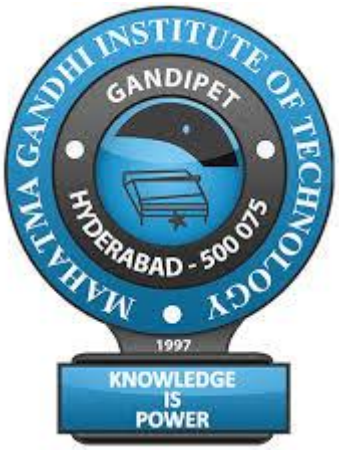
MAHATMA GANDHI INSTITUTE OF TECHNOLOGY

GANDIPET, HYDERABAD-500075

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



SOFTWARE ENGINEERING LAB MANUAL (R18)

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CS505PC: SOFTWARE ENGINEERING LAB

III Year B. Tech. CSE I- Sem **L T P C**

Course Code: CS505PC **0 0 3 1.5**

Course Objectives

1. To have hands on experience in developing a software project by using various software Engineering principles and methods in each of the phases of software development.

Course Outcomes

1. Ability to translate end-user requirements into system and software requirements
2. Ability to generate a high-level design of the system using CASE tool from the software requirements.
3. Ability to prepare software requirements specification (SRS) document
4. Will have experience and/or awareness of testing problems and will be able to develop a simple Testing report
5. Ability to prepare of Risk Management documents.

List of Experiments

Do the following 6 exercises for any two projects given in the list of sample projects or any other Projects:

1) Development of problem statement.
2) Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3) Preparation of Software Configuration Management and Risk Management related documents.
4) Study and usage of any Design phase CASE tool
5) Performing the Design by using any Design phase CASE tools.
6) Develop test cases (Any testing approach).

Sample Projects:

1. Passport automation System
2. Book Bank.
3. Online Exam Registration
4. Easy leave Management System.
5. Online course reservation system
6. E-ticketing
7. E-Bidding.
8. Credit Card Processing

9. Software Personnel Management.

10. Recruitment system.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.

2. Software Engineering- Sommerville, 7th edition, Pearson Education.

3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.

INDEX

Content Beyond syllabus

1-PASSPORT AUTOMATION SYSTEM

Chapter-1

Problem Statement:

Passport Automation System is used in the effective dispatch of passport to all of the applicants. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, address etc.,) filled by the applicant whose testament is verified for its genuineness by the Passport Automation System with respect to the already existing information in the database. This forms the first and foremost step in the processing of passport application. After the first round of verification done by the system, the information is in turn forwarded to the regional administrator's (Ministry of External Affairs) office. The application is then processed manually based on the report given by the system, and any forfeiting identified can make the applicant liable to penalty as per the law. The system also provides the applicant the list of available dates for appointment to 'document verification' in the administrator's office, from which they can select one. The system forwards the necessary details to the police for its separate verification whose report is then presented to the administrator. The administrator will be provided with an option to display the current status of application to the applicant, which they can view in their online interface. After all the necessary criteria have been met, the original information is added to the database and the passport is sent to the applicant.

Chapter-2

Software requirement specification:

Preface:

The existing system is not providing secure registration and profile management of all the users properly. This manual system gives us very less security for saving data and some data may be lost due to mismanagement .In the previous management system all the details required were taken manually in the form of documents .In this system every individual had to stand in a queue which involved individuals in huge numbers and maintaining of documents submitted for passport registration was a tedious work as many number of individuals apply for registration.

If the entire process of 'Issue of Passport' is done in a manual manner then it would takes several months for the passport to reach the applicant. Considering the fact that the number of applicants for passport is increasing every year, an Automated System becomes essential to meet the demand. So this system uses several programming and database techniques to elucidate the work involved in this process. As this is a matter of National Security, the system has been carefully verified and validated in order to satisfy it.

Introduction:

Passport Automation System is an interface between the Applicant and the Authority responsible for the Issue of Passport. It aims at improving the efficiency in the Issue of Passport and reduces the complexities involved in it to the maximum possible extent.

Scope:

The System provides an online interface to the user where they can fill in their personal details and submit the necessary documents (may be by scanning). The authority concerned with the issue of passport can use this system to reduce his workload and process the application in a speedy manner. Provide a communication platform between the applicant and the administrator. Transfer of data between the Passport Issuing Authority and the Local Police for verification of applicant's information. Users/Applicants will come to know their status of application and the date in which they must subject themselves for manual document verification.

Glossary:

- **Administrator** Refers to the super user who is the Central Authority with the privilege to manage the entire system. It can be any higher official in the Regional Passport Office of Ministry of External Affairs.

- **Applicant** One who wishes to obtain the Passport.
- **PAS** Refers to this Passport Automation System.
- **HTML** Markup Language used for creating web pages.
- **J2EE** Java 2 Enterprise Edition is a programming platform java platform for developing and running distributed java applications.
- **HTTP** Hyper Text Transfer Protocol.
- **TCP/IP** Transmission Control Protocol/Internet Protocol is the communication protocol used to connect hosts on the Internet.

System Architecture:

- Admin module- This module provides administrator related functionalities.Administrator can view all the applicant requirements the admin also sends the notifications and updates the applicant's status.
- Applicant module -This module is about users of this portal. By using this module user can lodge any complaint about process.Applicant must be registered with the system the applicant also gets notified about the the processing of the passport.
- Police module- police verify the applicants details and report the same to the regional administrator, if the applicant is eligible for the passport or not.

System Requirements:

Non Functional Requirements:

- The PAS acts as an interface between the 'applicant' and the 'administrator'. This system tries to make the interface as simple as possible and at the same time not risking the security of data stored in. This minimizes the time duration in which the user receives the passport.
- The applicants require a computer to submit their information. Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring. The user has to be careful while submitting the information. Much care is required.
- The Applicants and Administrator must have basic knowledge of computers and English Language. The applicants may be required to scan the documents and send.

Functional Requirements:

- The system should provide login credentials and an application form to fill the details.
- Secure registration of information by the applicants.
- System should generate Applicant's ID.
- The system should support efficient storage and fetching of the applicant's details.
- Schedule the applicants, an appointment for manual verification of original documents.
- The system should verify the details provided by the applicants.
- The system should co-ordinate with the police and also with the applicants.
- Panel for passport application status display by the administrator.

- Sending SMS and Mail updates to the applicants by the administrator.
- Administrator can generate reports from the information and is the only authorized personnel to add the eligible application information to the database.
- System should also issue the passport.

System Models:

Refer chapter 4 for system modelling.

Index:

S.No.	Name Of The Uml Diagram
1)	Use case Diagram
2)	Class Diagram
3)	Sequence diagram for registration
4)	Sequence Diagram for Issue Passport
5)	Sequence Diagram for checking status
6)	Communication Diagram
7)	Component Diagram

Chapter-3

Study of Design Phase Case Tool:

- **StarUML**

StarUML is an open source software modeling tool. It provides eleven types of diagram. StartUML 2 is compatible with UML 2.x versions. It provides a platform to carry out your modeling. It was an open source tool, but now it is acquired by a company and being upgraded. So you need to purchase. It supports both forward engineering and reverse engineering. It supports different languages such as Java, C++, C#.

Features:

- Allows you to create Obje3ct, Use case, Deployment, Seque3nce, Communication, Activity, and profile Diagram.
- Allows you to discover and install third-party extensions.
- Work with same UX in multiple platforms including macOS, Windows, and Linux.
- No limit for using this commercial software for evaluation.

Download link :http://staruml.io/

Installation of StarUML:

You can easily make setup in windows platform. Just search in Google with keywords star UML, you will find the first link taking you to the website for StarUML 4.0. Then download and do setup.

Chapter-4

System Design:

Class Diagram:

The class diagram is referred as object modeling in the static analysis diagram. The main task of object modeling is to graphically show what each object will do in the problem domain. The problem domain describes the structure and the relationships among objects. The Passport Automation system class diagram consists of five classes

1) Login class
2) Appointment class
3) Registration class
4) Authority class
5) Verification class

1) LOGIN CLASS: It consists of two attributes and two operations. The attributes are user name, and password. The operations of this class are creating login ( ), sign in ( ).

2) APPOINMENT CLASS: The attributes of this class are appointmentid, applicantid, date, time, and description. The operation of this class are get appointment ( ), get appointmentstatus ( ), Modify ( ), cancel ( ).

3) REGISTRATION CLASS: The attributes are applicantid, name, dob, gender, birthplace, father name, addr1, addr2, district, state, country, pin code, mobile, emailid, qualification. The operation are add ( ), modify ( ), view ( ).

4) AUTHORITY CLASS: The attributes of this class are officered, name, designation, and password. The operations are search ( ).

5) VERIFICATION CLASS:The attributes of this class are verification id, appointmentid, applicantid, officer id, statusid, description. The operation are verify ( ).

Class Diagram:

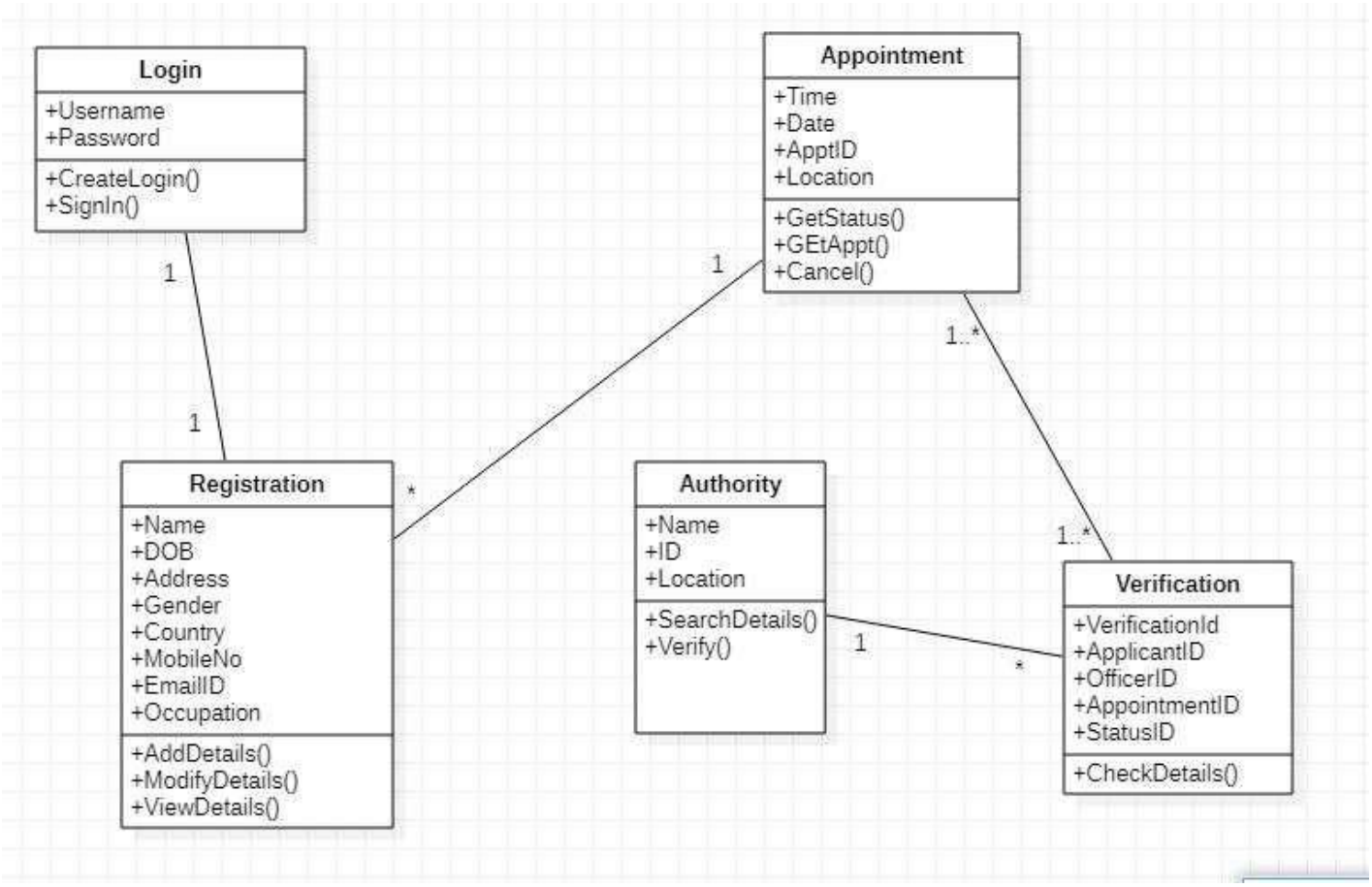

Figure 4.1: Class Diagram for Passport Automation System

Use-Case Diagram:

The administrator check or process the application which are submitted by applicant .Process the application means the data which are given by the applicant is processed to create a passport for the applicant and finally dispatches the passport to the applicant.

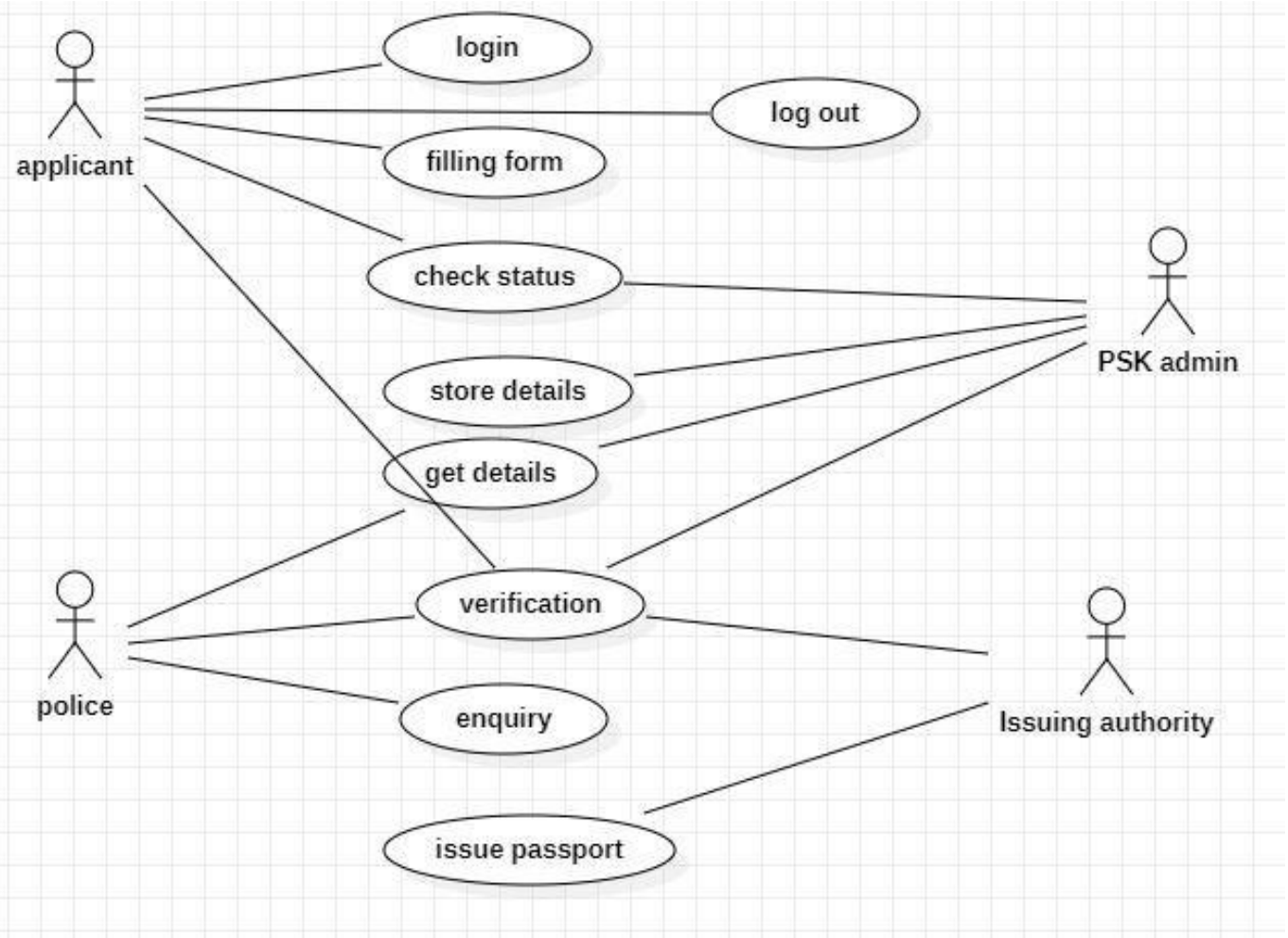

Figure 4.2: Use Case Diagram for Passport Automation System

Sequence Diagram:

- A sequence diagram represents the sequence and interactions of a given use-case or scenario. Sequence diagrams can capture most of the information about the system. Most object to object interactions and operations are considered events and events include signals, inputs, decisions, interrupts, transitions and actions to or from users or external devices.
- An event also is considered to be any action by an object that sends information.
- The event line represents a message sent from one object to another, in which the object performs the operation using a method that the class contains.
- It is also represented by the order in which things occur and how the objects in the system send message to one another. The sequence diagram for each use-case that exists when a user administrator, check status and new registration about passport automation system are given.

