themes, intellectuals and social structures. More interestingly, the study will focus on future developments in the field of e-recruitment of people with disability using technology and how organizations put efforts create inclusive culture. The most relevant words, three-field plot and thematic evolution remained the foundation for future developments in context of e-recruitment of disability using technology.

3.5 Descriptive and trend analysis

Figure 2 shows the different document types i.e., article 501, book chapter 08, proceeding papers 05 and review article 25 published during the 2004-2022 period. It also provided the count of authors i.e., 1,418 contributed to 549 articles. The information also reflects that sixty articles were published by single authors only. We can easily witness the jump in publications
related to e-recruitment in Covid-19 year i.e., 2019 and post pandemic years shows high growth. However, the annual growth rate remained at 21.9%.

4. Analysis and Findings

This section provides possible answers to the developed research questions and a short discussion about the primary findings of the bibliometric analysis conducted.

4.1 Source analysis

Table 2 contains information about articles and their rankings along with JCRI score i.e., 272 articles published in Q1 ranked journals, similarly 54 published in Q2, 24 articles in Q3 and six in Q4 ranked journals. However, the work related to search query has been published in top 10 journals (See figure 3) i.e., Internet Search (20), Journal of Business Research (20), Technological Forecasting and Social Change (14), International Journal of Contemporary Hospitality (13), European Journal of Marketing (12), International Journal of Manpower (9).

![Figure 2: Main information and year wise publication trend](image)

<table>
<thead>
<tr>
<th>Table 2: Journals, Ranking and JCR Score</th>
<th>Table 2: Journals, Ranking and JCR Score</th>
</tr>
</thead>
</table>

**MAIN INFORMATION ABOUT DATA**

<table>
<thead>
<tr>
<th>Timespan</th>
<th>2004-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources {Journals, Books, etc}</td>
<td>232</td>
</tr>
<tr>
<td>Documents</td>
<td>539</td>
</tr>
</tbody>
</table>

**DOCUMENT TYPES**

| Article                           | 501       |
| Article: book chapter             | 8         |
| Article: proceedings paper        | 5         |
| Review                            | 25        |

**AUTHORS**

| Authors                           | 1418      |
| Authors of single-authored docs   | 57        |
| AUTHORS COLLABORATION             |           |
| Single-authored docs              | 60        |
| Co-Authors per Doc                | 2.82      |
The following Figure 3 provides a visual representation of the distribution of given keywords in the selected journals i.e., e-recruit, disability, inclusion, AI, Artificial Intelligence, online recruit, and smart recruit. The keywords that were examined in this study include "e-recruit," which refers to the use of electronic methods for recruiting and hiring candidates; "disability," which pertains to the recruitment and inclusion of individuals with disabilities; "inclusion," which emphasizes the importance of creating diverse and inclusive work environments; "AI," an abbreviation for Artificial Intelligence, which explores the use of advanced technologies in talent acquisition; "Artificial Intelligence," an extended term for AI; "online recruit," which signifies the process of recruiting candidates through online platforms; and "smart recruit."

Moreover, selected journals in given field contributed significantly. Internet Research focused on the impact of the internet and digital technologies on various aspects of business, including talent acquisition; Journal of Business Research provides insights into various areas, including talent acquisition. Articles published here shed light on the use of AI, online recruit, and smart recruit in the recruitment process; Technological Forecasting and Social Change examined the intersection of technology, society, and business and addressing both the opportunities and challenges they present; International Journal of Contemporary Hospitality Management focused on the hospitality industry, this journal explores talent acquisition strategies that promote inclusion and diversity, including the inclusion of individuals with disabilities; European Journal of Marketing explored the impact of inclusive and diverse recruitment practices on marketing outcomes; International Journal of Manpower journal specifically examined issues related to workforce planning, management, and talent acquisition; International Journal of Selection & Assessment journal focused on how AI and online recruit can optimize candidate evaluation and decision-making; Personnel Review journal covered various aspects of human resource management, including talent acquisition. It published research on topics such as inclusive recruitment practices, the use of AI, and online recruit in the selection and hiring process; Similarly, Journal of Retailing and Consumer Services and Journal of Fashion Marketing and Mgt. emphasized on using technology in hiring best talent for innovative positions to enhance customer service and overall retail experience.

**Figure 3:** Top ten journals produced high number of papers. Source: Authors’ elaborations
4.2 Document and author analysis

Figure 4 shows the most influential authors in the research domain of smart recruitment and disability i.e., Patrick Van Esch has made notable contributions by explaining the integration of AI technologies in HRM processes and their impact on organizational performance. Further he maintained a human-centered approach and addressing ethical considerations when implementing AI in HRM; Ashish Malik emphasized on HRM and innovation, smart work and AI; J. Stewart Black discussed the HRM practices, diversity, equity and job satisfaction constructs; Nripendra P. Rana, Li-Chun Hsu, Lynn Wu focused on following keywords: e-recruit, disability, inclusion, AI or smart recruitment.

On the other hand, Figure 5 highlighted the top articles which are cited the most among the 539 articles selected for bibliometric analysis. Following articles [36] published in year 2018, cited 2,262 times; [37] cited 1531 times; [38] cited 975 times; and [39] cited 842 times.

