A COMPARATIVE STUDY ON EFFICIENCY OF E-RECRUITMENT USING DATA MINING TECHNIQUES

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ABSTRACT
The Internet has proven to be the most powerful social network, exerting a great influence on our society and catalyzing the process of globalization. Recent trends and data show that the Internet is being used for employment all over the world. This paper presents a systematic review of the e-recruitment literature. It is also concluded that performance, reliability, security, and cost-effectiveness can be used as criteria when evaluating online recruitment.[1][5]

Keywords:Data mining, Classification, E-Recruitment

I. INTRODUCTION

In recent years, there has been a continuing trend among young people to pursue higher education in order to obtain better qualifications and better education. New technologies, especially the Internet, have had a tremendous impact on knowledge management,dissemination of information in education. Web portals as knowledge management systems are a very popular topic in many organisations, including universities. Job portals have different applications and services to solve different problems.

One of the main purposes of web portals is to facilitate the exchange of information over the Internet. For example, in college, undergraduate freshmen need access to information resources in order to select courses and determine the various majors available in their undergraduate degree. This need can be addressed by a knowledge portal that should contain sufficient data and information about student requirements. Today, unemployment among college graduates is one of the most serious problems in both developing and developed countries. The Internet has changed the way people look for jobs with the development of job portals. A job portal is a type of web portal that provides an efficient way to search for vacancies on the internet or web.[2]

Figure 1: Recruitment Process

Several independent technologies were developed in the past to serve different facilities, but all were different, independent and separate. Integrate different technologies with each other as shown here.
• Create dynamic websites
• Group SMS
• Apply online
There was no correlation between all these technologies. All these technologies are separated by isolation. Multiple technologies To solve this problem, we have developed a new application "Job Portal" that offers the possibility to access multiple technologies within a single application. SMS, dynamic website creation, a job portal that offers a variety of services grouping online applications are all available in the same application. As a result of this website, you will be able to access various services efficiently.

1. Job Opportunities: Old Ways and New Ways

A job search typically has a variety of ways to find a job, including: B. Through personal contacts, direct calls to employers, recruitment agencies, scans of online job listings, etc. Before the Internet became a popular way to search for jobs, job seekers spent a lot of time searching for job postings in a variety of ways. Today, job seekers are using online methods that are very convenient and save a lot of time. Guaranaki cites the following traditional (ancient) ways for recruitment:
• Employment agency
• Job fairs
• Advertising in mass media such as newspapers
• Advertising on television and radio
• business consultant
• Existing employee contact information
• Schools, colleges and universities
• Employee or professional referrals\

These old ways of finding jobs are too slow, stressful, challenging, and of poor quality. there is. Finding all available vacancies is an important step in finding a job.[3]

2. Knowledge Management System “KMS”

Alavi and Leidner said the KMS must be able to respond quickly to changing conditions and support invention, decision-making and productivity. KMS is a multi-function system. KMS requires technology tools in three aspects, he said: database and database management. communication and messaging; and search and retrieval. Tools from these three domains can be integrated to control his internet-based KMS framework [4].

3. Decision Support System (DSS)

A decision support system (DSS) combines data, advanced analytical models and tools, and easy-to-use software into a single powerful system that can support semi-structured and unstructured decision-making. The main elements of DSS are the DSS database, the user interface, and the DSS software system. [4]

4. Use of Corporate or Commercial Websites

Parry and Tyson conducted a survey of companies' hiring practices over a six-year period using survey and interview methods to find out why respondents used or did not use online hiring, and how hiring changed. asked if they anticipated Internet use for and what impact it would have. Internet recruitment expects the use of other recruitment methods. Survey respondents were her HR directors and managers, financial directors, managing directors and recruitment specialists from a sample of UK companies with more than her 25 employees. The survey had 25,524 responses and 20 HR or resource managers were interviewed.

Research has shown that cost effectiveness is the most common reason for using a corporate or commercial website when hiring [5].

Kar and Bhattacharya also conducted a similar study. They identified factors that may contribute to the effectiveness of job portals and elements of job portals that may contribute to increasing user satisfaction with using the portal. To achieve these goals, research methods and personal interviews were conducted.[5]

Haroon and Zia-ur-Rehman also learned about online recruitment in Pakistan. Total 65 (65)
The survey included respondents from small and medium enterprises from various industries in Pakistan. Data collection was done through telephone interviews. Haroon and Zia-ur-Rehman showed that small firms are preferred over large firms when it comes to using Internet job postings. It was also shown that large companies have their own his website and use it for recruiting, compared to small businesses.They also believe that online recruitment is a new medium that replaces other traditional means of recruitment, such as reduced recruitment costs, time savings, the ability to respond quickly when checking application status, and the ability to create online resumes. revealed that it was becoming.

