COURSE: CSE2101 – SOFTWARE ENGINEERING 1

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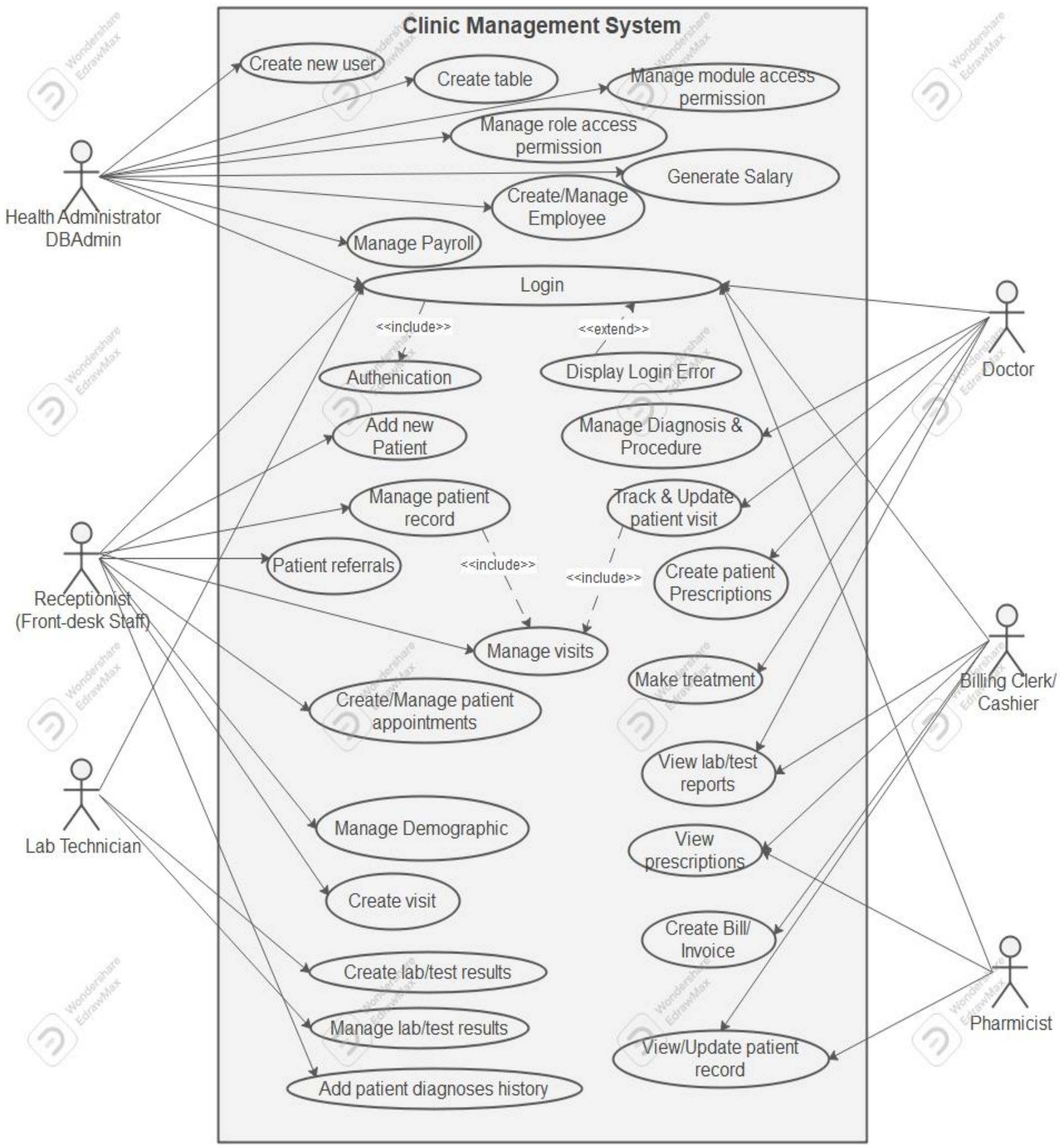
CONTENTS

USE CASE DIAGRAM



The diagram above is a Use Case representation model of the Clinic Management System

The use case diagram above depicts the behavior of the Clinic Management system and aids in capturing the system's (basic) needs. The figure depicts the CMS's high-level functionality and scope. The diagram depicts the system's and its actors' interactions. The use case diagram's actors and use cases define what the system will perform for the clinic and how the staff/actors will utilize it, but not how the system operates internally.

