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Article

# Technological Advancements and Organizational Discrimination: The Dual Impact of Industry 5.0 on Migrant Workers

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**Abstract:** This study explores the impact of Industry 5.0 on discriminatory behaviors toward migrant employees within organizations. Through semi-structured qualitative interviews with 15 migrant workers in the UK, this research identifies key challenges faced by migrant employees amidst the integration of advanced technologies like AI and robotics in HRM systems. Thematic analysis reveals that while Industry 5.0 has the potential to mitigate human biases, it can also perpetuate existing prejudices if not managed effectively. This study highlights two main themes: the experiences of discrimination and challenges in the context of Industry 5.0, and the role of technology in HRM systems. The findings indicate that automated HR systems can both reduce and increase biases, highlighting the importance of inclusive practices and targeted support programs to help migrant workers adapt to a technologically advanced labor market. This research contributes to the literature by providing insights into the duality of technological advancements in reducing and reinforcing workplace discrimination.

**Keywords:** Industry 5.0; migrant workers; organizational discrimination; human resource management; technological advancements



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## 1. Introduction

Despite significant research on discrimination against migrant workers, there is a notable gap in understanding the role Industry 5.0 plays in this context. Existing studies largely overlook how the integration of advanced technologies, like AI and robotics in HRM systems, can both reduce and exacerbate discrimination. While some research highlights the potential of these technologies to reduce human biases, there is limited exploration of how they might perpetuate existing prejudices, particularly for vulnerable groups, such as migrant workers. This research addresses this gap by examining how automated HR systems can unintentionally reinforce discrimination against migrant employees.

The evolving dynamics of the global labor market have brought the issue of discrimination against migrant workers to the forefront. Despite the proven benefits of diversity and inclusion within organizations, migrant workers often face systemic biases that hinder their career progression. This research addresses the persistent discrimination faced by migrant workers, particularly in the context of the technological advancements heralded by Industry 5.0. While the human capital theory (HCT) suggests that the labor market should evaluate candidates solely based on their skills, real-world practices reveal a different scenario where migrant workers frequently encounter various forms of discrimination at societal, organizational, and individual levels.

The emergence of Industry 5.0, characterized by the integration of human intelligence with advanced technologies like artificial intelligence (AI) and robotics, brings significant changes to Human Resource Management (HRM) practices. While these technologies have the potential to reduce human biases, they also risk perpetuating existing prejudices if not properly managed (Soleimani et al. 2022). This duality forms the core of our investigation into how Industry 5.0 impacts discriminatory behaviors toward migrant workers. To explore this issue, we conducted semi-structured qualitative interviews with 15 migrant employees working in the UK. This method allowed for an in-depth understanding of the personal experiences of migrant workers, capturing the nuances of discrimination in the workplace. Thematic analysis of the interview data revealed two main themes: the challenges faced by migrant workers in the context of Industry 5.0 and the role of technology in HRM systems.

Our findings contribute to the literature by highlighting the interactions between technological advancements and discriminatory practices. Specifically, we identify how automated HR systems can both mitigate and exacerbate biases, depending on their design and implementation. This study also emphasizes the importance of inclusive practices and targeted support programs to help migrant workers adapt to the demands of a technologically advanced labor market.

This study has six sections. The Section 1 introduces our research. The Sections 2 and 3 provide a literature review that focuses on discrimination toward migrant workers and Industry 5.0's impact on discrimination toward migrant workers. The Section 4 details the research method. The Section 5 presents the findings and the Section 6 is the Discussion and Conclusions.

## 2. Discrimination toward Migrant Workers

Companies with higher diversity and inclusion engagements have been found to perform better in the capital market (Cillo et al. 2022). The human capital theory (HCT) posits that the labor market treats all applicants equally based on their skills, assuming that applicants possess perfect information and mobility (Almeida et al. 2015). Ten Berge and Tomaskovic-Devey (2022) argue that, at the industry level, unions tend to defend workers' rights, making immigrant workers less likely to be subjected to unequal treatment. However, the main expectation for highly skilled migrants is to work in lower-level positions, and they experience lower response rates during job applications (Guo et al. 2021). Migrant workers still face discrimination during recruitment and career development at the societal/industry, organizational, and individual levels (Reskin 2003; Guo et al. 2021; Risberg and Romani 2022). This discrimination can lead to lower outcomes and impaired mental and physical health for migrant workers (Dhanani et al. 2018).

Ascriptive inequality refers to the unfair treatment of people based on inherent demographic characteristics, such as gender and race (Reskin 2003). There are two types of discrimination related to ascriptive inequality: taste-based and statistical discrimination (Becker 2010). Taste-based discrimination occurs when specific racial or ethnic groups are favored without any other relevant information. For example, studies have found that job applicants with foreign names receive a lower response rate (Zschirnt and Ruedin 2016). Statistical discrimination occurs when specific ethnic groups are discriminated against due to imperfect or insufficient information about them. For instance, recruiters might hesitate to hire migrant workers because of the lack of available records about them in the country (Zschirnt and Ruedin 2016).

Institutional regulations on migrant workers impact discrimination against them based on institutional logics, which provide rules, beliefs, and values for individuals and organizations (Thornton et al. 2012; Dhanani et al. 2018). These regulations shape how institutions view and treat migrant workers, often leading to systemic biases and unequal treatment. Industry 5.0, characterized by the integration of human intelligence with advanced technologies like artificial intelligence and robotics, brings significant changes to HRM practices. These changes can either exacerbate or mitigate discrimination against

migrant workers. For instance, the use of AI in recruitment processes has the potential to reduce human biases, but if not properly managed, it can also perpetuate existing prejudices due to biased data inputs (Bogen and Rieke 2018; Fraij and László 2021).

