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AI Based Recruitment Tool

Surya Partap Singh[1], Amitesh Srivastava[2], Suryansh Dwivedi[3], Mr. Anil Kumar Pandey[4]
[1, 2, 3]*Bachelor of Technology, Computer Science and Engineering, Babu Banarasi Das Institute of Technology and Management Lucknow, Uttar Pradesh, India*
[4]*Assistant Professor, Department of Computer Science and Engineering, Babu Banarasi Das Institute of Technology and Management, Lucknow, Uttar Pradesh, India*

Abstract: ***In this study, the researchers narrowed their focus to the application of algorithmic decision-making in ranking job applicants. Instead of comparing algorithms to human decision-makers, the study examined participants' perceptions of different types of algorithms. The researchers varied the complexity and transparency of the algorithm to understand how these factors influenced participants' perceptions. The study explored participants' trust in the algorithm's decision-making abilities, fairness of the decisions, and emotional responses to the situation. Unlike previous work, the study emphasized the impact of algorithm design and presentation on perceptions. The findings are important for algorithm designers, especially employers subject to public scrutiny for their hiring practices.***
Keywords: Artificial Intelligence, Flutter, Frontened, Backened.

I. INTRODUCTION

AI, a term coined by John McCarthy in 1956, refers to the science and engineering of creating intelligent machines and computer programs. Hiring the right talent in today's competitive world is a challenging task for organizations. Recruiters strive to attract suitable candidates, provide a seamless recruitment experience, and foster a thriving workplace. Job seekers need insights into placement possibilities and salary expectations, approaching their search like product managers seeking the best market fit. The project aims to help candidates become smarter and understand the qualities and skills desired by the job market. Fairness in ranking algorithms for hiring is a crucial aspect, given the prevalence of Applicant Tracking Systems (ATS). New developments in AI and machine learning have the potential to improve human resource management, but assessing fairness and justice becomes difficult with automated procedures. AI HR tools can automate candidate sourcing and prescreening, saving time and reducing manual effort. Unconscious biases in HR decisions, such as gender, culture, and ethnicity, can be mitigated through AI-assisted chatbots and interview platforms. The project seeks to provide insights and solutions to enhance the hiring process, ensuring fairness for both candidates and organizations.

II. LITRATURE REVIEW

2020, Raghavan et al a three-phase experimental technique 52 CVs, content analysis, algorithm tweaking, and results execution, Kaggle website. The process of hiring employees is enhanced by RS based on content. After taking the organization's needs and necessary abilities into account, it assists in selecting and offering the best applicants. More candidate profiles from different industries need to be used to test the concept. The study also included a few parameters to screen resumes, however these criteria could be expanded.

2019, Cohen et al. The study focused on how a chatbot may reduce both conscious and unconscious prejudice in hiring and was based on the Artificial Intelligence Chatbot Viewpoint. theoretical understanding that only uses case studies.

2021, Woods et al. Interviews with professionals in the hospitality industry were part of this study, which also used an HR information system with optical character recognition. The study focuses on how incorporating AI helps HR recruiters in the hospitality business while also avoiding the problems of eliminating prospects as a result of an ineffective keyword search. only concentrating on the hospitality sector, with no operational meaning of the term hospitality sector.

2020, Faliagka et al. They employed machine learning techniques and automated online recruitment. Test 100 candidates for technical jobs. developed a semantic matching, personality mining, and job application module-equipped automated e-recruitment system. only three technical roles were the focus. It is necessary to compare the applicability to another employment category. The platform selects users who have both a personal blog and a LinkedIn presence. With such predetermined parameters, strong profile prospects are therefore unlikely.

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2019, Fernandez et al In this study, automation, advanced analytics, and viewpoint were used. The importance of HR analytics is emphasised in early workforce detection and better recruitment tactics. advanced analytics were just briefly mentioned, with little emphasis placed on the application side of analytics.
2021, Gikopoulos et al. The idea was built around automation. The results imply that in order to advance in the field of HRM for smarter recruitment, a human touch to automation is the key to blending along with Artificial Intelligence. Primary research can be used to support certain pieces of evidence, making them more reliable.

III. SOLUTION APPROACH

A web app or Android app is considered the most practical solution for enhancing the recruitment experience for both recruiters and candidates.
The web app will be developed using HTML/CSS, Bootstrap for the front-end, and Flask for the back-end. The Android app will be built using the Flutter framework along with Flask for the API.
Data science techniques, including exploratory data analysis, will be employed. Classification algorithms such as Linear Regression, Logistic Regression, Naïve Bayes, SVM, and Decision Tree Classifier will be used for model training. The API will be deployed using Heroku.

IV. PLATFORM AND TOOLS USED

A. Frontend:

1) The frontend is created using Flutter, an open-source UI software development kit.
2) Cross-platform development is possible with Flutter for Google Fuchsia, Android, iOS, Linux, Mac, Windows, and the web.
3) Platform, layout, and foundation widgets are available together with a reactive framework thanks to the Flutter framework.
4) It supports Cupertino widgets for Apple's iOS Human interface principles as well as Material Design widgets for Google's design language.

