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| **INTRODUCTION**  1.1 Overview  A high rate of employment and fewer highly skilled job-seekers have led to greater difficulty in identifying candidates for roles. 62% of recruiters say that their job is more difficult today than one year ago, and 67% claim a higher rate of difficulty than five years ago.  According to the report, suggested by Monster it is likely that recruiters who embrace data and analytics will be more successful than those who do not. The report states that 70% of recruiters say their organization is keeping up digitally. It’s important for recruiters to pay attention to the changing trends within the industry, and of course, to act accordingly.  Therefore, recruiting new talent isn’t just time-consuming and challenging, it requires a different approach given the current age of competition and technological availability, where the recruiters should get the top talent that their organization demands as well as make sure that the candidates are being able to apply to and have a correspondence at all the job listings they qualify for and desire. Thus, making recruiting is a two-way street. The recruiters need to sell their job well and make sure the communication they strike with the candidate is followed up on efficiently and without bias.  1.2 Purpose  Our solution aims to solve the following problems in a unique and innovative manner:  1. *Automates tasks where they can be automated*  According to a survey of talent acquisition leaders [1], 50% of them agreed`that the most difficult part of recruitment was identifying the right candidate from a large applicant pool. Resume screening has always been an integral step in short-listing candidates. One recent report [2] shows that 93% of the recruiters still rely on resumes to find good candidates. Industry stats [1], however, show that around 75-88% of the resumes received for an open job requirement are unqualified or not strong enough to move forward with a recruitment process.  Since most recruiters are very busy people, automating the tedious, time-consuming tasks such as resume screening can not only help save time but also provide better results. By coupling hybrid  filtering with the use of an AI-driven chat bot, the proposed solution can not only remove heaps of these mundane tasks but also provide a better means of candidate sourcing, screening and shortlisting.  2. *Reduces bias in judgments*  Ensuring that our judgments are not clouded by any bias is crucial when finding right candidate for a job [4]. Using content-based and collaborative filtering methods, the proposed AI-based solution ensures that recommendations are free from any bias.    3. *Helps find the right candidate*    By analyzing a person’s online presence, we make predictions about how likely is he/she to accept a job and what roles he/she might be interested in. We also analyze the profiles of candidates who have already started a job within the company for collaborative filtering. By combining all the available information, we identify candidates with similar personalities and skills and further decipher which candidates might be interested in certain roles and thus directly target relevant job adverts at them.     1. **LITERATURE SURVEY** | | | |
| 2.1  Existing problem  Recruiting the right candidate for a job description is like finding a “needle in a haystack”. Apart from being a tedious and time-consuming process, it is marred by a number of challenges such as:   * Large applicant pool for a given job listing. * Difficulty in validating an applicant’s profile * Economic fluctuations * Bias in judgments | | |  |
| 2.2  Proposed solution  We propose a solution where recruiters can post their job description with all the necessary details and advertise their organization and its job listings and the candidates can apply to them by uploading their resume consisting of skills, past work experiences and qualifications. And our system will recommend the best candidates to the organization with an efficient process of analysis and testing which will unfold in 3 phases.  **Phase 1: Resume screening:** A candidate can apply to a job of their liking, and on the basis of analyzing their resume, our system will check if the skills and experience possessed by the candidate is in line with the requirements of the organization and shortlist an intermediate pool of candidates.  **Phase 2: Interview with Chatbot:** Understandably this pool might also be too large to submit to the organization, hence the shortlisted candidates will then have to answer a few questions by interacting with our system’s chat bot. Using natural language processing, our system will measure the accuracy of the answers and analyze the candidates personality traits and assign them scores. On the basis of a threshold, a final pool of selected candidates will be given to the organization.  **Phase 3: Online/Video Interview:** The organization will be able to interact with these final candidates via a video call service that our system will provide and on the basis of their specific needs, the organization can recruit their picks. | | |  |
| **THEORITICAL ANALYSIS** | | | |
| 3.1  Block diagram                        Flow Diagram (Candidate Side)Flow Diagram (Recruiter Side)    Use Case Diagram | | | |
| 3.2  Hardware / Software designing | | |  |
| **EXPERIMENTAL INVESTIGATIONS** | | |  |
| *Front-end*   * HTML * CSS * Bootstrap * Embedded Javascript (EJS)     *Back-end*   * Node.js * Express * Helmet for security * MongoDB as a database * Mongoose as an ORM for MongoDB     *Library & Dependencies*   * IBM Watson SDK for Node.js * Socket.io for messenger chat * WebRTC for peer-to-peer video conferencing * Tensorflow.js * PassportJS for user authentication     **FLOWCHART** | | | |
| **RESULT** |  | | |
| * Resume Generator. * Job Recommendation System using hybrid filtering. * Skill-based filtering system. * AI ChatBot for skills and personality analysis. * Messenger for connecting applicants and recruiters. * A secure peer-to-peer video conferencing system for interviews.     **ADVANTAGES & DISADVANTAGES** | | |  |
| Over 31 lakhs students appear for the 12th CBSE exams annually, moving to universities or entering the workforce. The job market in India is scarce given its massive populous. In such conditions, every candidate needs to make sure he/she has the means to put themselves out there for the recruiters to see. They need an equal and unbiased opportunity to apply for the jobs they seek and deserve. Similarly, the recruiters also face a major issue to choose suitable candidates for their organization when the applicant pool is so large. The recruiters need means to reduce the redundancy in the recruitment process and save valuable man-hours by avoiding mundane tasks and hence enabling them to increase their productivity. With this vision in mind, our solution provides the following advantages:  1. An easy and uniform format to make one's resume. The candidates don't have to fuss with resume formatting and the recruiters can form unbiased opinions since all resumes will be uniform.  2. Ability to conduct HR interviews, without any human assistance with Interview Bots. This ensures the candidates can give the interview when they please, also the human effort to take the interviews of so many people is efficiently gotten rid of.  3. Ability to see all and every active job posting so the candidates don't miss out on crucial opportunities. And making sure the recruiters can the word out regarding their job openings effectively.  4. Ability to chat with other candidates in order to exchange ideas or ask doubts and stay in touch with similar job seekers.  5. Inbuilt video call features that will enable remote interviews possible especially given the current social distancing situation.    The disadvantages of our solution could be as possible:      **APPLICATIONS** | | | |
| Any hiring facilities can make use of the services our solution provides. Be it an established corporation or a start-up or individuals seeking freelance professionals will be able to sought out recruits and employees very easily.  Hirable job seekers can have a plethora of job options to apply to. Be it graduates, post-graduates or students seeking work experience can make a profile on our website and sought out the jobs that interest them.  This solution's application is high and wide. Any body wishing to hire can make their public profile and post their job requirements, and anyone who has the necessary qualifications can apply for it.        **CONCLUSION** | | | |
| **Our solution is aimed at the problems of recruitment and job seeking. It is a revolutionary change that will help unburden the recruiting firms and also provide an all-encompassing platform to the job seekers to apply to desirable jobs and follow the process without any fear of missing out on crucial communication, as all the activities of selection will occur in one place. Our solution will provide means to create resumes, to carry out virtual interviews- be it by using Interview Bots or video calls, and to stay in touch with fellow candidates or employers. Our system selects candidates on the basis of their qualifications and skills as well as their overall personality in accordance to the job profile. We belive it will make the recruiting game a lot more easier and more inclusive.**    **FUTURE SCOPE:**  **Converting the web-application to a native application as well is the future scope of our application. Having said that, our web-application is fully web-responsive and supports all browsers.** | | | |
| **BIBILOGRAPHY** | | | |
| **APPENDIX** | | | |
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