

AED-Assignment-3

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Proposal for performance measurement solution for Universities.

1. We are designing a model to check the performance of the universities and its associated departments.
2. We took the feedback of courses and its associated professors from the students for each semester in every department and its streams.
3. We also took the Employment and Co-op history of the students over the 5 yr period along with their pay scales per streams for each Department.
4. To measure the overall departmental level performance measurement. We had taken the following into consideration.
 - a. We calculated the overall average rating per course and also per professor from the students feedback.
 - b. We calculated the average percentage of co-op and employment over the last 5 years.
 - c. Also included the last 5 yrs average increment percentage of the pay scales and no of promotions of the graduates from each department and its associated streams.
5. Mathematical model for the University performance measurement model.

$$\text{CourseAvgRating} = \left(\sum_{i=0}^n (\text{courseRating}) \right) / n$$

CourseRating taken from the students feedback rating for the courses they have taken.

$$\text{ProfessorAvgRating} = \left(\sum_{i=0}^n (\text{professorRating}) \right) / n$$

ProfessorRating taken from the students feedback for the professor's course they have taken.

$$\text{Co-op percentage} = \left(\sum_{i=0}^n (\text{coop achieved}) \right) / n$$

"n" is the total no of students

$$\text{Employment percentage} = \left(\sum_{i=0}^n (\text{Employed after graduation}) \right) / n$$

"n" is the total no of students

$$\text{Average growth of Alumni} = \left(\sum_{i=0}^{5\text{yrs}} (\text{payscale percentage Incre}) \right) / n$$

"n" is the alumni count

Calculating the overall Departmental level rating by using the below mathematical model.

$$\text{Overall Rating} = (\text{courseAvg} + \text{professorAvg} + \text{Co-op Avg} + \text{Employ per} + \text{Alumni growth}) / 5$$

Above formula is scaled to meet a common scale for averaging.

Finding the most impactful Courses and Professors.

1. We are taking feedback from the graduates about the courses that have hugely impacted them for their growth in their software field.
2. Using this feedback along with the growth of the graduates we have used the following algorithm to rate the courses and the professors in that department.
 - a. We calculate the growth of the graduates over the 5yr period by taking their pay scale changes and also their role changes.
 - b. Then we take the top 20% of the graduates sorted by their average growth.
 - c. Using their student ids we trace back them to the courses that had hugely impacted them on their career from their employment-courses feedback.
 - d. We then find the most impactful courses of all them by grouping the common courses along with their ratings.
 - e. Also we find the same for the professors by finding the common professor with their ratings included.

Growth of Alumni = $(\text{payscale at 5th yr} - \text{payscale at 1st yr}) / (\text{1st yr payscale}) \times 100$

We take the top 20% of the alumni with maximum growth and then trace back their courses that had impacted their Employment and count the most common courses in them.

Ranking universities based on the promotions and jobs graduates get over time (Along with research Outputs).

1. We had devised a mechanism to rate the universities based on the overall research output along with the graduation rates, growth of the graduates over the 5yr period combined.
2. We calculate the graduation percentages of all the departments and combine them to get the global average of the university.
3. We also calculate the growth rate of the graduates of the university by finding the average percentage increment in the pay scale and the number of promotions they had.
4. Combining the overall average of those three metrics we are able to rate the universities.

Research based ranking = ranking taken from csrankings.org

Graduation percentage = Average value from all Departments

Growth of Alumni = Growth calculated over 5yrs

Dashboard for University Administrators to track performance of Academic Units.

1. Using the feedback by the students on the courses and the professors along with the average growth we are ranking the different Academic units along with their streams.
2. We calculated the average rate of feedback of the courses along with the professors ratings combined with the graduates growth of each stream. Then we combine the global average of the Academic units and compare them with the others in the same university.