B. Backend

1) Machine learning techniques are used in the backend to do prediction jobs.
2) Algorithms like Logistic Regression, Decision Tree Classifier, Support Vector Machines, Artificial Neural Networks, and Naive Bayes classifiers can be utilised for binary classification tasks like predicting job placement.
3) Linear Regression is appropriate for regression issues like pay prediction.
4) Machine learning algorithms are used to find patterns in the data and make predictions based on the learned patterns.

C. Exploratory Data Analysis (EDA) and Data Science

1) The dataset is processed and analysed using data science approaches.
2) Exploratory Data Analysis (EDA) is used to comprehend the data, spot trends, and obtain new perspectives.
3) To explore the data, EDA employs summary statistics and graphical representations.

D. Flask

1) The Python microweb framework Flask is used for backend development.
2) It has a simple design and allows for extensions to provide more application functionality.

E. Deploying Heroku Apps

1) The app is put on Heroku, a Platform-as-a-Service (PaaS), for cloud deployment.
2) The project files will be managed through a Git repository.
3) A new Heroku app is made using the Heroku CLI, which has been downloaded.
4) Pushing the local git repository to the remote Heroku app's repository deploys the application.
5) The Heroku CLI allows for the checking of logs.
6) For configuration, the sandbox's webhook URL is reset to the URL of the Heroku app.

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V. SOME IMPORTANT CODES

```
#Using Logistic Regression Algorithm
from sklearn.linear_model import LogisticRegression
clf=LogisticRegression()
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)

print("Accuracy",accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
```

```
Accuracy 0.7941176470588235
              precision    recall  f1-score   support

           0       0.70      0.64      0.67        11
           1       0.83      0.87      0.85        23

    accuracy                           0.79        34
   macro avg       0.77      0.75      0.76        34
weighted avg       0.79      0.79      0.79        34
```

- **Using Logistic Regression Algorithm, the accuracy obtained is 79.41%.**

```
#Using SVM Algorithm
from sklearn.svm import SVC
clf=SVC()
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)

print("Accuracy",accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
acu.append(accuracy_score(y_test, y_pred))
f1.append(f1_score(y_test, y_pred))
```

```
Accuracy 0.6176470588235294
              precision    recall  f1-score   support

           0       0.25      0.09      0.13        11
           1       0.67      0.87      0.75        23

    accuracy                           0.62        34
   macro avg       0.46      0.48      0.44        34
weighted avg       0.53      0.62      0.55        34
```

- **Using Support Vector Machine Algorithm, the accuracy obtained is 61.76%.**

```
clf=MultinomialNB()
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)


print("Accuracy",accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
acu.append(accuracy_score(y_test, y_pred))
f1.append(f1_score(y_test, y_pred))
```

```
Accuracy 0.6176470588235294
              precision    recall  f1-score   support

           0       0.25      0.09      0.13        11
           1       0.67      0.87      0.75        23

    accuracy                           0.62        34
   macro avg       0.46      0.48      0.44        34
```

- **Using Naïve Bayes Algorithm, the accuracy obtained is 61.76%.**

```
#Using Decision Tree Classifier
dtree = DecisionTreeClassifier(criterion='entropy')
dtree.fit(X_train, y_train)
y_pred = dtree.predict(X_test)
print("Accuracy",accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
acu.append(accuracy_score(y_test, y_pred))
f1.append(f1_score(y_test, y_pred))
```

- **Using Decision Tree Classifier Algorithm, the accuracy obtained is 64.70%.**

```
Accuracy 0.6470588235294118
              precision    recall  f1-score   support

           0       0.47      0.64      0.54        11
           1       0.79      0.65      0.71        23

    accuracy                           0.65        34
   macro avg       0.63      0.64      0.63        34
weighted avg       0.69      0.65      0.66        34
```

VI. COMMERCIAL UTILITY OF PROJECT

The project is ideal for testing on a commercial scale. This is due to the project's suitability for training on any organization's dataset. It has a number of benefits that make it ready for the market. These benefits consist of:

1) Establishing an intermediary layer between the manual auditors and the dataset and substantially reducing manual effort.
2) Effectiveness in predicting outcomes and potential application of many coupled algorithms.
3) Shortening the process's duration and accelerating its speed.
4) Less reliance on the availability of subject-matter specialists.
5) User interface with ease of use.

Both business-to-business and business-to-customer interactions are made easier by the initiative. It's relatively easy to develop on demand for both iOS and website deployment.

VII. CONCLUSION AND FUTURE

Target clients can access specially trained data and analytics tools, which would permit better decisions, enhanced predictions, and acquire insights about the various elements affecting a candidate's placement, through the application of Machine Learning (ML) and Data Science. An application powered by data science would assist in digitising a process that is currently carried out manually and is, thus, obviously far more time-consuming and demands enormous quantities of work.

As a result of our project endeavour, candidates would be able to: • Gain comprehension and an idea about what requirements are necessary to get successfully in an organisation thanks to our ML-based recruiter-candidate interaction tool.

