

# **Online Health Facility Assessment Survey for Directorate General of Family Planning (DGFP)**

**Anik Mahamood**  
**Student Id: 012161015**

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In  
The Department  
Of  
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Presented in Partial Fulfillment of the Requirements  
For the Degree of Master of Science in Computer Science and Engineering

United International University

Dhaka, Bangladesh

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# Approval Certificate

This project titled "**Online Health Facility Assessment Survey for Directorate General of Family Planning(DGFP)**" submitted by **Anik Mahamood**, Student ID: **012161015**, has been accepted as Satisfactory in fulfillment of the requirement for the degree of Master of Science in Computer Science and Engineering on 08.03.2019.

## Board of Examiners

1.

---

Prof. Dr. Mohammad Nurul Huda  
Professor & Director-MSCSE Program  
Department of Computer Science & Engineering  
United International University (UIU)  
Dhaka 1212, Bangladesh

Supervisor

2.

---

Mr. Mohammad Moniruzzaman  
Assistant Professor  
Department of Computer Science & Engineering  
United International University (UIU)  
Dhaka 1212, Bangladesh

Examiner

3.

---

Prof. Dr. Mohammad Nurul Huda  
Professor & Director-MSCSE Program  
Department of Computer Science & Engineering  
United International University (UIU)  
Dhaka 1212, Bangladesh

Ex-Officio

## Declaration

This is to certify that the work entitled “**Online Health Facility Assessment Survey for Directorate General of Family Planning (DGFP)**” is the outcome of the research carried out by me under the supervision of **Prof. Dr. Mohammad Nurul Huda**, Professor and Director Masters of Science in CSE (MSCSE) Program.

---

**Anik Mahamood**

ID: 012161015

MSCSE Program

Department of Computer Science & Engineering

United International University (UIU)

Dhaka 1212, Bangladesh

In my capacity as supervisor of the candidate’s project, I certify that the above statements are true to the best of my knowledge.

---

Prof. Dr. Mohammad Nurul Huda

Professor & Director-MSCSE Program

Department of Computer Science & Engineering

United International University (UIU)

Dhaka 1212, Bangladesh

## **Abstract**

Now-a-day survey or assessment is becoming very popular for understand the field situation of anything like new product launching, health situation in the health facility, review of the product etc. In the paper, base survey or assessment is not so secure, time friendly or cost effective. By considering all of issue, I am trying to developing an online assessment system.

I my system I am trying to develop an online health facility assessment system for the Directorate General of Family Planning (DGFP). So that the government can know the condition of the health facilities in upazilla and union level and take the necessary steps for the betterment in health sector.

In my system, there has a provision to create questionnaires with option and each option has value. Health facility provider answers these questionnaires. By answering, these questionnaires there produce a number, which is sum of the option value selected by the provider. By calculating, these number each facility are divided by the category of A, B and C.

This system is help the DGFP to understand the situation of their health facilities. Moreover, can take necessary action of poor facilities within the shortest possible time.

## **Acknowledgement**

I would like to express my deep sense of gratitude and convey thanks to everyone who helped me and supported during the completion of this project and my research paper. First, I would like to express a deep sense of gratitude to my academic supervisor Prof. Dr. Mohammad Nurul Huda, Professor, Department of Computer Science & Engineering and Director, Masters of Science in CSE (MSCSE) Program, United International University (UIU) for helping, guiding, and supporting me throughout my master's degree. Without his guidance, this report would not have been possible. I also convey thanks to my all committee members for helping me from time to time and for being on my committee. I also must thank to all the faculty members of United International University for all their direct and indirect encouragement and assistance in this work. Their cooperation, suggestion, guidance and sincere encouragement played significant role throughout my working period.

As well as my company, Jamil Anwar Zaman, for helping I develop the skills necessary to design this application as part of my master's research. In addition, I would like to thank my family members for their constant and unrelenting support towards my education and for their impartial love for me. I would also like to thank my friends, without whom this project would have been impossible.

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# Chapter 1

## INTRODUCTION

### 1.1 Introduction

Survey or assessment is very necessary element for NGO sector and health sector. From the top level, it is not possible to judge the field situation. Here survey can help to identify the situation[1]. By surveying in filed level, they can know the service situation, structural situation etc. Therefore, it is very helpful for judge what the condition is.

Manual survey is not so much cost effective and time flexible. In this case, online survey is so much cost reasonable and in the case of time reviewer can get live assessment of survey and take regular monitoring of the system[2]. As cost and time take less, the result can get faster.

### 1.2 Motivation

In Ngo sector or Govt. sector or different companies need survey or assessment system in regular basis[2]. Not all of this sector using paper base system, which is time flexible or cost effective.

After considering all of these issues my idea is to develop an online base system, which is faster, cost effective, and need low work force.This system is also secure the data and store these data as long as, whatever we need.

My current organization helping me to develop this online based survey system. They are also running a similar system. While developing this Online Health Facility Assessment Survey for DGFP, I try to understand their facility condition and developed necessary features, which added in the software to betterment their facility. It is very successful system and they are happy to get this system and using this system in regular basic.

### 1.3 Project Schedule

Project Proposal	01.07.2017-02.07.2018
Requirement gathering and specification	05.07.2018-30.07.2018
Process design and enhancement	01.08.2018-30.11.2018
Testing and enhancement	01.12.2018-05.03.2019
Project submission	06.03.2019

### 1.4 Project Overview

This project actually designed for the development of the health sector of Bangladesh under Directorate General of Family Planning (DGFP). Under DGFP there are many health facilities in all upazilla and unions of Bangladesh[5],[6]. Some of them are UH&FWC, USC, UHC, UTC etc. To categories them according to the quality, this online Health Facility Assessment Survey is developed. This system is providing the facilities for Infrastructure, equipment, human resource and some other things.

In this document, I try to describe the background, project scheduling, software requirement specification, purpose, product scope and future work. Some main usage scenarios are describe in more detail, and functional and non-functional requirements are provide.

## Chapter 2

### **BACKGROUND AND LITERATURE REVIEW**

#### **2.1 Health Situation at a Glance in Bangladesh**

##### **Some basic information and data on Bangladesh**

Division: 8

City Corporation: 12

Metropolitan city: 4

Municipality: 327

District: 64

Upazila: 409

Union: 4553

Ward: 40977

Village: 87310(Approx.)

Estimated population on 1 July 2017: 162.7 million

Population density (per sq. km): 1,077; in land area 1,236.811 (In 2015; WB 2016)

Population growth rate: 1.37%

Sex ratio (M/F\*100): 100.2 /100.0. [7]

##### **Health Service and Medical Education**

Total number of government hospitals under the DGHS: 610

Government hospitals of secondary and tertiary levels under the DGHS: 128

Government hospitals under the DGHS at the upazila and union levels: 482

No. of private registered hospitals and clinics under the DGHS: 4,596

No. of private registered diagnostic centers under the DGHS: 9,741

Total in the DGHS-run hospitals and registered private hospitals: 127,360. [7]

Health has accepted as a fundamental right of all people by the Constitution of the World Health Organization (WHO) and in the International Declaration of Human Rights. Several research organizations both in private and public sectors and departments are conducting regular health research in their focused area.[6],[7]

## **2.2 System Study**

This system is mainly for DGFP facility assessment. Before this assessment done by paper base, now I am design a system by which this assessment can done by online. In this system, there has some question, which is relate to facility, and this question can be add and remove automatically by my system. Before starting to design, I was doing some study on this system and get requirement from DGFP.

The activity has three parts:

- Get request clarification from DGFP,
- Feasibility study on the system, and
- After finishing the system getting approval from DGFP.

### **2.2.1 Existing System**

Before this system was paper base and some disadvantage of the existing system are:

- Take too much time
- Lot of people are involve in this system and lots of paper are need that is why it is expensive.
- Needed an agent, physical location.

