ONLINE POSTGRADUATE ADMISSION SYSTEM: A CASE STUDY

by

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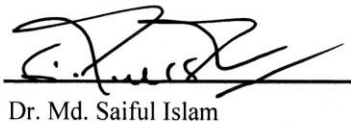

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It is hereby declared that this report or any part of it has not been submitted elsewhere for the award of any degree or diploma.

Fatema-Tuz-Sabiha

Fatema-Tuz-Sabiha

ID: 0416311005

Dedicated

To

My Parents and Family Members

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ABBREVIATION & KEY TERMS

URL	Uniform Resource Locator
HTTP	Hypertext Transfer Protocol
WWW	World Wide Web
HTML	Hyper Text Markup Language
PHP	Hypertext Preprocessor
CSS	Cascading Style Sheets
UIR	User Interface Re-engineering
DR	Database Re-engineering
DBMS	Database Management System
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
DD	Database Diagram
PC	Personal Computer

Acknowledgement

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Abstract

The admission procedures of universities worldwide, mainly for a sharp strike in number of potential applicants for university studies, are experiencing a competitive environment nowadays. Globalization has created a new dimension in this field as well. Students from all over the world are applying to different countries to study abroad. An admission process can be centralized or can be run by departments/institutes individually. Many developed countries have stepped forward to automated online admission systems from the pen and paper method. But in spite of technological advancement, still many universities in developing countries process their procedures manually, which is very inefficient, time-consuming, requiring lot of effort. This project will focus on the development ofan online system for the postgraduate admission of a department/institute of a university. Here the students and the administration both can access their parts and can be facilitated using this online system. The online system will enable tracking all the details of an applicant from the start of the online application to the end of admission which can be used for all reporting purposes. 'Waterfall Process Model' has been used to develop the whole software.The designed online admission system has two modules. One is for the applicantsand the other is for the administrator. In the applicant's module a candidate can submit their application to their desired programs. In this module they check their application status, print their admit cards for the written admission test if they get selected for the test. The authorized person of the administration can update notices as well as can evaluate the submitted applications of the applicants.For the system implementation or execution, a webserver named WampServer 3.1.9 has been used as a Windows web development environment. In the front end, for server-side web development, Hypertext Pre-processor (PHP-5.6.40) as scripting language, Bootstrap, an open source of Cascading Style Sheets (CSS3) for responsive design as well as jQuery for dynamic scripting have been used. MySQL-5.7.26 as database has been used for relational database server. Unit testing and system testing were performed before the software was finalized. Implementation in broad scale with online payment and online examination system, can be done in future. The system developed here met the expected requirements. So, this can be easily adopted by any educational institution.

CHAPTER-I
Introduction

1.1Introduction

Postgraduate education, or graduate education, involves learning and studying for academic or professional degrees for which a bachelor's degree generally is required, and it is normally considered to be part of higher education. Nowadays higher education has become popular than before which results a sharp strike of the number of applicants who are seeking admission to universities or institutions for enhancing their potentiality academically as well as professionally. That is why the admission process of the Institutions worldwide is experiencing a competitive environment. Globalization has created a new dimension in this field as well. Online postgraduate admission system is a web based system which is a great compatible solution of this competitive environment and already many developed countries have stepped forward to this online admission systems from the pen and paper method. It facilitates the applicants with the opportunity to go online from any corner of the world and apply for admission to the graduate schools of any institution globally. But still in this era of technology, universities in many developing countries process their admission manually. The manual pen and paper method of applying and processing students‘ admission is very stressful and cumbersome, forms and files may get lost during the process, students cue up just to process their admission details while staff sit for long laborious hours attending to students which makes the process very inefficient, time consuming and unfriendly for international candidates. An online admission system can overcome all these short comings of the manual admission system. Both the centralized or department wise independent process can be done using this online admission system. But this project focuses on the department wise scheme.

1.2 Objectives with specific aims and possible outcome

The objective of this project is to facilitate the potential applicants and the university administrators by developing a web based online system for university admission. The aim of Web Based Admission System is to digitize university admission process for higher education. Its basic objectives are to extend their reach to international applicants,

reducing time in activities, centralized data handling and paperless admission with reduced manpower. To accomplish the aim, the following processes will be carried out:

- The process of online application including payment information for the applicants.
- The process to view and asses the list of applicants and update their status by the management.
- To generate notices and admit cards and different other printable reports for the applicants and the management.

The possible outcome after the successful completion of this project will be an online system for postgraduate admission process of a university or institution.

1.3 Organization of the Project Report

The rest of the report is organized as follows:

In Chapter 1, the project overview and objectives are illustrated briefly. The system study and requirement analysis are described in Chapter 2. Chapter 3 depicts of the design of the project and its development. The implementation of the online system is described in Chapter 4. Finally, the project strength, limitations, challenges as well as the future works are mentioned in Chapter-5.

CHAPTER-II
System Study and Requirement Analysis

The step by step development of the project are described in the following.

2.1 Feasibility Study

A feasibility study opens up the strengths and weakness objectively and rationally of a proposed project. It is also widely known as feasibility analysis [14]. For this analysis, the factors which are most likely to be taken into account are such as economic, technological, legal and scheduling. It is important to do feasibility study before investing time and money both for a project to have a complete picture of potential positive and negative outcomes of that project [13]. The study arises some questions like whether the proposed project is technically feasible, will it be feasible within the estimated cost and whether it will be profitable or not.

The manual system of admission using ink and paper is more time consuming, much costly as well as difficult to maintain. But this proposed automated admission system is more feasible in terms of cost, effort and time as well. It is much more organized and easy to use. The project is economically feasible as it cuts the operation cost by cutting down the manpower. In this system only one official person is enough to play the role of an administrator. All the information of the applicants is shown in a tabular form to the administrator which makes the selection procedure much easier to the administrator. The project can be considered as technically feasible, since the whole system is designed into the latest technologies such as PHP, CSS and MYSQL Server which are the most used and recent technologies to develop web based systems and design databases. This proposed project also has Behavioral feasibility as the system is providing an attractive user interface to the operator/end user which makes the user feel easy and fast to work.

2.2 Planning

The system-development life cycle, _SDLC‘ in short, is a multistep process which is structured in a methodical way. It makes users enable to transfer a developed project to an operational phase. Planning is one of the most important steps of this cycle. In this project, this planning phase was taken into account in a very well-defined way. The system has some

fundamentals like, a database of the data of the Applicants, Information Management System, the assessment and shortlisting.

2.3 Scope

Project scope is generally an important part of a project planning. It is actually the tasks needed to be achieved to deliver a project [15]. Determining and documenting a list of specific project goals, deliverables, features, functions, tasks, deadlines, and ultimately costs are listed in project scope.

The scopes of the project are listed below

- The system makes the admission system of a university computerized.
- There is a common web interface for every user.
- Applicants can submit application for admission online from any corner of the world.
- The system creates a profile for each applicant who have applied for admission. All details of the applicant can be found at a glance from the profile.
- The admin can easily go through the profiles and evaluate each of them to short list for admission test.
- The central database stores all the information.
- The system generates roll no, admit cards as well as updates status of each applicant.
- It reduces workload, processing time and man power requirement.

2.4 Methodology

Methodology of a project is a model, which can be employed to design, plan, implement and achieve the objectives of the project. An organized methodology is the guidelines for successful completion of a study. The following steps were followed to develop the proposed online system:

1. First of all, requirement analysis was done regarding the department/institute wise admission procedure in a university. Next, software requirements specifications (SRS) had been prepared. For the overall system, an appropriate database was

designed after preparing the data flow diagram (DFD) and entity relationship diagram (ERD). Moreover, user interfaces or user screens were drawn.

2. There are two modules in the system, one for the applicants and the other for the management team known as administrator. In the system, the candidates will apply by registering and uploading their required documents. The administrator will publish a list of eligible applicants for the admission test, set up seats and after the test, result will be published online. Next the successfully selected candidates can accept or deny the offer for admission. Upon acceptance a roll number will be generated for each candidate. There is a provision to keep the reference number of payments for application and admission fees.

3. Next, the web-based software was developed using MySQL as database. In the front end, Cascading Style Sheets (CSS3) was used for style formatting, Hypertext Pre-processor (PHP) and jQuery for dynamic scripting. After the development of the software, thorough testing had been done with practical use case scenarios.

2.5 Requirements Analysis

Requirements analysis is an important part of project management [12]. The success or failure of a system or software project mostly depends on this process. It is also known as requirements engineering. In brief, the process by which the expectations for the product of the user is determined is widely known as requirements analysis. The project or product can be a new one or one which needs to be modified. On other words, it is a document which contains the full evaluation of the requirements of the specific project or product. The document should be actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for an efficient system design [16].

Requirement analysis is a significant stage in the Software Development Life Cycle model because it is the process of getting the whole view of the customer‘s need and expectations and it describes the details of how the proposed system or application should behave. Three views that the developer gets from the requirement analysis are as follows:

- Static View: System information
- Functional View: Function of the system
- Dynamic View: Behavior of the system

Four major types of activities are done in this stage of requirements engineering.

