



Faculty of Computing Department of Software engineering

Object Oriented Software Engineering

Group Project

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Abstract

As a component of the process of institutional development and quality maintenance, evaluation statistics play a significant role in the evaluation of teaching and learning. Many universities still use paper for evaluating instructors, teachers, and courses. The manual evaluation process is costly, time-consuming, and less precise. This computerized teacher evaluation system is required to lessen those issues.

Through their participation in the teacher evaluation process through the automated Teachers Evaluation system to quality instruction and academic excellence, students play a complementary role in the academic life of the university. They can participate in the evaluations from any location using their own devices, and the technology will provide automatic results for the authorities.

Finally, the outcomes of this work demonstrate how the incorporation of an automated evaluation system may give teachers accurate, timely, and more thorough information as well as how authority can know the department's teaching quality and take the necessary actions to sustain educational quality. Additionally, it helps to get better feedback and the manual system's issues will be lessened.

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1. Introduction

An essential and crucial element in ensuring quality teaching instruction is the evaluation of teaching performance. Teaching performance reviews have traditionally been used as a technique to keep teachers informed about how they are performing their duties. Performance is defined as a collection of results produced during a specific time period; it does not refer to the attributes, traits, or skills of the performer.

A teacher's performance in the classroom is evaluated systematically, and the results are then analyzed to offer the teacher helpful input for developing professionally. Since state laws govern them, specifics of a teacher evaluation survey may differ from district to district. Principals and administrative staff members are usually involved in evaluating a teacher. When evaluating a teacher, factors including student performance on class assignments, records kept by the teacher, daily or weekly lesson plans, etc. are taken into account. It is one of the most essential components for a teacher's entire professional development and upholds the standard of education.

Most people agree that the best method for raising the quality of instruction in schools is teacher assessment. Practically every step of the decision-making process benefits from accurate information. The earlier problems can be fixed, reducing the likelihood of unfavorable or costly consequences for the organization.

1.1 Existing System

When we see the background of teacher's evaluation method, Almost all activities are going on manually, which leads to wastage of time, labor, accuracy, and speed. This type of evaluation system evaluates the teacher's performance and skills using some criteria by using papers or manually. The paper distributed through the students by the evaluator committee and collected the paper back then the value given by the evaluator will be summed up for each teacher and the final result will be calculated based on what value has been get from the paper.

1.1.1 Problem of Existing System

According to our analysis the existing system has the following issues:

- The system is manual or paper-based, which makes it expensive i.e it requires duplicating of many papers.
- It takes a long time.
- The manual calculation of the result may go wrong.
- The evaluation may occasionally be delayed.
- A student has the capacity to evaluate a teacher multiple times.
- It is difficult to analyze the result manually
- It takes time to calculate the evaluated result.

- Administrative assistant waste their time in distributing and collecting the forms.

1.2 The proposed system

Comparing the suggested approach to the current system, there are several uses and benefits. It improves evaluation performance while resolving issues with the current system. We create a teacher evaluation system in our proposed system that is able to manage the evaluation form.

The applications of proposed system are:

- Replace the manual system with an automated one
- determine the evaluation result and keep evaluation data in a database.
- save data in the database and retrieve necessary information from the database, the program creates various forms.
- Make accounts for several users.

1.2.1 Overall Description of the proposed system

Our project is an effective and dependable approach for evaluating teachers. Any operation can be completed quickly and easily with a simple system interface. Additionally, the system could evaluate teachers more specifically and could compute the evaluation result more quickly than that of the existing system.

1.2.2 General Objectives

The general objective of this project is to develop a programmed automated system that can replace the manual ways of teacher's evaluation system. In order for a teacher assessment to be effective and useful, it must either focus on the quality of the teacher's performance, the growth and support of the instructor, or both. In summary, teacher assessment may and should take into account ways to hold instructors accountable for their job while also assisting them in improving their performance.

It also intend to implement a performance evaluation system that promotes collaboration between the teacher and evaluator and promotes self-growth, instructional effectiveness, and improvement of overall job performance.

1.2.3 Specific Objectives

Specifically our project will perform the following things.

- design teacher evaluation based on the institution standard and criteria.

- develop real time teacher evaluation system using java programming language and MySQL data base management system.
- Make the application Portable (it can access from any were. Whether the evaluator found in university or not)
- efficiently evaluate the teacher thorough a fully automated evaluation system, not only saves a lot of time but also give fast and accurate results
- prepare accurate result of evaluated instructor.

1.3 Significant of the project

The new system is bringing remarkable change in the teacher's evaluation system.