- Acquire knowledge and comprehension of the elements necessary for success in an organisation.
- Learn more about the impact these factors have on placement.
- Gain knowledge of the likely compensation they can anticipate given a particular set of marks, work experience, and other criteria.

The study demonstrated the impact of AI technologies only on the Recruitment and Selection process. This study can go further by focusing on other HRM procedures like performance management or training and development. 141 samples of HR professionals from Chennai-based IT organisations were used in the current study. This study can be expanded by including larger sample sizes from other major cities, such as Bangalore, Delhi, and others.

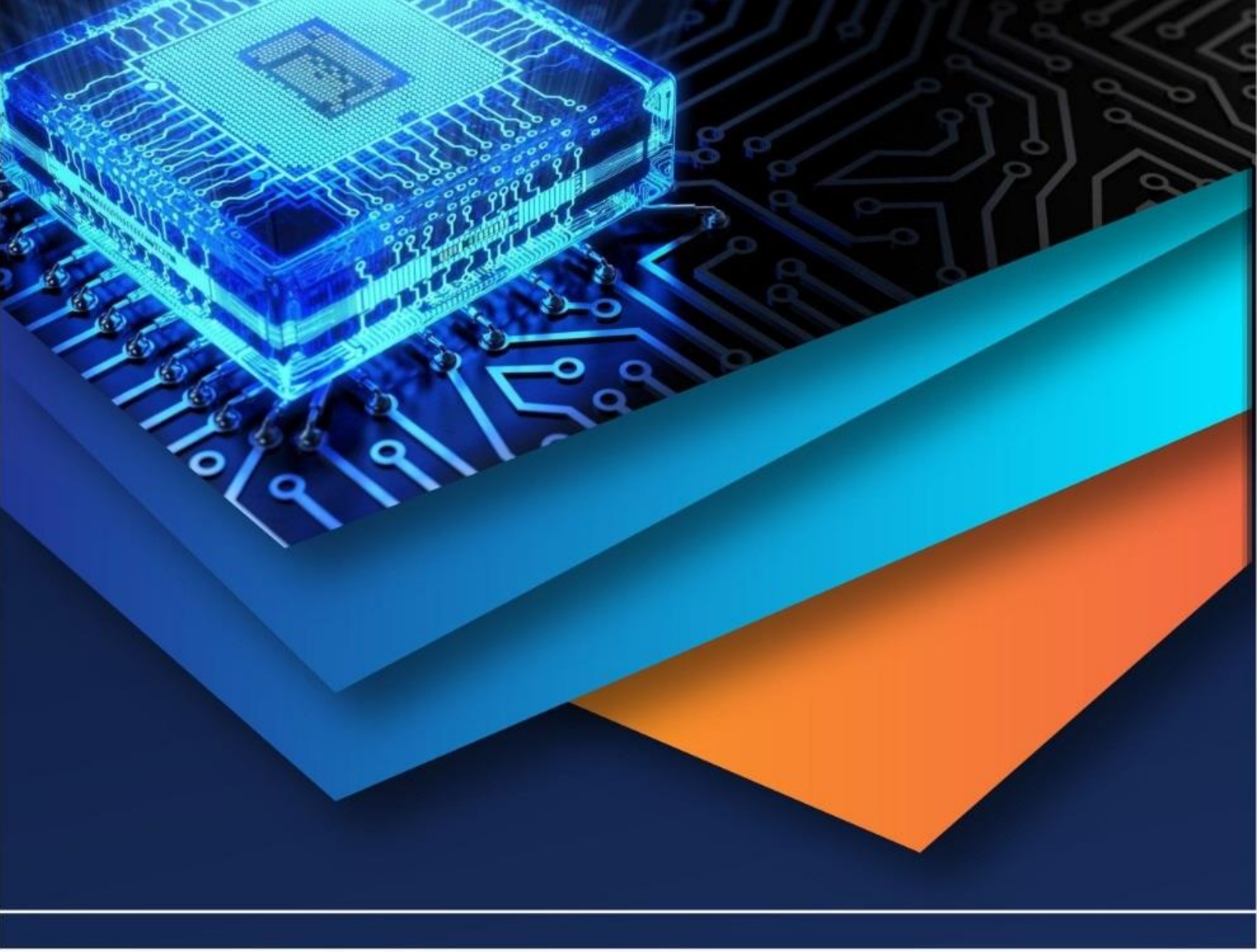
The recruiters revealed that utilizing AI technologies in the recruitment process can speed up the recruitment process and cost effective. Applying AI technologies in the recruitment process can enhance the recruitment process's quality with a high accuracy level and reduced human bias.

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The application of AI in the recruitment process can make it possible for the recruiter to get the right candidate with the right skill set for the right job with ease. Overall, the implementation of AI technologies in the recruitment process can reduce the workload for recruiters with enhanced candidate experience. It is suggested that the companies (recruiters) learn to join hands with AI technologies; they can train AI technologies to be extensions of their teams and not replace them.

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