

# **Studies in Systems, Decision and Control**

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Reem Khamis · Amina Buallay  
Editors

# AI in Business: Opportunities and Limitations

Volume 1

 Springer

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# Preface

In the rapidly evolving landscape of modern business, artificial intelligence (AI) has emerged as a transformative force with the potential to revolutionize industries and redefine the way we work. The integration of AI technologies into various aspects of business operations has opened up new horizons, presenting both opportunities and limitations that demand careful exploration and understanding.

This book is a comprehensive compilation of knowledge and insights gathered from leading experts in the field. The selection of the 55 chapters included in this volume was meticulously conducted through a rigorous evaluation process. Each chapter underwent peer-review evaluation by at least two reviewers, in addition to thorough scrutiny by our team of editors. This meticulous approach ensures that the content presented within these pages is of the highest quality and represents the cutting-edge advancements in AI and its impact on business.

The book is divided into five parts, each focusing on a distinct aspect of AI's influence on business:

Part One: AI and Business Growth

Part Two: Finance, Technology, and Sustainability

Part Three: CSR, Technology, and Empowerment

Part Four: ICT, Technology, and Business

Part Five: Logistics Technology and Quality Management

This book holds great significance for both the academic and professional spheres. For academics, it provides a comprehensive reference that consolidates the latest research and insights on AI in business. The diverse range of topics covered in the book ensures that scholars and researchers can delve into specific areas of interest and gain a deeper understanding of the complexities surrounding AI's integration into business practices.

Professionals, on the other hand, will find this book to be a resource for navigating the ever-evolving landscape of AI in business. The chapters offer practical insights, real-world examples, and strategic frameworks that can guide decision-making, implementation, and innovation within organizations. Executives, managers,

and entrepreneurs will find the book to be an essential companion in their journey to harness the potential of AI and maximize its benefits while mitigating its limitations.

May this book inspire and empower readers to navigate the intricate landscape of AI, seize the opportunities it presents, and overcome the limitations it imposes in order to shape a prosperous and sustainable future for businesses worldwide.

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Uxbridge, UK  
February 2024

Dr. Reem Khamis  
Dr. Ameena Buallay

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Taimour Alrubaiat

# Perspectives of Human Resources Professionals on AI's Role and Impact in the Recruiting Process



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## 1 Introduction

In today's highly competitive job market, it may be difficult for businesses to find and hire qualified candidates. The talent acquisition team, like any other, must constantly weigh the benefits of quantity above quality. This makes it difficult for businesses to fill open positions with qualified people and to keep the costs associated with recruiting constant. Human resources workers also have to deal with the stress and time commitment of doing a variety of tasks every day.

The rise of the digital age has made the incorporation of technology into routine business procedures a must. With a global shortage of skilled workers and rising competition for top talent, businesses that fail to keep up with technology advances risk failing to recruit and retain top employees. Luckily, these problems may sometimes be solved by introducing new technological systems into the company. Technology adoption across the HR value chain is assisting businesses with pre- and post-employee engagement, applicant selection, recruitment process customization, and automation of HR professional's daily responsibilities, etc. With the advent of new business models and the digital era, competition for talent has intensified, making it imperative for organizations to use cutting-edge HR solutions such as artificial intelligence (AI) and cloud-based technologies.

Minsky [1] Artificial intellect: A Foundation for a New Discipline (1968) defines AI as "the scientific study of designing machines to perform tasks that would normally require a high level of intelligence in a human." The field of computer science that

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includes artificial intelligence is often cited as one of the top three technological advancements of our time. It draws from several fields, including computer science, biology, psychology, linguistics, and many more besides. Due to its ability to learn on its own, artificial intelligence is increasingly able to take on and successfully complete human-like activities. These aspects of AI are very useful in fields like healthcare, education, infrastructure, finance, etc. Neural networks, machine learning, predictive analytics, deep learning, etc. are all included under one umbrella term. One or more of these words may be implemented to accomplish the desired operational aim of the company enterprise. All of these branches of AI are presently being employed in the telecom business, the performance of high-tech behaviors, etc., where activities requiring intelligence and analysis are to be carried out.

Human resources (HR) operations may benefit greatly from the use of AI in modern businesses. As a result, HR processes including hiring, payroll, talent acquisition, policy access, and reporting may all be enhanced. Human resources experts agree that AI will have far-reaching effects on businesses and will enhance working conditions for all employees.

