

INFO 5100
APPLICATION
ENGINEERING AND
DEVELOPMENT

**UNIVERSITY
PERFORMANCE
MEASUREMENT
SOLUTION**

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BASE UNIVERSITY MODEL

The current University model mainly focuses on capturing department, course, faculty, and student data; this model is biased towards research as it does not consider important factors like feedback from the students and alumni. When it comes down to choosing a university there are only a few resources presented to students and faculty as there are no performance metrics taken into consideration. The current university model consists of the following classes.

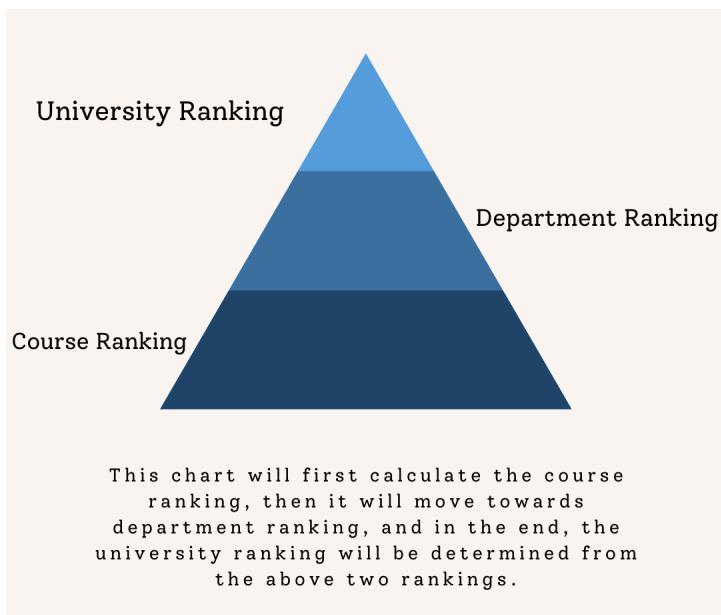
- **Course:** The class will have a Course catalog which will keep track of all the courses that are being offered by the department. New courses can be added or dropped according to the need.
 - Course Catalog: The course catalog will list all the courses available.
 - Course Schedule: The course schedule will list all the courses offered by the department.
 - Course Load: This class will give a list of seat assignments
 - Course Offer: The course offer will link seats with the faculty in the department.
- **Degree:** The degree class will determine whether a student has successfully completed the degree requirement. This class will be given out by the department. A student will have to choose from various electives in the course catalog.
- **Person:** This class will contain personal identification information.
- **Department:** This class includes various courses offered by faculty. It will also have a student directory and a person directory. This directory will help us keep track of incoming students and previous students.
- **Seat:** The Seat will give us the number of seats per course.
 - Seat Assignment: This class will assign a seat to students with their course load and also will allocate a seat to a student who has chosen a subject and paid the required course fee.
- **Student:** This class will return details of selected courses by a student in a semester.
 - Student Directory: This class will list all student profiles in a department.
- **Faculty Profile:** This class will describe all the courses taught by faculty.
 - Faculty Assignment: This class will map courses, faculty, seat assignment, and faculty rating.
 - Faculty Directory: The faculty directory will give a list of faculty in a given profile.

The above-mentioned classes are some of the important classes that help build the university model. These classes use the traditional methods to keep track of the student and faculty data.

There is no standardized format to get feedback from faculty and students and rank a particular university. Students have to refer to various sources which often leads to skepticism about which university is the best fit for them, and which university will lead them towards their goals. This report is going to help us give a better understanding of the proposed university model.

PROPOSED SOLUTION

- The previous University Model does not take the employment factor into consideration. After the student gets employed by an employer, factors such as wage per hour, promotions, and the courses relevant to employment are tracked.
- For example, if a student's end career goal is to become a Software Engineer then the student can go to the directory and can find the courses related to the job to the job title and can plan accordingly.
- We also track increments of the alumni or students working in co-op to cross-check the success ratio. This ensures transparency in the system.
- The proposed model will give us the result of what percent of students cleared the rounds in the interview, how many students actually got coop.
- Let's say out of 100 students who want to get placed 70 students were able to reach the final round in an interview and 50 got placed in different companies of their choice. Out of these 50 students who got placed how many got promoted, how many of these students are receiving increments.
- We can track their growth in real-time. This model will lead to a stronger alumni connection for incoming students.
- The new model will ensure a strong connection between the course module and the employment module.