These are some crucial aspects of this project:

- Used for the institute to evaluate teachers any time anywhere.
- It saves time to calculate teacher's evaluation result.
- The system gives fast delivery evaluation report.
- Developers will get experience.
- Teachers will be evaluated correctly.
- Generally it reduces expenditure of a lot of time, cost and man power.

1.4 Scope

This project, which can be easily accessed by WAN, internet, and LAN networks, proposes and implements a method for evaluating teachers in the institute.

- The students, co-workers, School head should fill the evaluation form and submit it.
- The system handles all the operations and generates reports as soon as the test is completed which saves the precious time of departmental executives, teachers.
- The system Calculate the values filled by the evaluator and store it in to the database.
- Then the head can easily view each teacher's evaluation total value as well as average result.

2. Nonfunctional requirement

A Non-Functional Requirement is usually some form of constraint or restriction that must be considered when designing the solution. Non-functional requirements of the proposed system are:

2.1 usability

Description: the system must be easy understandable by the clients.

Requirement: the system is object oriented approach.

Rank: essential

2.2 reliability

Description: it describes the functionality of the system

Requirement: the system must be includes all the requirements of the client.

Rank: essential

2.3 performance

Description: describes the ability of the system for its function and

Waiting for an application to load can be frustrating for an end user. so make them a quick start up is extremely important.

Requirements: The System must have a startup time of less than 5 seconds,

Rank: essential

2.4 supportability.

Description: the system must be run in all operating systems.

Requirement: The system must compile and run successfully on any operating systems.

Rank: essential.

2.5 implementation

Description: The system is implemented using java,javaFx and uses MySQL for database.

Requirement: the system must be corrective, adaptive, or perfective though time.

Rank: desirable

2.6 interface

Description: boundary between the user and the system.

Requirement: the system has an interface that enables for the data flows from the data base.

Rank: essential

2.6.1 User Interface and Human Factors

- The system will provide easy and flexible user interface in supporting different users
- The user is particularly protected from making mistakes.
- It should take minimal learning time.

2.7 Hardware considerations

Since we want to develop an automated system it has a Front-End which refers to the user interface and Back-End where the server, application and database work behind the scene to deliver information to the user.

backend

- processor
- Recommended: X64 architecture based processor running at 2.2 GHz or faster.

Memory

- Minimum: 8 Gigabytes of RAM
- Recommended: 64 Gigabytes of RAM

Hard disk

- Minimum: 250 GB.
- Recommended: 1 TB with expandable size.

Backup devices

- External hard drive
- USB Flash Drive

Operating system

- microsoft window based operating system
- linux based OS

3. System Designing

The conversion of the analytical model into a system design model is known as system design. Up until this point, we were dealing with issues. The first phase of

software development to enter the solution domain is system design. This part of the document is concerned with converting the analysis model into the design model, which incorporates the constraints and nonfunctional needs mentioned in the problem statement and requirement analysis sections previously covered.

The goal of designing is to demonstrate how the system is constructed and to gather sufficient and accurate information to guide the system's actual implementation. It is based on knowledge of the model that the software was constructed from. The goal of design is to create a high-quality representation of the system. The nature of the designer's design will determine how well a system is implemented. The quality of the system design will determine whether changes can be made to the system after it has been put into operation. As a result, it will be simple to make adjustments to the system if it is designed well.

3.1 Overview of System Design

Software design is a process through which the requirements are translated into representation software. Design of software includes conceiving, planning out and specifying the externally observable characteristics of the software product. The goal of design process is to provide a blue print for implementation, testing and maintenance activities.

3.2 Design Goal

The design goals are derived from non-functional requirements that means non-functional requirement is the description of the feature characteristics and attribute of the system as well as any constraints that may limit the boundary of the proposed solution.

Design goals describe the qualities of the system that the developers should consider.

- i. Reliability:** the system should be reliable
- ii. Security:** the system should be secured, i.e., not allow other users or unauthorized users to access data that has no the right to access it.
- iii. Fault Tolerance:** the automated evaluation system should be fault tolerant to loss of connectivity with the service.
- iv. Modifiability:** the system should be modifiable for further modification and enhancement of the application.

- v. **Performance:** The system should respond fast with high throughput, i.e. it should

Perform evaluation and report generation in a time less than 2 minutes.

- vi. **Cost:** The system should be developed with minimum cost possible. In reality there is always trade-offs or disadvantages and therefore, from its previous experience the university prefers to invest more in development cost than maintenance cost to minimize bugs which may appear the later stage.
- vii. **End User Criteria:** - The system should have simple and understandable graphical user Interface such as forms and buttons which have descriptive names. It should give reliable response for each user request at least before the session expires. All the interfaces, forms and buttons are written or designed in a simple language or common language so that the user can access it without any difficult.
- viii. **Response time:** As we mentioned the performance characteristics in the non-functional requirement of the requirement analysis document the system should respond the user requests within a specified period of time and up to the standard response time after the request has been issued.