According to Bhardwaj [2], in reality, only a tiny percentage of the applications an organization receives are even somewhat competitive. He continued by saying that AI helps HR schedule and coordinate new hire onboarding as well as scan, screen, and choose candidates. He concludes by speculating that AI may help businesses with both forecasting and meeting their future workforce demands. Ahmed [3] said that the days of manually sorting through hundreds of resumes and profiles on internet job boards to find the best candidates for open positions would soon be over, and that AI would replace such labor-intensive operations. He went on to discuss how AI lessens the HR manager's burden while also boosting efficiency in the workplace.

According to the yoh.com blog There is a plethora of candidates but they don't have the appropriate credentials, and recruiters are losing the best ones to their competitors. Third, giving the interviewees a poor experience, Slow recruiting procedure and little internet presence 4. According to the findings of Dimple et al. [4], the automation of recruitment using AI apps in HRM is led by problem-solving and data-driven function control.

Dessler [5] noted that using AI-based recruiting tools would make the process easier, despite the fact that AI will continue to replicate mistakes made in the past. According to Niehueser and Boak's [6] research, AI increases productivity and efficiency. According to Sarah Fister Gale [7] HRD is crucial to an organization's success and requires cutting-edge technology like AI to be competitive throughout the company's life cycle. Moreover, the recruiter is a human being, which means they are subject to prejudice and error. To counteract this, we may use AI in the hiring process to establish objective standards and make better informed judgments about the applicants. The purpose of this research is to get an understanding of how artificial intelligence is used in the recruitment process. Knowing the goals and difficulties of the recruiting process, as well as the general public's view of artificial intelligence's place in it, is essential.

## 2 Importance of AI in the Job Search

Artificial intelligence (AI) is one of the most talked-about HR topics since it's altering the status quo. In order to incorporate human interactions in a variety of human resource operations, including recruiting, the response of HR enquiries, and the creation of individualized learning experiences, several well-known businesses, like Google and IBM, are building virtual assistants like Chabot's. According to research published in 2018, Joshbersin [7] discovered a new class of intelligent Chabot's may facilitate intelligent and simpler interactions. Human resource operations are predicted to be profoundly altered by the introduction of AI in the following three ways: The development of user-friendly interfaces, AI, and predictive algorithms. It's crucial to a company's hiring operations since it streamlines and automates otherwise laborious tasks. Artificial intelligence (AI) systems created specifically for use in HR departments may streamline processes like candidate screening, sourcing, and the identification of the best possible hires from a vast pool of applicants. Some examples of applications and functions are as follows:

- Beyond the scope of key words;
- Tailor-made solutions;
- New hire orientation
- Acceptance of an offer,
- Individualized learning and growth,
- Candidate re-engagement.

Table 1 shows AI Innovative Techniques used in different stages of recruitment process.

## 3 Literature Review

According to Jia et al. [8] the introduction of AI (also known as machine intelligence) has been motivated by a desire to create "thinking machines" that are capable of mimicking human intelligence and behavior. While algorithms may have trouble making fair and suitable conclusions without the help of AI, randomization may be a beneficial addition to the decision-making process. When AI is integrated with various business functions such as HR, finance, operations, marketing, etc., it can help businesses make more objective decisions, foster a more equitable workplace, and better deal with risks and uncertainties (Jarrahi, Shweta Jain.). According to Christopher McFadden's argument, on-demand services like Uber, Ola, Zomato, etc., have benefited greatly from the incorporation of AI features. Clearly, only 10% of corporations are making extensive use of AI right now, but by 2020, that number is predicted to rise to 36%. 9 Despite technological progress, Fraij and Laszlo [9] and Harver [10] stress that firms still have a significant barrier in adapting to new technologies. According to Abdeldayam et al. businesses must use conversational AI

**Table 1** AI innovative techniques used in different stages of recruitment

Screening programs with intelligence	In order to eliminate inefficiency and restore order, candidate screening software may be used to centralize and visualize the whole process
Chatbots for hiring	An automated messaging tool, a recruitment chatbot may guide potential employees through your company's employment site and through the application process
Recorded chat videos	An in-person interview may be replicated using a live video chat. You will be asked questions by an individual or panel of interviewers in real time
Boosting one's reputation	Effectively conducting interviews is a key component of the augmentation approach
Analyzing candidate's voices using a natural language processing algorithm	Information may be entered into the system through text/character recognition and speech/voice recognition; natural language processing (NLP) aids these applications in making sense of the inputted data
Superior competency evaluations	A competence test, also known as a competency assessment, is a procedure wherein one's skills are formally evaluated in relation to a set of standards
Text enhancement	Authoring job descriptions is made easier with an enhanced authoring platform. All members of your target audience will be interested in the job postings you write
Automating task aboard	By streamlining and automating tasks like employee background checks, paperwork, offer letter creation, training and meeting scheduling, document tracking, and the distribution of company policies and login information, artificial intelligence aids recruiters in performing the on-boarding functions of recruitment

for HR transactions if they want to stay competitive in the modern global economy. In order to improve HR productivity, businesses should use AI to handle routine administrative tasks. According to Jain [11] many businesses now employ these tools in their human resources operations.

