Recruitment Support System with CV Classifier Expert System

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***Abstract*: Recruitment Support System (with CV classifier) is a web based system in which job seekers can register online and apply for a job and attend the initial selection test given by the company. It involves uploading CV, classifying CVs, and recommending job categories that the CV is most suitable. The system is developed as a web based environment to provide a user friendly, online and multi-user access environment. An Expert system is used for classification of CVs. The rule base was implemented using XML and the developed prototype successfully gives a suitable job category for a given employee data.**

1. INTRODUCTION

Recruitment Support Systems (RSSs) provide online help to users all over the world. Such websites have facilities where prospective candidates can upload their CVs and apply for jobs suited to them. Such sites also make it possible for recruiters and companies to post their staffing requirements and view profiles of interested candidates. Earlier, recruitments were done manually and it was a time consuming task. However now it is possible to much work involved in recruitment in a fraction of a second. It can be all done online without spending much time or effort.

Today's recruitment applications are designed to do a variety of functions than just reduce paperwork. They can make a significant contribution to a company's marketing and sales activity. Recruitment websites and software make it possible for managers to access information that is crucial to managing their staff, which they can use for promotion decisions, payroll considerations and succession planning.

In this paper we propose an Expert System (ES) to classify the CVs according to required qualifications. Normally, the CV classification part is done manually in the recruitment systems. In this paper, section 2 gives the problem definition, in Section 3 we discuss the factors considered in CV classification, sections 4 and 5 describe design and implementation respectively, section 6 is about further improvements and the section 7 gives the conclusion.

2. PROBLEM DEFINITION

This system is designed to handle the recruitment process for a Software Development Company. Usually in a software company, there are three main job categories.

- Software Development
- Quality Assurance (Software Testing)
- Database Administration

At present selection of suitable candidates are usually done by the staff of the human resources management section manually. This is a long slow process. When the number of the CVs become bigger, the problem gets worse because the process becomes slower than before.

3. FACTOR CONSIDERED IN CLASSIFYING CVS

For the CV classification function we use an expert system where expert domain knowledge is stored in the knowledge base [1,2,3].

- Education level
- Professional Qualification
- Technology/Platform Skills and Skill Level
- Working Experience (Relevant Field)

Educational Level could be graduate or undergraduate.
Professional Qualifications considered are:

- Microsoft Certified System Developer (MCSD)
- Sun Certified Java Exams (SCJP, AJD, J2ME)
- Quality Assurance and Software Testing Certification (QASTC)
- Microsoft Certified Database Administrator (MCDBA)
- Microsoft Certified IT Professional (MCITP)
- Oracle Database Administration (Oracle DBA)
- None

Technology/Platform Skills considered are:

- Java Framework
- .NET Framework
- PHP
- Oracle
- MS SQL Sever
- Automated & Dynamic Testing
- None

Skill Level could be Beginner, Intermediate or Advanced.
Working Experience in the relevant field is counted as:

- None
- 1-3 years
- 3-5 years
- 5 or more years

The qualification requirement change according to the Job category. There are few sub categories identified within the three main categories.
Sub categories within Software Development are:

- Associate Software Engineer (SD01)

- Software Engineer (SD02)
- Senior Software Engineer (SD03)
- Tech Lead (SD04)
- Architect (SD05)

Quality Assurance or Software Testing consists of:

- Associate QA Engineer (QA01)
- QA Engineer (QA02)
- Senior QA Engineer (QA03)
- QA Lead (QA04)

Database Administration is categorised into:

- Junior Database Administrator (DBA01)
- Senior Database Administrator (DBA02)

4. DESIGN OF THE SYSTEM

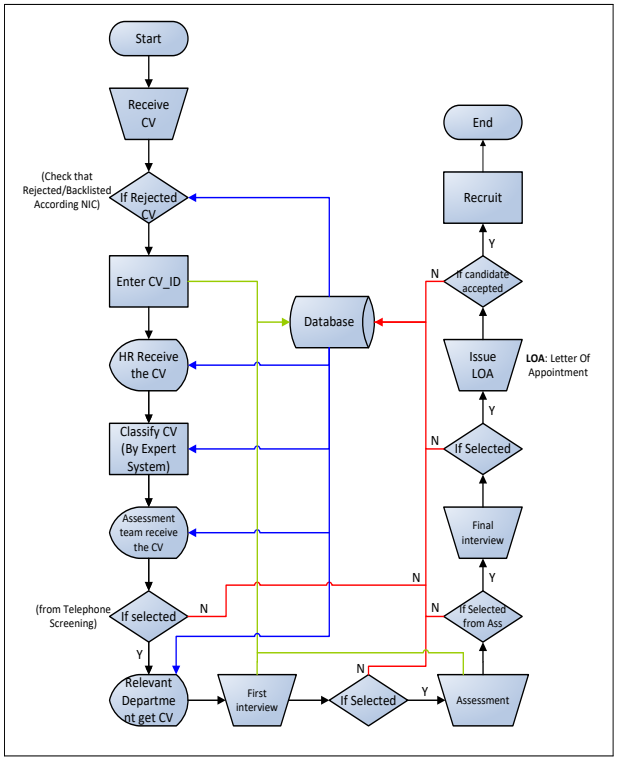

Fig.1. Design Flow of the Overall System

After login to the website the user is asked to enter the information in his/her CV to the relevant fields in the CV form. Then user can directly input the factors such as education qualifications, professional qualifications, skills, experience and others relevant details. This data is then fed to the Inference Engine for classification. In the inference engine the input factors are examined using backward chaining and finally the output is given as a recommended job category.

If the company is willing to give the initial selection test, it could be opened for the user. The user is also notified of the job category he was selected to and if he/she wishes can opt to take the initial selection test offered by the company.