Moreover, the emphasis on personalized and human-centric approaches in Industry 5.0 can enhance the inclusion of migrant workers by fostering a more diverse and inclusive workplace culture. For example, advanced HRM systems can provide better support and resources for migrant workers, such as language training programs and cultural assimilation workshops, thus helping to reduce the barriers they face (Harrison et al. 2021). However, the shift toward automation and digitalization also poses challenges. Migrant workers might be at a disadvantage if they lack the digital skills required in the new labor market. Therefore, it is essential to implement training and development programs that equip migrant workers with the necessary skills to thrive in an Industry 5.0 environment (Raja Santhi and Muthuswamy 2023).

### 3. Industry 5.0's Impact on Discrimination toward Migrant Workers

Industry 4.0 has led to significant improvements in productivity and the creation of value-added products and services. However, issues such as worker welfare, attitudes toward new technologies, and the flexibility of material handling remain unresolved (Akundi et al. 2022). In 2021, Industry 5.0 was proposed to create more human-centric, resilient, and sustainable industries (Aydin et al. 2023). Unlike Industry 4.0, which focuses on the collaboration between humans and machines, Industry 5.0 aims for machines to work for us, leading to more autonomous and digitalized systems, as well as mass customization and personalization.

In Industry 5.0, the well-being of human resources is central to organizational operations (Cillo et al. 2022). This paradigm shift will drive technological changes, new forms of machine–human collaboration, and further digitalization of HRM assessments, thereby reshaping workers' roles in the workplace (Ganer et al. 2022). However, the technological changes and uncertainties of Industry 5.0 pose risks and may exacerbate inequalities faced by migrant workers. Migrant workers are particularly vulnerable due to barriers such as the lack of recognition of their previous experiences, skills, and qualifications; unfamiliarity with the local labor system; lack of local professional and social connections; insufficient language proficiency; and restrictions on work permits (Zikic et al. 2010; Guo et al. 2021). These factors may legitimize discrimination against them. Therefore, it is crucial to understand the impact of Industry 5.0 on migrant workers during recruitment and career development.

Technological changes may worsen existing labor market inequalities, favoring those already in advantageous positions and posing more challenges for migrant workers. These changes might even legitimize discrimination against them (Ten Berge and Tomaskovic-Devey 2022). Industry 5.0 will transform how humans and machines collaborate in the workplace (Battini et al. 2022; Borchardt et al. 2022; Cillo et al. 2022; Ganer et al. 2022; Kolade and Owoseni 2022). Some research (e.g., Borchardt et al. 2022; Cillo et al. 2022; Ganer et al. 2022) demonstrates that the increased use of technology can free people from repetitive tasks, allowing them to focus on creative ones. However, this technological shift will also lead to job losses and require significant reskilling for certain occupations. Since technologies often replace lower-skilled, repetitive, or manual jobs, migrant workers in these positions are particularly vulnerable to job loss (Ten Berge and Tomaskovic-Devey 2022).

Additionally, the new human–machine collaboration model will alter the roles of technologies and workers' skills, potentially creating an unstable and volatile employment environment, such as an increase in gig or contract jobs. For migrant workers, who may face restrictions on work permits and lack language proficiency in the host country, finding jobs will become even more challenging. This instability can heighten feelings of uncertainty and insecurity, increasing perceptions of ethnic threat and competition. Consequently, this may strengthen in-group favoritism and lead to increased discrimination against immigrant workers (Ten Berge and Tomaskovic-Devey 2022).

Many HRM assessment systems proposed under the Industry 5.0 paradigm consider demographic factors during evaluations to construct more human-centric and personalized systems (Battini et al. 2022; Borchardt et al. 2022; Cillo et al. 2022; Ganer et al. 2022; Laskowska and Laskowski 2022; Orlova 2021a). However, discrimination has become more subtle. The more personalized and digitalized HRM assessments may even rationalize discrimination toward migrant workers. Typically, HRM systems require information about workers, such as previous work experience, education, and qualifications. They often underestimate migrant workers' qualifications, skills, capabilities, and performances due to a lack of information. Organizations are sometimes hesitant to hire migrant workers because of the uncertainties and risks associated with the lack of available information about them (Risberg and Romani 2022), leading to statistical discrimination, especially under unstable economic conditions (Haughton et al. 2018; Petrozziello 2019). Organizations may argue that decisions are made according to data-based HRM assessment systems and are therefore not subjective, normalizing discrimination against migrant workers. Besides the rationalization of statistical discrimination, migrant workers are also subject to taste-based discrimination under the Industry 5.0 HRM system.

The incorporation of a focus on creating a connected workplace in HRM assessment systems can also legitimize taste-based discrimination. According to the social identity theory, recruiters are more likely to hire those who resemble themselves and fit into the company's culture (Almeida et al. 2015; Zschirnt and Ruedin 2016), leading to taste-based discrimination. Technologies may further differentiate people based on their demographic characteristics. Some HRM assessment systems under Industry 5.0 consider employees' social connections and political status as factors for more personalization and creating a more connected workplace (Kadarik et al. 2021; Orlova 2021b; Ten Berge and Tomaskovic-Devey 2022). This can disadvantage immigrants, as they typically do not have the same number of connections in the host country compared to non-immigrant workers (Orlova 2021a). Additionally, this may reinforce ethnic stereotypes and in-group favoritism. Decisions made by the HRM system may even allow employers to avoid culpability for exclusionary practices toward migrant workers, further legitimizing discrimination against them.