FACTORS

- **Relevance:** When a student will get placed in any given company, the relevance of the graduate program and job also plays a vital role, let's say some student from a Computer science lands a job in the sales department then there is no relevance in this case described.
- **Ranking:** One of the important factors while choosing a university is that how well it is ranked. To calculate the rank of the university we take into consideration feedback given as input by the faculty and students.
 - We have generated a performance matrix that keeps a track of the number of full-time jobs available, the ranking of the department, the weighted average of course ranking, wage per hour offered by the employer, increment of the employee.
 - The current model only focuses on the revenue generated and does not take into account the employment factor.
 - Each department of the college will have a ranking.
- **Weighted Average:** The weighted average of course ranking, department ranking, and university ranking will calculate so that it can be measured on a scale. This will help the students make a clear choice about what university to choose for their graduate studies. The weighted average will rank the university according to the score.
 - In the class Course Ranking, a method is invoked where the relevance of the course and the job is checked and then this method calculates the weighted average of the course.
 - In department class there is a function defined that is responsible for calculating the weighted average of all courses, also the research score of the department will be calculated. The research score will mean the papers published by the student of the given department.
 - The next weighted average will be calculated for university ranking, wherein the weighted average of all departments will be calculated. This will determine the ranking of the university.

The formula that we have used to calculate the weighted average is as follows:

$$W = \frac{\sum_{i=1}^n W_i X_i}{\sum_{i=1}^n W_i}$$

W = WEIGHTED AVERAGE

WI = WEIGHTS OF THE CLASS

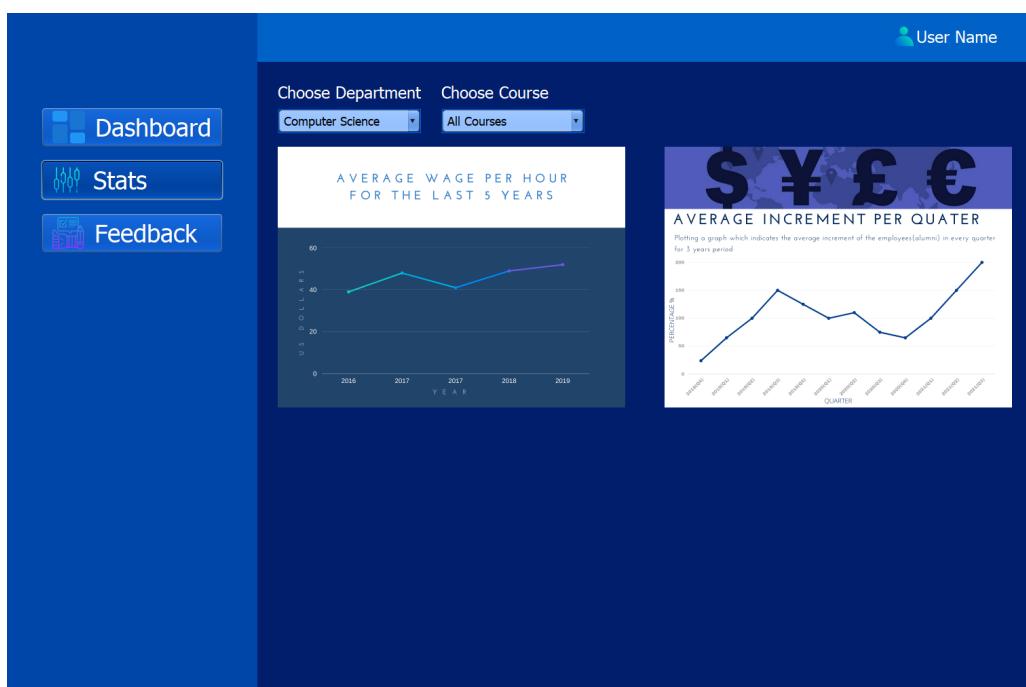
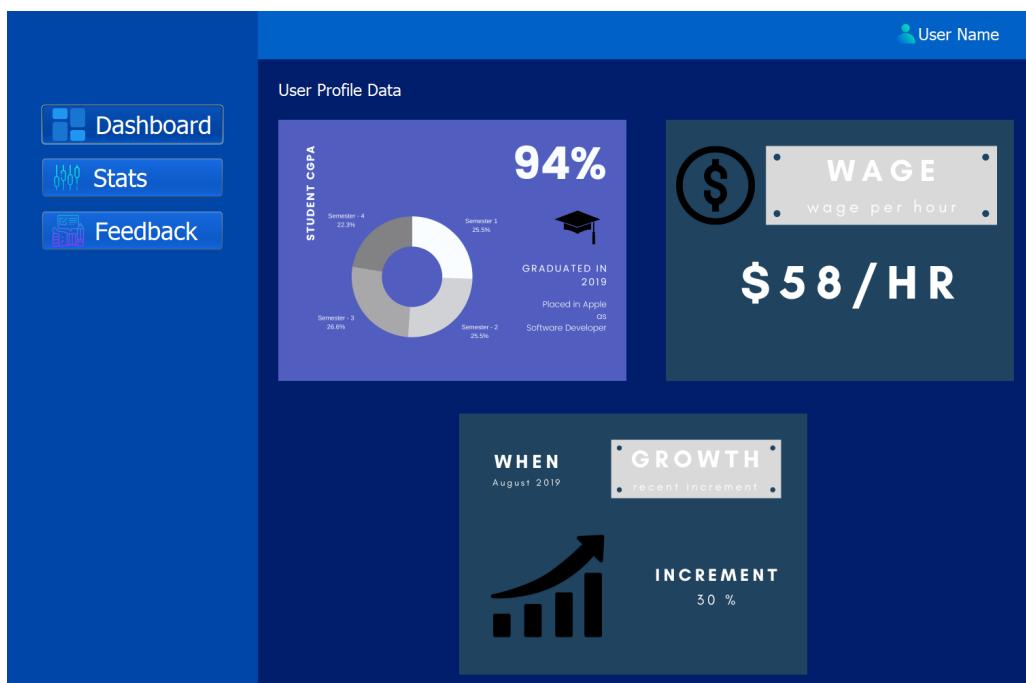
XI = ATTRIBUTES OF CLASS