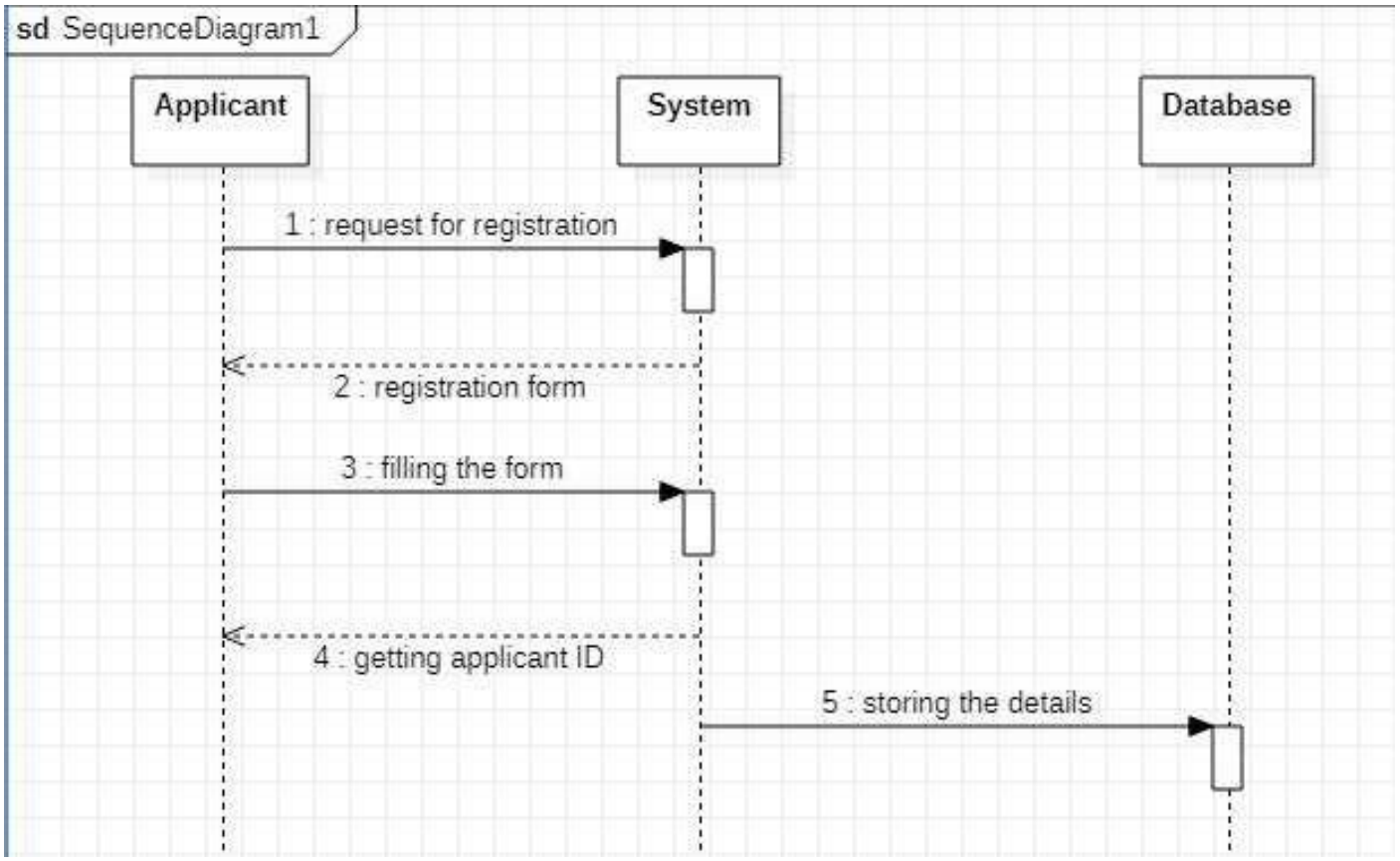

Figure 4.3.1: Sequence Diagram for Passport Automation System

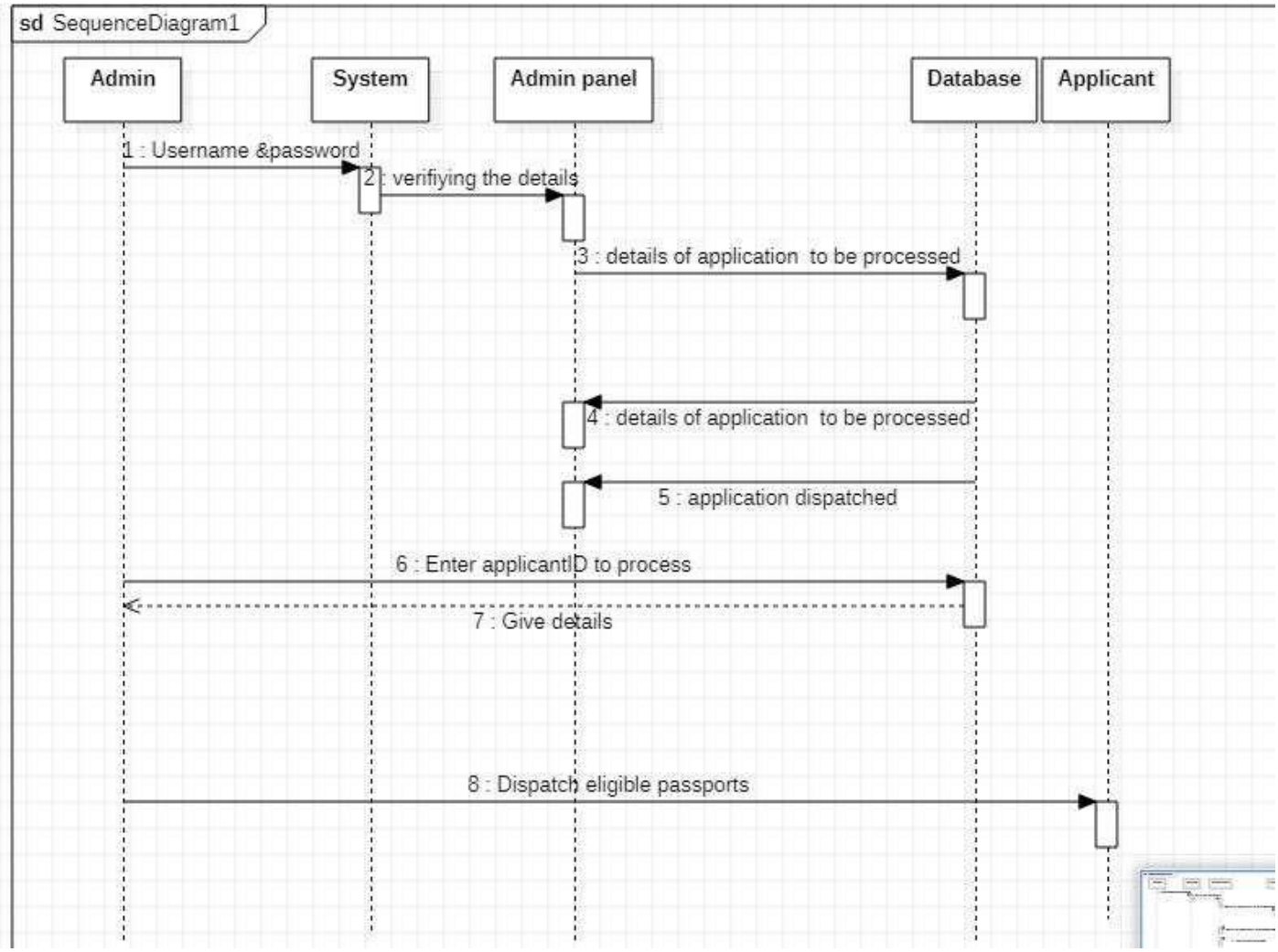

Figure 4.3.2 : Sequence Diagram for Issuing passport in Passport Automation System

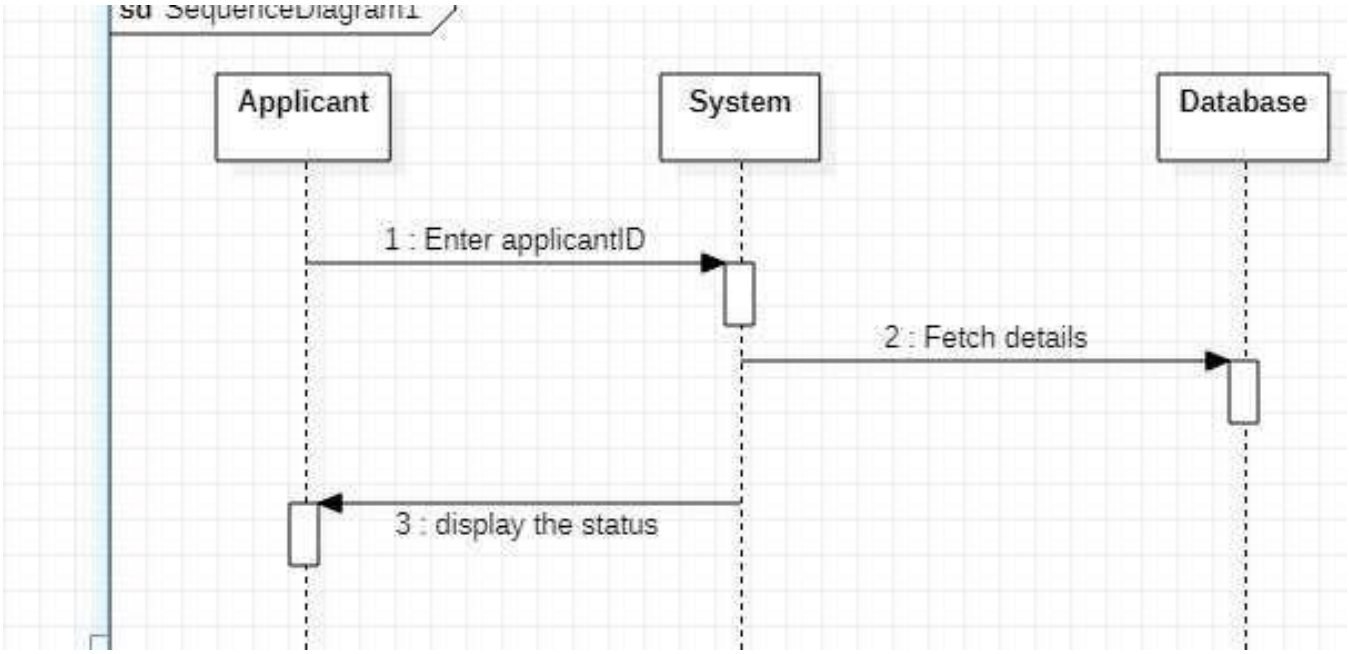

Figure 4.3.3: Sequence Diagram for Checking status in Passport Automation System

Communication Diagram:

The diagrams show the process done by the Passport Authority to the Passport Automation system. The applicant has to enter his details. The details entered are verified by the Passport Authority and the applicant is approved if the details match then the passport is dispatch, otherwise an appropriate error message is displayed.

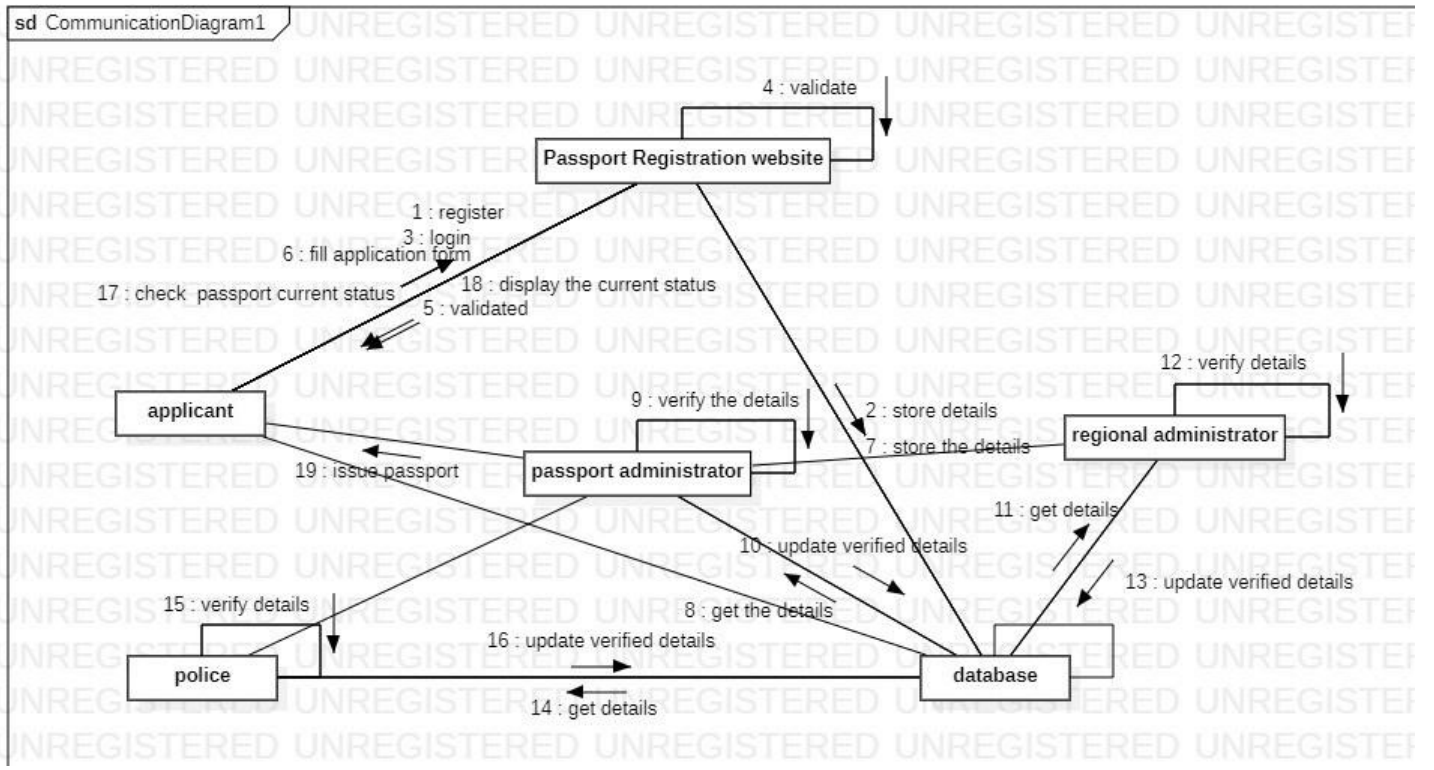

Figure 4.4: Collaboration diagram for Passport Automation System

Component Diagram:

Component diagrams are used to visualize the organization and relationships among components in a system.

