



CSE 307: System Analysis and Design
TERM Project

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Section: 1

SECTION 1

Task 1: Introduction

In my upcoming project I have chosen to create a new urban geological mapping and traffic detection system which is incredibly similar to google maps but perfected for small roads which are "Goli" of Bangladesh. Thus I have decided to name it Goli for now.

Task 2: History leading to project request

The history or the life cycle of this project began not very long ago, during last month I was supposed to meet my friend at Jamuna Future Park from IUB. He called told me that it shouldn't take more than 5 minutes as he already checked google as there was no traffic. But as got on a rickshaw I could see there was a huge traffic that stretched pretty long as it was Ramadan after all. So I reached there after 45 minutes and got in a fight soon after as we thought the other one was lying. After he realized that google was so inaccurate, the first question popped into my head why though?! After a few hours of personal research I could see why an alternative app could be created for small and urban Bangladeshi roads.

Task 3: Identify Problem, Solutions and Opportunities

a. Identifying Problems: After my intensive research I was able to identify all the problems leading these errors in google maps. Firstly google was designed by and for U.S and other European countries where roads are quite bigger and 78% of roads are highways and the mainly used by Cars, Trucks, Motorbikes which are all motor based vehicles. In google maps if you select a location then it will apply a shortest path algorithm and select a road for you while it also detects the traffic using heating detection via google satellites and gives you an estimated time for travel. But as I already said all their vehicles are motor based which generates incredible amount of heat, which is perfect for their road systems. But in Bangladesh the highways maybe dominated by busses and cars, in urban areas and roads the majority of vehicles are rickshaws and cycles which is has no heat signature thus comes in the main source of inaccurate data.

b. Solutions: To these problem we will introduce the integrated system where we will use only user based data for their own betterment. If a rider or courier chooses a path to their destination we will record the time for their delivery ex. If a rider picks up your food we can start the timer and stop it when it reaches its destination. And whenever that same user orders from the same restaurant we will show the rider the last used route with the least amount of time for that delivery.

c. Opportunities: At first we can offer this service for free until we gather an obsolete amount of data. After calculating all these data we can generate a

traffic system monitor which can be used by regular user. We can also use the data from regular users and integrate it into the system which take a lot of time but it will come in the next update in the application.

Task 4: Project goals and Objectives

Now we will discuss about the major goals of this project

- My aim is to deliver a system which will have a more accurate assessment for small roads rather the main highways.
- The systems goal is not to replace or rival high tier apps like google maps but to integrate their data and make it more assessable.
- As one of our user base will be riders who go to many location to deliver food, parcel or any online purchased product, we will give them the shortest and fastest routing system.
- The system can also be integrated into popular apps like Uber, Pathao, Foodpanda Etc. app that need a mapping and routing system.
- We can also make the app for public use as people know where all the traffic is going and can change their routing making their commuting a faster one.
- My goal is to make the lifecycle for this project as long as possible as mapping systems still have a long way to go and so much to offer.

Now we will discuss a few Objectives this system is yet accomplish,

1. The system will be designed for mass use and distribution so it will require a tested and accurate data assortment, where the system will be ready for people of all age and locality to use.
2. For commercial distribution will serve as an alternative or an add-on to their existing mapping and routing system, so client preferences and user based-input on the system is our top priority.
3. We will start off with Dhaka as our first city to be offered our service but we will offer our services to other cities as the time comes with the possibility of a global expansion.

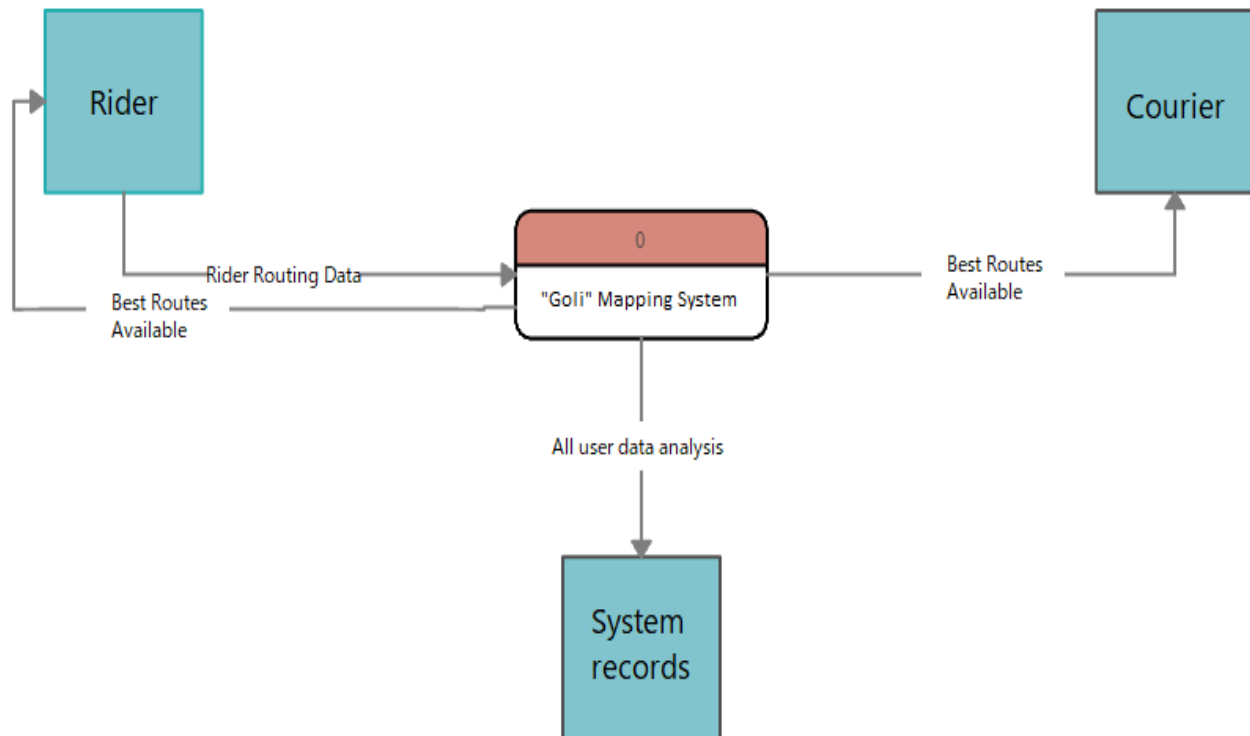
SECTION 2

Task 5: Product Description

a. **Product Summary:** It will be a free to use application at first with services such as geographical mapping, integrated weather system, traffic analysis, forecasting and live traffic updates with estimated time and road routing specified for urban road systems of Bangladesh.

b. **Product Stakeholders:** At first our client base will be the food delivery services, ride sharing and courier service applications such as Foodpanda, Pathao, Uber, GreenEX etc. and our starting user base will be the rider who will use the mapping and traffic data. Eventually we will update our application to a regular user base.

