CSE-516 (SOFTWARE ENGINEERING & INFORMATION SYSTEM DESIGN LAB)

Group : 7 (G)

Report on "Traveller's Diary"

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Chapter 1

Problem Definition Document (PDD)

Traveller's Diary

Android application to make your trip a piece of cake!

1. Introduction:

Around the globe, traveller's need such a tool that makes their journey easier. Keeping that in mind, an android based application named Traveller's Diary is presented. This application is to meet the desire of a traveller for convenient journey anywhere in Bangladesh. Maps are provided by Google and Global Positioning System (GPS) is used to get the exact location to be visited.

This report consists five sections. These are: problem statement, project objectives, preliminary solution, project scope, feasibility study.

2. Problem statement:

The problem statement can be illustrated in a practical scenario. Suppose, When we the 15th batch of CSE CU decide to go on a tour firstly we have to make a list of suitable places form which we will choose one to visit. We must keep in mind that the budget allocated for the tour. Then comes the problem of transportation. Which way or which medium of transportation is safe, suitable and cost efficient to reach our desired place. So, there arise question in our mind .that is - Bus? Train? Plane?

After that we need to find a temporary resident. It can be hotel rooms, guest houses and rest houses. We have to also keep in mind that is it safe for women and children? Is it enough to accommodate all of us? We have to make an arrangement for food within our budget and the food should be of good quality. How we will manage such food there?

Now our goal is to solve this problems through this application.

3. Project objective:

The objective of this project is to create an application that provides information related to location, transportation, food and living to fellow travelers. In previous sections there stated some major problems and their solution of traveling a place. Now, this section tells about the purpose of this application/project to meet up the travelers expectations.

This application will provide user/people the exact location of their desired place and proper schedule of all transportation with cost. It will also show them the location of nearest restaurant and food corner of that place and available living arrangements.

4. Preliminary solution:

All possible solutions for solving any problem are called preliminary solution. When we want to travel any place, we must know that the exact location of that place & traveling cost. For this we have some preliminary solutions in this project. These are –

4.1 Googling : We can find any tourist location by using Google map, browsing different travel agencies website.

4.2 BTB(Bangladesh Tourism Board): This organization is built for making a tour in different places. It provides different types of facilities for tourist.

4.3 Accessing previous information : We can find location by accessing previous information.

4.4 Experts solution : There have some tourist expert who can help us in our traveling.

4.5 A mobile application : A mobile application can also help us in our traveling. It have many features to find location, traveling cost, restaurant, hotel etc.

A mobile application can be used easily as a diary in our smart phone. So, the best and easiest solution is building a mobile application to make a travel peaceful & safe.

5. Project scopes:

Project scope presents the estimated cost and time needed for the project to be successful.

Table-I Project scopes

Functions	The functions provide exact location route, nearest restaurant & hotel, approximate traveling cost, add information and a game.
Features	The features that the application will consist of search bar, GPS location, route, food, cost, game bar, add info bar.
Facilities	This app will offer such kind of facilities that its user can easily find the desired place & also get information about this place.

The approximate estimated cost of this project is 865,000 BDT(Eight Lakh Sixty Five Thousand Taka). And the estimated time of this project is 10 (Ten) months.

6. Estimated cost and time for Feasibility Study:

One Analyst will perform feasibility study in order to investigate possibilities for the project. The cost and duration of doing feasibility study are 10,000TK (Ten Thousand Taka) and 2 (Two) weeks.

Chapter 2

Feasibility Study

1. Introduction:

Feasibility study is the study that is made before committing to project. It is a primary requirement for the development of the project. It leads to a decision whether to or not to go ahead or think again. The purpose of feasibility study is not to solve the problem but to determine whether the problem is worth solving. And so to decide whether to proceed with the project or not. The technical, operational and economical feasibility is needed to be done. Economical feasibility determines whether the benefit or return justifies the cost or investment. And if the payback period in which we recover the initial investment is less than the system life. In a nutshell, the purpose of economical feasibility is to determine if it is a good proposal or not, a good project to do or not from investment point of view. Technical feasibility refers to the availability of technology for implementation. Operational feasibility defines whether or not the project will be feasible as per rules, regulations, laws, organizational culture, union agreement etc. Now, to proceed with the study, we start by clearly understanding objectives from PDD. From which we get, the project tends to implement in the travelling sector. The users are fellow travelers, people around world who love to travel. The project is to make a generic software. In order to study the existing system, we interviewed the users and found that the task was to give information about the location only. Data were handled poorly and the problems that they faced were harder navigation, inconsistency along with fewer features. To overcome these inconveniences, we took this project. A logical model, Data Flow Diagram, is made for a better view of the project. Then we analyze feasibility for cost and benefit for the different alternatives that have been considered. After which a recommendation is to be made and a plan of action is developed for the project.

This report consists six sections. These are: background, outline of software project, methodology, overview of alternatives, conclusion and recommendation.

2. Background:

This section of the report gives an overview of what happened before and why have we taken this project. Before proceeding further, we may take a tour back to where it started. We suggested an android application named 'Traveller's diary' as a solution to the inconveniences that occurred. In existing system, traveller's or in our case, users need were not met upto their expectation. Users are those who love to travel or are compiled to do so for any consequence such as work, study etc. Most of them wish to plan their budget before travelling. This feature is absent in the existing system. In traveller's diary, user can access any location and plan their expenses according to their budget including transport, food and residence. Where existing system make navigation a tiresome process, ours make navigation easier. As the places along with their expenditure in transport, residence and food are divided into division, district and so on. An extra feature is added for the entertainment of the user. A trivial game on the basic knowledge of maps. But to end, the most attractive feature of all is that, user may include new places that they have discovered in the apps database. Existing feature, neither in which it has been introduced. Furthermore, this report on feasibility study of our project justifies all the possible alternatives for feasibility. And conclude by recommending an alternate.

3. Outline of software project:

As the application is generic, it can be used by any user having an android based device like tablets or smartphones. So, we can say that there is no particular user range for this application. But in general, probably this application will be mostly used by the people who loves traveling. This is also helpful to the foreigner who have no idea about the Bangladeshi tourist spots.

If a traveler planned for a long tour, he/she has to think about not only the location but also lot of information about transportation, residence where he/she could live and also food without which he/she can't enjoy anything.

This application provides to user the all possible information about the location he/she wants to travel include transportation, restaurant, residence etc. It can also be a valuable resource for the people who wants to know about new places for their travelling mind. They also can know the exact location of those desired place for the tour on the google map provided by the apps. But this feature will be accessible only by assuring the internet connection.

Required data for this application will be mostly about the transportation, living and food information. In this app, one of the feature will be accessible by the user that add new places that they know the place with some proper information but not listed. In order to identify the location it will use google map.

The Fig-1 illustrates the logical model of the apps using data flow diagram:

Fig-1: A data flow diagram for the android
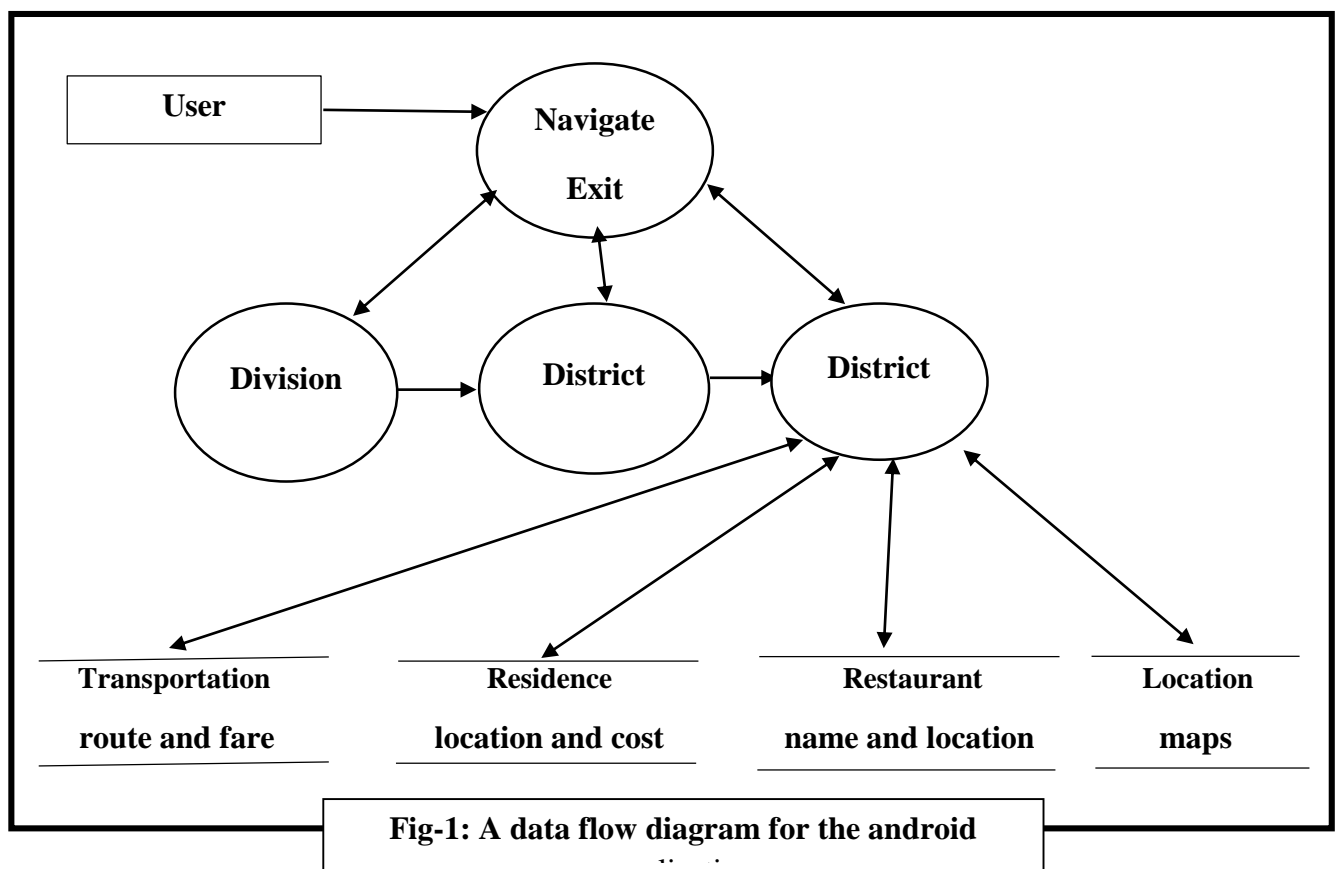
4. Methodology:

Methodology is a system of methods used in a particular area of study or activity. It involves discussion on method of analysis for feasibility study. The main objective of this feasibility study is to determine the solution based on three types of feasibilities: technical feasibility, operational feasibility, & economical feasibility.

4.1. Technical Feasibility: By studying technical feasibility, we will be able to know that if the required technology to implement the alternatives is available or not.

4.2. Operational Feasibility: Operational feasibility is dependent on human resources available for the project and involves projecting whether the system will be used if it is developed or implemented. It is a measure of how well a proposed system solves the problems and takes advantage of the opportunities identified during scope definition.

4.3. Economical Feasibility: By conducting the economic feasibility, we can compute the present value of our product by using future benefit. And we can use this following formula (1).

$$P = \frac{F}{(1 + I)^n} \qquad \text{...................} (1)$$

where "P" is for present value and "F" is for future benefit. And "I" indicates prevailing interest rate and "n" indicates the year of benefit.

So, we can say that, here the methodology is very much important for identifying the present value of our product by using future benefit.

5. Overview of alternatives:

Now we'll take a look to the alternative solutions as per the parameters **technical feasibility**, **operational feasibility**, & **economical feasibility**.

In the previous document (PDD), merely a prediction was estimated about total cost of 18,00,000 and 10 months. As per the result of feasibility study, the time and cost have been minimized. The costing can be different types.

One-time costs for our project are DBMS, Employee costs as they are contract based. **Recurring costs** are server maintenance cost, Google Map Service. And lastly The **Variable costs** initial data entry, other maintenance costs.

Two alternatives are considered. The overview of these alternatives are shown in the next page.

<u>**Alternative-1:**</u> **Static Data with Strong DBMS**

- One 30 GB file server with strong DBMS.
- Information and data are stored statically only in app's database server.
- Don't have to use 'Google Map Service'.

    Costs:

Table I: Cost for Alternative 1

Server	25,000BDT
DBMS	35,000BDT
Analyst	2,00,000BDT(3 Months)
System Designer	1,00,000BDT(2 Months)
Programmer	30,000(1.5 Months)
Initial Data Entry	1,10,000BDT(1.5 Months)
TOTAL	5,00,000BDT(8 Months)

Financial Analysis For Alternative-1:

- Initial Cost: 5,00,000 BDT

Table II: Benefits and Costs (Per Year)

A brief calculation of earnings from Advertisement, From	
8(avg) Travel Agencies	4,000BDT per month
15(avg) Hotels (Residential)	5,500BDT per month
3(avg) Bus Transport Agencies	1,000BDT per month
TOTAL	10,500BDT per month
That evaluates,	
Outcome from Advertisements (per year) 10,500*12	1,26,000BDT
Server Maintenance(per year)	20,000BDT
Other Maintenance(per year)	10,000BDT

- **Net Return Per Year = (1,26,000 - 20,000 – 10,000) BDT = 96,000 BDT**
Investment Analysis For Alternative-1:

Table III: Investment Analysis For Alternative 1

Year	Saving (Lakhs)	Present Value (at 12%)	Cumulative Value
1	0.96	0.85	0.85
2	0.96	0.77	1.62
3	0.96	0.68	2.30
4	0.96	0.61	2.91
5	0.96	0.54	3.45
6	**0.96**	**0.49**	**3.94****
7	0.96	0.43	4.37
8	0.96	0.38	4.75

(**As our initial data entry cost was 1,10,000 BDT, subtracting this value from our total investment, we get 3,90,000 BDT. We get our return of investment at the 6th year.)

<u>**Alternative-2:**</u> **Dynamic Data with Better UX(User Experience)**

- One 30 GB file server.
- Information and data are stored dynamically and access isn't bounded only in app's database server.
- Use of 'Google Map Service'.

Costs:

Table IV: Cost for Alternative 2

Server	25,000BDT
DBMS	25,000BDT
Analyst	3,50,000BDT
System Designer	1,50,000BDT
Programmer	50,000BDT
Initial Data Entry	1,00,000BDT
Google Map Service	30,000BDT
TOTAL	7,30,000BDT

Financial Analysis for Alternative-2:

- Initial Cost: 7,30,000 BDT

Table V: Benefits and Costs (Per Year)

A brief calculation of earnings from Advertisements, FROM	
15(avg) Travel agencies	7,500BDT per month
30(avg) Hotels(Residential)	10,500BDT per month
5(avg) Bus Transport Agencies	2,000BDT per month
50(avg) Restaurants	5,000BDT per month
TOTAL	24,500BDT per month
That evaluates	
Outcome from Advertisements (per year) 24,500*12	2,94,000BDT
Server Maintenance	20,000BDT
Other Maintenance	10,000BDT

- **Net Return Per Year = (2,94,000 - 20,000 – 10,000) BDT = 2,64,000 BDT**

Investment Analysis For Alternative-2:

Table VI: Investment Analysis For Alternative 2

Year	Saving (Lakhs)	Present Value (at 12%)	Cumulative Value
1	2.64	2.35	2.35
2	2.64	2.10	4.45
3	**2.64**	**1.88**	**6.33****
4	2.64	1.68	8.01
5	2.64	1.50	9.51
6	2.64	1.34	10.85
7	2.64	1.19	12.04
8	2.64	1.07	13.11

(**As our initial data entry cost was 1,00,000 BDT, subtracting this value from our total investment, we get 6,30,000 BDT. We get our return of investment at the 3rd year.)