According to Strohmeier and Piazza [12, 13] HRM is one of the functional areas that has begun to utilize via AI applications and has received a wide range of AI utilization implications. Human Resource Performance Evaluation (Zhang et al. 2012) [14], Employee Selection (Chien and Chen 2008) [8, 15], Employee Turnover (Sexton et al. 2005) [16], Emotional Involvement Prediction (Lucia-Casademunt et al.



2013) [17], and Employee Assignment (Karatop et al. 2015) [18] are just some examples of HRM functions where AI has been successfully implemented. The study topic of AI in HRM is relatively developing and undeveloped compared to other domains, according to Stroh Meier and Piazza [12, 13] as well as Tambe et al. (2019) [19]. Srivastava (2018) [20] chimes in to say that AI saves the HR manager time and energy by automating recruiting and handling the hiring of upper and middle management. He went on to say that AI is useful to businesses since it aids in personnel planning and productivity analysis. According to Jauhari (2017) [21], the significance of Chatbot in recruiting has expanded with the introduction of AI and neural networks, which in turn transformed the hiring procedures. Human resources professionals benefit from AI technologies and chatbots since they streamline processes like candidate communication, follow-up, screening, and selection, automated email dispatching, etc. In their study, Geetha and Reddy (2018) [22] discovered that AI helps keep data correct, saves money, and saves time throughout the recruiting process. According to Qamar et al. (2019) [23, 24], HR managers need to upgrade their knowledge and abilities to effectively implement technological change and adapt to the new realities presented by AI-enabled HR services. The initial step on the AI route involves making judgments based on algorithms, but progress has been sluggish in addressing difficulties related to personnel management at this stage. The complexity of HR phenomena, data issues from HR operations, fairness and legal limits, and employee attitudes to AI management are the four reasons why cited by Tambe et al. (2019).<sup>20</sup> Because of the potential for adverse consequences on employee behavior, we are also aware of the constraints imposed by a top-down, optimization approach to HR choices.

## 4 Methodology

Using a self-designed online questionnaire, this descriptive study collected data from 101 HR professionals working in a variety of businesses in and around Bengaluru, India (KMO and Bartlett's test of sample adequacy = 0.841). The statements for each variable were measured using a 5-point Likert scale, with 1 representing strongly disagreeing and 5 representing strongly agreeing.

The questionnaire's three scales are designed to measure, respectively, (1) the role of AI in the recruitment process (6 statements, Cronbach's alpha = 0.678), (2) candidates' preferences of AI in the recruitment process (6 statements, Cronbach's alpha = 0.825), and (3) AI's role in the recruitment process (9 statements). Through confirmatory component analysis, we found that the statements used to create each scale had a chi-square goodness-of-fit test value of 67.4, with a p value of less than 0.001.

The following assertions have been used to quantify the impact of AI in recruitment (AIR): Reduce hiring costs (AIR 3), boost recruiter efficiency (AIR 4), boost employee productivity (AIR 5), boost employee retention (AIR 6), automate screening to cut down on bias and errors (AIR 7), enhance corporate training and streamline employee onboarding (AIR 8), and reveal new insights on talent (AIR 9).

Analyze interviews, facial expressions, and word choice to evaluate applicant mood and engagement (RE1), and Create personalized feedback reports on top performers (RE2) are several ways that AI's impact on recruiting has been quantified. Image and post scanning and analysis on social media to boost recruiting (RE2).

Recruitment effectiveness 3 (RE3) is boosted by scanning candidate's work samples, resumes, and other application documents.

While artificial intelligence (AI) is the future of recruiting techniques (RE5), it cannot replace the importance of a personal touch (RE6), and chatbots and virtual assistants are becoming an increasingly feasible means for workers to acquire real-time responses. After that Candidate interest in the use of artificial intelligence (AI) in the hiring process has been quantified through, Candidates appreciate having their CVs screened by a computer (HRAI3), interviews conducted by a computer (HRAI4), pay negotiations conducted by a computer (HRAI5), and the time and money spent on the process reduced (HRAI6). Descriptive statistics, one-way analysis of variance, correlation, and simple linear regression were used to analyze the data in SPSS.

