

Original Article

Effective E-Recruitment Strategies and Sustainable Competitive Advantage: A Role of Artificial Intelligence

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ABSTRACT

The study seeks to analyze the role of Artificial Intelligence in the E-recruitment platforms and associated with Sustainable Competitive Advantage for the organisations in Pakistan. The moderating effect of Artificial Intelligence on the relationship between, Job Portals, Corporate websites, Social Networking Sites, and Recruitment Agencies with SCA was researched on the recruitment platforms. A Smart PLS was used to interpret the results from the survey questionnaire based on 400 HR professionals' opinions collected from the Pharmaceutical and FMCG industries. The results reveal that the HR professionals in Pakistan are not considering AI as a moderating variable in the E-recruitment process. Still, they view AI as an independent variable and it has a positive effect on SCA. The HR professionals who judge SCA contribution by the E-recruitment platforms considered Corporate Websites and Social Networking Sites to be the most valuable. The research outcome showed that Corporate Websites and Social Networking Sites are considered effective by HR professionals in Pakistan and other platforms are not very helpful. This means that there is a requirement for credible and supporting Job Portals as well as recruitment agencies that HR managers can trust.

Keywords: *E-Recruitment, Fast-moving Consumer Goods, Role of Artificial Intelligence, Sustainable Competitive Advantage*

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INTRODUCTION

In recent years, university performance has been the area of focus for Digital Transformation and its intersection with Human Resource Management (HRM). In today's world, organizations are constantly trying to stay competitive, and therefore universities are turning their attention to digital tools and practices of human resources. Purwanto et al. (2023) focus on the impact of digital transformation and HRM in enhancing the performance of the university. When these technologies are properly synergized, they cannot only simplify administrative work but also mandate strategic decisions that result in positive outcomes in sum. Nicolás-Agustín et al. (2022) also observe that HR practices are a key factor for the successful adoption of digital transformation and that there is a need for a strategic agreement between HRM and technology adoption.

One of the important elements of the digital transformation of the practices of HR is E-recruitment. Kucherov and Tsybova (2022) uncover how Russian companies use e-recruitment and what benefits they get from new e-recruitment practices, on the one hand, and demonstrate that e-recruitment solutions contribute to better recruitment outcomes. Not only does this digital approach lower the amount of administrative burden, but by so doing, it also adopts a sustainable approach to recruitment that matches our contemporary need for greater sustainability in HR processes. Additionally, as pointed out by Blanka et al. (2022), digital transformation will also not be successful if the employee competence is not secured when they need to take advantage of the potential of digital technologies in HRM. On the other hand, strategic HRM and knowledge management practices have a huge impact on reinforcing sustainable competitive advantages. The long-term advantages of HRM practices including digital tools that might contribute to innovation within the organization and to a sustainable competitive advantage (Alfawaire & Atan, 2021). For continuous economic success in an ever more digital world, it is important to see this HR practice and organizational innovation alignment. Likewise, the paper of Arshad et al. (2023) argue that the E-HRM practices have implications on bank performance particularly in terms of E-recruitment, E-training, and E-HR evaluations. However, these practices don't just contribute to increased efficiency of the organization but also help promote employee engagement which then helps boost outcomes.

Digital technologies are being integrated with HRM

practices which are changing organizational operations and positioning the HR functions as strategic partners for achieving competitive advantage. According to the research, e-recruitment and other E HRM practices are essential to achieving scope for operational efficiency and attracting talent using sustainability goals. These findings emphasize the need for organizations to stay current with these changes and incorporate this practice of digital HRM, as avoiding that may put them at peril to their future of excellence and growth.