6. Conclusion:

Now we'll take an overview to the alternatives that we have discussed earlier.

Table VII: Alternative-1

Net Investment	5 Lakhs
System Life Cycle	6 Years
Pay Back Period	6 Years
Net present Return Value	3.94 Lakhs

Table VIII: Alternative-2

Net Investment	7.3 Lakhs
System Life Cycle	6 Years
Pay Back Period	3 Years
Net present Return Value	6.33 Lakhs

In conclusion to the study of feasibility, Alternative-2 gives the best return value in short period of time rather than the Alternative-1 and also gives technically more features to the users. This alternative is economically, technically as well as operationally feasible.

7. Recommendation:

After considering all the alternatives, the recommended alternative would be **Alternative-2**. We can proceed further to our project along with the alternative-1 solution through feasibility study. Now the part of the project planning based on this study. Based on the project plan we will start our journey.

Chapter 3

Project Planning

Traveller's Diary

Android application to make your trip a piece of cake!

1. Introduction:

Project planning is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. It is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling and closing. A software project development is subject to a range of schedule, budget and organizational constraints. The project manager's job is to ensure that the software project meets and overcomes these constraints as well as delivering high quality software. He is responsible for planning, estimating and scheduling project development and assigning people to task. He supervises the work to ensure it is carried out the required standards and monitor progress to check that the development is on time and within budget. Project planning takes place at three stages in a project life cycle. Firstly, at the proposal stage, secondly during project startup phase and periodically throughout the project. The most important goals of project planning are to deliver the software to the customer at the agreed time, keep overall cost within budget, deliver software that meets the customer's expectations and also maintain a happy and well-functioning development team.

We are working on to develop a project named "Traveller's Diary" to implement in the travelling sector. The main objective of this project is to create an application that provides information related to location, transportation, food and living to fellow travelers. This application will provide user/people the exact location of their desired places and proper schedule of all transportation mediums with cost. It will also show them the location of nearest restaurants and food corners of that place and available living arrangements.

We have completed feasibility study on this project. From the feasibility study report we calculated that we will need approximately 7.30 lakhs Taka (Seven Lakhs Thirty Thousand Taka Only) and 10 (Ten) months to develop this project.

This report consists of seven sections. These are: project organization, risk analysis, hardware and software resource requirement, work breakdown, project schedule, monitoring and reporting mechanism and conclusion.

2. Project Organization:

The distribution of major works among development team members is called Project Organization. The development team for this project is seven (7) members. It is organized as one project manager, one Project manager, two Software analyst, two Software designer, two Programmer. A description about each member is shown in Table I:

Table I: Project Organization

Member Name	Job Description
Anika Sharif	Project manager
Tarjina Jahan Sonia	Software Analyst
Momtahin	Software Analyst
Taslima Rahman	Software Designer
Chandrima Barua	Software Designer
Abdullah Al Noman	Programmer
Chowdhory Junayed Mahmud Abrar	Programmer

3. Risk Analysis:

Risk analysis refers to the identification of risks that may affect the project schedule or performance of the app being developed. It helps taking action against risks with proper reduction strategy. Before analyzing risks, we must know what risk is and what the categories are. Risk is something that threatens the project and is not preferred to have happened during software development. The categories include project risk, product risk and business risk. Also, these types can overlap and make an individual category. Our app might be at the risk of project risk, if our project schedule is affected i.e. loss of previously hired experienced designer, coder or analyst. The risk that affects the performance i.e. bad performance of the purchased server, underperformance of graphics related software, coder with no experience defines the product risk of our app. Emerging new apps that are more developed, handy related to travelling, threatens our app. Our app will be at business risk if it doesn't stand strong in the competition.

Risk analysis involves identification, measurement, planning strategies and monitoring of risks. Issues that pose risk to our app are identified as, technological, people, organizational, tools, requirements and estimation. The app faces technological risks when server that we are to use, graphics software, operating system or hardware of functioning computer malfunctions.

People risks happen due to illness and unavailability of people including those who are inexpert, untutored for lack of accessibility to training. Organizational risks cause by financial breakdown from insufficient investment. There lie risks of tools when software tools don't work in an integrated way and generate insufficient codes. Though features have been developed by keeping user's necessity in mind, faulty design tends to a rework of design which brings requirement risks. Inaccurate assumption of time, scope, maintenance and investment resources infer to estimation risks.

During risk analysis, we have to measure probability and effect of the predicted risks. Per probability, flawed design, inoperative app, amateur coder, inexpert analyst and designer presents very high risk which is per effect catastrophic. Defective server and software's confer high risk where requirement and business risk stances moderate risk indicating serious risk. The risks ascended by people are low in probability denoting itself as tolerable. Scarcity of training the amateur unprofessional imposes very low risk stating insignificant risk.

In order to plan strategies, judgment depends on the combination of probability and effect of the risks. Avoidance, minimization and contingency plan establish risk reduction strategy. By replacing tools and technological risks with proper substitutes avoidance strategy is achieved. The impact of people risk reduced through reorganizing the team provides strategy to minimize risks. Contingency plan prepares for the worst comprising alternative beneficiaries to rely throughout financial mishap. Appropriate strategy should be taken in action when it's time. Anticipated risks should be monitored at all stages during our project frequently and regularly assessed irrespective of its probability and effect.

4. Hardware and Software Resource Requirement:

To make the project be successful required hardware and software are –

4.1. Hardware Resources: Hardware means the tangible resource for the project which should be used for making this application. The Hardware requirements for this application are tabulated as follows:

<div align="center">

Table II: Hardware Requirements

</div>

Hardware	Minimum Requirements
1. CPU	Intel® or compatible Pentium 2GHz or higher.
2. RAM	2GB MB Minimum; 4GB Recommended
3. Hard Disk Space	400 MB hard disk space + at least 1GB for Android SDK
4. Monitor	1280 x 800 minimum screen resolution.

So, we need a computer with described configuration. Estimated price of above configurations computer is 40,000 (Forty Thousand) BDT.

Table III: Hardware Delivery Schedule

Hardware	Quantity	Estimated price (per piece)	Delivery Date(dd/mm/yyyy)	Receiver
1. Computer	2	40,000 BDT	15/02/2017	Abdullah Al Noman

4.2. Software Resources: Software is the intangible resource for this application. Required software are -

4.2.1. Windows operating System: Must needed for running the computer. There are several versions of it. Such as Windows XP, 7, 8, 8.1, 10 etc. Windows 10 is the latest version of windows. One of them can be used. But it is recommended to setup latest versions.

4.2.2. JDK (Java Development Kit): It is an open source software. It must be installed on system. Latest version is recommended.

4.2.3. Android Studio/Eclipse/NetBeans: One of them can be used for developing the application. It is recommended to use android studio.

4.2.4. ADT (Android Development Tools): If android studio is installed then no need to install it. Otherwise it must be install after installing the Eclipse or NetBeans.

4.2.5. MySQL: It is needed for working on DBMS (Data Base Management System). Approximately 30GB storage needed for this application.

5. Work Breakdown:

Our development team consists of seven members. So, the project manager can break down the whole project into a set of activities and assign these tasks to different team members. This work breakdown is considered one of the most important tasks in a project planning. Project manager first determines deliverables, then decompose them to successively small parts of work.

5.1 Milestone: Each work progress can be assessed in certain stages to the project manager is known as Milestone where milestone is a recognizable end point of a software process activity. All the milestone of a project helps us to build a good software.

5.2 Deliveries: A Deliverable is a Project result that is delivered to the customer. It is usually delivered at the end of some major project phase such as specification or design.

In our feasibility study we estimated a duration for our project to complete this & that is 10(TEN) months & we have started our project on 24th January 2017(24.01.2017). So, Project manager divides the whole project into 10(ten) task which is based on our feasibility study & project criteria. The whole work breakdown of our project is given below in Following Table IV :

Stage of Development	Task	Description	Milestone	Deadline	Deliveries
Requirement Analysis	T1	Requirement Identification	M1	9.2.2017	
	T2	Budget Planning	M2	11.4.2017	
	T3	SRS Document Preparation	M3	11.5.2017	
Design	T4	Planning Process	M4	26.5.2017	
	T5	Application Design	M5	25.7.2017	
Implementation	T6	Welcome Screen, Icon & main menu Implementation	M6	9.8.2017	
	T7	Map Implement	M7	9.9.2017	
	T8	Data Entry, Adding Photograph, description	M8	24.10.2017	
Integration & Testing	T9	Tasting & Bug Fixing	M9	8.11.2017	
Deployment	T10	User Guide Preparation , Monitoring & Deployment		23.11.2017	User Guide & .apk file

Table IV: Work Breakdown

6. Project schedule:

6.1. Schedule of Task: The whole project work is divided into 10 small units of task. The following tabular representation shows that the task or activity name, efforts behind the task, duration and its dependencies.

Table V: Task Schedule

Task	Effort (person)	Duration (days)	Dependencies
T1	1	15	
T2	2	60	T1(M1)
T3	2	30	T2(M2)
T4	1	15	T3(M3)
T5	2	60	T4(M4)
T6	2	15	T5(M5)
T7	2	30	T6(M6)
T8	2	45	T7(M7)
T9	2	15	T8(M8)
T10	2	15	T9(M9)

From the table, we see that the first task T1 will be done by the effort of 1 members within 16 days and it depends no other tasks. And we'll reach the milestone M1.The second task T2 will be done by 2 members within 60 days and it depends on task T1, after the completion of this task, we shall reach to the first milestone M2.

Similarly, T3 will be done by 2 members within 30 days and it depends on the tasks T4; after the completion of this task, we will reach to the 3rd milestone M3.
T4 will be finished by 1members within 15 days and it depends on the task T3;after the completion of this task , we will reach to the 4th milestone M4.

 T5 will be completed by 2 members within 60 days and it depends on the tasks T4 ; after the completion of this task, we will reach to the 5th milestone M5.

T6 will be finished by 2 members within 15 days and it depends on the task T5; after the completion of this task, we will reach to the 6th milestone M6.

T7 will be finished by 2 members within 30 days and it depends on the task T6; after the completion of this task, we will reach to the 7th milestone M7.

T8 will be finished by 2 members within 45 days and it depends on the task T7 ; after the completion of this task, we will reach to the 8th milestone M8.

T9 will be finished by 2 members within 15 days and it depends on the task T8; after the completion of this task, we will reach to the 9th milestone M9.

T10 will be finished by 2 members within 15 days and it depends on the task T9. After completing T10, we will reach to the finishing point of our project.
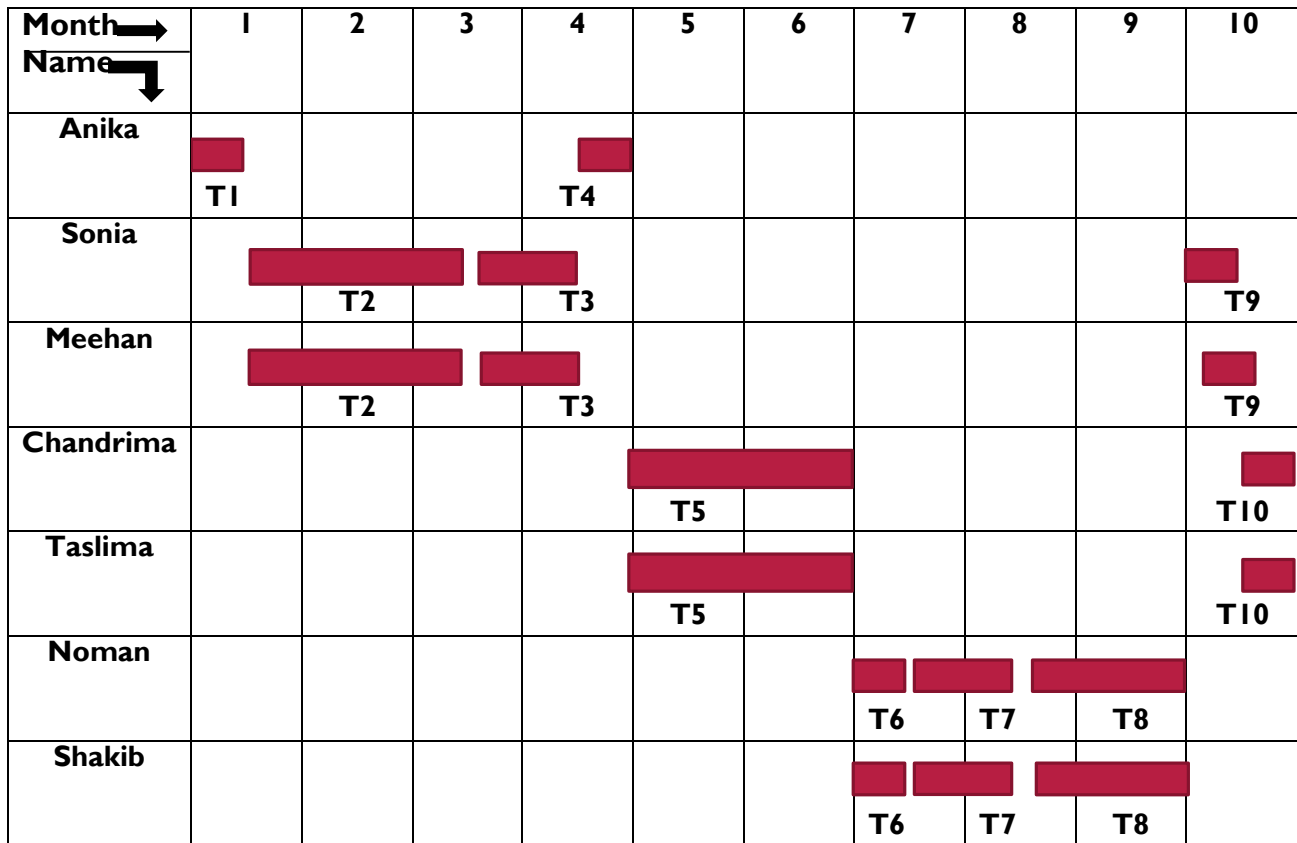
The task dependency and milestone are best represented through a graphical chart called **Gantt chart.**
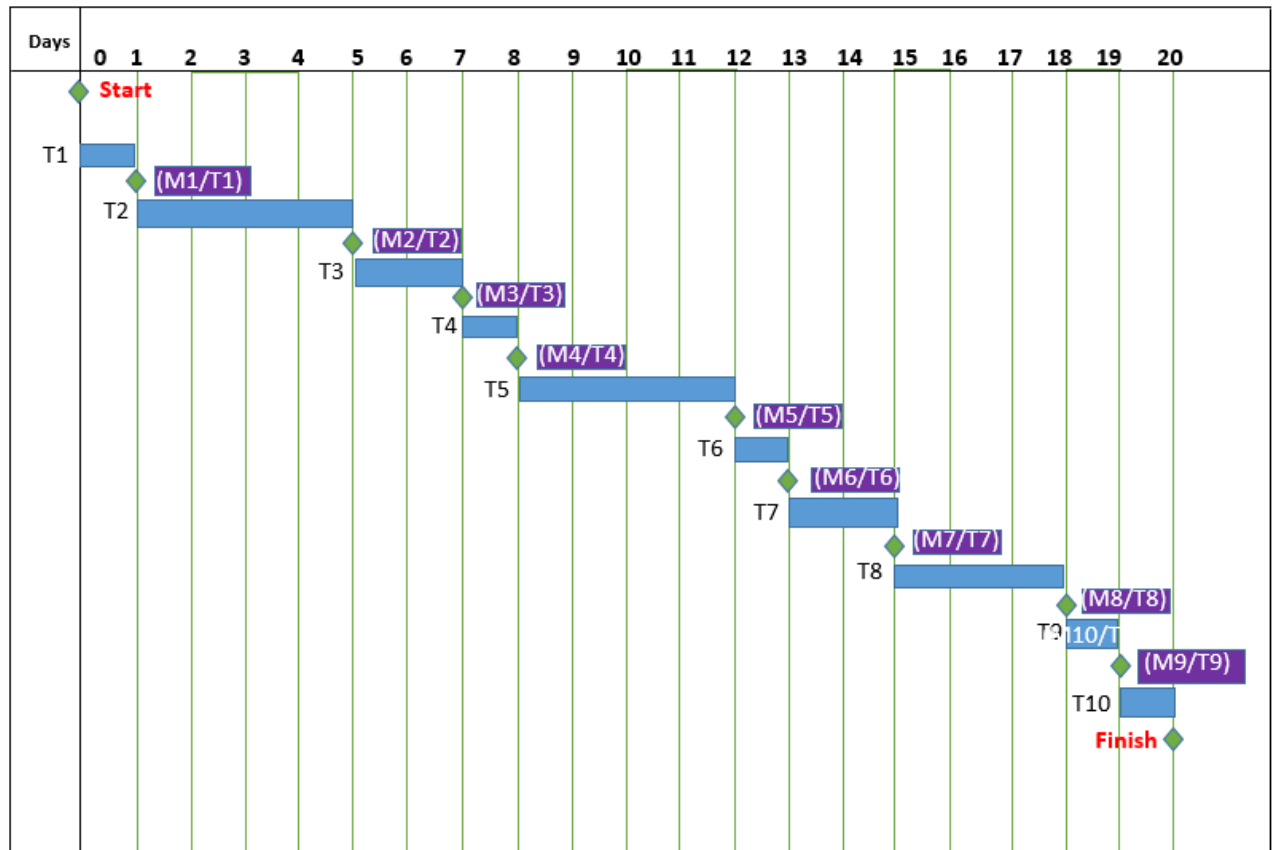
Fig 1.6: Gantt chart