4.3 Science Mapping (Conceptual, intellectual, and social structures)

We used three-field plot in R software to understand the relations between authors, keywords, and countries (See Figure 6). The left column represents countries having more author affiliation, right column represents the author who contributed to related keywords, and the
middle column shows keywords used by authors in selected 539 articles. The height of the box and thick connecting lines represent the more work in the related area. AI base recruitment is relatively new and widely discussed in recent years.

**Figure 6:** Three-field plot

The current study identifies that there is significant work in the domain of artificial intelligence-based recruitment, which is further focused on use of social networking sites channels. However, the top five authors from belonging to top eight countries who contributed to smart recruitment using AI are USA, Australia, China, United Kingdom, Germany, India, France and Canada respectively (See Figure 6 and 7).

**Figure 7:** Collaborative network

The hotspots in Figure 8 are determined using VOSviewer. These hotspots are the result of author’s keyword co-occurrence networks, which represents the knowledge structures and research themes in the field of e-recruitment. To calculate and analyze the strength among keywords, authors used density parameters [40]. The more nearness and little or no separation represents i.e., recruitment cluster in red color overlaps the keywords social networking sites, innovation, and talent management. This density shows interconnectedness and is studied together by veteran researchers over the couple of years. However, we can also witness more hotspots like these i.e., technology and recruitment in yellow color, which is not much dense and evolving; employer branding, organizational attractiveness, corporate social responsibility, employee engagement cluster looks like newly established relationship among keywords. And the most prominent cluster is AI-based recruitment and persons with disabilities. We can also witness other multi-dimensional trends form the given figure.
5. Discussion and Conclusion

This section answers the research questions, where it provides an overview regarding publication trends in the field of smart recruitment and disability and work/social inclusion over the past eighteen years in terms of publication growth, author’s contribution, most impactful authors and papers, key themes, field’s intellectual and social structures.

In this conceptual study, we aim to identify emerging trends in the field of smart recruitment, particularly focusing on the intersection with disability and work/social inclusion. By conducting an extensive literature review, we extracted a thematic map (Figure 9) that serves to define the evolving trends within this domain. The map visually represents the various research themes that are currently being explored by different researchers in this field. Each circle on the map represents a distinct theme that is the subject of investigation and analysis by these researchers. This study provides valuable insights into the novel areas of research and highlights the potential for advancements in talent acquisition and human resource management practices, specifically about smart recruitment and its implications for disability inclusion and social integration.

The research conducted on the topic of smart recruitment and disability inclusion has primarily been carried out by authors from the United States of America, Australia, China, the United Kingdom, Germany, and India. Notably, researchers from the USA, China, and Australia have placed a particular emphasis on the application of artificial intelligence (AI) in the recruitment process. Their studies have focused on exploring the effectiveness and efficiency of AI-based recruitment methods in identifying and selecting candidates, particularly with regards to individuals with disabilities. On the other hand, authors from the UK, Germany, and Canada have concentrated their efforts on examining the significance of social inclusion within organizations and its long-term benefits for both the organization and society. Their research has delved into the ways in which fostering an inclusive environment can lead to improved employee engagement, productivity, and overall organizational performance, while also contributing to the broader social fabric by promoting diversity and
equal opportunities. These studies collectively contribute to the body of knowledge on smart recruitment and disability inclusion, offering valuable insights for organizations, policymakers, and researchers seeking to enhance recruitment practices and promote social inclusivity.

This conceptual study allowed authors to identify new trends in the field of smart recruitment with an interesting and promising link to disability and work/social inclusion. In result, many clusters in Figure 9 were highlighted that represent new and emerging themes i.e., AI based recruitment and person with disabilities; e-recruitment and use of social networking sites (SNS); human resource and automation; and many more, which are being researched by different researchers. A previous study identified already some themes i.e., AI enabled recruitment, social recruiting, and gamified recruitment [21]. Similar results with further elements investigated (disability and social/work inclusion) have been outlined.

In summary, this conceptual study contributes to the existing body of knowledge by giving directions to researchers to explore about newly emerging and associated trends in the field of smart recruitment i.e., person with disabilities, AI based recruitment, employer branding, social inclusion, use of technologies (machine learning, AI, big data, deep learning, automation etc.) in the recruitment processes.

6. Future research directions and limitations

Similarly previous studies [21] also identified the three emerging themes related to e-recruitment i.e., social/network recruitment, AI-based recruitment, and gamified recruitment. This conceptual study also endorses the two emerging themes highlighted in previous i.e., social recruitment and AI-based recruitment. Thus, we recommend researchers to undertake their research in the above highlighted domains as they are emerging and have limited body of work published yet.

Like other similar studies, this current study presents some limitations. Firstly, we conducted a comprehensive analysis for most relevant papers selected from Web of Science (WoS), but databases are not limited to this one. Secondly, we mainly focused on articles from scholarly journals, paying minor attention to book chapters, and dissertations, considering also specific categories such as Business and Management, non-adopting an interdisciplinary journal also. For future research on the phenomenon, we should consider these limitations as starting points, so we should develop specific and stimulating propositions and then hypothesis to test through empirical studies using both qualitative and quantitative research methods.

References