Discrimination faced by migrant workers of different ethnicities, genders, ages, and skill levels is not uniform. Those whose culture and values are closer to the host country are favored (Zschirnt and Ruedin 2016). Gender also plays a role in how migrants are treated. Scandinavian studies have found that female migrant workers are more likely to receive interviews than male migrants. This may be because women are seen as less threatening than men or because more less-skilled jobs are taken by women, making it easier for them to receive interviews (Zschirnt and Ruedin 2016). Additionally, migrant workers over 50 years old may not adapt well to the dynamic workplace of Industry 5.0 (Laskowska and Laskowski 2022). Since employers may argue that recruitment or promotion decisions are made by data-based assessment systems, the unequal treatment of migrant workers is then rationalized. Other factors, such as the economy and local labor market status, the size and inclusion policy of the organization, etc., can also affect how migrant workers are treated. During economic booms and local labor shortages, employers are more willing to hire migrant workers (Zschirnt and Ruedin 2016). The size of the company, the background of the recruiters, the company's public or private sector status, and its diversity and inclusion policies also influence how they treat migrant workers. Since discrimination is a complex issue and varies in specific cases, it is essential to further explore how Industry 5.0 HRM assessment systems legitimize discrimination toward migrant workers and what factors influence it.

#### 4. Research Method

Within the context of this research, we aim to demonstrate how Industry 5.0 shapes discriminatory behaviors against migrant employees in organizations. To achieve this objective, we conducted semi-structured qualitative interviews with 15 migrant employees working in the UK. The qualitative method is widely used in management studies (e.g.,

[Shanmugam et al. 2015](#)) and provides flexibility and specificity instead of generalizing and standardizing the results ([Marshall and Rossman 2006](#)).

The study involved 15 participants who were migrant employees currently living and working in the United Kingdom. The participants were selected to provide a diverse representation of various industries, educational backgrounds, and lengths of stay in the UK. The interviews were conducted from March 2023 to June 2023. The age of the participants ranged from 21 to 53 years old, ensuring a broad spectrum of perspectives related to different stages of career development and life experiences. The gender distribution included 10 females and 5 males, reflecting a variety of gendered experiences in the workplace.

The participants originated from five different countries: China (11), Iran (1), Sri Lanka (1), Greece (1), and Bangladesh (1). This diversity in national origin provided insights into how migrant experiences may vary based on cultural backgrounds. The length of time the participants had been living and working in the UK varied significantly, from as short as 6 months to as long as 28 years. This range allowed the study to capture both the initial challenges faced by new migrants and the long-term experiences of those who have been in the UK for many years.

In terms of employment status, the sample included individuals who were employed full time (11), part time (3), and on a contract basis (1). The participants worked across a variety of industries, including higher education (7), engineering (2), maritime and shipping (2), finance (1), art (1), education (1), and logistics (1). This diverse range of industries was intentionally chosen to explore the specific challenges and opportunities that are unique to different professional contexts. For example, the experience of a migrant worker in higher education might differ significantly from that of someone in the maritime sector due to varying industry standards, technological integration, and workplace cultures. By including participants from a wide range of industries, the study aimed to provide a comprehensive understanding of the broader implications of Industry 5.0 on migrant workers across the labor market.

Educationally, the participants were highly qualified, with the majority holding doctoral degrees (11), followed by master's degrees (3), and one participant holding a bachelor's degree. This high level of education among the participants provided a unique perspective on the role of advanced qualifications in career development and the recognition of foreign credentials in the UK job market.

Most participants were not part of any specific migrant or cultural community or organization in the UK, with the exception of one participant who was a member of the Chinese community and another who was a Fellow of the Higher Education Academy. This lack of formal community involvement among most participants highlighted the potential for workplace inclusivity efforts to serve as critical support structures for migrant employees.

The selection criteria aimed to include individuals with varied professional backgrounds and experiences to provide a comprehensive understanding of the challenges and opportunities faced by migrant employees in the context of Industry 5.0. To recruit participants, we adopted a snowball sampling technique, a method commonly used in qualitative research to access hard-to-reach populations or those with specific characteristics ([Noy 2008](#)). Snowball sampling is particularly effective in studies involving migrant employees, as it allows researchers to leverage social networks and referrals to identify additional participants who meet the study's inclusion criteria ([Atkinson and Flint 2001](#)). This technique enabled the research to capture a wide range of perspectives and experiences, contributing to the richness and depth of the findings. Based on the semi-structured in-depth interviews and the thematic analysis conducted using the NVIVO 12 data categorization tool, [Table 1](#) shows the data structure for our research.