From the chart we see that the tasks are represented through blue colored horizontal bars, the milestones and task dependencies are represented here through violet colored horizontal bars. Also if a task is depended on another task, then the second task is started from the bottom-right corner of the previous task. And if a milestone is reached after the completion of a task, then a diamond is placed on the top-left corner of that task. Moreover, the tasks are started by placing a diamond on the top-left corner of horizontal bar of the first task and finished by placing a diamond on the bottom-right corner of the horizontal bar of the last task.

6.2 Tasks Allocation to Project Members: We have presented a task allocation chart in the following. Here, each task is represented by the horizontal bar with. Each bar is expanded to its width with respect to the time duration. Here, team member Anika is allocated to tasks T1 & T4. Sonia & Meehan are allocated to tasks T2,T3,T9. Chandrima and Taslima are allocated to tasks T5 & T10. Noman & Shakib are allocated to tasks T6 ,T7& T8.

Month Name	1	2	3	4	5	6	7	8	9	10
Anika	T1			T4						
Sonia		T2		T3						T9
Meehan		T2		T3						T9
Chandrima					T5					T10
Taslima					T5					T10
Noman							T6	T7	T8	
Shakib							T6	T7	T8	

Fig 1.7: Task allocation to the project members

7. Monitoring and reporting mechanism:

Monitoring is the continuous process of assessing the status of project implementation in relation to the approved work plan and budget. The overall purpose of monitoring is to ensure effectively managed results and outputs through measurement and assessment of performance. Monitoring is the responsibility of the project coordinator. To successful a project good monitoring should consist of the following:

The project coordinator has to keep an eye on "what is going well" and "what is not progressing" in terms of progress toward the intended results.

The project coordinator or manager should be dedicated to assessing progress, looking at the big picture and analyzing problem areas. They should ensure continuous documentation of the achievements and challenges as they occur.

The project coordinator or manager should review project-related reports, including financial reports, by the implementing partners to serve as a basis for their analysis.

Use of participatory monitoring mechanisms to ensure commitment, ownership, follow -up, and feedback on performance: These include outcome groups, stakeholder meetings, steering committees, and focus group interviews.

Project reporting is the formal presentation of monitoring information. It serves as a reference for future projects. Reporting maintains a record of all actions taken during project implementation. It therefore constitutes a vital resource for auditors and evaluators in assessing whether a project has been implemented in accordance with the rules and regulations and as efficiently and effectively as possible.

Monitoring and reporting should be in such way that avoid repeating mistakes from the past. It also ensures that all project reports are submitted on time. Projects can only be closed once all the reporting requirements have been met.

8. Conclusion:

In these report the necessary steps and working plan to build up an app of travelling information is presented. Proper steps including pricing, the work schedule, cost estimation, minimizing risk.

Chapter 4

Requirement Analysis

Traveller's Diary

Android application to make your trip a piece of cake!

1. Introduction:

A system requirement specification is a document or set of documentation that describes the features and behavior of a system or software application. It includes a variety of elements that attempts to define the intended functionality required by the customer to satisfy their different users. In addition to specifying how the system should behave, the specification also defines at a high-level the main business processes that will be supported, what simplifying assumptions have been made and what key performance parameters will need to be met by the system. Depending on the methodology applied the level of formality and detail in the System Requirement Specification Document will vary, but in general System Requirement Specification Document should include a description of the functional requirements, system requirements, technical requirements, constraints, assumptions and acceptance criteria.

2. Overview of the system:

Our "Traveller's diary" is a GPS based mobile application which helps people find fascinating tourist spots based on user's desire with other specifications like transportation schedule, existing accommodation and location of available restaurant of that place.

The application shall be free to download from either a mobile phone application store or similar services. Furthermore, the software needs both Internet and GPS connection to fetch and display results. All system information is maintained in a database, which is located on a web-server.

3. User requirement definition:

User requirements definition describes the services provided for the user. The success of a project lies on the satisfaction of users. To develop a system, we first need to find out the requirements of the different users so that full satisfaction of users can be attained which is a measure of successfulness of a project. Requirements are description that the system should do under some constrains. It should describe the functional and non-functional requirements. It should be understandable by system user who doesn't have detailed technical knowledge. We should not include the details of the system architecture or design. We also should not include software jargon, structure notation or formal notations. We should write user requirements in natural language, with simple tables, forms and initiative diagrams. User requirements are as follows:

3.1. Functional requirements:

3.1.1. System shall show necessary information about user's desired place.

3.1.2. System shall have information search feature.

3.1.3 System shall provide exact location route, nearest restaurant and hotel, approximate cost of entire trip.

3.1.4. System shall have information update feature by user.

3.2. Non-Functional Requirements:

3.2.1. System shall be fast and memory effective and user friendly.

3.2.2. System shall be secured and reliable.

Table-I shows the functional and non-functional requirements of the app:

Table-I: Functional and Non-functional requirements

Functional Requirements	Non-Functional Requirements
1. Information considering users destination	**1.** Fast and effective of memory space
2. Navigation feature	**2.** Secured and reliable
3. Confirm location of hotels, restaurants and related expenditure	
4. Updating information access to user	

4. System requirement specification:

The meaning of the term of System requirements is giving the requirements to be met in the design of a system or sub-system. System requirements are more detailed descriptions of the software system's function, services and operational constraints. The system requirements document should define exactly what is to be implemented. It may be part of the contract between the system buyer and the software developers.

System requirements of Traveller's Diary are given below:

4.1. Functional Requirements:

The Functional requirements for Traveller's Diary are given below:

4.1.1. Traveller's Diary implements a series of categorized buttons, which users press and gather information on the location along with the information about transportation mediums available to reach that location, living residences for travelers and nearest restaurants. Each tourist location has its own description, such as the natural or historical interest of the place, how to go there, estimated cost of staying in that place etc. And with each location, some photographs will be shown by pressing the button for photographs.

4.1.2. The app displays an interface, which is integrated to Google Maps Android app. The map shows a route with a red line the tourist location. The route is determined by certain functions inside the app, and the layout of the road or river is pre-determined by Google's satellite.

4.1.3. The app is designed in such a way that user can directly interact with the system. User can add information about new places if it is not available in the system.

4.2. Non-functional Requirements:

4.2.1. The app is designed to be more user-friendly. It is not hard for any user to find his desired location. Moreover, a user can easily search through the categories, such as division or district, to find a tourist spot of his interest. The buttons are easy to understand, and provided that the user has internet connection and GPS enabled, it can show the route accurately.

4.2.2. The app is also efficient in storage saving. In the previous version, the route of the location was designed one by one, and this approach will take a lot of memory space of the device. But now, we are designing it by placing all of the locations into a single activity interface of the app, and this would cause the size of app to be reduced.

4.2.3. The app gives the best performance in delivering the desired output to a user and is also reliable. The co-ordinates of the locations are precisely calculated and integrated into the system. With a high-speed internet connection and GPS enabled, the route is shown almost instantly.

4.2.4. This system will be reliable as all possible steps will be taken to avoid any failure. If any error occurs there has specific the correction strategy to solve it.

4.2.5. This system is flexible and easy to use in any configuration and different environments.

5. System's scenario:

It's easier to relate to real-life crisis than abstract descriptions. Scenarios can be particularly useful in this manner. It can add detail to an outline requirement description. Starting with an outline of the interaction it adds detail to create a complete description of that interaction.

Scenarios maybe described in plain text or supplemented by diagrams, screenshots etc. Simple text is used in this report.

Here's a table for the overview of depicted scenarios in Table-II:

Table-II: Emphasized scenarios at a glance

Scenario	Description
Scenario 1	Searching for a place of choice
Scenario 2	Discover new location of places at random
Scenario 3	Route and cost of transport
Scenario 4	Location and cost of residence
Scenario 5	Name and location and of restaurants
Scenario 6	Addition of a new place

Scenario 1 (Searching for a place of choice):

Initial Assumption:

User has selected a place he would like to visit and got into the app. The app will give user access to the systems database to get desired info about that particular place. User shall enter the name of that place and voila.

Normal:

The user opens the app from the device in which it's installed. He types in the name of the place in the search bar. The app shows information related to that place if available. It basically shows the route and fair of transport whether bus, train or airplane.

What Can Go Wrong:

The place user enters as input might not be present in the systems database. In that case, the app gives user option to add that place in the database. He may add it with proper information that is known to him. It can be modified afterwards.

What If user only knows the name? And nothing else! Then, he would have other options. For instance, he could search for a different place. The system strictly discourages addition with improper info at any cost.

Other Activities:

User may add place but it'll be added to the database only after appropriate validation. User shan't face any trouble using other features simultaneously.

System State on Completion:

The place is added to the database and ready for further use upon navigation. User closes the app and the system returns to improved state.

Scenario 2 (Discover new location of places at random):

Initial Assumption:

The place is not yet decided; user would like to pick it at random. For which, he uses the app to search among division of his choice in accordance with the district ending up with a place whereas user begins his journey. The app provides with the information.

Normal:

User gets into the app and navigates the given options division, district, place as such. He searches by division and chooses one. Or he just goes through the options. Suppose, Chittagong division is what he picks. And under this division, he gets many options of district. From those he selects Bandarban district. He gets the list of places to visit in Bandarban including the map giving route and cost of transport, living and food arrangements for each one of them on the click of a button! From there he decides which one to point out and move along.

What Can Go Wrong:

User may not get what he wants or the way he wants it. The system fails to satisfy user for lacking in improvement of database.

Other Activities:

The database gets updated every minute without interrupting user quest for travelling. It is recommended for the user to refresh home screen for improved information.

System State on Completion:

The uncertainty of the user is resolved. User picks up a place of his choice and the system returns to its former state.

Scenario 3 (Route and cost of transport):

Initial Assumption:

The user has enough knowledge about the place he wants to travel. He may travel through buses, train or airplane. Here, the exact location might be known or unknown to him as well as how much it might cost. By using the app user get the precise route of getting there by bus, train or airplane along with its cost of fair.

Normal:

User enters the app in search of the place. He finds the place and information attached to it. Suppose, user wants to travel to Nilgiri located in Bandarban district of division Chittagong. User is currently stated in Dhaka city under Dhaka division. It is shown in the app that there is transport facility by bus, air and train from source to destination. The app shows user the route

with maps provided by Google. It gives valid information about intercity buses that travel from Dhaka to Chittagong, local ones that go from Chittagong to Nilgiri i.e. where can user find 'Chandergari' (used by locals for travelling indoors) and how much it costs etc. The schedule of train is inserted based on the information collected from Bangladesh Railway. Whether or not tickets are available, how to get them online and its cost etc. Same system applies if user prefers to travel by air. The domestic airplane schedule is here with news on available ticket, its cost and nearest airport site. The app enlists the schedule and cost of all form of transportation i.e. how much bus fair, train ticket or airbus ticket is going to cost and how to get them.

What Can Go Wrong:

The app may fail to show information related to all forms of transport facility of the destination. For instance, if user desire to travel by sea or river, the app may not fulfill that wish of the user.

If the user wishes, he may add or modify information to the database with confirm knowledge.

Other Activities:

User may browse every form of transport related information at once without delay and even modify. But validation is a must for addition to database.

System State on Completion:

User is provided with the required information. He may reach for destination depending on the information he got. The system returns to its former or modified state.

Scenario 4 (Location and cost of residence):

Initial Assumption:

The user wants to know the residence facility of the place to be visited. He has gotten into the app to get info related to the living arrangement of the selected place. The app shall provide him with info about the site, price and vacancy list of the hotels according to user's likings.

Normal:

User searches for the place to be visited and available hotel or living arrangements related to that place. The app gives a list of hotels that are unoccupied. The app also offers the cost of each room depending on the time of stay. It suggests user the best living experience within that location and the price range. Accurate location (with pictures) and expense (with compare) is included too.

What Can Go Wrong:

Even though user finds various options, price range of the user might not match. In addition to extreme cases, the destination may turn out to be inhabitable for which there remains no living facility.

The user may know better living facility that's not in the database. User is encouraged to add it to the existing database upon validation.

Other Activities:

Users switch from one hotels info to other for investigation (browsing pictures, maps etc.) purpose at the same time. This won't do any harm to the systems performance.

System State on Completion:

User finds the perfect hotel he was looking for. The system goes back to its former state if not modified.

