

**MOBILE APPLICATION DEVELOPMENT ON “LAUNCHGHORI – A MOBILE
BASED APPLICATION FOR PASSENGER-LAUNCH TIMING”**

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**Launchghori – A Mobile Based Application for Passenger-Launch Timing**”, submitted by Md. Imran Hossain, ID No: 113-15-1592 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 05-12-2019.



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DECLARATION

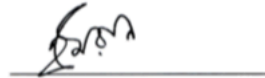
I hereby declare that, this project has been done by me under the supervision of **Mr. Shaon Bhatta Shuvo, Senior Lecturer, Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

The project “Launchghori – A Mobile Based Application for Passenger-Launch Timing” is a mobile application. This application is for Android Platform. This application is intended for gather all scheduling and details information of Launch Transport in Bangladesh. This application is written by Java Programming Language and XML with Android Studio IDE. To develop this project, the most essential part is generating a code in Java language and simulate it successfully. I observe that people can not remember which launch are departing from Sadarghat to their desired location. Also which launch are heading to Sadarghat from their location. So, I think of an idea that if I can gather all information about Launch’s and develop a system so that everyone can easy find their desired information about Launch’s. That’s why I want to build a simple system which is mobile based application in Android platform.

After implementation of all functions, the system is tested in different version of Android OS and different types of Mobile phones. And it works successfully as a mobile application for Android based smartphone. It can run also both in Offline and Online.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A mobile application or mobile app or simply app is a software specially designed and developed for small devices like smart-phones, tablets, smart-watch. Applications have been at the beginning meant for productiveness help which includes clock, electronic mail, calendar, and make contact with databases, however the trendy public demand for apps prompted fast growth into other regions consisting of cellular video games, manufacturing unit automation, GPS and location-based offerings, order-tracking, and price ticket purchases, in order that there are actually billions of apps available. Apps are usually downloaded from utility distribution systems which might be operated through the proprietor of the cellular running system, together with the App Store (iOS) or Google Play Store(Android). [1]

1.2 Motivation

I observe that many of people don't know the exact schedules of launches which departure from Dhaka to other districts or other districts to Dhaka. So they go to launch terminal and find that launches are gone or they are few hours earlier. This is the huge waste of time. Also, my friends are calling me sometimes about the schedules of many launch. There are many people are planning to travel many places with water transportation system but the don't know about the launch schedules. That's why I want to develop a simple system which is mobile based application for Android platform. As now Android smartphone is available and majority of people use so I choose Android platform. This application is easy to use. It's an offline application so anyone can use this application without internet connection.

After implementation of all functions, the application is tested in various variation of mobile devices and it works effectively as a mobile application for Android based smart phone.

1.3 Objectives

The main objectives of this application is to find launch schedule with one press of a button on anyone's phone. I try to make this application as user-friendly as possible. This application has very easy UX as user can easily navigate to one page to another with few buttons click. User can download this application for free of cost and also can use it without internet. For that reason, this app has zero cost.

User can know about the launch routes, routes specific launch list, launch details etc. In details page user can know about the time when launch with departure, launch fares for different locations, passenger capacity, number of life jacket a launch have and many more important information. User can also make call from the app to the desired launch authority.

1.4 Expected Outcomes

The expected outcomes of my application are discussed bellow:

Launch Route: This screen includes the route of launches departure from Dhaka to many districts and many district to Dhaka. This application includes six most used water transportation system routes. There are many routes active in Bangladesh.

Launch List: This screen includes the list of launches for specific route. The time for departure of the all launches. Each routes have several number of launches. Some are very comfortable and luxury some are moderate.

Launch Details: This screen includes the details of every launch. There are lots of launches, so it is very important to know which launch is best by comparing with other launches. User can know about the detail departure time of launch, fares of different seats, capacity of passenger, number of life jackets the launch have and many other important info.

Calling System: This app includes a calling system with it's details page. User can make a call via this application to desired launch authority for information or reservation of seat.

This application enables a convenient system to keep the information in effective and standard way.

1.5 Report Layout

In this report I try to explain my full project with six (6) chapters. So, there are six chapter in my report which describe full project with clarity.

