ARTIFICIAL INTELLIGENCE APPLICATIONS FOR FACE RECOGNITION IN RECRUITMENT PROCESS

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ABSTRACT

Understanding the development paths in artificial intelligence and its impact on the recruitment process extremely pertinent of technology-driven human resource management. This study was conducted to identify the various applications of Artificial intelligence (AI) in face recognition of the recruitment process. The sample study included 24 articles from the period of 2006 to 2020 in the Scopus database, based on that the present study presented the results and discussion. The study found that face recognition feature is very important in the recruitment process to know more about the applicant. The present study was very specific to the area of face recognition in the recruitment process, and the future studies can be studied on facial expression, sentiment profile and emotional analysis of applicant.

Keywords: Artificial Intelligence; Face Recognition; Recruitment; Artificial Intelligence Applications; Recruitment Industry.

INTRODUCTION

In the present competitive world, every business organization looking for best human resources management. It is capital for improving business performance. Any business becomes very successful when it can meet the need of the consumers and to do so, every organization will have to adopt innovative steps in HR practices. After this action, human resource management will be moving away from the traditional administrative functions like human resource planning, recruitment & selection, training and development, appraisal to more advance processes like automation, robotics automation process (RPA), augmented intelligence and artificial intelligence (AI) (Adistyasari et al., 2020). These technologies will be completely reshaped and transform the functions of human resource management. In recent days, (Velicanu et al., 2013) AI is a buzz word is completely renovate human resource management, enabling millions of jobs, showing easy ways in the hiring process and (Lee et al., 2019) assisting in problem-solving through innovative technologies.

Artificial Intelligence is an application, which utilizes human knowledge in different fields to improve the effectiveness, and it is a rising innovation, which is utilized in all enterprises to improve profitability. Artificial intelligence (AI) has a giant capacity to act like a human brain, and it gives full productivity in the entire business (Niehueser & Boak, 2020). Across organizations, for example, robotics has been introduced through human knowledge, which is most useful in every part of the business. Another innovation human knowledge created machine is called as artificial intelligence, producing a lot of work & discourse acknowledgement, critical thinking and so on. Designed algorithms of artificial intelligence resolving complex issues through its activities in the entire business environment. Artificial Intelligence has an extremely embedded with a number of utilizations in the present society (Dickson & Nusair, 2010). It is utilizing in airlines services, software engineering, constructions, accounts, environment, human services,

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substantial industry, promoting, online business, client assistance, transportation and so on. AI is giving continues promising support to all the industries and getting its popularity.

The present AI developed very quickly, and its innovations have been utilized broadly over the fields. Knowledge framework directs a serious vast portion of each person; it is nearly utilized in each filed. The Internet of Things (IoT) has changed our carries on with a great deal. In the age of digitization, (Jia et al., 2018) the businesses are substantially more reliant on the innovation to do or work more sophisticatedly, therefore, businesses are highly associated with innovations.

Human resources process keeping up individuals to engage their association and it is tied in with managing individuals and their personalities in the association is to manages mobilization, choice, preparing, advancement and so on. Human resources activities like manage salaries and their payrolls, performance evaluation, it urges workers to put forth a noble effort in the association and to accomplish profitability so that company's objectives, vision and mission can be accomplished (Prasanna, 2019). The human resource is a significance of association with other sub-office in the organization to build a warm association to make authoritative progress among the employees and will boost the association strong.

Industry showing interests in AI that expanding the governments are attempting to grasp what the innovation could mean for their residents or citizens. The assortment of "Big Data" and the extension of the Internet of Things (IoT), has made an ideal domain for new AI applications and helping to develop. Associations are progressively moving to examination and AI to help improve various business capacities. However, AI facilitating more opportunities, innovations & discovering its way into the human resource field. HR is one stage at the back in the advanced change, and AI presently offers the opportunity to make up latest to research expectation of the Industry.

AI can help in assignments, accelerate the best ability, reduce the work burden and improve efficiency and work commitment. Employee appraisal is very keen in HR activity to need to gather information about the employee and will help in the measurement of performance. Artificial intelligence applications depend entirely on the information gathering. There are many changes taken place in human resource because there are many innovative technologies are incorporated, that all forced to change the human resource, it is happing from the decades. Information driven technology providing innovations, that reflecting on HR business organizations so that the organizations reorganizing their corporate culture to meet the demand of information driven technology (Martínez-Miranda & Aldea 2005). Al and machine learning (ML) both are empowering innovations through their activities, the ML using data and transforming intelligent data (Rab-Kettler & Lehnervp 2019) this act enhancing the human efficiency in that organization, in another hand the various kind of AI filters the information and providing opportunities to develop new and alter existing program activities.