4.1 System model

4.1.1 Scenarios

Scenario name: Teacher's evaluation System

At the end of the semester our institute need to evaluate the Teacher's performance. Assume Alemu is an admin and he want to check the performance of the teacher Kasa, who is supposed to be evaluated by the student Elias using the system.

To do so, all the above participating actors Elias, Kasa and Alemu will create their own account. Then the they login to Teacher's evaluation System

And the student Evaluate teacher's performance based on the prepared form displayed by the system by filling the evaluation form and click the submit button, Based on the evaluation rule and regulation the System calculates the Teacher's Evaluation Result. Then each teacher can see their own result and also the Admin Alemu can see all Teacher,s evaluation result.

4.1.1 Use case model

Use case diagrams are created to visualize interaction of our system with external world. Also a use case model is the representation of the system intended functions and its environment. The functionalities are specified by the “use case” and “the actor” specified to the environment. Since the identification of these two entities goes hand in hand, we have identified them together.

The actors are: -

- Student
- Teacher
- Admin

The use cases are: -

student can:

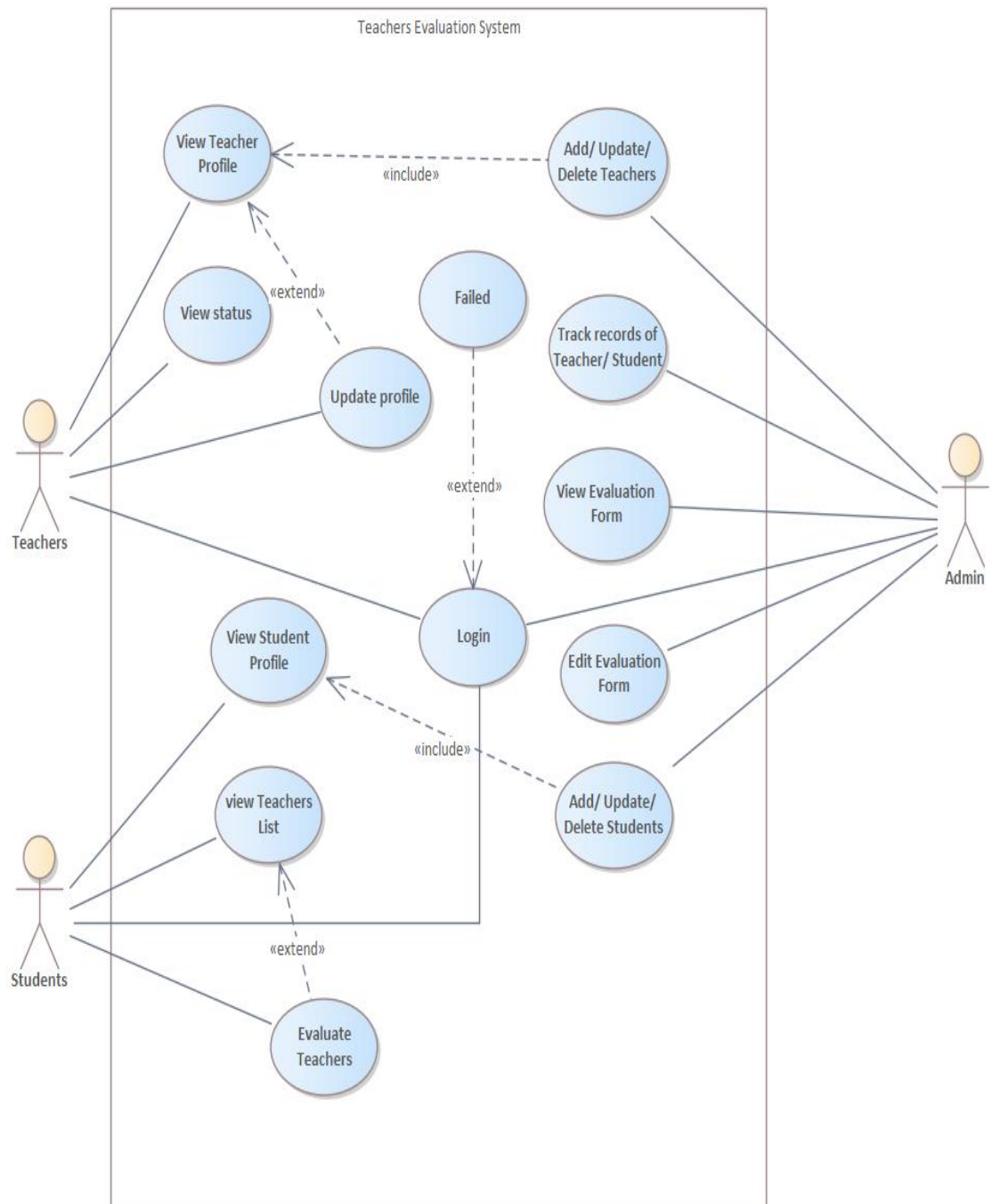
- View student list
- Evaluate teachers

The teacher can perform:

- Login
- View teacher profile
- Update profile
- View status

The admin can do the following:

- Add/update/delete student
- Edit evaluation form
- View evaluation form
- Track records of teacher and student



Use case diagram for the system

Use case Description (scenarios)

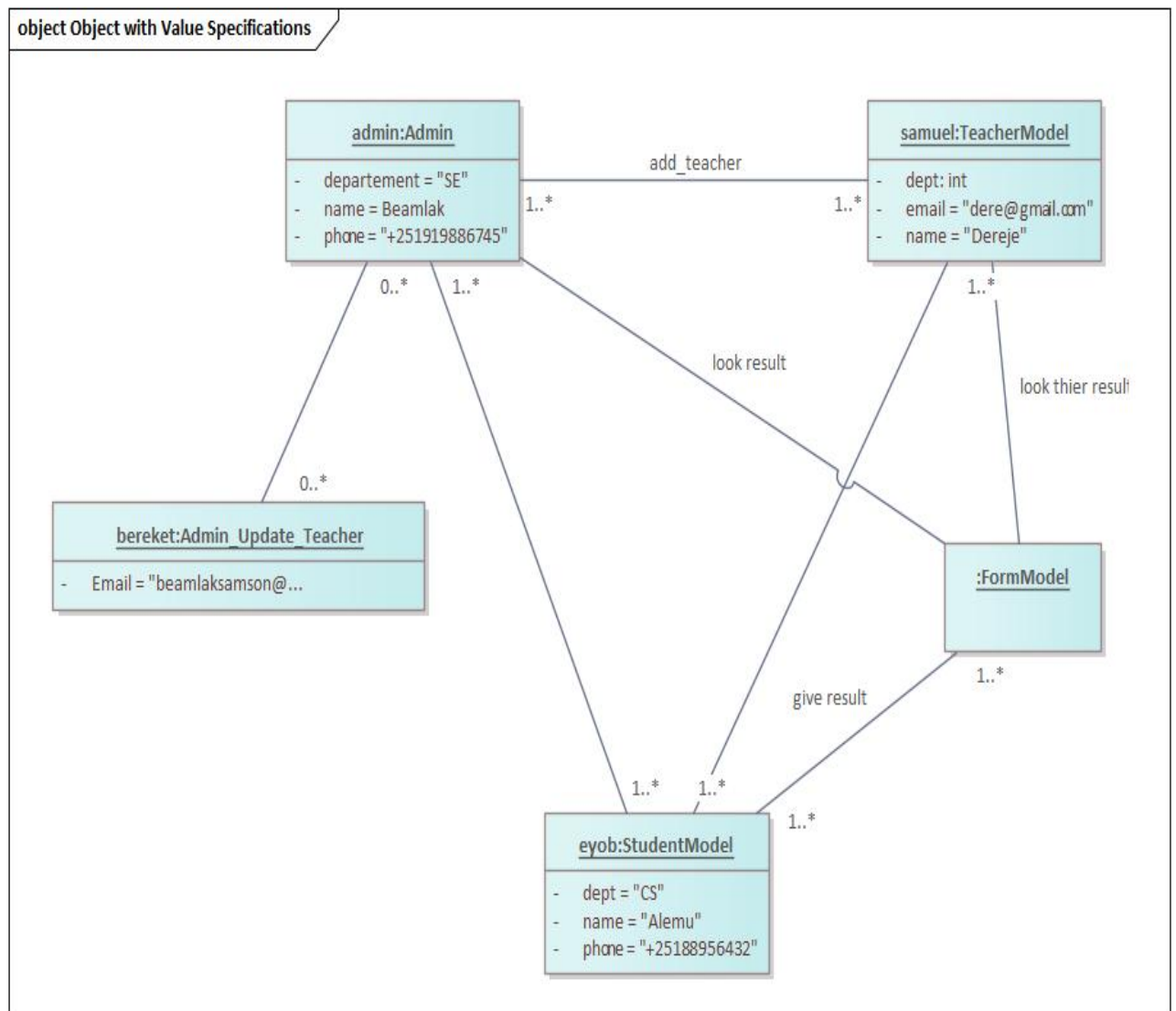
Use case name	View teacher profile,view status, View student profile and View teacher's list
Identifier	
Actor(s):	Teacher, Student and Admin
Description	<ul style="list-style-type: none"> - Allows Teacher and student to see their own respective profile - Allows Teacher to see their own status - The admin can get access to both the teacher and the student profile
Precondition	All of the actors: the teacher, the student and the admin must have an account
Basic course of actions	<ol style="list-style-type: none"> 1. Click on Login button 2. Choose view teacher, student profile or see teacher list button accordingly. 3. Use case ends
Alternative course of action	<ul style="list-style-type: none"> - If the actors don't have an account, the login will fail. - If either teacher or the student has no profile the admin can not access information about them - if there are no record of teacher the student can't see teacher's list
Post condition	The teachers and the student can update their own profile .
Use case name	Add / update /delete Teachers and students,Track record of teacher and student, view and edit evaluation form
Identifier	
Actor(s)	Admin
Description	<ul style="list-style-type: none"> - Allow admin to add/delete/update the Teachers and students information.

