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Helping hands - Job Hiring System for Specially Abled People

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***Keywords*— Behavior analysis, job hiring, personality, personality detection, recommendation engine, specially abled.**

***Abstract*—** *Employment of the specially abled has become a serious issue now-a-days. As the specially fit people have a chance to work there should be a fair chance for disabled people also. In today's competitive climate, people tend to have higher levels of education, which may result in fewer career opportunities being offered to them. Even the greatest in their industries are desired by the companies. Finding persons who are intelligent enough to be hired then becomes challenging. The task of the need for businesses to locate individuals who can meet their standards grows. To tackle these problems and make the work more straightforward, one could consider adopting a method. There are people who want to work but they are not reaching the appropriate place where they can work without any problem. To solve this issue and to help specially abled to find jobs where they can work easily this system is developed.*

I. INTRODUCTION

In this developing world there are around 400 million disabled people and in that there are 70% unemployed people. Total population of India is 2.3 billion and according to 2011 census , 21 million people suffer from one or other kind of disability. There are a lot of people who want a job but because of their disabilities they can't get a fair chance like others who are perfectly fine. They should not be compared with others. This website just addresses the specially abled. According to behavioral analysis the jobs are recommended to them so that they work happily and motivate others to work. For that purpose CNN algorithm is used. The GUI is made in such a way that they don't have to struggle much to find jobs.

The project's objective is to streamline the online hiring process by creating a system that can manage job applications. The system allows interested applicants to apply for any available positions within the organization. Once the applicant has registered, they will be given an account and considered as an applied user. The system will provide updates to the user regarding their application status, particularly if they are deemed qualified for the position. The project was developed in response to requests from the company managers so that the recruiting module could be included to the company's website and users could browse the openings in the company and submit applications immediately from a distance.

To make people comfortable at the workplace firstly in the website personality of the user is detected using different types of questions and according to the personality of the person the jobs are recommended so because of that they will not get any difficulty while working and they will work happily. For example , if a person is deaf and extrovert so he will get the recommendation like coffee shops and other places where they need to communicate with the others. So like this it will work. It makes both the owners and workers happy.

II. LITERATURE REVIEW

In this paper [1], the authors propose a hybrid deep learning technique that combines two popular deep

learning models, Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM), to classify the personality traits of individuals based on their textual data. The authors first preprocess the text data and then use the CNN model to extract features from the text, which are then used as input to the LSTM network. The LSTM network is trained to predict the personality traits of the individuals based on the features extracted by the CNN.

In this paper, authors evaluate the proposed technique on a large corpus of text data and compare the results with several advanced techniques. The results provided show that the proposed hybrid approach outperforms the individual techniques in terms of accuracy and efficiency, achieving a high level of accuracy in classifying personality traits. The paper also provides a thorough analysis of the results and discusses the strengths and limitations of the proposed approach. The authors conclude that the hybrid deep learning technique is a promising solution for personality trait classification and has potential for further improvement and refinement.

In summary, this paper presents a novel approach to classifying personality traits from text data that combines the strengths of CNNs and LSTMs. The results of the experiments indicate that this hybrid approach leads to improved accuracy and efficiency in personality trait classification.

The paper [2] is a review of recent trends in deep learning-based personality detection, which is the task of automatically identifying the personality traits of individuals based on their digital footprints, such as text data, social media posts, and other types of digital behaviour. Convolutional neural networks (CNNs), recurrent neural networks (RNNs), and long short-term memory (LSTM) networks are only a few examples of the deep learning techniques covered in this article by the writers. The authors also discuss the challenges and limitations of deep learning-based personality recognition, such as the lack of sufficient diverse and large-scale data and the requirement for effective feature engineering and data pretreatment.

The current paper provides a complete analysis of recent developments in deep learning-based personality recognition and emphasises the potential for further research in this area. The development of more reliable and scalable deep learning models as well as the investigation of fresh data sources and personality recognition methods are some of the recommendations made by the authors for future research.

The paper provides an overview of the most recent developments in deep learning-based personality recognition, discusses the difficulties and limitations associated with this field, and identifies promising areas for future study.

The paper [3] presents a recommendation system that helps individuals with disabilities find suitable employment opportunities. The system is based on a machine learning approach and uses a variety of features to make recommendations, including demographic information, education and training history, and previous work experience.