### **2.2.2 Online Assessment versus Paper Surveys**

Paper Survey take too much time to fill up. On the other hand, Online Assessment easy to fill up.[2] That is why Paper Survey need too much time where Online Assessment takes less time. In the Paper Survey there need lot of people involvement.[3] On the other hand

there need less people involvement. Paper base system can lost or destroy. In this case Online Assessment is more secure system and difficult to lost or destroy.[3]

### **2.3 Scopes of Online Surveys**

Individuals in distant locations can access to online surveys. [2]Automated data collection is another advantage of '**Online Health Facility Assessment Survey**' software, which is reduce the time and cost of DGFP to assess the health facility. This Online Assessment survey system saves the time to identify the category of the health facility from the large volume of data[2].

## Chapter 3

### SYSTEM ANALYSIS

- This system is all about the converting the survey system from manual to online.
- Any person can participate online survey after login to the site.
- Administrator is adding survey and user to database.
- Administrator can edit or delete the survey questionnaires from the database.
- Administrator can delete/block the site user from the admin panel in database.
- Administrator can add/manage categories user from the admin panel in database.
- Admin can see daily feedback given by respondent.
- Administrator is adding the delivery report to the database.
- Administrator can control static pages by a CMS on admin panel.

#### 3.1 Objectives and Success Criteria of the Project

This online assessment is very helpful for DGFP to identify the condition of their facilities from different area. In this system, they can add or remove questionnaires. In paper base system, this feature is very difficult to do and cost involvements to doing these changes[5]. By answering all questionnaires the facility category are identify automatically where in paper base system it take lot of time to identify the category. The person who are using this system, can operate this system very easily and very happy to use this system and helpful for them.

The system will allow the following feature:

- Online Assessment for the DGFP.
- Categories the all facility by this Assessment.
- All facilities can be view by the single system.
- Govt. can take initiative to betterment of the bad facility.

### **3.2 Need for the Proposed System**

Here the following features are proposed:

- It is a web-based system.
- User can add provider for and can assign then the survey or assessment.
- Facility will be categorize automatically according to the answering of the questionnaires.
- Assessment questionnaire can be add or remove anytime.

### **3.3 Features and Benefits**

The Online Health Facility Assessment Survey System is easy to operate where health provider or survey user can easily fill up their facility information.

- Provider can easily submit their facility information according to the questionnaires.
- Data is secure for every submission because tracking every submission to compare previous scenario.
- Need very basic computer or smart phone uses to operate this system.
- Extendible questionnaires system, thus anytime can change the questionnaires set to assess the facility scenario.

This system provides some benefits to the health sector of Bangladesh. Such as-

- Online assessment system of health facility of the Govt.
- Automatic category assessment
- Analysis through bar chart
- Questionnaires can be extend or reduce any time.

### **3.4 Feasibility Study**

Before finalizes this system I were doing some Feasibility Study where I was crate some questions to assess this system. In this Health Facility Assessment Survey System, we check for:

- Does the system capable to access facility information, which will helpful for Govt.?
- Can the system is cost effective, thus Govt. can scalable this system?
- Can the system be integrate with systems, which are already in place?
- Can any individual provider do this assessment of his or her own facility?
- Is there any unique URL for every individual provider?

#### **3.4.1 Technical Feasibilities**

- Do this system access from everywhere?
- Do it store properly?
- Do this system faster to access or store or get the report?

### **3.4.2 Financial Feasibilities**

- Is the system requiring minimal resource?
- Is this benefit for the Govt. by financially?
- What are the server and hosting maintenance cost and are that affordable for Govt.?
- What are the development and operational costs?

### **3.4.3 Operational Feasibilities**

Define the urgency of the problem and the acceptability of any solution; if the system is developed. Includes people-oriented and health issues, internal issues, such as manpower problems, ability of health workers/doctors, organizational conflicts and policies; also external issues, including social awareness and government regulations.

## Chapter 4

### SYSTEM REQUIREMENTS AND SPECIFICATIONS

System require is very necessary in developing a software. It is the base of a software from where the software can stand strongly.

The software specification document satisfies the following:

1. It specifies the behaviors all external system.
2. It defines how I am implementing the system.
3. It is easy to change.
4. It serves as reference tool for system maintainers.
5. It record forethought about the life cycle of the system.
6. It characterizes acceptable response to undesired events.

#### 4.1 User Class and Characteristics

There are three types of user of this software:

- Survey administrator –

Survey administrator is name as Superadmin. He or she can do anything in this system. Like add user of Superadmin, admin and provider, add questionnaires and view all reports.

- Admin –

Admin is another important user. The can create the questionnaires and create the survey user. Also the can view the all assessment information and report.

- Survey takers –

Survey taker is the basic user of this system. They play the main role of this system to assess the facility by answering the questionnaires. They have only provision to answering the survey questionnaires. These users are divided into two levels –

1. UFPO – They can participate to the assessment from upazilla level and all unions under the same upazilla.
2. FWV/SACMO - They can participate to the assessment from only his/her union.