Task 5: Context Level Data Flow Diagram

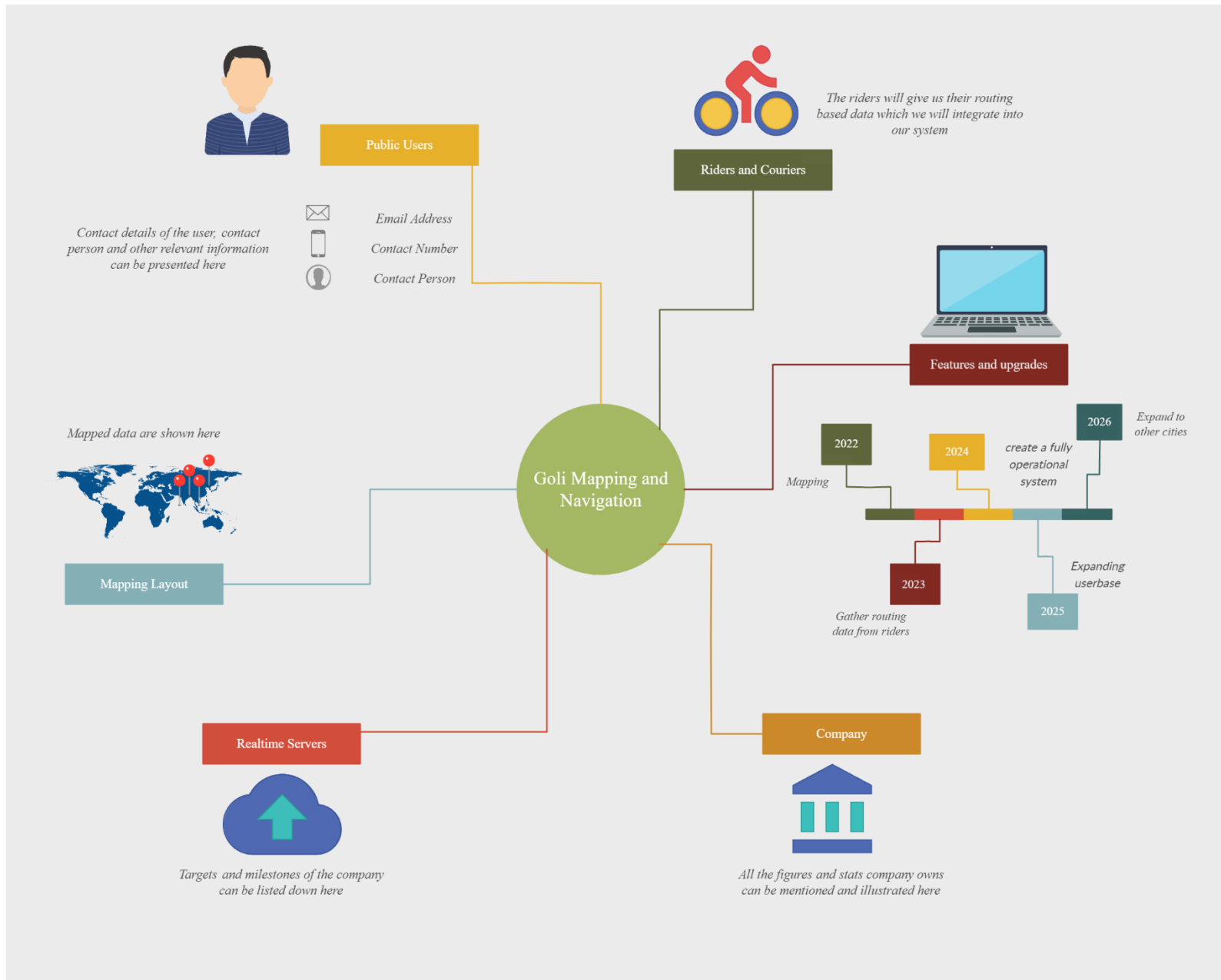


Task 7: Product Description

Now we will look at technical features of the application

- The application will have the entire mapping data of Dhaka, Chittagong. (other cities will be added later on)
- The traffic forecasting and live traffic updates with estimated time for deliveries.
- Road routing specified for urban road with shortest and alternate available paths.
- Public level mass data integration. (will be added later on updates)

Task 8: Rich Picture



SECTION 3

Task 9: Information Gathering Methods

a. **Interview:** Before you interview someone, you must, in effect, interview yourself. You need to know your biases and how they will affect your perceptions. Your education, intellect, upbringing, emotions, and ethical framework all serve as powerful filters for what you will be hearing in your interviews. You need to thoroughly think through an interview before you go. Visualize why you are going, what you will ask, and what will make it a successful interview in your eyes. You must anticipate how to make the interview fulfilling for the individual you interview, as well. An information-gathering interview is a directed conversation with a specific purpose that uses a question-and-answer format. In the interview, you want to get the opinions of the interviewee and his or her feelings about the current state of the system, organizational and personal goals, and informal procedures for interacting with information technologies. Above all, seek the opinions of the person you are interviewing. Opinions may be more important and more revealing than facts. In order to prepare for an interview,

1. Read background material.
2. Establish interviewing objectives.
3. Decide whom to interview.
4. Prepare the interviewee.
5. Decide on question types and structure.