**Table 1.** Data structure.

First Order Theme	Second Order Theme	Aggregate Theme
<i>Cultural Differences</i>	Experiences of Discrimination and Challenges Faced	<b>Challenges in the Context of Industry 5.0</b>
<i>Language Barriers</i>		
<i>Visa Issues</i>		
<i>Competition with Local Workers</i>	Specific Challenges in the Context of Industry 5.0	
<i>Technological Adaptation</i>		
<i>Job Replacement by AI</i>	Impact of Industry 5.0 Technologies and Practices	
<i>Enhanced Efficiency</i>		
<i>Increased Administrative Burdens</i>		
<i>Efficiency and Fairness</i>	Perceptions of Technology in HRM Assessment Systems	<b>Role of Technology in HRM Systems</b>
<i>Underestimation of Qualifications</i>		
<i>Automated Screening Systems</i>	Barriers Amplified by Technological Changes	
<i>Lack of Human Interaction</i>		

## 5. Findings

In this section, we highlight the main themes for the research. There are two main themes that are challenges in the context of Industry 5.0 and Role of Technology in the HRM system. The first theme has two sub-themes that are “Experiences of Discrimination and Challenges Faced” and “Specific Challenges in the Context of Industry 5.0”. The second theme has three sub-themes: “Impact of Industry 5.0 Technologies and Practices”, “Perceptions of Technology in HRM Assessment Systems”, and “Barriers Amplified by Technological Changes”.

### 5.1. Challenges in the Context of Industry 5.0

#### 5.1.1. Experiences of Discrimination and Challenges

There are three main challenges under this sub-theme that are cultural differences and language barriers, competition with local workers, and visa issues. Many migrant employees highlighted the cultural differences and language barriers as significant challenges in their workplaces. These barriers often make them feel like outsiders and hinder effective communication. For instance, a female respondent from China mentioned feeling like an outsider due to the unfamiliarity with local working culture and the assumption that everyone understands implicit norms and standards (*Participant 1*). Similarly, another respondent from China noted that people sometimes prefer to associate with those from the same background, which can lead to feelings of isolation and being ignored in group settings (*Participant 12*). Additionally, language difficulties were frequently mentioned as a hurdle to better communication and deeper integration within the workplace (*Participant 3*; *Participant 9*).

Competition with local workers was also a prominent theme. Migrant employees often face additional scrutiny regarding their visa status, which can be a significant barrier to employment. For instance, a male respondent from Iran shared that visa complexities and the cost of employing foreign staff lead many companies to prioritize local employees (*Participant 2*). Another interviewee from China indicated that the need for job sponsorship is a substantial hurdle, as some companies are unwilling to incur the costs associated with hiring migrant workers, even when they meet all job requirements (*Participant 14*). This competition is further intensified by the preference for local candidates who do not require work permits, as highlighted by several respondents (*Participant 3*; *Participant 11*).

Visa issues are a recurrent challenge for migrant workers. Respondents shared that the need for work visas and the associated bureaucratic processes create significant obstacles. A respondent from Bangladesh pointed out that automated resume screening systems

often filter out candidates who need work permits, thereby limiting their job opportunities from the outset (*Participant 11*). Another respondent from China expressed frustration with the 20 h work limit imposed on students, which restricts their ability to gain more work experience and financial stability (*Participant 13*).

#### 5.1.2. Specific Challenges in the Context of Industry 5.0

There are two main findings under this sub-theme that are technological adaptation and job replacement by AI. The rapid advancement of technology and the integration of Industry 5.0 practices pose unique challenges for migrant employees. While some respondents did not notice significant changes yet, there is a general concern about the need to adapt to new technologies. A respondent from China in the logistics sector emphasized that technological changes might reinforce fairness by reducing human biases, but poorly designed systems could still perpetuate discrimination (*Participant 14*). Moreover, the increased reliance on technology in HR processes, such as online job applications and automated assessments, can undervalue the qualifications and experiences of migrant workers, as noted by several respondents (*Participant 3*; *Participant 2*).

Additionally, the transition to digital platforms can exacerbate the feeling of isolation among migrant employees. One respondent highlighted that online meetings and remote interactions could limit the opportunities for migrant workers to integrate fully into the company culture and build personal connections with colleagues (*Participant 12*). This sentiment was echoed by another respondent who mentioned that technological tools often fail to consider the nuanced differences in foreign qualifications and experiences, leading to a systematic undervaluation of their competencies (*Participant 14*). Furthermore, the pace at which new technologies are introduced can be overwhelming, especially for those who may already be struggling with language barriers and cultural adjustments (*Participant 3*).

To address these issues, companies need to ensure that technological tools and systems are designed inclusively, with a clear understanding of the diverse backgrounds of their workforce. Training programs specifically tailored for migrant workers can help bridge the technological gap and provide them with the necessary skills to thrive in an Industry 5.0 environment. Moreover, creating platforms for regular feedback and dialogue can help identify and mitigate any biases that may arise from automated systems, ensuring a fair and equitable workplace for all employees.

The potential for job replacement by AI and automation is another significant concern among migrant employees. Respondents expressed fears that low-skilled jobs, which are often filled by migrant workers, are particularly vulnerable to being replaced by automated systems (*Participant 15*). A male respondent from China working in the finance sector highlighted that automation in HR might ignore the unique challenges faced by migrants, such as cultural differences and language barriers, leading to their concerns being overlooked (*15*). Furthermore, a respondent from China pointed out that online job application systems could disadvantage migrant workers due to biases in automated resume screenings and the undervaluation of foreign qualifications (*Participant 14*; *Participant 11*).

The risk of job displacement due to AI is not limited to low-skilled positions. Highly skilled migrant employees also face challenges as automation and AI systems are increasingly used for tasks that require specialized knowledge and expertise. A respondent from Bangladesh with extensive experience in the maritime sector reported that automated resume screening systems failed to recognize his 22 years of experience, effectively disqualifying him from job opportunities, despite his qualifications (*Participant 11*). This highlights the need for more nuanced and human-centric approaches to integrating AI in HR processes.

