ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

# Data Mining: A Professional Tool for Effective Counselling and Course Selection in Educational Institutions

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**Abstract: The most important decisions in selecting appropriate branch in Engineering is needs for every student who wants a increasing the number of career paths and also job opportunities. The Council of Scientific and Industrial Research's (ISIR), give info about the almost students are confusion and fail in selection of their interest of branch in Engineering. This type of students, taking the counselling of choosing branch is essential. If the student select the branch without any prior knowledge, based on their parents pressure or getting influenced from their friends, the students face many difficulties in the course period or in his career also. It is better for the student to select the branch based on his skills, interest and career goal. In this process, the student should take survey or feedback from parents, teachers, professionals and experts.**

**Index Terms— Career Prediction, Data Mining,REP Tree,Weka 3.9.2, Neural Networks**

## 1. INTRODUCTION

After completion of Intermediate, the student passion over the subject and will to get succeeded in his carrier, the student can achieve this by studying in the normal colleges also. IF the student has communication skills and grip towards the subject, opportunities are open in all the branches. In this research world, there are many new career opportunities in every field. The student must choose right choice for the interest branch in engineering Or otherwise this create more confusions could be unawareness of self-talent and self-personality, unawareness of the various options available, equal interests in multiple fields, less exposure, market boom etc. Due to theses confusions, the student may select a wrong career option and the consequences of this wrong decision could be work dissatisfaction, poor performance, Thus, there should be proper counselling of the student's psychology, interest and their capacity to work in a particular field.

## II. RELATED WORK

The most important factor which we have to keep in mind while selecting the branch in engineering is, the interest of the student, if the student wants to get succeeded in his carrier through the technical courses, the student should have passion towards the subject and a will to achieve something in the subject. There is no much different in the opportunities of various branches in Engineering. There are many opportunities in each of the branch, but the student should select the branch based on his interest, passion and liking towards the subject.

***Selection of Branch as per student interest and skill having***

- If a student is interested in electronics or electrical related things he can select Mechanical, Automobile and Production Engineering.
- If a student is interested in production of pesticides, chemicals or producing petro chemical, he can select Chemical Engineering.
- The branches of EEE and Mechanical will have more opportunities in public sector than the other branches.
- A student can gain knowledge on selecting the branch by, reading more articles on engineering, attending seminars and discussing with parents, teachers and friends.

## III. OVER VIEW

The project was to develop a web application that can be used by any student who needs help in selecting the branch as per his skills and choice. The following diagrammatical representation, the student can identify and branch selection and skills required for a prescribed joining branch.

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## III. ALGORITHM USED

Decision trees can support classification and regression problems. Decision trees are more recently referred to as Classification And Regression Trees (CART). They work by creating a tree to evaluate an instance of data, start at the root of the tree and moving town to the leaves (roots) until a prediction can be made. The process of creating a decision tree works by greedily selecting the best split point in order to make predictions and repeating the process until the tree is a fixed depth. After the tree is constructed, it is pruned in order to improve the model's ability to generalize to new data. This process goes on until all data classified perfectly or run out of attributes. The knowledge represented by decision tree can be extracted and represented in the form of IF-THEN rules.

**IF CSE** (Branch_selection=CSE) AND (skills=programming)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF IT**(Branch_selection=IT) AND (skills=Information_Technology)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF EEE** (Branch_selection=EEE) AND (skills= Electronics & Electrical)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF ECE** (Branch_selection=ECE) AND (skills= Electrical Communication)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF MECH** (Branch_selection=MECH) AND (skills= Machine Learning)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF ARCH** (Branch_selection=ARCH) AND (skills= Architecture)AND (credit_rating=80-90) THEN Branch_selection=yes
**IF CHEMICAL** (Branch_selection=CHEMICAL) AND (skills= Chemical & Pesticides)AND (credit_rating=80-90) THEN Branch_selection=yes

## IV. IMPLEMENTATION

***Step 1***
The first step of implementation of branch selection, the data collect from professional survey. The data obtained from the survey will be pre-processed and consolidated into a common format as required by the mining system. The following table showing collecting of the data for selection of branch as per student skills and interesting.

***Table1: Branch selection in a Table form for Decision making***

| Branch | skills | Credit Rating | | Branch_selection | |
|---|---|---|---|---|---|
| CSE | Programming | 80-90 | <75 | Yes | No |
| IT | Information Technology | 80-90 | <75 | Yes | No |
| EEE | Electronics & Electrical | 80-90 | <75 | Yes | No |
| ECE | Electrical Communication | 80-90 | <75 | Yes | No |
| CIVIL | Construction & Building | 80-90 | <75 | Yes | No |
| MECH | Machines | 80-90 | <75 | Yes | No |
| ARCH | Architecture | 80-90 | <75 | Yes | No |
| CHEMICAL | Chemical or pesticides | 80-90 | <75 | Yes | No |

***Step2***
The dataset was then used to derive the decision tree for various courses. Using Weka 3.6.9 software in REP Tree algorithm was applied on the data set for different courses. The result decision tree shows that the student take decision to join in branch and skills required for the student.