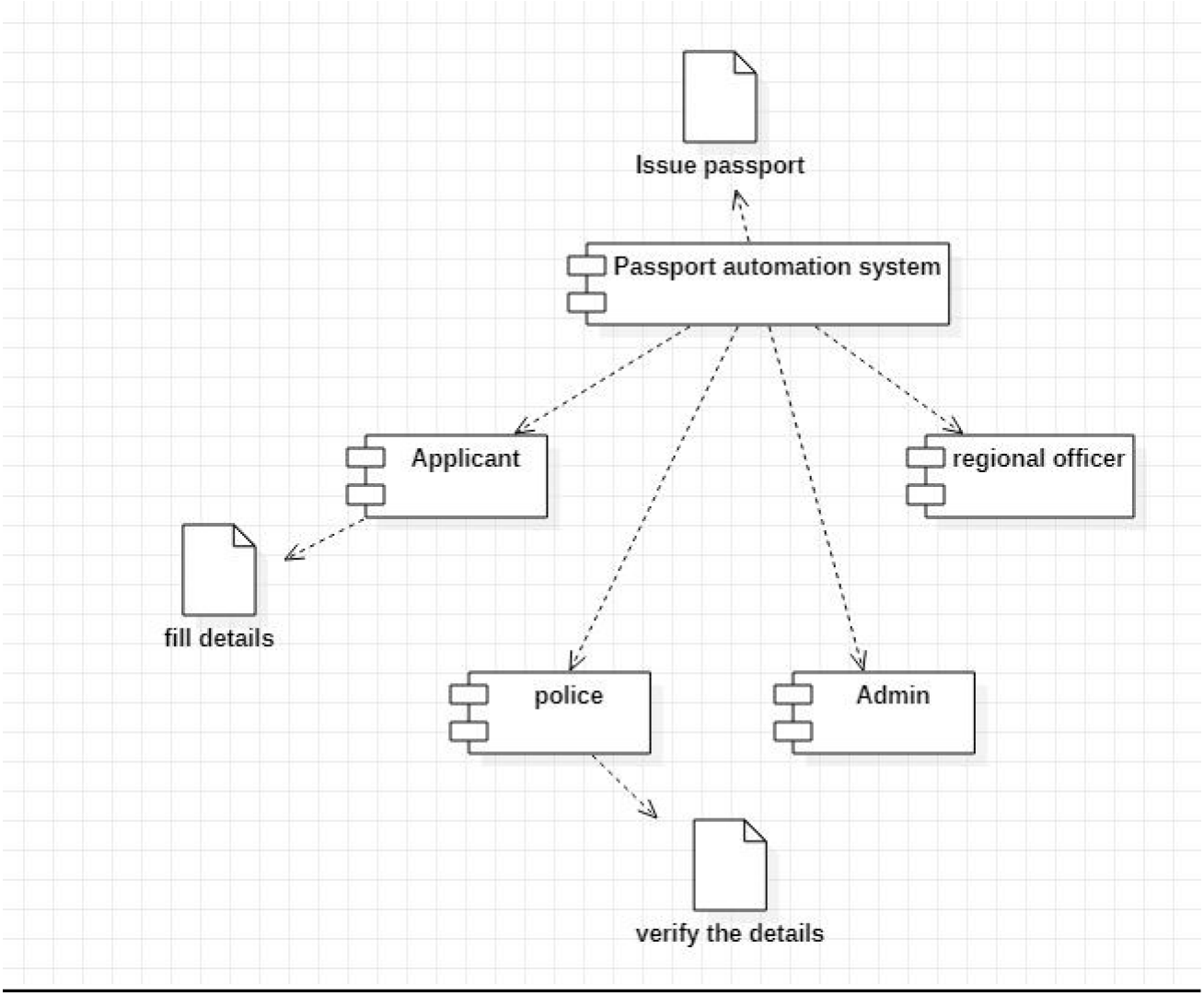

Figure 4.5: Component Diagram for Passport Automation System

Chapter-5

Test Cases:

Login

TS1	Summary	Depen dency	Pre-condition	Post - Condition	Execution steps	Expected output
TC1	Verify that user already registered with the PAS is able to login with correct user ID and password		Employee ID *149405* is a registered user of LIS; user's password is *this_is_passwor d*	User is logged in	1. Type in employee ID as *149405* 2. Type in password *this_is_pass word* 3. Click on the 'Login' button	"Home" page for the user is displayed
TC2	Verify that an unregistered user of PAS is unable to login		Employee ID *149405xx* is not a registered user of PAS	User is not logged in	1. Type in employee ID as *149405xx* 2. Type in password *whatever* 3. Click on the 'Login' button	The "Login" dialog is shown with a *"Login failed! Check your user ID and password"* message
TC3	Verify that user already registered with the PAS is unable to login with incorrect password		Employee ID *149405* is a registered user of pas; user's password is *this_is_passwor d*	User is not logged in	1. Type in employee ID as *149405* 2. Type in password *whatever* 3. Click on the 'Login' button	The "Login" dialog is shown with a *"Login failed! Check your user ID and password"* message
TC4	Verify that a registered user can login after three consecutive failures by correctly		This test case is executed after execution of TC6 before executing any	Email sent containing new password. The email is	*1.* Type in the answer as *my_answer* 2. Click on the 'Email	Login dialog is displayed; an email containing the new password

	answering the security question		other test case. Answer to the security question is *my_answer*.	expected to be received within 2 minute	Password' button	is received
TC5	Verify that a registered user's account is blocked after three consecutive failures and answering the security question incorrectly		Execute the test cases TC3, TC4, and TC5 once again (in order) before executing this test case	User account has been blocked	1. Type in the answer as *not_my_answer* 2. Click on the 'Email Password' button	The message *"Your account has been blocked! Please contact the administrator."* appears

Issuing Passport:

TS1	Summary	Dependency	Pre-condition	Post - Condition	Execution steps	Expected output
TC1	Verify that passport is issued, provided that all details are properly verified.		Verifying the details of the applicant	Issue passport	1.Login 2.Fill the application Details 3.Details verification	Issuing the passport
TC2	Verify that passport is not issued, provided that the applicant has a criminal record.		Verifying the details of the applicant	Passport is not Issued	1.Login 2.Fill the application Details 3.Details verification	Terminate the application
TC3	Verify that passport is not issued, provided that the applicants documents are incomplete.		Verifying the details of the applicant	Passport is not Issued	1.Login 2.Fill the application Details 3.Details verification	Terminate the application
TC4	Verify that passport is not issued, provided that the applicant's		Verifying the details of the applicant	Passport is not Issued	1.Login 2.Fill the application Details 3.Details	Terminate the application
TC5	Verify that passport is not issued, provided that the applicant is not available at the time of verification.		Verifying the details of the applicant	Passport is not Issued	1.Login 2.Fill the application Details 3.Details verification	Terminate the application

Chapter-6

Risk Management:

Introduction:

A risk is a potential problem—it might happen, it might not. But, regardless of the outcome, it's a really good idea to identify it, assess its probability of occurrence, estimate its impact, and establish a contingency plan should the problem actually occur.

Software Risks:

Although there has been considerable debate about the proper definition for software risk, there is general agreement that risk always involves two characteristics:

- **Uncertainty—**the risk may or may not happen; that is, there are no 100 percent probable risks
- **Loss—**if the risk becomes a reality, unwanted consequences or losses will occur.
- **Project risks**: threaten the project plan. That is, if project risks become real, it is likely that the project schedule will slip and that costs will increase. Project risks identify potential budgetary, schedule, personnel (staffing and organization), resource, stakeholder, and requirements problems and their impact on a software project.
- **Technical risks**: threaten the quality and timeliness of the software to be produced. If a technical risk becomes a reality, implementation may become difficult or impossible. Technical risks identify potential design, implementation, interface, verification, and maintenance problems.
- **Business risks:** threaten the viability of the software to be built and often jeopardize the project or the product. Candidates for the top five business risks are (1) building an excellent product or system that no one really wants (market risk), (2) building a product that no longer fits into the overall business strategy for the company (strategic risk), (3) building a product that the sales force doesn't understand how to sell (sales risk), (4) losing the support of senior management due to a change in focus or a change in people (management risk), and (5) losing budgetary or personnel commitment (budget risks). **Known risks:** are those that can be uncovered after careful evaluation of the project plan, the business and technical environment in which the project is being developed, and other reliable information sources (e.g., unrealistic delivery date, lack of documented requirements or software scope, poor development environment).
- **Predictable risks:** are extrapolated from past project experience (e.g., staff turnover, poor communication with the customer, dilution of staff effort as ongoing maintenance requests are serviced).
- **Unpredictable risks:** They can and do occur, but they are extremely difficult to identify in advance.

Risk Projection:

Risk projection, also called risk estimation, attempts to rate each risks in two ways —

(1) The likelihood or probability that the risk is real and

(2) The consequences of the problems associated with the risk, should it occur.

You work along with other managers and technical staff to perform four risk projection steps:

1. Establish a scale that reflects the perceived likelihood of a risk.

2. Delineate the consequences of the risk.

3. Estimate the impact of the risk on the project and the product.

4. Assess the overall accuracy of the risk projection so that there will be no misunderstandings.

6.3.1 Risk Table:

A risk table provides you with a simple technique for risk projection. A sample risk table is illustrated in Figure 6.1. You begin by listing all risks (no matter how remote) in the first column of the table. Each risk is categorized in the second column (e.g., PS implies a project size risk, BU implies a business risk).

Risks	Categor y	Probability	Impact
Size estimate may be significantly low.	PS	60%	2
Larger number of users than planned.	PS	30%	3
Less reuse than planned.	PS	70%	2
End users resist system.	BU	40%	3
Delivery deadline will be tightened.	BU	50%	2
Funding will be lost .	CU	40%	1
Customer will change requirements.	PS	80%	2
Technology will not meet expectations.	TE	30%	1
Lack of training on tools.	DE	80%	3
Staff inexperienced.	ST	30%	2
Staff turnover will be high.	ST	60%	2

The probability of occurrence of each risk is entered in the next column of the table. The probability value for each risk can be estimated by team members individually. One way to accomplish this is to poll individual team members in round-robin fashion until their collective assessment of risk probability begins to converge.

Next, the impact of each risk is assessed. The categories for each of the four risk components—performance, support, cost, and schedule—are averaged to determine an overall impact value. Once the first four columns of the risk table have been completed, the table is sorted by probability and by impact. High-probability, high-impact risks percolate to the top of the table, and low-probability risks drop to the bottom. This accomplishes first-order risk prioritization.

2- BOOK BANK

Chapter-1

Problem Statement:

A Book Bank lends books and magazines to member, who is registered in the system. Also it handles the purchase of new titles for the Book Bank. Popular titles are brought into multiple copies. Old books and magazines are removed when they are out or date or poor in condition. A member can reserve a book or magazine that is not currently available in the book bank, so that when it is returned or purchased by the book bank, that person is notified. The book bank can easily create, replace and delete information about the tiles, members, loans and reservations from the system.As the size and capacity of the institute is increasing with the time, it has been proposed to develop a Book Bank for the benefit of professors, students and employees of the institute. A Book Bank will enable the members to borrow a book (or return it) with ease while sitting at his desk/chamber. The system also enables a member to extend the date of his borrowing if no other booking for that particular book has been made. Any non-member is free to use this system to browse/search books online. However, issuing or returning books is restricted to valid users (members) of the Book Bank only.

Chapter-2

Software Requirement Specification:

Preface:

If the entire process of 'Issue of Books or Magazines' is done in a manual manner then it would take several months for the books or magazines to reach the applicant. Considering the fact that the number of students for Book Bank is increasing every year, an Automated System becomes essential to meet the demand. So this system uses several programming and database techniques to elucidate the work involved in this process. The system has been carefully verified and validated in order to satisfy it.

Introduction:

Book Bank is the interface between the students and Librarian. It aims at improving the efficiency in the Issue of books or magazines and reduces the complexities involved in it to the maximum possible extent.

Scope :

The System provides an online interface to the user where they can fill in their personal details and submit the necessary documents (may be by scanning). The authority concerned with the issue of books can use this system to reduce his workload and process the application in a speedy manner.

Glossary:

- Admin -Refers to the super user who is the Central Authority who has been vested with the privilege to manage the entire system.
- Student -One who wishes to obtain the Books or Magazines.
- HTML -Markup Language used for creating web pages.
- J2EE -Java 2 Enterprise Edition is a programming platform and it is the part of the java platform for developing and running distributed java applications.
- HTTP -Hyper Text Transfer Protocol
- TCP/IP -Transmission Control Protocol/Internet Protocol is the communication protocol used to connect hosts on the Internet.

System Architecture:

- Admin module- This module provides administrator related functionalities. Administrator can view all the borrower's details and can update the borrower's status.
- Borrower module -This module is about users of the Book bank. Borrower must be registered with the system the applicant also gets notified about the dues & status.

System Requirements:

Non Functional Requirements:

- These include performance requirements, security requirements, software quality attributes, database requirements and design constraints such as:
- Performance Requirements:
  - This system should remain accessible 24x7
  - At least 50 users should be able to access the system altogether at any given time
- Security requirements:
  - This system should be accessible only within the institute LAN
  - The database of LIS should not store any password in plain text -- a hashed value has to be stored
- Design constraints:
  - The LIS has to be developed as a web application, which should work with Firefox 5, Internet Explorer 8, Google Chrome 12, Opera 10
  - The system should be developed using HTML 5
- The Students require a computer to submit their information. Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring. The Students has to be careful while submitting the information.

Functional Requirements:

- Secure Registration of information by the Students.
- Admin can generate reports from the information and is the only authorized personnel to add the eligible application information to the database.
- **New user registration:** Any member of the institute who wishes to avail the facilities of the library has to register himself with the Library Information System. On successful registration, a user ID and password would be provided to the member. He has to use this credentials for any future transaction in the Book Bank.
- **Search book:** Any member of Book bank can avail this facility to check whether any particular book is present in the institute's library. A book could be searched by its:
  - Title
  - Authors name
- **User login:** A registered user of book bank can login to the system by providing his employee ID and password as set by him while registering. After successful login, "Home" page for the user is shown from where he can access the different functionalities of book

bank: search book, issue book, return book, reissue book. Any employee ID not registered with book bank cannot access the "Home" page -- a login failure message would be shown to him, and the login dialog would appear again. This same thing happens when any registered user types in his password wrong. However, if incorrect password has been provided for three time consecutively, the security question for the user (specified while registering) with an input box to answer it are also shown. If the user can answer the security question correctly, a new password would be sent to his email address. In case the user fails to answer the security question correctly, his book bank account would be blocked. He needs to contact with the administrator to make it active again.

- **Issue book:** Any member of book bank can issue a book against his account provided that:
    - The book is available in the library i.e. could be found by searching for it in book bank
    - No other member has currently issued the book
    - Current user has not issued the maximum number of books that can
- If the above conditions are met, the book is issued to the member. Note that this functional requirement would remain incomplete if the "maximum number of books that can be issued to a member" is not defined. We assume that this number has been set to four for students and research scholars, and to ten for professors. Once a book has been successfully issued, the user account is updated to reflect the same.
- **Return book:** A book is issued for a finite time, which we assume to be a period of 20 days. That is, a book once issued should be returned within the next 20 days by the corresponding member of book bank. After successful return of a book, the user account is updated to reflect the same.
- **Reissue book:** Any member who has issued a book might find that his requirement is not over by 20 days. In that case, he might choose to reissue the book, and get the permission to keep it for another 20 days. However, a member can reissue any book at most twice, after which he has to return it. Once a book has been successfully reissued, the user account is updated to reflect the information.
- In a similar way we can Book Bank other functionality offered by the system as well. However, certain features might not be evident directly from the problem system, but which, nevertheless, are required. One such functionality is "User Verification". The book bank should be able to judge between a registered and non-registered member. Most of the functionality would be available to a registered member. The "New User Registration"

would, however, be available to non-members. Moreover, an already registered user shouldn't be allowed to register himself once again.

System Models:

Refer chapter 4 for system modelling.

Index:

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6)	Communication Diagram
7)	Component Diagram

Chapter-3

Study of Design Phase Case Tool:

StarUML

StarUML is an open source software modeling tool. It provides eleven types of diagram. StartUML 2 is compatible with UML 2.x versions. It provides a platform to carry out your modelling. It was an open source tool, but now it is acquired by a company and being upgraded. So you need to purchase. It supports both forward engineering and reverse engineering. It supports different languages such as Java, C++, C#.

Features:

- Allows you to create Obje3ct, Use case, Deployment, Seque3nce, Communication, Activity, and profile Diagram.
- Allows you to discover and install third-party extensions.
- Work with same UX in multiple platforms including macOS, Windows, and Linux.
- No limit for using this commercial software for evaluation.

Download link :http://staruml.io/

Installation of StarUML:

You can easily make setup in windows platform. Just search in Google with keywords star UML, you will find the first link taking you to the website for StarUML 4.0. Then download and do setup.