1. Eliciting requirements or requirements gathering
2. Analyzing requirements
3. Requirements modelling
4. Review and retrospective

2.6 Steps of Requirements Analysis Process

The steps of Requirements Analysis Process for the proposed project are briefly described here.

i. **Fixing System boundaries:** The preliminary step of the process is to assimilate the project and ensure its suitability with the existing system, service or environment. Future scopes and limitations should also be identified in this step in order to complete the project in a good planned way [18].

ii. **Identifying the customer:** It is important to focus on identifying the customers, broadly known as _stakeholders‘ in the initial steps of the requirement analysis process. The group or groups of people who will be directly or indirectly impacted by the application are known as customers or stakeholders of the project. They are considered as a vital project planning resource. This defined group helps the requirement analyst to find his answers.

iii. **Requirements elicitation:** In this step, information is congregated and a final whole picture of the requirements are drawn by listing the expectations of the defined group or groups of the stakeholders. It is important not only to list the requirements but also to categorize them. Activities in this step include:

- Finding the facts
- Gathering requirements
- Evaluation and rationalization
- Prioritization
- Integration

Some remarkable problems faced during this stage of the proposed project was inconsistency within a single process by multiple users, conflicting interests of the stakeholders, insufficient input from them, changing requirements after beginning the project.

Some popular techniques used for requirements elicitation are like,

- Prototype
- Use cases
- Data Flow Diagram (DFD)
- Transition Process Diagrams
- User interfaces

iv. **Requirements analysis process:** After gathering the requirements, analysis should be done in order to specify some requirements. While specifying, it is important to present them unambiguously. Some widely used software requirements analysis techniques are requirements animation, automated reasoning, knowledge-based critiquing, consistency checking, analogical and case-based reasoning [18].

v. **Requirements Specification:** Clear documents with unambiguous terms should be prepared and distributed to all the stakeholders or customers as well as the developers for a final and clear view of the outcome of the project. It can be documented separately for the users with specific easy text and for the application development and testing team with the programming or mathematical model.

vi. **Requirements Management:** In this final step, while the documentation is approved and done, requirements status should get focus. All the requirements have to be track able and manageable. Efficient requirements management practices ensure that all system requirements are stated explicitly, that oversights and errors are corrected and that sprouting specifications can be combined later in the project lifecycle [12] [18].

2.7 Requirements Engineering Tasks

In this section the core tasks or functions of requirements engineering are explicitly discussed. The process is proficient through the execution of seven different functions:

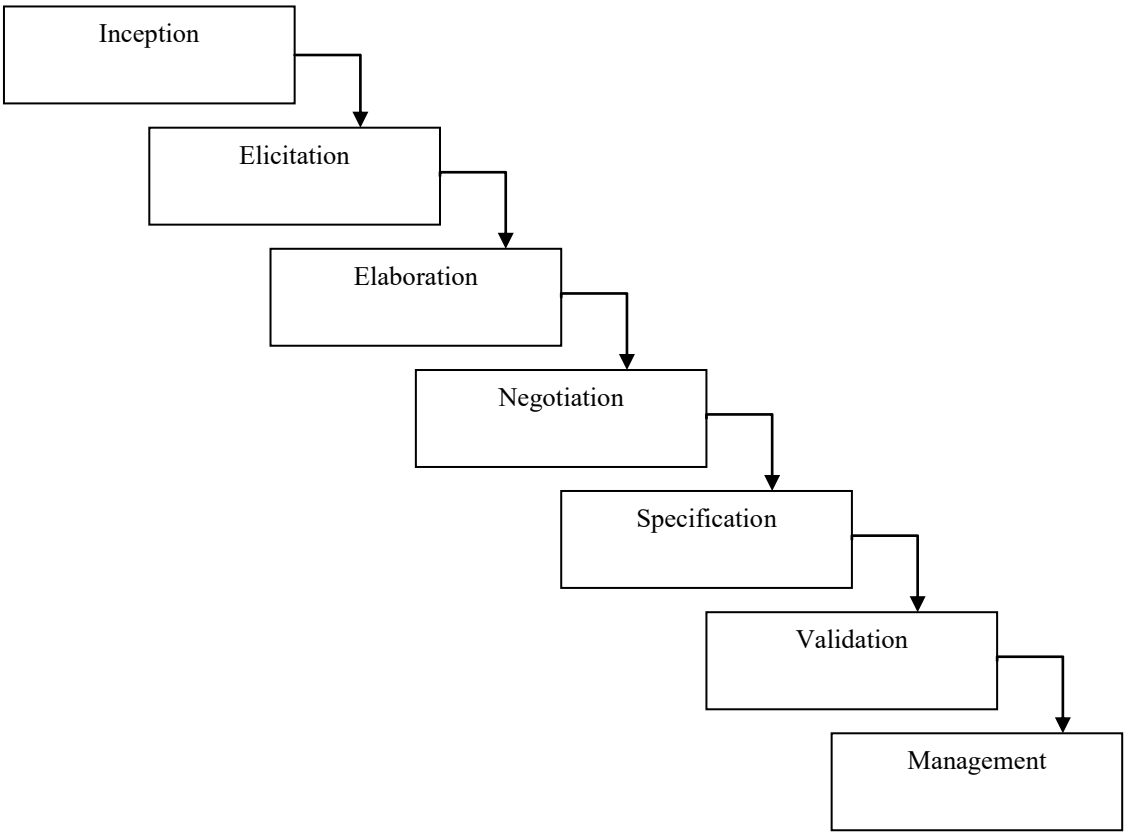


Fig-2.1: Different functions of requirements engineering tasks

The diagram of fig -2.1 illustrates the different function of requirement engineering tasks including inception, elicitation, elaboration, negotiation, specification, validation and management which are briefly discussed below:

- Inception: The requirement analyst asks the stakeholders context-free questions to understand the basic problem, customer‘s expectation and the nature of the solution for preliminary inception.
- Elicitation: Finding out the objectives of the project, the day to day usage of the product and most importantly how the product fits into business needs from the stakeholders is elicitation. Problems of scope, problems of understanding and problems of volatility are most commonly faced problems while doing this task.

- Elaboration: Elaboration refers to an analysis modeling action that is composed of number of modeling and refinement tasks of software functions, features, and constraints using the information which are collected from inception and elicitation.
- Negotiation: Usually the stakeholders and developers need to go through a negotiation process to balance the product‘s performance, functionality and system characteristics against time and cost to market. Sometimes negotiation is needed within the stakeholders of a defined group of customers as they may have different opinions and priorities. This process of negotiation is necessary to develop the plan of the project which reflects the real-world constraints (e.g. time, people, and budget) as well as provides some measure of satisfactions to both the developer and the customers.
- Specification: This can be a written document of some graphical models, a formal mathematical model, a collection of usage scenarios, a prototype or any combination of these [17]. For large projects description using natural language and sets of graphical models containing documents are best. It is necessary to describe the function and performance of computer based system and the constraints that will govern its development. The specification is considered to be the requirement analyst‘s last work product.
- Validation: The task validation refers to the formal technical reviews which is done to assess the quality of the product of requirements engineering. This review team includes the developer, customers, users and other stakeholders. The work product confirms the standard of the project. It examines the specifications to ensure that the requirements have been stated unambiguously, inconsistencies, omissions, errors have been detected and corrected.
- Management: Activities that allow the developer team to identify, control and track the requirements and changes with the progress of the project development are considered to be in management activities. Traceability tables can be updated with the modification of the requirements any time.

2.8 Software Requirements and Platform Selection

Considering the requirements, factors and options a programming language has to be chosen. Choosing the right platform from an endless choice also depends on some special characteristics. The choice also depends on the expertise of the developers on both language and platform. It seems easy but sometimes risky as well as difficult to determine the suitable platform or language for a proposed project. A wrong decision may put the developer in

trouble to meet the service requirements, security and expectations. So, to ensure the maximum service and satisfaction to the customers a suitable programming language and platform is necessary to choose.

2.9 Sources of Data

Data is the fundamental unit of information or unorganized statistical facts and figures collected for analysis and interpretation for research studies. Data sources are widely divided into two categories, like: (i) Primary Source (ii) Secondary Source.

(i) Primary Data- Primary data are the first hand information considered to be pure, original and collected data which has never gone through any kind of statistical treatments before It may become necessary to collect original data to conduct first- hand investigation. Two major methods of primary data collection are mentioned here:

(a) Questioning and
(b) Observation

(ii) Secondary Source- Secondary data are those data which are already collected and published before. Researchers can find and use these data from sources like journals, reports, government publications, publications of research organizations, trade and professional bodies etc.

Beside primary and secondary sources internal sources of data can be considered as important source of data. The measurements that are produced by the routine business record keeping like accounting, finance, production, personnel, quality control, sales, R&D etc is named internal data [19].

2.10 Methods of Data Collection

There are different methods or techniques for collecting data. It is important to choose the appropriate technique to drive a good research. The choice of method is influenced by the data collection strategy, the type of variable, the accuracy required, the collection point and the skill of the enumerator. Here, in this section, the methods which were applied for this project are explained below:

- Observation
- Questionnaires

- Interviews
- Document study

2.10.1 Observation: It is a great source for information of a particular group. In this technique the observer can use video cameras to monitor what actually happens in the existing system but the privacy issue of a workplace should be considered before embarking the path. For the proposed system video cameras were not used. This method can produce both qualitative and quantitative data. But this process does not go with requirements analysis process.