The performance of the recommendation system was evaluated in the paper "Intervention Recommendation for Improving Disability Employment" by using actual data and comparing it to several baseline methodologies. The outcomes show that in terms of accuracy and effectiveness, the recommendation system outperforms the baseline approaches. The authors also acknowledge the drawbacks of the recommendation system and offer potential directions for further investigation, like the incorporation of new features and improvements to the user interface.

The research concludes by introducing a recommendation system that helps people with disabilities find suitable employment opportunities. The results of the trials show that this method is advantageous for disability employment. The system has the ability to be improved upon and advanced further.

This paper presents [4], a recommendation system that provides recommendations to the user based on their location. The system uses geolocation information, such as GPS coordinates, to identify the user's location and provide personalised recommendations based on the current location and previous preferences.

The performance of a geolocation-based recommender system is evaluated in this research using real-world data and contrasted with other baseline methods. According to the findings, the geolocation-based recommender system is more precise and effective than the standard methods. The authors also go through the restrictions of the recommendation system and suggest possible lines of inquiry for further study, such as the incorporation of further characteristics and improving the scalability of the system.

The research evaluates the performance of a geolocation-based recommender system using real-world data, and it concludes that it performs better than the baseline methods. Future research on the system may benefit from the authors' suggestions for enhancements and improvements, such as adding new features and enhancing scalability.

In summary, the paper "Geolocation Based Recommender System" presents a recommendation system that provides recommendations to users based on their location. The results of the experiments indicate that the geolocation-based recommender system is effective in providing personalised recommendations and has potential for further improvement and refinement.

In this paper [5], it presents a recommendation system that provides job recommendations to users in career-oriented social networking sites. The system uses user interaction data, such as job postings viewed, skills endorsed, and job applications submitted, to identify the user's career interests and preferences.

The recommendation system is assessed using real-world data and compared to many baseline techniques in the study. It provides personalised job suggestions to users of career-focused social networking sites. The results show that in terms of accuracy and effectiveness, the recommendation system performs better than the baseline techniques. The authors also go through the restrictions of the recommendation system and suggest potential directions for further investigation, such as adding other features and improving the system's scalability.

The findings of the studies show that the recommendation system the article develops, which offers users personalised job suggestions on career-focused social networking sites, is successful in doing so. The system has the potential to be improved and advanced further.

The paper [6] presents a candidate management system that uses Artificial Intelligence (AI) to help organisations in the hiring process. The system is designed to reduce bias and discrimination in the hiring process by using eXplainable AI (XAI) techniques to make the decision-making process more transparent and explainable.

The authors evaluate the performance of the system using real-world data and compare its performance with a traditional, non-XAI based candidate management system. According to the results, the XAI-based system performs better than the conventional system in terms of reducing bias and discrimination, and that it is more transparent and explainable in its decision-making process.The authors also go over the system's drawbacks and offer possible avenues for future research, such adding more XAI methods and enhancing the system's scalability.

In summary, the paper describes a candidate management system that uses AI and XAI techniques to reduce bias and discrimination in the hiring process. The results of the experiments indicate that the XAI-based system is effective in mitigating bias and discrimination and has potential for further improvement and refinement.

The paper presents [7] a job scheduling system for cloud data centres that optimises energy usage while meeting real-time constraints. The system uses deep reinforcement learning (RL) to decide on scheduling in real-time based on the load and energy usage of the data centre.

The paper evaluates the performance of the system using simulations and compares its performance with several baseline approaches. Results depicts that the RL-based system performs the baseline approaches in the terms of energy efficiency and meeting real-time constraints. The authors also go over the system's drawbacks and offer some possible directions for future research, such adding more features and enhancing the system's scalability.

In this paper [8], it presents a job scheduling system for cluster computing systems that uses task sampling based learning to optimize performance. The system uses machine learning algorithms to learn from a sample of tasks and make predictions about the performance of other tasks, and uses these predictions to schedule jobs in the cluster. Using simulations, the authors assess the system's performance and evaluate it in comparison to a number of benchmark strategies.

The results show that the task sampling based system performs the baseline approaches in the terms of job completion time and resource utilization. The authors also go over the system's drawbacks and offer some possible directions for future research, such adding more features and enhancing the system's scalability.

The paper [9] is a study of gig workers with disabilities and the challenges and opportunities they face in this emerging form of work. The paper discusses the rise of the gig economy and how it has changed the labor market, with a focus on the experiences of gig workers with disabilities.