Research Objectives

These study objectives have been developed from the problem statement and correspond with E-recruitment and Sustainable Competitive Advantage (SCA) variables:

- To establish the key connection between Social Media recruitment and SCA.
- To evaluate whether corporate website recruitment creates significant relationships with SCA.
- To investigate the correlation between Recruitment Agencies and SCAs.
- To examine how SCA responds to Job Portal recruitment methods.
- To evaluate how Artificial Intelligence affects the association between Social Media recruitment and SCA.
- To examine Artificial Intelligence as a moderation variable for the social cognitive attitudes between corporate website recruitment and SCA.
- To investigate how Artificial Intelligence influences the SCA variables in the relationship between SCA and Recruitment Agencies.
- To examine how Artificial Intelligence impacts the link between Job portal recruitment and SCA.

LITERATURE REVIEW

Electronic recruitment (e-recruitment) and artificial intelligence (AI) integration in human resource management (HRM) have greatly changed the way organizations operate, making it possible to create a sustainable competitive advantage (SCA). Digital platforms used for e-recruitment enable companies to expand the talent pool attracted to the company and increase the efficiency of the recruitment process. However, AI could further refine and speed up this process by automating resume screening, assessing candidates, and then making better decisions while minimizing bias (Armstrong & Taylor, 2023). Individual

intentions (and hence behavior) are said to be under the influence of their attitudes, subjective norms, and perceived behavioral control (Ajzen, 1985), according to the Theory of Planned Behavior (TPB). Attitudes of HR professionals toward the use of digital tools in the implementation of digital recruiting technology in organizations and perceived social pressure from their intention to adopt e-recruitment as a strategy (Valecha, 2022). Based on this theoretical framework, firms are more likely to adopt e-recruitment practices if HR managers have a favorable attitude toward technology, feel a normative expectation of using digital platforms, and are confident about their skills in using these tools (Al-Busaidi et al., 2021). Following this, the proposed hypotheses according to the impact of e-recruitment channels on SCA and the moderating role of AI based on the TPB.

H₁: Recruitment via social media has a positive effect on sustainable competitive advantage.

Organizations have the chance to gain access to a huge number of candidates as well as a diverse pool that enables them to attract talent specifically aligned with organizational needs (Alfawaire & Atan, 2021). Social media empowers job seekers to utilize social media to the extent to enhance job posting visibility and facilitate organizations' engagement with potential candidates (Battour et al., 2021). Since this increased engagement can result in a more efficient recruitment process, as well as a match between the candidate and the organization's culture, it will create a more efficient sustainable competitive advantage (SCA) (Alfawaire & Atan, 2021).

H₂: Sustainable competitive advantage can be promoted through the successful recruitment of employees from corporate websites.

Through a corporate website, an organization is a direct way to present its brand and culture to a potential candidate without having to use an employment agency (Fabrizio et al., 2022). A good corporate website designed and informed to be a good fit for the corporation as well as the candidates will help in promoting employee retention and performance (Gilch & Sieweke, 2021). Sustainable competitive advantage (SCA) is more likely to be accomplished when candidate sources are aligned with organizational culture. Recruitment through recruitment agencies positively encourages sustainable competitive advantage (Alfawaire & Atan, 2021). Moreover, recruitment agencies have a particular aptitude for business and are acquainted with potential applicants, their strengths, as well as their flaws can be beneficial in expediting hiring and

selecting a perfect candidate (Fabrizio et al., 2022). By utilizing the resources and experience of recruitment agencies, organizations get to employ a much larger talent pool much faster, cutting back on the time to hire, which in turn contributes to operating efficiency and SCA. Therefore,

H₄: Recruitment via job portals positively influences sustainable competitive advantage.

Job portals aggregate and bring together job listings and candidate profiles, having it all in one place for both employers and job seekers (Kucherov & Tsybova, 2022). Job portals enable organizations to manage applications more efficiently and find candidates with the required skills and experience (Cavaliere et al., 2021). The efficiency in the recruitment process can result in cost savings as well as reduced time-to-hire, which streamlines better organizational competitiveness (Kucherov & Tsybova, 2022).

H₅: Social media recruitment is moderated by artificial intelligence in terms of its relationship with sustainable competitive advantage.