	-Allow the admin to Track record of teacher and student. -Allow the admin to view and edit evaluation form of the system
Precondition	- Admin must have an account - The evaluation form must be provided
Basic course of actions	1. administrator login in his/her own account 2. Choose either teacher Add/delete/update record button, student Add/delete/update record button, or view and edit evaluation form button 3. Click Add/delete/update or submit button 4. Use case ends
Alternative course of action	- If the administrator doesn't have an account, the login fails. - If the teacher or student information is not correct or not found , Add/update/delete record will fail.
Post condition:	- Student and teacher information is added,updated or deleted
To Evaluate teacher	
Use case name	Evaluate teacher
Identifier	
Actor(s)	Student
Description	Allow the Students to fill the evaluation form to evaluate teachers
Precondition	Student must be registered to perform the evaluation.
Basic course of actions	1. Student enters or login to the system. 2. Clicks on evaluation button 3. Selects the teacher name to evaluate. 4. Fills the evaluation form. 5. Clicks save button 6. The use case ends

Alternative course of action	<p>Step 1. If the student's username or password is incorrect the system displays incorrect username or password and displays try again.</p> <p>Step 4. If the evaluation form is filled partially or not filled at all, the system displays fill all the fields' message.</p>
Post condition	The system will calculate the teacher's performance and display the total evaluation result.

4.1.2. Analysis object model

The followings are instances of some classes used in the system that we propose.



The following classes are included in our project.

1. Student
2. Admin
3. Teacher
4. TeacherTableView
5. StudentTableView
6. login
7. Admin_question

Students:

allows to performing the following action

- ✓ Evaluate instructors
- ✓ Modify their own account

Admin:

allows to performing the following action

- ✓ Add student
- ✓ Add instructor records
- ✓ Register department information
- ✓ Update account information
- ✓ View evaluation result
- ✓ Create account
- ✓ Add new evaluation criteria
- ✓ Update evaluation criteria

Teacher:

- ✓ View evaluation result
- ✓ Filling the evaluation forms
- ✓ Update account information

login:

use different attribute of the actor Student and teacher to enable them including

- ✓ User name
- ✓ Password

TeacherTableView and StudentTableView:

using this classes the admin and teacher can check the performance of evaluated teacher.