2.10.2 Questionnaires: This method is the most useful method for gathering information. The questionnaires can be asked or sent to the subject by phone, email or online. It is one of the most popular technique of data collection as it provides opportunity to the researchers to go through the answers and formulate it at their own time and own pace. Although it is easy to send the questionnaires, the response rate may be less. To optimize it while making the questionnaires the researcher should focus on choosing the right questions.

2.10.3 Interview: Even though interviewing is time consuming and not that much cost effective, it overcomes most of the short comings of other techniques. It is mainly qualitative in nature and can be structured, semi-structured or informal. Telephone interview has become very popular now a days and it was very helpful for this project. After the interview session the interviewer generates a document which helps in the research process.

2.10.4 Documents study: Examining the formats of the existing system can be a good method of gathering information about the operations. By studying the internal source data like internal reports, annual journals, operating systems the researcher can get an idea of the system and its limitations as well. In this proposed project this method was used for gathering information.

2.11 Requirement Gathered for the System

2.11.1 Hardware Requirement

A mid-range server with Windows or Linux operating system and a personal computer with ability to browse on internet are the hardware required for the system as hosting server and workstation respectively.

2.11.2 Communication Interfaces

Internet Protocol (IP) like other systems was used for the data transmission between the server and the client and at the upper level hypertext transfer protocol (HTTP) was used for communication between the web server and client.

Memory Constrain: No specific memory constrain was used in the system.

2.11.3 Software System Attributes

System attributes are the properties to measure the quality of the system or how much the system satisfies the stakeholders. There can be different genres of attributes of a software system such as correctness, reliability, adequacy, learnability, robustness, maintainability, readability, extensibility, testability, efficiency, portability etc. The attributes of this software are reliability, security, maintainability and portability.

a) Reliability: System reliability refers to the probability of the satisfactory execution of functions for which it was designed of for a specific time period and environment including all its components. Reliability engineering highlights dependability in the lifecycle management of a product. It derives from correctness and availability. Maintainability and maintenance are also often defined as a portion of "reliability engineering" in Reliability Programs. Reliability is hard to achieve when the complexity of software tends to be high. While the complexity of software is inversely related to software reliability, it is directly related to other important factors in software quality, especially functionality, capability, etc. Reliability plays a key role in the cost-effectiveness of systems. To measure reliability the software has to be operated for the full time period.

b) Security: This attribute refers to the ability to protect the system from the likelihood of malicious or accidental actions. It is also responsible for reducing the possibility of theft or loss of information. The authorization mechanism of the system will block the unwanted attempts to the server and also let the system decide which privileges the user. The system has different types of users who need to login with a specific authorization number so that unwanted information will not make the system overwhelmed.

c) Maintainability: It is the ability of the system to support changes like modification or extension of functionality. The detail of the system is explained thoroughly in this document which will help the admin to maintain this software easily.

d) Portability: A software system can be considered to be portable if the porting of the system is less affordable than a new implementation. This software is an online service which makes it accessible globally. Only the server of the system must have the required software including MySQL, Apache2. In this system it is designed using PHP (Hypertext Preprocessor) because of its cross platform nature which makes the developer stress free from worrying about the operating system of the use as it is suitable for all operating systems as well as the availability of its hosting server provider. PHP is an extremely rich programming language and it contains the basic components of developing user‘s interface.

2.11.4 Architecture of web Application:

The following architecture was followed for the proposed project.

(1) The client Side- An applicant is a client who uses a personal computer, laptop or mobile to send requests to the resources through internet by using interface. It handles the presentation logic

(2) The Admin Side- Admin is also a client similarly uses the computer, laptop, mobile etc. which requests the resources, through the internet with a user interface but for creating, updating and deleting information.

(3) The Web Server- Authentication, authorization and ensuring security is the key role that a web server plays. It is the heart of any system as most of the works are being done in this server. A database server restores all the data required for the application.

2.11.5 Functional Requirements: Functional requirements of the proposed system are depicted bellow within their categories:

a) Network specific requirements: A server is mandatory for a system. This system requires a streaming server.

b) Database management and file requirements:

- Creation of profile: Applicants can create their own profile and afterwards view and edit it till a specific deadline. An admin can view the profile, evaluate and update the status evaluating the application.
- User Authentication: For logging in to a profile the user has a unique User ID and password.

- System file: Information is stored in the system file.
- Image file: Images of the applicant can also be stored. Applicant and admin both can view the image.
- Save data: The stored information are clustered and saved.

c) Query and retrieval requirements:
- User identification: There are different modules for the applicant and the admin.
- View user info: The applicants can view their own profile as well as the admin can view.
- Submit application: The candidates can submit their own application for admission.

d) User Interface requirements:
- Platform: The system can operate in any operating system the user uses.
- Runs: It runs on computers as well as mobile devices.
- Provide data: The applicants can provide his/her personal data. The admin is also allowed to provide data.
- Update data: In this system all the users can update their data which they are allowed to.

e) Security requirements:
- Authentication: For user identification, the system has authentication mechanisms.
- User access: A user can access the specific content which he/she is allowed to access based on their username and password.
- Data encryption: The system uses data encryption.

2.11.6 Other Non-Functional Requirement Analysis

Non-Functional requirements are often called quality attributes of a system. These are not the features but required characteristics of the system. Some Non-functional requirements which were taken into account while developing the project are listed below.

- Performance: For a better performance the proposed system requires high speed internet availability for intensive data transmission.
- Scalability: A system should be scalable to expand to support increasing traffic or user data. A scalable system can run with limited space and resources for small number of

users but as long as the demand increases it can adapt to support all users rather than needing to be replaced.

- Availability: It is important to ensure the access to the system for the authorized users interminably.
- Robustness: In case of failure of any function of a system there should be an alternative to provide relentless service. The fault should be detected and recovered soon. It should not hamper the process.
- Maintainability: With time a system needs to be updated. While updating, to ensure the service the old version of the system should be on run.
- Usability: A system should always be easy and friendly to use. The proposed system is out of complexity. It provides very easy access of the required data to the authorized user.

2.12 Input and Output Finding of the System

The possible inputs are the application with the required documents and image, the evolution result, program contents and notices which the admin can enter or update.

The outputs are the registration number, admit card, status update etc.

2.13 Process Flow and Analysis

1. An authorized admin has to first log in to the system with a given username and password and afterword that person can change the password.
2. The authority then will open admission by declaring the session, programs to be offered for that session, deadline for application submission and deadline for accepting admission offer, admission test date.
3. An interested applicant for admission first has to pay an application fee and with the transaction ID of the payment he/she has to sign up or register in the admission system.
4. If the sign up is successfully done then the system will automatically generate a registration ID which will be unique for each applicant applying for the declared session.
5. Then the applicant has to login into the system and apply with required documents and information. Before applying, it is recommended to go through the instructions on ―How to Apply".

6. After a successful application the applicant can view his/her application status in his/her own profile.
7. The administrator will start evaluating the applications after the last date of application and qualify the qualified applicants for the written admission test.
8. Admit card will be generated and can be printed by the qualified applicants.
9. A written admission test will be conducted manually according to the seat plan and after the test the score will be inserted in the system by the admin.
10. Finally, the qualified scored applicants will get an admission offer. The offer has to be accepted within the declared date. Applicants who accept the offer, will get a roll no generated by the system.

2.14 Implementation Tools and Technologies

A Web development platform that allows creating dynamic Web applications with Apache2, PHP, MySQL is required for the project execution. WampServer will be used here as it is applicable in Windows. The web based software will be developed using Hypertext Preprocessor (PHP) as the dynamic scripting language. In the front end of the software, HyperText Markup Language (HTML5), jQuery, Cascading Style Sheets (CSS3), Bootstrap which is a library of CSS will be used. MySQL will be used as the database.

2.15 Chapter Summery

This chapter overall has depicted the early stage of development process of the project. It covers the stages of development of the project such as the feasibility studies, planning, scope and methodology. The requirement analysis, sources of data, methods of data collection, process flow and analysis, possible input and outcomes, implementation tools and technology also are focused in this chapter.

CHAPTER-III
System Design and Development

3.1 Scope and Features of the Proposed System

The proposed system is a web based automated system for the admission process of a university or institution. Waterfall Process Model was used to develop the whole system. This process model is also renowned as linear sequential life cycle model where there is no option of overlapping of phases. All the phases such as software requirement analysis, design, implementation, verification and maintenance are done sequentially.

The designed online admission system has two modules. One is for the applicants and the other is for the administrator. A centralized database is there in the system to keep records of all the applicants. In the applicant‘s module a candidate has to first pay an application fee and with the transaction number can register into the system. After a successful registration the applicants can login to submit their application for admission to their desired programs. In this module they can edit their profile within the specified deadline, check their application status, print their admit cards for the written admission test if they get selected for the test. The candidates who get offered for admission can also accept or deny the offer through it. The authorized person of the administration can login through the admin portal and then can update session, programs to offer, notices as well as can evaluate the submitted applications of the applicants and generate admit cards for each short listed candidates for their admission test.