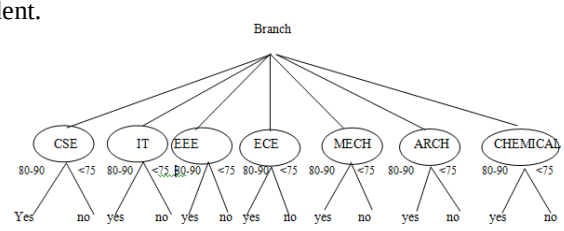


***Fig1: Classification***

***Step3***
The Classification of Mining Tool REP Tree Classifier algorithm was applied on the new dataset and calculate and the interest and skills required by the student The review a visualization of a decision tree prepared on the entire training data set by right clicking on the "Result list" and clicking "Visualize Tree".

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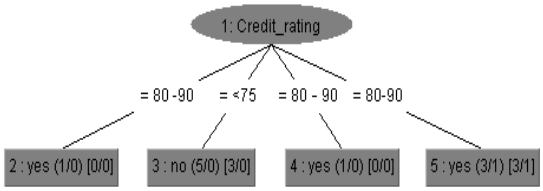


*Fig2:Decision Tree REP Tree*

```
Kappa statistic                          0.5429
Mean absolute error                      0.2008
Root mean squared error                  0.3348
Relative absolute error                 48.2536 %
Root relative squared error             72.7308 %
Total Number of Instances               16

=== Detailed Accuracy By Class ===

TP Rate   FP Rate   Precision   Recall  F-Measure   ROC
Area  Class
               0.667    0.2       0.667     0.667    0.667
0.775     yes
               1        0.25          0.8       1
0.889       0.969     no
               0         0          0         0          0
0.732     Yes
Weighted Avg.  0.75  0.2       0.65      0.75      0.694
0.867

=== Confusion Matrix ===

 a b c   <-- classified as
 4 2 0 | a = yes
 0 8 0 | b = no
 2 0 0 | c = Yes
```

Using Neural Network in Weka Tool the MultilayerPerception function to generate a neural network in Weka. Here selection of branch in engineering for a student is specified skills and branch weightage in the formal visuality by Neural network representation.

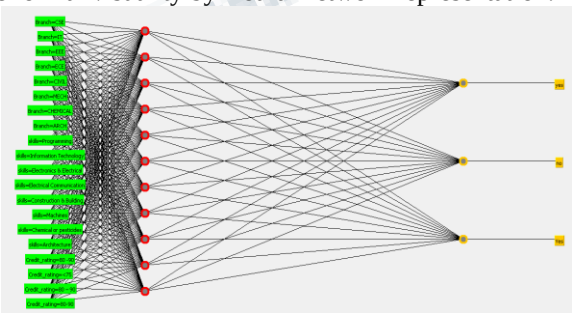

*Fig3: Neural Network visual representation using Weka*

```
=== Run information ===

Scheme:weka.classifiers.functions.Mult
ilayerPerceptron -L 0.3 -M 0.2 -N 500
-V 0 -S 0 -E 20 -H a -G -R

Relation:     branchok1

Instances:    16

Attributes:   4
              Branch
              skills
              Credit_rating
              Branch_selection

Test mode:10-fold cross-validation
```

## VI. PROFESSIONAL EDUCATION STUDENT COUNSELLING & SELECTION PROCESS

The student gets admitted into any branch in Engineering like Computer Science Engg, Information Technology, Civil Engg, Mechanical Engg, Electrical & Electronics Engg, Chemical Engg etc.The selection is based on highest score obtained by student in the entrance examination.

The counselling process starts when student is selected by the admission process and get registered. The student get counsel for throught the academic year for attending regularly, assignment submission intime, preparing and writing internal and as well external exams. After completion of successfully the prescribed course by student, the student get counsel by faculty, experts and professional of related branch for better placement. The following diagrammatic representation give inform about student and choice of program and placement details.

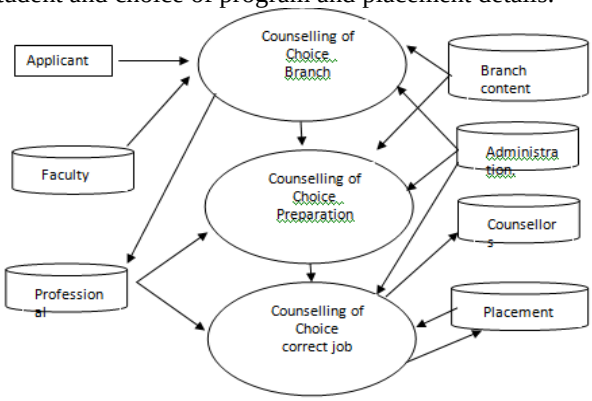


*Fig4: Counselling Process*

## CONSLUSION

Data Mining is effective tool for appropriate counselling and course selection in Engineering institutions. Its decision making and learning process. Data mining combines the best practices of the current technological scope, information technology, academic processes through efficient models, analyze the student relationship management etc. This research paper also discussed for the student select and join for a particular branch, how he can progress for better career development. And also it will help the educational institutes to meet the requirement of student prosperity, career path and enhance the all over student development progress.

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