

A STUDY ON THE ROLE AND IMPACT OF ARTIFICIAL INTELLIGENCE IN RECRUITMENT PROCESSES: THE PERSPECTIVE OF HR PROFESSIONALS

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Abstract

One of the best-known trends in the human resource sector is the application of artificial intelligence, as it is changing the ways things are being done. The one obstacle faced by organizations presently is in finding the best-fit candidate. Another key priority for organizations is to balance the speed, quality, and costs incurred during the hiring process.

It is seen that only 14 percent of organizations are having the proper talent acquisition technology which can give them powerful insights. Artificial intelligence helps to evaluate, process, and produce the data in a way that is completely intelligible by the HR managers. This study attempted to understand the role and importance of artificial intelligence technologies in the HR function and recruitment process. The data collected and analysed refers to the various factors such as the importance of artificial intelligence in recruitment, how it is applied presently in recruitment and the significance of it in different stages of recruitment, the different barriers of artificial intelligence, and the perception towards it across various demographic profiles.

Keywords: Artificial Intelligence, Technology, Human Resources, Recruitment, Process and HR professionals

1. INTRODUCTION

Organizations in recent years are facing a great deal of stress in hiring a suitable applicant from the flourishing competitive employment market. The talent acquisition team is always in a dilemma between qualities versus efficiency too. This means an organization struggles in finding the best quality candidate, and also in stabilizing the cost associated with an unoccupied post and the recruitment work. In addition to this, the HR professionals within an organization carry out different processes and functions on a daily basis which can be stressful and also time-consuming.

With the advent of the digital era, it has become inevitable for an organization to implement technology in their day-to-day functions. As the world is experiencing scarcity in key skills and

increasing talent demands organizations who doesn't adapt to these technological changes are more prone to face inefficiency in attracting talent to the organization. Implementing technology can act as a panacea for these challenges faced in the organization. The adoption of technology across the different processes of the HR value chain is helping firms in pre and post-employee engagement, in selecting the right candidate, personalization of the recruitment process, and in automating the HR professionals' day to day tasks, etc. One of the relevant topics in the HR technology is how the new-age technologies like AI and cloud-based technologies will help in building the future team of an organization which is transformed gigantically by different business models and digital era in competing for talent.

Artificial Intelligence is the science of creating machines do things that would need high level of intelligence if it is done by human being – M Minsky (ed) (1968). Artificial intelligence is considered as a part of computer science and is one among the world's best three technologies. It is a combination of various disciplines such as computer science, physiology, psychology, linguistics, and so on. Artificial intelligence is capable of self-learning because of which it can perform human-like tasks efficiently and effectively. These features of artificial intelligence are of great help to sectors like health care, education, infrastructure, financial service, etc. It is a blanket term that comprises terms such as neural networks, machine learning, predictive analytics, deep learning, etc. Depending on the goals of the business firm, one or more of these terms can be incorporated to achieve the expected operational objective. All these subsets of AI are being currently used in industries where tasks involving intelligence and analysis based namely telecom industry, hi-tech behaviours are to be performed, etc.

Artificial intelligence contributes significantly in boosting the activities of the HR department in an organization. They can improve HR functions such as recruitment, payroll, talent acquisition, policy and procedure accessing and reporting, etc. HR professionals believe that the impact and advantages of artificial intelligence are numerous in an organization that also improves the overall employee experience. However, Rajeev Bhardwaj (2019) said that from the majority of applications that organization receives from the candidates, few applications only are relevant to the organisation. He further mentioned that AI tools help the recruiters like scanning, screening, and selecting the candidates as well as planning, scheduling, and organizing the on boarding activities of the new hires. He concludes by saying that AI tools can predict the employee requirements in an organization and also can help in the retention of the employees.

Owais Ahmed (2018) said that the high amount of time involved in filtering of thousands of CVs and online job-board profiles to select new employees has come to an end and old-method of recruitment and human resource processes will be discarded and AI will be the new norm in the future. He further said that said that artificial intelligence increases the productivity of an organization's workforce and how it reduces the workload of the HR manager.