Scenario 5 (Name and location of restaurants):

Initial Assumption:

There's restaurant in every other corner today but quality differs with expense. It depends on the user requirement. The app shall offer user that look for place to eat with list of restaurant they can go to within budget and have a great experience.

Normal:

The user needs information about the food service of a place considering he knows where to go, how to go there, where to live. Now, he looks it up in the app to find out. The app presents info regarding number of renowned restaurants nearby. The restaurants are segregated according to the customer review (five star, four star, three star), expenses, nearer to hotel that user is staying etc. The app includes every possible information related to the food and its quality of every restaurant that is listed.

What Can Go Wrong:

User may face difficulty in meeting up the price due to non-updated menu of restaurant or sudden increase in price of food. Though, user satisfaction relies on the restaurant and its service, app might not succeed in rendering info about better restaurants at same price.

If possible, user may add or modify information about better restaurant present in that location and must be up to date.

Other Activities:

User shall face no trouble in navigating through various restaurants at once. User is encouraged to explore new restaurant and add it to the database.

System State on Completion:

Upon finding the preferred restaurant, user enjoys his crave for food. If modified the system turns to its modified state. And if not, system returns back.

Scenario 6 (Addition of a new place):

Initial Assumption:

Fellow travellers discover new place every day. They often need such a tool that might introduce others to go and visit that new place. The app presents this unique feature in itself. The user is given access to add any newly discovered place (that's not present in the systems database) for using in future.

Normal:

User searches for a place that is known to him but fails to retrieve info. He then clicks on the 'add new place' button and a form appears. He fills out the form with proper information that's known to him. Any invalid information about the location including facility for transport, residence and food is strictly prohibited. The database is updated only when user gives valid info as input.

What Can Go Wrong:

User gives fallacious information about new place. When system updates or modifies, these improper data may create malfunction as well. User shall abstain from putting unacceptable worthless data into the database.

Just a minute after adding, user may not get updated database. User might consider re-opening the app for improved and updated version.

Other Activities:

Upon adding, the other features might be unavailable or browsing may turn a little slow for a few minutes. The system becomes more efficient and user friendly on updating.

System State on Completion:

User add newly discovered place to the systems database. The database is modified as well as improved. The system turns to a newly modified and much improved state.

6. System's use cases:

In software engineering, use cases plays an important role by defining the interaction between a role and a system, in order to achieve a particular goal. It is a list of some action or event steps. The actor can be a human, external system as well as time.

The use cases of Traveller's Diary are given below:

UC 1: Search a place of choice

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. The phone displays the home screen of the application 'Traveller's Diary' and there is a search box for searching

7. Click on the search box

8. Type the name of the place to search

9. The phone displays the place name on suggestion list.

10. Click the place name from suggestion list.

11. The phone displays a screen contains some button including 'Show Location' button.

12. Click the 'Show location' button.

Post condition:

The phone displays the location of that place which is typed in search box with google map location.

Alternative Course:

1a. The Phone does not turn on

      1a.01. Locate an electrical outlet

      1a.02. Plug the phone into the outlet

      1a.03. The Phone displays the charging symbol

      1a.04. Resume @ 1

UC 2: Discover new location of places at random

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. The phone displays the home screen of the application 'Traveller's Diary' and there is a button named 'Division'.

7. Click on the 'Division'

8. The phone displays the list of division.

9. Select the division by clicking on a division name.

10. The phone displays the list of districts name of the selected division.

11. Select the district by clicking on a district name.

12. The phone displays the list of places name of the selected district.

13. Click the desired place name from the list.

14. The phone displays a screen contains some button including show location button.

15. Click the show location button.

Post condition:

The phone displays the location of that selected place with google map location.

Alternative Course:

2a. The Phone does not turn on

       2a.01. Locate an electrical outlet

       2a.02. Plug the phone into the outlet

       2a.03. The Phone displays the charging symbol

       2a.04. Resume @ 1

UC 3: See route and fare of transport

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. The phone displays the home screen of the application 'Traveller's Diary' and there is a button named 'Division'.

7. Click on the 'Division'

8. The phone displays the list of division.

9. Select the division by clicking on a division name.

10. The phone displays the list of districts name of the selected division.

11. Select the district by clicking on a district name.

12. The phone displays the list of places name of the selected district.

13. Click the desired place name from the list.

14. The phone displays a screen contains some buttons including 'Transportation' button.

15. Click the 'Transportation' button.

16. The phone displays two buttons route and fare.

17. Click route for see the route and click fare to see the required fare for desired place.

Post condition:

The phone displays the possible transportation route and fare for that selected place.

Alternative Course:

3a. The Phone does not turn on

       3a.01. Locate an electrical outlet

       3a.02. Plug the phone into the outlet

       3a.03. The Phone displays the charging symbol

       3a.04. Resume @ 1

UC 4: See location and cost of residence

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. The phone displays the home screen of the application 'Traveller's Diary' and there is a button named 'Division'.

7. Click on the 'Division'

8. The phone displays the list of division.

9. Select the division by clicking on a division name.

10. The phone displays the list of districts name of the selected division.

11. Select the district by clicking on a district name.

12. The phone displays the list of places name of the selected district.

13. Click the desired place name from the list.

14. The phone displays a screen contains some buttons including 'Residence' button.

15. Click the 'Residence' button.

16. The phone displays two buttons route and cost.

17. Click location for see the location on Google Map.

18. Click cost to see the list of required residential facilities, cost per night, other facilities etc.

Post condition:

The phone displays the feasible residential facilities route and cost for that selected place.

Alternative Course:

4a. The Phone does not turn on

      4a.01. Locate an electrical outlet

      4a.02. Plug the phone into the outlet

      4a.03. The Phone displays the charging symbol

      4a.04. Resume @ 1

UC 5: See name and location of restaurants

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. The phone displays the home screen of the application 'Traveller's Diary' and there is a button named 'Division'.

7. Click on the 'Division'

8. The phone displays the list of division.

9. Select the division by clicking on a division name.

10. The phone displays the list of districts name of the selected division.

11. Select the district by clicking on a district name.

12. The phone displays the list of places name of the selected district.

13. Click the desired place name from the list.

14. The phone displays a screen contains some buttons including 'Restaurants' button.

15. Click the 'Restaurants' button.

16. The phone displays the list of restaurants name and a button named location on the right side of name.

17. Click location for see the location on Google Map.

Post condition:

The phone displays the feasible food facilities cost for that selected place.

Alternative Course:

5a. The Phone does not turn on

   5a.01. Locate an electrical outlet

      5a.02. Plug the phone into the outlet

      5a.03. The Phone displays the charging symbol

      5a.04. Resume @ 1

UC 6: Add new places

Actor: User

Precondition:

1. The phone is powered on.

2. Traveller's Diary is installed.

3. User knows a place name and other informations.

Main Success Scenario:

1. Press the power button.

2. System displays the home menu

3. Tap the 'Main Menu' symbol on the menu

4. The phone displays the main menu.

5. Tap the 'Traveller's Diary' symbol on the menu

6. Searching a place.

      6a. The phone displays the home screen of the application 'Traveller's Diary' and there is a search box for searching.

            6a.01. Click on the search box

            6a.02. Type the name of the place to search

            6a.03. The phone displays the place name on suggestion list.

            6a.04. The suggestions doesn't match to the searched place name.

            6a.05. System displays a button named 'Add new place'.

      6b. The phone displays the home screen of the application 'Traveller's Diary' and there is a button named 'Division'.

6b.01. Click on the 'Division'.

6b.02. The phone displays the list of division.

6b.03. Select the division by clicking on a division name.

6b.04. The phone displays the list of districts name of the selected division.

6b.05. Select the district by clicking on a district name.

6b.06. The phone displays the list of places name of the selected district.

6b.07. The list of places doesn't have the desired place listed

6b.08. At the bottom of the list page system displays a button named 'Add new place'.

7. Click on 'Add new place'.

8. System will give a form to be filled by the user for a new place to be added.

9. User will add the 'Name', 'Google map location', 'Brief description of the place', 'Transportation route and fare', 'Residential facilities and cost', 'Food facilities', some photos of that place and other information of that place if have any.

10. Click on submit button.

Post condition:

System will display 'Thank you for improving our database. Your given informations of the place will be added to the database after verification.'

Alternative Course:

6a. The Phone does not turn on

6a.01. Locate an electrical outlet

6a.02. Plug the phone into the outlet

6a.03. The Phone displays the charging symbol

6a.04. Resume @ 1

7. Use case diagram:

Use case diagram is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accomplished by other types of diagram as well.

In use case diagram actors are represented as stick Figure. Interaction is represented as a named ellipse. Lines link the actors with the interaction. It identifies the individual interactions between the system and its users or other systems. It is used to define user interaction requirement. We pop out 7(seven) use cases for our project. The use case diagrams are described below.

7.1 Use case diagram for UC 1: Searching for a place of choice:

USER
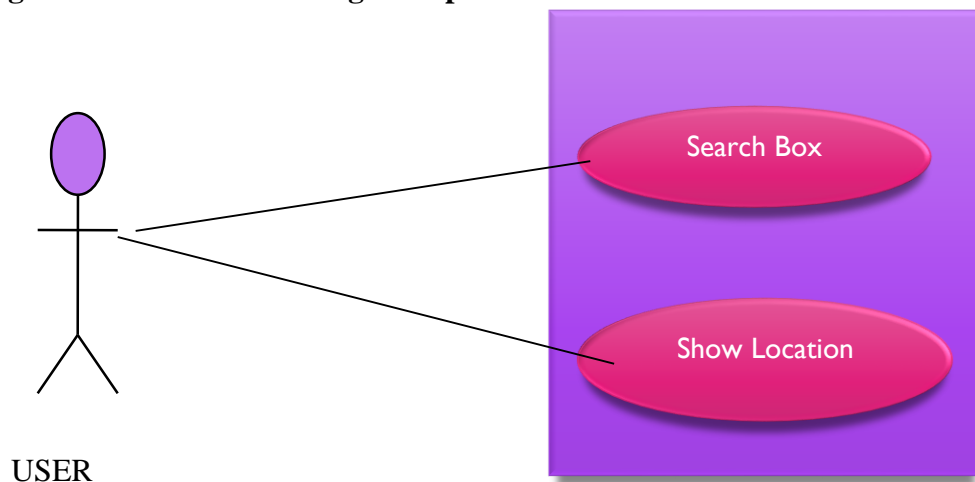
Figure 1: UC1 Use Case Diagram

7.2 Use case diagram for UC 2: Discover new location of places at random :

USER
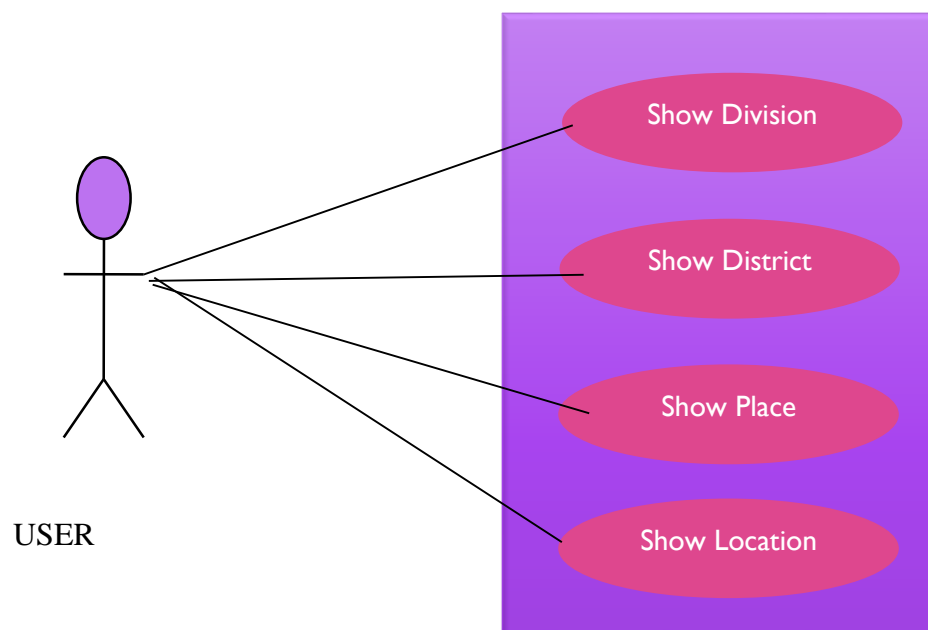
7.3 Use case diagram for UC 3: Route & Cost of transport:
Figure 2: UC2 Use Case Diagram
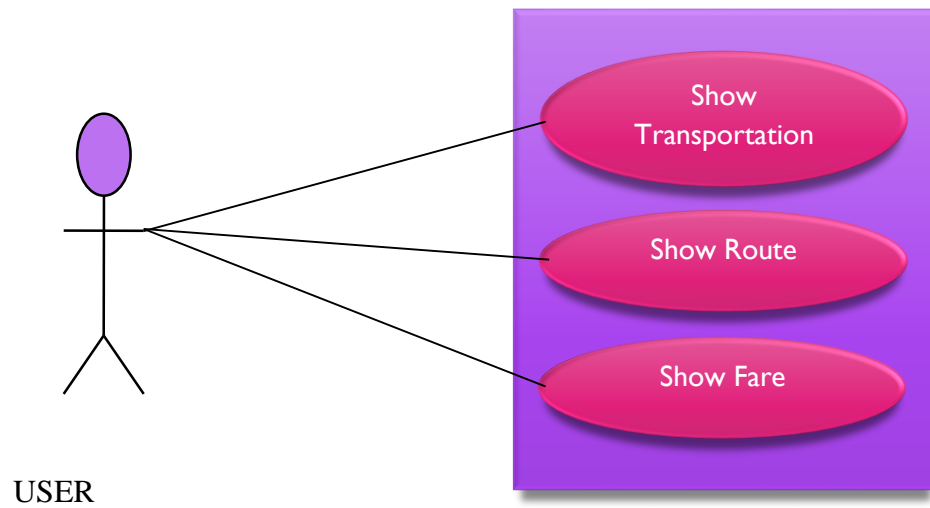
Figure 1: UC1 Use Case Diagram

7.4 Use case diagram for UC 4: Location & cost of Residence:
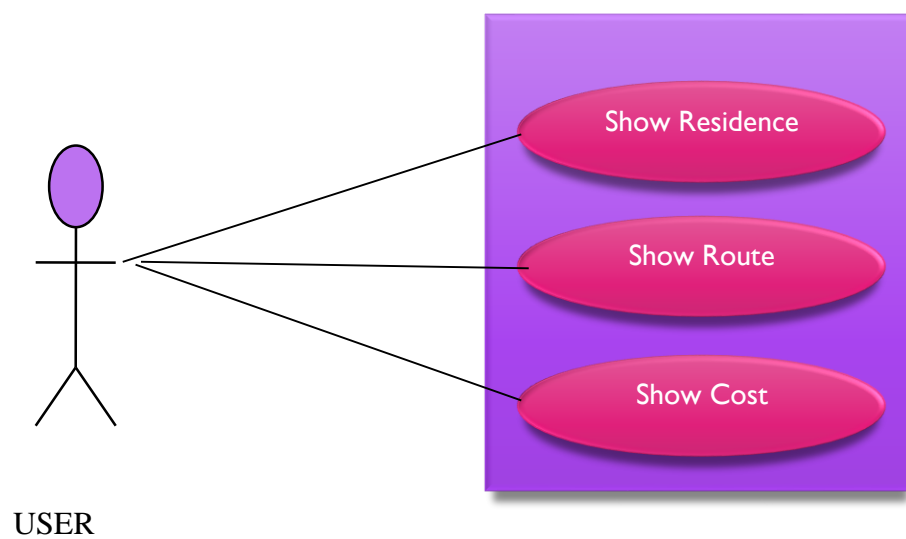
Figure 4: UC4 Use Case Diagram

