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AN INTELLIGENT SYSTEM FOR REQUIREMENTS VALIDATION PROCESS USING DECISION TREE

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Abstract- An industry or a business or a firm requires quality personnel for accomplishment of objectives framed by them in order to survive in this competitive era. They all are in the beginning of fourth industrial revolution. To remain competitive in this digital world all search for bright, potential and dynamic employees. Organizations with an effective recruitment strategy will be able to employ suitable individual in order to manage the digital world and developing business environment. So, the recruitment strategy is the prime factor for every organization in hiring skilled employees who could be more efficient and effective in accomplishing the job objectives. The recruitment strategy as it is a major function of organization apparently takes help of data analysis for decision making process. The data analysis is known as “Artificial Intelligence” which plays a crucial role in recruitment decision. Artificial intelligence in a most basic terminology and is a human develop intelligent machines. AI will work and react like human and its ultimate goal is to facilitate computers to carry out the work as normally done by people. AI leads with an incredible speed and accuracy. The major objective of this paper is to study how Artificial Intelligence influences the recruitment strategy.

Keywords- Artificial Intelligence, Decision Tree and Machine Learning Algorithm.

I. INTRODUCTION

Organizations develop and sustain by innovating new ideas to compete in the digital era. Innovation leads to decrease in manpower and increase in machine handling. Organizations will also need to train its employees to handle machines, software or any equipment for that matter. Now organizations are trying to implement recruitment techniques which lead to acquire talented employees. Artificial Intelligence term was coined by John McCarthy (1950) soon after when he published a paper entitled “Computing Machinery and intelligence” and this paper led to open the doors to the field termed as AI. Now, HR managers implement Artificial Intelligence technology to recruit, retain and inspire the proficient manpower which leads to success and growth for both the employer and employee. AI in recruiting has a major role in talent acquisition (Madeline

Laurano Co-Founder & Chief Research Office). Nearly 30% of companies implementing AI for recruiting activity which can lesser down time, cost reduction and can place right talent in the right position. Artificial Intelligence is defined as “An area of study in the field of computer science. Artificial intelligence is concerned with the development of computers able to engage in human-like thought processes such as learning, reasoning, and self-correction”. Artificial intelligence is all about fast thinking with lot of knowledge, think as human, logical reasoning, etc., as it is a part of computer science leading to efficiency in problem solving by giving solutions.

II. LITERATURE SURVEY

<i>s.no</i>	<i>Title</i>	<i>Author</i>	<i>Published year</i>	<i>Methodology</i>
[1]	Requirements validation techniques:An empirical study	H.A. Bilal, M.Ilyas, Q.Tariq and M. Hummayun	2016	This paper gives an overview of requirements validation techniques which have been practicing in industry, which includes requirements inspections, requirements prototyping, requirements testing and viewpoint-oriented requirements validation. This paper also highlights pros and cons of these techniques. In requirements testing, special attention is given to TCD inspections.
[2]	A review on software requirements validation and consistency management	S.T. Demirel and R. Das	2018	This paper provides a review of requirements validation and consistency management based on the existing literature in order to identify the gaps in the existing knowledge on the process of software requirements specifications. This paper begins with a review of the definitions of the 3Cs, upon which the understanding of the 3Cs is derived. Overall, this paper identifies the various gaps existing within the process of validating and managing the consistency of requirements to avoid re-inventing the wheels in the diverse and comprehensive knowledge of requirements engineering.
[3]	Improving software quality using machine learning	K.Chandra, G. Kapoor, R.Kohli A. Gupta	2016	This paper highlights the significant analysis in the area's subject to learn and stimulate the association between the metric specifying the object orientation & the concept of change proneness. We have two views to be addressed: (1) Parameters quantification that affects the quality, functionality and productivity of the software. (2) Machine learning technologies are used for predicting software Here, the focus of the research paper is to equate and compare all of learning methods corresponding to performance parameter with its statistical method & methodology which would often results enhanced. Data points are the basis for prediction of models
[4]	Software requirement analysis: Research challenges and technical approaches.	S.T. Demirel and R. Das	2018	Requirement analysis is one of the key challenges in software development projects. Customer requirement specification and management entails various impacts to software projects and still is an improvement area on both academic and industrial fields. Models like CMMI also uncovers requirement development and management and specifies the specific goals and practices for them. In this paper, key challenges and issues of requirement management are listed with respect to a standardization activity, namely CMMI.