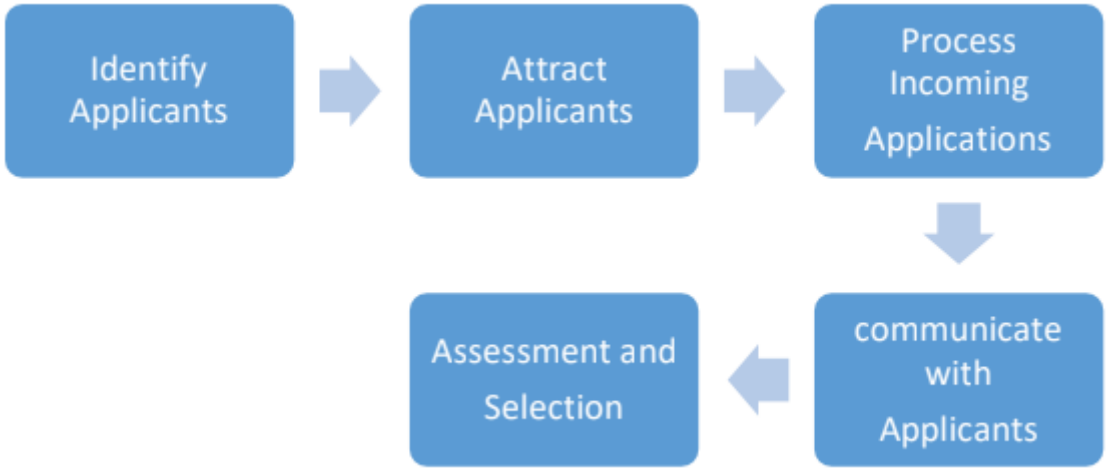

Figure 2: Traditional Recruitment Process Using Advertising [16]

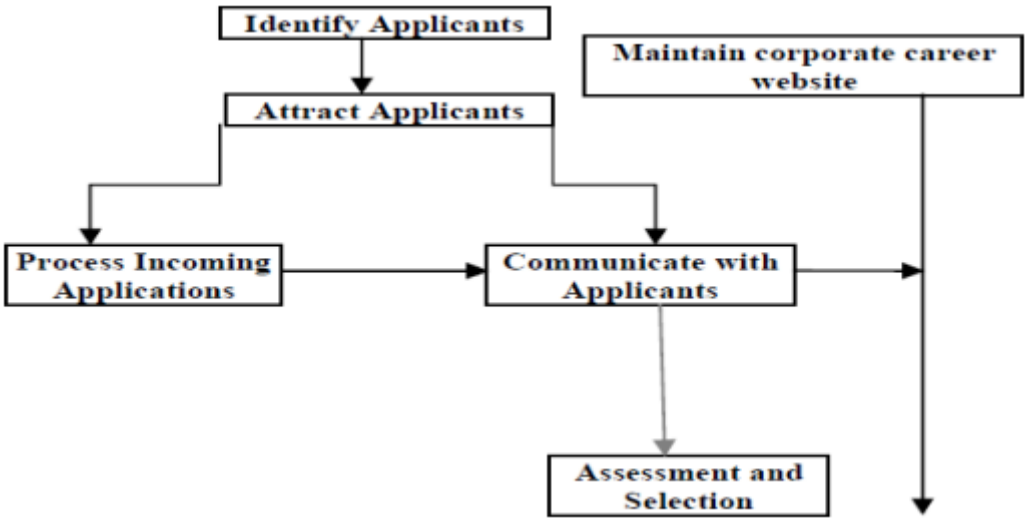

Figure 3: E-Recruitment Process [16]