### **Objectives of the study**

- To understand the significance of AI in human resources and the hiring procedure.
- The goal of this survey is to determine how different segments of the HR workforce see the use of AI in the hiring process.
- The goal of this study is to quantify the recruiting process's sensitivity to and adaptability to applicant preferences for the use of artificial intelligence.

### **Hypothesis**

Hypothesis 1: There is a significant difference between AI in the recruitment process with various subsets of HR staff hiring process.

Hypothesis 2: There is a significant impact of Artificial intelligence's role and preference of AI on Recruitment Process.

### **Profile of the HR Personnel**

It turns out that 64% of respondents are men and 36% are women; 51% of respondents are between the ages of 31 and 40; 36% are between the ages of 31 and 50; 13% are between the ages of 41 and 50; and 56% of respondents have less than 5 years of experience, 33% have 6 to 10 years of experience, and 11% have more than 10 years of experience.

## **5 Analysis and Interpretation**

### **Descriptive Statistics**

For objective 1, which was to learn about the value of AI in the HR department and the hiring process, we calculated the mean, standard deviation, and number of replies for each statement to see how widely they were agreed upon (Tables 2, 3 and 4).

### **Analysis of Variance (Anova)**

**Table 2** Artificial intelligence in the HR function and recruitment

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
AIR1	0	0	3	38	38	3.3615	0.5537
AIR2	0	0	3	36	63	3.5887	0.5386
AIR3	0	3	5	15	77	3.3077	0.7310
AIR4	0	0	8	36	36	3.3836	0.6331
AIR5	0	3	18	36	33	3.3051	0.8338
AIR6	0	36	13	38	33	3.7336	1.3383
AIR7	0	0	5	63	31	3.3563	0.5386
AIR8	0	3	10	31	36	3.3077	0.7663
AIR9	0	8	15	33	33	3.0356	0.8038

\* Values are in % *Source* Primary Data

**Table 3** Artificial intelligence is used currently in the recruitment process

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
RE1	0	10	9	53	29	3.0001	0.9995
RE2	3	3	5	57	33	3.1292	0.9739
RE3	0	9	15	37	31	3.1027	0.9302
RE4	0	5	9	51	37	3.1795	0.7905
RE5	0	0	10	53	37	3.2573	0.7373
RE6	0	10	10	39	31	3.0010	0.9177

\* Values are in % *Source* Primary Data

**Table 4** Application of AI in the present recruitment process

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
HRAI1	0	31	13	31	37	3.8718	0.1833
HRAI2	0	8	10	51	31	3.0513	0.1373
HRAI3	0	31	8	31	31	3.7153	0.1975
HRAI4	0	37	15	13	37	3.1795	0.3031
HRAI5	0	31	15	15	38	3.3077	0.3050
HRAI6	0	15	10	33	31	3.8973	0.1733
HRAI7	0	0	10	57	33	3.3308	0.1003

*Source* Primary Data

Therefore, the alternative hypothesis is accepted, namely that there is a significant difference on artificial intelligence technologies in the recruitment process across demographic profiles of respondents, including age and gender, and work experience (Table 5).

**Table 5** ANOVA table

Source of variation between groups	Gender		Age		Work experience	
	Between groups	Within groups	Between groups	Within groups	Between groups	Within groups
SS	111.2033	30.7738	77.7135	41.1303	92.0065	43.4893
Df	1	76	1	76	1	76
MS	111.2033	0.3062	77.7135	0.5412	92.0065	0.5722
F	271.272					
p-Value	0.0000		0.0000		0.0000	
Hypothesis	Accepted		Accepted		Accepted	

Source Primary Data

**Simple Linear Regression Analysis**

Results of regression analysis (Table 6) reveals that overall regression model is fit at 0.05 significant level; prediction on Recruitment Process is significantly predicted by AI in Recruitment- and Candidate’s preference of AI in Recruitment—HRAI process and candidate’s preference of AI in Recruitment is highly impacting predictor, followed by AI in Recruitment.