[5]	Requirement validation model for virtual distributed system	T. Kiran, S. Farhan, H. Tauseef and M. A. Fahiem	2013	In this research paper, a requirement validation framework has been proposed for distributed virtual projects. Main purpose of this framework is to enhance the quality of the distributed virtual systems by providing easy and systemic way for validating the requirements of such systems. Distributed Virtual Environments are those systems which are designed for users who are located at different geographical areas and uses different networks. Our proposed framework provides a systematic way to requirement engineers through which they could analyze the requirements that come from user end on the basis of some factors like completeness, correctness etc.
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III. EXISTING SYSTEM

Most of previous literatures have placed arguments regarding job loss due to automation or AI as an intelligent machine that can potentially become a threat to human as they threaten human efficiency. However it was really necessary for this research from the perspective of Human Resources because not all the jobs are susceptible to alteration due to the fourth industrial wave. According to WEF (WEF,)reports jobs with the requirements of unique skillsets will be in demand despite the threat of redundancy. In this paper the researcher has tried to find the correlation between the bulk hiring drives and the effectiveness of implementing AI into finding top performing talents that will be interested in the organizational development for the long run. Due to the serious gap in knowledge access and relevant resources. It was a challenge to find sufficient data and link it with the research objectives.

DISADVANTAGES OF EXISTING SYSTEM

- Low retention
- Low recruitment

IV. PROPOSED SYSTEM

Artificial intelligence is a technology which can work smartly as equal to human brain in different situations. It gains attention and importance in automating recruiting system when compared to traditional recruitment methods. Recruitment is the central activity of all organization to work on. Now, recruitment industry is taking up growth by implementing smart way to recruit i.e., recruiting through artificial intelligence. And numerous industries are focusing on the changes taking place in recruitment process. AI technology has tremendous impact on recruitment activity as it enables the recruiter to align all some unstructured candidate bio-data, construct profile into uniformity, identify and match skill sets required for the industry. In today's era, recruiters think AI technology is competing with them for recruitment activity. But, it is human built software to make the work at ease while the process is carried on. To conclude the role of AI it is the combination of humans and AI that leads to data maintenance, save the cost and time to the organizations with more accuracy and access in total recruitment process.