7.5 Use case diagram for UC 5: Name and location of Restaurant:
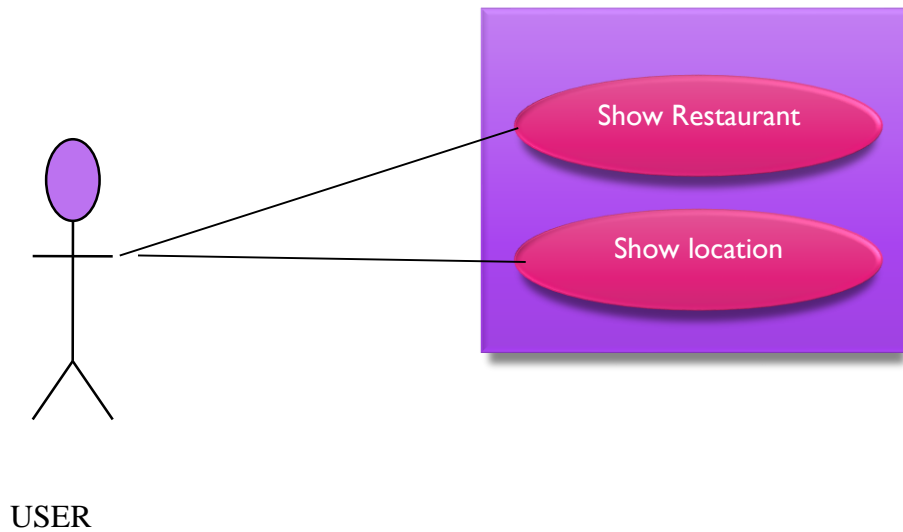
Figure 5: UC5 Use Case Diagram

7.6 Use case diagram for UC 5: Adding of New Places:
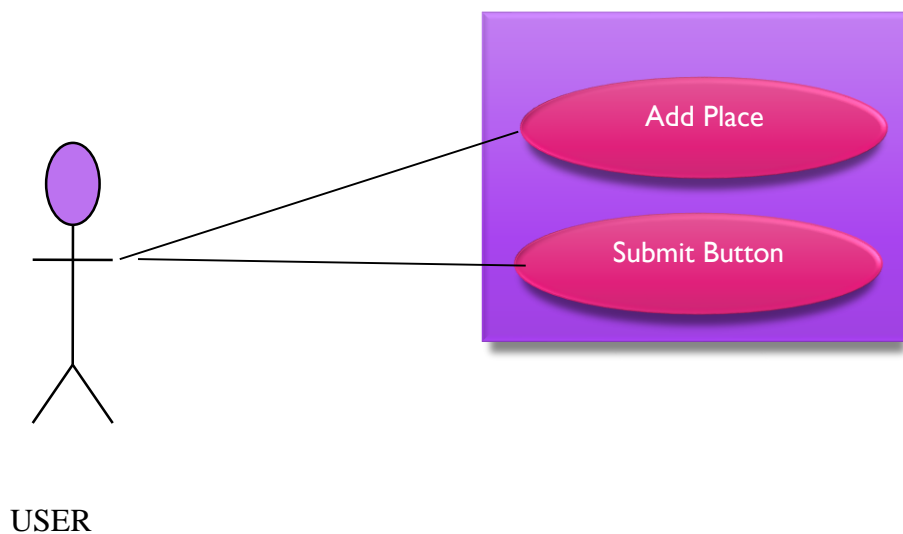
Figure 6: UC6 Use Case Diagram

8. Conclusion:

From the system requirements specification document, the users can specify their requirements. It describes each and every aspect related to the customer's requirements as specific as possible. A specific and clear software requirement specification document is very useful for the authority and project manager to run the project without facing any problem.

Chapter 5

Detailed Design Document

Traveller's Diary

Android application to make your trip a piece of cake!

1. Introduction:

Software design is a process by which the software requirements are translated into a representation of software components, interfaces, and data necessary for the implementation phase. The SDD shows how the software system will be structured to satisfy the requirements. Design Documentation is done before doing any of the actual "work" of a project. It is the primary reference for code development and, therefore, it must contain all the information required by a programmer to write first line of actual code. The SDD is performed in two stages. The first is a preliminary design in which the overall system architecture and data architecture is defined. In the second stage, i.e. the detailed design stage, more detailed data structures are defined and methods are developed for the defined architecture.

This software design document describes the architecture and system design of Traveller's Diary.
This report consists of five sections. These are: Activity Diagram of Use Cases, E-R (Entity Relationship) Diagram, Conceptual Class Diagram, Sequence Diagram and conclusion.

2. Activity Diagram of Use Cases:

This diagram is intended to show the activities that make up the system process. It shows the sequence from one process or action to another of the target system. It also describes the parallel, branched and concurrent flow of activities of the system. But activity diagram does not match exactly with the code.
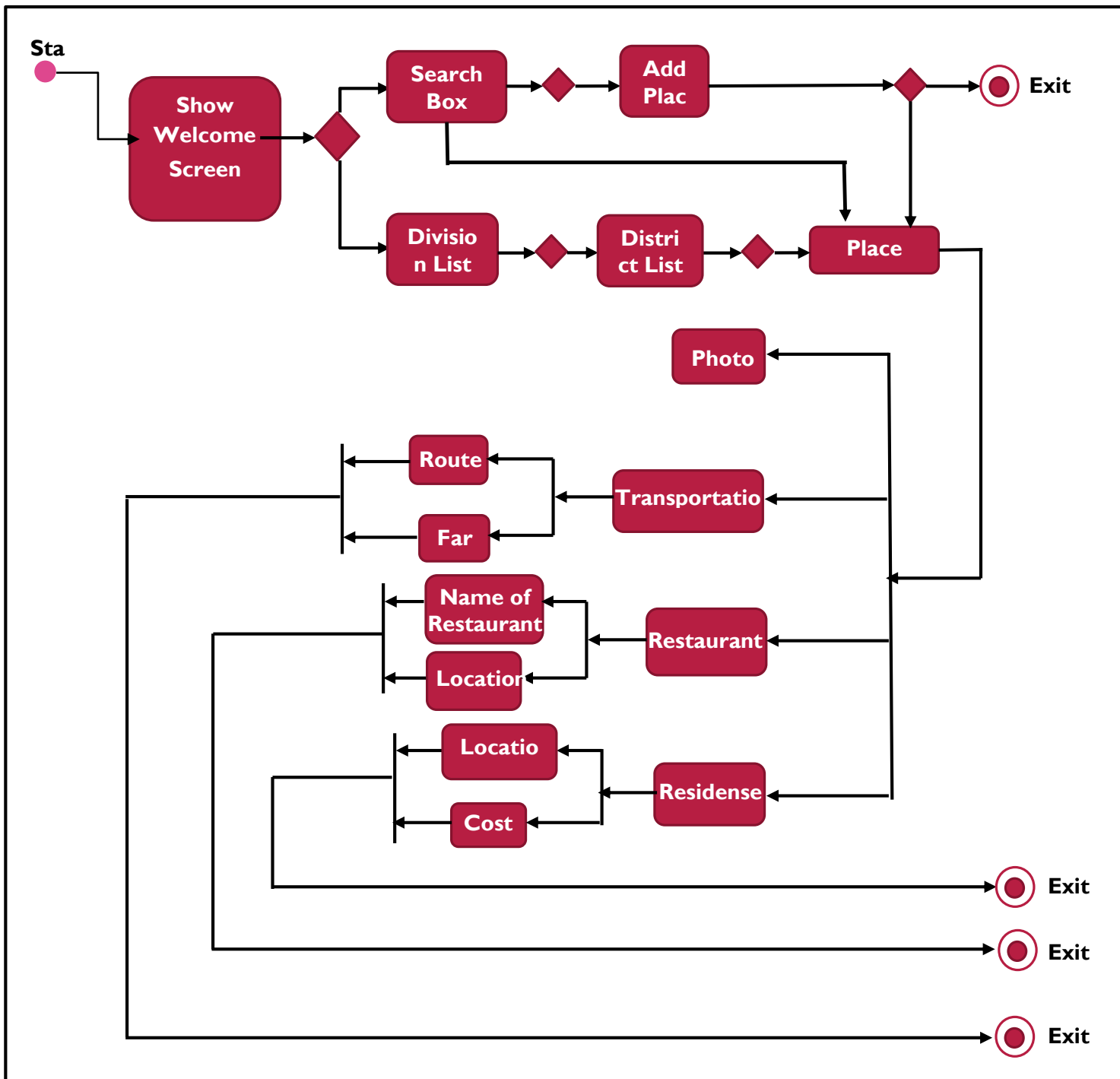
Figure 1: Activity Diagram

3. E-R (Entity Relationship) Diagram:

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is a component of data. In other words, ER diagrams illustrate the logical structure of databases. At first glance an entity relationship diagram looks very much like a flowchart.

In our project there will remain location info based on location name, division & district of location, photograph, short description of this location. Transport info which will contain in traffic type & cost. Hotel info which will contain hotel name, facilities of hotel & cost. In restaurant information there will contain hotel name, food menu of restaurant & their cost. Location & transportation has many to many relation, location and hotel has one to many relation, & location & restaurant has also one to many relations. Here, given a E-R diagram in figure 3:
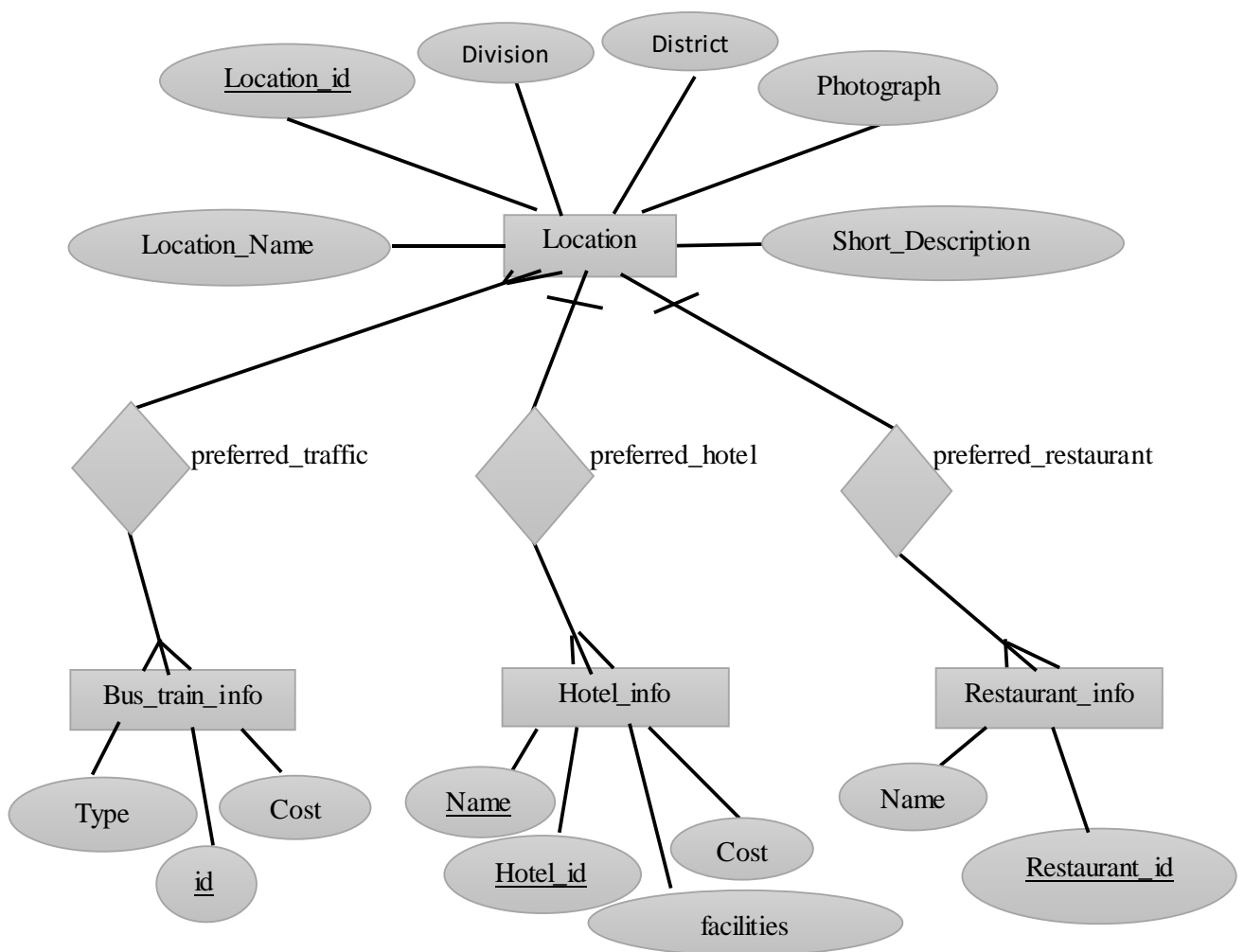
Figure 2: E-R Diagram