Chapter-4

System Design:

Class Diagram:

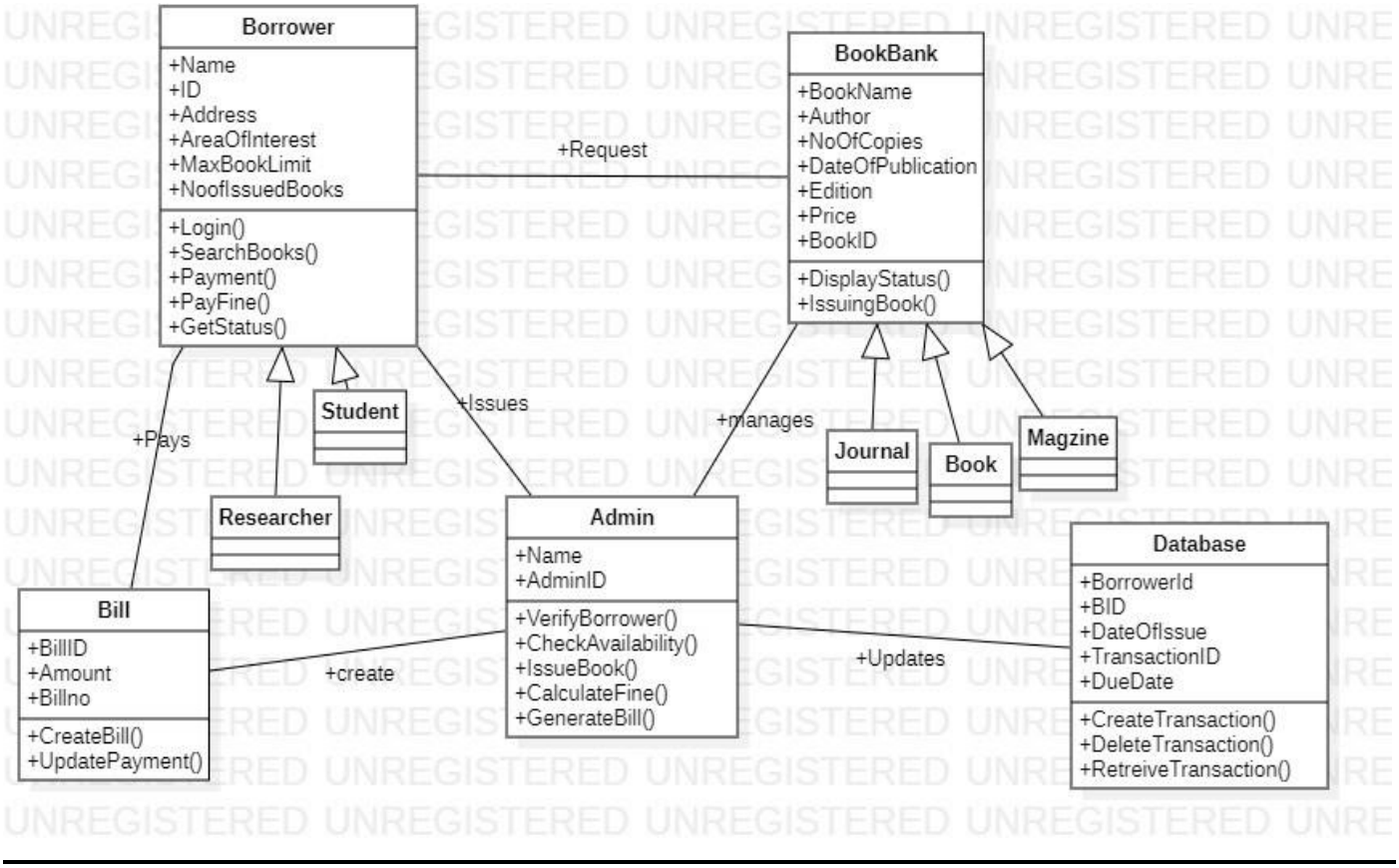


Figure 4.1: Class Diagram for Book Bank

Use-Case Diagram:

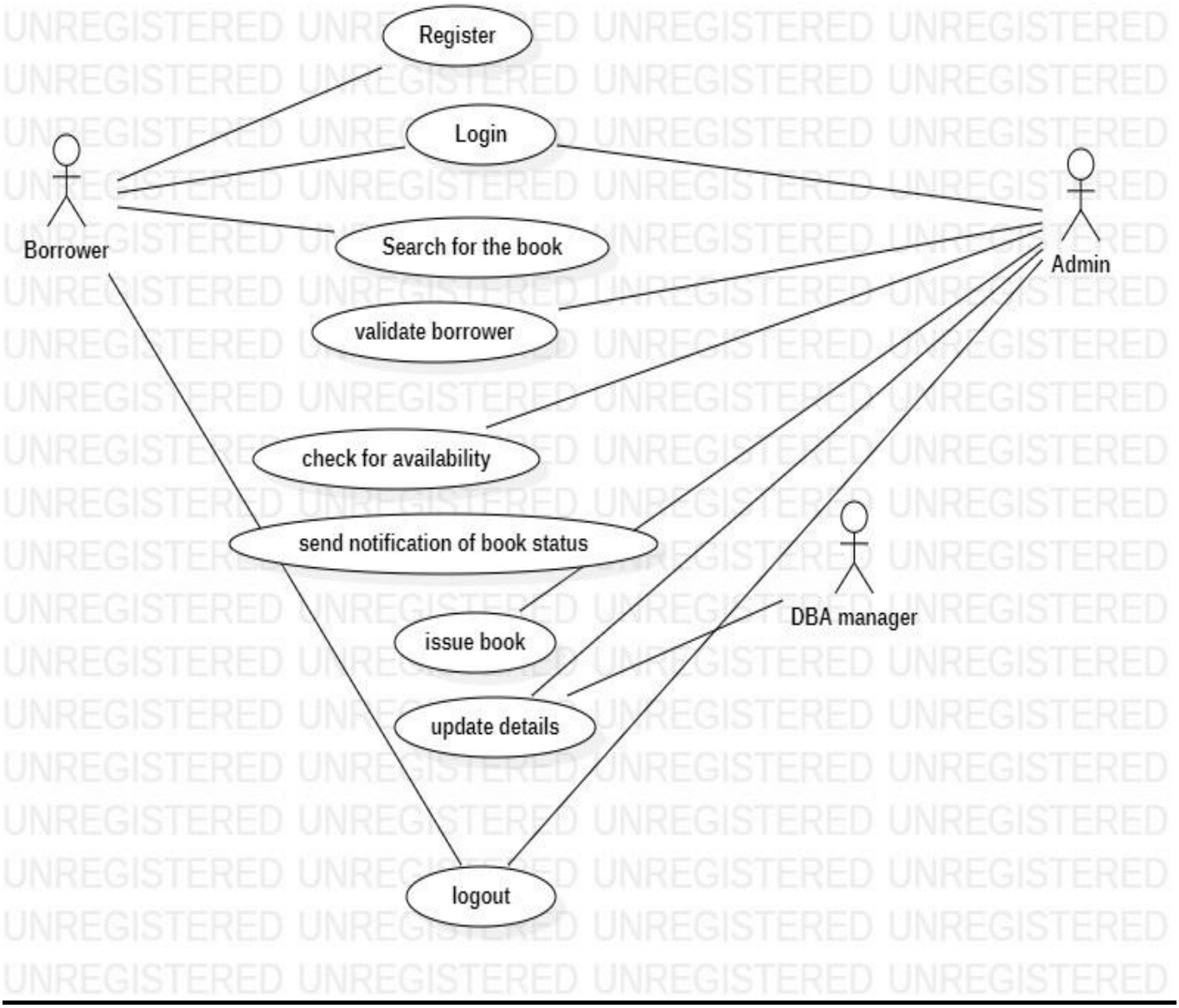
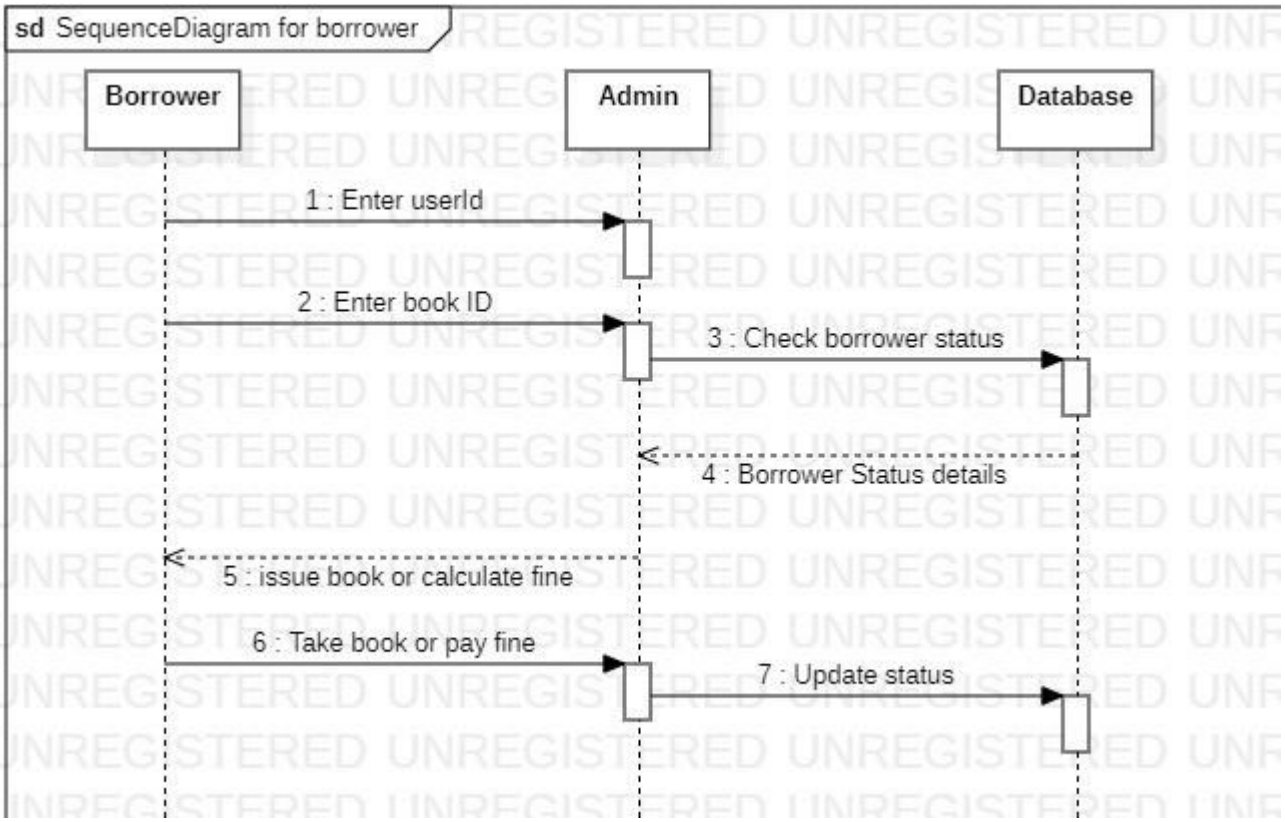
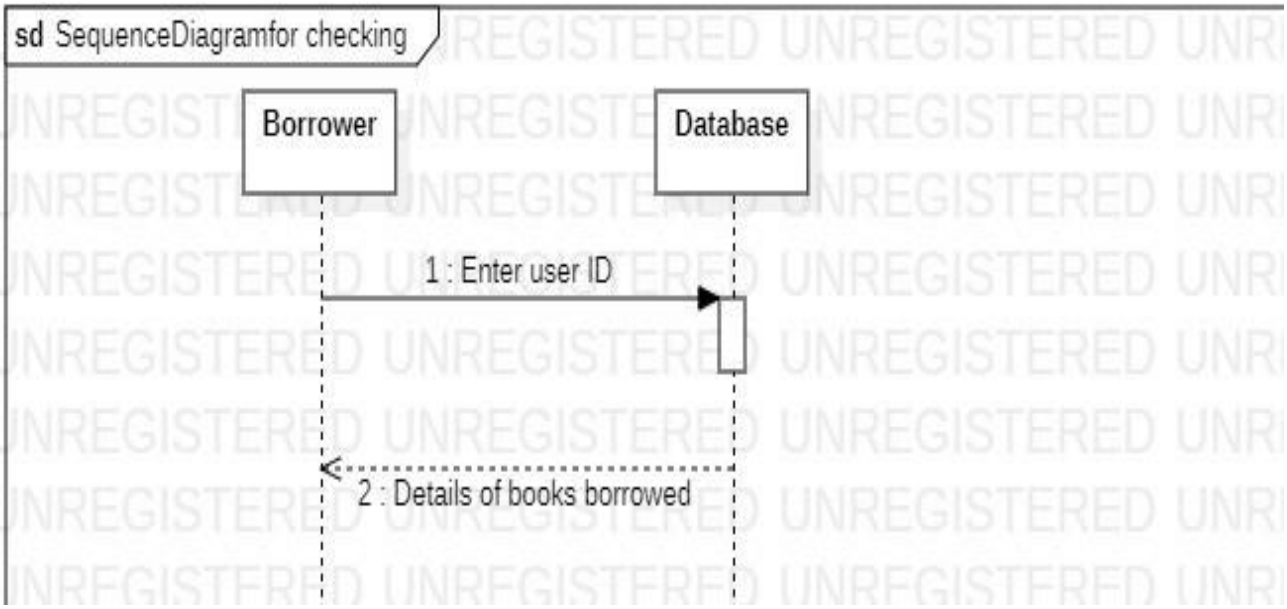


Figure 4.2: Use Case Diagram for Book Bank

Sequence Diagram:





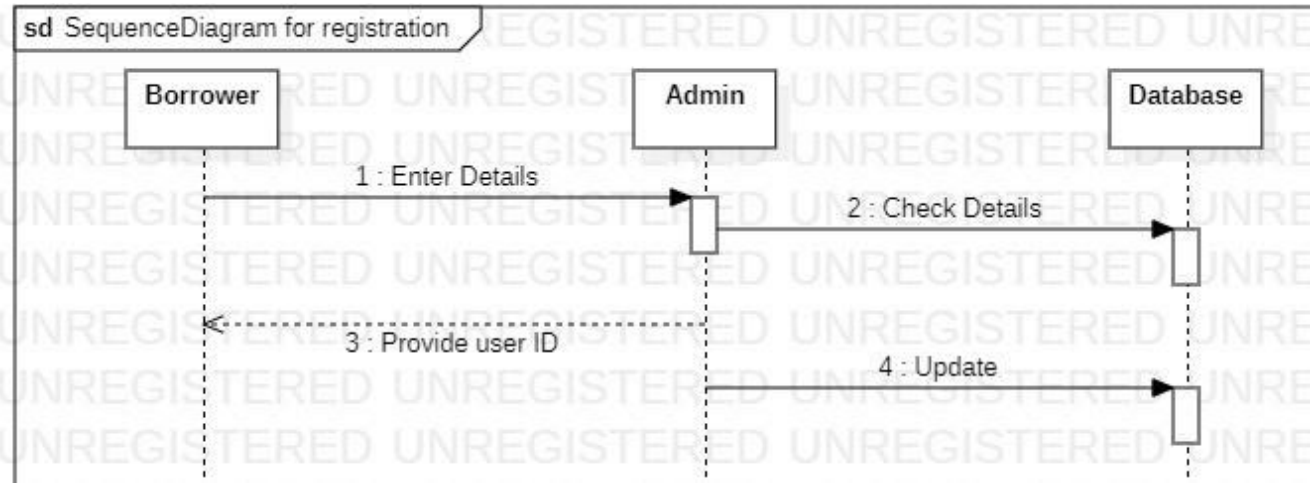
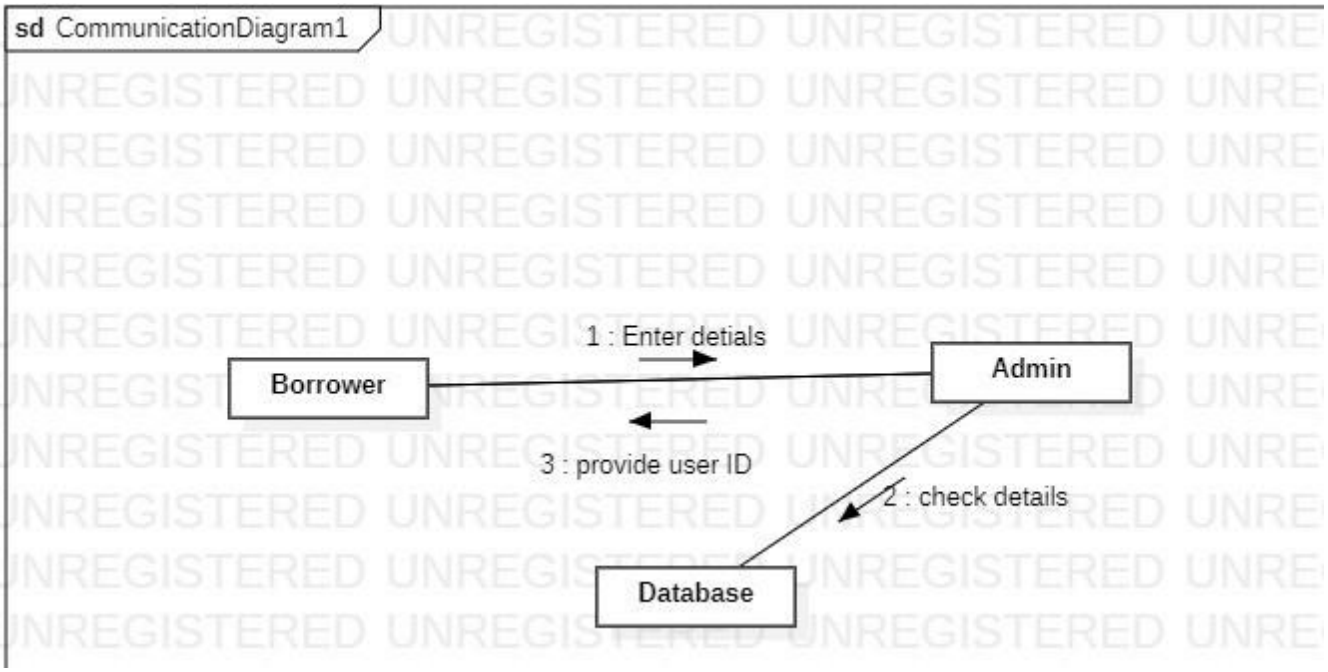
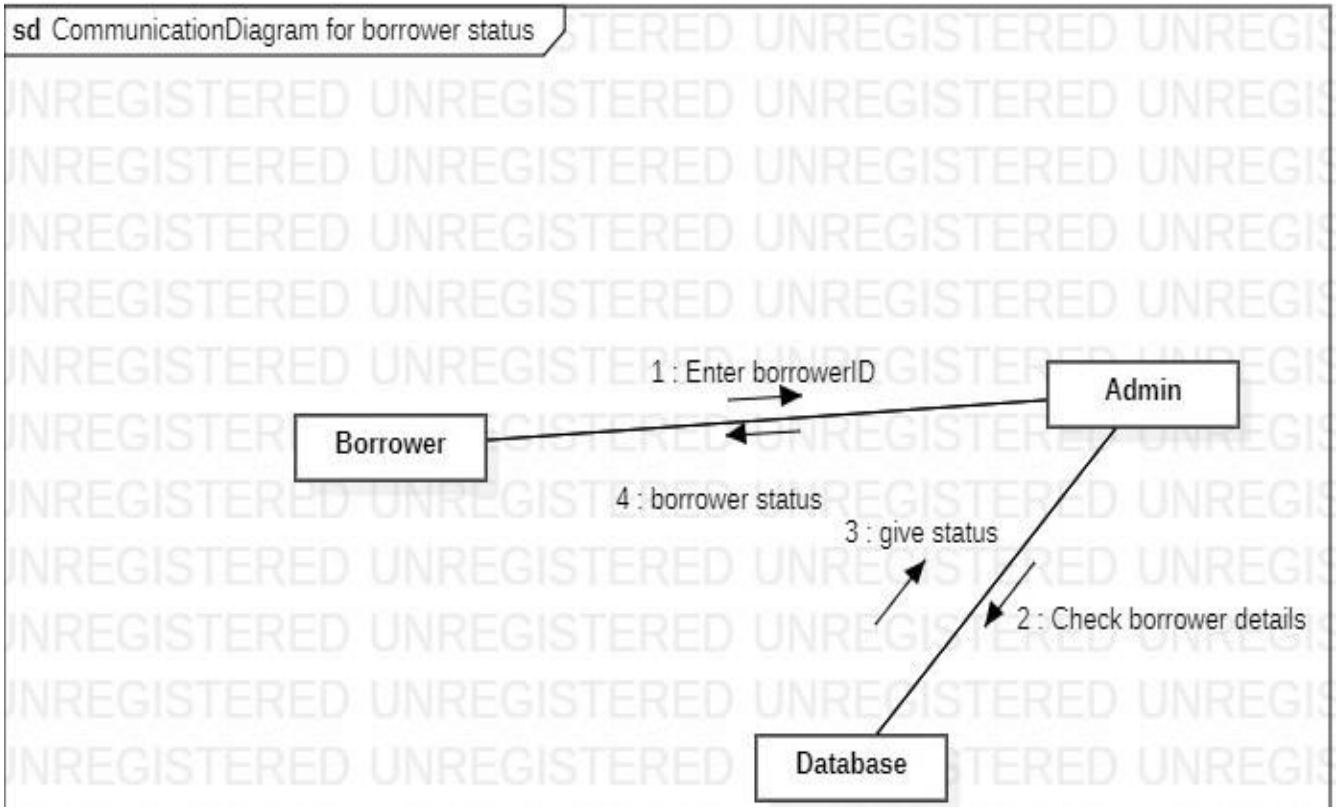