The authors present findings from surveys and interviews with gig workers with disabilities and other stakeholders, including policymakers, employers, and disability advocacy groups. The findings highlight the challenges faced by gig workers with disabilities, such as discrimination, lack of accommodations, and lack of access to benefits and protections.

The authors also discuss the opportunities that the gig economy presents for gig workers with disabilities, such as increased flexibility and the ability to work from home. They also explore the regulatory response to the gig economy and the challenges and opportunities for policymakers in protecting the rights of gig workers with disabilities.

The paper presents [10] a study of using ML/DL techniques for performance prediction in hiring process and performance appraisals. The authors develop and evaluate a machine learning model that predicts an individual's performance based on their demographic information, job-related information, and other relevant factors.

Using information from a large organisation, the authors assess the model's performance and compare it to the performance of numerous benchmark models. The findings demonstrate that the machine learning model accurately predicts employee performance and outperforms the baseline models. The authors also discuss the potential implications of the results for the hiring process and performance appraisals, including reducing bias and improving the fairness of these processes.

They also suggest potential directions for future work, such as incorporating additional data sources and exploring other machine learning algorithms.

The paper [11] is a study that examines people's reactions to different types of hiring processes. The authors wanted to understand how people perceive the fairness and objectivity of hiring processes led by humans versus those using AI and machine learning, as well as processes that combine both human and AI decision-making.

The study found that people generally trust and feel more comfortable with human-led hiring processes, but their perceptions of the fairness and objectivity of augmented hiring processes depend on a variety of factors. For example, people are more likely to trust an AI/ML-based hiring process if they believe the process is transparent and explainable, and if they trust the competence of the decision-makers. They may also be more likely to trust an augmented hiring process if they feel that the human decision-makers are still in control and have the final say.

The authors suggest that organizations using AI/ML-based or augmented hiring processes should take steps to address concerns about fairness and bias. This could include being transparent about how decisions are made, providing opportunities for feedback and appeal, and ensuring that the human decision-makers have the final say. The study highlights the importance of understanding people's perceptions of augmented hiring processes, and the need for organizations to consider the potential implications of using these processes in their hiring practices.

III. PROPOSED METHODLOGY

In this section a job hiring website for Specially abled people has been proposed. In this approach there are basically 3 user modules: Super admin, Company, Normal User. There is one more main module for personality detection of the user. This website will basically provide a platform for specially abled people to apply for jobs. The website is made keeping in mind Specially Abled people will have an easier access. User Modules of the website is described below:

Super Admin: In this module Admin will verify the company that is being registered for the website. The admin can check all information of the company that has been provided and verify it. Once the company is verified it will be approved to post jobs on the website and the admin can also verify job applicants data which will allow them to apply for jobs. Super admin can also remove the company if needed. The other main role of the super admin is to verify the users by checking the documents they submitted and then verifying the user.

Company User: Once the Company gets verified via the Super Admin, they can post new jobs on the platform. They can select their requirements according to their needs and also mention how many openings they have. Once the job is posted they can see how many people have applied for a particular job, and see all of their details along with their personality and behaviour details. And based on this they can approve or reject the application. Once the application is approved or rejected an automatic mail will be sent to the Job Applicant regarding the Status.

Normal User: The user will have to first register on the platform and fill all the personal details and the details regarding Handicap Certificate. After completely filling the profile user can give a personality assessment his/her personality type is recognized.

Once the details are filled the Super Admin will verify the details and verify the user. Once the user is verified he can apply for the jobs. There are different sorting available for the user to choose from so that he/she can choose a proper job according to his/her needs. They will be directed to a personality detection test. Then they will be directed to website where they can apply for jobs They can filter out the jobs that are being recommended to them according to their personality using a recommendation engine. Will receive a mail for job confirmation if application is approved by Company User.

Personality detection model. In this Model we have a set of questions which the user has to answer and they are evaluated and a personality is assigned to the user. K-means algorithm has been used to detect personality.

We made use of a dataset that was gathered (from 2016 to 2018) via an engaging online personality test. So personality assigning is quite accurate. Each factor was considered while taking the dataset so personality is assigned properly. There is one more module which will filter out the test according to personality which uses Random Forest for assigning a personality to a particular user; the personality is not shown to use it fully for recommendation purposes and the registered companies can view the personalities of the applicants, so that the choose the appropriate candidate for the respective job. This will make it easier for users to choose a job which will be more comfortable. In the KYC process the verification will be done manually by the company so there is no mistake and only Specially abled people will be able to apply for Jobs. There is an automated mail sender service when Company users accept the application the mail will be sent to the Job applicant and further verification process will be done using mail.