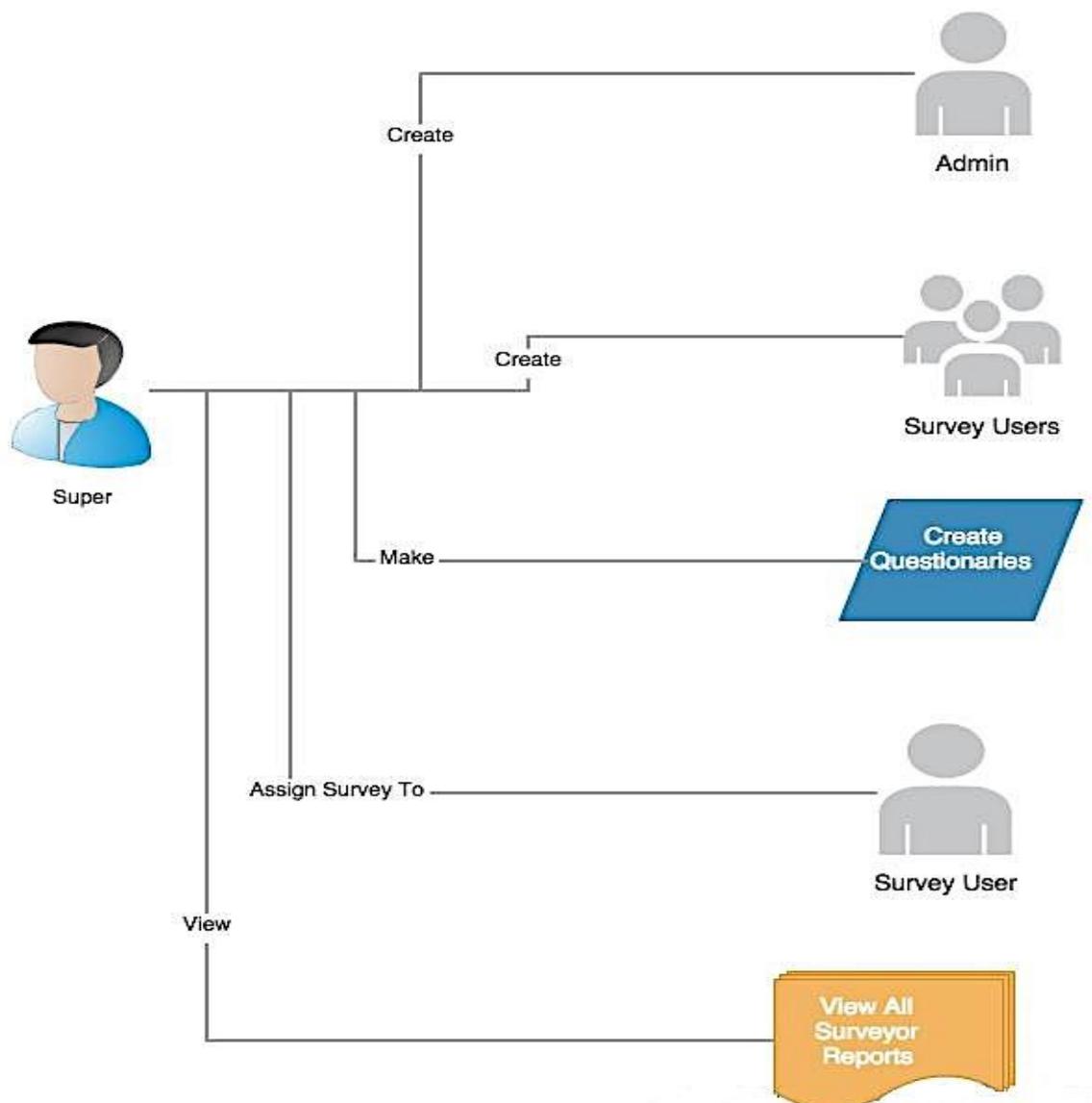


Figure 1: User Case Diagram for Superadmin

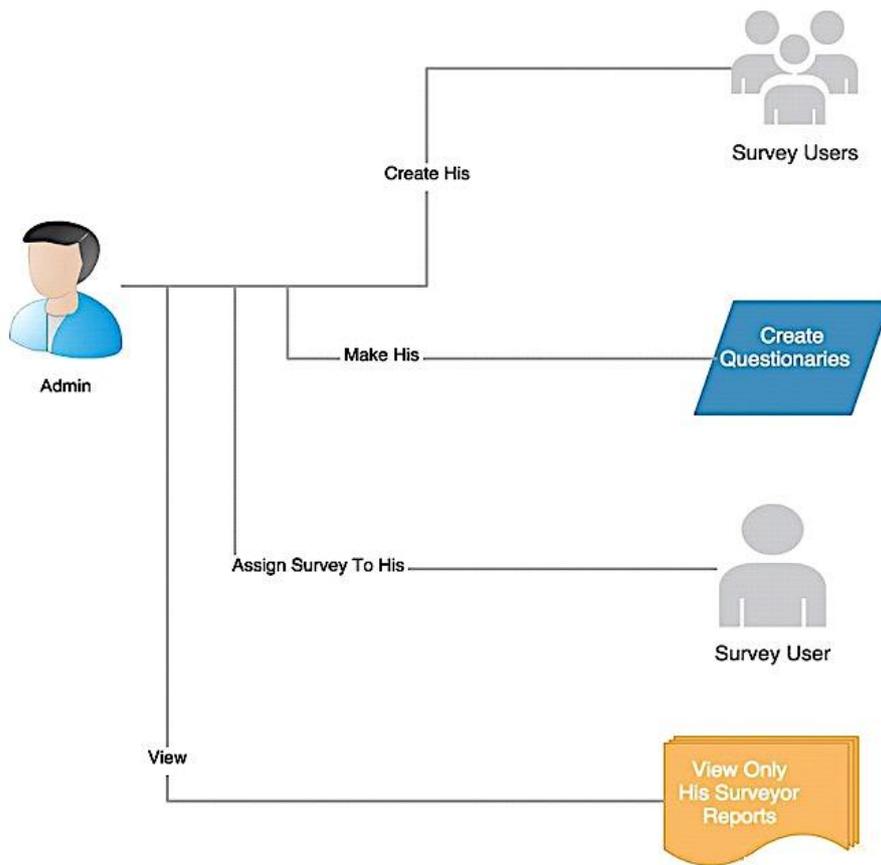


Figure 2: User Case Diagram for Admin

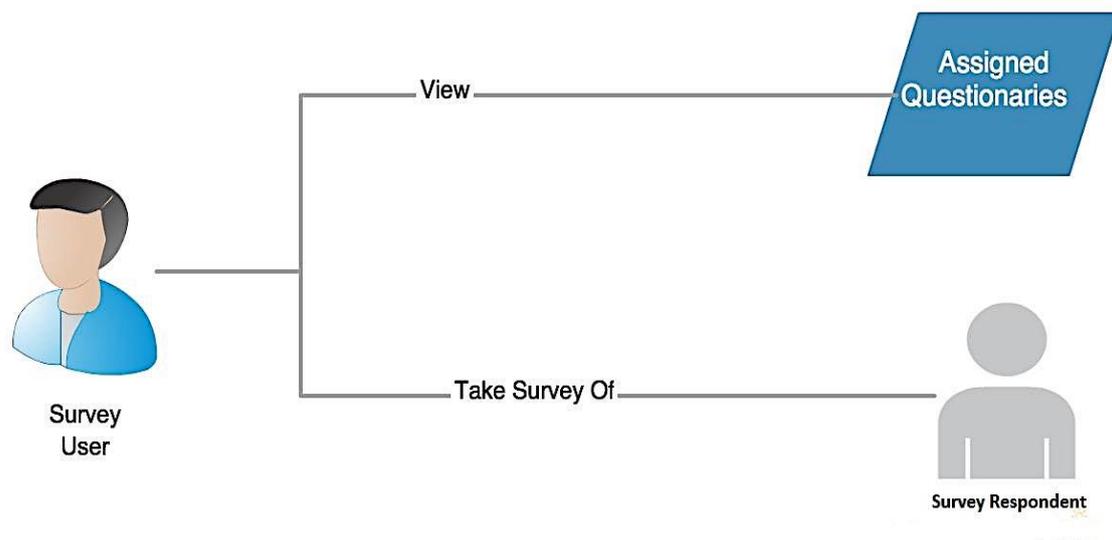


Figure 3: User Case Diagram for Survey User

## 4.2 Functional Requirements

‘**Online Health Facility Assessment Survey**’ software providing following functionalities:

- Store all assessment record.
- Store all the user record like Superadmin, Admin and provider.
- Storing each assessment record of each provider.
- Storing all assessment questionnaires and option of each questionnaire.
- Storing the reviews selected by the respondent in the database.

## 4.3 Performance Requirements

For ‘**Online Health Facility Assessment Survey**’ in order to performance related matter I am following below steps for getting high performance-

- I am using optimize query for taking less time get the result.
- I am using high performance server where huge number user can access the system without fetching any loading time.
- I am using good hosting where down rate near to null.

## 4.4 Non Functional Requirements

For ‘**Online Health Facility Assessment Survey**’ following Non-functional requirements will be there in the insurance on internet:

- 1) Ensure the data security of user information and assessment data information.
- 2) My system is 24 X 7 available.

3) Design the system with better component to get better performance at any time.

4) I design my system with flexible design pattern where my system can be extend with any module.

Various other Non-functional requirements are:

- Security
- Reliability
- Maintainability
- Portability
- Reusability
- Application Compatibility
- Resource Utilization

## **4.5 External Interface Requirements**

### **4.5.1 User Interface**

User of the system provided for '**Online Health Facility Assessment Survey**' with user-friendly UI design. User add and questionnaires add UI is very easy to understand. In questionnaires section question can be add at any number and against the each question there can be add any number of option. It is very flexible design where user can do their easily. In addition, report section can be easily understand for the user.

### **4.5.2 Hardware Interface**

For '**Online Health Facility Assessment Survey**' hardware part is most important because of huge number of user are connected in this system and generated report form huge number of data. Therefore, I am using Intel(R) Xeon(R) CPU E5-2620 v2 @ 2.10GHz with 6-core processor, 64-bit CPU, 16 GB RAM and 1 TB ROM.

### **4.5.3 Software Interface**

Software required for ‘**Online Health Facility Assessment Survey**’ to make working of product is –

- Operating System: I am using Linux CentOS as an operating system.
- Development platform: For coding language I am using PHP(Laravel), for Database I am using .

### **4.5.4 Communication Interface**

For to communicate with user and my system there need an interface. So to access my system there must be need internet.

## **4.6 General Constraints, Assumptions, Dependencies, Guidelines**

### **4.6.1 General Constraints**

‘**Online Health Facility Assessment Survey**’ software is in Bangla and English both languages. My system is working for single server, sender and receiver. My system take regular backup. So there has no afraid to losing the data. As my system is using lot of user, so this system is capable to serve every user without any interruption.