ADVANTAGES OF PROPOSED SYSTEM

- Time saving
- Cost saving
- Hire with quality

V. SYSTEM ARCHITECTURE

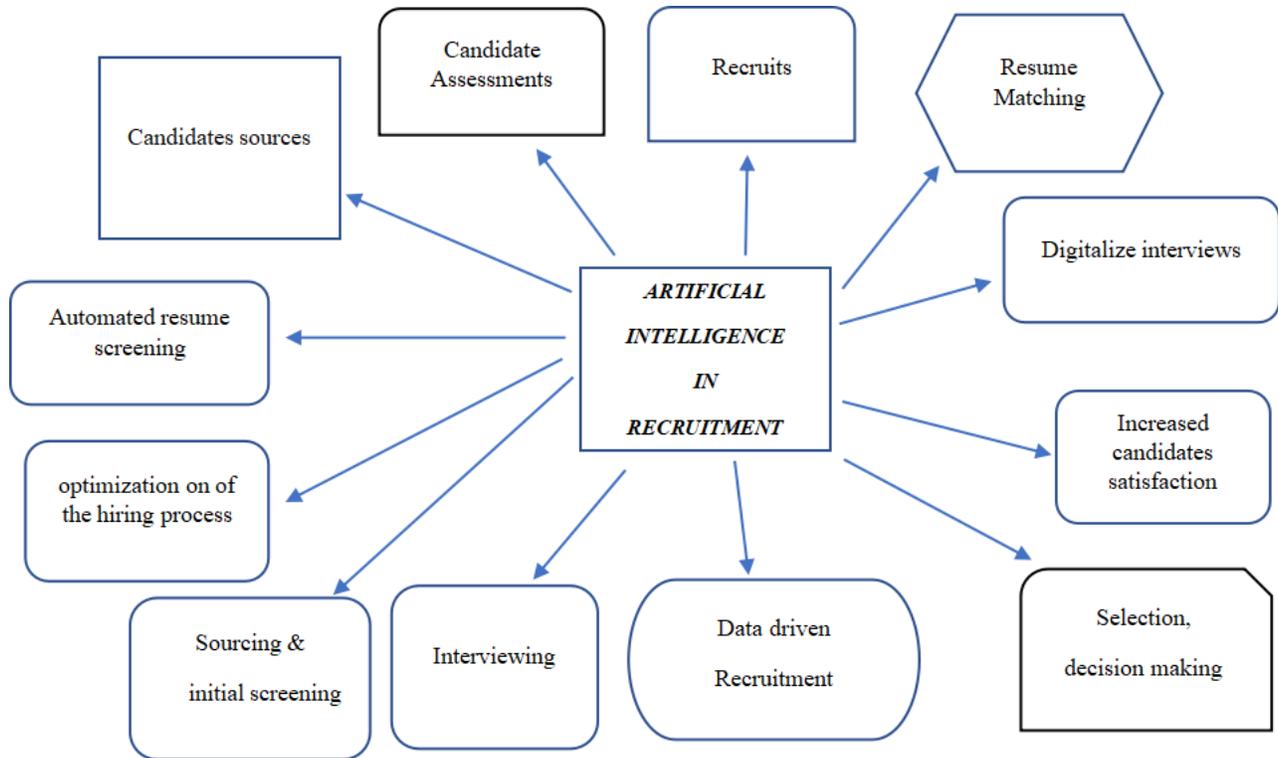


Fig.1. Artificial Intelligence in Recruitment

To recruit a candidate, we undergo few modules such as Candidate Source is used to analyse social network to identify who the candidate is. Resume screening where you have Identify candidates based on their criteria. Resume matching is finding someone with experience with strong skills. Based on the decision tree algorithm selections takes place. Allowing recruiters to make an evidence-based selection of candidates and hire the right candidate for a position, while speeding up the recruitment process. The legal team will be augmented as they will have in their possession all data available automatically gathered during the recruitment process. Hence the adaptability of this technology results in better performance of the employees.

VI. MODULES

- Data Sourcing Module
- Resume Screening Module
- Candidate Matching Module
- Checking Reference Module
- Legal Aspect Module

DATA SOURCING MODULE:

This means that today, as a recruiter, you will need to analyze social networks to identify correctly who a candidate truly is. Moreover, you can program AI based bots to automatically source candidates for you based on your criteria. Your data strategy needs to incorporate social networks to automatically cross reference information from a CV that will be scanned and analyzed in order to ensure that it tells the truth about the candidate’s experience. An AI algorithm will be able to source and analyze hundreds of millions of profiles. This is obviously something a human would not be able to do. AI is about human augmented and here the mundane task to source and check is taken care of as well as the communication with candidates whilst the process is ongoing. This will ensure engagement from all.

RESUME SCREENING MODULE:

The screening process is also about to improve. As you will have identified valuable candidates based on your criteria, you will not waste any time. Your potential talents would have a know-how in your industry and will be able to start rather quickly. Candidate ranking will be more efficient, and the right candidate will come out quicker. Facial recognition will ensure that you are talking to the right candidate and false identity will then be a problem of the past

CANDIDATE MATCHING MODULE:

Candidate matching will move towards a personalized candidate experience and with the help of a strongly backed AI algorithm you will be able to tailor a candidate experience to your own needs. Finding someone with 5 to 10 years’ experience with strong skills, network and know-how will become an easy task because the variety and varsity of data will allow detailed and precise analysis and extract of data. Candidate experience will be optimized so that you will truly understand what engages your candidate. You will also be able to know when to intervene to ensure longer service. For example, if you see that every 3 years your candidate changes jobs and responsibility you will be able to predict and offer something new before he/she reaches that critical timing.

CHECKING REFERENCE MODULE:

Checking references will be simpler. Your AI algorithm will use all types of data available. It will be able to cross reference people and build a network with starfish type of connections. You will then either contact their references, if possible, or check what has been written or said on social networks and make your own opinion.

LEGAL ASPECT MODULE:

Once all these steps have been completed, the legal aspect will become automated. The legal team will be augmented as they will have in their possession all data available automatically gathered during the recruitment process. Contracts will take into consideration all information discussed during the recruiting process and will be written with human input to ensure it matches all legal requirements.

VII. ALGORITHM

Decision Trees for Classification: A Machine Learning Algorithm

Decision Trees are a type of Supervised Machine Learning (that is you explain what the input is and what the corresponding output is in the training data) where the data is continuously split according to a certain parameter. The tree can be explained by two entities, namely decision nodes and leaves. The leaves are the decisions or the final outcomes. And the decision nodes are where the data is split. an example of a decision tree can be explained using above binary tree.

Step 1: Let’s say you want to predict whether a person is fit given their information like age, eating habit, and physical activity, etc.

Step 2: The decision nodes here are questions like ‘What’s the age?’, ‘Does he exercise?’, ‘Does he eat a lot of pizza’s’?

Step 3: the leaves, which are outcomes like either ‘fit’, or ‘unfit’.

Step 4: In this case this was a binary classification problem (a yes/no type problem).