In the Personality Detection model there are about 50 questions categorised in 5 types: openness, Conscientiousness, extroversion, agreeableness, neuroticism. Each question has different weights and different schemes of evaluation. Considering those differences, the model uses an equation to calculate the value of a particular type among the five.

The equation for finding the value of extroversion_score is given below:

extroversion_score = ques[1] + ques[2]- ques[3] + ques[4] + ques[5] - ques[6] - ques[7] + ques[8] + ques[9] + ques[10]. (1)

After evaluating this equation we get the total score of extroversion. Similarly there are 4 more equations for the rest of the types.

After finding the values they were normalised using the formula:

$$x' = (x - min) / (max - min) \quad (2)$$

The traits that will be detected using personality detection model are as follows:

1)ESTJ- It is true that the Executive (ESTJ) is Extraverted, Observant, Thinking, and Judging. They have incredible tenacity and constantly rely on their own good judgment. Among other things, they are frequently a stabilizing influence, able to offer constant direction in the face of difficulty.

2)ISTJ- The Logistician (ISTJ) is an introverted, perceptive, reflective, and judgmental personality type. Such folks have a reasonable outlook on life and are quiet but resolute. They prepare their actions in great detail and execute them with great care.

3)INFP- Introverted, Intuitive, Feeling, and Prospecting are indeed characteristics of the Mediator (INFP). These uncommon personality types tend to be cool, creative, and open-minded, and they approach everything they do with attention and originality.

4)ENFJ- The Protagonist (ENFJ) is indeed someone who is Extraverted, Intuitive, Feeling, and Judging. These pleasant, forthright people enjoy assisting others and have strong opinions and convictions. They back up their viewpoint with the creative energy needed to attain their objectives.

5)ISFJ- It is true that The Defender (ISFJ) is an introverted, perceptive, emotional, and judgmental person. These people have a steady way of being nice and modest. In their daily lives, people are diligent and effective, giving special attention to practical issues.

IV. FIGURES AND TABLES

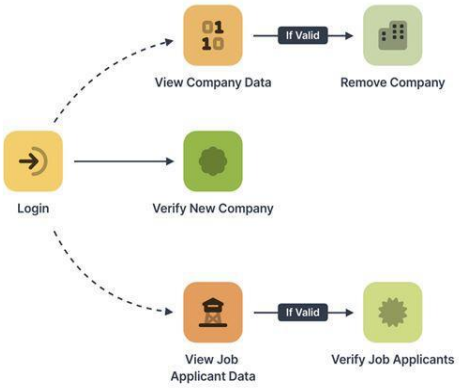

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Fig.1. Super Admin flow Diagram

