





Artificial Intelligence (AI) in Hrm (Human Resources Management): A Sentiment Analysis Approach

Punamkumar Hinge^(✉) , Harshal Salunkhe , and Mohit Boralkar 

School of Business and Management, Christ University, Bangalore, India
punamkumar.hinge@gmail.com

Abstract. As a time-saver and matchmaker, artificial intelligence can play a growing role in hiring and selecting. Automation can be used intelligently to increase workplace humanity. It enables you to take exclusively human abilities forward while putting technology in the background. Most people who work in HR do so because they want to interact with people and assist them in finding solutions to their challenges. Where appropriate use of automation can provide them more time to pursue their task and result in careers that are more satisfying. Artificial intelligence (AI) can be used to create job descriptions, promote and share jobs, automate applicant searches, and scan cover letters and resumes. This research paper focuses on how AI can be used in selected areas of HR to improve the human resources management with some leading business entities examples regarding their use cases in AI (Artificial Intelligence) and user sentiment analysis for using We360.ai application.

Keywords: Human resource management · Artificial intelligence · Human resources challenges · Automation · sentiment analysis · We360.ai application

1 Introduction

We can define Artificial Intelligence (AI) as a set of pre-programmed algorithms with the ability to learn, with the goal of being both more advanced than and more similar to humans. The most fundamental aspect of artificial intelligence is that it is a programmed algorithm with a strong capacity for computation, analysis, and prediction.

The influence of machine learning on the HR function is increasing day by day. One of the biggest advantages of using robotic process automation, according to experts, is that it can free up human resource (HR) staff to use their people skills to help find solutions to urgent business problems. Using robotic process automation has advantages, such as improving the accuracy of HR data and lowering labor costs [1].

2 Literature Review

2.1 How Artificial Intelligence (AI) Works in HR

The use of AI tools in HR is very advantageous. Employee data is already produced in large numbers by your HR tech database. You can utilize AI to derive insights from

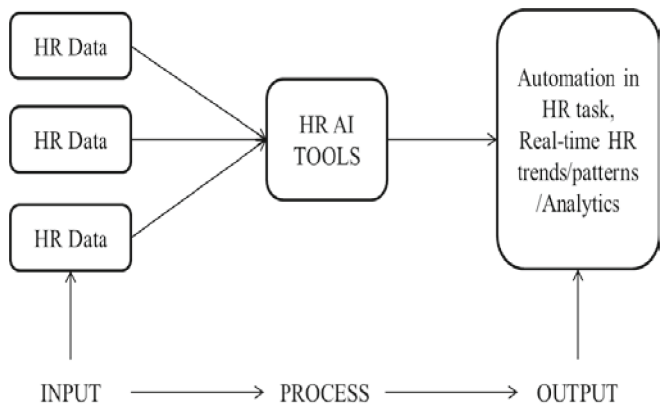


Fig. 1. Working of AI in HR

that data to assist guide your talent strategy rather of passively collecting and storing it. Machine learning in particular helps AI program learn to recognize patterns and trends in data [2]. At a high level, AI-powered insights can offer guidance for choosing where to post job openings, identifying employees who are most likely to quit, and highlighting chances to fill skills gaps (Fig. 1).

2.2 Evidenced-Based Management Through AI

There are too many variables to decide the decision and complexity of the business environment is increased over a period. It is applicable to people also so many behavioral patterns, personality attributes to identify right people for taking right decisions. Relying on management’s or one’s own intuition has grown too dangerous. AI can help to keep tracking these complex variables of human resources to suggest time to time to take decisions related to that particular situation, which are more evidence based. More CEOs are recognizing the need for fact-based decision-making or the increased use of data.

Case of Google

The Google oxygen project is the most well-known example. Google examines the straightforward but crucial question of whether having a competent leader makes a difference and tried whether it helps to find from data analysis findings, they got good results to identify good leaders through this data analysis. They used different feedback survey collected on different events and occasions, which gave evidence, based insights as a data sources. This analysis gave very useful results in identifying and comparing different managers. Google required to do this as their project are relied on managerial competencies to handle the project. Discovered a strong statistical connection. The amended list of ten Oxygen behaviors was much more predictive of team outcomes like turnover, contentment, and performance. The two new behaviors were substantially

connected with manager effectiveness where it found the team was performing well year on year and there was retention of employees in Google under that manager [3].

Case of Hitachi

Hitachi produced some AI based wearable gadget in the year 2016, that employees put on their body and it collected all the data including bio-physiological ones, they were not even conscious, about it, latter it was analyzed them using AI which gave more useful insights regarding establishing the connection between satisfied employees and vibrant organizations' and good performance [4].