According to the yoh.com blog (2021) the major problems faced by the recruiters in the present




scenario are 1. Wide array of applicants without right qualifications, 2. Losing the right applicants to their peers, 3. Providing an inappropriate interview experience to the candidates, 4. Lack of strong online presence and delayed hiring process. Dimple et al (2018) from their research it is evident that problem-solving and data-driven function control lead the automation of recruitment by using AI applications in human resources management (HRM).



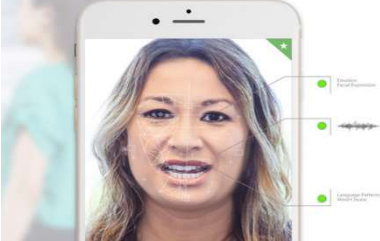



Dessler (2020) said that AI will continue to repeat decisions taken in the past but it will be simplified with the support of AI-based recruitment tools. Niehueser and Boak (2020) found that AI improving speed and task efficiency. Sarah Fister Gale (2019) said that HRD is a vital part of an organization and it needs technologies like artificial intelligence to be competitive in the different phases of business and therefore the employees and managers in an organization should know about AI. In addition to that, as a human being, the recruiter is always biased and can make mistakes, hence we can deploy the AI in recruitment process to ensure unbiased criteria and more accurate prediction about the candidate. Hence this study, an attempt is made to understand how an organization uses AI in their talent acquisition function. This involves understanding the role, importance and effect of AI in recruitment, their priorities, and challenges, understanding the perception on artificial intelligence on recruitment process.

Role of AI in Recruitment

The most discussed trends in the human resource sector is artificial intelligence, as it is changing the ways things are been done. Many popular companies such as Google and IBM are developing virtual assistants like Chabot’s to implement human interactions for various activities of human resource such, recruitment, for answering HR queries and for personalized learning experience etc. Joshbersin (2018) found that a new breed of intelligent Chabot’s can make interactions intelligent and easier. The use of AI in the human resource is expected to transform the HR activities in three intense ways they are: Emergence of interactive interface, Machine learning, Predictive models. It plays an essential part in the recruitment processes of an organisation by reducing and eliminating time consuming tedious works. The purpose of artificial intelligence which is designed for the recruitment activities in an organisation is to automate the tasks such as screening the resumes, sourcing etc. and identifying the best fit candidate to the organisation from a large pool of candidates. The following are some of the uses and roles: 1. going beyond key words, 2. Fast and accurate, 3. Customize needs, 4. Orientation of new employees, 5. Post offer acceptance, 6. Customized training and development, 7. Reengagement of candidates.

Table No: 1 AI Innovative Techniques used in Different Stages of Recruitment

<p>Intelligent Screening</p>	<p style="text-align: center;">CV Screening</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Your HR data</p> <p>CVs of your employees</p> </div> <div style="text-align: center;">  <p>Automated CV Screening</p> <p>Scan not only key words but meaning</p> </div> <div style="text-align: center;">  <p>Find patterns</p> <p>Talk to most promising candidates</p> </div> </div>		
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<p>Software¹</p>		
<p>Recruiter Chatbots^{2 3}</p>	<p style="text-align: center;">ChatBot & ML Assisting Application</p> 	
<p>Video Interview^{4 5}</p>		<p style="text-align: center;">Video Interview</p>  <ul style="list-style-type: none"> • Body language • Word choice • Tone • Interview transcript
<p>Profile Augmentation⁶</p>	<p style="text-align: center;">Profile Augmentation</p> 	
<p>Natural language process to analyse candidates' speech patterns⁷</p>	<p style="text-align: center;">Language competency</p>  <ul style="list-style-type: none"> • Fluency • Pronunciation • Vocabulary usage • Grammatical complexity • Topical coherence • Progression of ideas 	

¹https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/cv-screening-ai-luxoft.jpg

²https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/chatbot-ai-luxoft.jpg