4. Conceptual Class Diagram:

In object oriented approach, class is a fundamental concept that represents objects of the system. Class diagram is used to show the necessary classes of the system, association between them and the inherited property between the classes. Association is a link between classes that

represents that there is a relationship between the classes. Required Classes and its association is shown in figure 4:
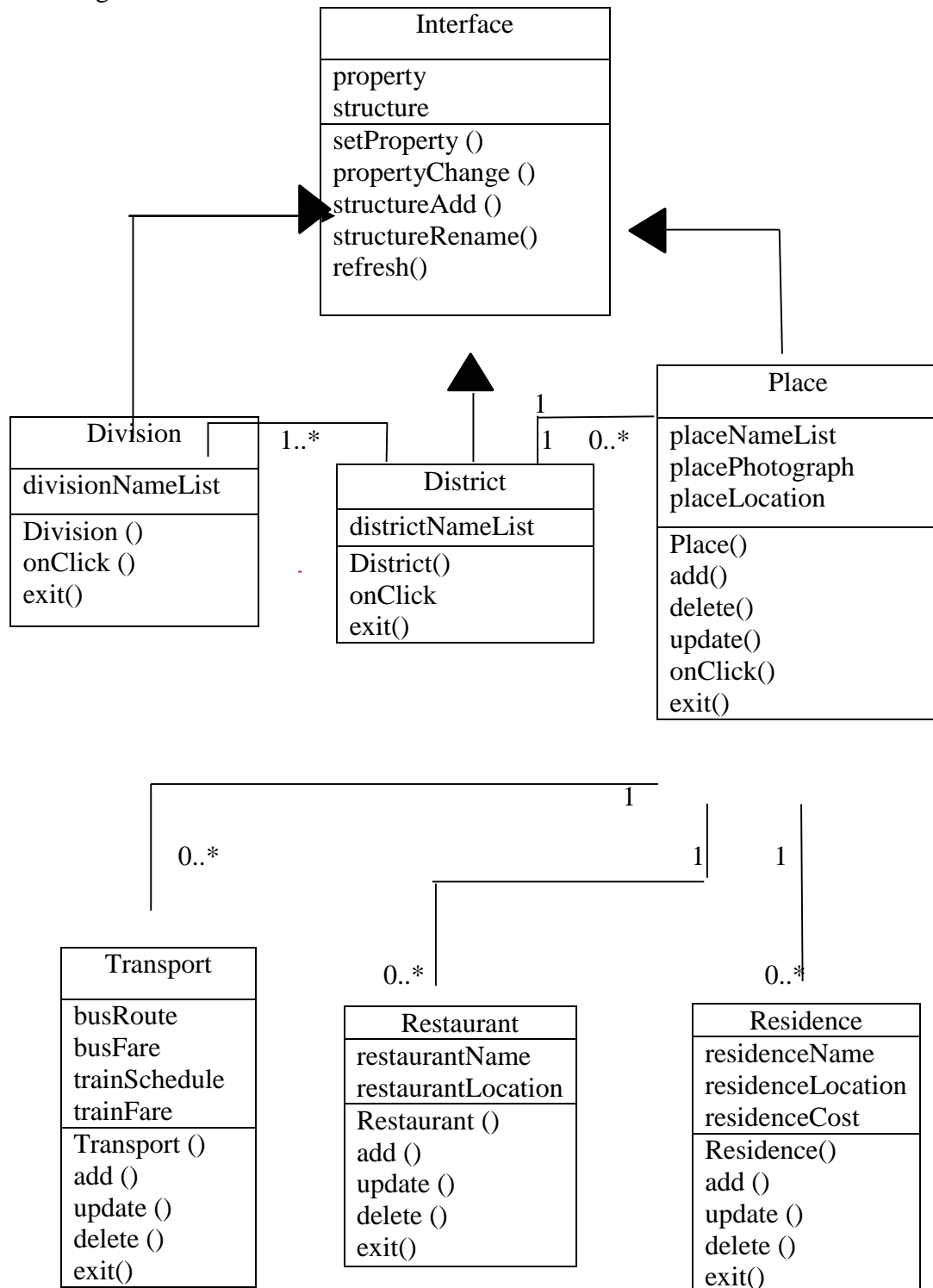
Figure 3: Class diagram

5. Sequence Diagram:

In order to model interaction between system components sequence diagram is needed. It shows the sequence of interactions that take place during a particular use case. It is used to model interactions between actor and the objects in a system. And the interaction between objects themselves. It describes the flow of messages, events, and actions between objects in a system.

In the sequence diagram of our app, user is represented as stick figure. Objects are represented as squares with their type preceded by name. Placement is at the top for them both and a dotted line is drawn from those. Interactions between objects are indicated by annotated arrows with message consisting a name and arguments. Dashed arrow back indicates return. The rectangle on the dotted lines indicates the 'lifeline' of the object.

The Alt- frame is used in the left corner of the rectangle. Brackets is used for true/false condition. If it evaluates to true, then the message is sent. Otherwise, the message of else is sent.

These four steps have been followed through the process of drawing this sequence diagram. First up, identifying input message seeing the flow of activity from activity diagram. The messages are described from the user to the system using the message notation. Over the identification of a special condition, Alt-frame is used. Return values are identified with separate dashed line for explicit return and added output values.

In our previous report we had six (6) use cases. These are shown in Table –I

Table-I : Use cases

Use Case Number	Name of the Use case
UC 1	Searching for a place of choice.
UC 2	Discover new location of places at random.
UC 3	Route and fare of transport
UC 4	Location and cost of residence.
UC 5	Name and location of restaurants.
UC 6	Addition of new places.

The following figures are the sequence diagram of traveller's diary application as per the use cases:

Sequence Diagram 1: Searching a known place.
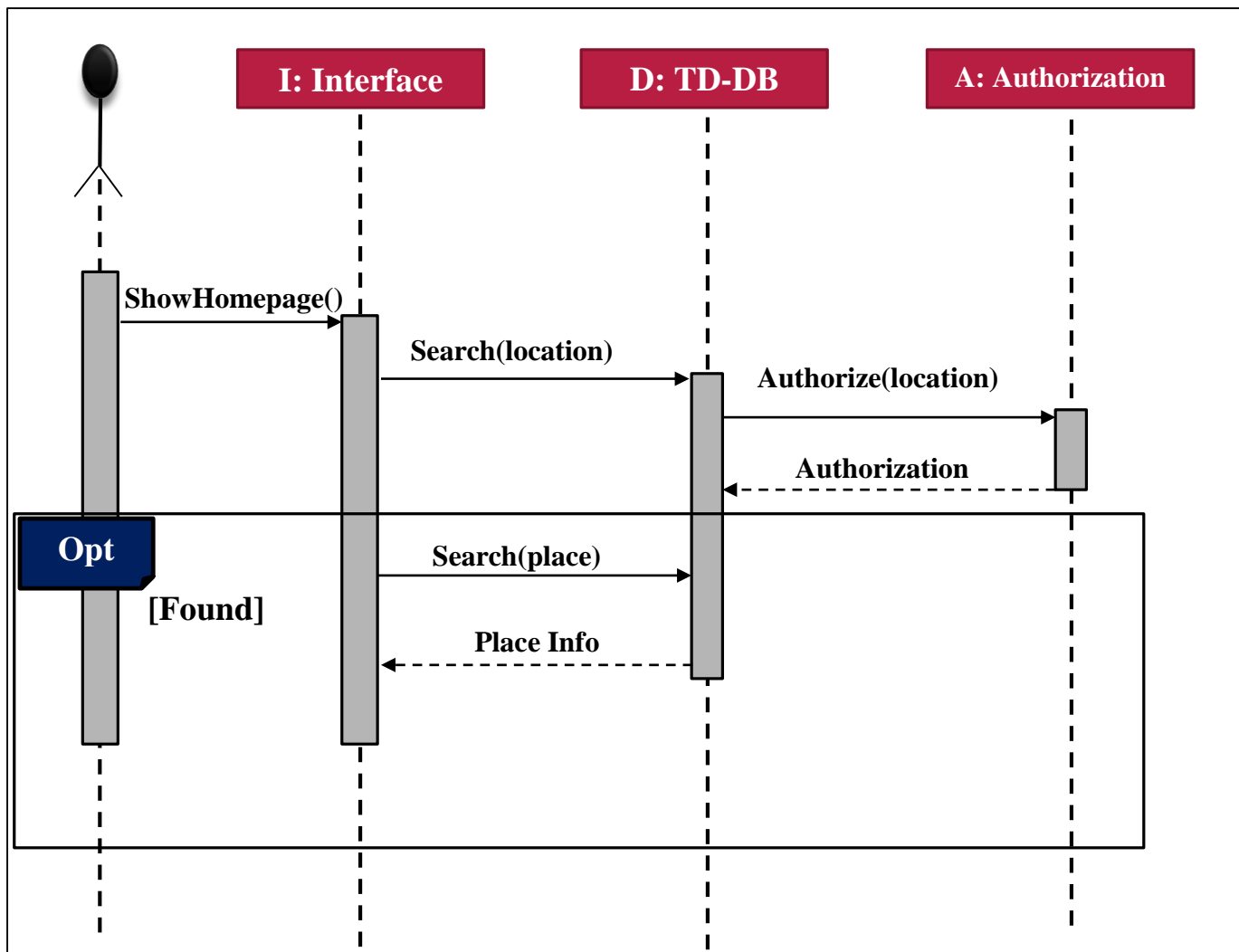
Fig 4: Sequence Diagram of Use case 1 of Traveller's Diary

It is assumed that user has selected a place he would like to visit and got into the app. The app will give user access to the systems database to get desired info about that particular place. User shall enter the name of that place into the search box and can navigate directly to the place information.

Sequence Diagram 2: Searching a place at random**.**
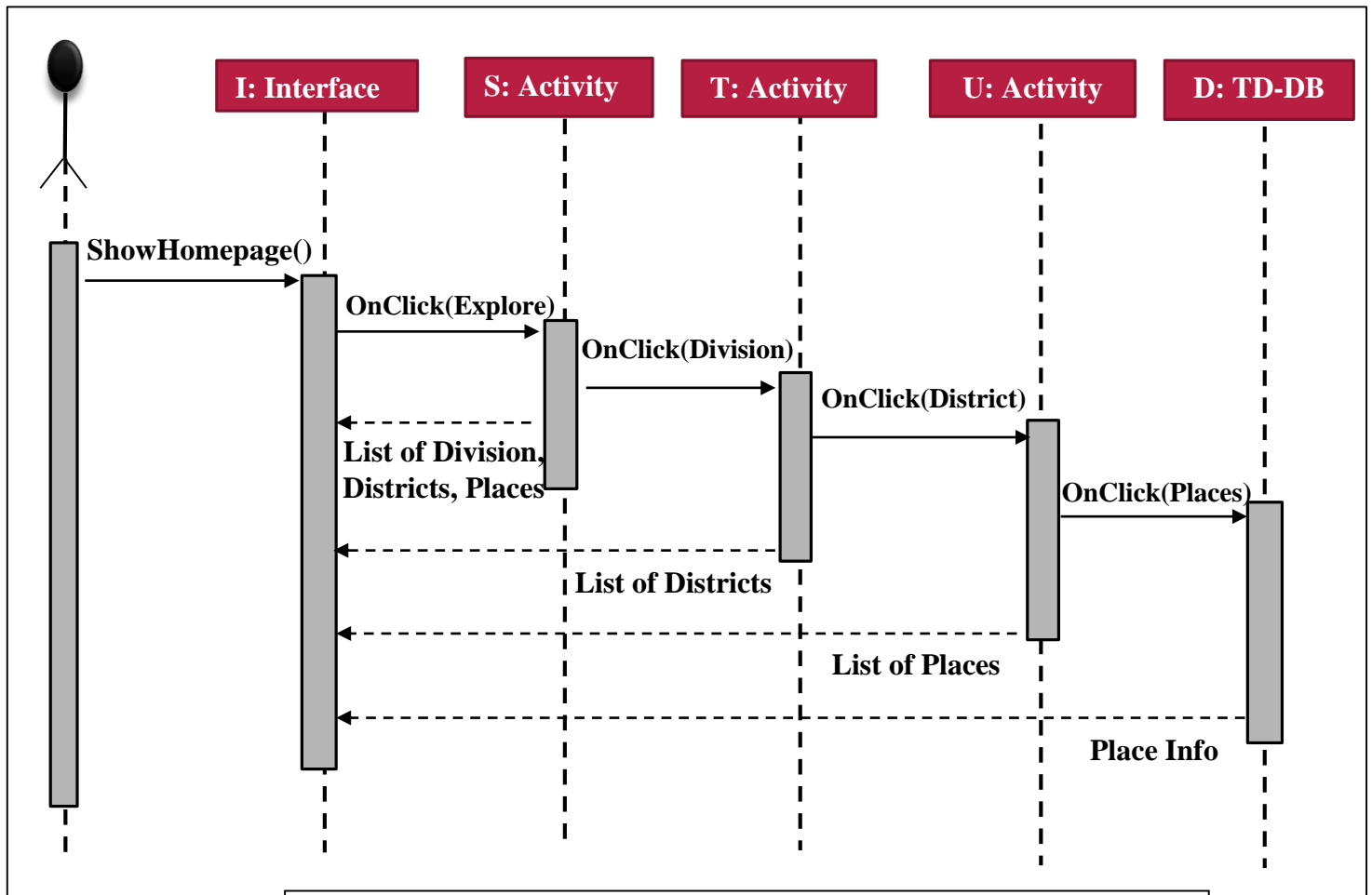
Fig 5: Sequence Diagram of Use case 2(Alternative) of Traveller's Diary

The place is not yet decided; user would like to pick it at random. For which, he uses the app to search among division of his choice in accordance with the district ending up with a place whereas user begins his journey. The app provides with the information.

Sequence Diagram 3: Finding route and fare of transport.
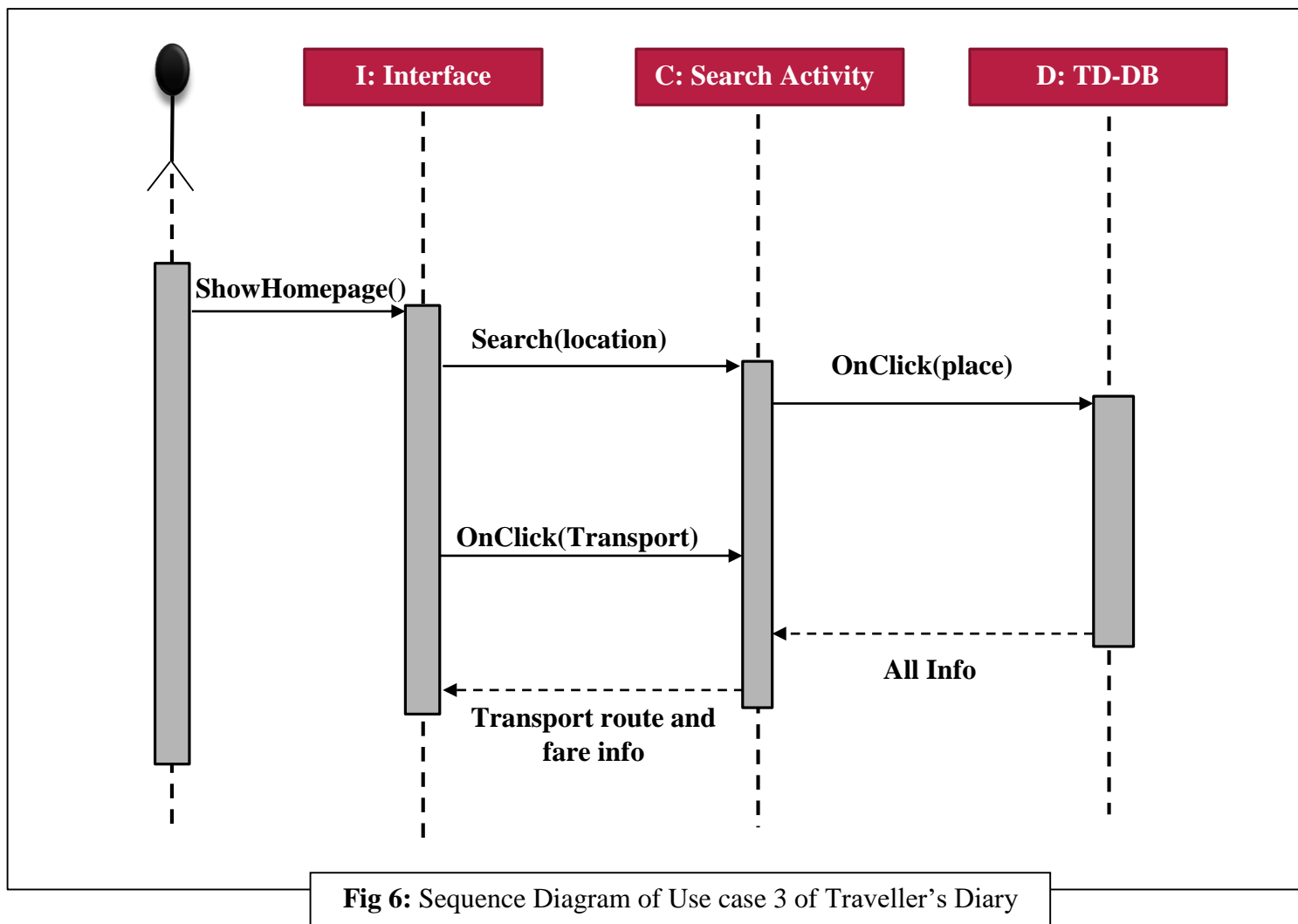
Fig 6: Sequence Diagram of Use case 3 of Traveller's Diary

The user has enough knowledge about the place he wants to travel. He may travel through buses, train or airplane. Here, the exact location might be known or unknown to him as well as how much it might cost. By using the app user get the precise route of getting there by bus, train or airplane along with its cost of fair.