The main features of the project are:

- Applicants‘ registration
- Online application
- Upload required documents as well as image
- Edit or update profile till a deadline
- Change password
- Update session, offered programs and deadline
- Evaluation by the admin
- Short listing
- Seat plan
- Admit card generation

- Status update of the application
- Offer admission
- Accept or deny admission
- Generating roll no for offer accepting applicants

3.2 Major Section of the System Activities

The whole system has two modules. One is for the applicant or candidate and the other for the admin. The major activities of the modules are mentioned:

Admin‘s Features	Applicant‘s Features	System
• Log in to the system with the given username and password first time and afterwards can change that. • Can add/ update/ delete programs as well can enter the required deadlines or dates. • Can check and evaluate applications • Can generate notice	• Registration • Can check instructions for applying. • Apply online for admission • Upload and change documents till deadline. • View Profile • Accept/Deny offer	• Generate report/ Admit card • Generate registration ID/ Roll No.

3.3 System Architecture

The overall system architecture is shown below.

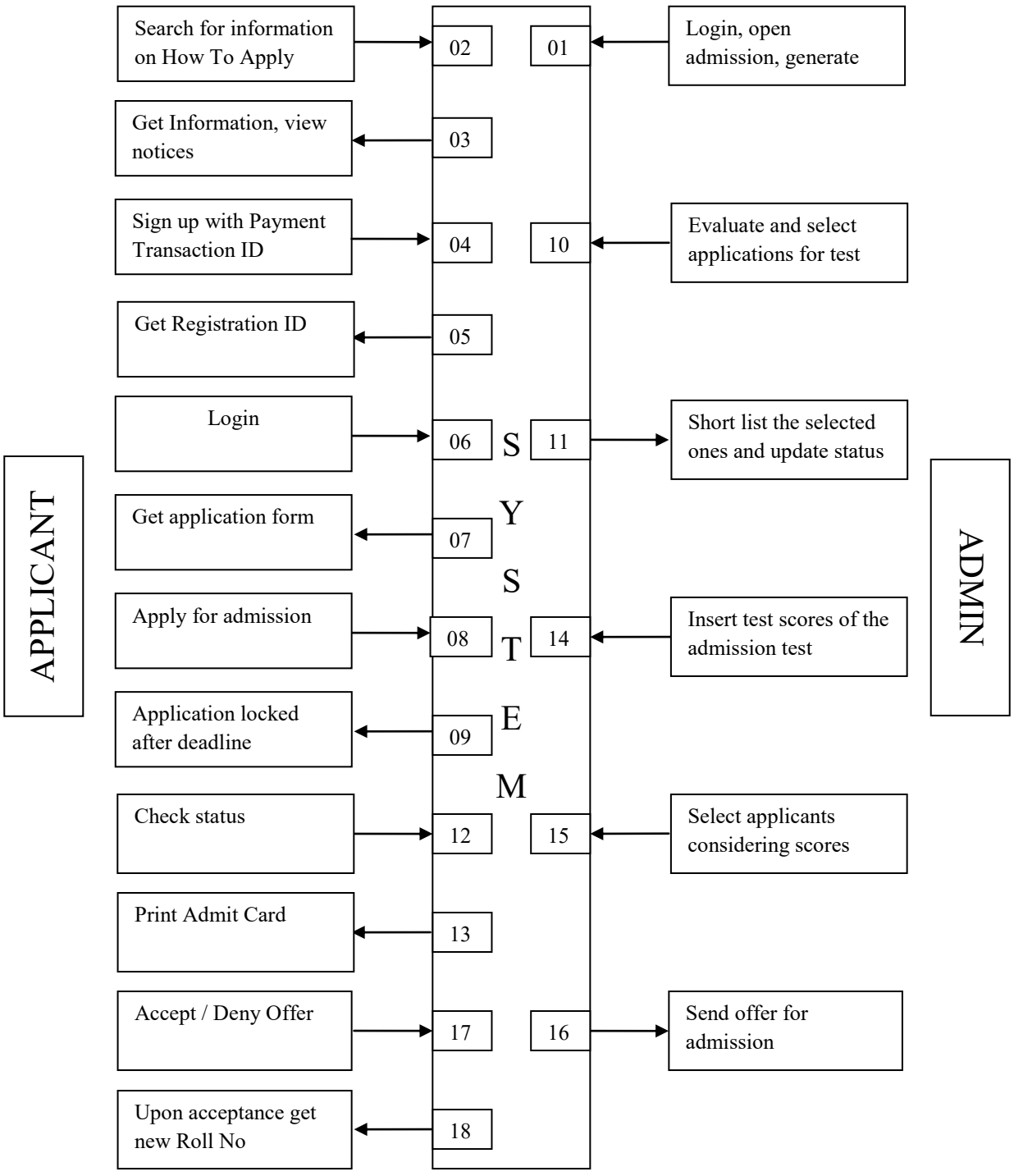


Fig-3.1 System architecture

The step by step work follow is demonstrated underneath:

	Applicant		**Admin**	
Steps	**To System**	**From System**	**To System**	**From System**
01			Login, open admission, generate notice	
02	Search for information on how to apply			
03		Get information, view notices		
04	Sign up with payment transaction ID			
05		Get registration ID		
06	Login			
07		Get application form		
08	Apply for admission			
09		Application locked after deadline		
10			Evaluate and select applicants for test	
11				Short list selected and update status
12	Check status			
13		Print admit card		
14			Insert test scores of the admission test	
15			Select applicants considering scores	
16				Send offer for admission
17	Accept / Deny offer			
18		Upon acceptance get new Roll no.		

3.4 Use Case Diagram

The Use Case diagram of the proposed Online Admission System is shown by fig-3.2 below:

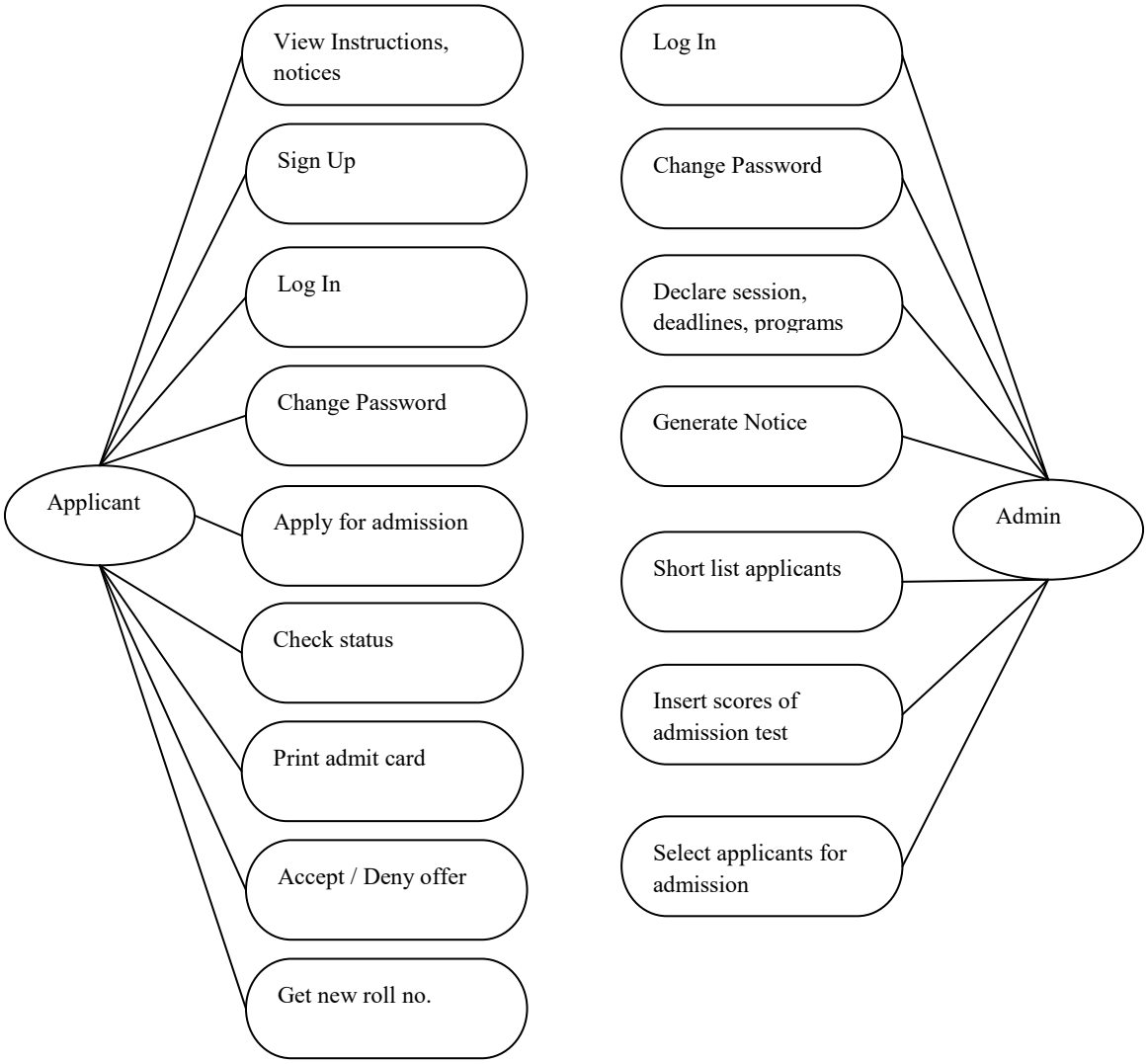


Fig-3.2 Use Case Diagram

3.5 Flow Chart

The flow chart of the online admission system is as follows:

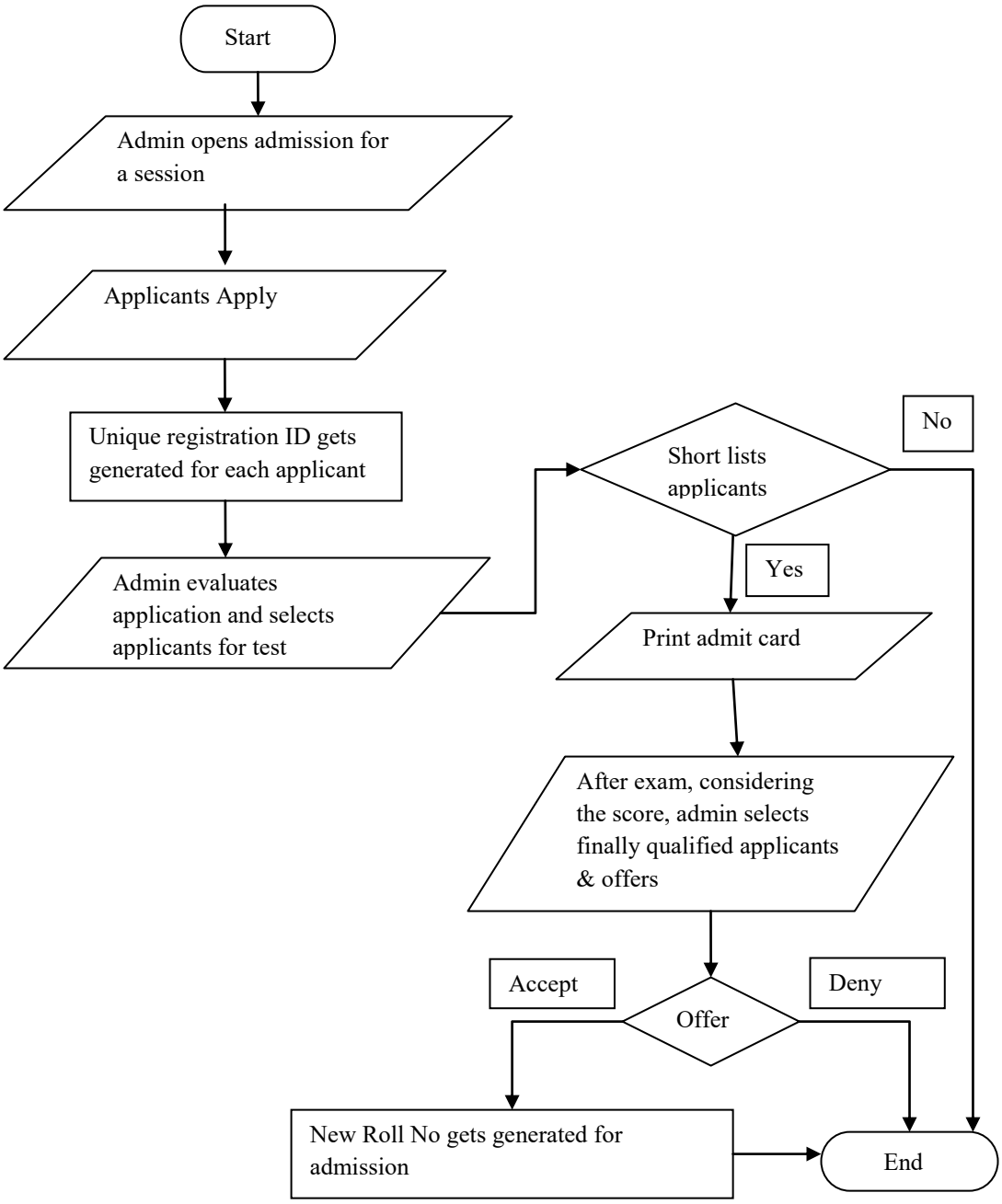


Fig-3.3:Flow chart

1. An authorized admin has to first log in to the system with a given username and password and afterword that person can change the password.

2. The authority then will open admission by declaring the session, programs to be offered for that session, deadline for application submission and deadline for accepting admission offer, admission test date.

3. An interested applicant for admission first has to pay an application fee and with the transaction ID of the payment he/she has to sign up or register in the admission system.

4. If the sign up is successfully done then the system will automatically generate a registration ID which will be unique for each applicant applying for the declared session.

5. Then the applicant has to login into the system and apply with required documents and information. Before applying, it is recommended to go through the instructions on ―How To Apply".

6. After a successful application the applicant can view his/her application status in his/her own profile.

7. The administrator will start evaluating the applications after the last date of application and qualify the qualified applicants for the written admission test.

8. Admit card will be generated and can be printed by the qualified applicants.

9. A written admission test will be conducted manually according to the seat plan and after the test the score will be inserted in the system by the admin.

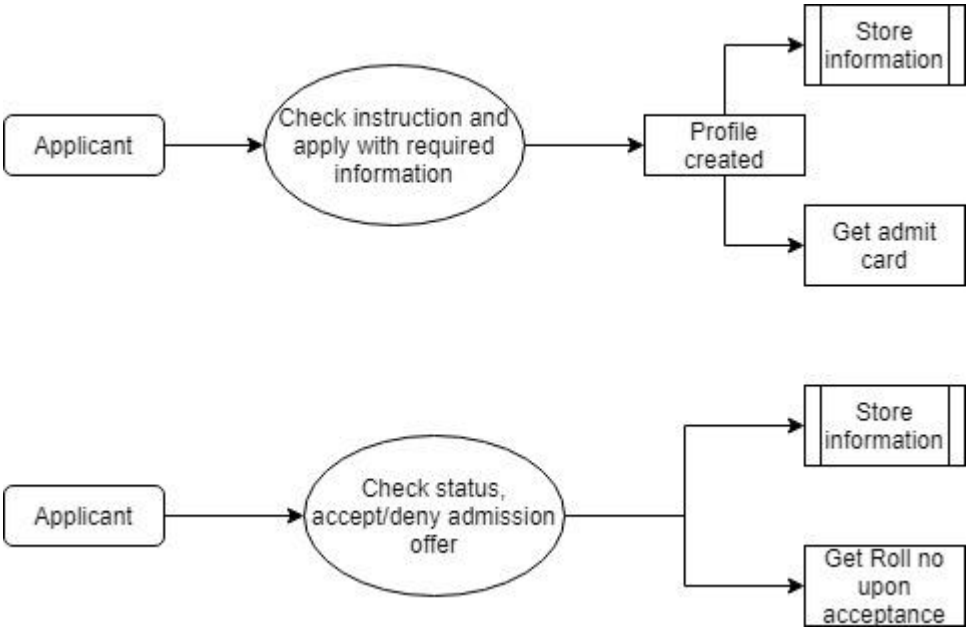
10. Finally, the qualified scored applicants will get an admission offer. The offer has to be accepted within the declared date. Applicants who accept the offer, will get a roll no generated by the system.

3.6 Data Flow Diagram (DFD)

A Data Flow Diagram, widely known as DFD as well as Bubble Chart is used to graphically represent the movement of data between external entities and the processes and data stores within an overall system. The elements required for the system and their changes are represented by DFD. It is the starting point in system design that decomposes the

requirements specifications down to the lowest level detail. In the following, the DFDs of the overall system are demonstrated.

DFD for Applicant:



DFD for Admin:

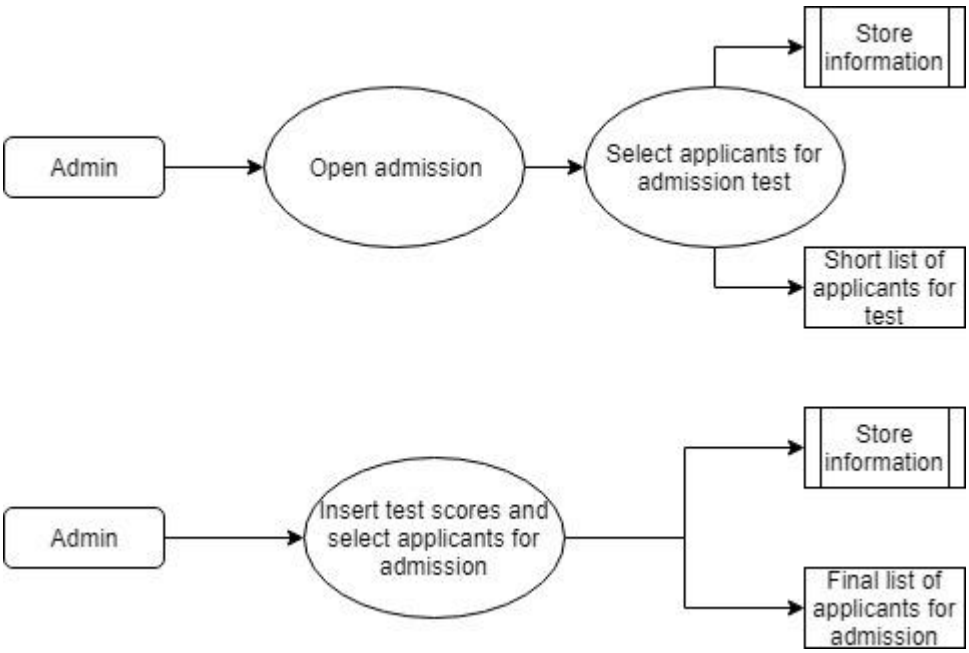


Fig-3.4 Data Flow Diagram (DFD)

3.7 Front end and Back End Design

3.7.1 What is System Design?

System design refers to a systematic structure to the design of a system. It is also known as logical design of a software which is a process to design the system elements, the interfaces of those elements as well as the data that goes through that system. In the very beginning this design provides a complete view of the software.