2.3 HRM Carried Out in Real-Time with AI

Due to the environment's continual changing, quick action has taken precedence over precise decision-making. It is possible to use real-time intervention and decision-making in human resource management. AI frequently uses real-time feedback and evaluation of human resources in businesses. Some companies that do this include Adobe, IBM, GE, and Microsoft, among others. Data analysis and real-time decision-making can also be used to determine promotions, changes in roles and responsibilities, and real-time recognition and spot bonuses.

Case of IBM

IBM has built the agile organization by using the AI where it tracks their employees in terms of Competencies company require in upcoming projects and AI suggests necessary changes to be taken to cope the new upcoming projects in terms of skill development, people replacement, transfer, promotion etc. IBM substituted personally tailored training and development for traditional collective development with the help of AI tools to cater the individual human resources needs [5].

2.4 Use of AI to Increase Routine HR Activities

Routine HR tasks must be completed effectively. The most well-known tool for this is robotic process automation (RPA).

Case of Nissan

Nissan adopted an employee of RPA in China. The automobile manufacturer selected UiPath based on its robotic process automation (RPA) software and its capacity to automate routine digital processes. Reduced workload and workforce are the goals of these RPA, allowing workers to focus on more important work [6]. RPA can be used in accounting to process invoices and expenditure reports. RPA may automatically sort and process manual forms that are fed into a system, including generating reports.

2.5 Conducting the Interviews by AI Software/Robot

A growing number of real-world recruiters are using AI -led job interviews, employing software that screens and evaluates applicants before a recruiter ever tries to enter on

the candidate. Every applicant gets an automated interview link for various vacancies. The “interview” can be accessed whenever applicants choose, and there are frequently practice questions they can attempt before the real questions are asked. Some are text-based, while others ask candidates to record a video. Before human recruiters utilize this analysis to choose which candidates to invite to a second interview or hire, the answers are recorded and marked by artificial intelligence (AI), indicating the candidate’s suitability on specific attributes [7].

Case of Softbank

Pepper, a wise-cracking humanoid robot whose creators believe can read people’s emotions, was introduced in Tokyo. Pepper was developed by mobile carrier Softbank, and the company claims that it can understand 70 to 80% of natural conversations while also selecting an appropriate response from a list of pre-programmed options [8]. Based on the detection and evaluation of facial expressions and voice tones, Pepper can identify emotions. Several offices in the UK are presently using Pepper as a receptionist. Pepper can recognize guests using facial recognition, alert meeting organizers, and make arrangements for drinks [9].

2.6 Artificial Intelligence (AI) Initial Scrutiny of the CVS

Within Human Resources, talent acquisition is a crucial, challenging, and time-consuming task. In addition to the alarming one million new workers that enter the labor force each month, there is also a significant amount of turnover. According to LinkedIn, India has the largest proportion of workers who are “actively looking for a new job” [10]. AI based application tracking system can help the company to shortlist resumes from millions of database.

Case of Amazon

Amazon uses “Sourcer” ATS (Automatic Tracking System) which is AI based where it can shortlist resumes in seconds from public sources of data. Amazon’s “Sourcer” is trained and programmed in such a way that it will shortlist accurately those resumes matching to job requirement, skills etc.

2.7 Benefits Using AI in HRM

Case of IBM

IBM employees around 350000 employees and its AI based technology can predict who is looking for a new job position now. IBM’s artificial intelligence technology is now 95% accurate at identifying employees who intend to quit their jobs [11]. A “predictive attrition program” created by IBM HR with the use of Watson has a patent. It predicts the likelihood that an employee will leave their job and suggests management strategies to keep them on board. Thus far, AI has helped IBM avoid paying nearly \$300 million in retention costs [11].

Case of Microsoft’s Power Platform Applications

With the help of Power Virtual Agents, you can create a chatbot that can swiftly and

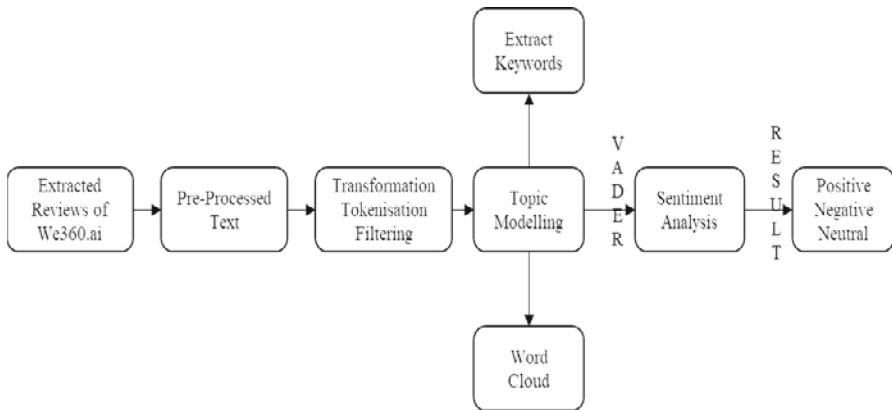


Fig. 2. Sentiment Analysis Process

simply address employees' HR-related queries. The agent can be pre-loaded with a variety of queries and responses to address all of the most frequent (and possibly some of the more specialized) questions that HR teams encounter on a regular basis. Depending on what works best for your business, you may then put this chatbot into your Microsoft Teams site, website, or even staff app [12].