Accompanying the use case diagram are the use case tables which are presented below. They will define the functions that the system will carry out in order to meet the user's objective. The tables below serve as a container for a series of high-level use cases that the system will perform. The CMS capability is not restricted to the use cases listed below.

(The diagram above, as well as, the ones that follow was developed using a free version of a software called "WonderShare EdrawMax" which is why each diagram has watermarks.)

USE CASE TABLES

Name	End-user Login
Description	This function lets the end-users into the system to access the system functionalities.
Actors	Receptionists, Doctors, Pharmacist, Billing Clerks, Lab Technicians, Lab Assistants, Data Entry Clerks, etc.
Pre-conditions	End-users must have user ID and password.
Main flow of events	1. User accesses the login page. 2. User fills in his/her user ID and password in respective fields. 3. User clicks on the Login button to submit form. 4. The system then authenticates user credentials. 5. The user is greeted with a welcome message and granted access to the system.
Extensions	If user enters wrong credentials, a login error is displayed and the user is prompted with the login page again.

Post Conditions	User is granted controlled access to the system based on their roles.

Name	Create new user
Description	This function lets the DB Admin (Health Administrator) to create a new user to the system.
Actors	Health Administrator
Pre-conditions	The user must login with DB Admin ID and password to be granted highest level access.
Main flow of events	1. User selects “Create User” at landing page. 2. User is prompted with “Create User” page. 3. User enter data into required fields. 4. User selects the “Add” button 5. “User account successfully created” is displayed. 6. System generates a user ID and password and displays it.
Extensions	If necessary, fields left empty by the end- user, prompt the user to fill in all required field.
Post Conditions	User account credentials is added to employee user file.

Name	Add Patient
Description	This function gets the details of the patient and adds the record to the patient file and generates a patient registration number.
Actors	Front-desk staff, receptionists
Pre-conditions	The end-user should log into the system with user credentials.

Main flow of events	1. User selects "add patient" at the home page. 2. Patient entry form displayed. 3. User enter data into required fields 4. User selects the "Add entry" button 5. "Record Add Successfully" message displayed. 6. System generates a patient ID and displays it.
Extensions	If necessary, fields left empty by the end-user, prompt the user to fill in all required field.
Post Conditions	Patient record added to the patient file.

Name	Patient referrals
Description	This function assigns a number to the patient for relevant channeling.
Actors	Receptionist
Pre-conditions	Patients must register to the system
Main flow of events	1. User selects "generate a number" at the Receptionist Module. 2. System prompts to select the medical situation type. 3. If OPD, generates the next available number to the available doctor and displays the number. 4. User confirms number and prints card.
Extensions	-
Post Conditions	Patient records should be updated with patient channeling details.

Name	Add prescription entry
Description	This function records patient prescription details
Actors	Data entry operator/doctor
Pre-conditions	Doctor's ID and password

Main flow of events	1. User selects "Prescription form" from the patient module. 2. System prompts to enter the patient's registration number. 3. User enters the system registration number. 4. Prescription form displayed with relevant patient details. 5. User navigates to 'Tests' field and selects prescribed test details. 6. User navigates to the 'vaccine' field and enters vaccine details. 7. User navigates to the 'medicine' field and enters medicine details. 8. User enters re-consolation date. 9. User selects the 'Add' button and add prescription details. 10. User selects 'Print' and print the prescription details.
Extensions	-
Post Conditions	

Name	Calculate Bill/Invoice
Description	This function calculates the total charge for the patient.
Actors	Cashier
Pre-conditions	Both patient and end-user must be registered in the system.
Main flow of events	1. User selects patient receipt card. 2. System prompts patient registration number. 3. User enters registration number. 4. System prompts date and time, which the total charge required for. 5. User enter date and time 6. Receipt form displayed with patient details, lab tests details, X-ray details, ECG details, etc., and total the fee. 7. User select print receipt. 8. The patient receipt is printed.

Extensions	-
Post Conditions	The payment details should be update in payments file and patient records.

Name	Add Patient diagnoses history
Description	This function adds patient’s diagnosis details to the system.
Actors	Doctor
Pre-conditions	Patient must register to the system.
Main flow of events	1. User selects patient diagnosis card. 2. System prompts for patient ID 3. User enters the patient ID 4. System display patient details in the form. 5. User enters diagnosis details and date. 6. User selects Add diagnosis record.
Extensions	
Post Conditions	The diagnoses record should be added to the diagnosis file.

