# Team Name: Optimizers3

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University Performance Tracking

Overview

The objective is to develop a performance measurement Solution to enable the Universities measure the quality of education being offered for over a period of 5 years. Also, to rank the Universities based on various factors.

Object Model:
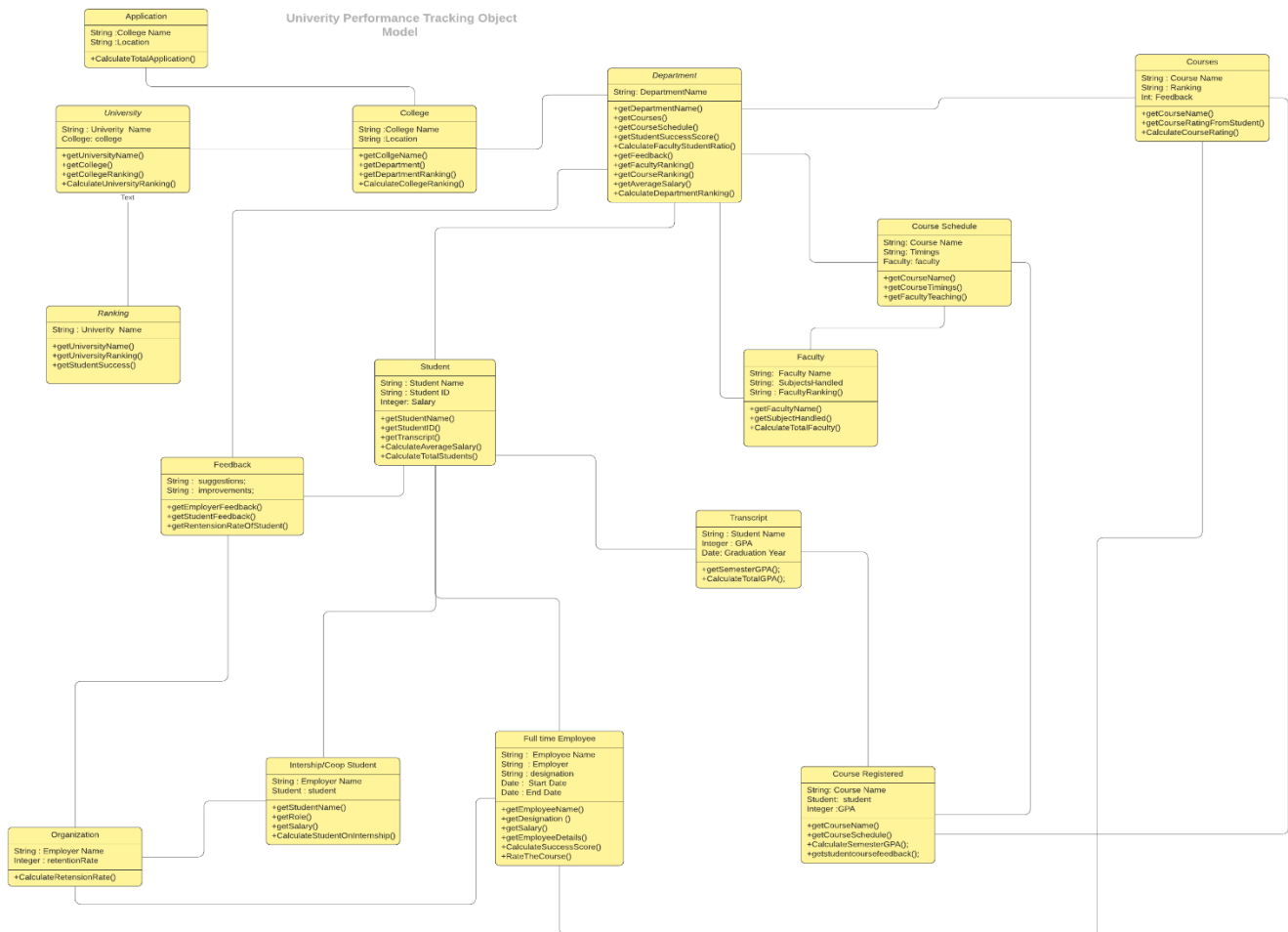
Object Model Entities:

Department:

The department is responsible for maintaining all the information related to Students, Faculty, and Courses offered.

Courses:

All the Courses offered by a Particular Department. The calculateCourseRating() provides rating for individual courses based on the getStudentCourseFeedback().

The Following would be the attributes

- Course ID
- Course Name
- Course Description

Course Schedule:

The Course Schedule contains all the information related to a Course Such as Timings, Faculty handling the course, section, etc.

- CRN number
- Faculty
- Schedule

Faculty:

Manages all the Faculty details and contains a method to calculate the total number of available faculty(). The Designation of the faculty, Courses handling, Job history of the Faculty, etc.