³ <https://rallyrecruitmentmarketing.com/wp-content/uploads/2019/02/Yodelchatbot.png>

⁴https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/hirevue.jpg

⁵https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/video-interviews-ai-luxoft.jpg

⁶https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/profile-augmentation-ai-luxoft.jpg

⁷https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/natural-language-processing-ai-luxoft.jpg

<p>Advanced competency tests⁸</p>	<p style="text-align: center;">Advanced competency test</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Neuroscience games Understand the candidate on a deep level through fun</p> </div> <div style="text-align: left;"> <p>Cognitive traits</p> <ul style="list-style-type: none"> • Processing speed • Pattern recognition • Continuous attention • Ability to avoid distraction • Impulsivity • Working memory • Planning • Sequencing • learning </div> <div style="text-align: left;"> <p>Emotional traits</p> <ul style="list-style-type: none"> • Trust • Risk profile • Reward sensitivity • Perseverance • Tolerance for ambiguity • Emotional sensitivity • Creativity • Learning from feedback • Ability to delay gratification </div> </div>
<p>Augmented writing</p>	<p>Augmented writing helps recruiters in improving the content of the texts by giving suggestions while preparing a job posting or job description for recruitment. They help in creating a job posting more effective and attractive and help in grabbing the attention of potential candidates.</p>
<p>On boarding</p>	<p>Artificial intelligence helps the recruiters with the on boarding functions of recruitment by automating the activities such as background check of the employee, documentation, creation of offer letter, scheduling trainings and meetings, tracking the training documents, distributing company policy and login information to new employees etc.</p>

2. LITERATURE REVIEW

Jia et al (2018) has said that AI, also termed as machine intelligence, has been introduced to develop “thinking machines” that imitate human capabilities and intellectual behaviour and are capable enough to supersede and replace human intelligence. Randomization can be a useful component of an AI-augmented decision process, it is often considered as fair, and algorithms may otherwise find difficulties to make fair and appropriate decisions (Qamar, 2021). Artificial intelligence supports an organization in unbiased decisions, maintaining equality, and helps in handling uncertainties too (Jarrahi, 2018) and also artificial intelligence revamps the organization's culture and brings a digital transformation when it is integrated with the different departments like human resources, finance, operations, marketing, etc., (Shweta Jain, 2017). Christopher McFadden (2019) argued that AI functionality has proven to be a good benefit in the functioning of on-demand applications like Uber, Ola, Zomato etc. It is evident that only 10% of companies presently utilise AI in a high context, and 36% of organizations are expected to have complete utilisation of use of AI in the future ⁹ ¹⁰(Harver, 2020) and J. Fraij & V. Laszlo (2021) emphasis that despite advancement in technology, a major challenge exists in terms of companies' readiness for these sort of new technologies. Marwan Mohamed Abdeldayam et al (2020) said that if organizations wish to remain competitive in today’s global economy, they have to incorporate conversational AI for HR transactions in their decision-making process. Organizations should rely on AI to perform administrative duties so that HR departments may become more efficient. Jain (2018) said that numerous firms use these technologies for their HR activities such as performance appraisal, training, hiring etc.

⁸https://content.linkedin.com/content/dam/business/talentsolutions/global/en_us/blog/2018/02/advanced-tests-ai-luxoft.jpg