System design or logical design is the process of designing a system which takes into account all related variables of the system that needs to be created—from the architecture, to the required hardware and software, right down to the data and how it travels and transforms throughout its travel through the system. It may take a bottom-up or top-down approach. In short, it is a sketch of the requirements for a developing software.

3.7.2 Basic Design of Software

The Automation Application administrator can store necessary data easily with more comfort, safety and security in a short time and retrieve those in necessity. The administrator can manipulate data with the help of this software. There are two interfaces of the Stake Holder Relationship Management System which are depicted below:

Administrator Interface: The software is connected with company server database, thus no more connection with other systems is needed. No system interface is needed during the development of this project.

User Interface: The software must be designed as a web based that has a main user interface. Format of main screen must be standard and flexible. The system must be user friendly. Pages must be connected to each other in a consistent way. Operations to be done with the system being repeatable.

3.7.3 Front End and Back End Design of the Proposed System

The web based software will be developed using PHP as the dynamic scripting language. In the front end of the software, HTML5, jQuery and CSS3 will be used. MySQL will be used as the database in the back end. For responsive and attractive design of the website, Bootstrap version 3 will be applied.

3.8 Database

A database (DB), in general term, is an organized collection of data. More specifically, a database is a set of programs in a computer that allows data to be easily accessed, manipulated

and updated. . The main goal of a database is to provide a way to store and retrieve database information that is both convenient and efficient. [11]

3.8.1 Classification

One way to classify databases involves the type of their contents, for example: bibliographic, document-text, statistical, or multimedia objects. Another way is by their application area, for example: accounting, music compositions, movies, banking, manufacturing, or insurance. A third way is by some technical aspect, such as the database structure or interface type.

3.8.2 Database System versus File system

Databases are created to address all issues that arises from file system based information management. Conceptually, databases were developed to overcome the problems of traditional file environments, such as data redundancy, data inconsistency, program-data dependence, lack of flexibility, poor-security and sharing etc, which are defined below. Therefore, database is considered as a paradigm shift from file system to a centralized management protocol.

Data redundancy: Data is said to be redundant if same data is copied at many places. *Data Inconsistency*: Data is said to be inconsistent if multiple copies of same data does not match with each other.

Lack of flexibility: A user should know the exact location of file to access data, so the process is very cumbersome and tedious.

Program-data dependence: Programs rely on s specific format of data to work on. *Unauthorized Access*: File System may lead to unauthorized access to data.

Sharing: The access of same data by multiple users at same time is known as concurrency. File system does not allow concurrency as data can be accessed by only one user at a time.

No Backup and Recovery: File system does not incorporate any backup and recovery of data if a file is lost or corrupted.

3.8.3 Main Phases of Database Design

Primary phases that create database design are as follows:

- Conceptual design: A conceptual database plan is being created when every data requirement is stored and analysed.
- Logical design: This phase is also known as the *data modelling mapping phase*. We can get ER diagram from this phase.

- Normalization: To reduce any superfluity, the relationship schema is being changed in this phase of Normalization.
- Physical design: Implementation of the database design takes place in this last stage. A Database Management System is mandatory to choose in this level.

3.9 Database architecture and Database Management System (DBMS)

The Database Architecture is a set of rules and processes to how to data will be stored in the database. This architecture describes organization of all the database objects. It effects on integrity, performance and reliability. The architecture defines the nature of the data, structure of the data and the data flow.

On the other hand, Database Management System (DBMS) refers to the technology solution used to optimize and manage the storage and retrieval of data from databases. DBMS offers a systematic approach to manage databases via an interface for users as well as workloads accessing the databases via apps. The management responsibilities for DBMS encompass the information within databases; the processes applied to databases such as access and modification; as well as the logical structure of the database. DBMS also facilitates additional administrative operations such as change management, disaster recovery, compliance and performance monitoring, among others.

3.9.1 Key Components of Database Management System (DBMS)

DBMS has the following key components:

Software: DBMS is primarily a software system that can be considered as a management console or an interface to interact with and manage databases. The interfacing also spreads across real-world physical systems that contribute data to the backend databases. The OS, networking software and the hardware infrastructure is involved in creating, accessing, managing and processing the databases.

Data: DBMS contains operational data, access to database records and metadata as a resource to perform the necessary functionality. The data may include files with such as index files, administrative information and data dictionaries used to represent data flows, ownership, structure and relationships to other records or objects.

Procedures: While not a part of the DBMS software, procedures can be considered as instructions on using DBMS. The documented guidelines assist users in designing, modifying, managing and processing databases.

Database Languages: These are components of the DBMS used to access, modify, store and retrieve data items from databases; specify database schema; control user access and perform

other associated database management operations. Types of DBMS languages include Data Definition Language (DDL), Data Manipulation Language (DML), Database Access Language (DAL) and Data Control Language (DCL).

Query Processor: As a fundamental component of the DBMS, the Query Processor acts as an intermediary between users and the DBMS data engine in order to communicate query requests. When users enter an instruction in SQL language, the command is executed from the high-level language instruction to a low-level language that the underlying machine can understand and process to perform the appropriate DBMS functionality. In addition to instruction parsing and translation, the Query Processor also optimizes queries to ensure fast processing and accurate results.

Runtime Database Manager: A centralized management component of DBMS that handles functionality associated with runtime data, which is commonly used for context-based database access. This component checks for user authorization to request the query; processes the approved queries; devises an optimal strategy for query execution; supports concurrency so that multiple users can simultaneously work on same databases; and ensures integrity of data recorded into the databases.

Database Manager: Unlike runtime database manager that handles queries and data at runtime, the database manager performs DBMS functionality associated with the data within databases. Database manager allows a set of commands to perform different DBMS operations that include creating, deleting, backup, restore, cloning and other database maintenance tasks. Database manager may also be used to update the database with patches from vendors.

Database Engine: This is the core software component within the DBMS solution that performs the core functions associated with data storage and retrieval. A database engine is also accessible via APIs that allow users or apps to create, read, write and delete records in databases.

Reporting: The report generator extracts useful information from DBMS files and displays it in structured format based on defined specifications. This information may be used for further analysis, decision making or business intelligence.

3.10 Information Modeling

Within the field of software engineering and data modeling an information model is usually an abstract, formal representation of entity types that may include their properties, relationships and the operations that can be performed on them. The entity types in the model

may be kinds of real-world objects, such as devices in a network, or occurrences, or they may themselves be abstract, such as for the entities used in a billing system. Typically, they are used to model a constrained domain that can be described by a closed set of entity types, properties, relationships and operations. Information modeling pertains to the development of model in information generation, storage, destruction, evaluation, manipulation, synthesis and utilizations. These models help in systematization of information generation, flow, interpretation synthesis of more information.

3.10.1 Concept of Information Modeling

Firstly, Entities has to be chosen in information modeling. An entity is any object in the system that we want to model and store information about. Entities are atomic that they are invisible. The parameters of entity are known as attributes. Attributes are known as quantum of information, which describes the entity entirely.

Secondly, relationships among the entities have to be figured out.

The second step in information modeling is relationship among entities. It is the most important in making sense of the entity and inter-entity relationship. The relationship is the information, which links two entities. The relationship can be of four categories:

One-to-One (1:1) –One instance of the first entity can correspond to only one instance of the second entity. It is known as binary relationship.

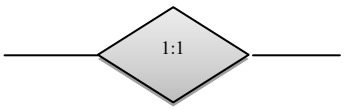


Fig-3.5: One-to-One relation

One-to-Many(1:M) – One instance of the first entity can correspond to more than one of the second entity.

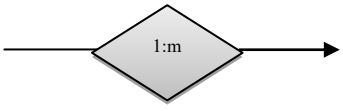


Fig-3.6: One-to-Many relation

Many-to-One (M:1) – More than one instance of the first entity can corresponds to the same one instance of the second entity

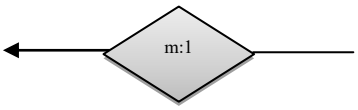


Fig-3.7: Many-to-One relation

Many-to-Many (M:M) – More than one instance of the first entity can correspond to more than one instance of the second entity.