Sequence Diagram 4: Finding location and cost of residence.
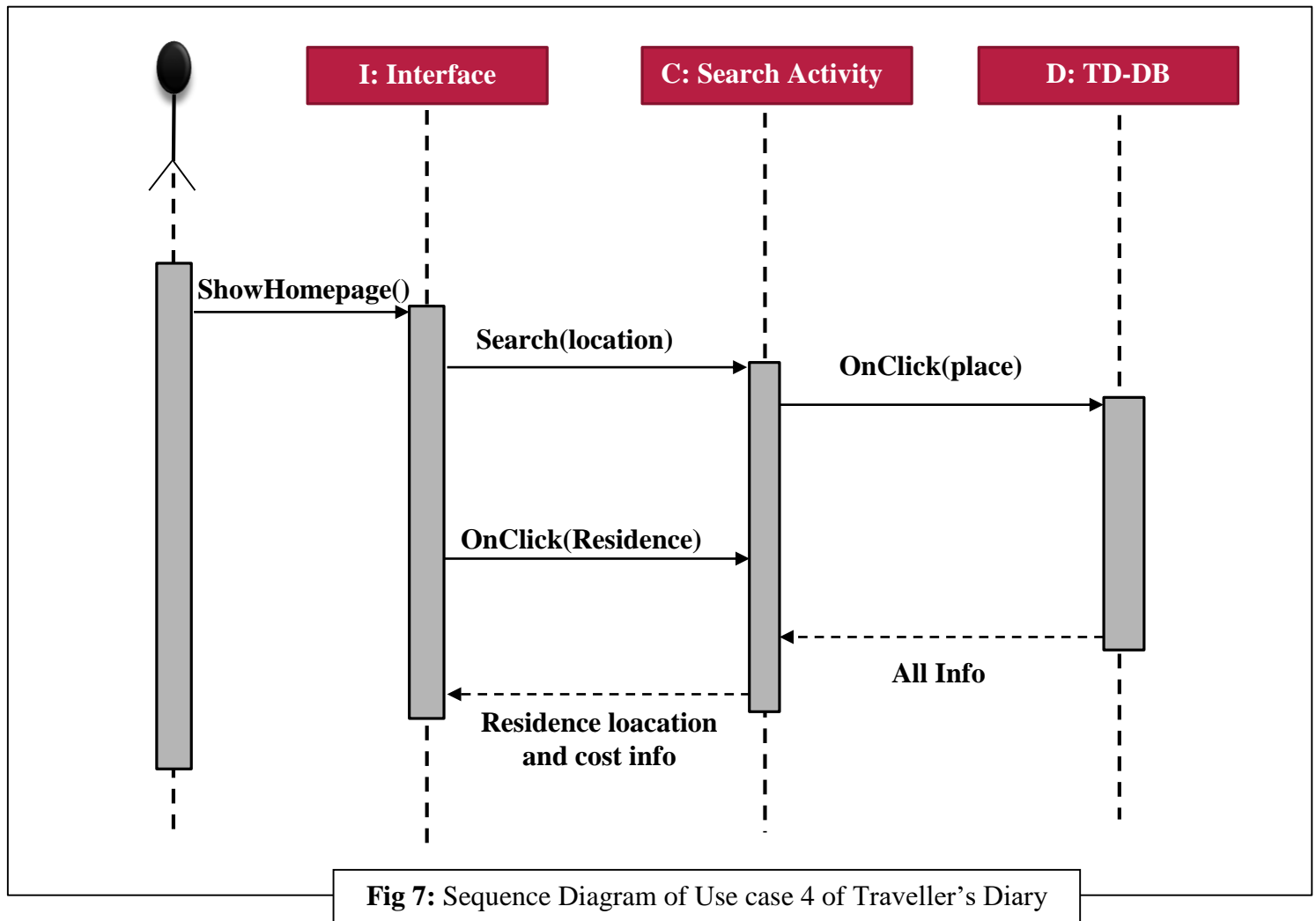
Fig 7: Sequence Diagram of Use case 4 of Traveller's Diary

The user wants to know the residence facility of the place to be visited. He has gotten into the app to get info related to the living arrangement of the selected place. The app shall provide him with info about the site, price and vacancy list of the hotels according to user's likings.

Sequence Diagram 5: Finding name and location of restaurant.
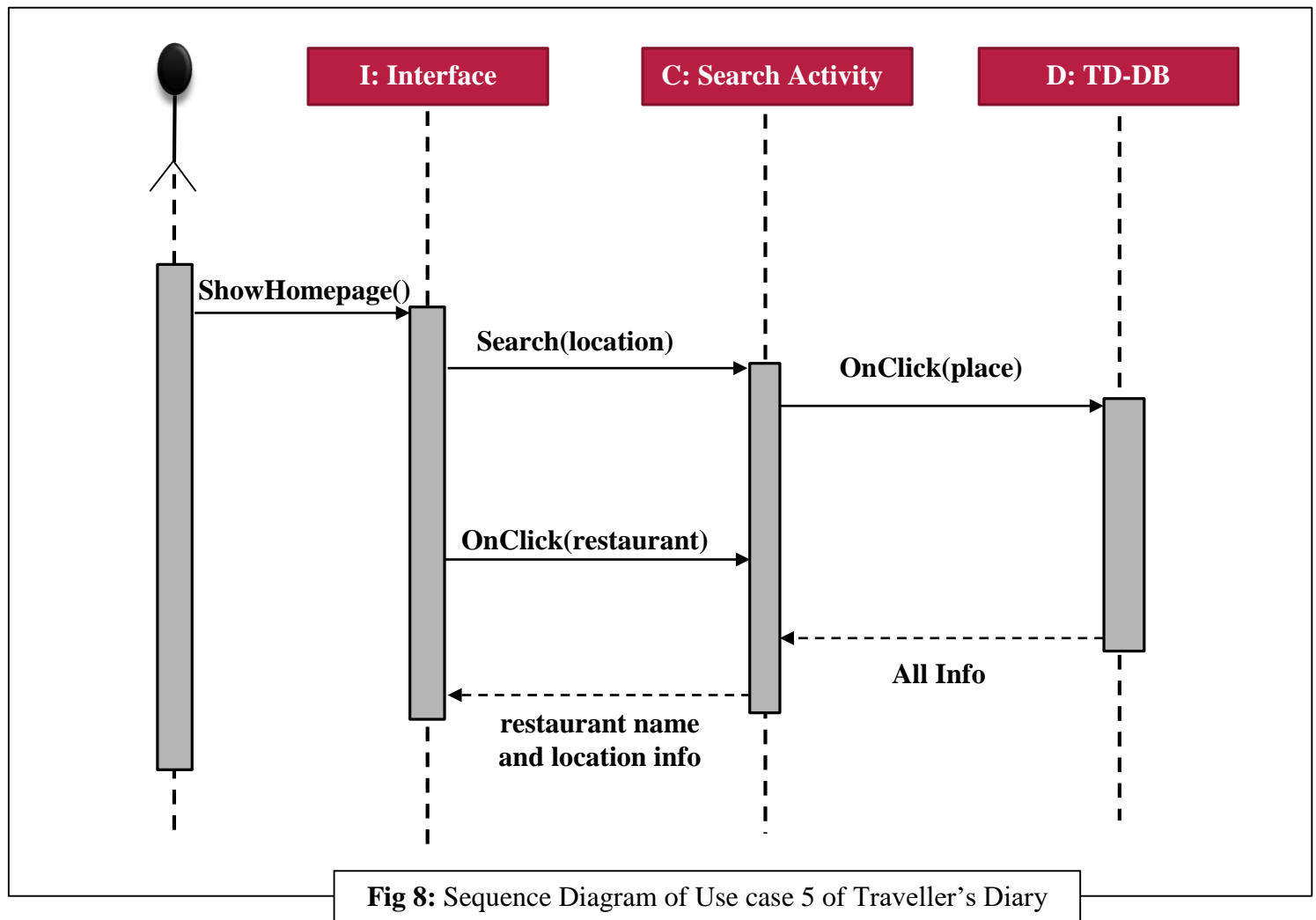
Fig 8: Sequence Diagram of Use case 5 of Traveller's Diary

There's restaurant in every other corner today but quality differs with expense. It depends on the user requirement. The app shall offer user that look for place to eat with list of restaurant they can go to within budget and have a great experience.

Sequence Diagram 6: Addition of new place.
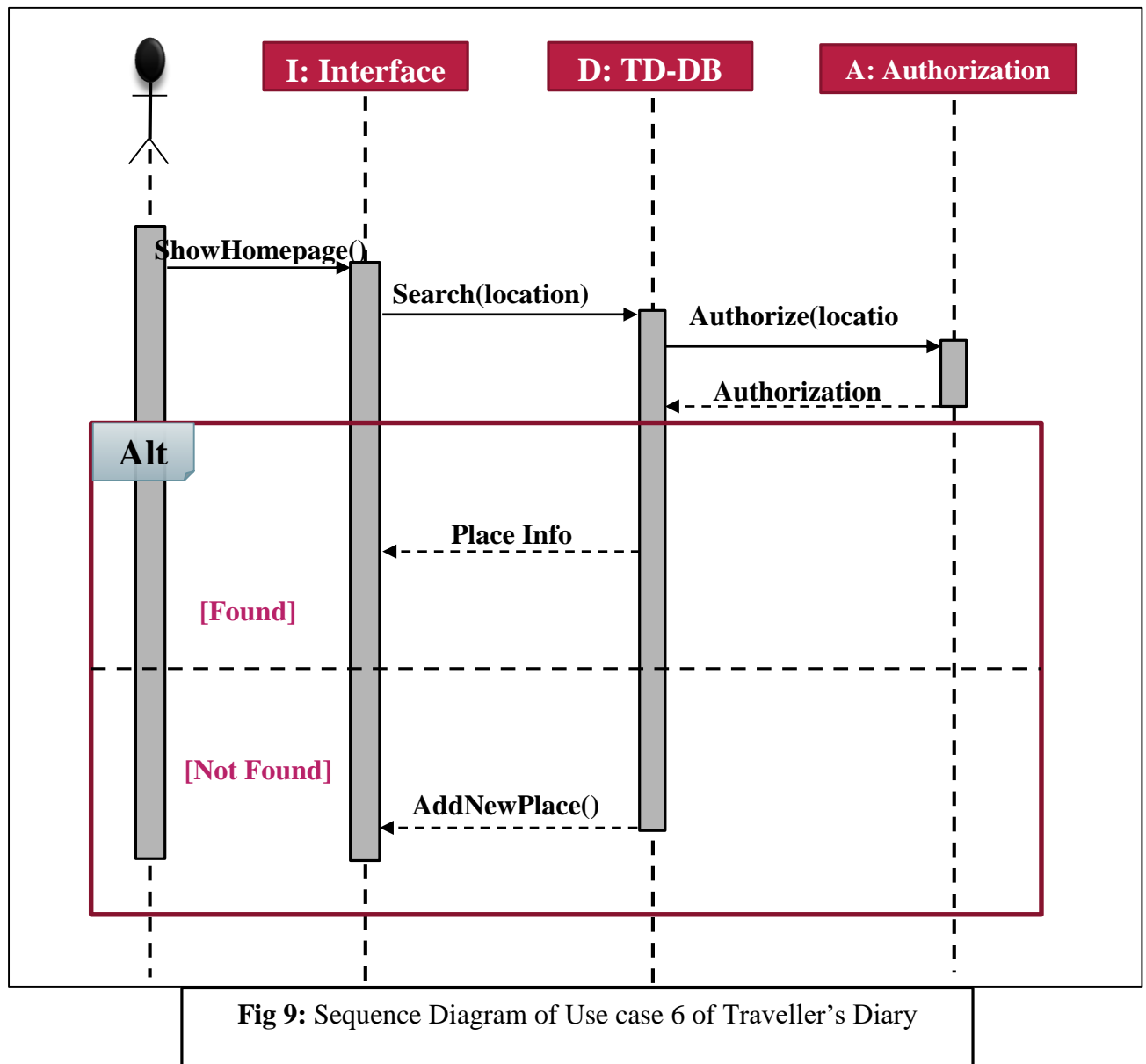
Fig 9: Sequence Diagram of Use case 6 of Traveller's Diary

Fellow travellers discover new place every day. They often need such a tool that might introduce others to go and visit that new place. The app presents this unique feature in itself. The user is given access to add any newly discovered place (that's not present in the systems database) for using in future.

6. Conclusion:

Model-driven engineering is an approach to software development in which system is represented as a set of models that can be automatically transformed to executable code. The above report discussed the design process using UML diagrams. Activity diagram, Class Diagram, E-R Diagram and Sequence Diagram are shown in this report for implementation of the app.

Chapter 6

Implementation

Traveller's Diary

Android application to make your trip a piece of cake!

1. Introduction:

Implementation is the action that should follow in any preliminary thinking in order of something to actually happen. It encompasses all the processes involved in getting new software or hardware operating properly in its environment. The importance of having this process set lies in the systematic analysis and way to carry out the tasks. The critical stage of software development process is implementation, where we create an executable version of the software. It starts when developer begin developing the application. The best built software can fail if proper attention is not paid to the implementation.

This report concludes our project and gives the feedback of the software which we have developed named as 'Traveller's Diary'. Traveller's Diary is an android operating system based application for android devices like smart phone or tablet. This document describes the project implementation for developing our application.

This report consists of six sections. These are: architectural pattern, detailed class diagram, system demonstration, limitations of system, future work of the system and conclusion.

2. Architectural Pattern:

Pattern is a description of the problem and the essence of its solution, so that the solution may be reused in different setting. There are three types of patterns. Architectural Pattern is one them.

Architectural Pattern defines the overall shape & structure of software applications. It should describe a system organization that has been successful in previous system. The most popular layered architecture patterns are

- MVC Architecture Pattern
- Layered Architecture Pattern
- Repository Architecture Pattern
- Client-Server Architecture Pattern
- Pipe & Filter Architecture Pattern

In our project we use MVC (Model View Controller) pattern.