Comparison of methods for different types of e-recruitment

Name of paper	**Publication**	Methods	Merits	**Demerits**
Recruitment Process Outsourcing: A new type of service provider by Amita Betgerikar	Dublin Business School in partial for the degree of Masters of Business Administration	Human resource outsourcing (HRO) discussed by Sheehan, Holland and Nelson in 2002 And Recruitment process outsourcing (RPO) by Whelan and Carcary in 2011	Save costs, Looking for better services, Strategic concerns	Pitfalls are – Validity , Practicality, Cost, Acceptability And Legality.
Development of a Job Web Portal to Improve Education Quality by Marjan Mansourvar and Norizan Binti Mohd Yasin	International Journal of Computer Theory and Engineering, Vol. 6, No. 1, February 2014	Job Procurement: Old and New Ways By Galanaki	It provides ways to look for jobs through personal contacts, direct calls to employers, job agency office.	These methods are tooslow, stressful, Challenging and also lack quality.
Development of web portal to capture industry needs By Marjan Mansourvar	Faculty of computer science and IT university of Malaya kualalumpur march 2011	Knowledge Management System (KMS) and Decision Support Systems (DSS)	Sophisticated analytical tools, user-friendly that support semi structured and unstructured decision making	Limited services Seems complicated for first-time login users , Cluttered information
Job Search study by Anne E. Green, Maria de Hoyos, Yuxin Li and David Owen	Department for Work and Pensions, Commercial Support and Knowledge Management Team	Economic job-search it addresses a selective aspect of the job-search process.	Searching, screening, extracting and reporting.	Time pressures, targets and other work constraints.

Table 1: Comparison

III. Observation and Discussion DATA MINING TECHNIQUES

I. EDUCATIONAL DATA MINING

Education is an essential component of a country's improvement and progress. It empowers the people of civilized and polite nations. Educational data mining is an emerging field that involves developing methods to explore unique kinds of data from educational databases. Mining in educational settings is called educational data mining and deals with developing new methods for discovering knowledge from educational databases. A

lack of sound and adequate knowledge in higher education systems can hinder system administration from achieving quality goals. Data mining methodologies can help bridging these knowledge gaps in the higher education system [16].

II. DATA MINING DEFINITION & TECHNIQUES

Data mining, also commonly known as knowledge discovery in databases, refers to extracting or "mining" knowledge from large amounts of data. Data mining techniques are used to manipulate large amounts of data to discover hidden patterns and relationships that aid decision making.