Figure 4.3: Sequence Diagram for Book Bank

Communication Diagram:





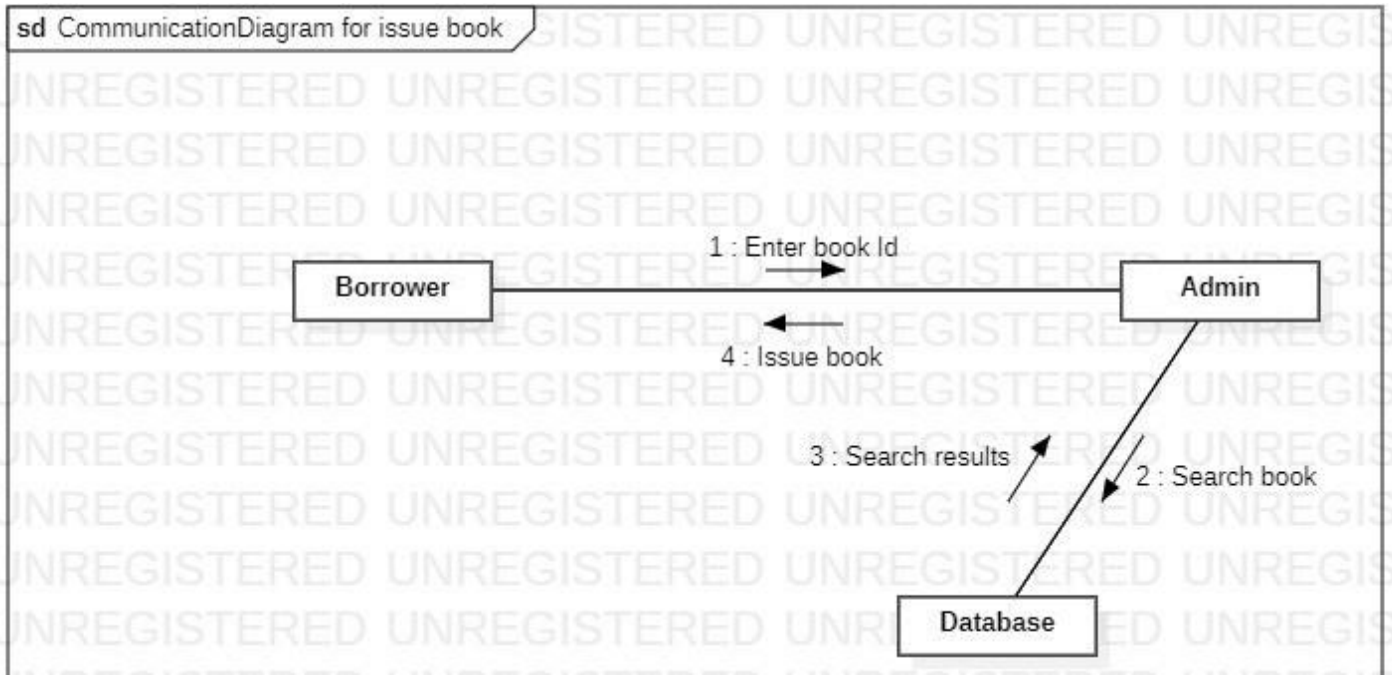


Figure 4.4: Communication Diagram for Book Bank

Component Diagram:

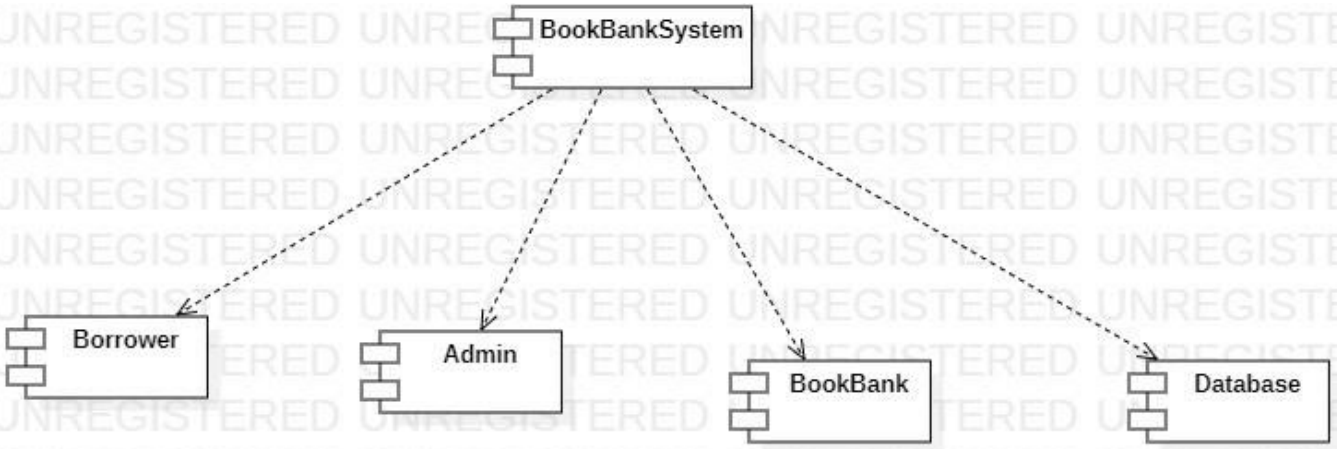


Figure 4.5: Component Diagram for Book Bank

Chapter-5

Test Cases:

Login:

TS1	Summary	Depen dency	Pre-condition	Post - Condition	Execution steps	Expected output
TC1	Verify that user already registered with the book bank is able to login with correct user ID and password		Employee ID *149405* is a registered user of book bank; user's password is *this_is_password*	User is logged in	4. Type in employee ID as *149405* 5. Type in password *this_is_password* 6. Click on the 'Login' button	"Home" page for the user is displayed
TC2	Verify that an unregistered user of book bank is unable to login		Employee ID *149405xx* is not a registered user of book bank	User is not logged in	4. Type in employee ID as *149405xx* 5. Type in password *whatever* 6. Click on the 'Login' button	The "Login" dialog is shown with a *"Login failed! Check your user ID and password"* message
TC3	Verify that user already registered with the book bank is unable to login with incorrect password		Employee ID *149405* is a registered user of book bank; user's password is *this_is_password*	User is not logged in	4. Type in employee ID as *149405* 5. Type in password *whatever* 6. Click on the 'Login' button	The "Login" dialog is shown with a *"Login failed! Check your user ID and password"* message

TC4	Verify that a registered user can login after three consecutive failures by correctly answering the security question	TC5	This test case is executed after execution of TC6 before executing any other test case. Answer to the security question is *my_answer*.	Email sent containing new password. The email is expected to be received within 2 minute	3. Type in the answer as *my_answer* 4. Click on the 'Email Password' button	Login dialog is displayed; an email containing the new password is received
TC5	Verify that a registered user's account is blocked after three consecutive failures and answering the security question incorrectly		Execute the test cases TC3, TC4, and TC5 once again (in order) before executing this test case	User account has been blocked	3. Type in the answer as *not_my_answer* 4. Click on the 'Email Password' button	The message *"Your account has been blocked! Please contact the administrator. "* appears

Issue book:

TS1	Summary	Dependency	Pre-condition	Post - Condition	Execution steps	Expected output
TC 1	Verify that the borrower is issued a book, without any dues.		Checking the borrower status ,i.e; no. of books borrowed.	Issued the book	1. Enter the book Id. 2. Check status 3. Issue the book.	Book is Issued
TC 2	Verify that the borrower is not issued a book, with dues.		Checking the borrower status ,i.e; no. of books borrowed.	Book is not Issued	1. Enter the book Id. 2. Check status 3. Notify the amount to be paid	Fine to be paid is notified
TC 3	Verify that the book is not issued to the borrower, if the requested book is not available in the stock at the moment.		Checking the borrower status ,i.e; no. of books borrowed and the availability of the book.	Book is not Issued	1. Enter the book Id. 2. Check status 3. Notify the if the book is being to be issued or not.	Book is not Issued
TC 4	Verify that the book is not issued to the borrower, if the borrower has exceeded his limit ,but without any dues to be cleared.		Checking the borrower status ,i.e; no. of books borrowed and the availability of the book.	Book is not Issued	1. Enter the book Id. 2. Check status 3. Notify the if the book is being to be issued or not.	Book is not Issued
TC 5	Verify that the book is not issued to the borrower, if the requested book does not exist in the book bank.		Checking the borrower status ,i.e; no. of books borrowed and the availability of the book.	Book is not Issued	1. Enter the book Id. 2. Check status 3. Notify the if the book is being to be issued or not.	Book is not Issued

Chapter-6

Risk Management:

Introduction:

A risk is a potential problem—it might happen, it might not. But, regardless of the outcome, it's a really good idea to identify it, assess its probability of occurrence, estimate its impact, and establish a contingency plan should the problem actually occur.

Software Risks:

Although there has been considerable debate about the proper definition for software risk, there is general agreement that risk always involves two characteristics:

- **Uncertainty—**the risk may or may not happen; that is, there are no 100 percent probable risks
- **Loss—**if the risk becomes a reality, unwanted consequences or losses will occur.
- **Project risks**: threaten the project plan. That is, if project risks become real, it is likely that the project schedule will slip and that costs will increase. Project risks identify potential budgetary, schedule, personnel (staffing and organization), resource, stakeholder, and requirements problems and their impact on a software project.
- **Technical risks**: threaten the quality and timeliness of the software to be produced. If a technical risk becomes a reality, implementation may become difficult or impossible. Technical risks identify potential design, implementation, interface, verification, and maintenance problems.
- **Business risks:** threaten the viability of the software to be built and often jeopardize the project or the product. Candidates for the top five business risks are (1) building an excellent product or system that no one really wants (market risk), (2) building a product that no longer fits into the overall business strategy for the company (strategic risk), (3) building a product that the sales force doesn't understand how to sell (sales risk), (4) losing the support of senior management due to a change in focus or a change in people (management risk), and (5) losing budgetary or personnel commitment (budget risks). **Known risks:** are those that can be uncovered after careful evaluation of the project plan, the business and technical environment in which the project is being developed, and other reliable information sources (e.g., unrealistic delivery date, lack of documented requirements or software scope, poor development environment).
- **Predictable risks:** are extrapolated from past project experience (e.g., staff turnover, poor communication with the customer, dilution of staff effort as ongoing maintenance requests are serviced).
- **Unpredictable risks:** They can and do occur, but they are extremely difficult to identify in advance.

Risk Projection:

Risk projection, also called risk estimation, attempts to rate each risks in two ways —

(1) The likelihood or probability that the risk is real and

(2) The consequences of the problems associated with the risk, should it occur.

You work along with other managers and technical staff to perform four risk projection steps:

1. Establish a scale that reflects the perceived likelihood of a risk.

2. Delineate the consequences of the risk.

3. Estimate the impact of the risk on the project and the product.

4. Assess the overall accuracy of the risk projection so that there will be no misunderstandings.

6.3.1 Risk Table:

A risk table provides you with a simple technique for risk projection. A sample risk table is illustrated in Figure 6.1. You begin by listing all risks (no matter how remote) in the first column of the table. Each risk is categorized in the second column (e.g., PS implies a project size risk, BU implies a business risk).

Risks	Categor y	Probabil ity	Impact
Size estimate may be significantly low.	PS	60%	2
Larger number of users than planned.	PS	30%	3
Less reuse than planned.	PS	70%	2
End users resist system.	BU	40%	3
Delivery deadline will be tightened.	BU	50%	2
Funding will be lost .	CU	40%	1
Customer will change requirements.	PS	80%	2
Technology will not meet expectations.	TE	30%	1
Lack of training on tools.	DE	80%	3
Staff inexperienced.	ST	30%	2
Staff turnover will be high.	ST	60%	2

The probability of occurrence of each risk is entered in the next column of the table. The probability value for each risk can be estimated by team members individually. One way to accomplish this is to poll individual team members in round-robin fashion until their collective assessment of risk probability begins to converge.

Next, the impact of each risk is assessed. The categories for each of the four risk components—performance, support, cost, and schedule—are averaged to determine an overall impact value. Once the first four columns of the risk table have been completed, the table is sorted by probability and by impact. High-probability, high-impact risks percolate to the top of the table, and low-probability risks drop to the bottom. This accomplishes first-order risk prioritization.

3-ONLINE RESERVATION SYSTEM

Chapter-1

Problem Statement:

The system is built to be used by students and managed by an administrator. The student and employee have to login to the system before any processing can be done. The student can see the courses available to him/her and register to the course he/she wants. The administrator can maintain the course details and view all the students who have registered to any course.

Chapter-2

Functional Requirements:

- The Students should be able to register and login and fill their details.
- Students should be able to search for the course required and the desired college.
- List of courses should be displayed.
- The system should also verify the eligibility of the candidate for the course selected.
- The system should check for the availability of seats of the selected course in the opted college.
- If both availability and eligibility criteria are met, then seat is allocated to the student, if not then , alternatives are searched for and then seat is allocated to the student.
- The system should also accept the payment done by the student online. Also the fee receipt should be generated after the payment.
- Security should be provided for the student details.
- Admin should be able to communicate with the student.

Non- Functional Requirements:

- The applicants require a computer to submit their information.
- Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring.
- The user has to be careful while submitting the information. Much care is required.
- The Students and Exam Controller must have basic knowledge of computers and English Language.
- The student may be required to scan the documents and send.