Chapter 1: Introduction

My first chapter for this report is Introduction. In this chapter I try to give an overview of my application. I discuss about the motivation behind the app, objectives of this app, expected outcomes of this app etc.

Chapter 2: Background

In this chapter I will discuss the background of my project. How this app's idea is come up with my mind? Related work for this application, comparative studies for this application also discussed here. Scope of the problems and the challenges I faced when developing this app is also discussed.

Chapter 3: Requirement Specification

In chapter 3 I will discuss about the requirement specification for this project. I will show the Business Process Modeling, requirement analysis, use case modeling and analysis, logical data model, design requirements.

Chapter 4: Design Specification

Design specification will discuss in chapter 4. Front-end design, back-end design, interaction with the system and user, requirements implementation discusses here.

Chapter 5: Implementation and Testing

Implementing the system and testing of this project will discuss in the chapter 5. I also show the testing results of my application.

Chapter 6: Conclusion and Future Work

In chapter 6 I will come an end of this project report with the conclusion and listing of the future works or modifications of this application.

CHAPTER 2

BACKGROUND

2.1 Introduction

A background study is an initial experiment that is made to decide the relative environmental influences connected with a proposed project.

Bangladesh is a small country but it has a large population. This caused various types of problem too. In Bangladesh, it is actually tough to get the suitable and massive data about water transport system and related information because there is no structured database server for those information. I realize that if I can arrange such information in one place then it will be very helpful for the mass people who are used water transport very frequently. For that reason, I think of develop this application for arranging most of scheduling data for water transport system in Bangladesh. By using this application user can easily access all relative information for passenger-launch timing and many more information. As most of smart-phone user in Bangladesh are Android Operated smart-phone user, so I decided to develop this application for Android platform.

2.2 Related Work

When I was thinking about this scheduling application named “Launchghori – A Mobile Based Passenger-Launch Timing” there are no similar type of application exist in Play Store or App Store. So, it was difficult to get an idea about how this app will look or how this app will interact with user. I have to search on internet if I found any similar application, but there was no luck. Then, after thinking about it, I come up with this design as this app is look now. I think this design has a simple UI/UX, as a result user can easily use this application with any hesitation or confusion. I think about it that my application will use only Bangladeshi people so I set my app’s language in Bengali. So, almost everyone can use this application.

Though, there were no similar application back then, I found some info from some Facebook groups. There are some Facebook groups related to launch schedules and many other things. They provide some information about different routes.

2.3 Comparative Studies

As there was no similar application I can not compare with other application. But as I found some information on some Facebook pages and groups, I get an idea how can I arrange my app's UI and Data Structure. If a user need to know about any launch information he has to login to Facebook and see the desired information. For that reason, he need to be connected to internet. But in my application the internet connection is not required for using it.

In Facebook groups all are schedules or information are not in one post, they had to go through all posts for finding any particular information. So I want to solve this problem by arranging all information at one place. In my app I use a simple structure for using it. Open the app, press on desired route, you can see list of launch and their departure time, then if you want to see details of the launch, just press the desired launch.

In Facebook groups user cannot call the launch authorities for any importance. But in my app user can call the launch authorities about their query through my application.

2.4 Scope of the Problems

- As there is no similar out there, so developing this type of application is main reason to reduce to the problem for getting enough information about this wide used transportation system.
- User do not get specific information for a specific route or launch.
- User do not know about different seat fare of the particular launch.
- User do not know the passenger capacity of the particular launch.
- User do not know how many life jackets has the particular launch.
- User can not call the specific launch authority.

2.5 Challenges

As there are no available app and database or information for developing this application, I have to collect most of data manually. I visited Sadarghat (Dhaka Launch Terminal). I go to launch by launch and talked with their supervisor and share my idea. After talked with them, many of them willing to help me and they are seeming happy. And then asked them to give me their launch information and then I note down that information. Thus I was collected my application's information. Some of information I collected via Facebook group, some information I already

know. I talked some passengers in Dhaka launch terminal and share my idea with them and they took interested to my project as they are also getting some advantage on my project.