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Strohmeier and Piazza, (2015) said that Human Resource Management (HRM) is one of the functional area that has started to leverage through AI applications and got numerous set of AI usage implications in Human Resource Management (HRM). AI has been successfully implemented in various HRM functions such as Human Resource Performance Evaluation (Zhang et al. 2012) employee selection, Chien and Chen (2008); Oswald et al., (2020); Shahhosseini and Sebt (2011), employee turnover, Sexton et al., (2005), prediction of the level of employees' emotional involvement, Lucia-Casademunt et al., (2013), and employee assignment Karatop et al (2015). However, Stroh Meier and Piazza, (2013) suggest that the research domain of AI in HRM is relatively emerging and underdeveloped as compared to other fields, Tambe et al (2019). Prashant Srivastava (2018) adds that artificial intelligence helps the HR manager from wasting so much time in the recruitment processes by automating them and by taking care of the hiring processes of senior and middle-level management. He also highlighted that artificial intelligence helps the organization in planning the workforce and also in analysing the productivity of the same. Anupam Jauhari (2017) says that the advent of artificial intelligence and neural networks brought a transformation in the hiring processes and also increased the importance of Chabot in recruitment. AI tools and Chabot help the HR managers by performing various tasks such as interacting with the candidate; follow up, screening and selecting the candidate, sending automatic emails, etc. Geetha R & Bhanu Sree Reddy D (2018) in their research found that artificial intelligence support recruitment activities accurate, cost, and time effective and in maintaining the data effectively. Yusra Qamar et al (2019) said that HR managers need to update their skills and competencies to bring effective technological change and get into the new changes induced by AI-enabled HR services. However, slow progress has been made in issues around the management of employees on the first step of the AI path, which are decisions guided by algorithms. Prasanna Tambe et al (2019) has identified four reasons interms of why: complexity of HR phenomena, data challenges from HR operations, fairness and legal constraints, and employee reactions to AI management. We also recognize the limits of a top-down, optimization approach to HR decisions because of the negative effects it is likely to have on employee behaviour.

3. METHODOLOGY

This descriptive research study deployed snowball sampling technique and administered 101 HR Personnel's responses (KMO and Barlett's test of sampling adequacy is 0.841) across different industries in and around Bengaluru, India through self-designed Questionnaire method (online). 5 point likert scale used to measure the statements for the respective variables, i.e. Strongly Disagree to Strongly Agree.

Questionnaire has three different sets of scale measuring 1. AI in Recruitment (9 statements, cronbach's alpha = 0.818), 2. AI's role in the recruitment (RE) process (6 Statements, cronbach's alpha = 0.678) and 3. Candidates preferences of AI in Recruitment (HRAI) process (6 Statements, cronbach's alpha = 0.825). The statements for each scale had been validated through confirmatory factor analysis with chi-square goodness of fit test value 67.4 and p value

is <0.001 .

AI in Recruitment (AIR) has measured using the following statements; AIR 1- Helps employees and company work better, Helps employees and company work better (AIR 2), AIR 3 -Decrease cost per hire, Increase the recruiter efficiency (AIR 4), Increase employee productivity (AIR 5), Increase employee retention (AIR 6), Automate screening, reduce bias and reduce errors (AIR 7), Augment corporate training and streamline employee on boarding (AIR 8), Reveal new insights on talent (AIR 9). AI's role in the recruitment (RE) process has been measured through, Analyse interviews, facial expressions, word choice to assess candidate emotion and engagement (RE1), Scan and analyse social media posts, photos to improve recruitment (RE2), Scan work/resumes and other materials presented by applicants improves recruitment (RE3), Chat bots and virtual assistants increasingly viable way for employees to get real time answers (RE4), AI is the future for recruitment practices (RE5) & It cannot replace the value of human touch (RE6). And then Candidates preferences of AI in Recruitment (HRAI) process has been measured through, Slow reply impacts the candidate decision (HRAI1), It changes the perception of candidate (HRAI2), Candidate prefer computer screen their CV (HRAI3), Candidate prefer computer interview them (HRAI4), Candidate prefer computer negotiate their salary (HRAI5), Less time consuming and cheap (HRAI6). Data analysed using descriptive statistics, one way ANOVA, Correlation and Simple Linear Regression in SPSS.

OBJECTIVES OF THE STUDY

- To appreciate the role, importance of artificial intelligence in the HR function and in the recruitment process.
- To assess the perception on artificial intelligence in the recruitment process across HR Personnel's demographic factors.
- To measure the impact of artificial intelligence's role and candidate's preference of AI in recruitment on the process of recruitment.