Social media recruitment has been augmented with AI technologies that can parse data from social media platforms to look for patterns and predict candidate success (Blanka et al., 2022). Integration of AI enables organizations to optimize their recruitment strategies to specifically reach out and recruit candidates who are more likely to succeed and align with the organization, thereby positively impacting SCA (Cavaliere et al., 2021).

H₆: Artificial intelligence moderates the relationship between corporate website recruitment and sustainable competitive advantage.

AI can personalize the candidate experience on corporate websites by providing tailored content and job recommendations based on user behavior and preferences (Kumar & Nagrani, 2020). This personalization can increase candidate engagement and satisfaction, leading to a higher quality of applicants and a better fit between candidates and the organization, thereby enhancing the contribution of corporate website recruitment to SCA (Magno et al., 2024).

H₇: Artificial intelligence moderates the relationship between recruitment agencies and sustainable competitive advantage.

AI can augment the capabilities of recruitment agencies by automating candidate screening and matching processes, allowing for a more efficient and accurate selection of candidates (Tschang & Almirall, 2021). This technological enhancement can improve

the quality of hires and reduce the time and cost associated with recruitment, thereby strengthening the role of recruitment agencies in achieving SCA (Purwanto et al., 2023).

H₈: Artificial intelligence moderates the relationship between job portal recruitment and sustainable competitive advantage.

AI can enhance the functionality of job portals by providing advanced search algorithms and predictive analytics, enabling organizations to identify and engage with the most suitable candidates more effectively (Blanka et al., 2022). This technological advancement can improve the efficiency and effectiveness of the recruitment process, contributing to the organization's competitive advantage (Dixit et al., 2021).

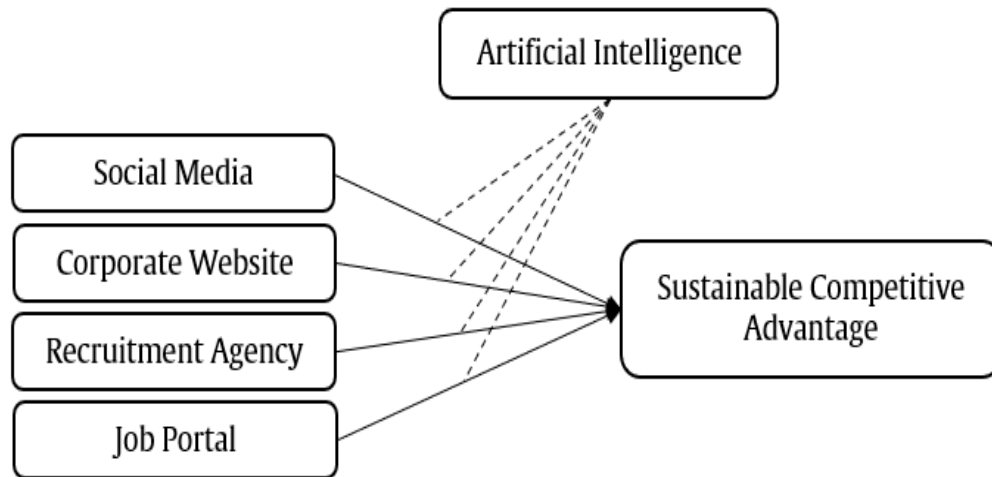


Fig. 1. Conceptual Framework

METHODOLOGY

This study employs a quantitative research methodology to examine the impact of E-recruitment sources and the moderating role of Artificial Intelligence (AI) on Sustainable Competitive Advantage (SCA) within the Pharmaceutical and Fast-Moving Consumer Goods (FMCG) industry. Primary data were collected using a structured survey questionnaire from Human Resource (HR) professionals at different organizational levels i.e. Director of HR, HR Manager, HR Partner, HR Executive, and HR Consultant. To measure perceptions of the (E) recruitment sources, AI integration, and SCA, a questionnaire was developed using a five-point Likert scale to which the respondents answered from 'Strongly Disagree' to 'Strongly Agree'. The Pharmaceutical and FMCG HR sample was taken from the ones who worked online, so the survey was given online through Google Forms.