As I developing my app for android devices so there are lots of different screen sizes for the Android platform. As a result, I have to deal with different screen sizes that my application can run on them without any issues. I do not face any big challenge for the development of my application. The biggest challenge I faced to collect the authentic data for the application. I collect most of data by myself with the help of particular launch authorities so those data are authentic.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Model

Business process modeling (BPM) in business process management and systems engineering is the activity of representing processes of an enterprise, so that the current process may be analyzed, improved, and automated. BPM is typically performed by business analysts, who provide expertise in the modeling discipline; by subject matter experts, who have specialized knowledge of the processes being modeled; or more commonly by a team comprising both. [2]

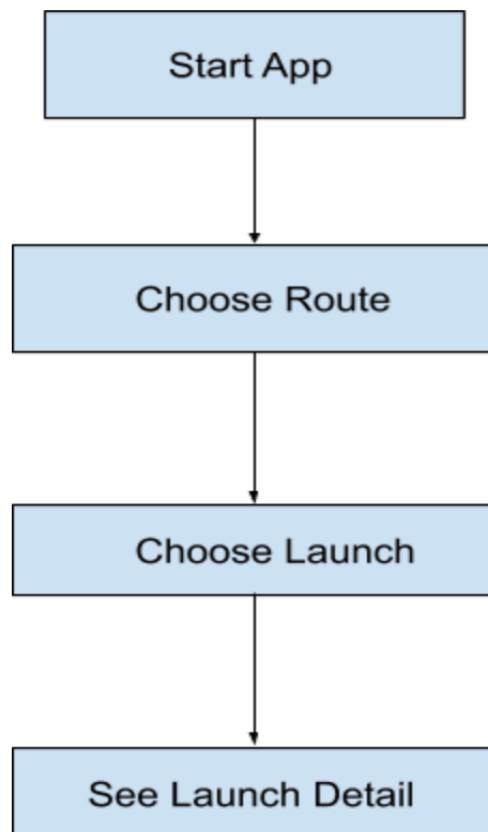


Figure 3.1: Business Process Model

3.2 Requirement Collection and Analysis

Requirement analysis is the important task for any development project or system. Collecting the requirement for a system is the vital part for developing system or Android application. In my application there are no needs of huge requirement. I specify the minimum requirements for my application.

- To use this application, you have to download this app from play store.
- To download the application, you have to connect to internet.
- An Android running smart-phone with minimum API level 16
- This app is light-weight, so no needs for lots of internal space.

Tools requirements to develop the project

- IDE: Android Studio
- Programming Language: Java, for logical development
- Scripting Language: XML, for UI design
- Database: Firebase Real-time Database, for storing data.
- Device: An Android running smart-phone for testing my application

Hardware requirement for this project

- Any OS (Windows, macOS, Linux) that can smoothly run Android studio.
- Internet connection

3.3 Use Case Modeling and Description

A use case is a term that is used in the software or system engineering field. Use case explains how a user uses software or system to achieve a specific target. Usually, a use case defines the interactions between an actor and a system. Actors could be a human being. A diagram is used to describe the use case by a language which is called UML - Unified Modeling Language. It helps to understand the user's need and how the system works. Planning for a use case consists of several factors like a primary actor, the scope of the use case, level of implementation, the flow of functionalities. [3].

In my project user don't need to signup or login. They just install the app on their Android smartphone and use. There is nothing difficult issues in my application.

Use case description as shown in the below table 4.1 where the use case name is "Launch Schedules".

Table 4.1: Launch schedules use case description

Use case name	Launch schedules
Primary Actors	Users
Description	In this case the users just open their "Launchghori" application. And then they should see a list of "Launch Route". Then after selecting a route the application will navigate "Launch List" page. User should see launch list for specific route. After selecting a specific application will navigate "Launch Details" page. In this page user should see launch specific details.
Navigation path	<ol style="list-style-type: none"> 1. Press the "Launchghori" icon 2. Select Route 3. Select Launch 4. Will see Launch Details page 5. For call the booking number press call icon from the Launch Details page

3.4 Logical Data Model

This application is one type of user meaning that there are no admin panel. Anyone with the minimum smart-phone requirements can download and use this application. They just need to

connect to internet for download the app and after installation they can use this app without any other requirements.

3.5 Design Requirements

Design requirements are very vital part of any project or system. A simple and sophisticated design is the key factor of any development project or system. If a system is doing many useful things but has poor design than this system may be get less popular. So design requirements are play a vital role.