Name	Generate lab report
Description	This function generates the report of a particular test and prints the report.
Actors	Lab Technician
Pre-conditions	The user should log in. Relevant lab test results should be available

Main flow of events	1. User selects lab report form from lab module. 2. System prompts patient id. 3. User enters patient id. 4. System displays patient details. 5. System prompts to select the lab test category. 6. User selects category by navigating to the relevant tab and entering test results. 7. User selects add lab test record. 8. System displays successfully added message. 9. User selects print report. 10. System prints the report.
Extensions	-
Post Conditions	-

Name	Generate salary
Description	This function generates the employee salary for the given pay period.
Actors	Health Administrator
Pre-conditions	The user should be login into the system
Main flow of events	1. Admin selects ‘Generate salary form’ in the employee management module. 2. System prompts employee ID and period. 3. User enter required data. 4. The total salary calculated by the system. 5. User select print pay slip.
Extensions	User enters allowance and bonus details if any.

Name	Add New Employee
Description	This function lets the DB Admin (Health Administrator) to add new employee to the system.
Actors	The user must login with DB Admin ID and password to be granted highest level access.
Pre-conditions	Health Administrator
Main flow of events	1. User selects “Add new employee” at landing page. 2. User is prompted with “Add new employee” page. 3. User enter data into required fields. 4. User selects the “Add” button. 5. “Employee was successfully added” is displayed. 6. System displays employee table with new employee highlighted.
Extensions	If necessary, fields left empty by the DB Admin, prompt the user to fill in all required field.
Post Conditions	Employee file is created.

Name	Update Patient Record
Description	This function lets the actors update the patient’s history/file from different areas within the system where patient’s history/file is required.
Actors	Doctor, Receptionist, Cashier, Lab Technician, Pharmacist.
Pre-conditions	The user must be logged in with user ID and password.
Main flow of events	1. User clicks on “Update patient History” on the interface. 2. System displays “Patient History Updated.”
Extensions	The user will have an option to edit the entry after it is added to correct errors.
Post Conditions	The patient’s file is updated with new information.

Name	View patient history
Description	This function lets the user to view the patient's (diagnoses history).
Actors	Doctor
Pre-conditions	Doctor's ID and password to login.
Main flow of events	1. User enters patients full name and ID on interface. 2. User clicks on "View patient history" button. 3. The system authenticates the patients name and id associated with it. 4. The system prompts the user with the Patient History Interface.
Extensions	If necessary, the user is prompted with an incorrect name or ID of patient if the user enters the wrong data.
Post Conditions	The system records the date and time the user accesses the patient's file.

Name	Make treatment
Description	The function lets the user create a treatment for the patient and add it to the patients file from the interface.
Actors	Doctor
Pre-conditions	Doctor's ID and password to login.
Main flow of events	1. The user clicks on "Make Treatment" button on the bottom of the interface below the "Enter Diagnosis" button. 2. System prompts to enter the patient's registration number. 3. User enters the system registration number. 4. Treatment form displayed with relevant patient details. 5. The user is asked to choose whether the treatment is IP or OP in nature. 6. The user clicks on "OP" button.

	7. The user then enters the treatment details into the textbox presented on screen. 8. User navigates over buttons of available options, e.g., “Add Prescription”, “Schedule Visit”, etc. 9. The user clicks on “Submit” button. 10. System displays “Treatment is successfully added” to screen.
Extensions	If the user clicks “IP” button option, then the “Add IP care” button transitions from gray to green. The user can then enter the necessary IP treatment into the form prompted.
Post Conditions	The new treatment is either added or updated to the patient’s file.

Name	Manage visits
Description	The functionality lets the user add, update or delete a patients visit to the clinic for treatment.
Actors	Receptionist, Doctor
Pre-conditions	The user must log in with a valid user ID and password.
Main flow of events	1. The user enters the patient’s full name and ID. 2. The user is prompted with the patients file displayed on the interface. 3. The user navigates to the “Scheduled visits” button. 4. The user on the “Schedule visits” button. 5. The user is the prompted with “Day”, “Week”, “Month”, “Timeline” button options. 6. The user clicks on “Day” button. 7. The system displays the scheduled visit for the day. 8. The user navigates over the “Add visit”, “Change visit”, “Delete visit” button. 9. The user clicks on the “delete visit” button.