AI usage improves the expert system of the organization that will reflect on the huge numbers of human resources. Moreover, there is no big surprise that artificial intelligence entered large size employment and enter a huge market. AI facilitate the multiple features that will improve various projects that will help the employer and industry. AI is utilizing in job search, whether it is helpful for recruiters or not, but in the near future AI will come up with a lot of updated factures that will support a lot to the HR organizations, (Van Esch et al., 2019) especially, in the recruitment process of the applicant.

AI applications are significant in using in the recruitment process because it will be the combination of human and computer collaboration that will work together to reach desired goals, in the concern of the facial identification is now to the built-up framework to recognize the

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individual face picture and video (Masud et al., 2020). Facial identification framework connected with AI innovation that will give acknowledgment of appearance and more it will give facial feeling acknowledgment and record the applicant feelings at the time of interview.

Artificial intelligence is utilized to break down the outward appearances of competitors during the recruiting procedure to assess whether their character is an ideal choice for the activity, just as deciding the trustworthiness of their answers (Van Esch & Black, 2019). A portion of the businesses utilizing this innovation in their employing procedure incorporates in the following companies the Boston Red Sox, Carnival Cruise Lines, Dunkin Donuts, IBM, and Unilever. Hence the present study put forward the research question: What is the impact of AI on face recognition of recruitment process?

The present study was developed as follows, next part literature review. Followed by methodology, then the results and discussion are presented. Finally, the paper is rapped with conclusion along with limitation and future research directions.

LITERATURE REVIEW

AI Recruitment

Technology is moving everywhere, and it is impacting the way things function, disruptive technologies are influencing. Human resource management functions have also been affected by these technologies, and it is in the form of digital technologies (Lochner & Preuß. 2018) like artificial intelligence, robotics, and networks. In the present artificial intelligence is used in human resource management functions like human resource planning, recruitment & selection, employees monitoring & training, learning, legal activities & communications, payroll management and performance management (Nawaz, 2019b). In the selection and interview process, collecting data of the applicant, classification of data of applicants is doing by robots.

Artificial intelligence, big data, algorithms now providing a path to process the information of the talented employees in an effective manner, and (Gupta et al., 2018) it will be giving much lower cost than previous period. This is showing a possible way to automate the profile of the employees to replace human resources to match the legal regulations.

Recruiting a right person in the pool of talent is the main function of the recruitment process, in detail, it is significant for any organization to select, attract, and to manage the talented resource, (Van Esch et al., 2020) why because talent is the most strategic point that directly leads to the enterprise profitability. Moreover, evaluating the application in every stage is important to reach the right applicant to select the right skills this will be very helpful to show the right responsibility this will empower the recruitment process successfully.

Artificial intelligence-based technologies facilitate the transition from rigid processes to flexible outcome-driven approaches. Al helps to analyse unstructured data from various sources of social media channels is helpful to identify talent (Nawaz, 2019a). AI-enabled recruiting is moving from the traditional approach to data-driven approach, this will use to select, identify a suitable candidate for the job and possible to give fair treatment for job seekers those who are eligible.

From the 21st century, AI and facial recognition are to bring the utilization in the enterprises. Unilever is one of the first company introduced AI innovation that breaks down the (Ibrahim & Ibrahim, 2009) facial and etymological data of each up-and-comer when posed a similar inquiry.

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The US organization Hirevue introduced AI-enabled technologies that will analyzing appearance and languages, how the applicant is answering for every question to identification of style of speaking (Izario et al., 2017), this mechanism will help to select right talent into the enterprise.

The traditional method database process like trash in-trash out. This process neglects various data sets in the database process; the business is unable to utilize the neglected data sets (Montalvo et al., 2011). It is very hard to understand the dataset structures so that unable to understand the risk, skilled candidate, the potentiality of human resource of the organization (Hutson, 2018). Moreover, it is very hard to understand human resource management about the datasets and their structures to manage, direct human resource activities.

The human brain is a wide range of ways that can work and convert data that will useful in various ways in the data process, that disclosure effective data (Siddiqui et al., 2020). This will support the process of human resource management to work professionally and effectively to enable enterprise profitability. Even, robotics automation process (RPA) will perform better on human resource functions, especially in the recruitment process (Nawaz, 2019c), it will shortlist, communicate, arrange the application data and so on, this technology also enhances the effectiveness in the enterprise and human resource departs (Madakam et al., 2019).