In this project I designed it as way that can be simple and user friendly. This app's UX is very easy and flexible that no one gets confused while using this app.

I made this app compatible with maximum coverage so that maximum android user can use this application.

I design and develop this application as a way that it can be very efficient. The efficiency is very important for a project. Efficient software or application is very popular in the software industry.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

The visual part which is visible for the user is front-end design. With the front-end part the user can interact with the back-end part or with the system. So, the front-end design should be as simple as that anyone can easily use the software or application.

For the Android application the screen is a front-end for that application. So the screen's UI/UX should be very easy that any user who just install the app can easily use this application.

I design my application as a way to keep in mind that my app will used by uneducated to educated people, and they can use this app with comfortable.

In my project there are four screens, the first screen name as Route List, second is Launch List, third screen is Launch Details and last one is about screen. User press the “Launchghori” application's icon to open the application. Then they see the route list screen, after selecting route list, application will navigate to launch list screen for that route list. After selecting any launch, the application will navigate to launch details screen for selected launch.

In the bellow section I will discuss different screens of my application.



Figure 4.1: Application Logo

Figure 4.1 shows the application logo. When anyone install this application the above logo will appear their phone.

My application has several screens. When user click on the app's icon from their phone the splash screen will visible to the user. My application's splash screen shown in bellow.

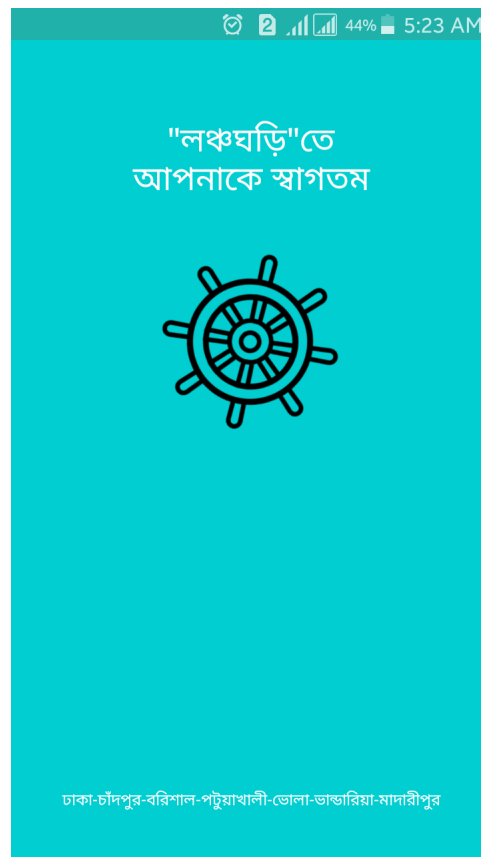


Figure 4.2: Splash Screen

Figure 4.2 shows the application's splash screen. When anyone open this application they see this splash screen first.

Splash screen is short-time visible screen that usually used for beautification of app and for the loading of database without keep waiting the user. A splash screen usually contains the welcome notes of the application, sometimes it has a image, or video, application's logo, current version of the application etc.

My application's home screen is called “লঞ্চ-রুটের তালিকা” or Route List Screen is shown below.



Figure 4.3: Route List Screen

Figure 4.3 shows the application's Route List Screen. After the splash screen visible for a certain time. This screen will appear.

In this screen user can see the route list of water transport system. This list is most used route list. There are lots of local and direct routes for passenger-launch. The above list is used by lots of people.

My application's another screen which is called by “লঞ্চার তালিকা” or Launch List is shown bellow.



Figure 4.4: Launch List Screen

Figure 4.4 shows the application's launch list screen. From the Route list screen when user select a specific route, then this launch list screen will appear.

This screen shows list of launches for a specific route. In this page user can see the launch name and departure time from the current terminal. From this page user can go to launch details page where they can see the details information for a particular launch.

My application's another screen which is called “লঞ্চার বিস্তারিত” or Launch Details is shown below.



Figure 4.5 shows the application's Launch Details page. From Launch List page, when user press one of the launches the application will navigate this page.

This screen shows the detail information for a specific launch. This page gives the name of launch, departure time for both end, fares of different seat or cabin, capacity of passenger, numbers of life jacket the launch have. Also from this page user can make call to launch authority for any kind of information or reservation.