- Faculty name:
- Job Title:
- Subjects Handling:

Student:

Student registers for the Courses through the Course Schedule provided by the department. Contains basic information related to Student and the Alumni of the Department. Involves method to calculate the total number of Students.

- Student Id:
- Student Name:

Courses Registered:

Courses registered has the details related to what particular Courses a Student has opted-in a given Particular Semester and the respective grading. The get courseSchedule() will retrieve all the course schedule details. The getStudentFeedback() will provide the feedback for each individual courses.

Calculate GPA() method calculates the GPA of the student in a particular Course.

- Student ID:
- Course ID:
- Course Name:

Transcript:

Transcript Calculates the Overall GPA of a Student for the entire course period. The get semester GPA () iterates and retrieves the GPA of all the courses the student has opted for in the overall course period.

The CalculateTotalGPA() method calculates the GPA based on the individual Subject GPA.

Student- Intern:

The Internship would provide the details about the Students on internship. CalculateStudentonIntership() method would give the total number of Students on Internship.

Employee:

We will get details about the Employee name, designation, current Salary and the Employee work history. The employeeFeedback() method provides the details about the courses which helped the employee to be successful.

Organization:

The organization can provide the details about how many students are currently working with the particular organization and the history of the employee.

calculateRetentionRate() method calculates the average retention rate of the students.

The calculateSuccessRate() method calculates the employee success rate on various factors such as Employee Salary, Employee Designation and years active in the field.

College:

The College provides information related to all the departments in the college. The getDepartment() provides all the details required to measure the College ranking. The getDepartmentRanking() provides the ranking for each individual department. The calculateCollegeRanking() would calculate the ranking for each individual college.
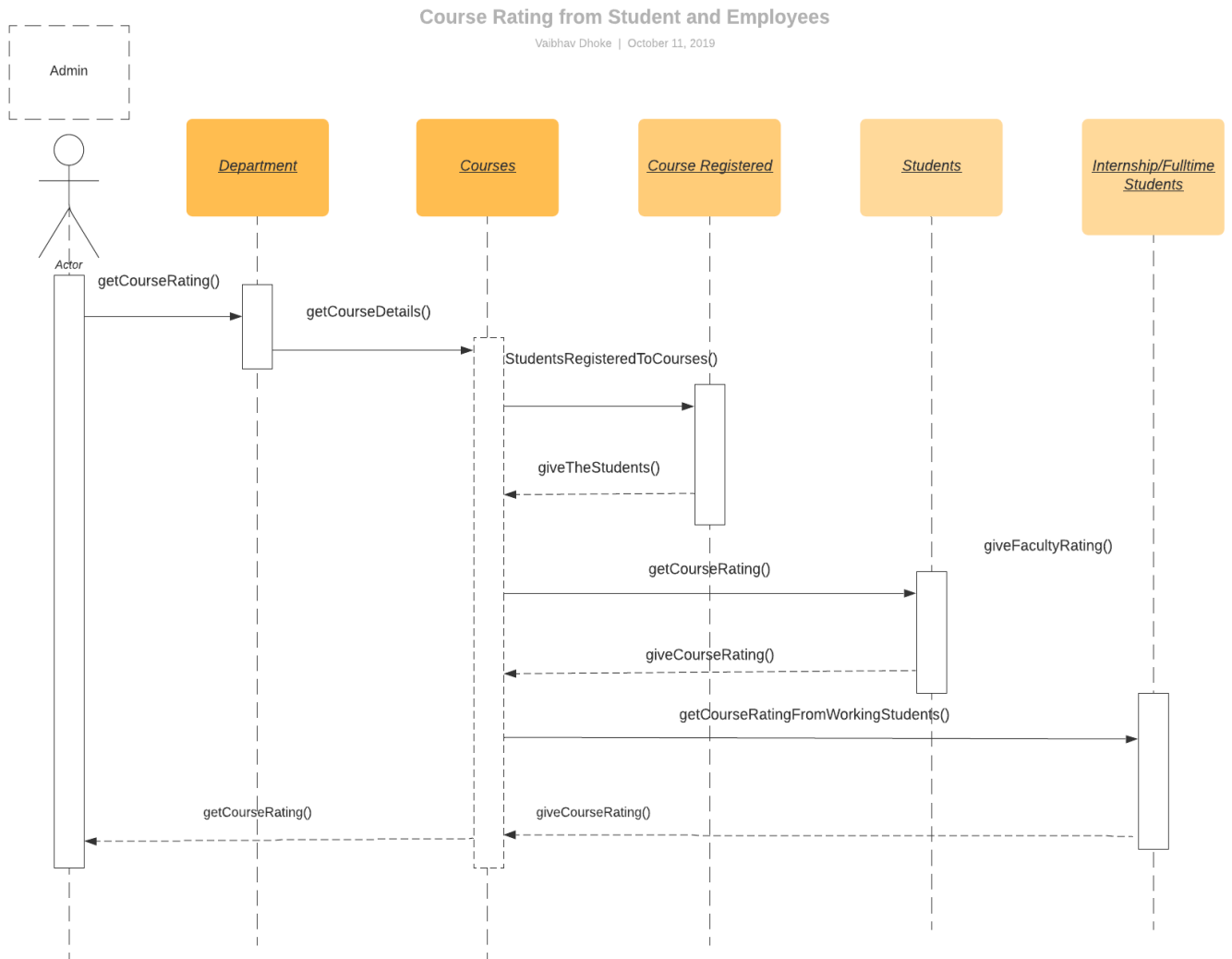
University:

University contains the required information about all the Colleges. The getCollege() provides all the details required to calculate the University ranking. The getCollegeRanking() provides the Ranking of each individual colleges in the Uninversity.
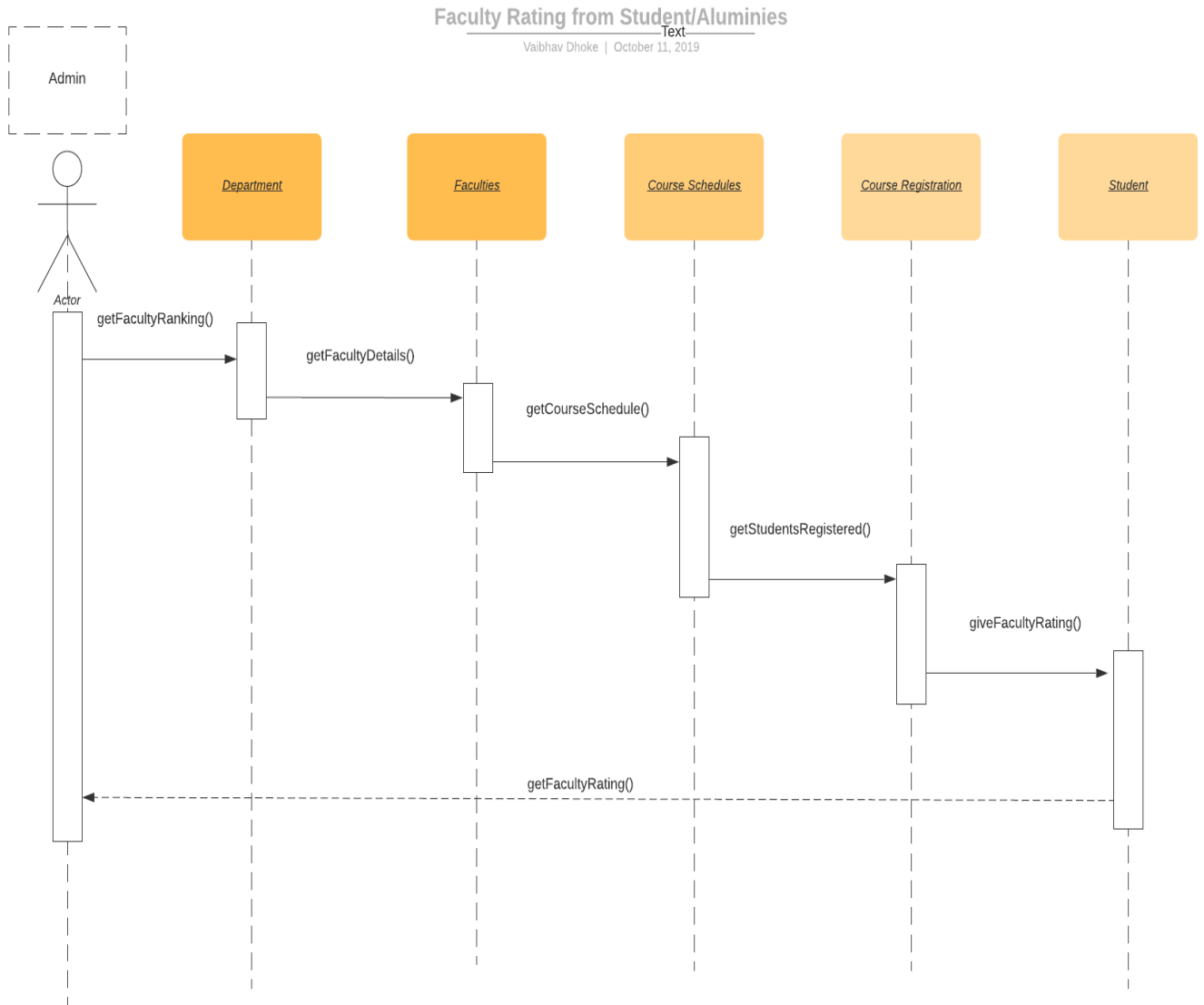
calculateUniversityRanking() would calculate the university ranking based on all the factors provided.