Case 1: AI Usage in the Hiring Process

The Unilever, candidates regularly find openings for work through LinkedIn or Facebook and either transfer their resumes or present their profiles on LinkedIn. At that point, they play a few games dependent on neuroscience that are planned to evaluate their characters to check whether they will be a solid match for the activity. In the wake of playing those games, they partake in a video meeting with preset inquiries. In these meetings, man-made brainpower is utilized to recognize and pass judgment on their outward appearances and character attributes. This outward appearance programming is given by HireVue. The program chooses the individuals it decides to be the best matches and notes what the computerized reasoning saw in the competitor and afterwards sends this information to a human scout (Recruiter, 2020).

Case 2 AI Usage in Recruitment Process

Facebook and Google

Again in 2014, Facebook reported the dispatch of its Deep Face program, which can decide if two-shot faces have a place with a similar individual, with an exactness pace of 97.25%. When stepping through a similar examination, people answer accurately in 97.53% of cases, or simply 0.28% better than the Facebook program.

In June 2015, Google went one better with Face Net. On the generally utilized Labeled Faces in the Wild (LFW) dataset, Face Net accomplished another record exactness of 99.63% (0.9963 ± 0.0009).

Utilizing a neural network system and another calculation, the organization from Mountain View has figured out how to interface a face to its proprietor with practically flawless outcomes. This innovation is consolidated into Google Photos and used to sort pictures and naturally label them dependent on the individuals perceived. Demonstrating its significance in the biometrics

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scene, it was immediately trailed by the online arrival of an informal open-source form known as Open Face.

Microsoft, IBM, and Megvii

An examination done by MIT researchers in February 2018 found that Microsoft, IBM, and China-based Megvii (FACE++) devices had high mistake rates while recognizing darker skin tones among ladies and men.

Toward the finish of June 2018, Microsoft reported in a blog entry that it had made generous upgrades to its one-sided facial recognition innovation.

Amazon

From 2018 Amazon is as of now effectively advancing its cloud-based face recognition administration named Rekognition to law requirement offices. The arrangement could perceive upwards of 100 individuals in a solitary picture and can perform face coordinate against databases containing countless countenances.

In July, Newsweek revealed that Amazon's facial recognition innovation dishonestly recognized 28 individuals from US Congress as individuals captured for wrongdoings (Recruiter, 2020).

After careful observation of the previous studies, the study found the gap, and there is no studies conducted in this direction, particularly in artificial intelligence and recruitment process with the focus of face recognition of applicant, therefore the present study was taken-up to reduce the gap between the theory and practice.

METHODOLOGY

The study was considered the literature review; for this purpose, the researcher searched Scopus database from 2002 to November 14, 2020. To get full information, the researcher followed steps to get into the right information to draw findings, discussion, and food for future research.

The study incorporated a systematic review process to identify relevant academic sources. First, the search query includes words in the title or keywords using Scopus online database (TITLE-ABS-KEY("artificial intelligence" AND recruitment process) and found the 114 articles which are covered by following disciplines computer science, engineering, mathematics, business, management and accounting, social sciences, medicine, decision sciences, environmental science, health professions, arts and humanities, economics, econometrics and finance, psychology, earth and planetary sciences, energy, materials science, pharmacology, toxicology and pharmaceutics and papers were published as a Conference Papers, Articles, Conference Reviews, Reviews, Book Chapters, Editorials and the information shown in the Table 1 and Table 2.

After reading of the abstracts, again the researcher scrutinizing in deep and removed the articles, which are not relevant to the selected topic, again the research limited to the Business Management & Accounting and Social Sciences by using following key words or titles via search query TITLE-ABS-KEY ("artificial intelligence" AND recruitment AND process) AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "SOCI") after researching the researcher found 24 articles, which are relevant to the topic and these papers were published as a Articles, Conference Papers, Book Chapter and Conference Review and the detail information presented in the Table 3 and Table 4.

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TABLE 1
YEAR-WISE CITED ARTICLES

Year	No of Articles
2020	23
2019	31
2018	10
2017	10
2016	6
2015	3
2014	8
2013	2
2012	4
2011	4
2010	5
2009	3
2007	1
2006	2
2002	2
Total	113

Source: SCOPUS database

TABLE 2
ARTICLES PUBLISHED PLATFORM

Conference Paper	70
Article	35
Conference Review	5
Review	2
Book Chapter	1
Editorial	1
Total	113

Source: SCOPUS database

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TABLE 3 YEAR-WISE CITED ARTICLES	
Year	No of Articles
2020	5
2019	8
2018	4
2017	1
2015	1
2011	3
2010	1
2006	1
Total	24

Source: SCOPUS database

TABLE 4 ARTICLES PUBLISHED PLATFORM	
Conference Paper	16
Article	6
Conference Review	1
Book Chapter	1
Total	24

Source: SCOPUS database

As a final step the researcher used following keywords or title via search query TITLE-ABS-KEY ("artificial intelligence" "recruitment process" AND applicant AND face AND recognition) in Scopus online database no study found. Therefore, the present study answered the research question through the results and discussion.