- ✓ Total result
- ✓ Average result

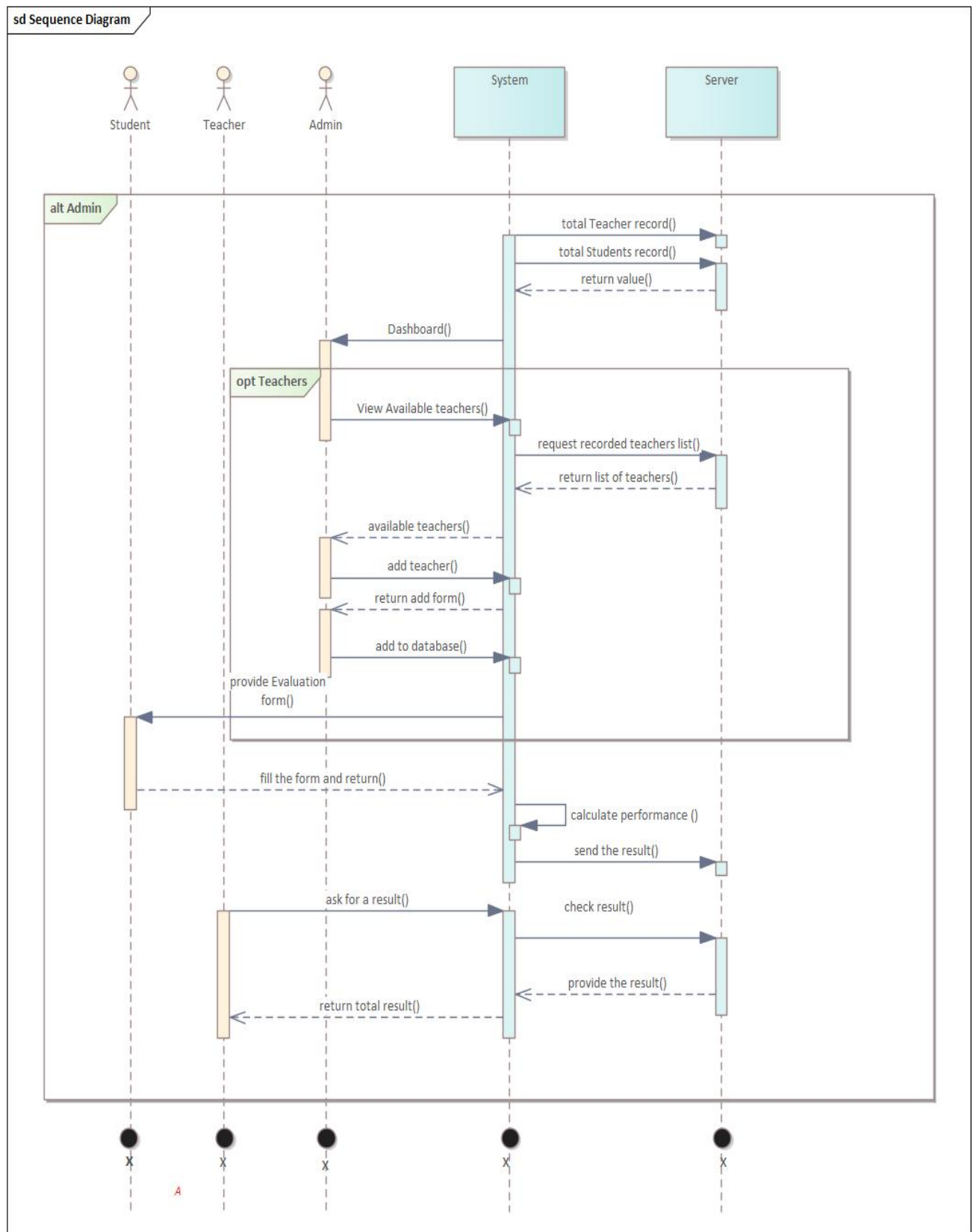
Admin_question:

Store evaluation criteria or question with having