### **4.6.2 Assumptions and Dependencies**

‘**Online Health Facility Assessment Survey**’ software requires MySQL as database. So I am using different database server of MySQL where storing user information and all assessment data. There has also use backup MySQL database server for to back up the main server data. It is because if the main server database is corrupted we can get the data form the backup server database.

### **4.6.3 Guidelines**

To use '**Online Health Facility Assessment Survey**' software a user must be know the basic computer and mobile operation functionalities. He or she must have the basic knowledge of using Bangla and English language for operating the computer as well as my system. Hardware and Internet facility must be up to the mark.

## Chapter 5

### SYSTEM DESIGN SPECIFICATIONS

#### 5.1 Architectural Design

##### 5.1.1 Data Flow Diagrams

Data Flow Diagram is very simple of my system. General user like provider, customer like admin and administrator like super admin who maintain the system can login through server and server check the authentication by accessing the database. Super admin has all access in the system. Admin can create the questionnaires. Moreover, provider can assess their facility by answering the questionnaires.

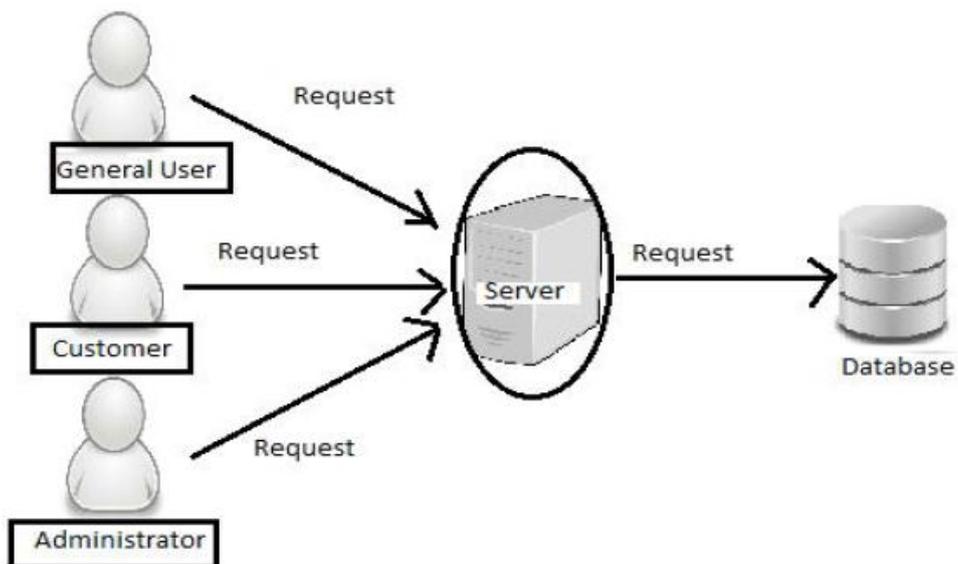


Figure 4: Data Flow Diagram of Online Survey System

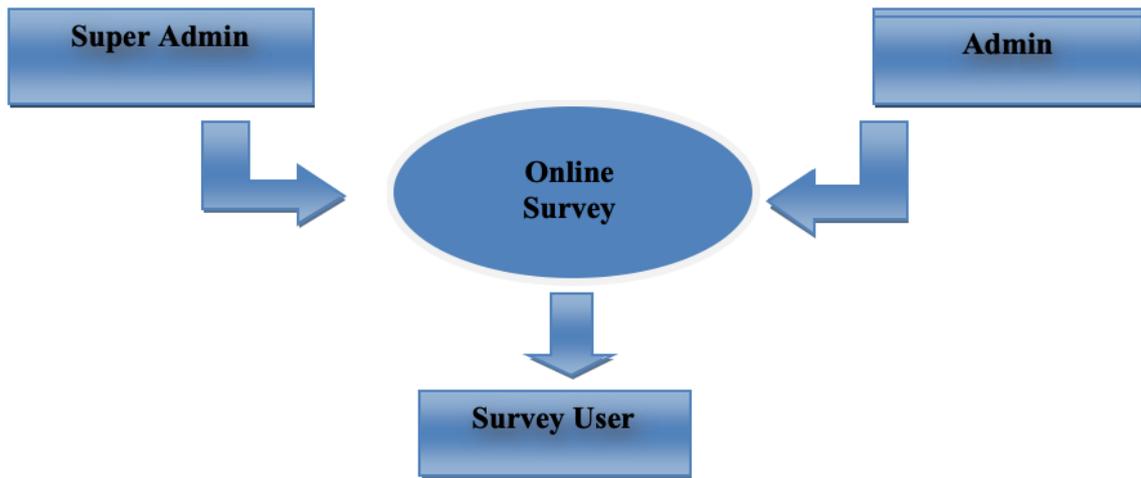


Figure 5: Context Analysis Diagram of Online Survey System

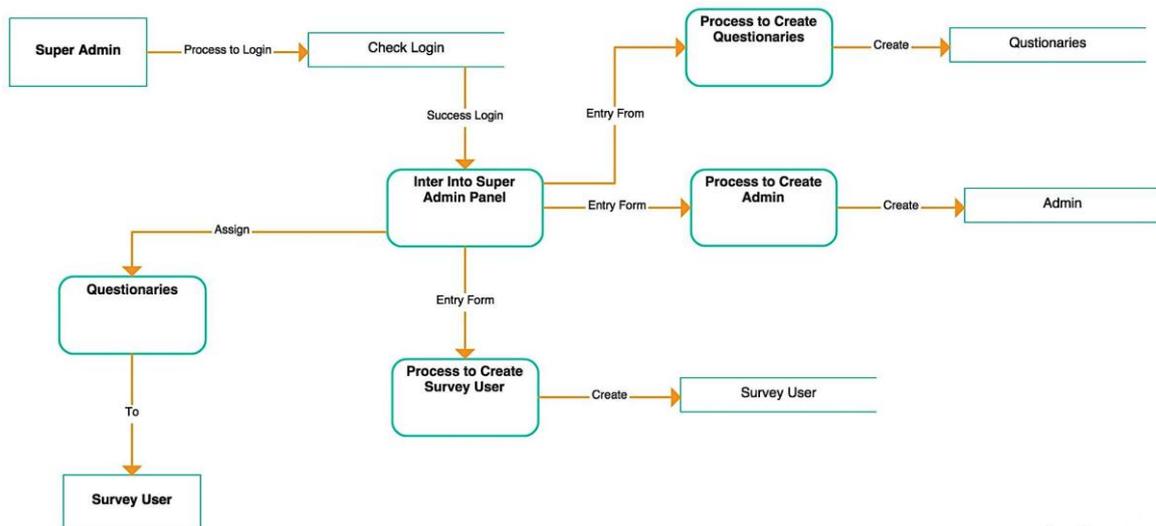


Figure 6: Level-1 DFD for Super Admin

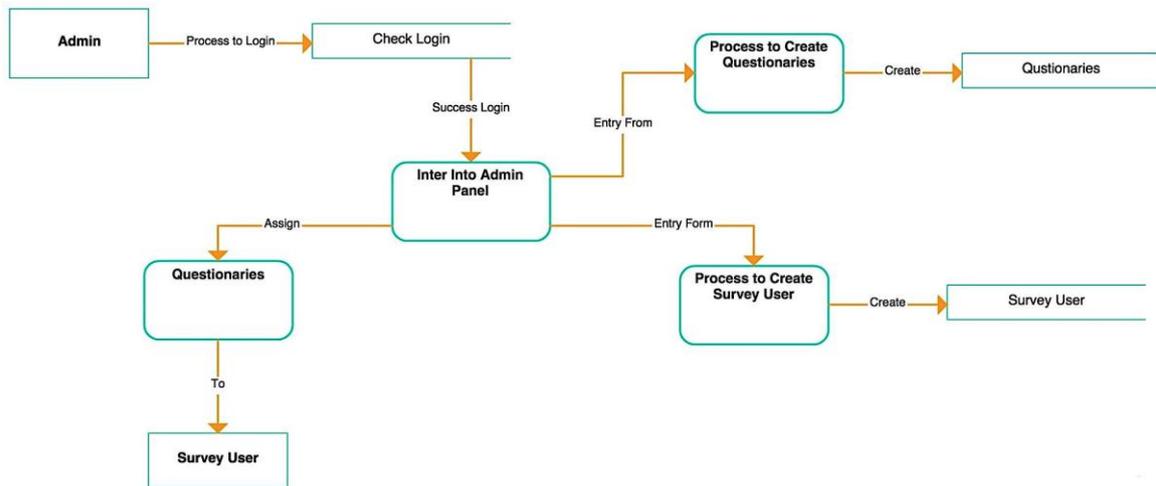


Figure 7: Level-1 DFD for Admin

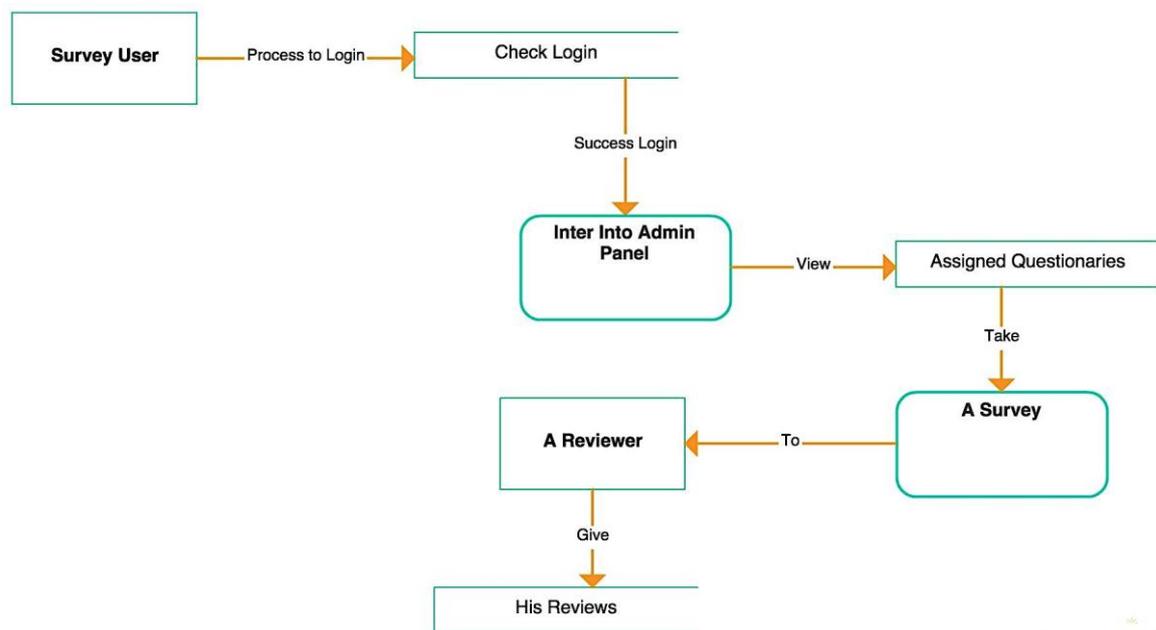


Figure 8: Level-1 DFD for Survey User

### 5.1.2 Database Design:

Before developing the system, I designed the database according to the system. For that, I prepared table structures and defined the relation between the tables according to the system. It helped me a lot to develop the system. Below I am providing the E-R Diagram of my system.

### 5.1.2.1 E-R Diagram:

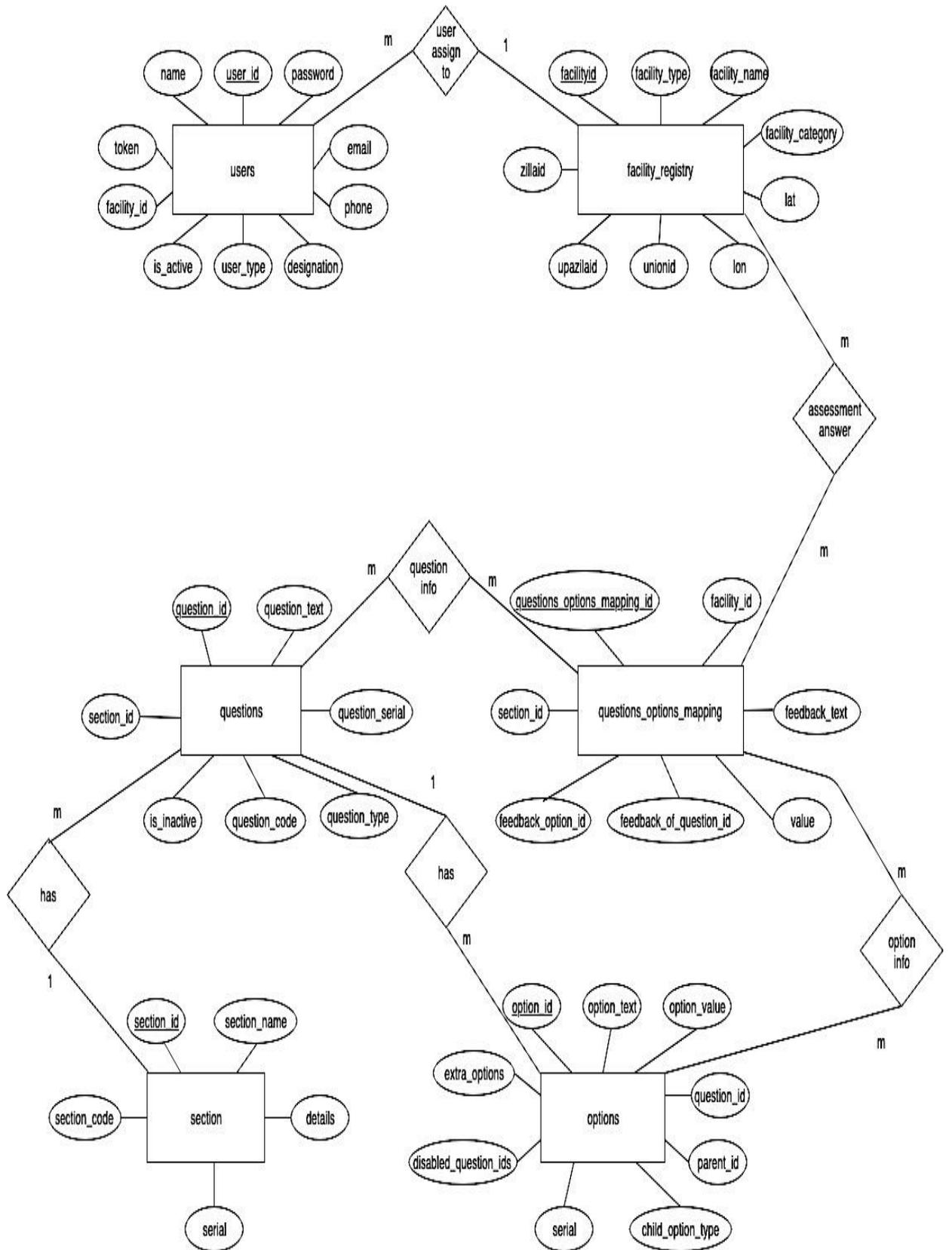


Figure 9: E-R Diagram

## Chapter 6

### TESTING

Software Testing is a pragmatic investigation conducted to provide stakeholders with information about the quality of the product or service under test, with respect to the context in which it is intended to operate.

#### 6.1 Testing Through Project:

Testing the project “**Online Health Facility Assessment Survey**” is done at every step of project design and enhancement.