Sequence Diagrams:

Diagram 1: Course Rating from Current Students and Employees

Course Rating from Student and Employees

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Admin

Department

Courses

Course Registered

Students

Internship/Fulltime Students

Actor

getCourseRating()

getCourseDetails()

StudentsRegisteredToCourses()

giveTheStudents()

giveFacultyRating()

getCourseRating()

giveCourseRating()

getCourseRatingFromWorkingStudents()

getCourseRating()

giveCourseRating()

Diagram 2: Faculty Rating from Students/Aluminies

Faculty Rating from Student/Aluminies
Text
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Admin

Actor

| | Department | Faculties | Course Schedules | Course Registration | Student |

getFacultyRanking()

getFacultyDetails()

getCourseSchedule()

getStudentsRegistered()

giveFacultyRating()

getFacultyRating()

Diagrams 3: University Rating Sequence Diagram.

University Ranking Use Case
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User

Actor

University

Colleges

Department

Course

Faculty

Students Excellence Rating

Employees

Employer Feedback

login()

getUniversityRanking()

getDepartmentRanking()

getCourseRanking()

giveCourseRanking()

getFacultyRating()

giveFacultyRating()

getStudentExcellenceRating()

getStudentSalaries()

giveStudenSalaries/()

getStudentFeedBackFromEmployer()

giveFeedbackToStudent()

giveDepartmentRating()

giveStudentExcellenceRating()

giveUniversityRanking

giveUniversityRankingDetails()

Parameters for calculating ranking:

Student-Faculty ration:

The Departments holds the information of the total number of students and total number of Faculty. Using which the Student to faculty ratio can be calculated. This could be iterated to all the departments and colleges and we could get the total student- faculty ratio of a Particular University.

calculateStudentFacultyratio() is used to calculate the **S-F** ratio.
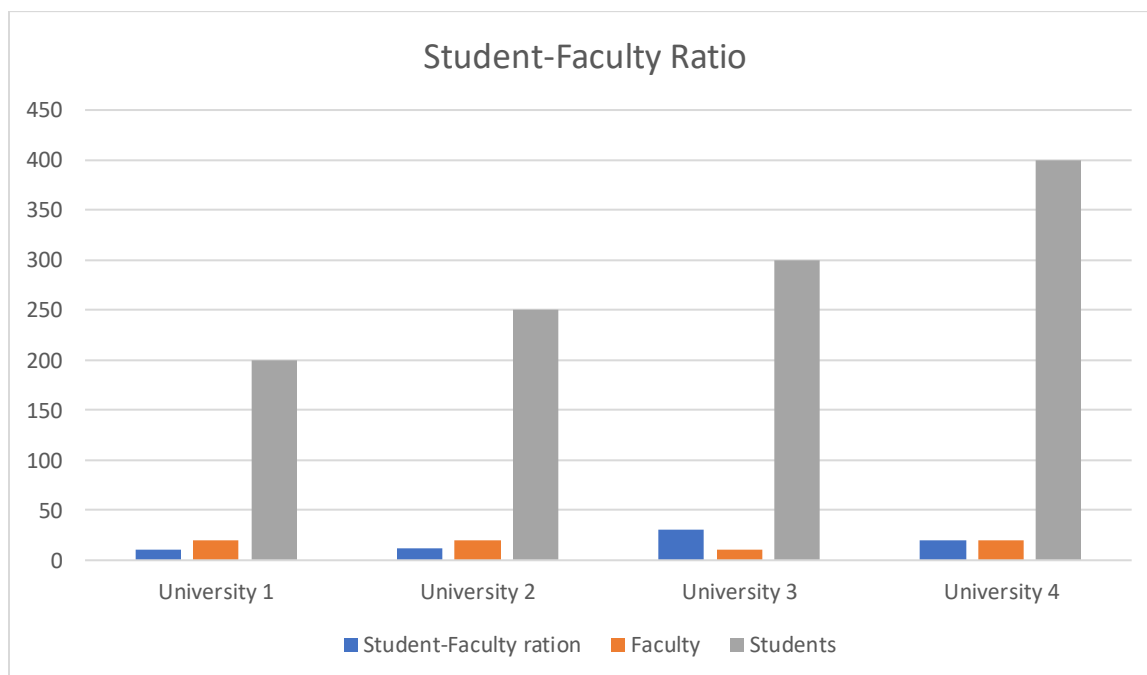
In the above case the University 1 has the least Student Faculty Ratio, which would be rated high in this aspect. The Student-Faculty ratio would contribute 15% in university ranking.
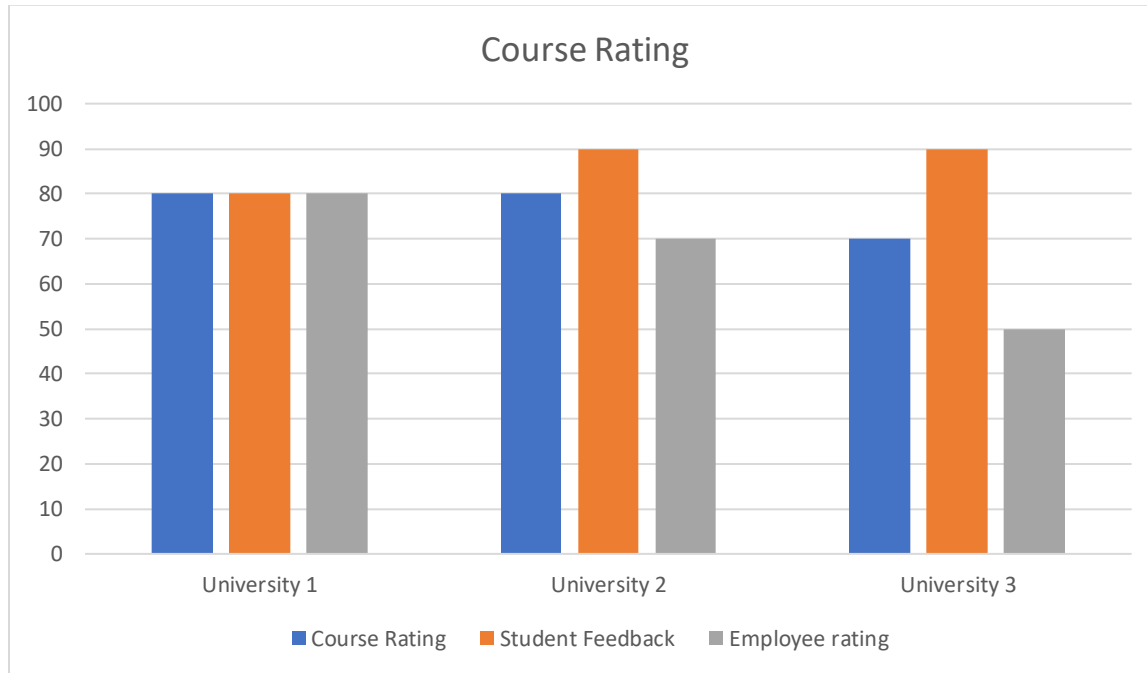
Employee-Success rate:

Employee success rate is calculated on various factors such as Employee Salary, Employee Designation and years active in the field. calculateSuccessRate() method calculates the employee success rate. Similar to the Student-Faculty ratio the Employee Success Rate can be calculated for a University. We would allocate a rating for the designation and salary of an Employee. The Success rate is calculated based on the average of the rating of salary and the designation. The Success rate would contribute 30% in University ranking.
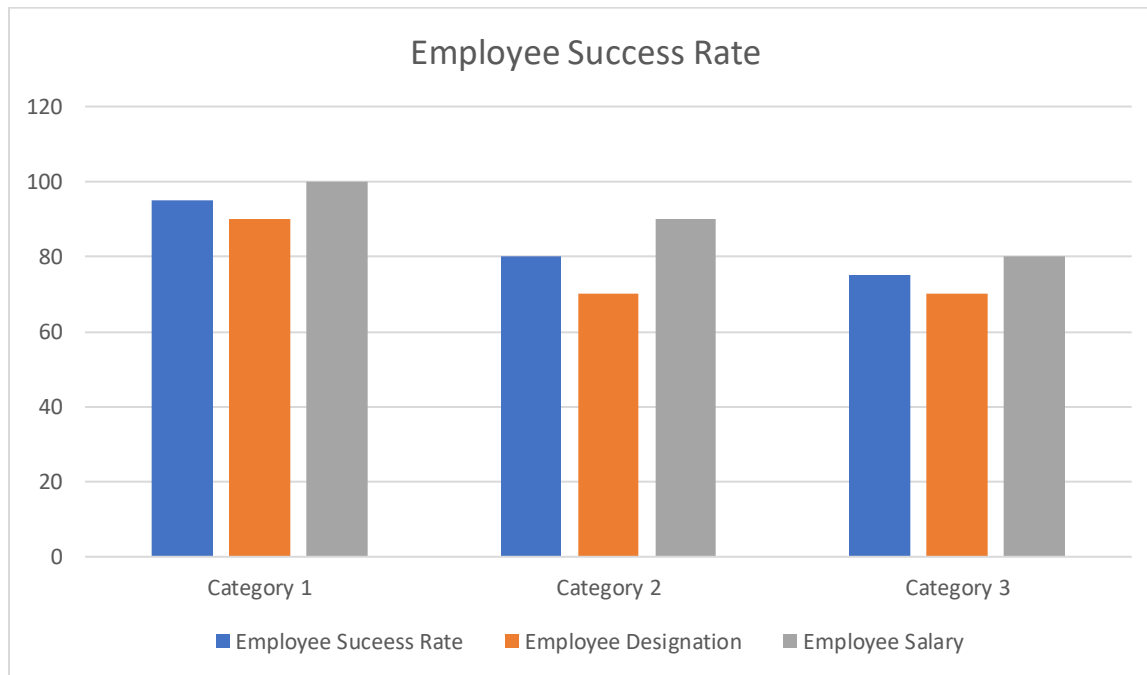
From the above chart University 1 has the highest Employee-Success rate.