	10. The user is then prompted with “Are you sure you want to delete visit?” dialog box. 11. The user clicks “Yes” 12. The system displays “Visit for *insert date* was deleted”.
Extensions	If the user made a mistake in deleting visit, the user is presented with an “Undo” button on top of interface. The user clicks on and it and enters his/her user ID and password to undo action.
Post Conditions	The patient’s file and the system schedule are updated.

Name	Manage Appointments
Description	This functionality lets the user create, update or delete appointments on the schedule.
Actors	Receptionist
Pre-conditions	The user must login in with a receptionist valid user ID and password.
Main flow of events	1. The user navigates over the landing interface and clicks on the “Schedule” button. 2. The user is prompted with the calendar schedule that shows all the appointments and visits for the month. 3. The user navigates to the top of the interface and clicks “Change view” drop down arrow. 4. The user clicks on the “Week” option. 5. The system prompts the user with a new interface that shows all appointments and visits for the week. 6. The user navigates to the top left of the screen and clicks on the “Appointments” button. 7. The system prompts the user with a new interface that shows all appointments for the week. 8. The user hovers over the weekly calendar view and clicks an available time slot.

	9. The system prompts the user with a pop-up box with a form. 10. The user enters the patient's full name and ID (generated if new patient). 11. The user the clicks on the "Save" button. 12. The system updates the interface with the new appointment added to the weekly (calendar) schedule.
Extensions	If necessary, the user can right click on the appointment on the weekly and an option to delete appointment will pop-up.
Post Conditions	The appointment is recorded to the system schedule table.

Name	View prescription
Description	This functionality allows the user to read/view prescription of a patient (recently) documented by the doctor.
Actors	Pharmacist
Pre-conditions	The user must login using a valid user ID and password of a pharmacist.
Main flow of events	1. The user clicks on the "View Prescription" button on the interface. 2. The user enters the patients full name and ID on the interface. 3. The system prompts the user with the patient's (recently added) prescription. 4. The uses hovers over the interface to the top and click on "Add Dispensary". 5. The user records the name(s) of the medication and amount dispensed to patient. 6. The system displays "patients prescription filled" message.
Extensions	-
Post Conditions	1. The system makes a note the date and time, and the user that access the record.

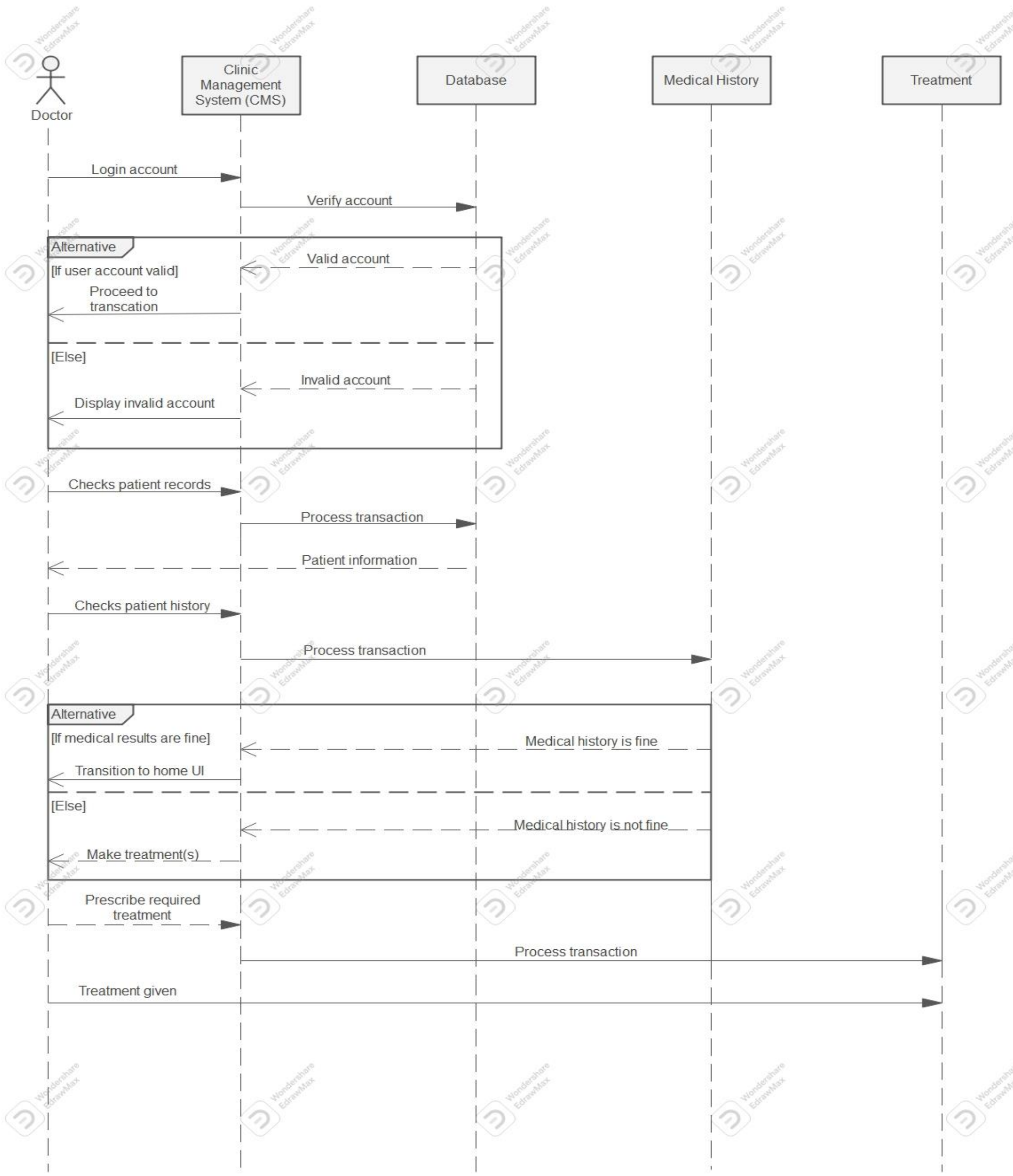
	2. The system records the filled prescription information and add it to the patient's (current) charges.