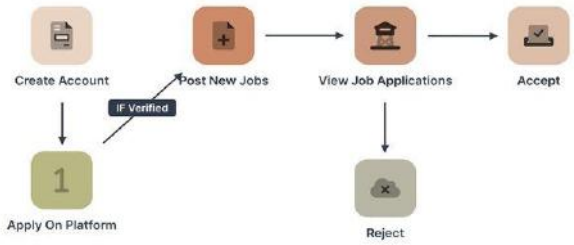

Fig.2. Company user flow Diagram

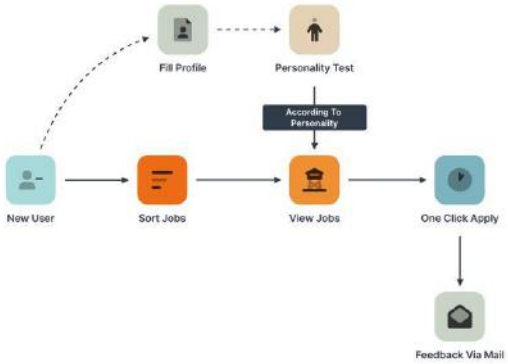

Fig.3. Normal User Flow Diagram

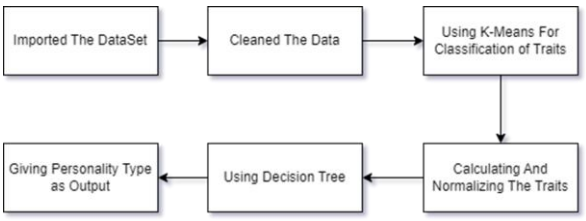

Fig.4. Personality Detection Model

V. CONCLUSION

The labeling of the data set with the K-Means algorithm was one of the most crucial jobs. As the data set was not labeled. As the data set was collected from 5 different personality detection websites the data was first cleaned, then formed into clusters. Responses were segregated into 5 types: extroversion, neuroticism, agreeableness, conscientiousness, openness. And then by calculating these values personality type was decided. Another important task was to allow the verified users and companies to apply to the particular jobs and post companies. The admin is assigned the task of verifying the documents and on the basis of that user and companies are going to get verified. If the user is not verified yet then he is not able to apply until he's verified and the same applies to the companies.

VI. FUTURE SCOPE

In this project more security features can be added such as:

a. To avoid fake people who are pretending to be disabled using fake certificates.

b. To avoid the typing struggle, a speech-to-text converter can be added so that the registration of the user can be simplified.

c. When the user profile is reviewed and accepted by the company manager, a chatbot feature can be added for better interaction between the applicants and company manager. So they will get the update and apply as soon as it is posted.

d. Those who can't read the text, a text-reader can be added. To do work faster automated KYC can be added and then this project will cover everything which can be used by any type of specially abled persons.

REFERENCES

[1] Aikpo, F. H., Ahouanse, M. D., Agbandji, L., Edorh, P. A., & Houssou, C. S. (2017). Assessment of contamination of soil by pesticides in Djidja's cotton area in Benin. *International Journal of Advanced Engineering Research and Science*, *4*(7), 1-5. doi:10.22161/ijaers.4.7.1

[2] Ahmad, H., Asghar, M. U., Asghar, M. Z., Khan, A., & Mosavi, A. H. (2021). A Hybrid Deep Learning Technique for Personality Trait Classification from Text. *IEEE Access, 9. doi: 10.1109/ACCESS.2021.3121791*

[3] Mehta, Y., Majumder, N., Gelbukh, A., & Cambria, E. (2019). Recent trends in deep learning-based personality detection. Springer. *doi:10.1007/s10462-019-09770*

[4] Tran, H. X., Le, T. D., Li, J., Liu, L., Liu, J., Zhao, Y., & Waters, T. (2020). Intervention Recommendation for Improving Disability Employment. *In Proceedings of the 2020 IEEE International Conference on Big Data (Big Data). DOI: 10.1109/BigData50022.2020.9378350*

[5] Pandey, N., Tandon, S., & Jain, P. (2021). Geolocation Based Recommender System. *In Proceedings of EasyChair. https://easychair.org/publications/preprint/CmwQ*

[6] Ahmed, S., T, M. H., Hoq, M. N., & Adnan, M. A. (2016). User Interaction Analysis to Recommend Suitable Jobs in Career-Oriented Social Networking Sites. *In 2016 International Conference on Data and Software Engineering (ICoDSE).*

[7] Hofeditz, L., Stieglitz, S., Rieß, A., Mirbabaie, M., & Clausen, S. (2022). Applying XAI to an AI-based system for candidate management to mitigate bias and discrimination in hiring. *Springer*.

[8] Yan, J., Huang, Y., Gupta, A., Liu, C., Li, J., Gupta, A., & Cheng, L. (2022). Energy-aware systems for real-time job scheduling in cloud data centres: A deep reinforcement learning approach. ScienceDirect.

[9] Hu, Y. C., Jajoo, A., Lin, X., & Deng, N. (Year). A Case for Task Sampling based Learning for Cluster Job Scheduling. *IEEE Transactions on Cloud Computing.*

[10] Blanck, P., & Harpur, P. (2020). Gig Workers with Disabilities: Opportunities, Challenges, and Regulatory Response. *Springer*.

[11] Shawabkeh, T. A., Mahmoud, A. A., Salameh, W. A., & Amro, I. A. (2019). Performance Predicting in Hiring Process and Performance Appraisals Using Machine Learning. *In 2019 10th International Conference on Information and Communication Systems (ICICS).*

[12] Gonzalez, M. F., Lobbe, C. E., Shirase, L., Tomczak, D. L., Liu, W., Justenhoven, R., & Martin, N. R. (2022). Allying with AI? Reactions toward human-based, AI/ML-based, and augmented hiring processes. *ScienceDirect.*