question id, that can do

- ✓ Add Question
- ✓ Edit Question

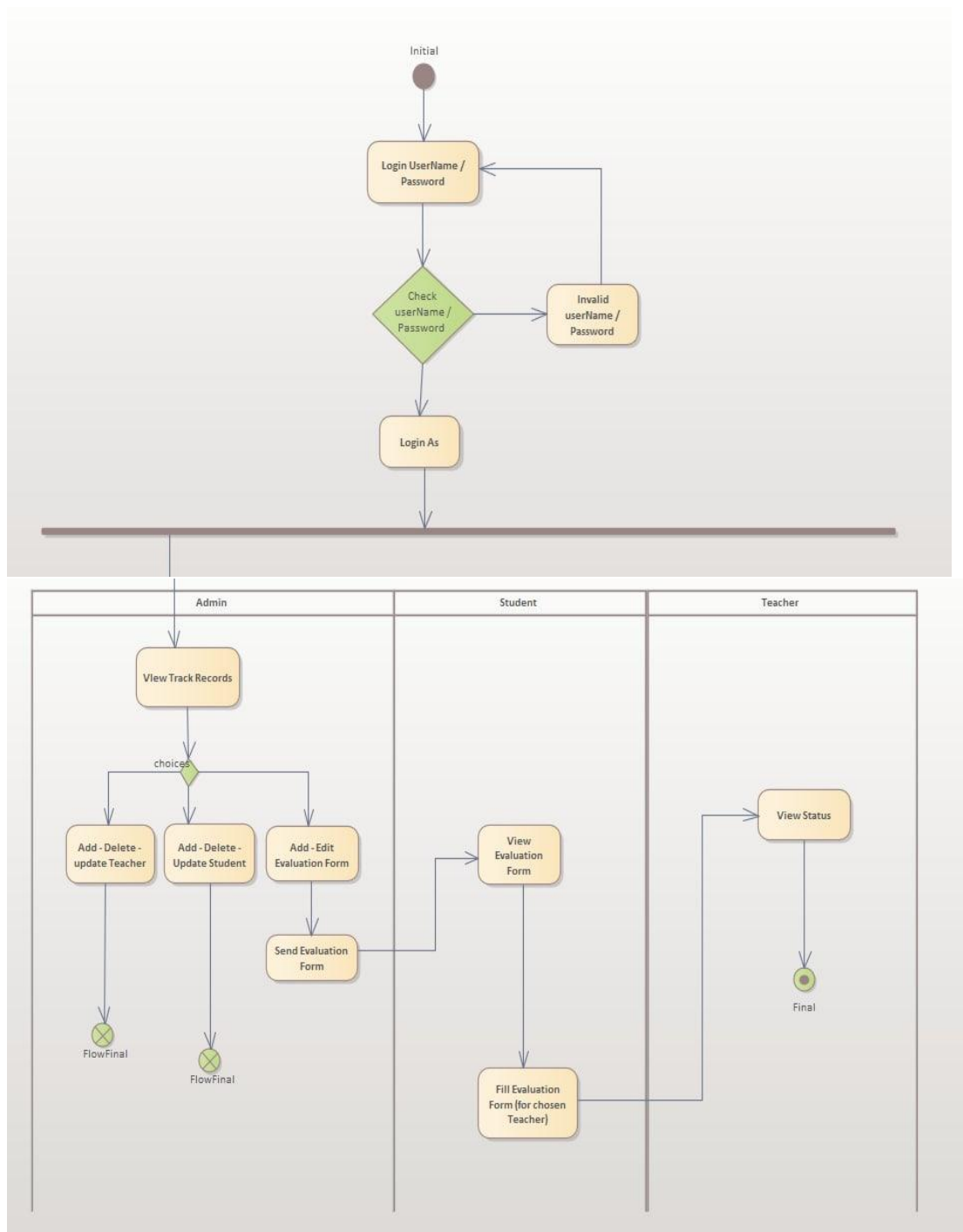
4.2 Dynamic model**4.2.1 Sequence diagram**