Chapter-3

System Design:

Use-Case Diagram:

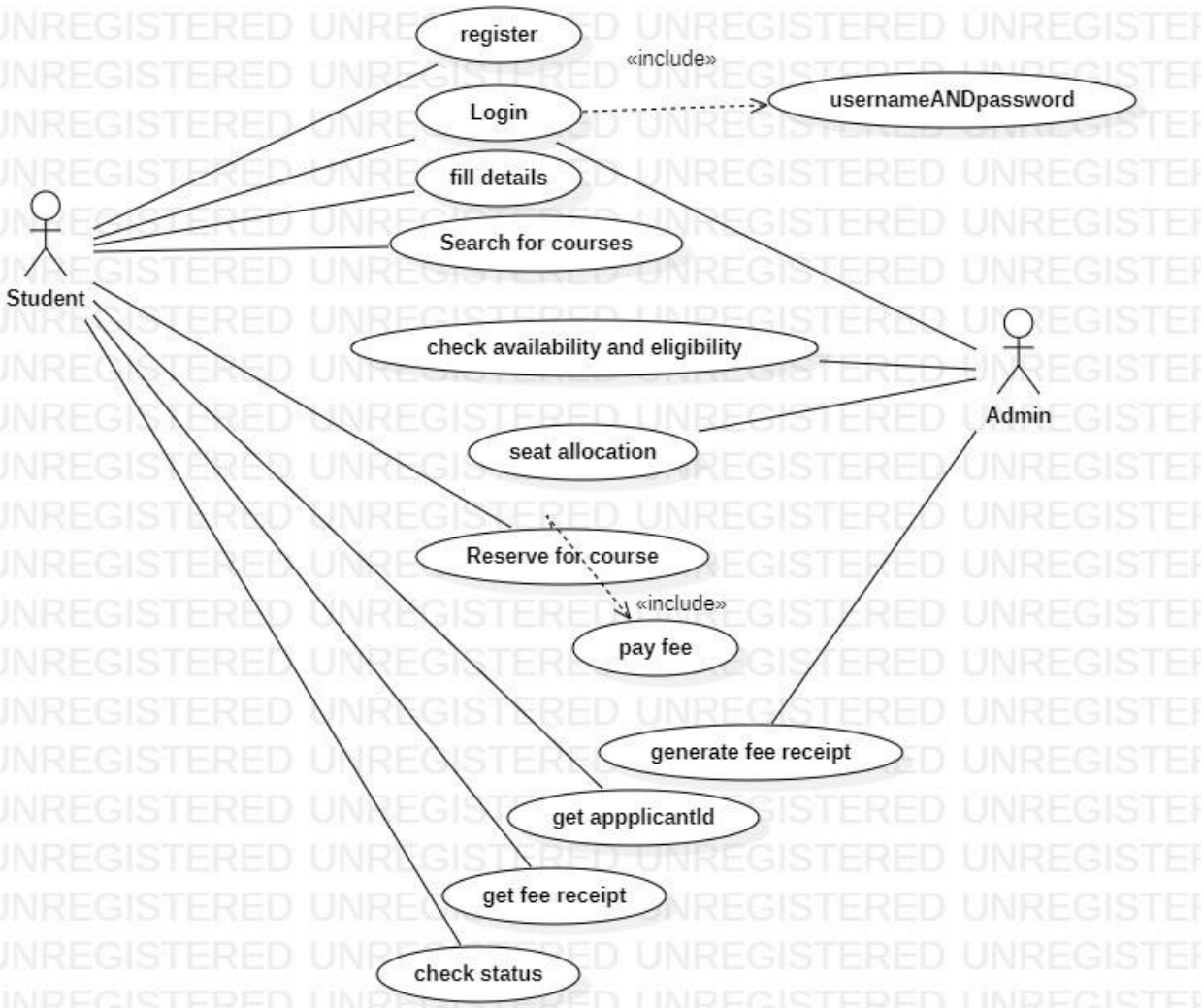


Figure 3.1: Use Case Diagram for Online Reservation System

Class Diagram:

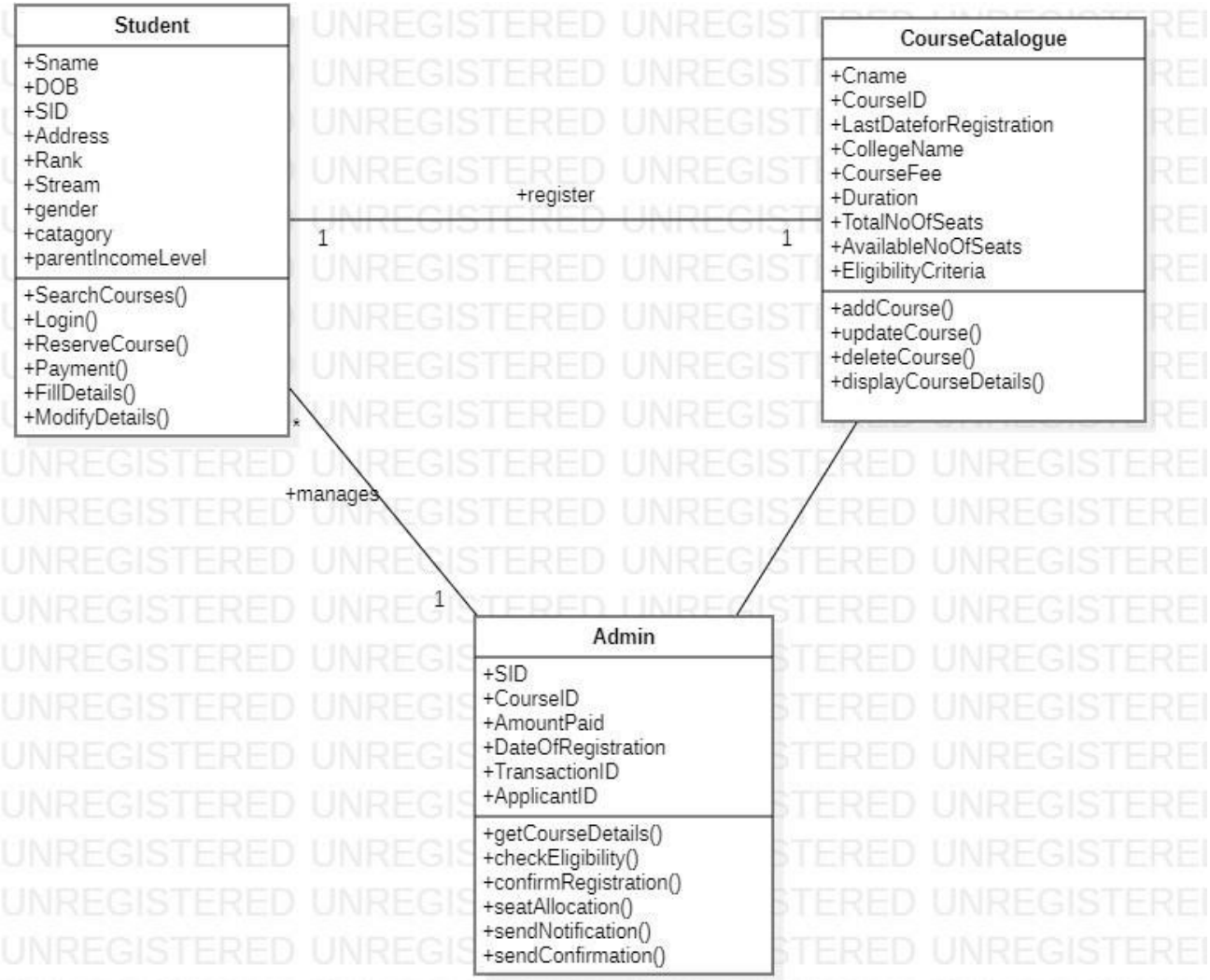


Figure 3.2: Class Diagram for Online Reservation System

Sequence Diagram:

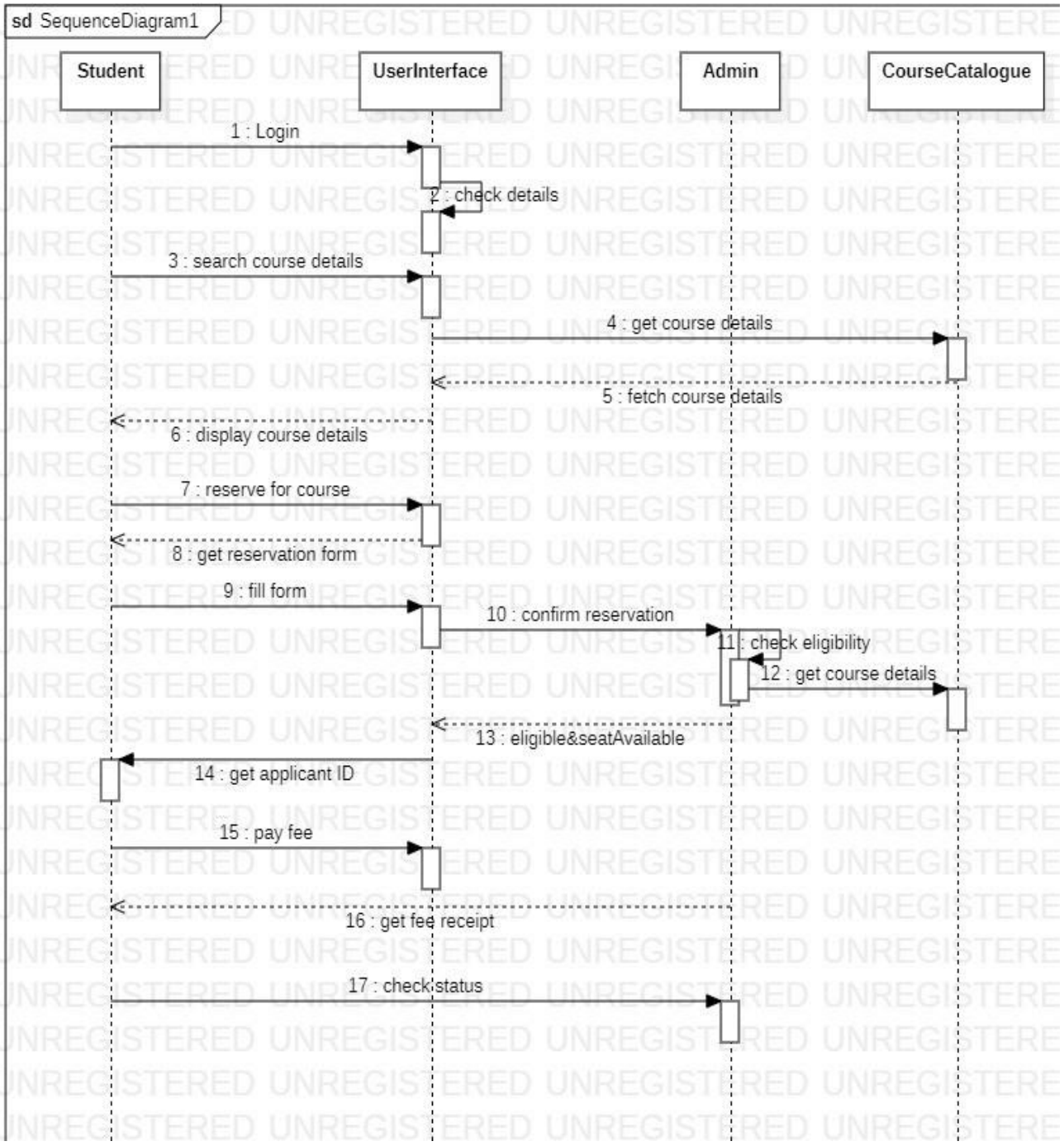


Figure 3.3: Sequence Diagram for Online Reservation System

Communication Diagram:

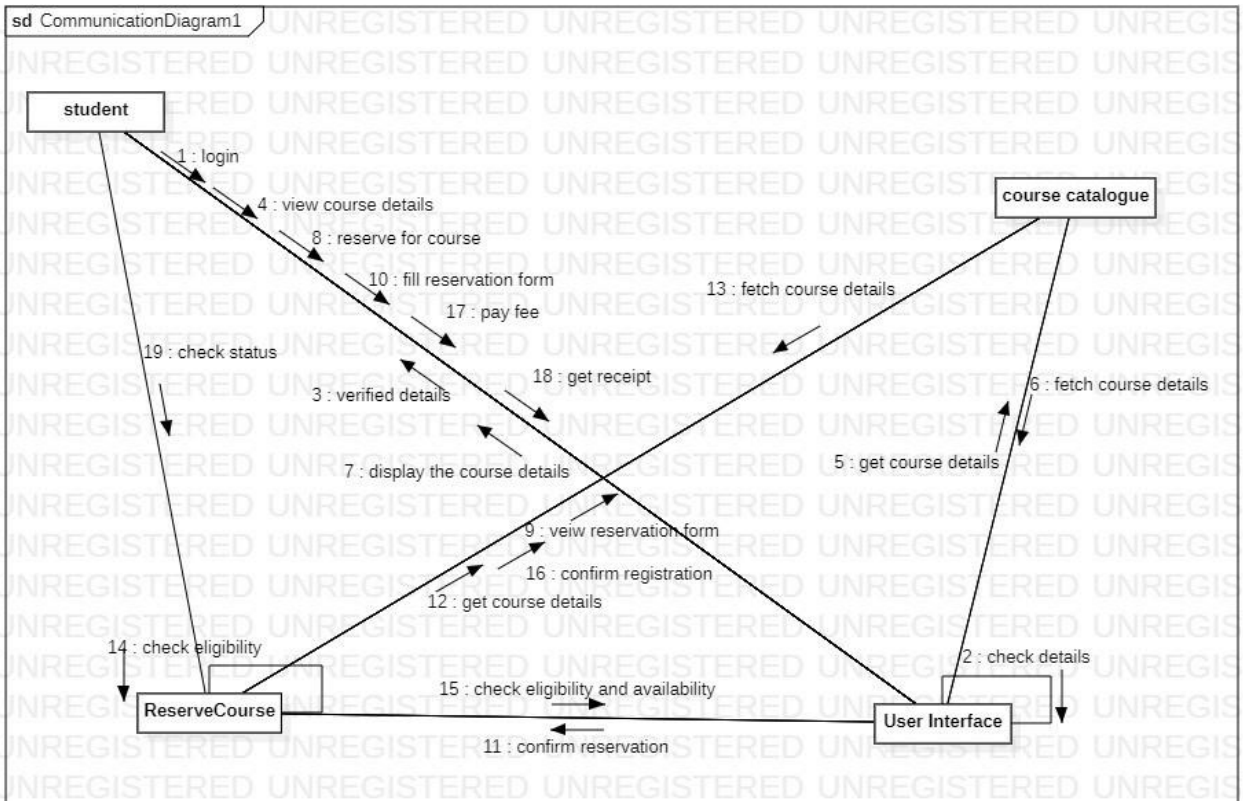


Figure 3.4: Communication Diagram for Online Reservation System

Component Diagram:

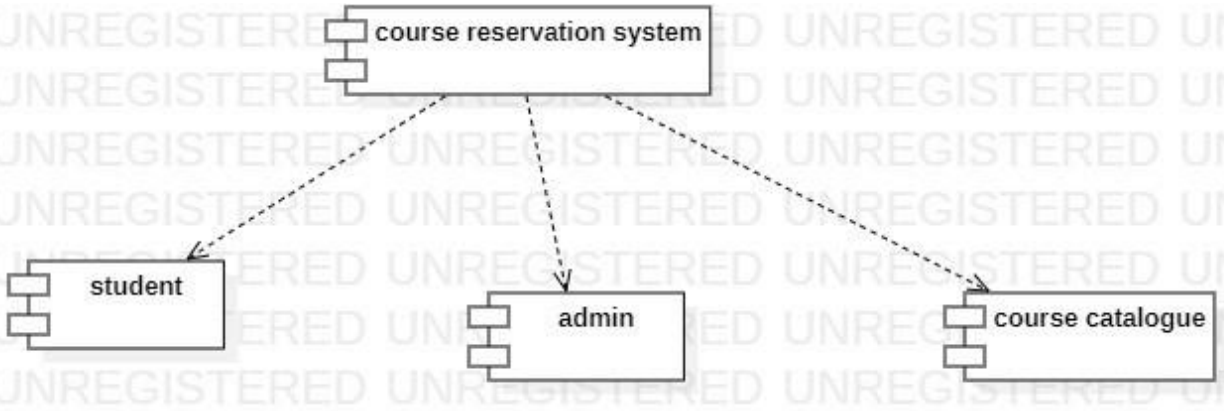


Figure 3.5: Component Diagram for Online Reservation System

4-RECRUITMENT SYSTEM

Chapter-1

Problem Statement:

The recruitment system allows the job seekers to view the job opportunity through Advertisement and helps to apply for the job. The organization shortlist the applicants for the interview. The shortlisted applicants undergo through a process of Test and Interview. The HR department selects the Applicant based on the performance in the Test and Interview. Finally the recruited applicants are informed. This system makes the task of the job seeker easier rather than waiting in queue for enrolment. This also reduces the time consumption for both for the job seeker and organization.

Chapter-2

Functional Requirements:

- The applicant views the jobs through the advertisement posted by the Organisation.
- The system should also allow the applicants to apply for the job.
- Short listing has to be done based on certain criteria.
- Shortlisted candidates are to be informed.
- Test and interview are conducted for the shortlisted candidates.
- Selected or recruited candidates are informed.
- HR manager can generate reports from the information and he or she is the only authorised personnel to add the eligible application information to the database.

Non- Functional Requirements:

- The applicants require a computer to submit their information.
- Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring.
- The user has to be careful while submitting the information. Much care is required.
- The Students and Exam Controller must have basic knowledge of computers and English Language.
- The student may be required to scan the documents and send.