There are two main types of Decision Trees:

- * Classification trees (Yes/No types)

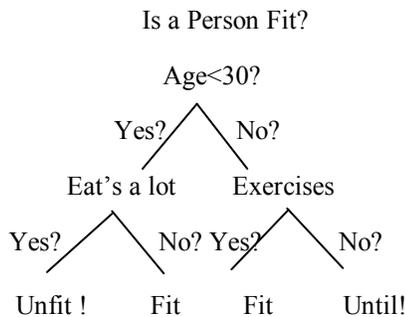


Fig 2. Decision Algorithm

- * What we've seen above is an example of classification tree, where the outcome was a variable like 'fit' or 'unfit'. Here the decision variable is Categorical.
- * Regression trees (Continuous data types)
- * Here the decision or the outcome variable is Continuous, e.g. a number like 123.
- * Working
- * Now that we know what a Decision Tree is, we'll see how it works internally. There are many algorithms out there which construct Decision Trees, but one of the best is called as ID3 Algorithm. ID3 Stands for Iterative Dichotomiser 3.

VIII. RESULT

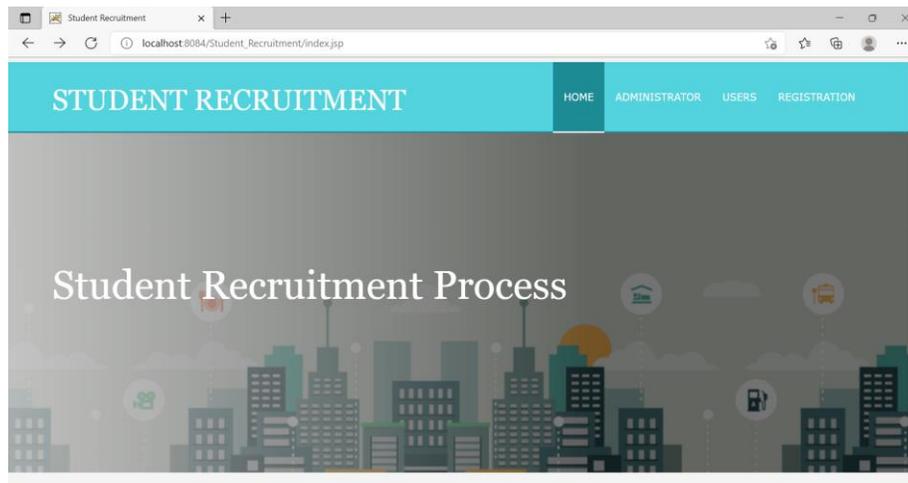


Fig.3 Student Recruitment

Fig. 3 shows the home page of the recruitment process. In this page we have Administrator, Users, Registration. In administrator the admin can login by giving their user id and password. Students and job seekers has to register first in registration and enter the details in users.

A screenshot of a web browser displaying the 'Users Registration' form. The browser's address bar shows 'localhost:8084/Student_Recruitment/reg.jsp'. The form is titled 'Users Registration' and contains the following fields: 'Name *', 'Email Id *', 'Phone No *', 'Role *' (a dropdown menu with 'Job Seekers' selected), and 'Password *'. At the bottom of the form are 'Submit' and 'Reset' buttons.

Fig 4 Users Registration

In Fig 4 where students and job seekers can register. Here the user has to enter the details like name, Email id, phone number, role whether your job seeker or student, enter a valid password and then submit.

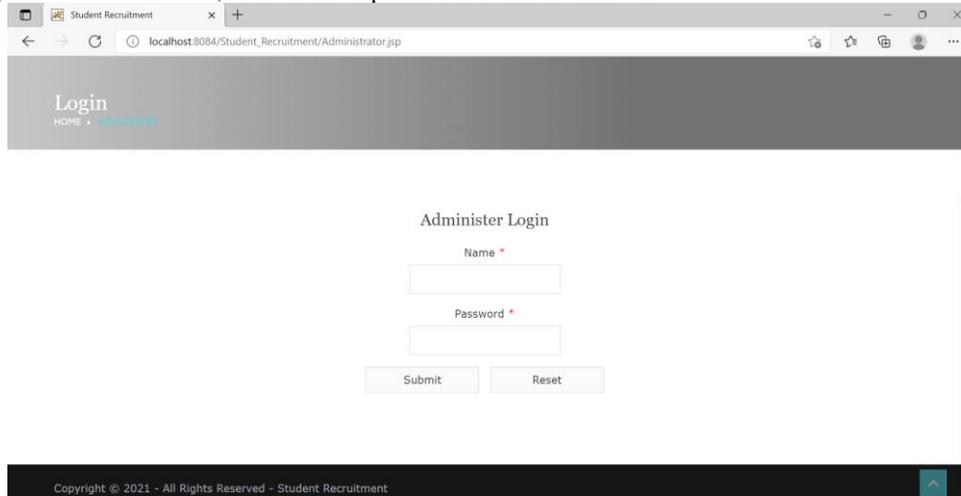


Fig 5 Administer login

Fig 5 displays Administer login page. Enter the valid admin details to login.