A primary data survey questionnaire was developed for collecting data from HR professionals of various levels of the organization such as the Director of HR, HR Manager, HR Partner, HR Executive, and HR Consultants across the industry. A five-point Likert Scale (1 – Strongly disagree, 5 – strongly agree) questionnaire was used to assess the permissiveness of E-recruitment

sources, AI integration, and Sustainable Competitive Advantage (SCA). The target and relevant sample of HR professionals in the Pharmaceutical and Fast-Moving Consumer Goods (FMCG industry) completed the survey through the Google Forms survey link. For this, purposive sampling was used to choose participants with other specified expertise on HR practices and E-recruitment. A general type of sampling, this non-probability sampling method suits basically when the researcher has a fair idea regarding particular attributes which he wishes to analyze and also wishes to contain a sample which precisely represents that attribute. The sample size was constructed to be 400 respondents which exceeded the minimum requirement of 384 for a 95% general's degree, fortifying reprise of the findings (Dixit et al., 2021).

Smart PLS 3.3.5 software was used to do data analysis and decompose the analysis to partial least squares structural equation modeling (PLS-SEM) to clarify the complexity of relationships between variables. PLS-SEM is an analysis that is suited for exploratory research and can effectively handle small sample sizes, which are important for exploratory research (Shamsiya, 2023). The data collected was first evaluated with respect to the evaluation of the measurement model for internal consistency, convergent validity, and discriminant

validity, and then to test the hypothesized relationships within the structural model. Explanatory power and predictive relevance of the model are analyzed based on key metrics of R-squared, F-squared, and Q-squared (Banmairuroay et al., 2022).

Survey questionnaires have been widely used in HR research, covering a systematic method of reporting on a number of practices related to HR and their outcomes. For example, survey research is used by HR professionals to provide strategic direction for the different functional areas and the organization as such, as exemplified in conducting analyses of internal strengths and weaknesses, in addition to opportunities and threats from the external environment, for decisions on subsequent action (Lee, 2021). Therefore, PLS-SEM has been widely used in HRM research for data analysis because the model of latent constructs is better and also can deal with nonnormal data distribution, and so on for datasets with smaller sizes. In particular, it is highly desirable when there exist complex inter-variable relationships in HR studies (Cheung et al., 2024).

RESULTS & FINDINGS

Table 1
Discriminant Validity

Variables	AI	CW	ERec	JP	SNS	SCA
AI	0.752					
CW	0.544	0.746				
ERec	0.606	0.603	0.753			
JP	0.598	0.538	0.635	0.713		
SNS	0.503	0.437	0.479	0.492	0.721	
SCA	0.503	0.531	0.417	0.463	0.482	0.733

AI = Artificial Intelligence
 CW = Corporate Websites
 ERec = E-Recruiting Agencies
 JP = Job Portals
 SNS = Social Networking Sites
 SCA = Sustainable Competitive Advantage

The Measurement Model

The psychometric evaluation of the scales showed that items with outer loadings between 0.694 and 0.795 met reliability standards. Composite reliability

The results and explanations from Smart PLS analysis assess both the measurement quality and reliability of the questionnaire. Outer loadings revealed item reliability to exceed 0.745 and reach up to 0.90 thereby confirming their acceptance as a measure of internal consistency. All items with loadings lower than 0.70 received removal to maintain reliability standards. Assessments of Composite Reliability (CR) demonstrated high internal consistency between variables since all constructs achieved values between 0.936 and 0.957. The constructs demonstrated effective factor convergence based on Average Variance Extracted calculations which produced values between 0.676 and 0.730 surpassing the minimum standard of 0.50. Discriminant validity assessment compared both the AVE square root values and the cross-loading data from other construct variables. The evaluation results showed that the square root values of Average Variance Extracted values fell between 0.822 and 0.854 above which demonstrated a separate identity between each of the latent variables. The study results demonstrate that research constructs display reliable and valid measurements since they produce strong internal consistency alongside appropriate discriminant validity.