Name	View test report
Description	This functionality allows the user to read/view test reports of a patient.
Actors	Doctor
Pre-conditions	Doctor's ID and password to login.
Main flow of events	1. The user enters the patients full name and ID on the interface. 2. The system prompts the user with the patient's file. 3. The user navigates over ribbon at the top of the interface and clicks on "Tests" tab. 4. The user the hovers over the drop-down list and select "recent". 5. The system then prompts the user with the interface that shows the recent test(s) of the patient.
Extensions	The user has the options to choose from different types of tests down by the patient, i.e., blood test, urine test, etc.
Post Conditions	The system makes a note the date and time, and the user that access the record.

Name	Add patient history
Description	This functionality allows users to add history of patient is the patient is new.
Actors	Receptionist
Pre-conditions	The user must login in with a receptionist valid user ID and password.
Main flow of events	1. The user enters the patients full name and new ID into the interface. 2. The system the prompts the user with the interface patient's new account. 3. The user the hovers over the ribbon at the top of the interface and clicks on "Add History" button. 4. The user enters details from documentation requested from other

	medical institutions based on the patients. 5. The user also enters information gathered from patients. 6. The clicks on “Add history” button. 7. The system displays “The patient’s history is successfully added” message. 8. The system then prompts the user with the patient’s account. 9. The system displays “the patient profile has been updated” on a red ribbon at the bottom of the screen.
Extensions	If necessary, fields left empty by the end- user, prompt the user to fill in all required field.
Post Conditions	The system records the updates made to the patient file.