b. Questionnaires: The use of questionnaires is an information-gathering technique that allows systems analysts to study attitudes, beliefs, behavior, and characteristics of several key people in the organization who may be affected by the current and proposed systems. Attitudes are what people in the organization say they want (in a new system, for instance); beliefs are what people think is actually true; behavior is what organizational members do; and characteristics are properties of people or things. Responses gained through questionnaires (also called surveys) using closed questions can be quantified. If you are surveying people via email or the Web, you can use software to turn electronic responses directly into data tables for analysis using a spreadsheet application or statistical software packages. Responses to questionnaires using open-ended questions are analyzed and interpreted in other ways. Answers to questions on attitudes and beliefs are sensitive to the wording chosen by the systems analyst. Through the use of questionnaires, the analyst may be seeking to quantify what was found in interviews. In addition, questionnaires may be used to determine how widespread or limited a sentiment expressed in an interview really is. Conversely, questionnaires can be used to survey a large sample of system users to sense problems or raise important issues before interviews are scheduled. Now the planning for a questionnaire,

1. The people you need to question are widely dispersed (as in different branches of the same corporation).
2. A large number of people are involved in the systems project, and it is meaningful to know what proportion of a given group (for example,

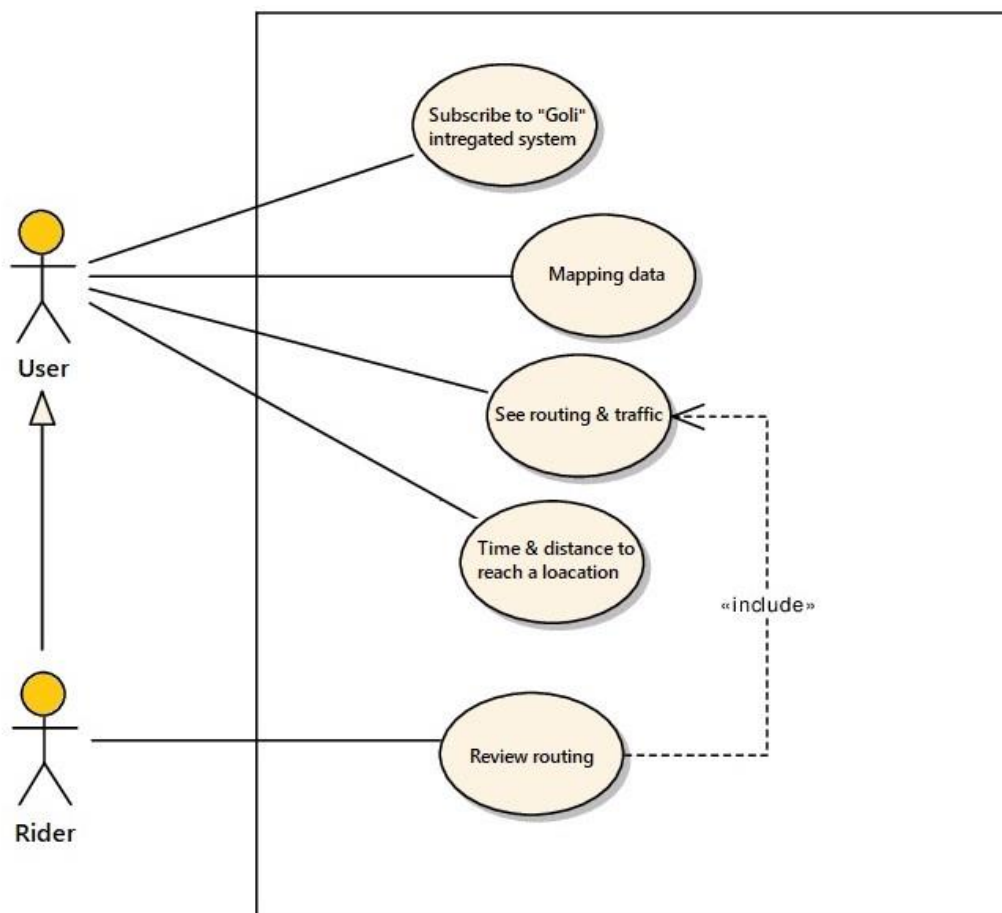
management) approves or disapproves of a particular feature of the proposed system.

3. You are doing an exploratory study and want to gauge overall opinion before the systems project is given any specific direction.
4. You wish to be certain that any problems with the current system are identified and addressed in follow-up interviews.

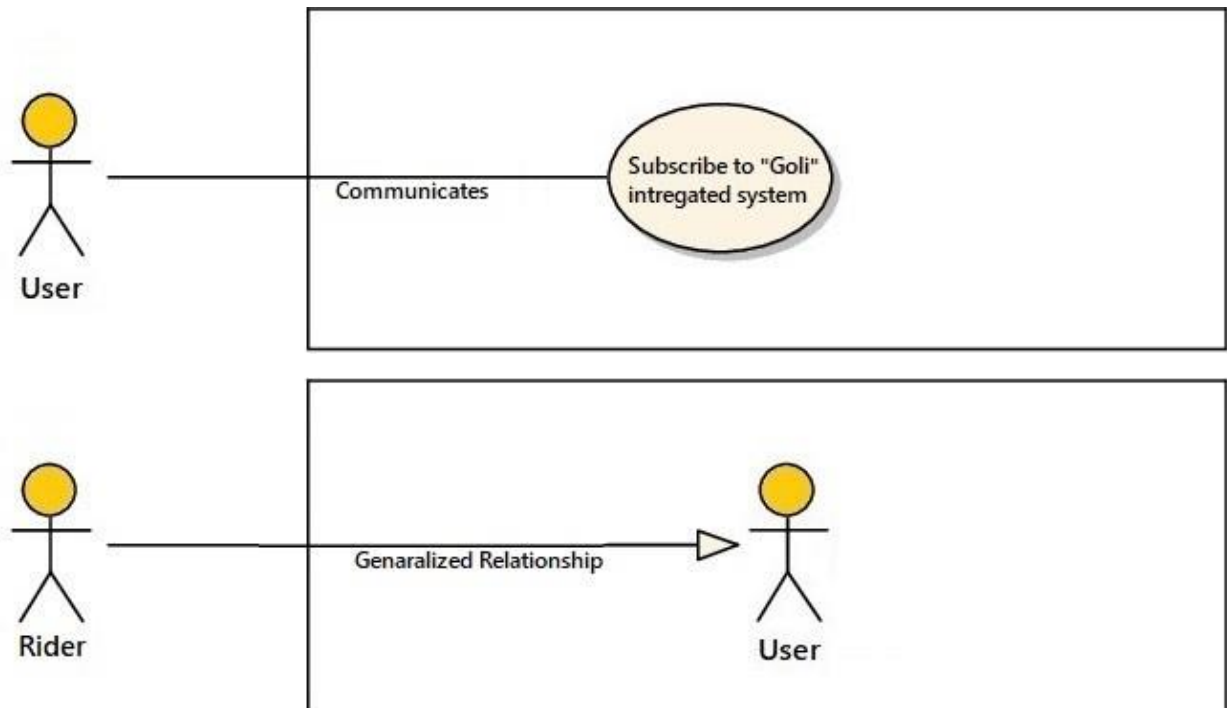
c. **Joint Application Design:** No matter how adept you become as an interviewer, you will inevitably experience situations in which one-on-one interviews do not seem to be as useful as you would like. Personal interviews are time consuming and subject to error, and their data are prone to misinterpretation. IBM developed an alternative approach to interviewing users one by one, called joint application design (JAD). The motivations for using JAD are to cut the time (and hence the cost) required by personal interviews, to improve the quality of the results of information requirements assessment, and to create more user identification with new information systems as a result of the participative processes. Although JAD can be substituted for personal interviews at any appropriate juncture during the SDLC, it has usually been employed as a technique that allows you, as a systems analyst, to accomplish requirements analysis and to design the user interface jointly with users in a group setting. The many intricacies of this approach can only be learned in a paid seminar demonstrating proprietary methods. We can, however, convey enough information about JAD here to make you aware of some of its benefits and drawbacks in comparison with one-on-one interviews. Now the conditions for JAD,