Now the question is why we choose MVC pattern? It allows the data to change independently of its representation and vice versa. It presents the same data in different ways. It has less drawback than the other architectural pattern. As there are less dependency of the components in MVC pattern in future when we will work on any change of data or modify bugs it will be easier.

It separates presentation & interaction from the system data. This pattern has three logical components.

- **Model:** it manages the system data and associated operations on that data.
- **View:** it is the presentation layer. It contains of all user interface.
- **Controller:** it handles communications between users and model. It also manages user interaction and passes this interactions to the view.

For our project we establish a MVC pattern diagram, which is given below in figure 1:
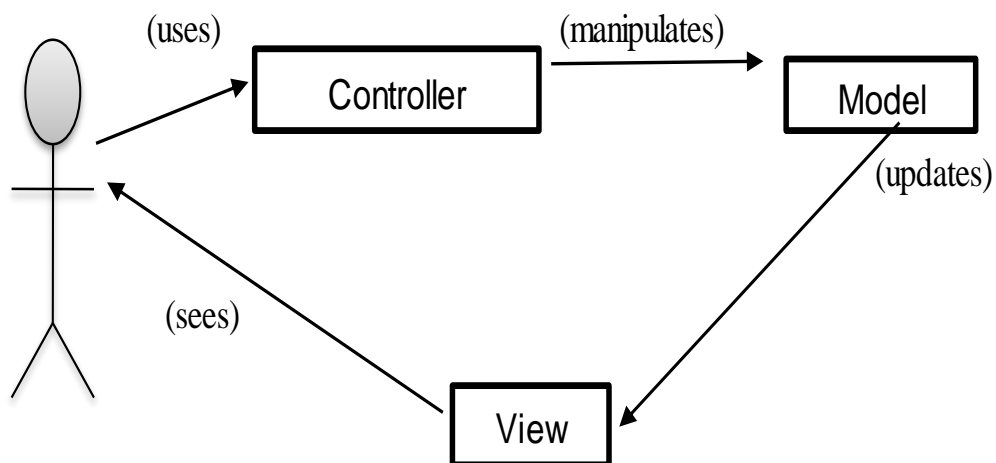
Fig 1: MVC pattern for Traveller's Diary android application

In our system VIEW component do our system layout work which users see. MODEL component is our system model for Database. CONTROLLER is our Buttons taps etc. which interact between user and model. The flow is shown in Figure 2 below:
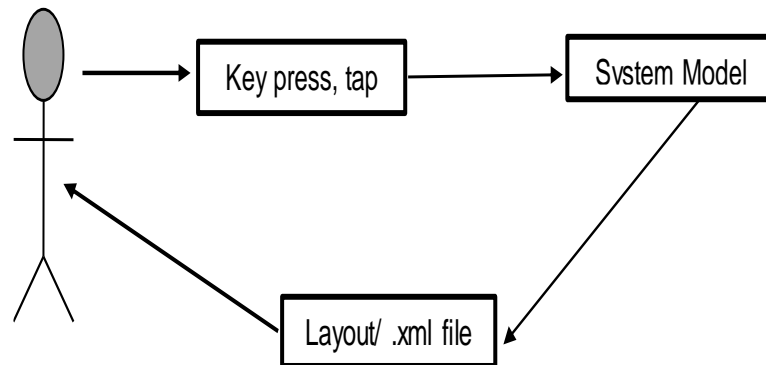
Fig 2: MVC pattern for Traveller's Diary android application

In MVC pattern there is another component which is Business Logic and in our project Business Logic is a Java class which is Mytask Class. Download Data from server is the work of Mytask class. The related diagram of Figure 3 is shown below:
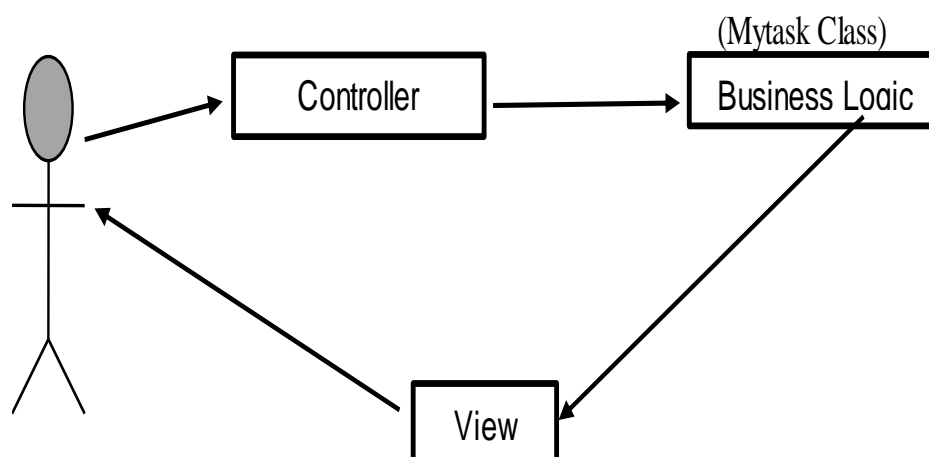
Fig 3: MVC pattern for Traveller's Diary android application

3. Detailed Class Diagram:

The class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing and documenting different aspects of a system but also for constructing executable code of the software application.

The class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of object oriented systems because they are the only UML diagrams which can be mapped directly with object oriented languages.

The purpose of the class diagram is to model the static view of an application. The class diagrams are the only diagrams which can be directly mapped with object oriented languages and thus widely used at the time of construction.

The UML diagrams like activity diagram, sequence diagram can only give the sequence flow of the application but class diagram is a bit different. So it is the most popular UML diagram in the coder community.

The class diagram shows a collection of classes, interfaces, associations, collaborations and constraints. Class diagram is a static diagram and it is used to model static view of a system. The static view describes the vocabulary of the system.

Class diagram is also considered as the foundation for component and deployment diagrams. Class diagrams are not only used to visualize the static view of the system but they are also used to construct the executable code for forward and reverse engineering of any system.

Generally UML diagrams are not directly mapped with any object oriented programming languages but the class diagram is an exception.

Class diagram clearly shows the mapping with object oriented languages like Java, C++ etc. So from practical experience class diagram is generally used for construction purpose.

So in a brief, class diagrams are used for:

- Describing the static view of the system.
- Showing the collaboration among the elements of the static view.
- Describing the functionalities performed by the system.
- Construction of software applications using object oriented languages.
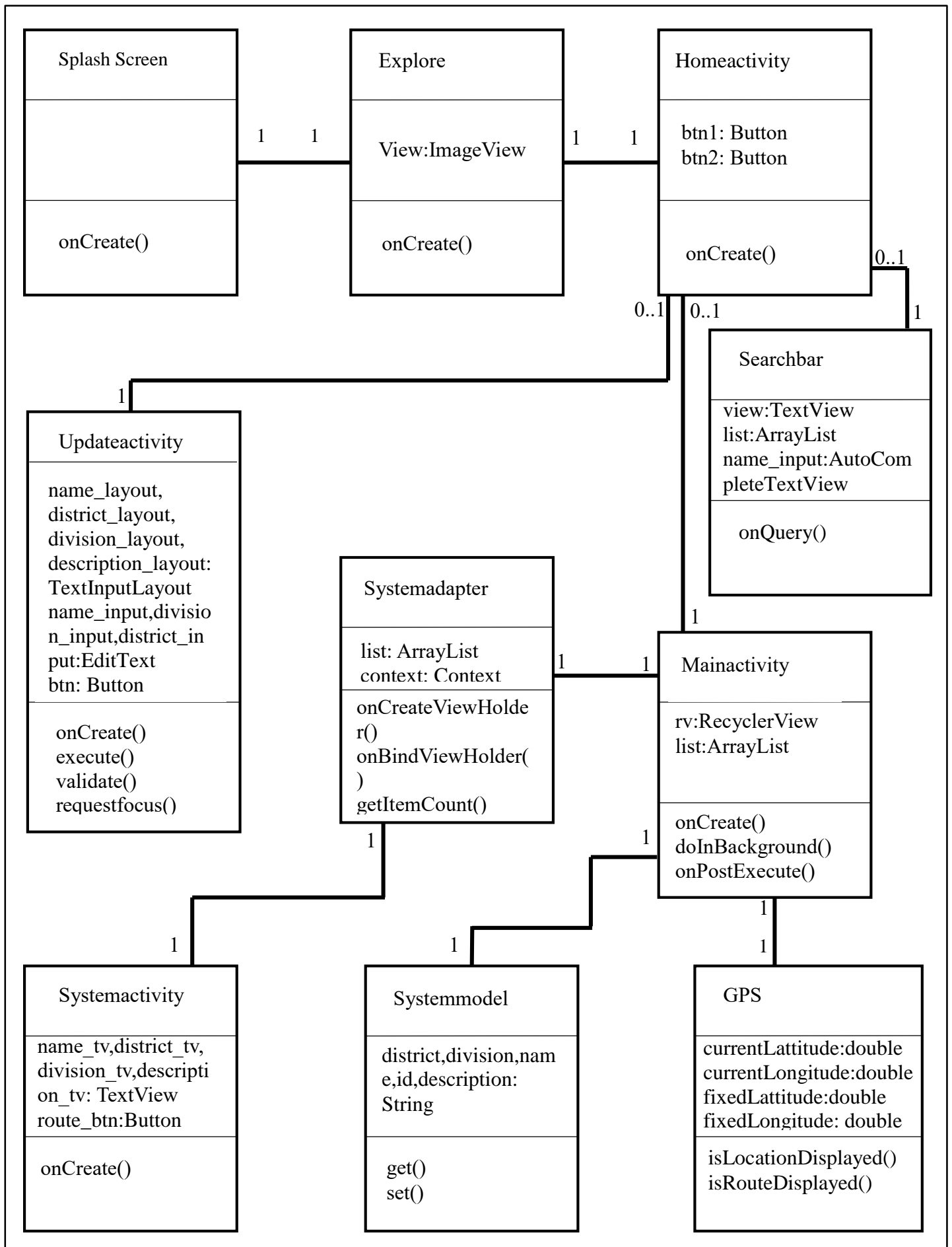
Fig 4: Detailed Class Diagram of Traveller's Diary android application

4. System Demonstration:

System demonstration shows us the actual application of the whole project. In this part we are going to describe our android application with some demo screenshots. In our 'Traveler's Diary' app we are going to show some information of specific places. It's important to attach description with the screenshots, so that the processes can be easily understandable.

4.1 Start-up and displaying welcome screen:

At the start-up of the application, system shows the welcome screen like a notepad named 'Traveler's Diary' as the Fig 5 below. Then after poping up for 3 second, the welcome screen automatically disappears and a button named EXPLORE appears as the Fig 6 below and wait for the user to click on it.
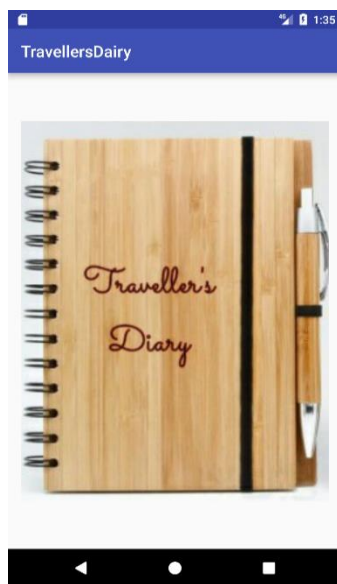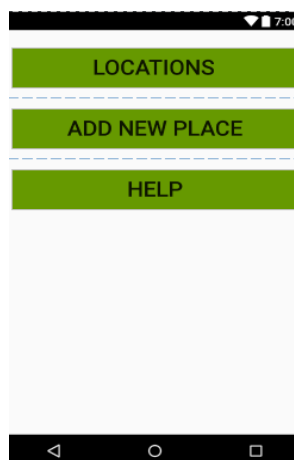

Fig 5: Displaying welcome screen
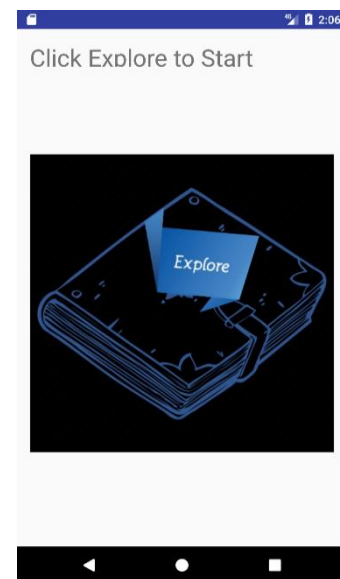
Fig 6: Displaying EXPLORE button

4.2 Exploring the navigation buttons:

After clicking on the EXPLORE button the system will take the user to the screen as the Fig 7 below. The screen shows the navigation buttons like Locations, Add new place, Help etc.

Fig 7: Displaying the navigation button

4.3 Inside the 'Location' button:

After clicking on 'Location' button, the system shows the list of the places as the Fig 8 below.

If user clicks on any place, then system will display a screen like the Fig 9. This contains the information of that place.


Fig 8: Displaying the place list

Fig 9: Displaying the place's information

4.4 Clicking on the button 'Add New Place':

If user click on the button 'Add new place', the system will show a screen which contains a blank form to be filled up as the Fig 10 below. If any place is not listed in our app's database, then a user can easily add that place's information through this option. The form contains place's name, district, division, decription etc.
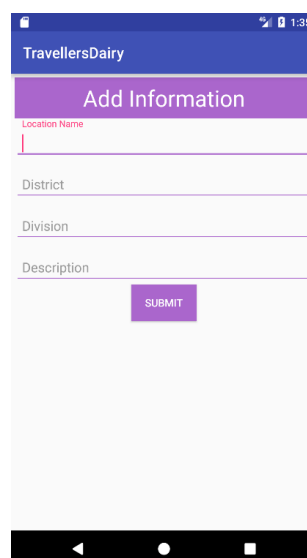
Fig 10: Displaying a blank form for adding new place

5. Limitations of System:

We have some limitations in our system. Our system is very much dependent on internet connection. Our system only show the route of the location but it can't give information about nearest restaurants with food menu, nearest hospitals or medical center, police station. There is also limitation in providing the contact list of professional guides for the travelers.

6. Future Work of the System:

Traveller's Diary is designed to fully satisfy users and customers. But we have plans to make them more satisfied. Now the drawback of this app it is very much dependent on internet connection. In future, our main target will be to provide user offline mode as well as online. Hope that, this will make our application more user friendly.

We have a plan to make the app more flexible. This app will not only show the route of the location but also will give information about nearest restaurants with food menu, nearest hospitals or medical center, police station. We will also provide the contact list of professional guides for the travelers.

At now we are trying to reach every corner of Bangladesh, But, in future we have a plan to expand the application Worldwide.

7. Conclusion:

This document on implementation is maintained by the developers and actual coders. This document, as a whole, represents information about the code. While writing the code, the programmers also mention objective of the code, who wrote it, where will it be required, what it does and how it does, what other resources the code uses, etc.

In the process of coding, the lines of code keep multiplying, thus, size of the software increases. Gradually, it becomes next to impossible to remember the flow of program. If one forgets how software and its underlying programs, files, procedures are constructed it then becomes very difficult to share, debug and modify the program.

This document increases the understanding between various programmers working on the same code. It enhances re-use capability of the code. It makes debugging easy and traceable.