HYPOTHESIS

Hypothesis 1: Perception on AI in the recruitment process significantly differs across HR Personnel's demographic factors.

Hypothesis 2: Artificial intelligence's role and preference of AI in recruitment has a significant impact on Recruitment Process

PROFILE OF THE HR PERSONNEL

Respondents' profiles are distributed based on the gender (male – 64% and female – 36%), age group (51 % are falls into less than or equal to 30 years, 36% are in 31-40 years, 13% are in 41-50 years), and 56 % of respondents are having 0-5 years of experience, 33 % are having 6-10 years of experience, 11% are having more than 10 years of experience.

4. ANALYSIS AND INTERPRETATION

Descriptive Statistics

Table No.2- Artificial Intelligence in the HR function & Recruitment

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
AIR1	0	0	3	49	49	4.4615	0.5547
AIR2	0	0	3	36	62	4.5897	0.5486
AIR3	0	3	5	15	77	4.3077	0.7310
AIR4	0	0	8	46	46	4.3846	0.6331
AIR5	0	3	18	36	44	4.2051	0.8329
AIR6	0	26	13	38	23	3.7436	1.2294
AIR7	0	0	5	64	31	4.2564	0.5486
AIR8	0	3	10	41	46	4.3077	0.7662
AIR9	0	8	15	44	33	4.0256	0.9028

*Values are in % Source: Primary Data

Table.No.3. Artificial intelligence is used currently in the recruitment process

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
RE1	0	10	8	54	28	4.0000	0.8885
RE2	3	3	5	56	33	4.1282	0.8639
RE3	0	8	15	36	41	4.1026	0.9402
RE4	0	5	8	51	36	4.1795	0.7905
RE5	0	0	10	54	36	4.2564	0.6373
RE6	0	10	10	49	31	4.0000	0.9177

*Values are in % Source: Primary Data

Table. No. 4. Application of AI in the present recruitment process

Variables	SDA	DA	Neutral	A	SA	Mean	Std. Dev
HRAI-1	0	21	13	31	36	3.8718	0.1843
HRAI-2	0	8	10	51	31	4.0513	0.1372
HRAI-3	0	31	8	31	31	3.6154	0.1965
HRAI-4	0	46	15	13	26	3.1795	0.2041
HRAI-5	0	41	15	15	28	3.3077	0.2050
HRAI-6	0	15	10	44	31	3.8974	0.1634
HRAI-7	0	0	10	56	33	4.2308	0.1003

*Values are in % Source: Primary Data

The mean, standard deviation and number of responses of each of the items for the objective 1 i.e., to understand the role and importance of artificial intelligence in HR function and Recruitment process revealed that agreeableness of each statement along with its mean score and standard deviation.

ANALYSIS OF VARIANCE (ANOVA)

Table.No.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	110.2043	30.8739	87.7135	41.1303	92.0065	43.4893
Df	1	76	1	76	1	76
MS	110.2043	0.4062	87.7135	0.5412	92.0065	0.5722
F	271.282		162.0758		160.7867	
p-value	0.0000		0.0000		0.0000	
Hypothesis	Accepted		Accepted		Accepted	

Source: Primary Data

The perception on artificial intelligence technologies differs across age of respondents ($F=162.0758 > 2.56$; $P=0.0000 < 0.05$), gender of respondents ($F=271.282 > 2.56$; $P=0.0000 < 0.05$), work experience of respondents ($F=160.7867 > 2.56$; $P=0.0000 < 0.05$), hence the alternative hypothesis is accepted, i.e. There is a significant difference on artificial intelligence technologies in recruitment process across demographic profiles of respondents.