1. User groups are restless and want something new, not a standard solution to a typical problem.
2. The organizational culture supports joint problem-solving behaviors among multiple levels of employees.
3. Analysts forecast that the number of ideas generated via one-on-one interviews will not be as plentiful as the number of ideas possible from an extended group exercise.
4. Organizational workflow permits the absence of key personnel during a two- to four-day block of time.

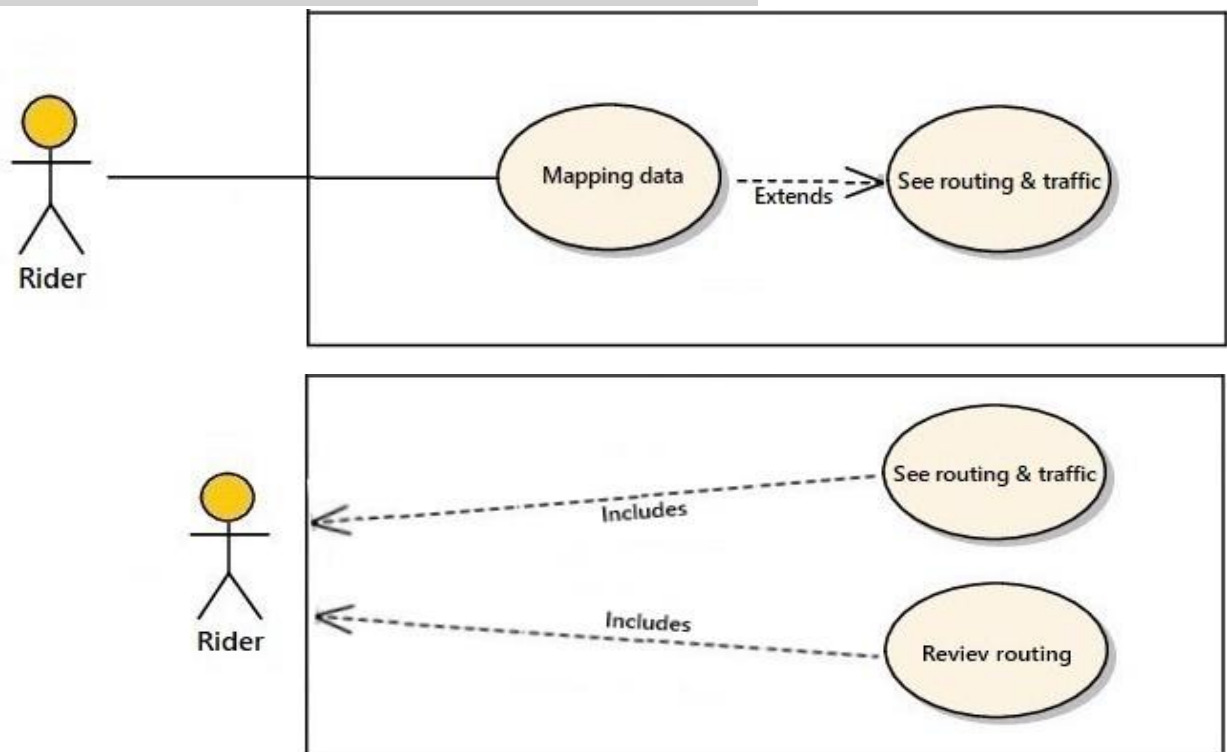
Task 10: Use Case Diagram of the system



Task 11: Normal Scenario for 2 Use Cases



Task 12: Alternative Scenarios for the Use Cases



Task 13: Major Functionalities

We can offer a diverse range of user functionalities such as

- Real-time data updates for our routing system.
- Traffic forecasting and live traffic updates with estimated time for deliveries.
- System will be mostly centered on riders and couriers so must understand the system well.

Task 14: Functional Requirements

There are multiple user based requirements that needs to be meet when designing the system,