Course Feedback:

calculateCourseFeedback() helps to calculate the average rating of the Course based on feedback received from multiple students (getFeedback()). The course feedback will help the Department to improve the Course plans. The course contributes 20% of University ranking.

Course Rating

A grouped bar chart titled "Course Rating" showing three metrics (Course Rating in blue, Student Feedback in orange, Employee rating in grey) for three universities, with the y-axis ranging from 0 to 100.

- University 1: Course Rating 80, Student Feedback 80, Employee rating 80
- University 2: Course Rating 80, Student Feedback 90, Employee rating 70
- University 3: Course Rating 70, Student Feedback 90, Employee rating 50

Faculty Rating:

The Faculty of the particular course would be rated by the students and the average of all the rating would give faculty rating. Hence, based on the rating the University can work improve in terms of the faculty provision.

We would also consider various aspects such as the total number of Full-time professors available at the University and the experience of the Professors to rate Faculty at any particular University. Faculty rating would contribute 20 % in University ranking.

Faculty Rating
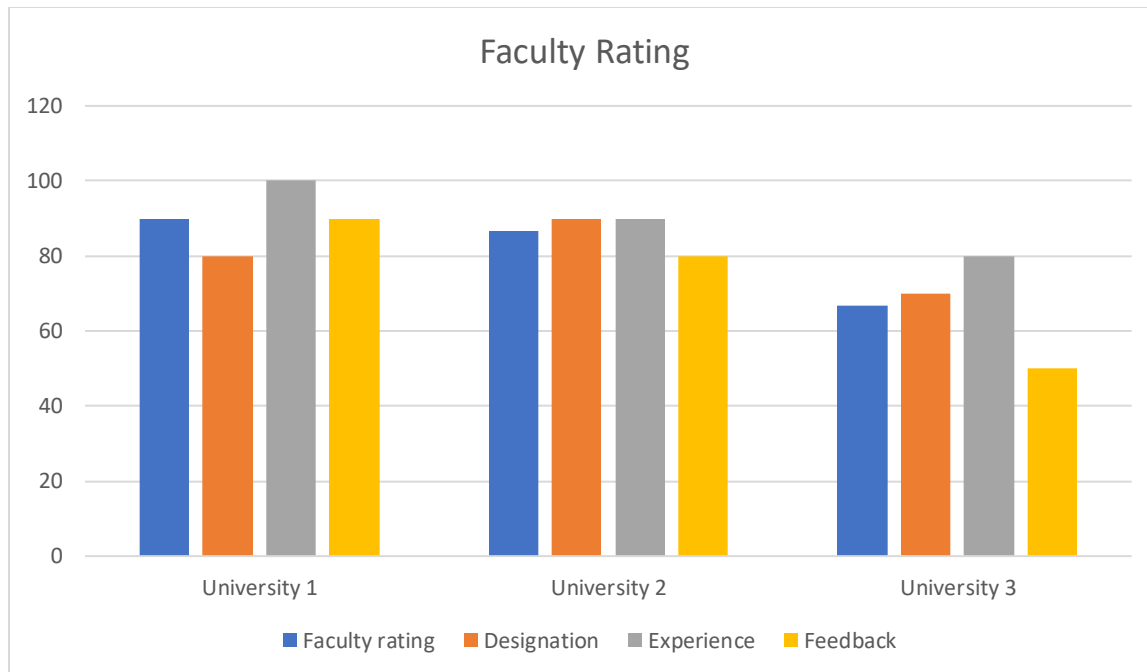
Internship:

The calculateStudentonInternship() would give us the total number of students currently on Internship. Using which we would calculate the percentage to Students having Internship.