Simple Linear Regression Analysis

Table.No.4.1.5. Regression analysis

ANOVA		Multiple R	R Square	Coefficients			t Stat		p-value		Hypothesis
F Stat	p value			Intercept	AIR	HRAI	AIR	HRAI	AIR	HRAI	
12.2	<0.001	0.6384	0.4076	1.865	0.24	0.354	1.9	3.84	0	<0.001	Accepted

Source: Primary Data

Results of regression analysis reveals that overall regression model is fit ($p = < 0.001$, $f = 12.2 > 2.56$) at 0.05 significant level; 40.7% of prediction on Recruitment Process is significantly predicted by AI in Recruitment- AIR ($p = 0.04 < 0.05$) and Candidate's preference of AI in Recruitment – HRAI ($p = 0.0001 < 0.05$) process and candidate's preference of AI in Recruitment is highly impacting predictor ($t = 3.84$), followed by AI in Recruitment ($t=1.94$). Based on the results of linear regression analysis, the following regression model is arrived.

Predictive Model of the study: $y = \alpha + \beta X_1 + \beta X_2 + SE$

Whereas, $y =$ Recruitment Process (RE); $\alpha =$ Constant; $X_1 =$ AI in Recruitment (AIR) and $X_2 =$ Candidate's preferences of AI in Recruitment (HRAI) process.

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

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

Hence the alternative hypothesis is accepted i.e., AI in Recruitment (AIR) and Candidate's preferences of AI in Recruitment (HRAI) process has significantly impacting the Recruitment Process of an organization.

5. FINDINGS AND DISCUSSIONS

Descriptive statistics revealed that most of the HR Personnel feels that the artificial intelligence contributes to the effective functioning of the HR activities and in the recruitment processes. ANOVA revealed that the perception on artificial intelligence significantly differ across the gender, age and work experience of HR Personnel and regression analysis proved that artificial intelligence is significantly predicting effectiveness in the recruitment process.

The perception on artificial intelligence technologies across the demographic profiles such as Age, Gender and Work experience of employees is also identified, and the alternative hypothesis is accepted. From the regression analysis it was found that the independent variable is predicting the dependent variable. Hence, the null hypothesis is rejected, and alternative hypothesis is accepted, which says that the organisation's recruitment processes are impacted by artificial intelligence and cloud-based technologies.

Further, the organizations should allocate adequate budget and have professionals skilled in artificial intelligence would increase the efficiency level of recruitment process in any organization across various industries and sectors. Facilitating some workshops and trainings in artificial intelligence technologies can educate the employees regarding the importance of it in recruitment and how it can bring a change in the organisation's talent acquisition.

Since the application of AI can increase the employee productivity and helps in employee retention and to make the work easier and faster, it is advised to include artificial intelligence in the overall tasks of the company along with recruitment as it will improve the quality of work in the company. The company should remember to retain the human touch in its recruitment processes as there are certain things which can't be replaced by technology like risk taking and instinctive ability of humans. It is suggested that the company include artificial intelligence technologies in areas other than recruitment like customer service, billing, detect security intrusions etc

6. CONCLUSION

The key purpose of the study was to highlight the role and impact of artificial intelligence technologies in HR function and recruitment process. It was understood from the study the different ways in which artificial intelligence used in different stages of recruitment and how it is beneficial for the HR professionals in finding best talents for the organisation. Artificial intelligence has advanced the operations of the organisation drastically. It plays a vital role in the company's recruitment functions starting from the resume scanning to retaining the employees. The main benefits of artificial intelligence were seen in how it improves the standard of work done and on how it aids in the elimination of routine tasks. It plays an essential part in influencing the perception of a candidate towards the company too. Artificial intelligence reduces the cost per hire in recruitment and helps in increasing the employee productivity. The most prominent obstacle of artificial intelligence is that however advanced it may get it still can't replace the human touch in recruitment. The study concludes that artificial intelligence technologies plays a great role in the HR functions of the organisation and most of the employees in the company feels that the company depends on artificial intelligence highly

in its current recruitment processes. This study primarily focused only on exploring the role, importance and perception on artificial intelligence among the HR Personnel's in and around Bengaluru; data collected through online mode, hence the applications of the study may not be applicable in other geographical areas. Future study can be conducted as an analytical study and comparative study across the various industries; further Applications of AI on various other areas of human resource department activities can be studied.

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