At first if any person or company want to register into the site, he have to fill up the registration form and submit it. Then the super admin add new user to the system.

	User Id	Name	Mobile No	Union	Upazila	Zila
1	515007	A.K.M. Jafor Sadek	1712624517	75	43	51
2	60096	A.K.M. Harunar rasid	01711111111	19	36	75
3	755015	A.S.M. Nur Hossain	1719643766	66	10	75

Figure 10: Add New User to the System

Then if super admin permits him as an active user, then he could be a admin of this survey system. An admin can add new questionnaires to the assessment, active survey takers, can assign assessment to any user and also can add weight to any question.

সেকশন ৮ (কেন্দ্রের বর্জ্য ব্যবস্থাপনা)

8.1 সাধারণ/কঠিন বর্জ্য (ব্যবহৃত স্যালাইন ব্যাগ, সুচ, সিরিঞ্জ, গজ, তুলা, ঔষধের প্যাকেটস্ট্রিপ, নষ্ট হ্যান্ড গ্ল্যাভস, ইত্যাদি) ধ্বংস করার জন্য ইনসিনারেটর আছে কি না?

হ্যাঁ

না

8.2 তরল বর্জ্য (ডেলিভারীর পর যে সমস্ত তরল পদার্থ বের হয়, গর্ভফুল/গর্ভসংক্রান্ত বর্জ্য, ইত্যাদি) ধ্বংস করার জন্য ডাম্পিং পিট (৫ ফিট ব্যাসার্ধ ও ৬.৫ ফিট গভীর গর্ত যার চারপাশে ইটের দেয়াল, উপরে সিমেন্টের ঢালাই এর ঢাকনা যুক্ত ও ঢাকনার সাথে ৬ ফিট উঁচু প্লাস্টিকের পাইপ যার ব্যাস ৩ ইঞ্চি) আছে কি না?

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Figure 11: Add New Section and Questionnaires in the System

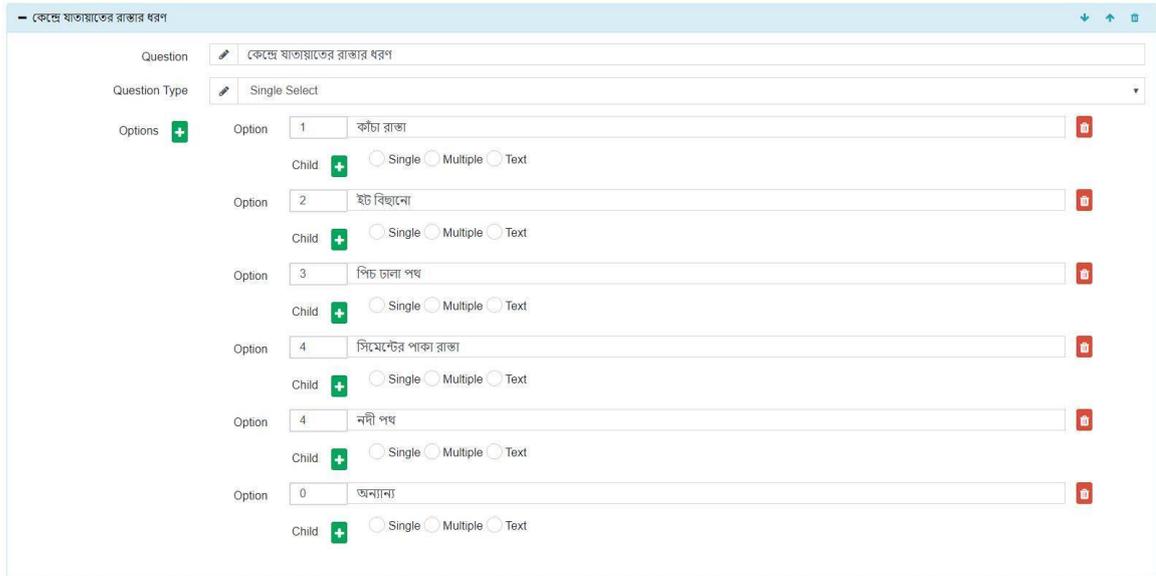


Figure 12: Adding Weight to the Questions in the System

After submitting the assessment response from respondent by survey taker, admin could see the summery. Other testing, as reports are comes properly or not, user are given their assessment properly or not etc.

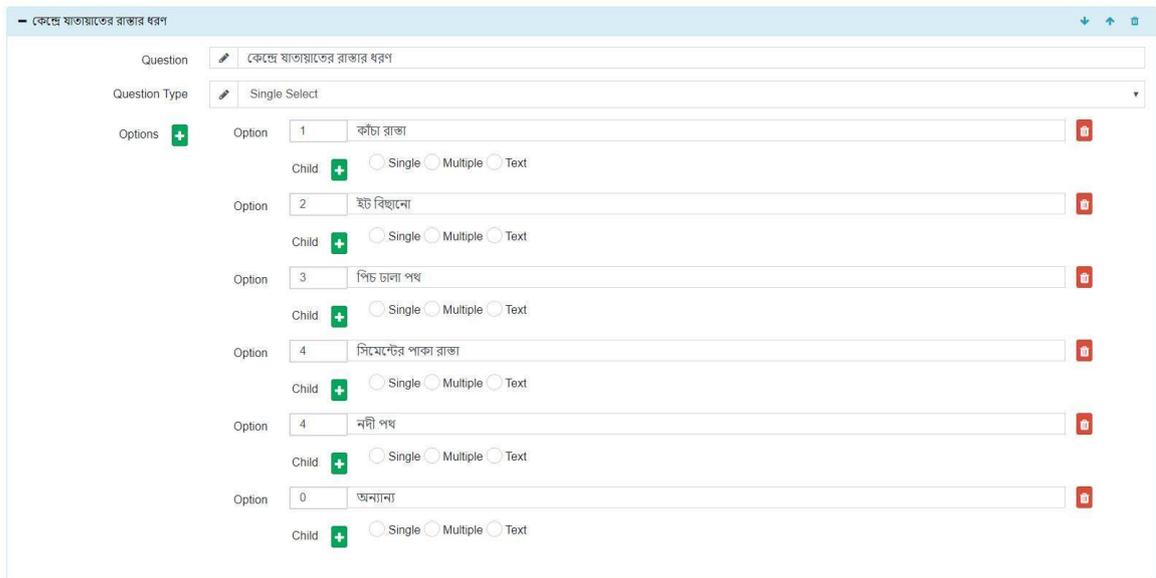


Figure 13: Summery Report after the assessment

After finishing the assessment, the system will calculate the weight of the answers and categories it by A,B and C, where category A is greater or equals to 200, category B is 100 to 199 and Category C is 0 to 99. The system also shows the level of the categories.

Refresh									
List of all sections									
	Zila	Upazila	Union	Facility Name	Baseline(2015-2016) Category	Lent(2018) Category	Change	Baseline(2015-2016) Score	Lent(2018) Score
1	HABIGANJ	HADHABPUR	BAGASURA	হাটহাটের ইউনিয়ন থেকে ৬ পর্যায়ের মাসিক পরীক্ষা	<b>B</b>	<b>B</b>	=	125	172