Moreover, the fear of job loss due to AI is compounded by the existing visa and work permit issues that many migrants face. As one respondent noted, the additional issue of job insecurity brought about by AI can make migrant workers feel even more vulnerable in the labor market (*Participant 15*). To mitigate these concerns, it is crucial for organizations to adopt a balanced approach to automation, ensuring that AI and technology



complement rather than replace human labor. Providing continuous learning opportunities and upskilling programs can help migrant workers stay competitive and adaptable in a rapidly changing job market.

## 5.2. Role of Technology in HRM Systems

### 5.2.1. Impact of Industry 5.0 Technologies and Practices

Industry 5.0 technologies have been recognized for their potential to enhance efficiency in HRM systems. Several interviewees highlighted the benefits of automation and digital processes in streamlining administrative tasks and improving the overall efficiency of HR functions. For example, a respondent from the finance sector noted that technology enables the management of large numbers of employees more effectively, reducing the manual workload involved in HR tasks (*Participant 15*). Similarly, another participant emphasized that technology facilitates online assessments and remote job applications, making the recruitment process more accessible and efficient (*Participant 12*).

Moreover, the ability to conduct virtual interviews and assessments has been particularly beneficial, allowing organizations to cast a wider net and consider candidates from various geographical locations. This not only speeds up the hiring process, but also reduces costs associated with travel and logistics. The shift to digital documentation and record keeping has also been praised for its ability to minimize errors and ensure that employee data are easily accessible and well-organized. For instance, a participant from the higher education sector mentioned that technology in HRM has made processes more transparent and accessible, allowing for the better management of employee records and performance evaluations (*Participant 6*).

Conversely, some respondents pointed out that the implementation of Industry 5.0 technologies can lead to increased administrative burdens. The shift to digital and automated systems sometimes introduces additional layers of complexity and requires extensive documentation and approvals. A participant in the engineering sector mentioned the extensive forms and administrative steps required for even minor tasks, which can create new challenges, particularly for migrant employees who may already face difficulties navigating unfamiliar bureaucratic processes (*Participant 15*).

Additionally, the transition to new technologies can be overwhelming and time-consuming, especially for employees who are not tech savvy. Training and adapting to new systems can initially slow down productivity and create frustration among staff. This is compounded by the fact that technological issues or system downtimes can halt operations and lead to delays in HR processes. For example, the increased reliance on digital platforms for tasks, such as DBS checks, has sometimes resulted in longer processing times, impacting the overall efficiency of HR operations (*Participant 1*).

While the benefits of Industry 5.0 technologies are clear, the adaptation to these new systems poses significant challenges. Migrant employees, in particular, may find it difficult to adapt to these changes due to language barriers or lack of familiarity with the new technologies. This adaptation challenge is not limited to understanding the technology itself, but also extends to adapting to new ways of working and communicating. A respondent from the maritime sector noted that the reliance on automated systems could lead to misunderstandings and miscommunications, which can be particularly problematic for those who are still adjusting to the local language and work culture (*Participant 11*).

Moreover, the introduction of advanced technologies often requires continuous learning and upskilling. While some employees may embrace the opportunity for professional development, others may feel overwhelmed by the constant need to keep up with technological advancements. This continuous learning curve can be particularly steep for migrant employees who may already be balancing the challenges of adapting to a new cultural and professional environment (*Participant 9*).

Another critical issue is the digital divide, which can exacerbate inequalities in the workplace. Not all employees have equal access to the necessary digital tools and resources, which can hinder their ability to fully participate in technology-driven HR processes. This

divide is often more pronounced for migrant employees who may not have the same level of access to digital devices or reliable internet connectivity as their local counterparts. This lack of access can create significant barriers to engagement and participation, further marginalizing migrant employees within the organization (*Participant 13*).

Furthermore, while automation and AI can streamline many HR processes, they also risk depersonalizing interactions and reducing the opportunities for meaningful human connections. This is particularly concerning for migrant employees who may rely on personal interactions to build relationships and integrate into the workplace culture. The reduction in face-to-face interactions can lead to feelings of isolation and disconnection, which can impact overall job satisfaction and performance (*Participant 12*).

### 5.2.2. Perceptions of Technology in HRM Assessment Systems

Interviewees generally acknowledged the efficiency brought by technology in HRM assessment systems. The automation of CV screening and the use of AI in performance evaluations were seen as positive developments that could potentially reduce biases and ensure a more objective assessment process. A respondent from the higher education sector appreciated the ability of technology to handle large volumes of applications and provide a systematic approach to evaluating candidates (*Participant 12*; *Participant 14*). Furthermore, technology's role in facilitating remote job applications and interviews was highlighted as a significant improvement, allowing individuals to apply for positions without geographical constraints, thus broadening the pool of potential candidates (*Participant 12*).

However, the perception of fairness was nuanced. While some saw technology as a way to reduce human biases in hiring, others pointed out that the design of these systems could still perpetuate existing biases if not carefully managed. For instance, automated systems might filter candidates based on criteria that inadvertently disadvantage those with non-traditional career paths or educational backgrounds, which is often the case for migrant employees (*Participant 14*).