Chapter-3

System Design:

Use-Case Diagram:

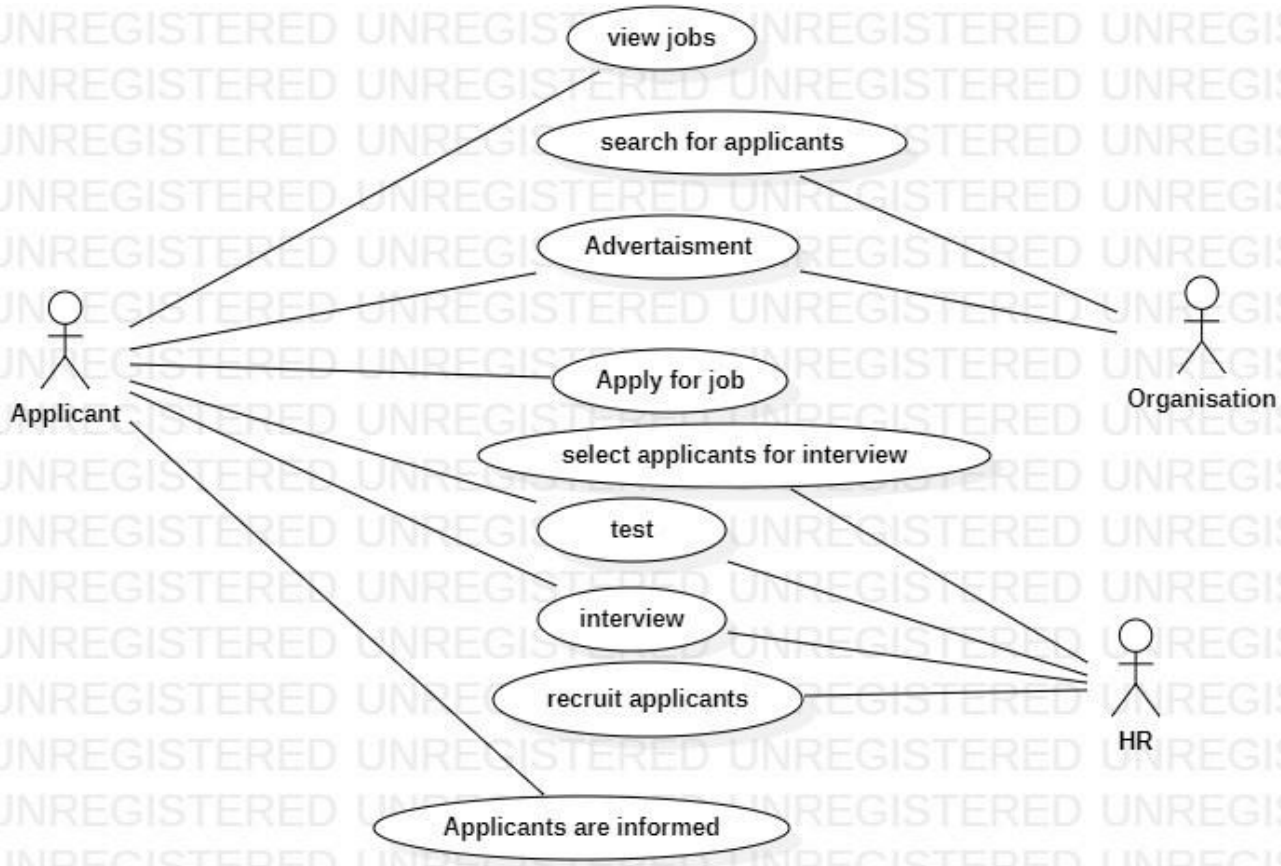


Figure 3.1: Use Case Diagram for Recruitment System

Class Diagram:

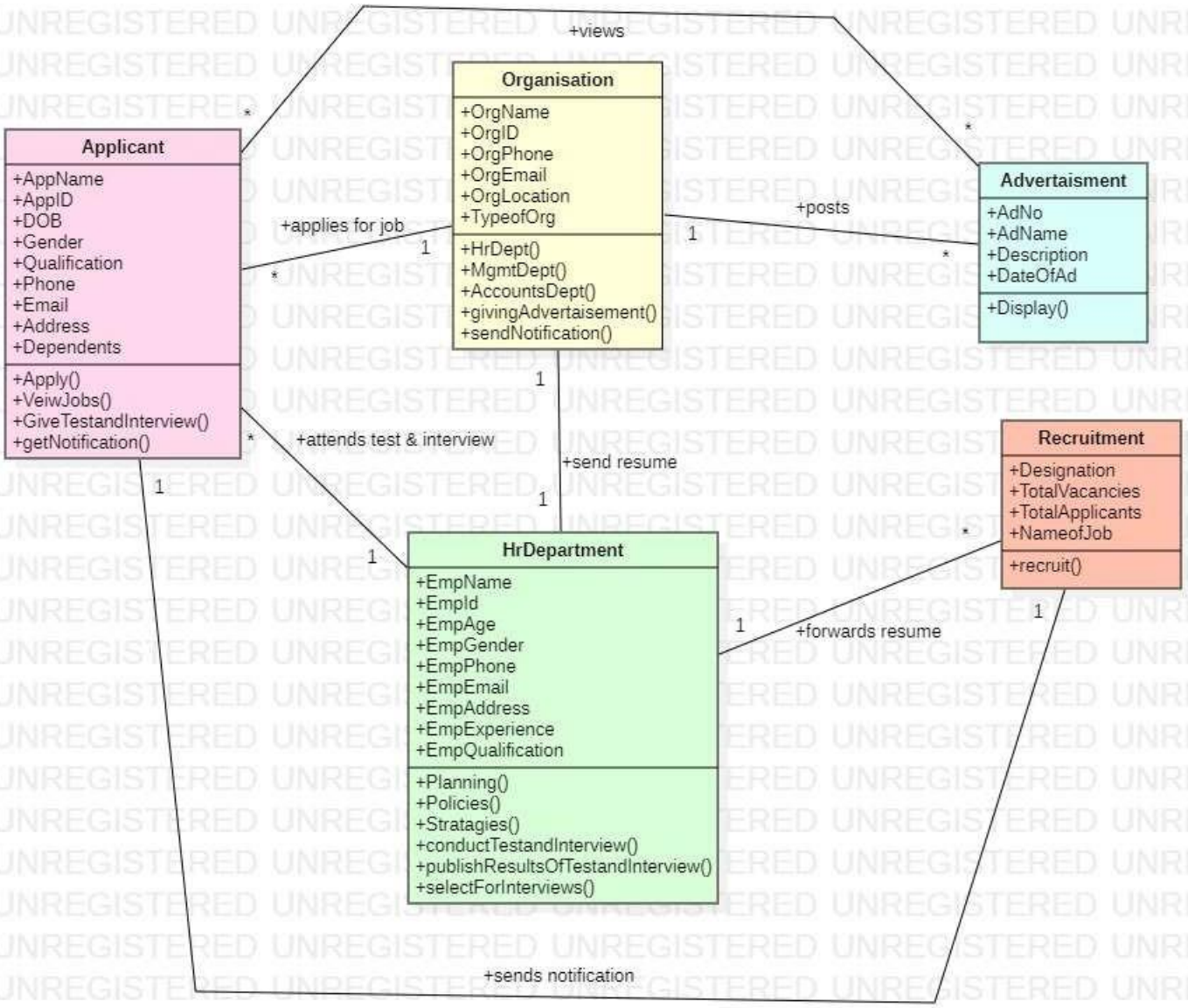


Figure 3.2: Class Diagram for Recruitment System

Sequence Diagram:

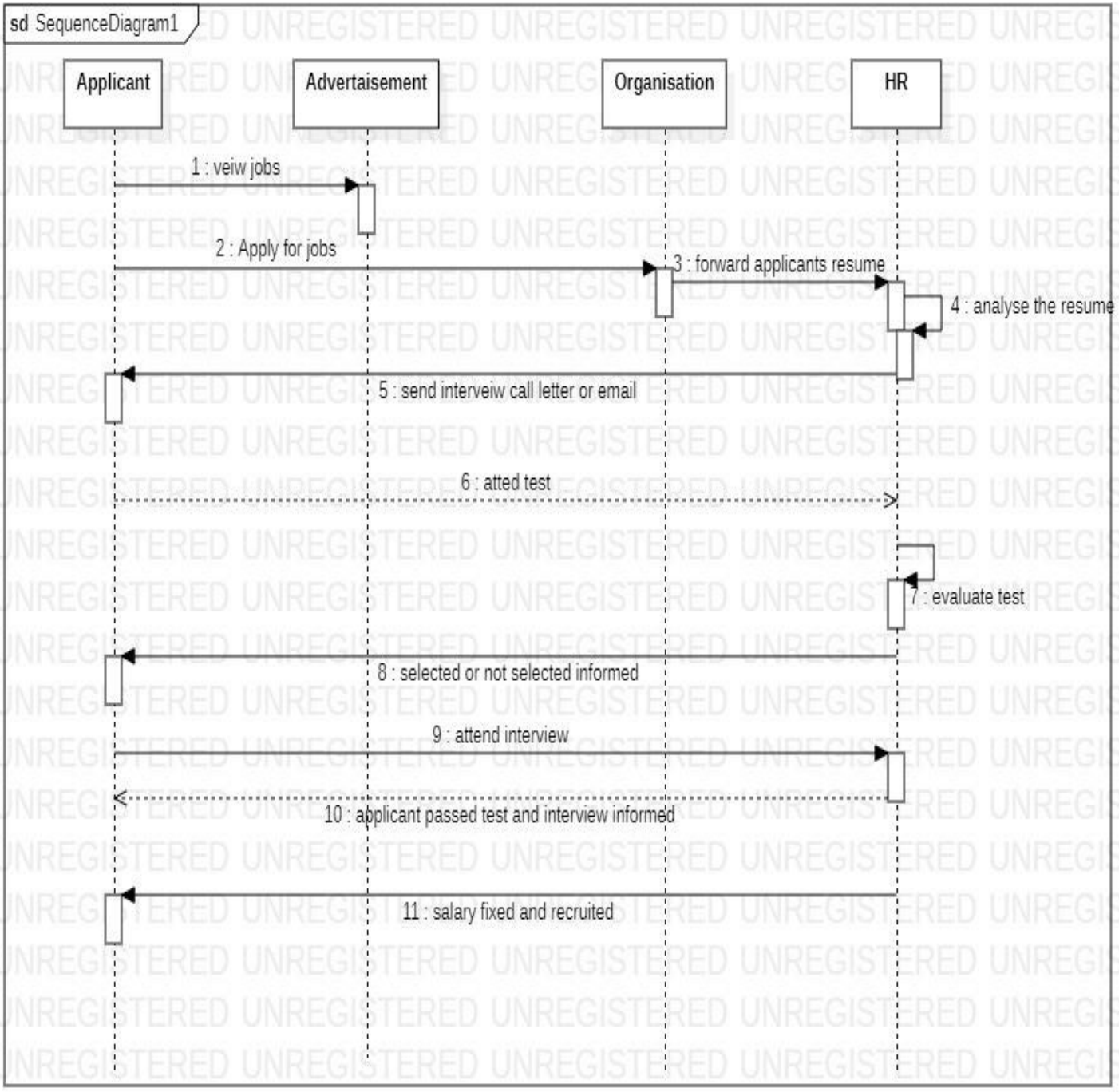


Figure 3.3: Sequence Diagram for Recruitment System

Communication Diagram:

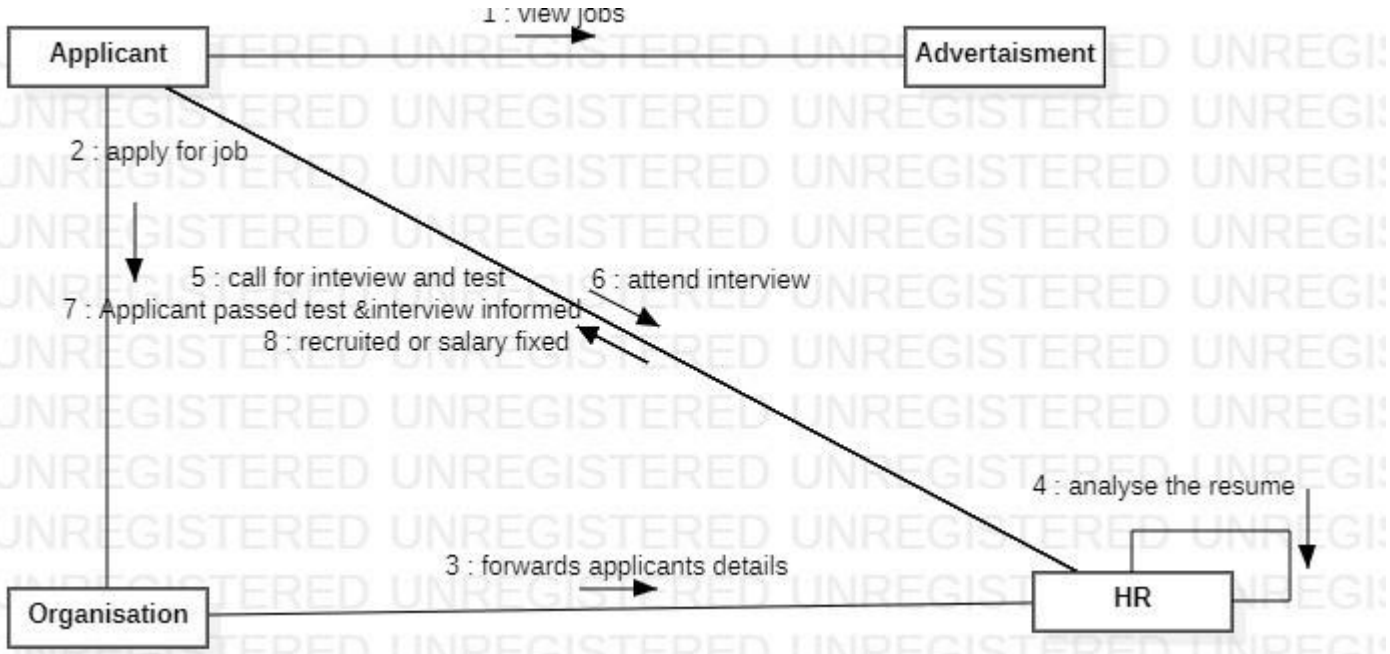


Figure 3.4: Communication Diagram for Recruitment System

Component Diagram:

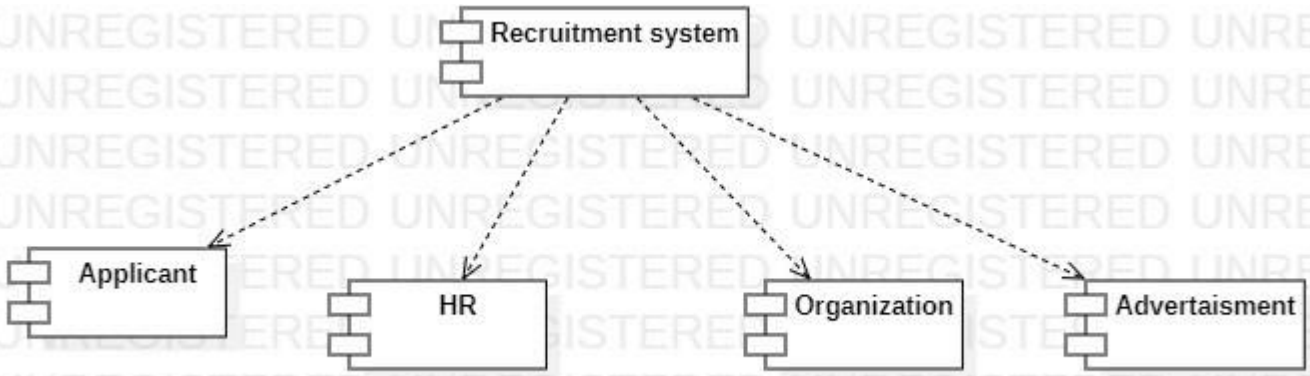


Figure 3.5: Component Diagram for Recruitment System

5 – ONLINE EXAM REGISTRATION SYSTEM

Chapter-1

Problem Statement:

Exam Registration system .is used in the effective dispatch of registration form to all of the students. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, reg. no etc.,) filled by the student whose testament is verified for its genuineness by the Exam Registration System with respect to the already existing information in the database. This forms the first and foremost step in the processing of exam application. After the first round of verification done by the system, the information is in turn forwarded to the Exam Controller. The application is then processed manually based on the report given by the system. The system also provides the student the list of exam dates. The controller will be provided with fees details to display the current status of application to the student, which they can view in their online interface. After all the necessary criteria has been met, the original information is added to the database and the hall ticket is sent to the student.

Chapter-2

Functional Requirements:

- Secure Registration of information by the Students.
- SMS and Mail updates to the students by the controller.
- Controller can generate reports from the information and is the only authorized personnel to add the eligible application information to the database.
- Get registration form from the students.
- Verify the details in the already existing database.
- Information is forwarded to the controller of examination.
- System provides the list of exam dates .
- Controller is provided with the fee details to display the current status of the student application.

Non- Functional Requirements:

- The applicants require a computer to submit their information.
- Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring.
- The user has to be careful while submitting the information. Much care is required.
- The Students and Exam Controller must have basic knowledge of computers and English Language.
- The student may be required to scan the documents and send.