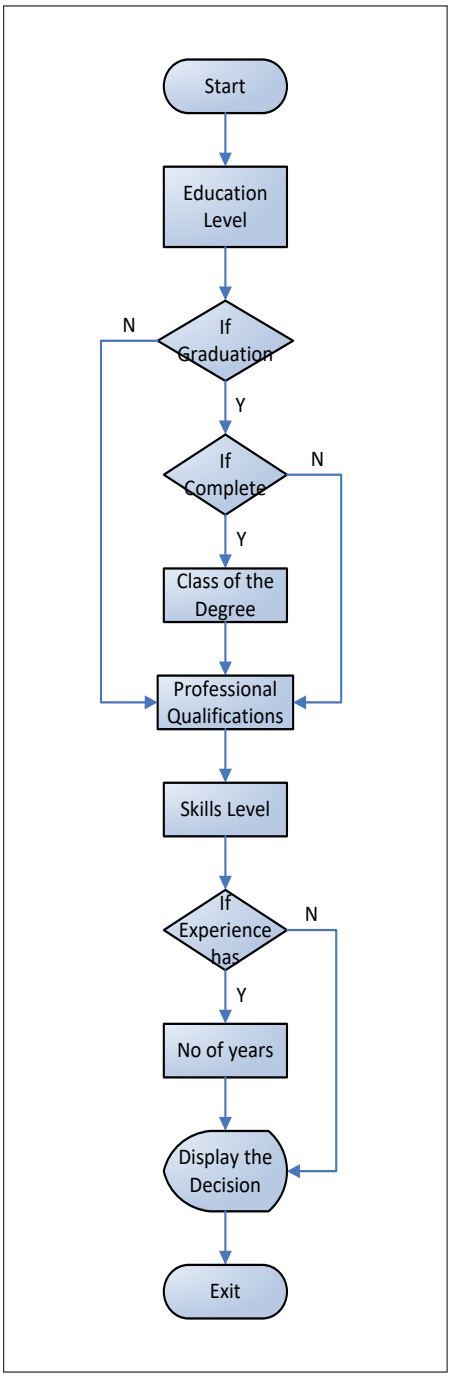

Fig. 2 Flow Chart illustrating the classification conditions of the Inference Engine

The decision tree shown in the next figure shows the path to arrive at one job category by examining the rules given in the rule base.

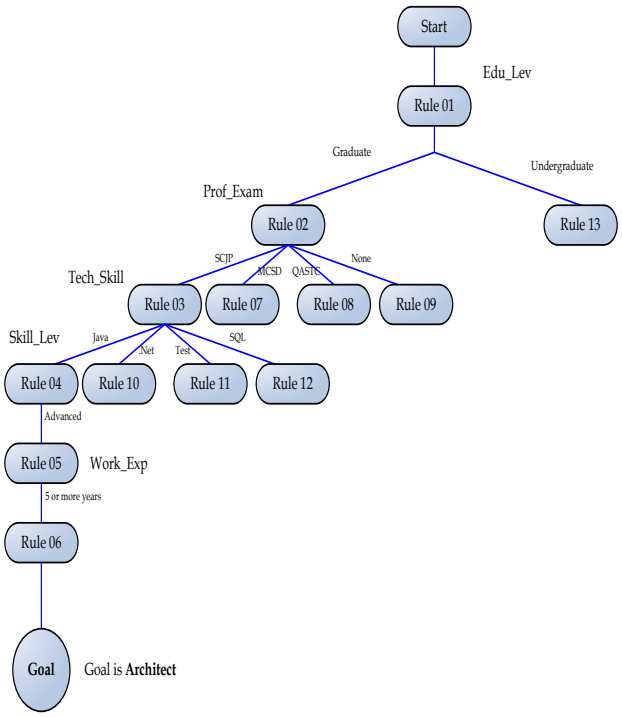

Fig. 3 Decision Tree

KNOWLEDGE BASE DESIGN

XML was used to design the Knowledge Base. XML defines a textual format for representing structured data. We used XML because of the availability of hierarchical representation of data thus enabling convenient organization of rules in the knowledgebase [3,4].

The architecture of the system allows addition of new rules to knowledge base there by enabling the learning facility through experience. When a new rule is added, keywords in that rule will be matched with keywords of existing rules. Such similar rules will be shown to the administrator to decide whether current rule is a completely new rule or not.

MAIN RULE STRUCTURE

```
<RuleName>
        <Question>question1</Question>
        <condition>condition1</condition>
        <true>if true then next</true>
         <false>if false then next</false>
</RuleName>
```

GOAL RULE STRUCTURE

```
<RuleGoalName>
        <Question>null</Question>
        <condition>goal1</condition>
        <true>null</true>
         <false>null</false>
</RuleGoalName>
```

5. IMPLEMENTATION

Visual Studio 2005 ASP.NET (C#.NET coding environment) is used to design Inference Engine and the Knowledge Base is implemented by using XML. MS SQL Server 2005 was used to create the database to store the CVs and other details of the candidates.

6. FURTHER IMPROVEMENTS

To input the details of the CV a questionnaire is given. System can be improved to read the uploaded CVs in different formats.

By giving confidence values to inputs and conclusions, this system can be further improved to handle imprecise and incomplete data.

6. CONCLUSION

There are so many web based systems for recruitment processes in the world to recruit people. But the CV classification portion is normally done manually in those systems. Here we propose a web based system as the user interface and design an expert system to classify CVs according to education qualifications, professional qualifications, skills, experience and etc.

Final target of this system is to find the most suitable job to a particular candidate according to his/her education qualifications, professional qualifications, skills, experience and etc. The implemented prototype is successful at achieving the target.

References

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