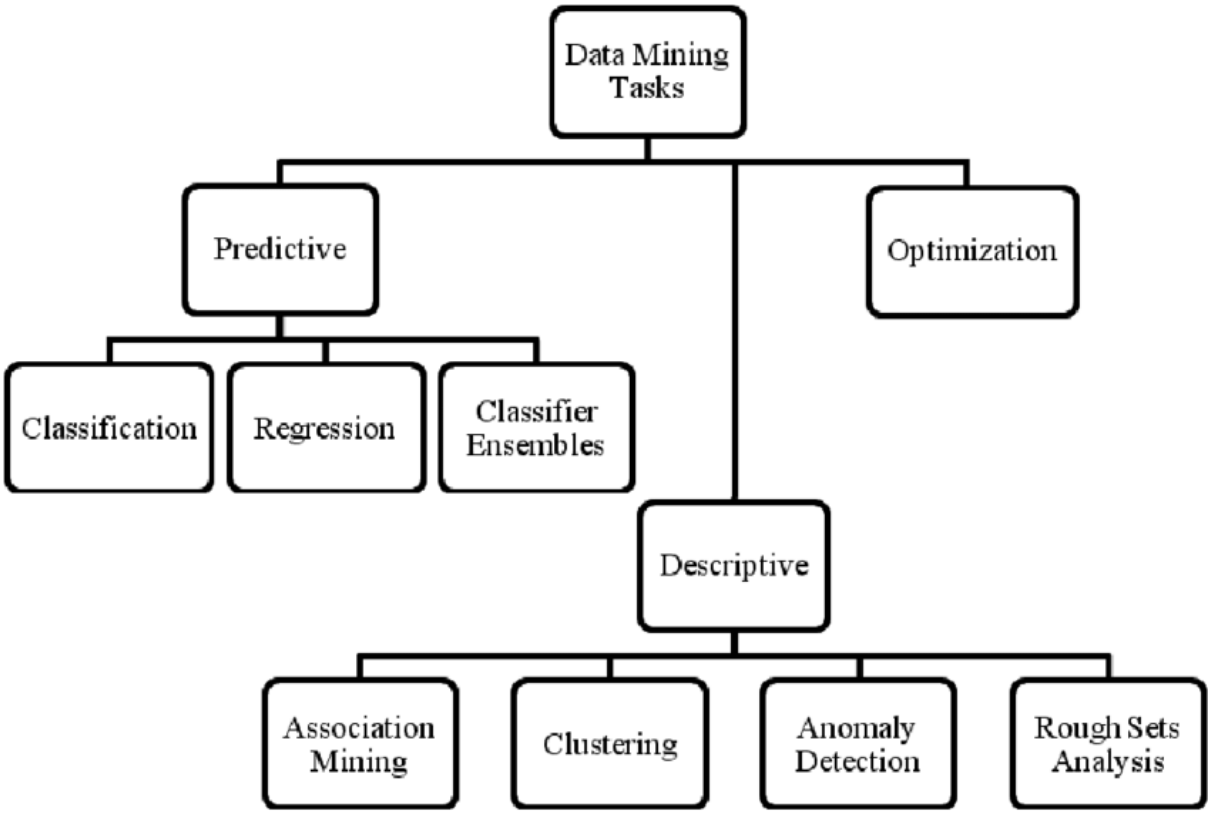

Figure 4: Data mining Techquines [6]

A. Classification

Classification is the most commonly used data mining technique that uses a set of pre-classified attributes to develop a model that can classify an entire data set. The data classification process includes learning and classification. In learning, training data is analyzed by classification algorithm. A classification test uses data to estimate the accuracy of a classification rule. We briefly describe the classification methods used in the comparative study.

1) Bayesian network

A Bayesian classifier is a statistical classifier that predicts class membership probabilities. This will give you the probability that a given tuple belongs to a given class. [7][8]. This is a graphical model that encodes probabilistic relationships between variables of interest. [9][10]

2) Naive Bayes

The Naive Bayes classifier [11] can handle any number of variables, whether qualitative or quantitative. This algorithm works under the assumption that the variables provided to the classifier are independent. Instead of multidimensional tasks, the algorithm only needs to compute a set of one-dimensional tasks. Moreover, regions close to decision boundaries do not appear to be significantly affected, leaving the classification task unaffected.

3) Multilayer Perceptron

A multilayer perceptron (MLP) is a feedforward artificial neural network model that maps a set of input data to a set of appropriate outputs. An MLP consists of multiple levels of nodes in a directed graph, with each level fully connected to the next. The current output depends only on the current input instance. Train with backpropagation [8][9][12][13].

4) IB1

IB1 is nearest neighbour classifier. It uses normalized Euclidean distance to find the training instance closest to the given test instance, and predicts the same class as this training instance. If several instances have the smallest distance to the test instance, the first one obtained is used. Nearest neighbor method is one of the effortless and uncomplicated classification algorithms, and has been effectively applied to a broad range of problems [14].

5) Decision table

Decision tables are classification models that are guided by machine learning algorithms and used to make predictions. A decision table consists of hierarchical tables in which each entry in a higher-level table is divided by additional attribute pair values to form a separate table. The structure is similar to dimensional stacking [8][15].

IV. RESULTS

Effectiveness of E-Recruitment

Parameters	E – Recruitment			Effectiveness (verbal Interpretation)
	Agree	Disagree	Mean	
Preference	32.50 %	17.50%	3.30	Moderately Effective
Use of Social Media	50%	22.50%	3.23	Moderately Effective
Quality of Resumes	47.50 %	15.00%	3.45	Moderately Effective
Speed of Recruitment	80.00 %	2.50%	4.38	Effective
Quantity of Resumes	72.50 %	12.50%	4.00	Effective
Reduction of Cost	67.50 %	12.50%	4.03	Effective
Organizational Success Rate	62.50 %	32.50%	3.90	Effective

V. FUTURE SCOPE

In terms of enhancement of the software, it is strongly recommended that an online exam be incorporated in the recruitment. Extra security features such as the level of access classified according to the position in the company also be incorporated in the software.[5]

VI. CONCLUSION

The developers challenged various issues to develop a system for responding some problems that job seekers and companies are facing today. The main aim of this work is to develop a web portal, which caters for various types of users and is easy to use. It would become a significant contributor to quality hire. It is also concluded that Performance, Reliability, Security, and Cost-effectiveness could be utilized as criteria in evaluating online recruitment software. It is concluded that the developed software was effective in selecting qualified applicants within a shorter period of [5].

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