3 Sentiment Analysis Process

The reviews of We360.ai were scrapped from online website. The extracted reviews were pre-processed by transforming the text to lower case, tokenising the data, and filtering the data by removing stop words such as 'the', 'an', 'a', numbers from the text and include only meaningful words. Topic modelling was carried out on these reviews. Latent Dirichlet Allocation method of topic modelling was used to define topics. The wordcloud was formed representing keywords and keywords were also extracted separately. The sentiment analysis on this topic was carried out using VADER method which further analyses the statements as positive, negative and neutral.

4 Data Interpretation and Analysis

User reviews of five AI applications (We360.ai, Traqq, Hubstaff, ActivTrak and Time-Doctor) were extracted to understand what users think about this AI-based recruitment and selection solution. But only **We360.ai reviews found more authentic** and recognized so **only We360.ai reviews were considered while analyzing** the data. A variety of small, mid-sized, and large enterprises reviewed this AI-based recruitment and selection solution. There were 67 reviews extracted, 39 of which were for Small-business (50 or fewer employees), 25 for Mid-market (51–1000 employees), and 3 for Enterprise (> 1000 employees). Using the company reviews about we360.ai, we were able to understand user sentiments, such as how technology can be used to provide HR services such as recruitment and selection. A good recruitment and selection tool can speed up the

Table 1. Count of user reviews as per business size

Business Size	Count
Small-Business (50 or fewer emp.)	39
Mid-Market (51–1000 emp.)	25
Enterprise (> 1000 emp.)	3
Total	67

Table 2. Weights of words

Words	Weights
We360	34
AI	33
We360 ai	33
Tool	14
Employees	11
Productivity	11

process, reduce costs, be easy to maintain, and be an effective and efficient tool (Table 1).

Wordcloud

In order to identify the keywords that made sense and were important from the perspective of the company to understand which aspects of their product or service need to be improved further to enhance the customer experience, the extracted reviews were pre-processed and topic modeling was applied. A wordcloud represents words in the form of a cloud, arranged based on a weight assigned to each word. Table 2. Accords weights to words according to their number of occurrences, arranged in descending order of their weight. In the center of the cloud, the words with the highest weight are in bold and larger font size, and as the weight of the words decreases, the font size also decreases (Fig. 3) (Table 4).

We360.ai, Traqq, Hubstaff, ActivTrak and TimeDoctor user reviews were also analyzed using sentiment analysis methodology to understand the usefulness of this AI-powered HR analytics application. Users’ emotions, count, and percentage are displayed in Table 3. From Fig. 2. and table 3. we can infer that 55.07% of users had trust in the application, 26.09% showed joy in using the application, 15.94% were surprised with the results of the application after its use, and 1.45% of users showed emotions of anger and sadness after use of the application (Fig. 4).

Table 4. Extracted Keywords from user reviews

Word	TF-IDF
We360	0.091
AI	0.087
Tool	0.067
Productivity	0.047
Great	0.043

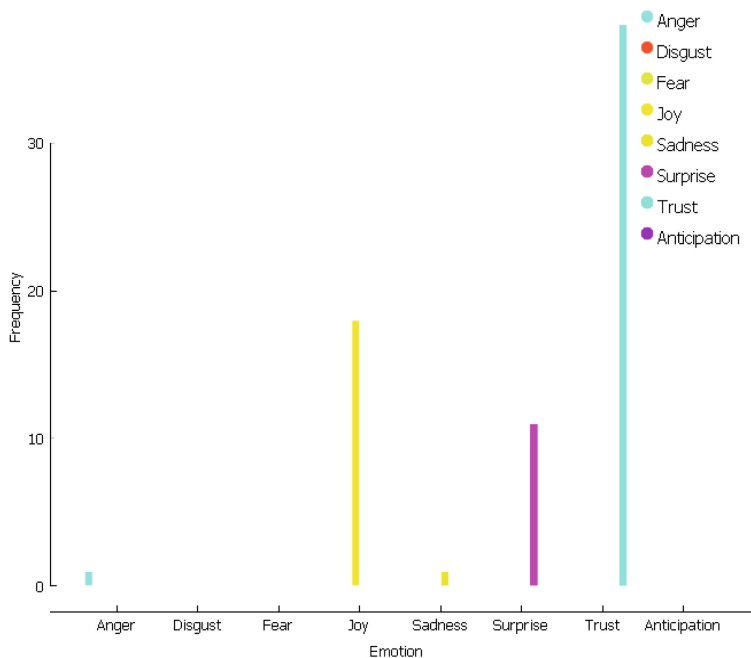


Fig. 4. Emotional Analysis

5 Ethical Issues and Challenges Using AI in Human Resources Management

The promise of artificial intelligence (AI) in human resource (HR) management and its actual use are very different.