My application's another screen which is called "সম্পর্কে" or About screen is shown bellow.

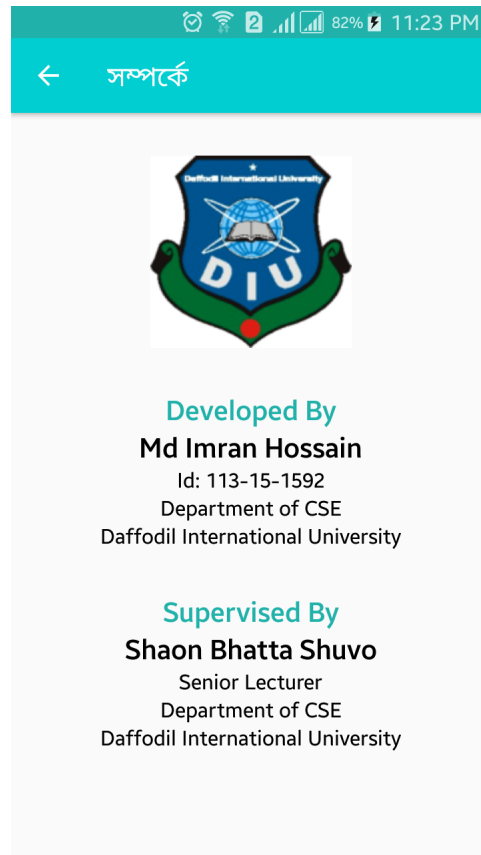


Figure 4.6: About Screen

Figure 4.6 shows the application's About Screen. User can navigate this from any screen of this application. This page is so not important for the user's perspective but as this page is including with this application for that reason I discuss about it. Basically this screen gives the information of the developer who develops this app and supervised of this application.

These are my app's font-end design. I try to design this app with simple but easy to navigate or operable. I try to give to my app's user a very positive user experience. They can easily interact with my app.

4.2 Back-end Design

The invisible part of a software or application is the back-end part. It is the most important part of a software. For the back-end design some are use database like MySQL, Oracle, NOSQL etc. For my application I use Firebase real-time database for storing data. I real-time database because I can change or update the information easily without updating the app the user also gets the updated information.



Figure 4.7: Firebase real-time database

Figure 4.5 shows the application's back-end. This is a Firebase real-time database dashboard. From this page I can change the data and without updating the app user can see the updated data.

4.3 Interaction Design and UX

Interaction with the application and user is important as the easy interaction will increase the app's popularity. It is very significant to have a better UX. Better UX is the main criteria for a good application. The more interactive design the more user friendly application. Using perfect color and suitable font is essential for a good interactive UX.

I try to use perfect color and beautiful font for my application so that user feels attractive for my application. I use minimum navigation through my application screens so that user can get through with my whole app within a short time. I try to not feel bored user with my application.

4.4 Implementation Requirements

I use various types of tools for developing this application. The main tool for development of an Android app is an IDE. I use Android Studio, an Integrated Development Environment for Android Development. It is the most popular IDE for Android development. I use Java Programming Language for develop logic and XML – A scripting language to design UI for my application. My application's minimum requirement for Android API level 16 which is Android 4.1 and able to run with latest Android version. For storing data, I use Firebase real-time database. It is a kind of database by which if I change the database, without updating the app, the app will get latest updates of the database.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

A database is a formal collection of structured information or data, normally saved and retrieved electronically from a computer system for easily access, manage and update.

The Database Management System (DBMS) is a software that interacts with users, applications and with itself to capture and analyze the data.

Relational Database Management System (RDBMS) which has relation within database or with the different table. There is another term which is called non-relational database referred as NoSQL. NoSQL is becoming popular as it uses different query language. [4]

There are different types of database such MySQL, Oracle, Microsoft SQL Server are most popular database management system.

In my application I use Firebase Real-time Database with use Non-Relational Database NoSQL. Firebase Real-time Database is a cloud-hosted database meaning that it is not hosted on local machine. Data is stored as JSON format and synchronized in real time to every connected device. [5]

5.2 Implementation of Front-end Design

The front-end design of any software or system plays significant role. It has direct connection for the engagement of the user. A good front-end design increases the user-system interaction. More interaction more engagement.