Figure 14: Categories of the Assessment

# Chapter 7

## SCREENSHOTS

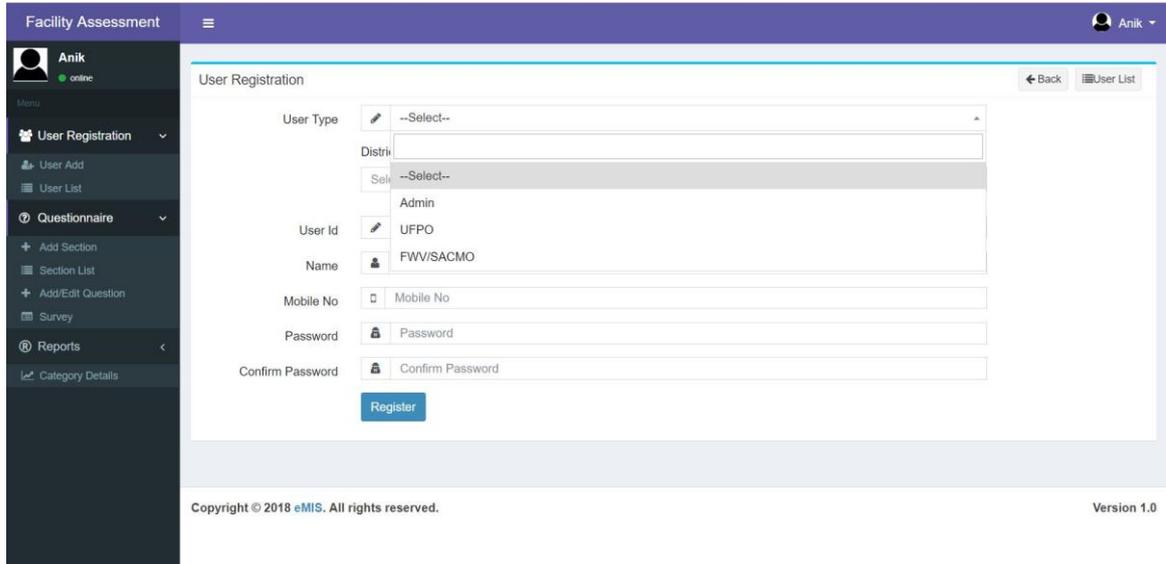


Figure 12: Add User Panel



Figure 13: User List

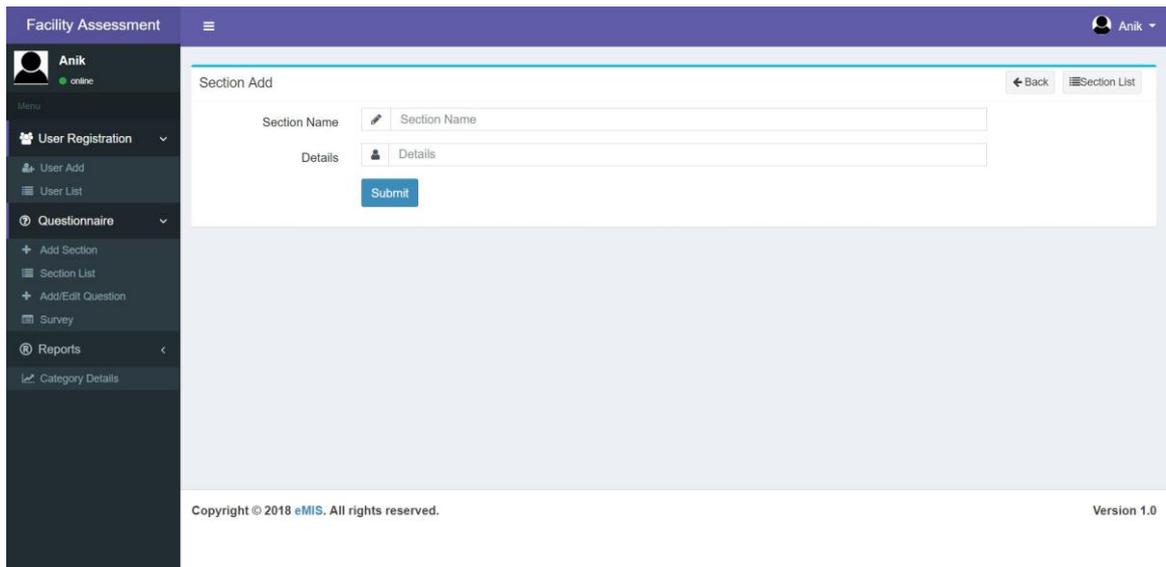


Figure 14: Section Add Panel

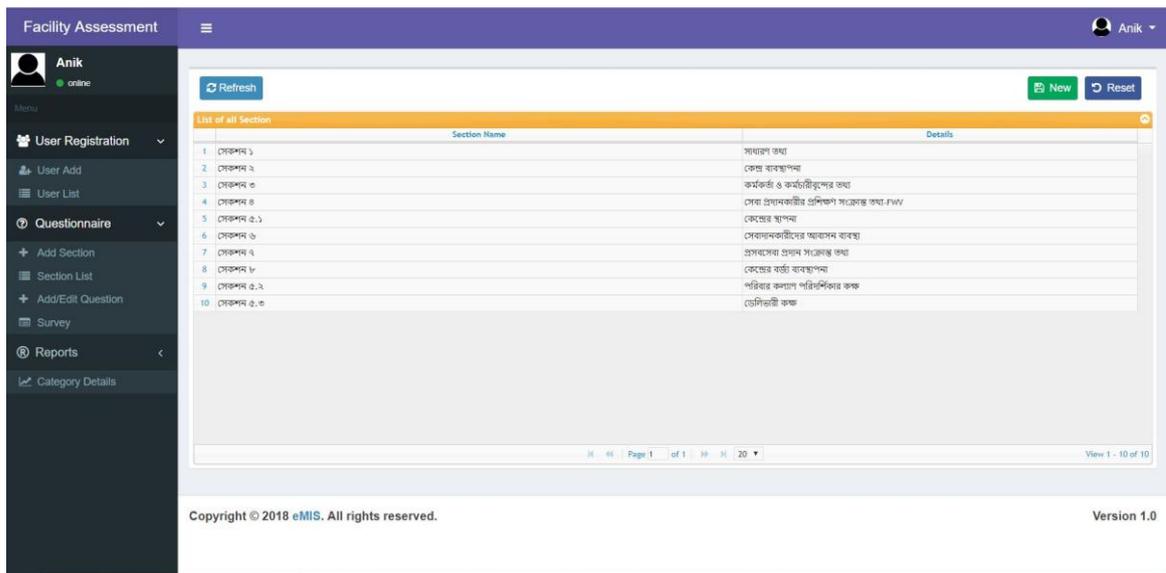


Figure 15: Section List

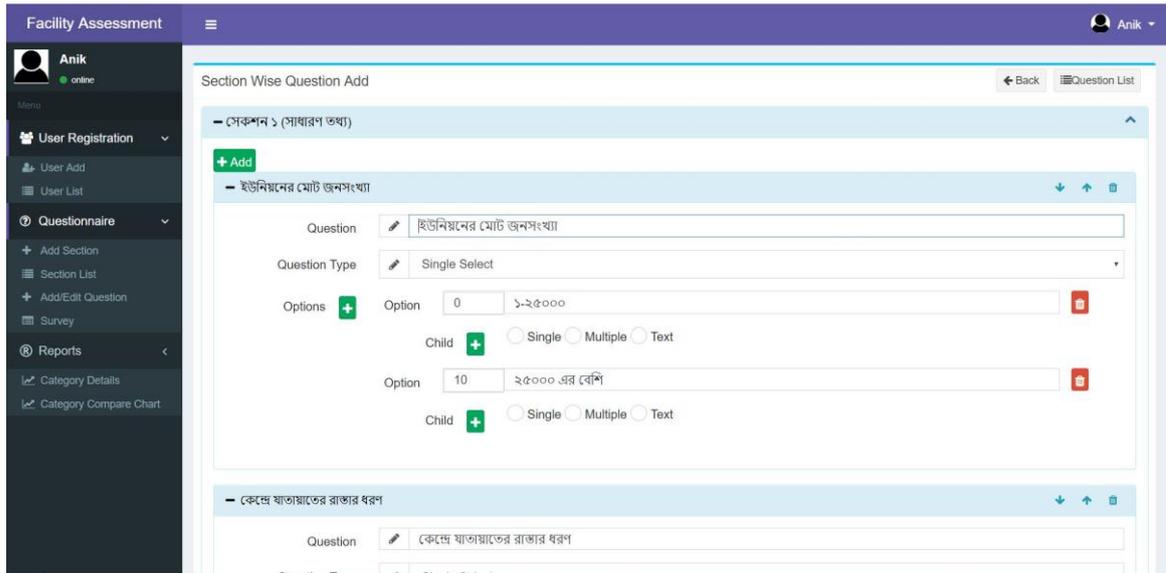


Figure 16: Question & Option add Panel

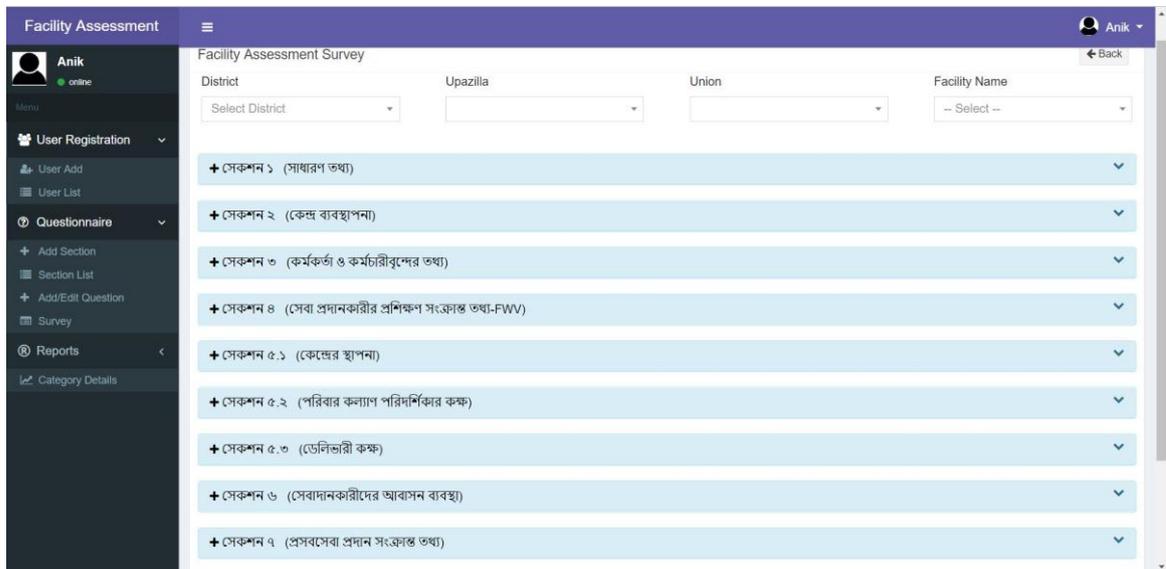


Figure 17: Assessment Panel

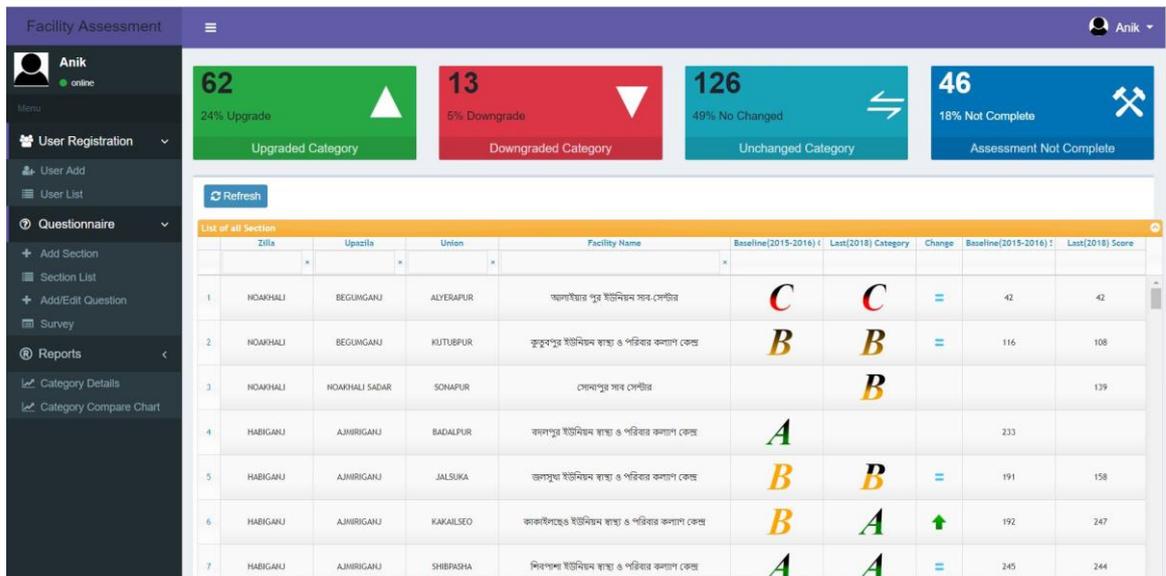


Figure 18: Report Panel where Facility are Shown by Category

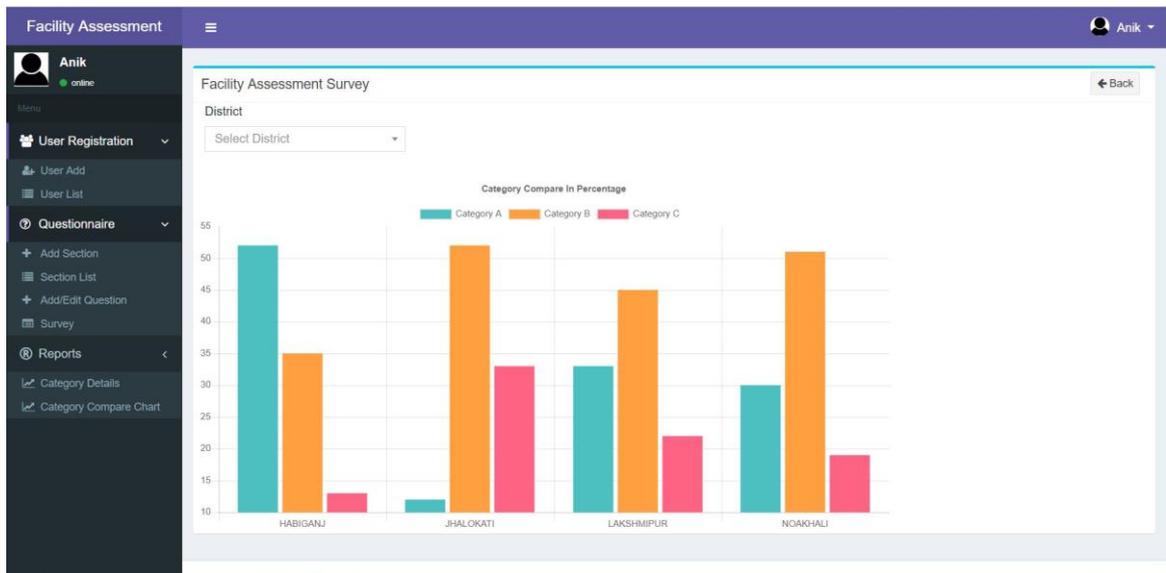


Figure 19: Bar Chart of Category Ratio by Region

## Chapter 8

### CONCLUSION

#### 8.1 Project Summery

This is to conclude that the project that I undertook was work upon with a sincere effort. Most of the requirements have been fulfilling up to the mark and the requirements, which have been remaining, can be complete with a short extension.

I tried to implement the best practices and Framework of PHP(Laravel). I also implement MVC design pattern with fronted templating system like Bootstrap.

#### 8.2 Future Scope of Project

The feature what I add in this system, it was proposed and running the system successfully. Additional feature can be add based on the requirement and improve the system accordingly. The following feature need to add for improve the system:

- Create provision to update existing questionnaires.
- Additional answer formats. Like as (Agree /Disagree), Dichotomous (Yes/No), Table (open ended) etc.
- In near future it will be extended for different type of mobile application.
- Need to add feedback table at database.
- Need to add different level of reporting system.

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