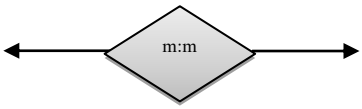


Fig-3.8: Many-to-Many relation

3.11 Data Modeling

A model is not just a way of structuring data: it also defines a set of operations that can be performed on the data. The relational model, for example, defines operations such as select (project) and join. Although these operations may not be explicit in a particular query language, they provide the foundation on which a query language is built.

There are two major classes of data models – logical data models and physical data models. These two classes reflect the fact that efficient physical storage and retrieval of data must be designed around the physical characteristics of storage media and devices, but user of data should be able to describe, think about and use data without being concerned of its physical storage.

3.11.1 Types of Data Modeling

The data modeling consists of three interrelated pieces of information, the data object, the attributes that describes the data object and the relationship that connects data objects to one another. A data object is a representation of almost any composite information that must be understood by software. Composite information means something that has a number of different properties or attributes.

Six different types of data models are given below:

- Entity-Relationship Model (E-R Model)
- Relational Model
- Object-Oriented Data Model
- Object-Relational Data Model

- Hierarchical Data Model
- Network Data Model

3.11.2 Entity–relationship model

An entity–relationship model is a systematic way of describing and defining a business process. In this business process, the components (entities) are connected with each other by relationships that express the dependencies and requirements between them, such as: a building may be divided into zero or more apartments, but an apartment can only be located in one building. Entities may have several properties (attributes) which characterizes them. To represent these entities, attributes, and relationships graphically are called entity–relationship diagrams.

An ER model is typically implemented as a database. In the case of a relational database, which stores data in tables, every row of each table represents one instance of an entity. Some data fields in these tables point to indexes in other tables; such pointers represent the relationships.

ER model

ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system. It develops a conceptual design for the database. It also develops a very simple and easy to design view of data.

An entity may be defined as a thing capable of an independent existence that can be uniquely identified. An entity is an abstraction from the complexities of a domain. When we speak of an entity, we normally speak of some aspect of the real world that can be distinguished from other aspects of the real world. Entities can be thought of as nouns. Examples: a computer, an employee, a song, a mathematical theorem.

A relationship captures how entities are related to one another. Relationships can be thought of as verbs, linking two or more nouns.

The model's linguistic aspect described above is utilized in the declarative database query language ERROL, which mimics natural-language, constructs. ERROL's semantics and implementation are based on reshaped relational algebra (RRA), a relational algebra that is adapted to the entity–relationship model and captures its linguistic aspect.

Entities and relationships can both have attributes. the proved relationship may have a date attribute.

The entity's primary key is a minimal set of uniquely identifying attributes which every entity (unless it is a weak entity) must have.

Entity–relationship diagrams don't show single entities or single instances of relations. Rather, they show entity sets (all entities of the same entity type) and relationship sets (all relationships of the same relationship type). Example: a particular song is an entity. The collection of all songs in a database is an entity set. The eaten relationship between a child and her lunch is a single relationship. [11] The relationship set is a set of all such child-lunch in a database. In other words, a relationship set corresponds to a relation in mathematics, while a relationship corresponds to a member of the relation.

3.12 Entity Relationship Diagram (ERD)

The ERD for the proposed system is drawn in the following.

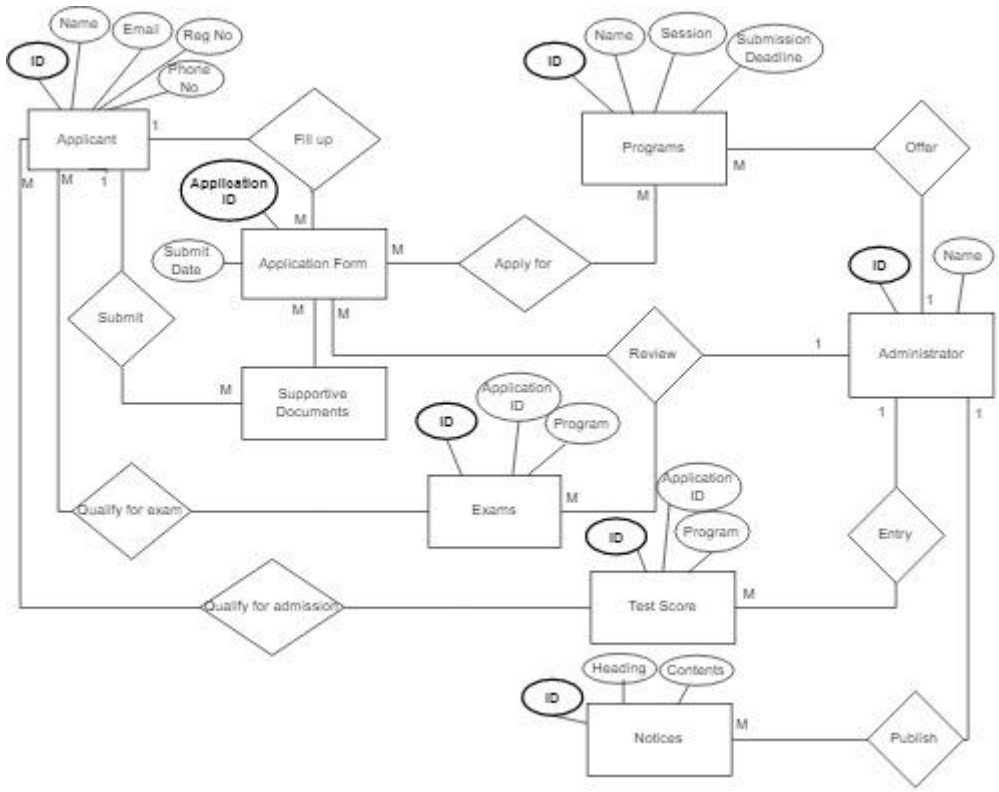


Fig-3.9: Entity Relationship Diagram (ERD)

3.13 Database Development

Relational database management system was used to manage the database. The database was developed in MySQL. The total data have been normalized and then tables are obtained.

3.13.1 Description of the Database Development

For the proposed project, in total seven tables have been designed to perform database applications like storing, updating, retrieving information and others. The table fields with their data types are mentioned below:

Table Name: user_info

Fields with data type:

`id` int(11)
`user_name` varchar(30),
`password` varchar(40)
`designation` varchar(30)
`reg_time` timestamp
`change_password` tinyint(4)
`change_time` timestamp
PRIMARY KEY (`id`)

Table Name: registration

Fields with data type:

`id` int(11)
`username` varchar(30)
`regid` varchar(30)
`email_id` varchar(60)
`question` varchar(100)
`answer` varchar(100)
`nid` varchar(30)
`payid` varchar(30)
`password` varchar(40)
`in_time` timestamp `change_password` tinyint(4)
PRIMARY KEY (`id`)

Table Name: programs_data

Fields with data type:

`id` int(11)
`session_name` varchar(40)

`program_name` varchar(100)
`submission_deadline` date
`offer_deadline` date
`exam_date` date
`status` varchar(20)
`signature` varchar(60)
`entry_by` int(11)
`entry_time` timestamp
`update_by` int(11)
`update_time` timestamp
PRIMARY KEY (`id`)

Table Name: db_notices
Fields with data type:
`id` int(11)
`type` varchar(30)
`appl_id` varchar(500)
`headline` varchar(100)
`effect_from` date
`effect_to` date
`body` varchar(1000)
`document` varchar(60)
`status` varchar(10)
`entry_by` int(11)
`entry_time` timestamp
`update_by` int(11)
`update_time` timestamp
PRIMARY KEY (`id`)

Table Name: apply_program_information
Fields with data type:
`id` int(11)
`user_id` int(11)

`program_id` int(11)
`roll_no` varchar(20)
`title` varchar(10)
`name` varchar(80)
`dob` date
`marital` varchar(20)
`gender` varchar(20)
`fname` varchar(80)
`mname` varchar(80)
`nid` varchar(30)
`nationality` varchar(20)
`religion` varchar(20)
`address` varchar(20)
`postcode` varchar(10)
`email_id` varchar(50)
`mobile_no` varchar(20)
`appl_status` varchar(20)
`entry_time` timestamp
`edit_time` timestamp
`qualified4exam` tinyint(4)
`room_no` varchar(10)
`q4exam_time` timestamp
`test_score` double
`score_time` timestamp
`qualified4admission` tinyint(4)
`q4admission_time` timestamp
`accept` tinyint(4)
`a_time` timestamp
PRIMARY KEY (`id`)

Table Name: apply_program_education
Fields with data type:
`id` int(11)

`application_id` int(11)
`type` varchar(20)
`degree` varchar(20)
`discipline` varchar(40)
`board` varchar(80)
`institution` varchar(80)
`pyear` varchar(10)
`cgpa` varchar(10)
PRIMARY KEY (`id`)

Table Name: apply_program_document

Fields with data type:

`id` int(11)
`application_id` int(11)
`category` varchar(40)
`description` varchar(100)
`image` varchar(50)
PRIMARY KEY (`id`)

3.14 Software Tools

3.14.1 Programming Language and Software Platform

Programming language is very much important because it helps to Design interface and runs the application smoothly. In addition, a programming language affords an organized mechanism for defining fragments of data, and the operations or alterations on that data automatically when required. The following software interfaces were used in the proposed system.