In mobile application the front-end design also plays vital role for growing the app on the play store. Mobile phone has small screen, so the application should be designed such a way that the user can interact with the system easily and user can experience a good feeling for using application.

I implement a calling system from my app so user can call the specific launch personnel for their query.

I implement the front-end design with such a way that user can use this application with a minimum click. I design and develop each section in such a way that user can easily interact with different screen. I use material color which is Google's recommendation. Choose color, font style, font size as a way that it looks very good, and user can feel good while using this application. As this application's target user are Bangladeshi people so I keep the app language in Bangla. So user can not feel any confusion using it.

5.3 Implementation of Interaction

The application's success depends on user's interaction with the application. If the interaction is not satisfactory they may not get enough engagement. If user is not happy with the application, they just rate less and give negative feedback. And when the app gets negative rating it will lose lots of user. When a user needs any application they look at the rating and review section, if the review is positive then they download it. Otherwise they just ignore it. So the interaction is very important for an app's success. An application should have good UI design, easy UX, smooth interaction, easy navigation. Reducing the app's size will also be a good thing. If the app's size is large then the user may lose interest to install that app.

5.4 Testing Implementation

Software testing is a process to test if the software is ready for production or not. Without proper testing a software or system or application should not go live. Something many developers skip the testing part. But it is the most important part for a system or application.

There are many types of testing out there for the software industry. UI testing, logical testing, white hat testing, black hat testing etc. In this application I implemented the UI testing. I tested all of the interaction. I tested whether the exact data is showing or not. I tested this application with different screen sizes so that I can assure the user that they can use it with different screen sizes without any issues. I tested this app from Android 4.1 to Android 9, and it worked fine. So this app will cover the maximum amount of mobile phones.

In the following table 5.1 shown several test cases and their results

Table 5.1: Test cases of this project

No	Test Case Name	Test Input	Expected Output	Actual Output	Result	Tested On
1	Installation of the Application	Tested on different version of the Android 4.1, 6.0, 7.0, 8.0	Installation should be successful for those versions	Installed successfully	Passed	20/11/2019
2	Open the application	Press on Application's icon on the device	Should open the app without any problem	The application launched successfully	Passed	20/11/2019
3	Showing Splash Screen	Press on Application's icon on the device	Should open app and show the Splash Screen	App launched and Splash screen showed	Passed	20/11/2019
4	Open the Launch Route Screen	Press on Application's icon on the device	After open and showing splash screen, the app should open the Launch Route Screen	Application navigates to Launch Route Screen Successfully	Passed	20/11/2019
5	Open the Launch List Page	In Launch Route Page, press any of the Route	After press, app should navigate to Launch List Page	Application navigates to Launch List Page successfully	Passed	20/11/2019

6	Open the Launch Detail Page	In Launch List Page, press any of the Launch	After press, app should navigate to that specific Launch Detail Page	Application navigates to that specific Launch Detail Page successfully	Passed	20/11/2019
7	Make call to Launch Authority	In Launch Detail page, there is option “ফোন করুন”, press it.	After press, app should make a call with the shown phone number	Application makes the call successfully	Passed	20/11/2019
8	Open About Page	From the App Bar there is a option “সম্পর্কে”, press it.	After press, App should navigate to About page	Application navigates to the About page successfully	Passed	20/11/2019

5.5 Testing Results and Reports

I tested all of the possible test cases and I passed all of them. So, my application is tested perfectly and it worked fine. This application gives a positive view as it is ready for the end users. After getting all positive test result I am very happy, that my application is working good.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

After all of implementation and testing this application is ready for use. This application gives lots of information about Launch schedules, route list, launch list, launch details, making call etc. This will help the people of Bangladesh who frequently use water-transport system of Bangladesh. I will upload it in Google Play Store within a short time. Anyone can find it from there by search keyword “Launchghori or “লঞ্চঘড়ি”.

6.2 Scope of Further Developments

1. Rating system will be added for launches which are give better user experience.
2. Ticket booking can be added for book ticket from this application.
3. Google Map can be added for current location of user.
4. Search option will be added for launches and routes.
5. Alarm option can be added for notify users.

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