(0.764–0.840) and average variance extracted (0.508–0.567) both exceeded the recommended thresholds, confirming internal consistency and convergent validity.

Table 2
Loadings, CR, and AVE

Construct	Items	Loadings	AVE	CR
AI	AI1	0.724	0.566	0.796
	AI2	0.795		
	AI4	0.735		
CW	CW1	0.776	0.556	0.790
	CW2	0.712		
	CW3	0.748		
ERec	ERec1	0.738	0.567	0.840
	ERec2	0.779		
	ERec3	0.728		
	ERec5	0.767		
JP	JP2	0.694	0.508	0.805
	JP4	0.703		
	JP9	0.735		
	JP13	0.719		
SNS	SNS1	0.715	0.519	0.764
	SNS2	0.699		
	SNS3	0.748		
SCA	SCA1	0.740	0.537	0.823
	SCA2	0.754		
	SCA7	0.725		
	SCA11	0.712		

AI = Artificial Intelligence

CW = Corporate Websites

ERec = E-Recruiting Agencies

JP = Job Portals

SNS = Social Networking Sites

SCA = Sustainable Competitive Advantage

CR = Composite Reliability

AVE = Average Variance Extracted

Assessment for Structural Model

The confirmation assessment of measurement models represents the second phase of PLS path modeling that allows researchers to analyze the

Table 3

Results of direct effects and indirect effect

Relationship	T-value	P-value	Decision
AI -> SCA	3.228	0.001	Supported
CW*AI>SCA -> SCA	0.894	0.371	Not Supported
CW -> SCA	4.341	0.000	Supported
ERec -> SCA	1.540	0.124	Not Supported
ERA*AI>SCA -> SCA	1.877	0.061	Not Supported
JP*AI>SCA -> SCA	0.895	0.371	Not Supported
JP -> SCA	1.220	0.222	Not Supported
SNS*AI>SCA -> SCA	0.961	0.337	Not Supported
SNS -> SCA	3.333	0.001	Supported

The results show that AI, CW, and SNS all have a significant positive impact on SCA. However, AI's moderating effect was not significant, suggesting it

structural model. Evaluation of the structural model commences with testing theoretical connections. Table 3 shows the findings about the direct and mediating effects.

should only be treated as an independent variable. The revised conceptual framework, depicted in Figure 2, reflects only valid items based on outer loadings.