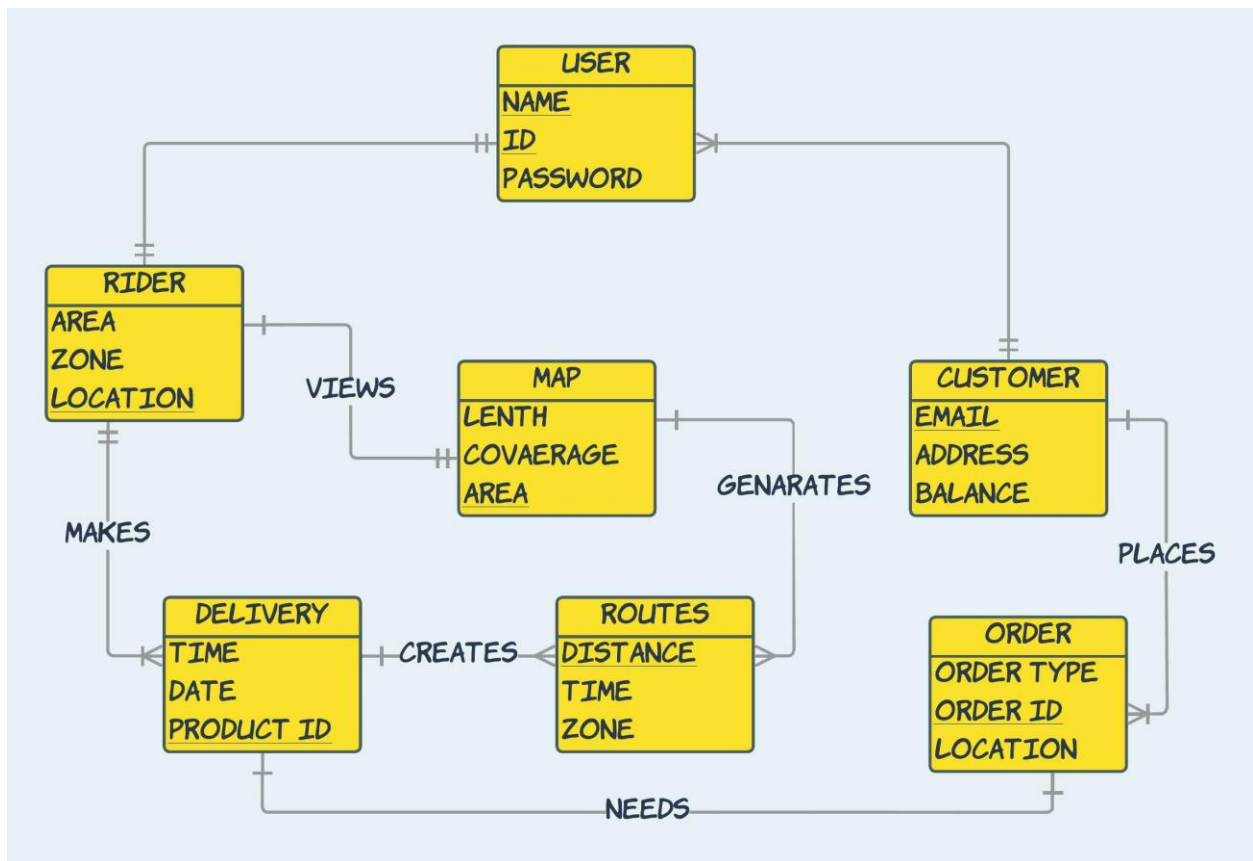
- The application must have the entire mapping data of Dhaka city.
- All the urban routes must be in precise distance as in real-time.
- The system must show all shortest paths from current location to the destination.
- The best available route must show timing and only one specific route to the destination.
- The traffic forecasting and live traffic updates must come at regular intervals.
- User interfaced must be designed to have a better communication with all riders and for better usability.
- System must keep records of all previous requests.
- System must be designed for mass level integration.

Task 15: Non-Functional Requirements

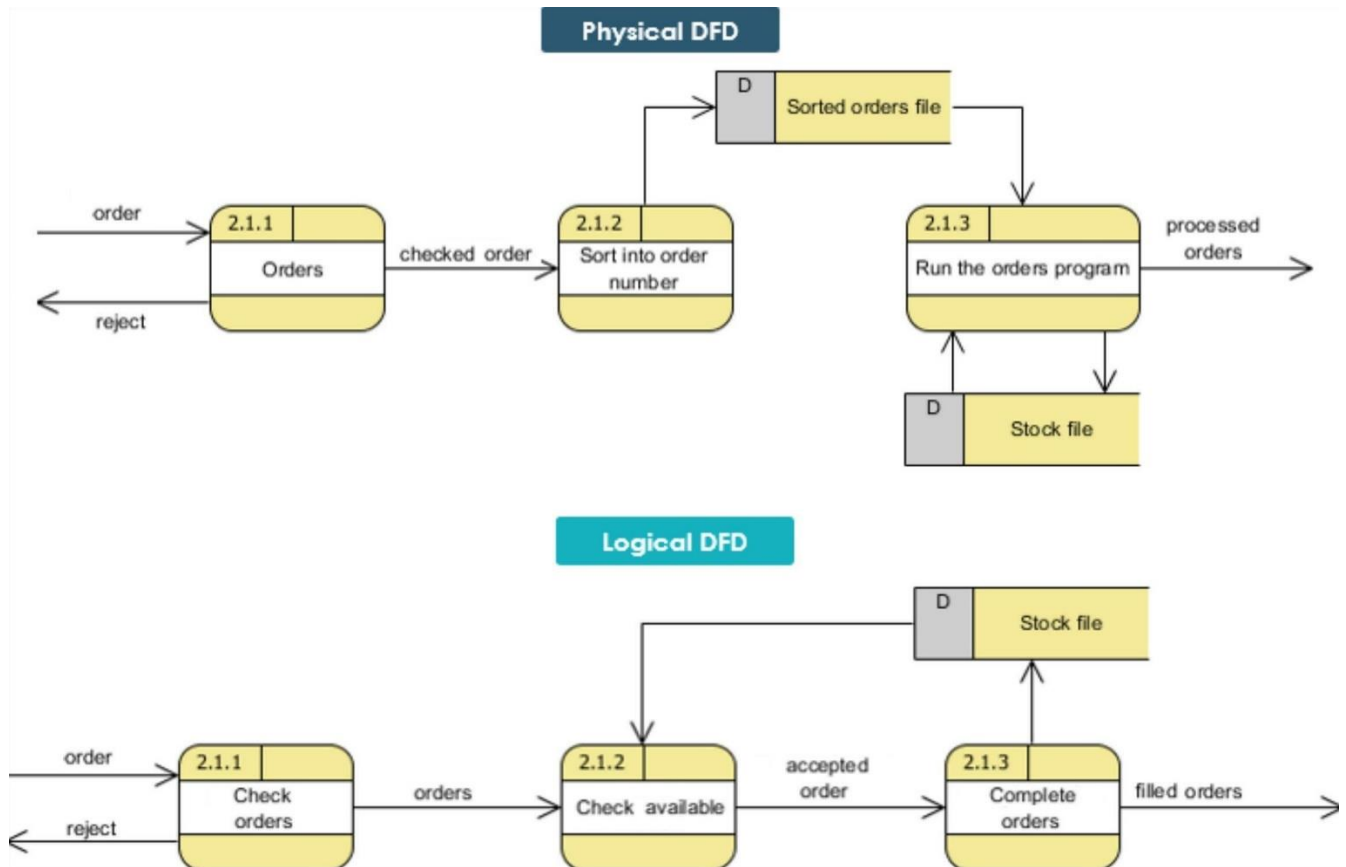
Requirements	Description
Performance	<ul style="list-style-type: none">• The system will not be able to serve a user if other user based review data has not been created.• The system will not suffice if it cannot sustain mass user base.
Efficiency	<ul style="list-style-type: none">• If the system does not select the correct routing based on most recent and less amount of time, there could be complications to the entire system.• It also cannot make errors in its shortest path algorithms.• Must not be inaccurate from original mapping data.
Economy	<ul style="list-style-type: none">• The app will be free at launch so we should be able to keep up with other market competitors in a business centered user base and clients.
Service	<ul style="list-style-type: none">• The system will be mostly centered on riders and couriers so must understand the system well.• The clients as in owners of other apps interested to integrate our system must be satisfied.• Common users such as general people must be included.
Security	<ul style="list-style-type: none">• Security is a big factor coming into mass level data systems so must be protected in better servers.• User authentication must be available at the launch.