EMPLOYMENT MODEL

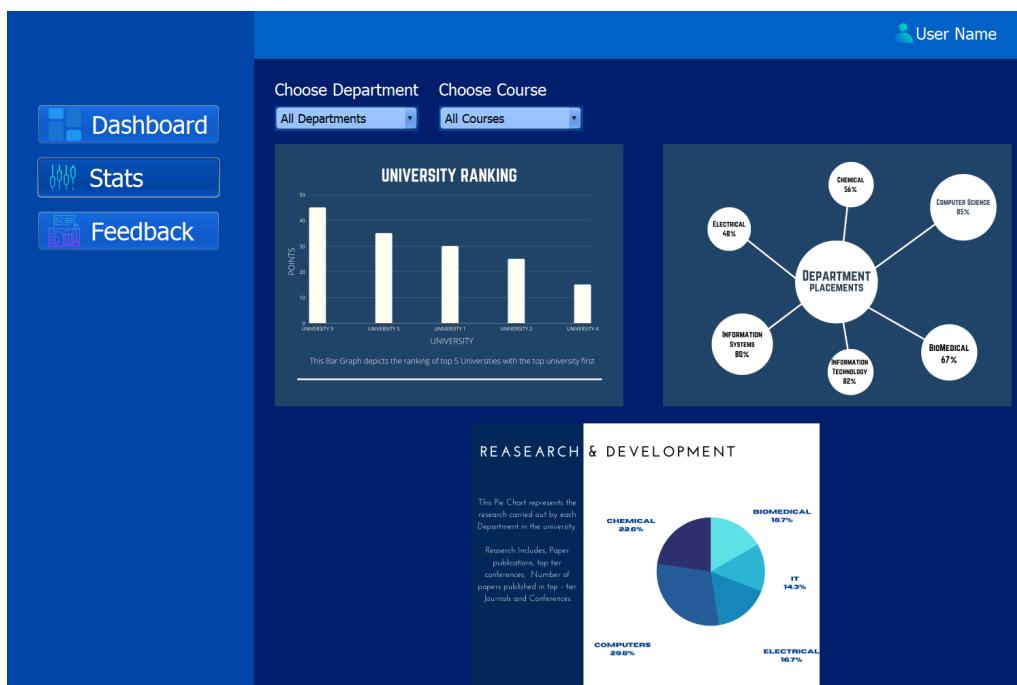
The employment model includes the following classes:

- **Job:** This class will capture all the details related to a new job like the employer, university batch, no of vacancies, wage per hour, university department, relevant courses, location.
- **JobApplication:** This class captures the details related to a new job application filled in by a student and its status. It will help us get to know till which round the candidate qualified and what was the employer feedback.
- **EmployerProfile:** This class will capture the details of a new employer, the number of jobs offered by them, and distinct job categories.
- **EmployerDirectory:** This class contains all employers information
- **EmployerHistory:** This class amasses all the job history of the university right from the past employers' list, departments, to promotions and increments of the alumni.
- **EmploymentFeedback:** This class will help us capture the feedback from the alumni using a survey. 2 main criteria will be captured:
 - **JobVsCourseRelevance Score:** to track the relevance of the courses to the current job.
 - **JobVsDeptRelevance Score:** to track the relevance of the university department to the current job.
- **CourseRanking:** This class will capture 3 parameters that will be used to calculate the course rank using the weighted mean formula given above:
 - JobVsCourseRelevanceScore
 - facultyRating
 - courseRating
- **DepartmentRanking:** This class will capture 3 parameters that will be used to calculate the Department rank using the weighted mean formula given above:
 - JobVsDeptRelevance
 - researchScore
 - employmentScore
 - weightedAvgAllCourses
- **UniversityRanking:** This class will capture 4 parameters that will be used to calculate the Department rank using the weighted mean formula given above:
 - weightedAvgScoreDept
 - deptIndustryRelevance