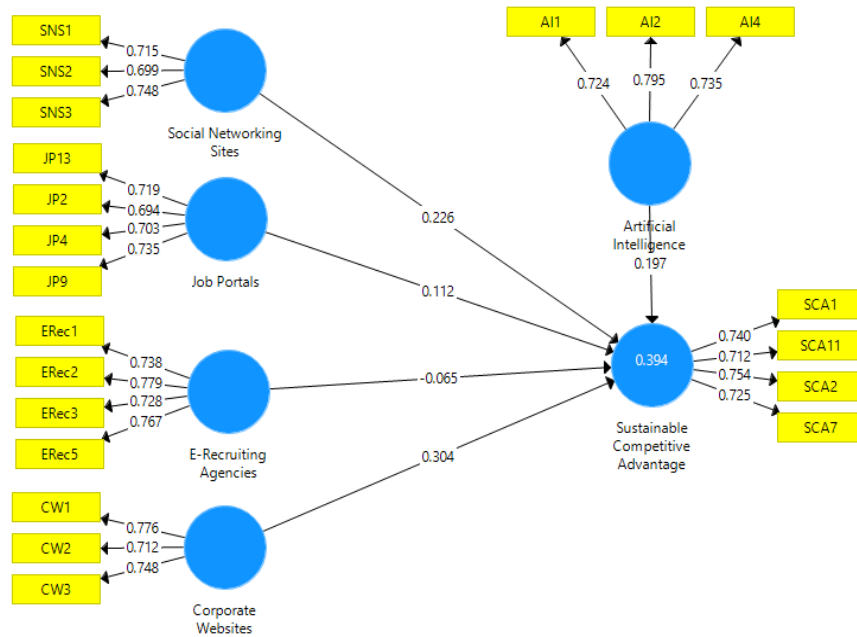


Fig. 2. Conceptual framework with outer loadings

Figure 3 illustrates the conceptual framework with t-values for SNS, CW, and AI showing significant relationships with SCA, as their t-values exceed 2. However, JP, ERec, and AI’s moderating effect have

t-values below 2, indicating no significant relationship. The final framework includes SNS, CW, and AI as independent variables.

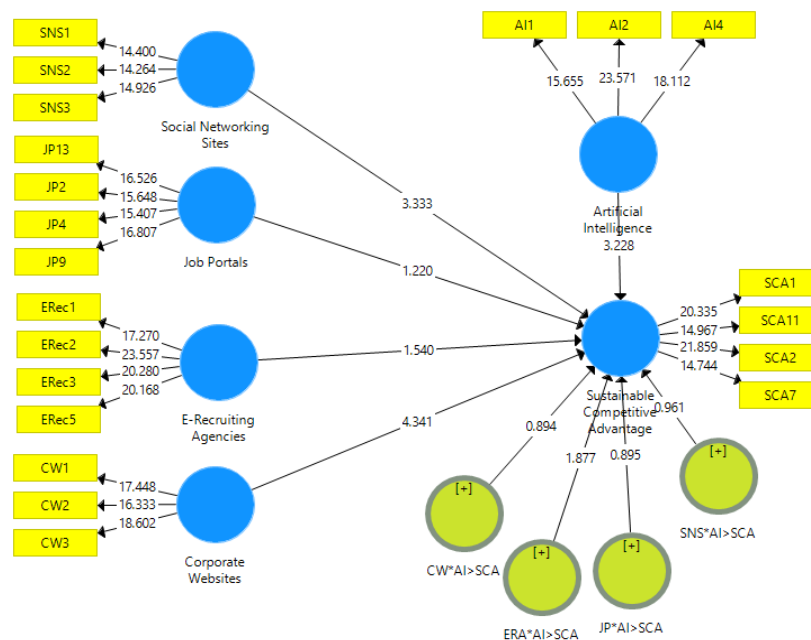


Fig. 3. Conceptual Framework with t-Values

Discussion

This study examined the role of E-recruitment in achieving Sustainable Competitive Advantage (SCA) and the moderating effect of Artificial Intelligence (AI) in the recruitment process. The empirical findings supported hypotheses H₁, H₂, and H₈, indicating that certain

E-recruitment practices, along with the integration of AI, can contribute to achieving sustainable competitive advantage. However, hypotheses H₃, H₄, H₅, H₆, and H₇ were not supported, suggesting that HR professionals do not strongly perceive these relationships as significant in their current organizational practices. These findings are partially consistent with previous

studies that highlight how E-recruitment enhances organizational efficiency by reducing recruitment costs, improving candidate reach, and increasing recruitment effectiveness (Parry & Tyson, 2008; Holm, 2012). Earlier research has suggested that digital recruitment systems allow organizations to attract a larger talent pool and improve the quality of hiring decisions, which may contribute to long-term organizational competitiveness (Chapman & Webster, 2003). However, the present study indicates that the adoption of E-recruitment as a strategic tool remains limited in the pharmaceutical and FMCG sectors in Pakistan. This may be attributed to the continued reliance on traditional recruitment practices, which remain prevalent in many developing economies.