SEQUENCE DIAGRAM

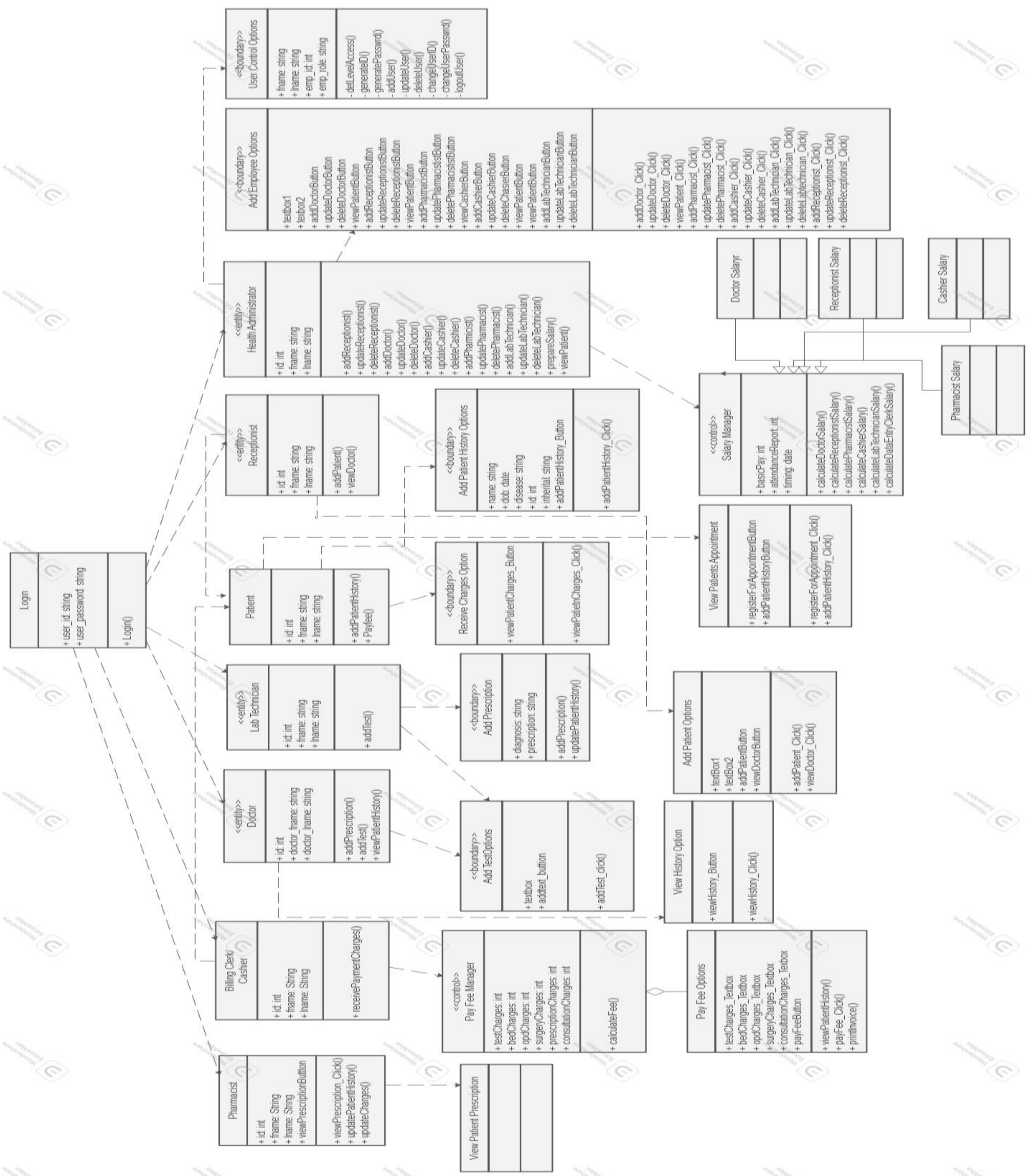


The diagram above is a sequence representation model of the use case "Make Treatment".

The Sequence Diagram essentially displays the sequence in which the components in the Clinic Management System (CMS) will interact. The sequence diagram illustrates how and in what order the system's items operate. The above diagram depicts the sequence of steps the doctor (actor) must follow to record a treatment when using the system. As you can see, the doctor must first log into the system. The doctor does so by the entering his/her user ID and password. The system then verifies the user credentials and grant the doctor access. The doctor then proceeds to view the patient ((current) diagnosis) history. The doctor then makes or formulate a treatment (or treatments based on the patients (current) diagnosis.

Note: if the patient does not have any diagnosis, the doctor makes a diagnosis and update the patient’s history. This is not shown on the sequence diagram but is assumed what happens if the patient does not have a diagnosis in his/her history.

CLASS DIAGRAM



The diagram above is the class diagram of the Clinic Management System.

The class diagram presents a static view of the Clinic Management System (CMS). The CMS class diagram describes the structure of the CMS classes, their attributes, operations or methods, and the relationship among the objects. Some of the main classes of the CMS are Login, Doctor, Patient, Receptionist, Health Administrator, Lab Technician, Pharmacist, Billing Clerk/cashier, Add New Employee and User Control Options. All the class mention above are entity classes with the exception of the login class. The system also has boundary classes, control classes and classes with parent-child relationships.

(The original class diagram was too large and unwieldly to fit on the page of the document. Errors were encountered while trying to work around this issue. The developer decided to create a much more concise version of the class diagram, which is presented above.)