A significant concern among migrant employees is that HRM assessment systems can underestimate their qualifications and experiences. Automated systems may not fully recognize or value qualifications obtained outside the host country, leading to migrant workers being unfairly assessed. This issue was highlighted by multiple respondents who felt that their foreign qualifications and experiences were often overlooked or undervalued by automated screening processes (*Participant 1*; *Participant 11*). For instance, a participant from the maritime sector shared that, despite having 22 years of experience, their CV often failed to pass initial automated screenings, highlighting a critical flaw in the system (*Participant 11*).

This underestimation is partly due to the lack of standardization in educational and professional qualifications across different countries. Automated systems, which rely on predefined criteria and databases, might not be equipped to accurately assess or compare international qualifications. As a result, migrant employees might be unfairly filtered out or placed at a disadvantage compared to local candidates, whose qualifications are more easily understood and recognized by these systems (*Participant 15*; *Participant 14*).

Additionally, some interviewees mentioned that the lack of human oversight in these automated processes exacerbates the issue. Human recruiters might be able to contextualize and appreciate the value of foreign qualifications and diverse professional experiences better than an algorithm that follows rigid rules. Therefore, the over-reliance on technology without sufficient human intervention can lead to significant underestimation of migrant employees' true potential and capabilities (*Participant 14*; *Participant 11*).

### 5.2.3. Barriers Amplified by Technological Changes

One of the major barriers identified by migrant employees is the reliance on automated screening systems in the recruitment process. These systems often include filters that disadvantage migrant workers, such as requiring disclosure of visa status, which can lead to automatic rejection of applications from those needing work permits. A respondent from

the finance sector noted that this automated exclusion can severely limit job opportunities for migrant employees (*Participant 15; Participant 11*). The rigid criteria and lack of flexibility inherent in these systems can prevent qualified candidates from even reaching the interview stage, as one maritime sector employee with 22 years of experience pointed out when his CV repeatedly failed to pass initial screenings (*Participant 11*).

Moreover, these automated systems may lack the sophistication to understand and evaluate diverse educational and professional backgrounds effectively. For instance, qualifications and work experiences from other countries might not be accurately recognized, resulting in potentially high-skill candidates being filtered out early in the hiring process. This not only frustrates the job seekers, but also deprives companies of valuable talent that could contribute significantly to their operations. The reliance on automated systems can create an opaque barrier, where the lack of feedback on application rejections prevents candidates from understanding or addressing potential gaps or misunderstandings in their submissions.

The increased use of technology in HRM systems has also led to a reduction in human interaction, which many respondents felt was detrimental. The move toward online meetings and automated processes can isolate migrant employees, preventing them from fully integrating into the company culture and forming meaningful relationships with colleagues. A respondent from the higher education sector pointed out that online interactions could prevent migrant workers from understanding and assimilating into the workplace culture, exacerbating feelings of isolation (*Participant 12*). Additionally, the lack of human oversight in automated systems means that nuanced qualifications and experiences of migrant workers are often not appreciated or understood, leading to unfair assessments (*Participant 11*).

Furthermore, the impersonal nature of automated interactions can hinder the development of mentorship and support networks that are crucial for career development. Migrant employees might miss out on informal advice, guidance, and feedback that typically come from direct interactions with managers and peers. This lack of engagement can lead to a sense of alienation and can impact job satisfaction and retention negatively.

## 6. Discussion and Conclusions

Our study explores the complex landscape of migrant workers' experiences in the evolving context of Industry 5.0, revealing a multifaceted array of challenges that stem from technological advancements in Human Resource Management (HRM) systems. The findings indicate that while these technological changes promise enhanced efficiency and reduced human biases, they also pose significant risks of perpetuating and exacerbating existing inequalities faced by migrant workers.

The integration of advanced technologies in HRM systems can be a double-edged sword. On one hand, automation and AI can streamline administrative tasks and potentially reduce overt biases in hiring and evaluation processes. However, our interviews reveal that these systems often fail to recognize and value foreign qualifications and experiences adequately. Automated screening processes tend to filter out candidates based on rigid criteria, such as visa requirements and standardized educational credentials, which do not account for the diverse backgrounds of migrant workers. This leads to the systematic undervaluation of their competencies and experiences, consistent with the concept of statistical discrimination, where imperfect information about migrant workers results in biased decision making.

Cultural differences and language barriers emerge as significant obstacles that hinder migrant workers' integration and career advancement. The shift toward digital and remote interactions exacerbates these challenges, creating a sense of isolation and limiting opportunities for personal interaction and mentorship. The competition with local workers, compounded by visa issues and the need for job sponsorship, further complicates the employment landscape for migrants. Automated systems that exclude candidates based on

their visa status effectively reduce job opportunities, aligning with the previous findings on the additional scrutiny and barriers faced by migrant workers.

The rapid technological advancements of Industry 5.0 necessitate continuous learning and adaptation. Migrant workers, already grappling with language and cultural adjustments, find this additional demand overwhelming. The fear of job displacement due to AI and automation is particularly acute among low-skilled migrant workers, who are most vulnerable to technological unemployment. However, highly skilled migrant employees also face challenges, as their foreign qualifications and extensive experience are often not fully recognized by automated systems, highlighting the need for more nuanced and human-centric approaches to integrating AI in HR processes.