Chapter-3

System Models:

Use-Case Diagram:

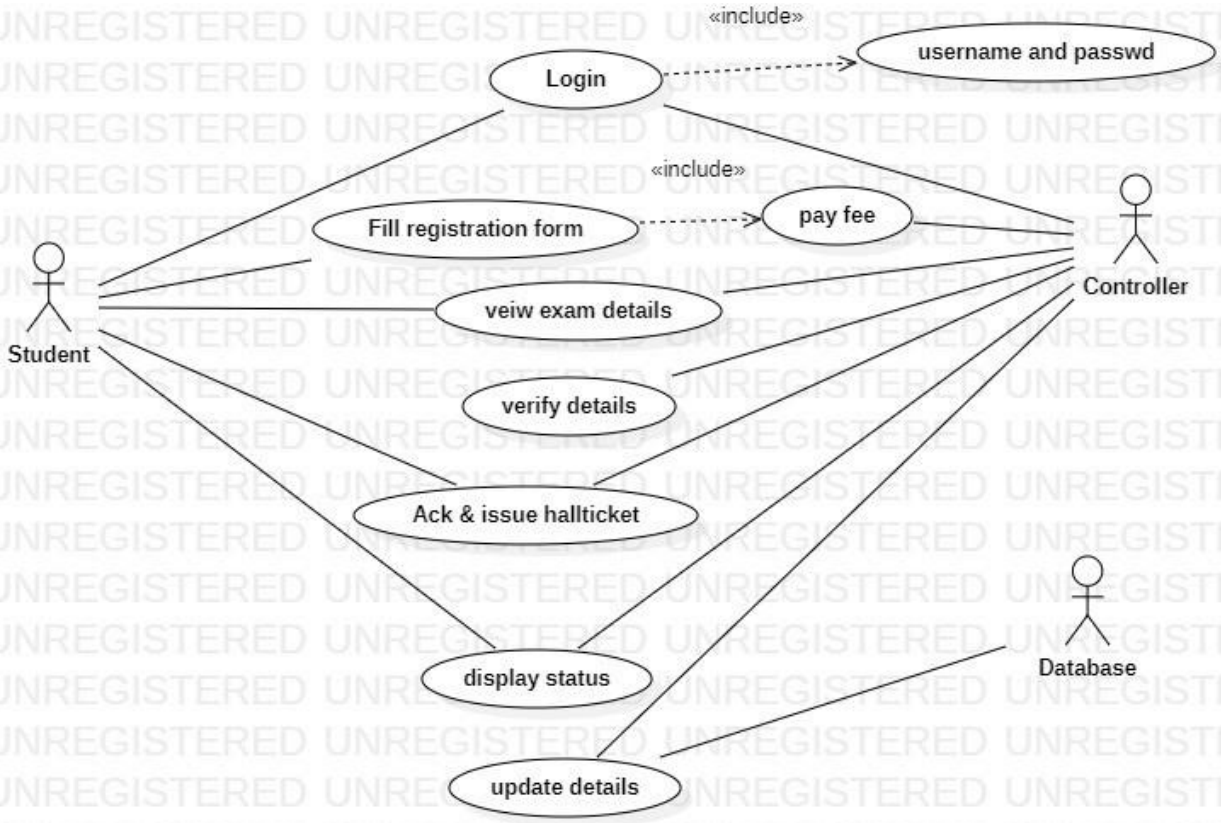


Figure 3.1: Use Case Diagram for Online Exam Registration System

Class Diagram:

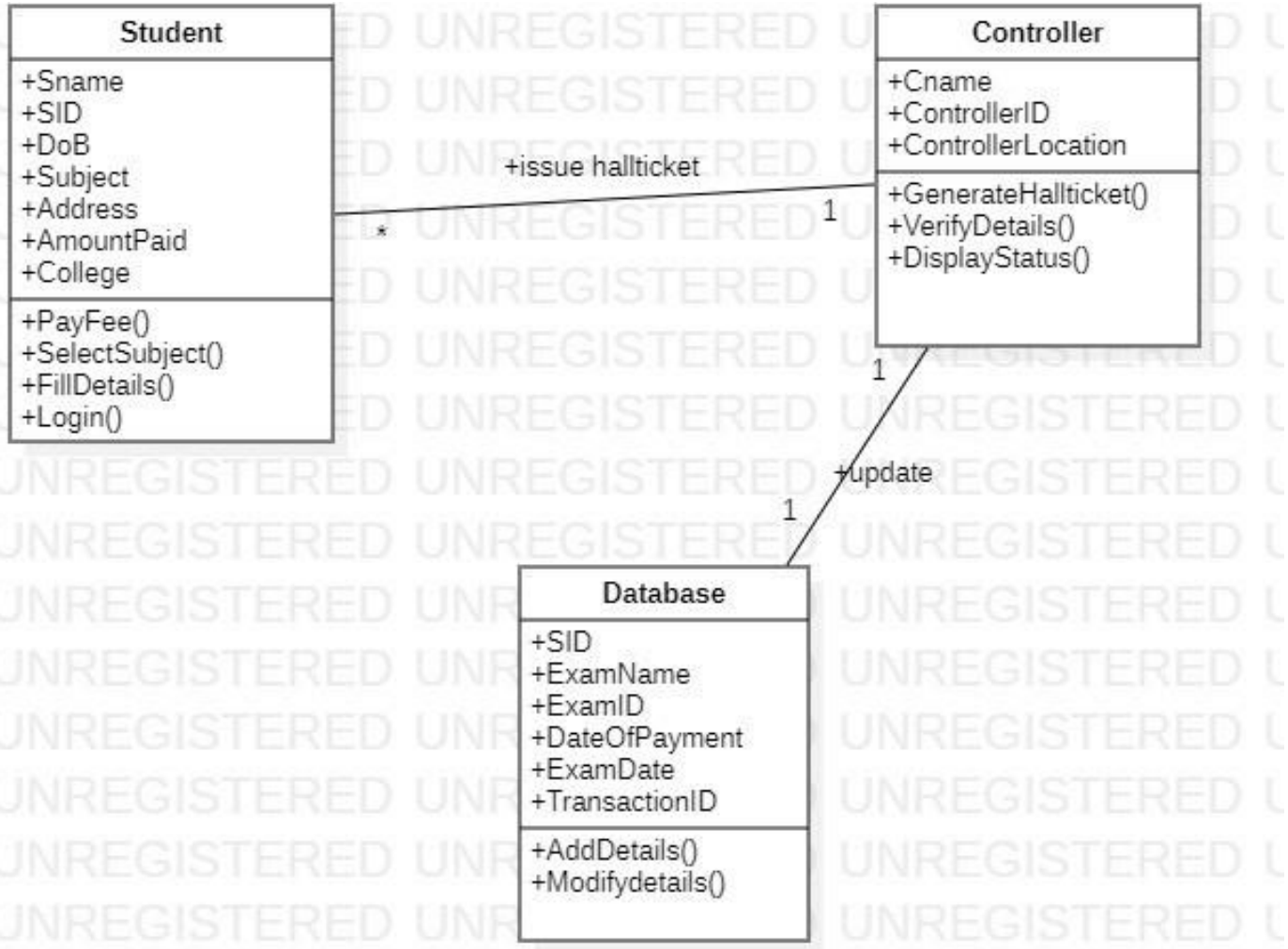


Figure 3.2: Class Diagram for Online Exam Registration System

Sequence Diagram:

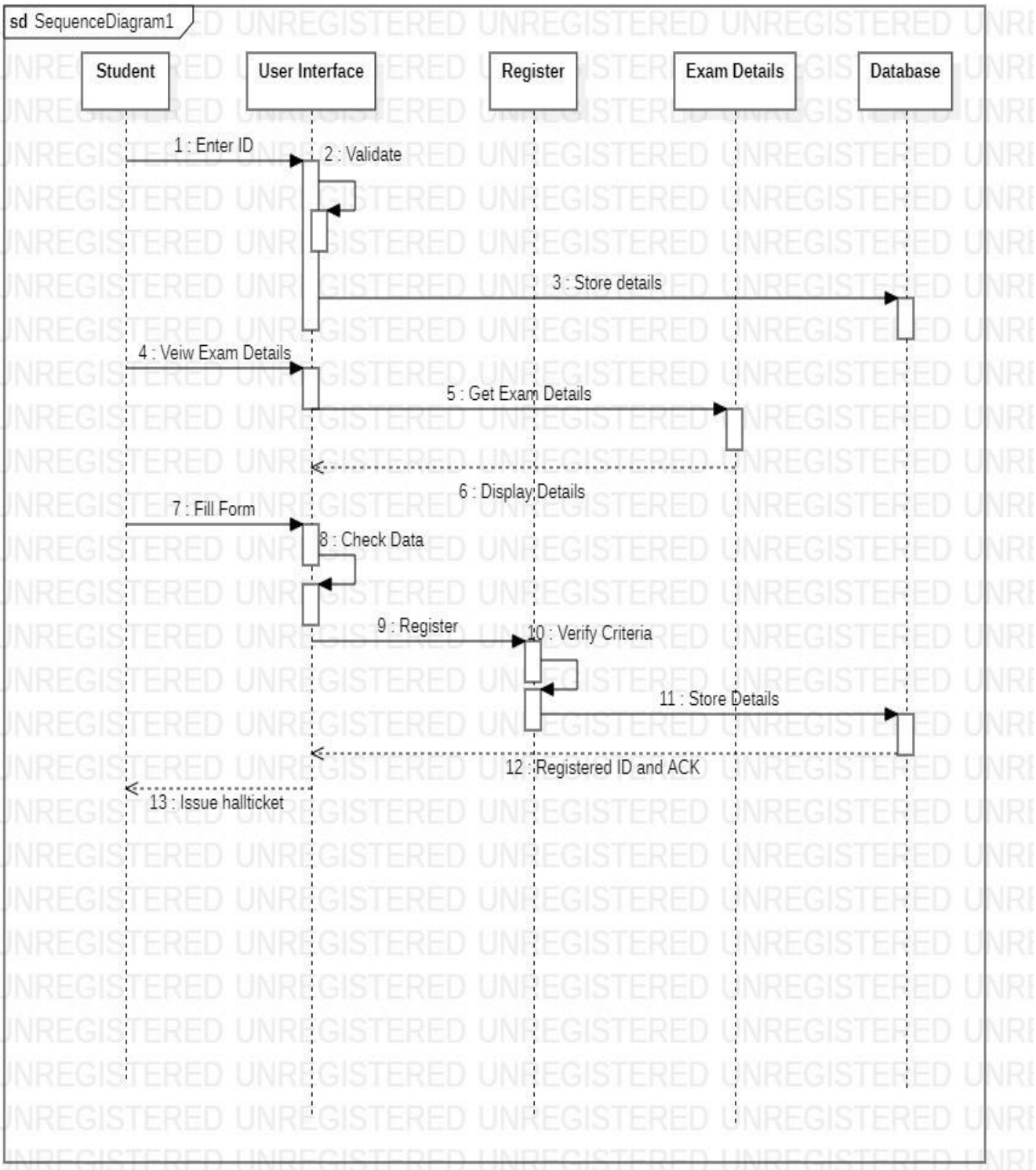


Figure 3.3: Sequence Diagram for Online Exam Registration System

Communication Diagram:

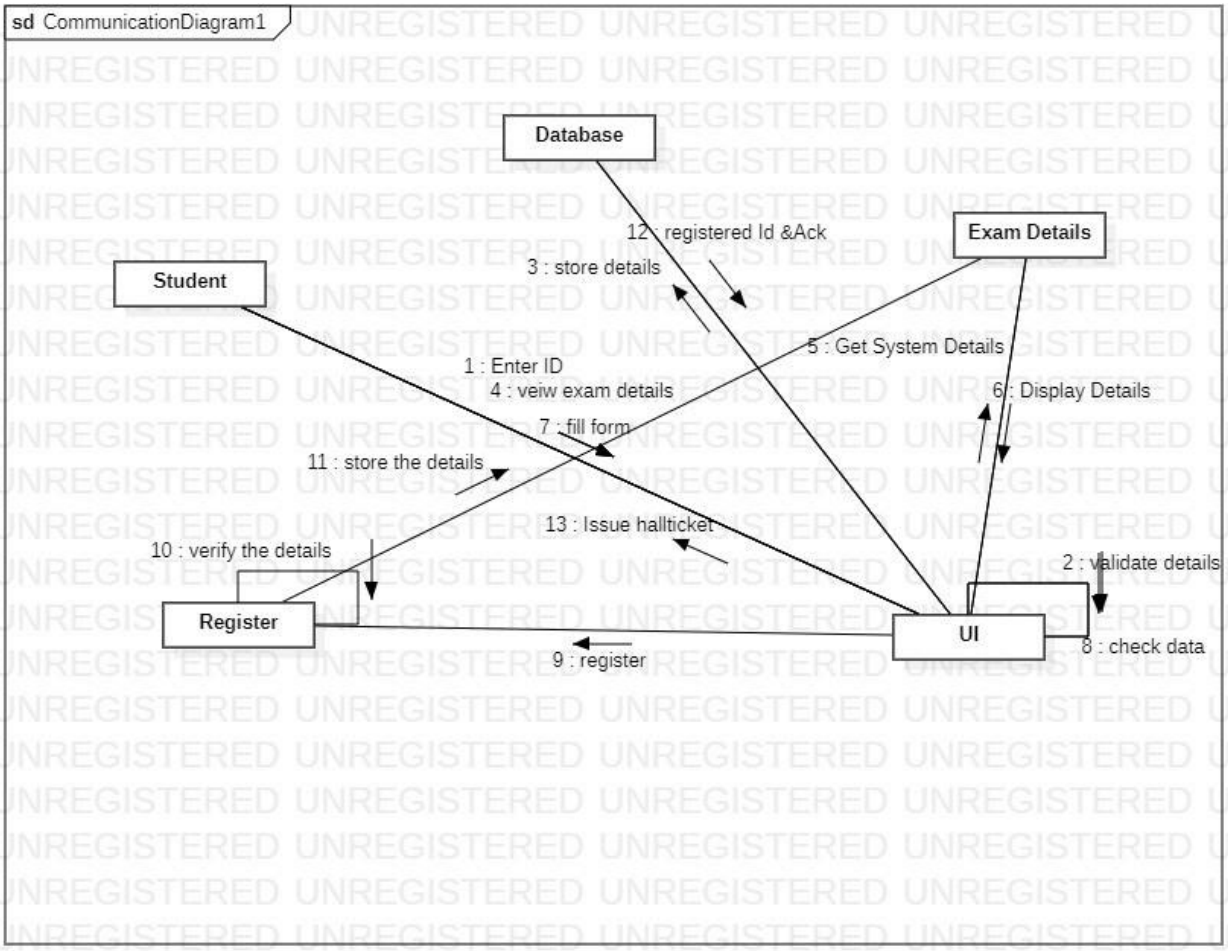


Figure 3.4: Communication Diagram for Online Exam Registration System

Component Diagram:

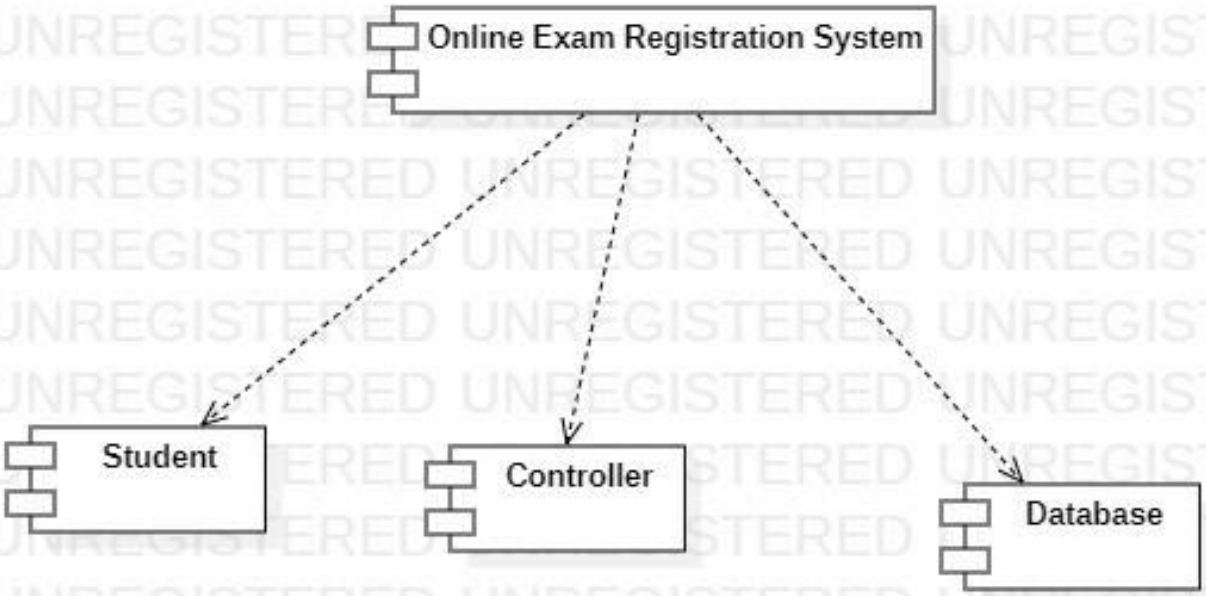


Figure 3.5: Component Diagram for Online Exam Registration System\

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