SECTION 4

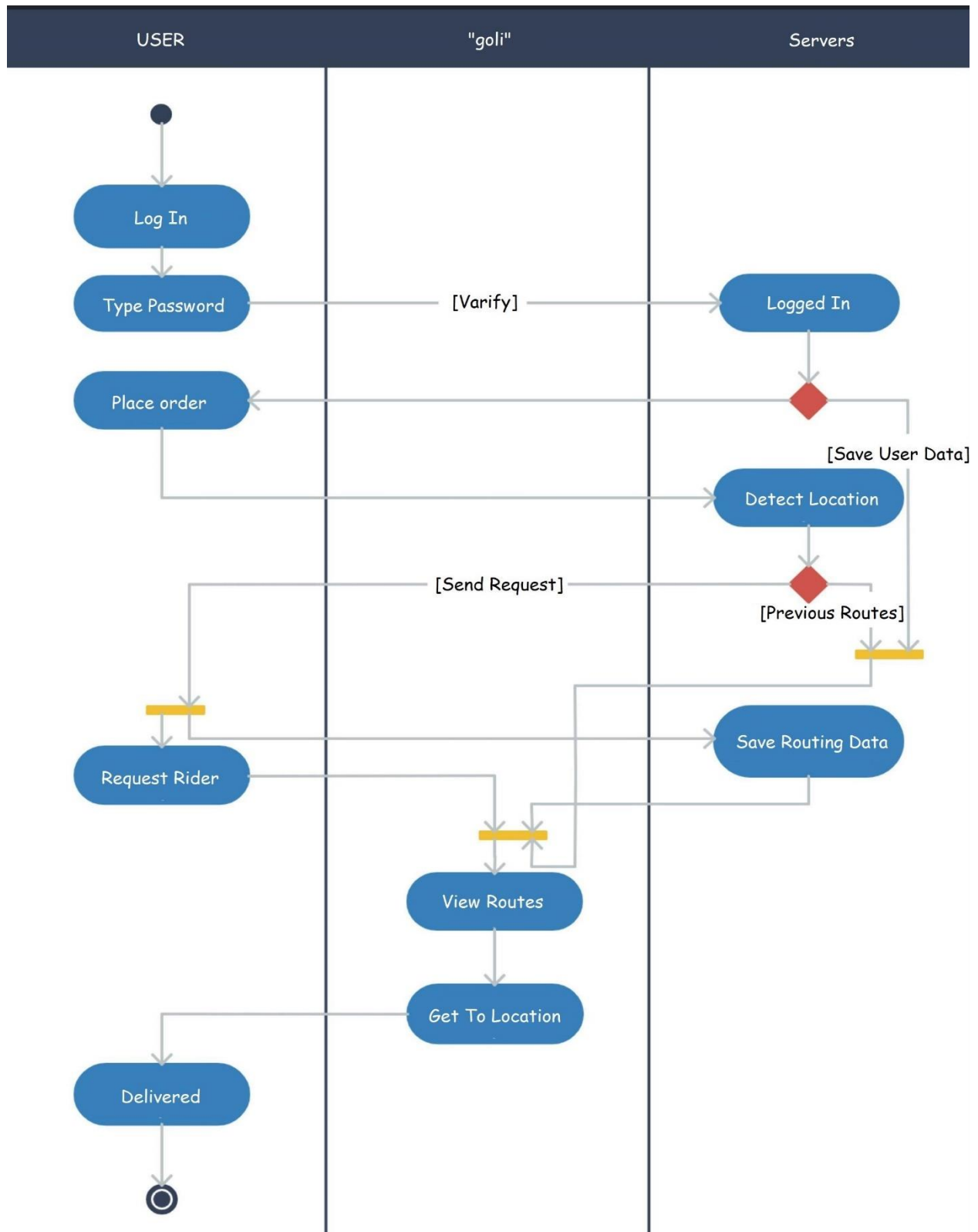
Task 16: Entity Relationship Diagram



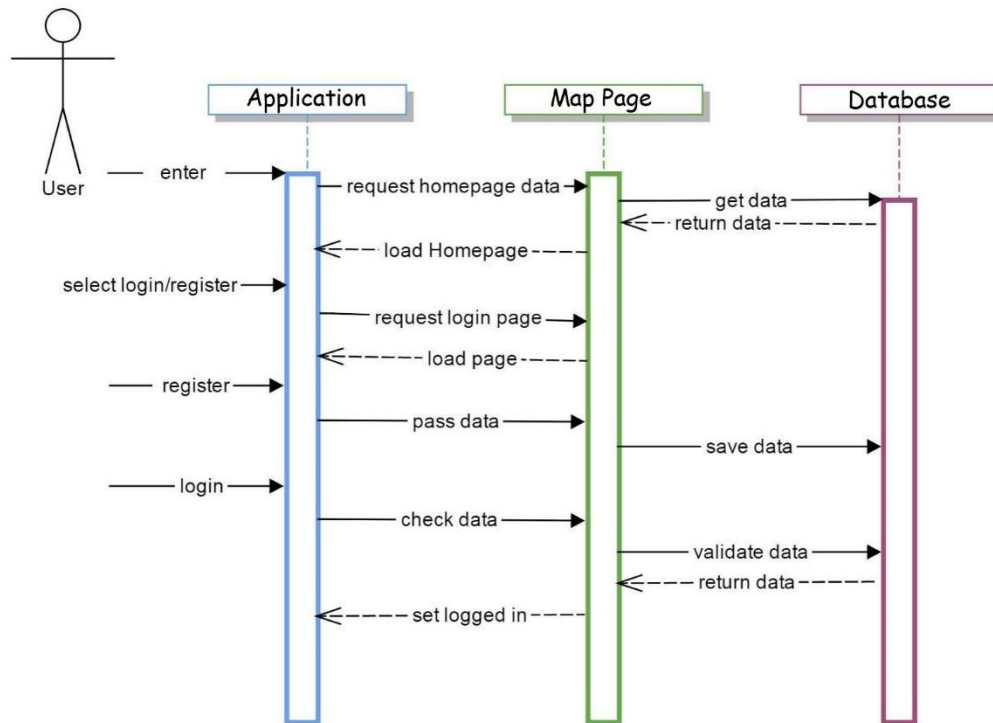
Task 17 & 18: Logical and Physical Data Flow diagram