RESULTS AND DISCUSSION

After careful examine of the literature, the author was carried out the following results and discussion, after that the study was ended with conclusion, limitation of the study and further research directions.

AI Based Applications of Facial Recognition in Recruitment Process

Applicant resume evaluation

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AI-based Applicant Tracking System (ATS) still unable to identify the keywords of the applicant resume so that the selection representative facing difficulties to identify the right applicant for interview process. It is having to understand what the recruiter is looking for exactly and need to ensure that the candidate who simply used different words to attract eyes.

Scheduling

AI-enabled programs are capable of reviewing human resource department staff planned schedules automatically tune with interviews of candidate body of the emails; this will help to prevent the overlaps in scheduling.

Sourcing

Artificial intelligence and applicant tracking system required more flexible to evaluate the effectiveness and validity of the various source of data like reporting of new employee turnover from each source and total number of qualified applicants applied. The applicant tracking system normally use various keywords, workflow to analyse thousands of resumes received through online, these should tackle properly.

Personalization

Gone are the times of "splash and implore" email strategies. We're in the time of personalization, where up-and-comers are accustomed to being served up focused, pertinent substance. Artificial intelligence gives information driven bits of knowledge with the goal that enrollment specialists can all the more likely match fitting substance and messages to explicit crowds.

Video analytics

Applications incorporate changing over meeting video into text and filtering that text to decide how well a competitor's ranges of abilities and capability level match the job. Highlight acknowledgement and articulation perusing applications are likewise in play for selection representatives.

Fraudulent application detection

Like identifying spam or dubious financial balance action, AI applications used to examine resumes can utilize information focuses and calculations to separate fake applications from certified ones.

Internal candidate sourcing

As there are some exceptionally amazing approaches to utilize AI in inside ability programs, including vocation way the executives, execution audit the executives, aptitudes hole examination, and interior competitor sourcing. Eminently, associations have a great deal of data on interior ability, which implies a strong measure of information focuses are accessible with which to upgrade inward AI applications.

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Candidate selection

Selecting of CV is very time to consume process for hiring managers or human resource department. The recruiters have to go through the papers of the applicants to know the skills sets, experience, personal interest, hobbies, and other certifications and so on.

The video button should add with candidate persona, utilizing face recognition software, the interviewers will assess the applicant quickly, and it will easy for recruiters to select the right person. The IDVerity offering this feature at a fundamental level, it is covering only facial recognition for verification and fraud prevention.

Personality screening

Applicant personality screening is a very effective tool to measure characteristics like interested, indifferent, anxious, stressed, confident calm, enthusiastic and irritable. The application should map the tiniest of a shift in eye, mouth movements, and jaw development. This will help to know the personality types; in other words, the chance of getting to know more about the applicant actual behaviour with regards to honest, what he/she really is. Then CEO of Human explained that the Workable is popular recruitment solution because it is work on to identify the moo and artificial emotional intelligence, this will helpful to recruit people on mood-based rather than skills.

Culture fit

The aim of every recruiter is to know the candidate will adopt the organization cultural ecosystem. Any advance facial recognition can screen the facial expression of the applicant entire work life; this will help to analyze the applicant attitude and characteristics.

AI predictive analytics

Through personality, screening will measure the personal traits, characteristics, flexibility, irritability, proneness to stress, excitability and so on. This will be possible prior to the employment in the field of work-life, and it is possible completely with AI based interview process.

CONCLUSIONS

The aim of the study is to understand the various applications of artificial intelligence in face recognition of the hiring process. AI applications is which extent will enhance the effectiveness of the recruitment process in the recruitment industry. The present study was discussed on applications of AI, which are available to detect face recognition in the hiring process. In addition, the study covered only face recognition of the recruitment process. The face recognition is one of the tools to identify the applicant identifications; this well is helpful in the process of the selecting right candidate for the right position. Therefore, face recognition will be very useful in the process of duplication and even can be useful omit the previously applied candidate.

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LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The present study embedded with its limitation; the study concentrated on face recognition of recruitment process only in the human resource functions. The study has further opportunities can be focused on how to identify applicant employability, facial actions units, emotions. Moreover, facial expression analysis should be more effective in identifications of movements of hair, temple, eyelash, iris, cheek, nostril, lip, forehead, eyebrow, eye, ear, nose, jaw and mouth. These will be useful to understand more about the applicant psychological behaviour and emotions. Can be prepared sentiment profile and even it will be useful for emotional analysis.

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