Proposed Solution:

The Department will now have access to various above mentioned methods such as the Faculty-Student Ratio, Employee Success rate, Course Feedback, Faculty rating, Employee Feedback on the courses and what Improvements could be incorporated to advance the existing course catalog, Employer retention period of the Students. These factors would help the Department to improve the Course Structure, have better faculty, and improve the resources available for the students which will over all contribute to the quality of education for the next generation.
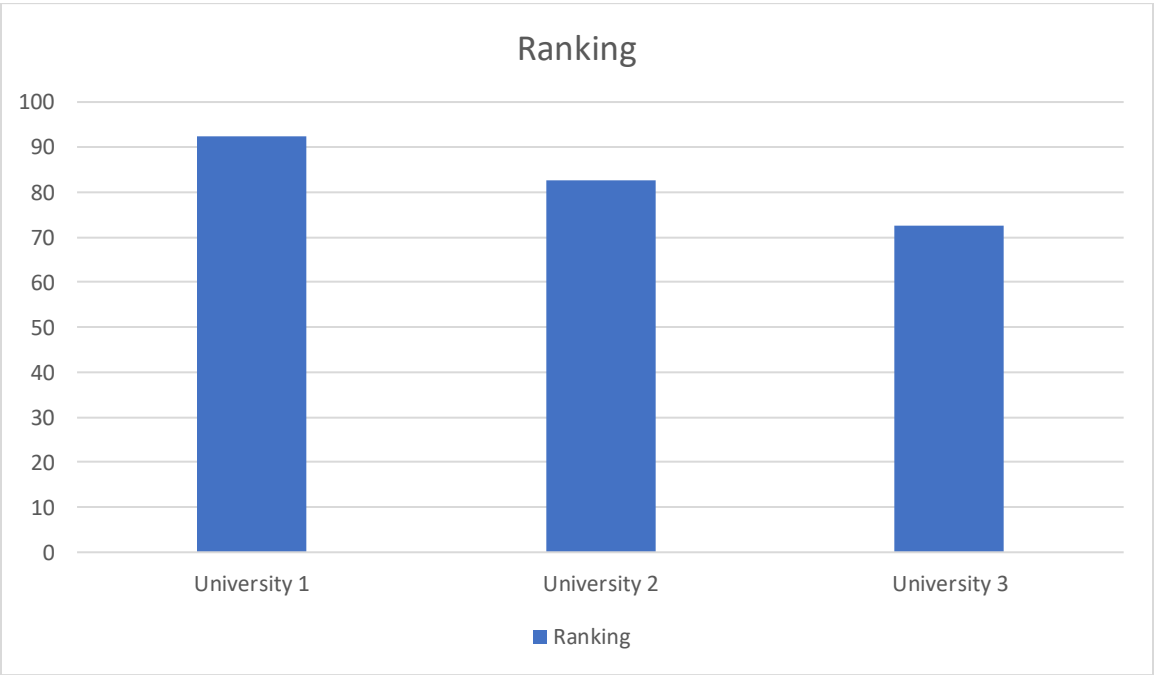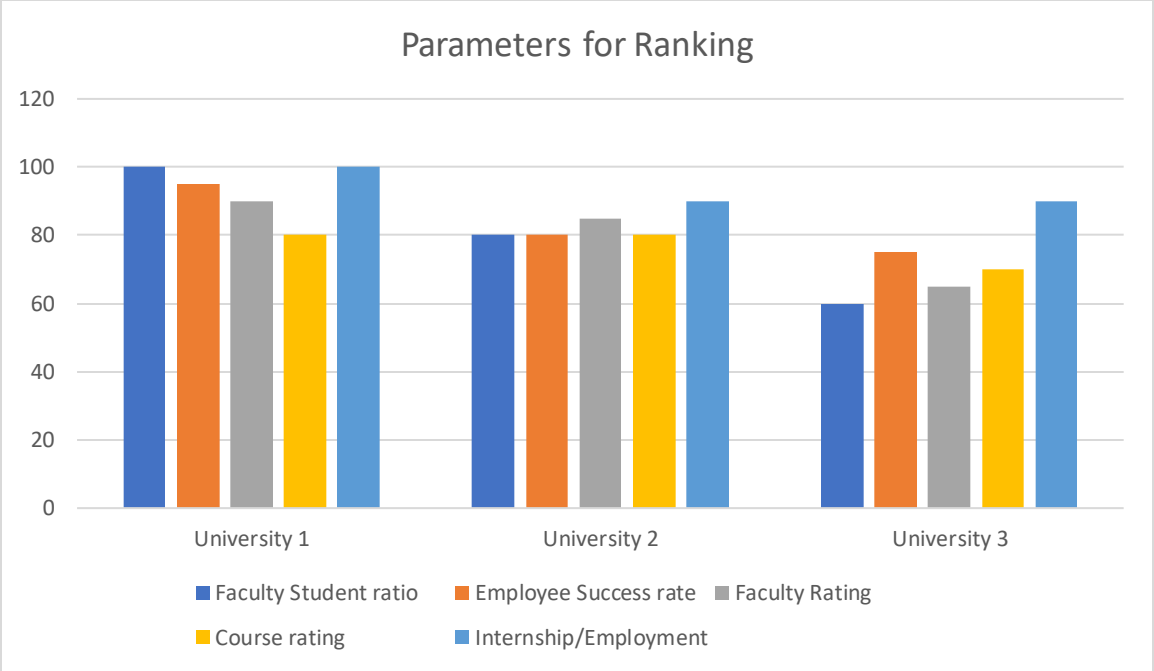
The Success of the University would be calculated on the Success rate of Student. We would keep track of the success rate of Students over a period of 5 years.
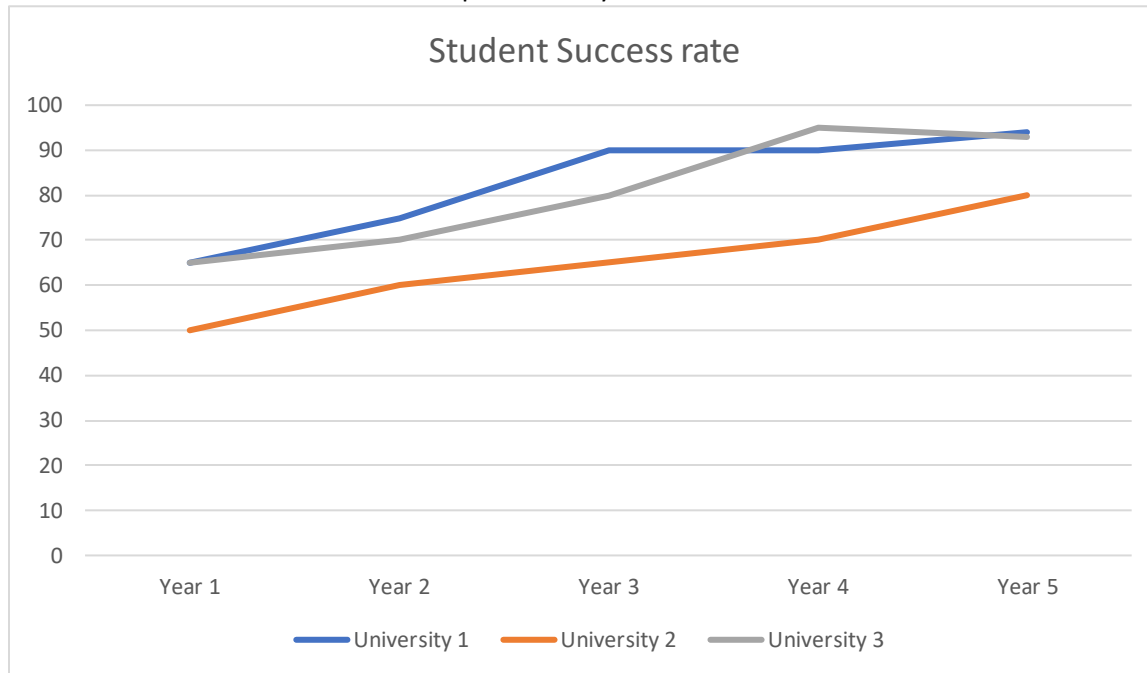
University Ranking:

University will be ranked based on all the above mentioned parameters. The getDepartment() method would give all the details related to a particular department. It would be iterated to get all departments information. It would be aggregated to the College the departments belong to. The getCollege() method would provide all the data at the College level for various colleges at the University.

The University would have all the consolidated information of all the colleges. Based on all these metrics the University would be ranked.

Parameters for Ranking

Legend: Faculty Student ratio, Employee Success rate, Faculty Rating, Course rating, Internship/Employment

Ranking

Legend: Ranking

University Performance Tracking

Dashboard

Current Logged in

Admin

Student Success Rate
| 2019 |
| 2018 |
| 2017 |
| 2016 |
| 2015 |

[Check]

Faculty Student Ratio
| 2019 |
| 2018 |
| 2017 |
| 2016 |
| 2015 |

[Check]

Faculty Rating
| Computer Science |
| Information System |
| Data Science |
| Data Analytics |

| Rob Chill |
| Henry Cavendies |
| Murty Shiva |
| Xan yu chi |

[Check]

Course Rating
| Database Management System |
| Web Design |
| Application Engineering |
| Web Tools |

[Check]

Students on Coop
| 2019 |
| 2018 |
| 2017 |
| 2016 |
| 2015 |

[Check]

Employed Students
| 2019 |
| 2018 |
| 2017 |
| 2016 |
| 2015 |

[Check]

Feedback
| Google |
| Microsoft |
| Tesla |
| General Motors |
| Verizon |

[Check]

Future Scope:

The future scope of this project is to build a more efficient product by considering the below mentioned parameters:

- The success rate of the student will be increased from 5 years to 10 years.
- The University comparison will be increased to many universities across the Nation.
- Parameters for ranking will be increased as a future scope to get more précised results.

Conclusion:

The University Performance tracking will help a person to choose a course and will also help the person to choose a specific subject with various future scopes like job, research etc. The product takes various parameters and factors for consideration so that even a person with no background about the course can choose the subjects easily.