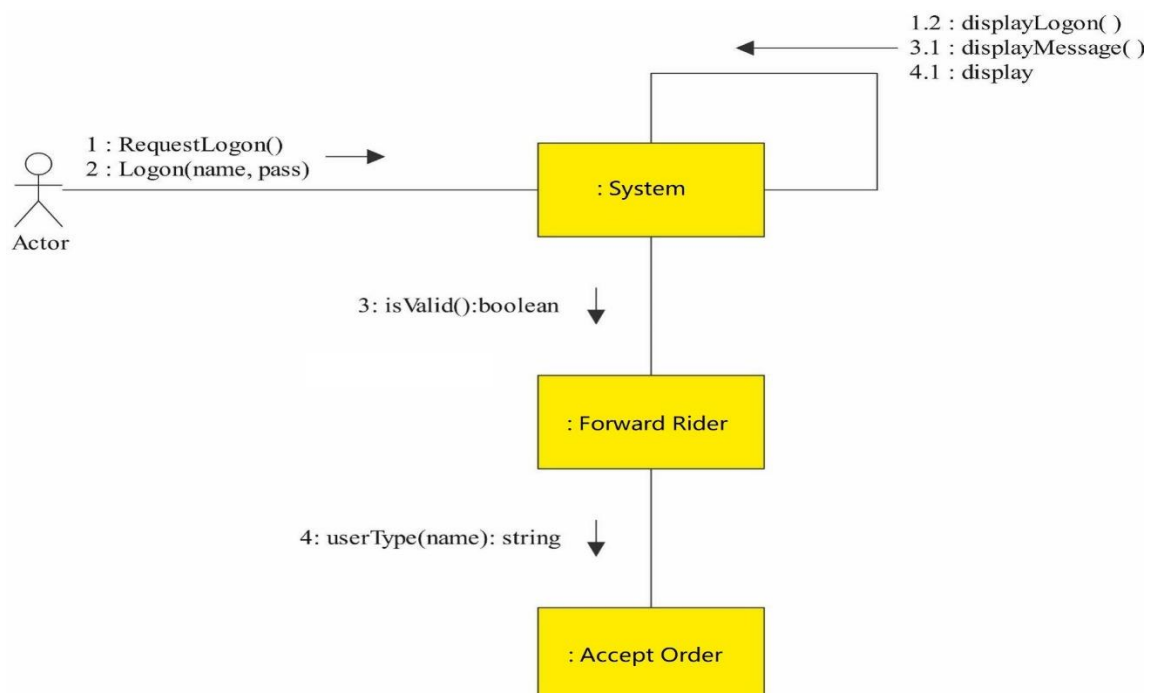
Task 19: Activity diagrams



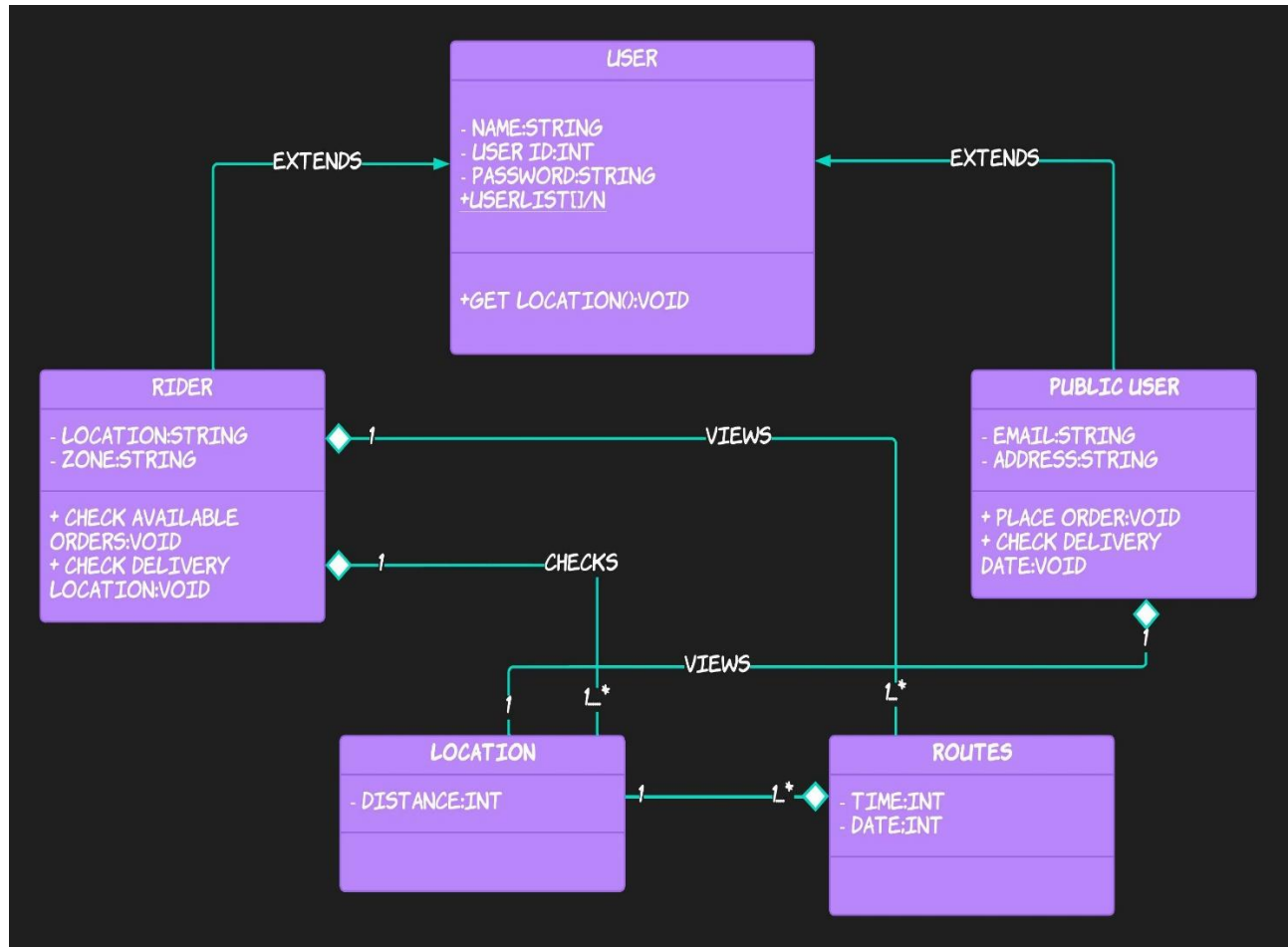
Task 20: Sequence diagrams



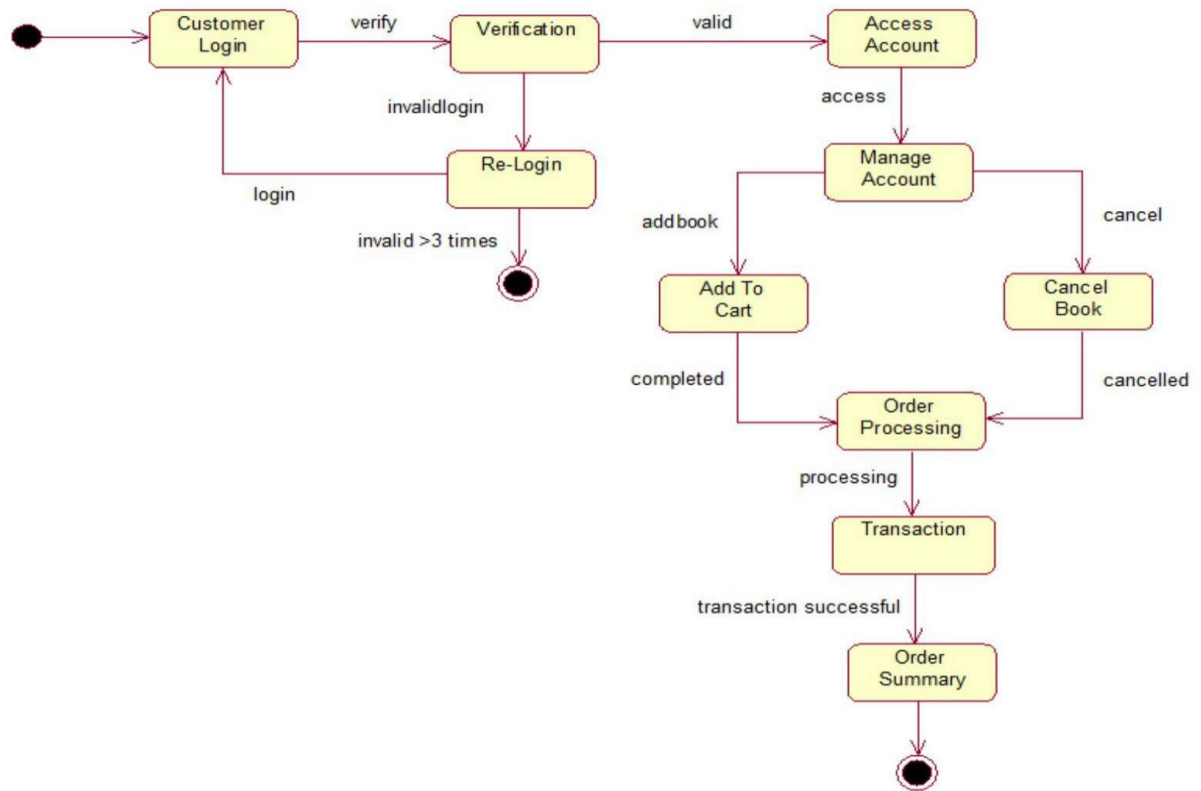
Task 21: Communication diagrams



Task 22: Class diagrams



Task 23: State-chart diagrams



Task 24: CRUD Matrix

	Customer	Customer Order	Customer Account	Rider Account	Rider
Receive Customer Order	R	C	CR		
Process Customer Order	CRU		RU		
Maintain Customer Order	U		U		RU
Terminate Customer Order	U		U		RU
Fill Customer Order	RU		RU		
Ship Customer Order			U		C

SECTION 4

Task 25: Structure English Pseudo Code for the System

1. The user can login to the system using their NAME, USER ID.
2. In the 2nd scene they must select the region from where they will be zoned.
3. Suppose, if the user selects Dhaka then he will again have the option to select the area he wishes to operate.
4. After all the selections and setting up the user is ready to view their mapping data.
5. If the user selects a service to pick up or courier then he will see all available services.
6. After selection he will see the best route selected from previous data from the available riders, where the best time and distance is calculated.
7. Thus, the delivery will be completed and the app will save the data once again for future usage.

Task 26: Prototype The User Interface

USER LOGIN

User ID:

Password:

User Type: ☐ Rider ☒ Courier

USER LOGIN

User ID: Aqib

Password: *****

User Type: ☐ Rider ☒ Courier



Available Regions

| Dhaka |

Dhanmondi | Mirpur | Uttara | Bashundhara

Khilgaon | Jatra Bari | Wari | Motijheel

Banani | Gulshan | Mohakhali



Select Region

User Region: | Dhaka | | Chittagong |