To address these issues, several policy and organizational changes are necessary. First, the design of HRM technologies must incorporate mechanisms to accurately assess and value foreign qualifications and experiences. Integrating human oversight into automated systems is crucial to contextualize and appreciate the diverse backgrounds of migrant employees. Second, organizations should implement training programs specifically tailored for migrant workers, helping them bridge the technological gap and acquire the necessary digital skills. These programs can enhance their competitiveness in the rapidly changing job market and support their long-term career development. Third, creating inclusive workplace cultures that value diversity and foster personal interactions is essential. Companies should facilitate mentorship and support networks for migrant employees, helping them integrate and thrive within the organization. Regular feedback and dialogue can also help identify and address biases in automated systems, ensuring a fair and equitable workplace for all employees.

The transition to Industry 5.0 presents both opportunities and challenges for migrant workers. Advanced technologies promise to enhance efficiency and reduce human biases in HR processes, but they also risk perpetuating and exacerbating existing inequalities. Our findings highlight the need for careful design and implementation of these technologies, ensuring they accurately assess and value the diverse qualifications and experiences of migrant employees. By adopting inclusive practices that support the integration and career development of migrant workers, organizations can harness the full potential of their diverse workforce and contribute to a more equitable and inclusive labor market. Future research should continue to explore the complex dynamics of discrimination in the context of Industry 5.0, providing further insights into effective strategies for fostering inclusivity and equality in the workplace.

Our findings align with the existing research that highlights both the positive and negative impacts of advanced technologies in the workplace. For example, similar to [Bogen and Rieke \(2018\)](#), our study found that AI-driven HRM systems have the potential to perpetuate discrimination when biased data are used in the design of these systems. Furthermore, [Zschirnt and Ruedin \(2016\)](#) also reported that migrant workers with foreign names often face discrimination, which resonates with our finding that migrant workers encounter significant barriers in automated resume screening processes. However, our research uniquely highlights how the Industry 5.0 context specifically amplifies these issues due to the increased reliance on technology in HR processes, which is less explored in previous studies. While previous research ([Ten Berge and Tomaskovic-Devey \(2022\)](#)) discusses the vulnerability of migrant workers to job losses due to automation, our study adds nuance by examining how this automation can reinforce both taste-based and statistical discrimination in more sophisticated ways.

This study contributes to the growing body of literature on discrimination in the workplace, particularly in the context of Industry 5.0. Theoretically, it extends the understanding of the human capital theory (HCT) by demonstrating that, even with advanced technology, biases in decision making persist, suggesting that technological advancements do not automatically equate to fairness. Our findings challenge the assumption that technological systems are inherently neutral, supporting the notion that the implementation and design of these systems need to be critically examined.

From a practical standpoint, the study has several implications for Human Resource Management (HRM) practices. Organizations must recognize the dual potential of AI-driven HR systems to either mitigate or exacerbate discrimination. Practical steps, such as ensuring that automated systems are transparent, include diverse datasets, and are regularly audited for biases, are necessary to avoid perpetuating discrimination. Additionally, targeted training programs and support systems must be developed to help migrant workers adapt to the demands of Industry 5.0, particularly those related to technological fluency and skill acquisition.

Despite the significant insights provided by this study, there are several limitations. First, the study is based on a relatively small sample of 15 migrant workers in the UK, which may limit the generalizability of the findings to other contexts and countries. Second, while the qualitative approach allowed for an in-depth understanding of personal experiences, it may not capture the full range of challenges faced by migrant workers across different industries and skill levels. Future research could expand the sample size and adopt a quantitative approach to test the findings in a broader context. Additionally, the focus on Industry 5.0 technologies means that other forms of discrimination, such as those that are not technology-related, were not explored in depth.

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## References

- Akundi, Aditya, Daniel Euresti, Sergio Luna, Wilma Ankobiah, Amit Lopes, and Immanuel Edinbarough. 2022. State of Industry 5.0—Analysis and Identification of Current Research Trends. *Applied System Innovation* 5: 27. [[CrossRef](#)]
- Almeida, Shamika, Mario Fernando, Zeenobiyah Hannif, and Shyamali C. Dharmage. 2015. Fitting the mould: The role of employer perceptions in immigrant recruitment decision-making. *The International Journal of Human Resource Management* 26: 2811–32. [[CrossRef](#)]
- Atkinson, Rowland, and John Flint. 2001. Accessing hidden and hard-to-reach populations: Snowball research strategies. *Social Research Update* 33: 1–4.
- Aydin, Erhan, Mushfiqur Rahman, and Emir Ozeren. 2023. Does Industry 5.0 reproduce gender (in) equalities at organisations? Understanding the interaction of human resources and software development teams in supplying human capitals. *Information Systems Frontiers* 1–15. [[CrossRef](#)]