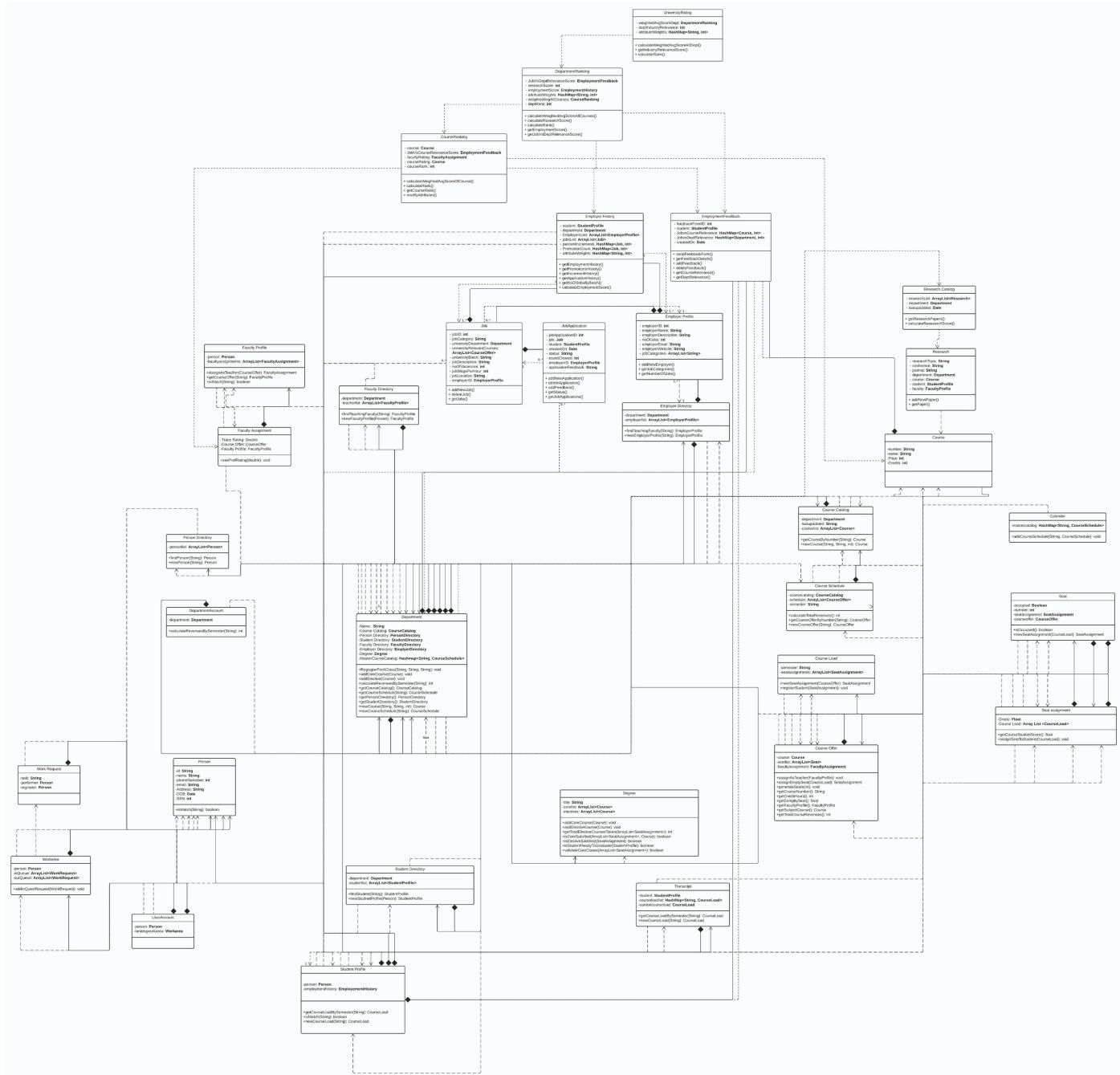
DASHBOARD



DASHBOARD

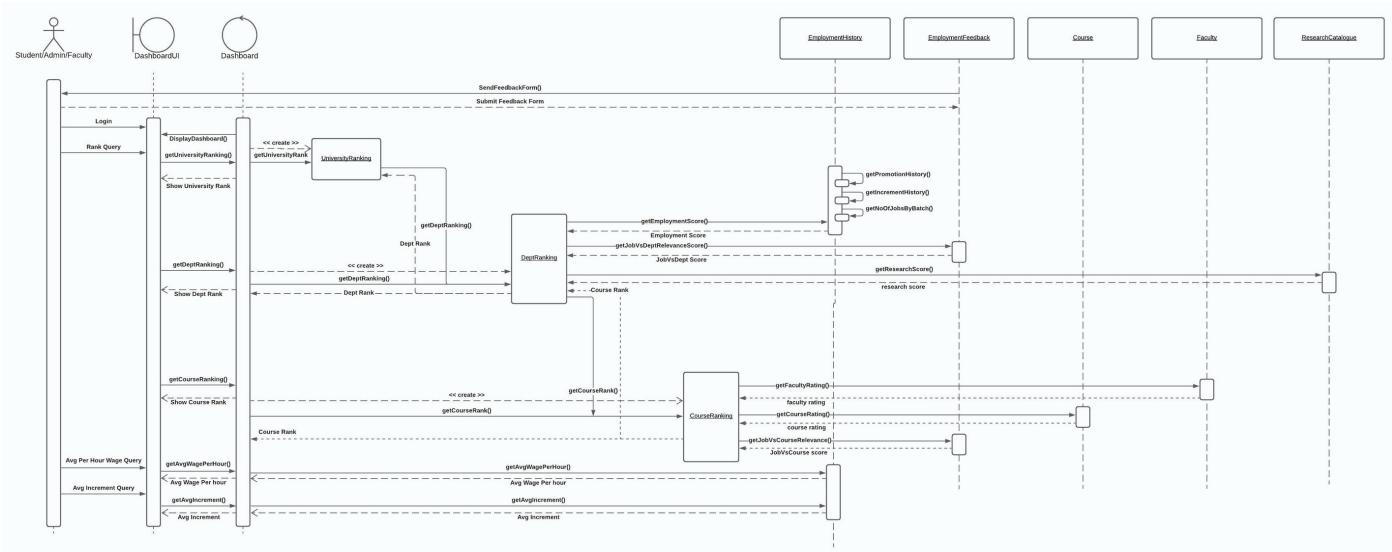


CLASS DIAGRAM



[CLICK HERE TO VIEW THE DIAGRAM IN LUCIDCHART](#)

SEQUENCE DIAGRAM



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