Furthermore, the results suggest that HR professionals may not yet perceive sustainable competitive advantage as a direct outcome of E-recruitment practices. One possible explanation is that the benefits of digital recruitment systems often emerge over the long term, making them less visible to practitioners focused primarily on short-term operational outcomes. Previous studies have also highlighted that organizations require sufficient technological infrastructure and strategic HR orientation to fully realize the advantages of digital recruitment systems (Bondarouk et al., 2017). Another important finding relates to the role of Artificial Intelligence in recruitment. The results indicate that many HR professionals have limited familiarity with AI-based recruitment tools. Prior studies have suggested that AI technologies can significantly improve recruitment decision-making by automating candidate screening, reducing human bias, and enhancing efficiency in the hiring process (Upadhyay & Khandelwal, 2018). However, the effectiveness of such technologies largely depends on the digital readiness and technological capabilities of HR departments. In many organizations, resistance to technological change and limited training opportunities hinder the successful adoption of AI-based recruitment systems (Tambe et al., 2019).

Additionally, a considerable proportion of respondents in this study had relatively limited professional experience, which may have influenced their ability to evaluate the potential advantages of AI in recruitment processes. The lack of exposure to modern recruitment technologies may also lead to uncertainty or neutral responses regarding the strategic importance of AI in recruitment practices. Overall, the study highlights that although e-recruitment and AI possess considerable potential to enhance recruitment effectiveness and organizational competitiveness, their

adoption in the Pakistani context remains at an early stage. Organizations should invest in technological infrastructure, HR training, and awareness programs to promote the effective utilization of digital recruitment systems. By strengthening the technological capabilities of HR departments and encouraging digital transformation in recruitment practices, firms can better leverage E-recruitment and AI technologies to achieve sustainable competitive advantage in an increasingly competitive business environment.

CONCLUSION

At present times, businesses largely rely on the use of technology to spur recruitment processes with E-recruitment being an important method used by businesses to attract talent. This study examined how E-recruitment platforms (Social Networking Sites, Job Portals & Corporate Websites) influence Sustainable Competitive Advantage (SCA) in the pharmaceutical and FMCG sectors. Additionally, it also discussed how Artificial Intelligence (AI) moderates this relationship. The results indicate that, while e-recruitment platforms and AI are perceived by HR professionals as instruments with the potential to impact SCA, they are yet to be viewed as a moderating factor in these trends. According to the findings, many HR professionals are not well versed in the fact that AI is affecting the recruitment process – and in most cases, they are, because it has not been integrated sufficiently in their recruitment practices. Improvements may be noticeable to some of senior management, but little to junior HR professionals. Its limitations are limited to the industries of HR professionals discussed, and the inclusion of fewer experienced participants. Further research could include asking for expert opinions from more tech-savvy industries or from in-depth interviews to elicit a more precise focus. Also, other e-recruitment tools like Applicant Tracking System and gamification can be explored that can add some more information on changing recruitment environment.

Managerial Implications

There are several managerial implications from the findings where we suggest that AI plays a vital role in E-Recruitment in Pakistan. Due to their roles in recruitment, they do not get exposed to the potential of AI in the screening selection phase so they can't really understand the extent to which it can benefit HR. While junior staff who might only handle things such as payroll management are getting used to handling them, senior human resource staff in charge of coming up with recruitment policies are mainly facing the effect of the

automation of the task of screening CVs or conducting online interviews by the AI bots. Therefore, to fill these gaps, Pakistan needs to support the HR department through training programs on AI-based E-recruitment of junior HR professionals. It will also help them get a clear picture of the process of recruitment and equip them with more insights and ideas to contribute timely input in the HR practices that will be in turn more effective. Additionally, creating reports that measure performance results between AI-based E-recruitment systems and existing methods including cost-benefit analysis will help prove the profits of these systems in achieving SCA in the long run.

Competing Interest

The authors had no competing interests.

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