Sequence diagrams are used to depict graphically how objects interact with each other via messages in the execution of a use case or operation. They illustrate how the operations are performed between objects and in what sequence.



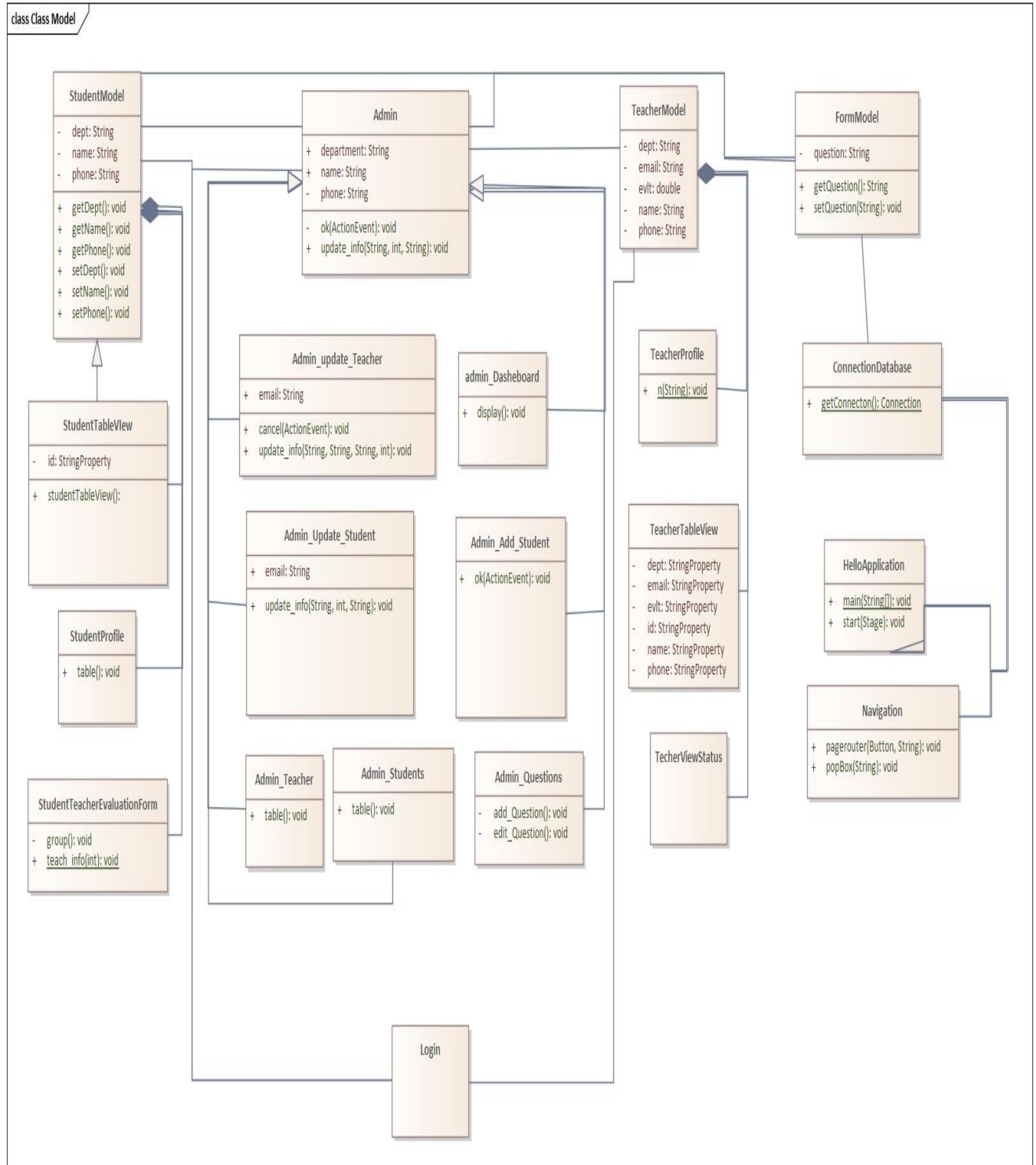
Sequence diagram

4.2.2 Activity Diagram



4.3 Static Model

4.3.1 Class Diagram



Class diagram of the system

5. Subsystem decomposition

Record management

This sub system Record information like school information, instructor's information, students information.

View management

The user module includes the follow functionalities:

View instructors result.

Database:

This component of teacher's evaluation system application comprise relational database store information in various tables regarding user detail, account detail, delivery Order and other service detail.

Account Management

- Add user account
- Delete user account
- Maintain the system
- Manage User Authentication and access control

5.1 Exception Handling

All exception handling will be managed by the Exception Handling subsystem. The Exception handling subsystem manages the following exceptions:

Database Exception – Occurs when there is an error accessing the database. Recovery from this error is achieved by displaying an error message stating that the database is temporarily unavailable.

Access Control Exception – Occurs when a user is trying to access a function that they do not have permission to access. Recovery from this error is achieved by preventing the user for executing this function.

6. Conclusion

Generally speaking, for this project, we created an automated system that supports many tasks occurring at the institute. You can carry out various tasks including

viewing the average outcome or evaluating the instructor. We are aware that the existing system is too backward to operate in a flexible manner and unable to reduce errors. The newly created system, however, offers dynamic data management and manipulation features. This article also provides the technical specifics of the main functions of the system as well as briefly describes the issues and our suggested solutions with illustrations to help the reader better understand them.

7.Recommendation

The actions that should be taken to convert the automated system's components into new technologies, such as connecting the system with e-learning, are recommended in this study. If these actions are implemented, users will receive greater help while accessing various information required more quickly and staff members' workloads would be reduced. The construction of an integrated software development process with a single lead agent in responsibility of creating, maintaining, and expanding the architecture will be necessary to achieve these gains.

Automation must be thoroughly examined and centered on the Core Task of evaluation. The entire system needs to have a plan. This plan must be a living document that adapts to new circumstances and accounts for requirements as they arise.

The evaluation of teachers was done manually. Automation solutions with the use of standardized applications within current software solutions could considerably simplify these processes instead of requiring numerous manual submissions of the same information.

Automation needs to be receptive to user wants and specifications. The final recommendation is to develop an effective, efficient, and dependable automation system. The design must be flexible enough to incorporate modifications before requirements for users.

8.Glossary

Main terms

Use case: A use case expresses a contract between the stakeholders of a system about its behavior. It describes the system's behavior and interactions under various conditions as it responds to a request on behalf of the stakeholders, the primary actor, showing how the primary Actor's goal gets delivered or fails. The use case collects together the scenarios related to the primary actor's goal.

Scenario: A scenario is a sequence of action and interactions that occurs under certain conditions, expressed without branching.

Actor: Something with behavior. It might be a mechanical system, computer system, a person, an organization or some combination.

Use case diagram: In UML, the diagram showing the external actors, the system boundary, the use cases as ellipses, and arrows connecting actors to ellipses or ellipses to ellipses. Primarily useful as a context diagram and table of contents

Sequence diagram: In UML, the diagram showing actors across the top, owning columns of space, and interactions as arrows between columns, with time flowing down the page. Useful for showing one scenario graphically.

Class diagram: Class diagrams show the classes of a system and their interrelationship's. Class diagrams are often mistakenly referred to as object models.

UML: unified modeling language

LAN: Local Area Network

WAN: Wide Area Network

MYSQL: MY Structured Query Language for the database