Case of Amazon

Automation, whether it be in warehouses or determining prices, has been essential to Amazon’s e-commerce dominance. Similar to how customer’s review things on Amazon, the company’s experimental hiring tool assigned job seekers scores ranging from one to five stars. In essence, Amazon’s technology trained itself to prefer male candidates.

The phrase “women’s,” as in “women’s chess club captain,” was penalized on resumes. Additionally, two all-colleges’ women’s graduates were degraded, according to those with knowledge of the situation [13].

A law that permits academics and journalists who test hiring website algorithms for discrimination to be prosecuted criminally is now being contested by the American Civil Liberties Union [13].

There are many challenges using Artificial intelligence in Human Resources as below:

The difficulty of HR phenomenon: HR phenomenon is mostly associated with the behavioral science and can’t be measured in perfect numbers which creates criticality in understanding by the algorithm created in AI or machine learning [14].

Limitations brought on by limited data sets: Data set on human resources is limited can cover all the aspects of human behavior and it gives limited capacity to machine learning to get the accuracy towards results coming out of AI.

Problems of Accountability relating to fairness and other moral and legal restrictions:

Those problems associated with fairness of company or managers, related to moral and legal restrictions don’t become the base of machine learning algorithm and it leads to wrong output regarding the perception of any human resources by reading the result provided by the AI.

The Potential for Unfavorable Employee Responses to Management Decisions Using Data-Based Algorithms

Employees always will oppose the decisions taken by management based on AI and machine learning based on database, as algorithms may not consider people behavioral aspects in different situation to lead the exact perception, it will bias in terms of people perception by AI.

Artificial intelligence “learns” from the algorithms it uses. Even if the person who created the AI’s machine learning process may not be conscious of their prejudices, that person’s biases will be incorporated into the AI [15]. A company’s talent acquisition procedure could accidentally be prejudiced if it uses biased technologies. HR leaders and the HR staff must assume ethical responsibility because the technology cannot be held liable for the bias if the hiring process is ever criticized or questioned.

Artificial intelligence (AI) has the potential to significantly reduce parts of HR’s hiring and evaluation workloads. But it’s simply not ready to replace real people in a number of situations. Companies do not just rely their recruiting decisions on a candidate’s hard abilities. Ambition and passion are two examples of emotional and psychological characteristics that are significant. Artificial intelligence (AI) is currently unable to observe or assess human emotion or take into account how emotion influences a person’s conduct [16]. The impact of personalities and emotions on teams is another area where AI falls short. When given the duty of recruiting a new team member to join an existing one, AI is unable to understand the subtleties of team dynamics and how different personalities get along. HR is a personal, human-centered function. AI cannot replace a manager’s specific perspective or capacity to “read” people in person, whether they are potential employees or present ones. Human resources is a private, human-centered function [17]. A manager’s unique perspective or ability to “read” people in person,

whether they are current or potential employees cannot be replaced by Artificial intelligence (AI). Today's HR teams must be ethically responsible, especially when it comes to employing minorities, responding to sexual assault, and other contentious problems. Artificial intelligence (AI) lacks the moral obligation that HR must uphold, and AI can unintentionally become biased as well. Now, AI is overly reliant on certain keywords. It searches the stacks of applications for words and phrases that will aid in choosing the top candidates for the position. However, those who are knowledgeable about how Artificial intelligence (AI) functions can quickly outwit and mislead it by utilizing these exact terms in their applications and making themselves appear qualified for positions, they are not.

6 Conclusion

It can be concluded that AI can help human resources management to perform effectively which will boost the human resources efficiency based on real time data provided by the system. This helps management to take fast decision and keep the organization agile to suit to the changing business environment. Routine activities can be automated to reduce the burden of HR department so that they can utilize their time for other strategic decision-making or solve the important problems. The sentiment analysis of We360.ai shows that the application measures employee productivity effectively which reflects in emotional analysis of users. We360.ai, Traqq, Hubstaff, ActivTrak and TimeDoctor applications could successfully build trust among users and could fulfill user requirements. Use of AI in resume shorting, interviews, measuring happiness index of the employee helps organization to improve efficiency of human resources management department and reducing the cost of the human resources. But still there are challenges using Artificial intelligence (AI) in Human Resources as they are unable to measure the emotions and people ambition and passion related things to form exact analysis where only human can play a role. Despite many challenges using AI in human resources management can speedup and automate the human resources related work.

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