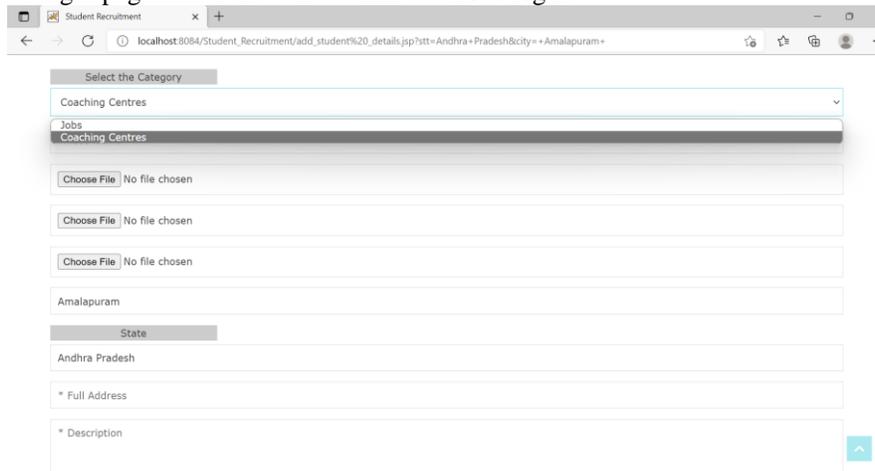


Fig 6

In Fig 6 Admin will enter the available details about job and coaching centers where the company is located and job description. Admin can attach the files which describes the company details.

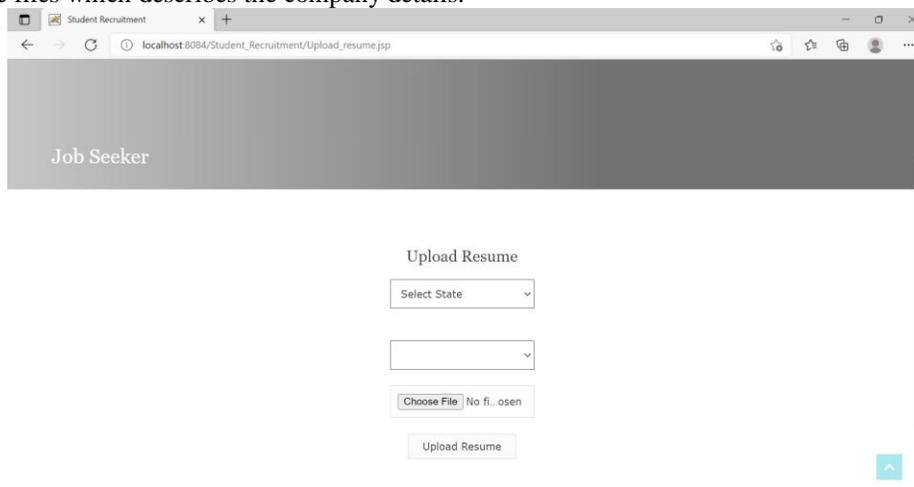


Fig 7 Upload Resume

In Fig 7 students and job seeker can upload their Resume. Based on the resume the candidate will be shortlisted.

Id	occupation	Company	vacancy	Description	Contact	Offmail	j_address	City	State	Post Time
1	Engineering Manager	tcs	150	developer 2	9135687654	tcs@gmail.com	egdghuhk	Chennai	Tamil Nadu	2021/10/23 18:14:49
2	Dentist	Hindu Mission Hospital	5	Need Dentist above 3yrs experience	9876543210	hindumission@gmail.com	hindu mission,chennai	Chennai	Tamil Nadu	2021/10/25 17:22:49

Fig 8 Job Details

In Fig 8, where students and job seekers can get the job details like occupation, company, identify the vacancy, job description, address of the company, state. Based on the above details students and job seekers can apply for their preferred roles. Students also can know the details of the coaching centers.

CONCLUSION

Artificial intelligence has been the most apt innovative technology that facilitates in better recruitment process when implemented strategically having a significant effect on the performance of the employees. Increase in productivity, training programmers, automation of the process and the reliability of reports improves the performance of employees. Hence the adaptability of this technology results in better performance of the employees and performance indicating variables are highly significant predictors.

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