- Battini, Daria, Nicola Berti, Serena Finco, Ilenia Zennaro, and Ajay Das. 2022. Towards industry 5.0: A multi-objective job rotation model for an inclusive workforce. *International Journal of Production Economics* 250: 108619. [CrossRef]
- Becker, Gary S. 2010. *The Economics of Discrimination*. Chicago: University of Chicago Press.
- Bogen, Miranda, and Aaron Rieke. 2018. Help Wanted: An Examination of Hiring Algorithms, Equity, and Bias. Upturn. Available online: <https://www.upturn.org/reports/2018/hiring-algorithms> (accessed on 5 September 2024).
- Borchardt, Miriam, Giancarlo M. Pereira, Gabriel S. Milan, Annibal R. Scavarda, Edithe O. Nogueira, and Leonel C. Poltosi. 2022. Industry 5.0 Beyond Technology: An Analysis Through the Lens of Business and Operations Management Literature. *Organizacija* 55: 305–21. [CrossRef]
- Cillo, Valentina, Gian Luca Gregori, Lucia Michela Daniele, Francesco Caputo, and Nathalie Bitbol-Saba. 2022. Rethinking companies' culture through knowledge management lens during Industry 5.0 transition. *Journal of Knowledge Management* 26: 2485–98. [CrossRef]
- Dhanani, Lindsay Y., Jeremy M. Beus, and Dana L. Joseph. 2018. Workplace discrimination: A meta-analytic extension, critique, and future research agenda. *Personnel Psychology* 71: 147–79. [CrossRef]
- Fraj, JihaD, and Várallyai László. 2021. Literature review: Artificial intelligence impact on the recruitment process. *International Journal of Engineering and Management Sciences* 6: 108–19. [CrossRef]
- Ganer, S. D., S. O. Kediya, A. K. Suchak, S. K. Dey, and G. Band. 2022. Analytical study of HRM practices in industry 5.0. Paper presented at the IOP Conference Series: Materials Science and Engineering, Nagpur, India, May 26–28, vol. 1259, p. 012041.
- Guo, Grace Chun, Luciana Turchick Hakak, and Akram Al Ariss. 2021. Institutional logics and foreign national origin based inequality: The case of international migrant employees. *Human Resource Management Review* 31: 100706. [CrossRef]
- Houghton, Jonathan, Wendi Sun, and Le Thi Thanh Loan. 2018. Discrimination against Migrants in Urban Vietnam. *International Advances in Economic Research* 24: 211–32. [CrossRef]
- Harrison, David. A., Teresa L. Harrison, and Margaret A. Shaffer. 2021. HRM challenges for immigrant employees: Status-laden transitions across cultures and workplace social environments. *Research in Personnel and Human Resources Management* 39: 203–37.
- Kadarik, Kati, Emily Miltenburg, Sako Musterd, and John Östh. 2021. Country-of-origin-specific economic capital in neighbourhoods: Impact on immigrants' employment opportunities. *Environment and Planning A: Economy and Space* 53: 1201–18. [CrossRef]
- Kolade, Oluwaseun, and Adebowale Owoseni. 2022. Employment 5.0: The work of the future and the future of work. *Technology in Society* 71: 102086. [CrossRef]
- Laskowska, Agnieszka, and Jan Franciszek Laskowski. 2022. "Silver" Generation at Work—Implications for Sustainable Human Capital Management in the Industry 5.0 Era. *Sustainability* 15: 194. [CrossRef]
- Marshall, Catherine, and Gretchen B. Rossman. 2006. *Designing Qualitative Research*, 4th ed. Thousand Oaks: Sage.
- Noy, Chaim. 2008. Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of Social Research Methodology* 11: 327–44. [CrossRef]
- Orlova, Ekaterina V. 2021a. Design of Personal Trajectories for Employees' Professional Development in the Knowledge Society under Industry 5.0. *Social Sciences* 10: 427. [CrossRef]
- Orlova, Ekaterina V. 2021b. Innovation in Company Labor Productivity Management: Data Science Methods Application. *Applied System Innovation* 4: 68. [CrossRef]
- Petrozziello, Allison J. 2019. (Re)producing Statelessness via Indirect Gender Discrimination: Descendants of Haitian Migrants in the Dominican Republic. *International Migration* 57: 213–28. [CrossRef]
- Raja Santhi, Abirami, and Padmakumar Muthuswamy. 2023. Industry 5.0 or industry 4.0 S? Introduction to industry 4.0 and a peek into the prospective industry 5.0 technologies. *International Journal on Interactive Design and Manufacturing (IJIDeM)* 17: 947–79. [CrossRef]
- Reskin, Barbara F. 2003. Including mechanisms in our models of ascriptive inequality. *American Sociological Review* 68: 1–21. [CrossRef]
- Risberg, Annette, and Laurence Romani. 2022. Underemploying highly skilled migrants: An organizational logic protecting corporate 'normality'. *Human Relations* 75: 655–80. [CrossRef]
- Shanmugam, Mohana, Yen-Yao Wang, Hatem Bugshan, and Nick Hajli. 2015. Understanding customer perceptions of internet banking: The case of the UK. *Journal of Enterprise Information Management* 28: 622–36. [CrossRef]
- Soleimani, Melika, Ali Intezari, and David J. Pauleen. 2022. Mitigating cognitive biases in developing AI-assisted recruitment systems: A knowledge-sharing approach. *International Journal of Knowledge Management (IJKM)* 18: 1–18. [CrossRef]
- Ten Berge, Jannes, and Donald Tomaskovic-Devey. 2022. Immigrant-biased technological change: The effect of new technology implementation on native and non-Western immigrant employment in the Netherlands. *Social Forces* 101: 404–39. [CrossRef]
- Thornton, Patricia H., William Ocasio, and Michael Lounsbury. 2012. *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. Oxford: OUP.
- Zikic, Jelena, Jaime Bonache, and Jean-Luc Cerdin. 2010. Crossing national boundaries: A typology of qualified immigrants' career orientations. *Journal of Organizational Behavior* 31: 667–86. [CrossRef]
- Zschirnt, Eva, and Didier Ruedin. 2016. Ethnic discrimination in hiring decisions: A meta-analysis of correspondence tests 1990–2015. *Journal of Ethnic and Migration Studies* 42: 1115–34. [CrossRef]

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