The subsequent regression model is based on the findings of linear regression analysis.

$$\text{Studys Predictive Model : } y = \alpha + \beta X1 + \beta X2 + SE$$

whereas, y = Recruitment Process (RE);  $\alpha$  = Constant; X1 = AI in Recruitment (AIR) and X2 =

Candidate’s preferences of AI in Recruitment (HRAI) process.

$$RE = \alpha + \beta AIR + \beta HRAI + SE$$

$$RE = 1.865 + 0.239AIR + 0.354HRAI + 0.408$$

This leads us to accept the null hypothesis and instead consider the evidence for the alternative hypothesis, namely that the use of AI in the recruitment process (AIR) and candidate’s preferences for HRAI have had a major effect on the recruitment process.

**Table 6** Regression analysis

ANOVA		Multiple R	R Square	Coefficients			t Stat		p-value		Hypothesis
F Stat	p value			Intercept	AI R	HRAI	AI R	HRAI	AI R	HRAI	
12.2	< 0.011	0.6393	0.3076	1.965	0.23	0.353	1.9	3.93	0	< 0.01	Accepted

Source Primary Data

## 6 Findings and Discussions

According to descriptive data, the vast majority of HR professionals believe that AI helps make HR operations and hiring decisions more efficient. Regression analysis confirmed that AI is a strong predictor of success in the recruiting process, while ANOVA showed that HR worker's perspectives on AI varied considerably across gender, age, and work experience.

Employee's perspectives on AI technology are identified across age, gender, and years of experience in the workforce, and a null hypothesis is accepted. According to the results of the regression analysis, the independent variable successfully predicted the dependent variable. Therefore, the alternative hypothesis is adopted, which states that AI and cloud computing have an effect on the organization's hiring practices.

In addition, companies across all sectors and industries would benefit from allocating more resources into the recruiting process and hiring people who are adept in artificial intelligence. Employees may learn about the value of AI in recruiting and the impact it can have on the company's ability to attract and retain top talent via the provision of workshops and trainings in AI technology.

It is recommended to incorporate artificial intelligence into the overall tasks of the company along with recruitment as it will improve the quality of work in the company as the application of AI can increase the employee productivity and helps in employee retention and to make the work easier and faster. It's important for the organization to keep things personal throughout the hiring process, since there are certain skills that machines just can't replicate, such as the capacity to take calculated risks. It has been recommended that the corporation use AI not only for hiring purposes, but also for customer service, invoicing, detecting security breaches, etc.

## 7 Conclusion

The primary goal of the research was to shed light on the importance of AI technologies to the human resources department and the hiring procedure. The research highlighted the many applications of AI across the recruiting process and demonstrated its value to HR experts in locating top candidates. The organization's processes have evolved significantly thanks to AI. From the first stages of the hiring process (such as resume screening) all the way through to employee retention, this tool is indispensable. The most notable advantages of AI were found to be in the enhancement of work quality and the reduction of mundane jobs. It is crucial in molding a potential employee's impression of the organization. Recruitment costs may be lowered and employee output can be raised with the aid of AI. One major roadblock for AI is that no matter how sophisticated it becomes, it will never be able to completely replace the human element in the hiring process. According to the results of the research, AI plays a crucial role in the HR department, and the vast majority of workers agree that the firm relies heavily on AI for its present hiring procedures. Data were obtained

through online method, therefore although the study's findings may be useful, they may be limited to HR professionals in and around Bengaluru and not necessarily representative of the HR landscape at large. Future research may take the form of an analytical and comparative study across businesses, and the applications of AI to human resources can be investigated further. The primary goal of the research was to shed light on the importance of AI technologies to the human resources department and the hiring procedure. The research highlighted the many applications of AI across the recruiting process and demonstrated its value to HR experts in locating top candidates. The organization's processes have evolved significantly thanks to AI. From the first stages of the hiring process (such as resume screening) all the way through to employee retention, this tool is indispensable. The most notable advantages of AI were found to be in the enhancement of work quality and the reduction of mundane jobs. It is crucial in molding a potential employee's impression of the organization. Recruitment costs may be lowered and employee output can be raised with the aid of AI. One major roadblock for AI is that no matter how sophisticated it becomes, it will never be able to completely replace the human element in the hiring process. According to the results of the research, AI plays a crucial role in the HR department, and the vast majority of workers agree that the firm relies heavily on AI for its present hiring procedures. Data were obtained through online method, therefore although the study's findings may be useful, they may be limited to HR professionals in and around Bengaluru and not necessarily representative of the HR landscape at large. Future research may take the form of an analytical and comparative study across businesses, and the applications of AI to human resources can be investigated further.

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