3.14.2 Software Interfaces:

Software interfaces which can be used for the proposed project are listed below with brief discussion:

- **Browser:** Firefox, Chrome and Microsoft Internet Explorer (IE) of any version can be used to execute the user side of the software. Mozilla, Google and Microsoft Corporation are the sources of these browsers respectively.

  Firefox is one of the world's most popular browsers. It includes a variety of features that are designed to give you a fast and secure browsing experience.

A freeware web browser developed by Google is Google Chrome. It used the WebKit layout engine until version 27 and, with the exception of its iOS releases, from version 28 and beyond uses the WebKit fork Blink.

The Microsoft Internet Explorer provides easier, faster, safer, flexible and reliable browsing experience with enhanced web privacy features for all users.

- **Web Server:** For this project, Wamp Server 3.1.9- 32bits will be used as the web server. This server is required here to provide the client software at the server site. WampServer is a Windows web development environment. It allows us to create web applications with Apache2, PHP and a MySQL database. Alongside, PhpMyAdmin allows us to manage easily our databases. A software stack denotes by WampServer for the Microsoft Windows operating system, created by Romain Bourdon and consisting of the Apache web server, OpenSSL for SSL support, MySQL database and PHP programming language.
- **Web Development:** PHP- 5.6.40 is going to be used. It is a product of PHP group which is used for server-side web development. Usually it runs on a web server which work with MySQL database and Apache server.

  PHP is a mostly-used general-purpose scripting language that has improved object-oriented capabilities especially suited for web development and can be embedded into HTML.
- **Database:** As database, for relational database server, MySQL-5.7.26 is planned to use. It is the world's most popular and powerful open source relational database software, with over 100 million copies of its software downloaded or distributed throughout its history. With flexibility, superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT managers because it eliminates the major problems associated with downtime, maintenance, administration and support.

3.15 Testing

Testing is a process of executing a system prior to hand over the project to the customer or user in order to find errors or any kind of inconvenience. It is one of the most important parts of any data entry system which explains the performance of the system and helps to examine the newly developed system to come to a conclusion on whether the system is as per the expectation of the stakeholder or not. As a result it delivers a good quality product to the end

user by fixing the bugs. Fig 3.10 depicts different levels of testing of a system. These levels are briefly described below:

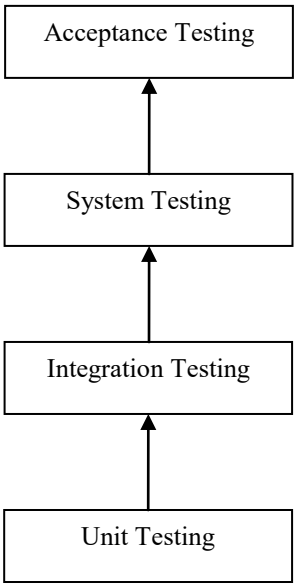


Fig 3.10: Levels of testing

3.15.1 Unit Testing

A unit is the most micro testable part of any software. Unit testing is a level of software testing where individual units/ components of a software are tested. Usually it is done by the software developers or by their peers as it needs comprehensive knowledge of the internal program design and code. In rare cases, it may also be performed by independent software testers. [23]

3.15.2 Integration Testing

This testing is executed by combining some units to check whether the integrated units are synchronized and working together or not. It is done after the unit testing Test drivers and test stubs are used to assist in Integration Testing. It contains several forms together and each form is working parallel with one another.[24]

3.15.3 System Testing

In this level of software testing the complete integrated software is being done. Normally, individual testers perform this testing process. [25]

3.15.4 Acceptance Testing

It is a level of software testing where a system is tested for acceptability. The purpose of this test is to evaluate the system's compliance with the business requirements and assess whether it is acceptable for delivery. Acceptance testing means the final certification that the system is ready to be used in production setting.[26]

3.15.5 Test Case

A test case for the testing of proposed software project is represented below:

<table>
<tr><td colspan="7">Project Name: Online Postgraduate Admission System-A Case Study</td></tr>
<tr><td colspan="7">Sample Test Case</td></tr>
<tr><td colspan="3">Test Case ID: test_7</td><td colspan="4">Test Designed By: Mr. X.</td></tr>
<tr><td colspan="3">Test Priority: Medium</td><td colspan="4">Test Design Date: 17.06.2019</td></tr>
<tr><td colspan="3">Module Name: System Login Screen</td><td colspan="4">Test Executed By: Mr. Y</td></tr>
<tr><td colspan="3">Test Title: Verify Login with valid User_ID and Password</td><td colspan="4">Test Execution Date: 17.06.2019</td></tr>
<tr><td colspan="7">Description: Test the online admission System Login Page</td></tr>
<tr><td colspan="7">Pre-conditions: User has valid User_ID and Password</td></tr>
<tr><td colspan="7">Dependencies: N/A</td></tr>
<tr><td>Step</td><td>Test Step</td><td>Test Data</td><td>Excepted Result</td><td>Actual Result</td><td>Status (Pass/Fail)</td><td>Notes</td></tr>
<tr><td>1</td><td>Navigate to Login Page</td><td>User_ID: sana</td><td>User should be able to login</td><td>Successful login</td><td>Pass</td><td></td></tr>
<tr><td>2</td><td>Provide valid User Name</td><td>Password: 123456</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Provide Valid Password</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Click on Login Button</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">Post-Conditions: User is validated with database and successfully logged in to account. The account session details are logged in database.</td></tr>
</table>

3.16 Verification and Validation

The verification and validation of the proposed software project are taken into consideration.

3.16.1 Verification

Verification is a static practice of verifying documents, design, code and program. It is the process of evaluating software to fix whether the components of a development phase satisfy the conditions executed at the start of that phase.

Verification will help to determine whether the software is of high quality, well-engineered, error-free, but it will not ensure whether the system is useful. This process helps the developer to answer the question *"Did I build what I need?"* [21]

3.16.2 Validation:

Validation is a process of evaluating software during or at the end of the development process to determine whether it satisfies specified requirements.

It evaluates the product whether it has been built according to the design specifications and requirements or not. It endures that the product actually meets the user's needs and that the specifications were accurate in the first place. It is a dynamic mechanism of validating and testing the actual product which helps to answer *"Did I build what I said I would?"* [21]

3.17 Chapter Summery

The process of the system is illustrated in this chapter. System architecture, flow charts, Data flow diagram, ER diagram are shown here. A brief discussion on database and modeling took place in this chapter. It also focused testing process of the software.

CHAPTER-IV
Implementation and Findings

4.1 Implementation

In the stage of **Project Implementation** or **Project Execution,** the proposed project comes into reality. The logical conclusion is done after evaluating, deciding, visioning, planning, applying for funds and finding the financial resources of a project [22].

In this process of implementation project inputs are converted to project outputs. It can be done as follows:

- Project plan should put into motion through actions.
- Transforming the project proposal into the actual project by following the project document.
- Management of the project or executing the project deliverables.

The main two steps of project implementation are

- **Project activation** which refers to the arrangements for making the project operational
- **Project operation** which indicates the practical management of a project to achieve immediate objectives of the proposed project.

Approaches to project implementation:

Approaches listed below are the options from where the project manager can choose the best approach for a project.

Top-down approach: In the Top-down approach, implementation principally done by agencies from outside the community with limited participation by the beneficiaries.

Bottom-up approach: Beneficiaries implement the project. Here outside agencies can provide financial resources and technical assistance if needed.

Collaborative participatory approach: Both top-down and bottom-up approaches to project implementation are applied in the process.

Considering the situation or necessity of a project, the implementation methods can be:

- Parallel Implementation: This implies to a new solution which is implemented parallel to the current operating system in use. Those who are using the system will not see major downtime once it is implemented. The trick here is to implement the system.
- Phased Implementation: It is usually chosen when a system is on run and it cannot be out of operation for development for a long time. In this case normally the front office staffs attend the operation of this kind of implementation.
- Crash Implementation: Careful planning needs to take place when considering a crash (also known as full-blown) implementation. It takes an incredible amount of planning and re-planning to ensure no problems arise. In fact, with this type of implementation, the necessary contingencies need to be prepared and reviewed well in advance of the actual implementation, in order to minimize any potential failure.

4.2 Input and Output

Input:

Sign Up: Username, Email ID, Security Question, Security Answer, NID/Passport No, Payment Transaction ID, Password, Re-type Password.

Personal Details: Full name, Date of Birth, Marital status, Gender, Father‘s name, Mother‘s Name, Nationality, Religion, Address, Postal code, Email Address, Mobile No.

Educational Details: Degree name, Discipline, Institution, Board, CGPA.

Documents Upload: Category of the Document, Description and the Required Documents.

Session, Programs to Offer, Deadline for Application Submission, Deadline for Accepting Offer, Examination Date, Test Scores.

Output:

Registration ID, Application Status, Admit Card, Roll No for Admission.

4.3 Description of the developed software

The developed software has two modules. One is for the end users that means candidates who want to apply for admission and the other is for the administration.

A brief description of the software is given below:

i. **Front page:** The front page shown in fig- 4.1, has been developed in a way so that both the applicants and admin can proceed through the provided links from the thumbnails.

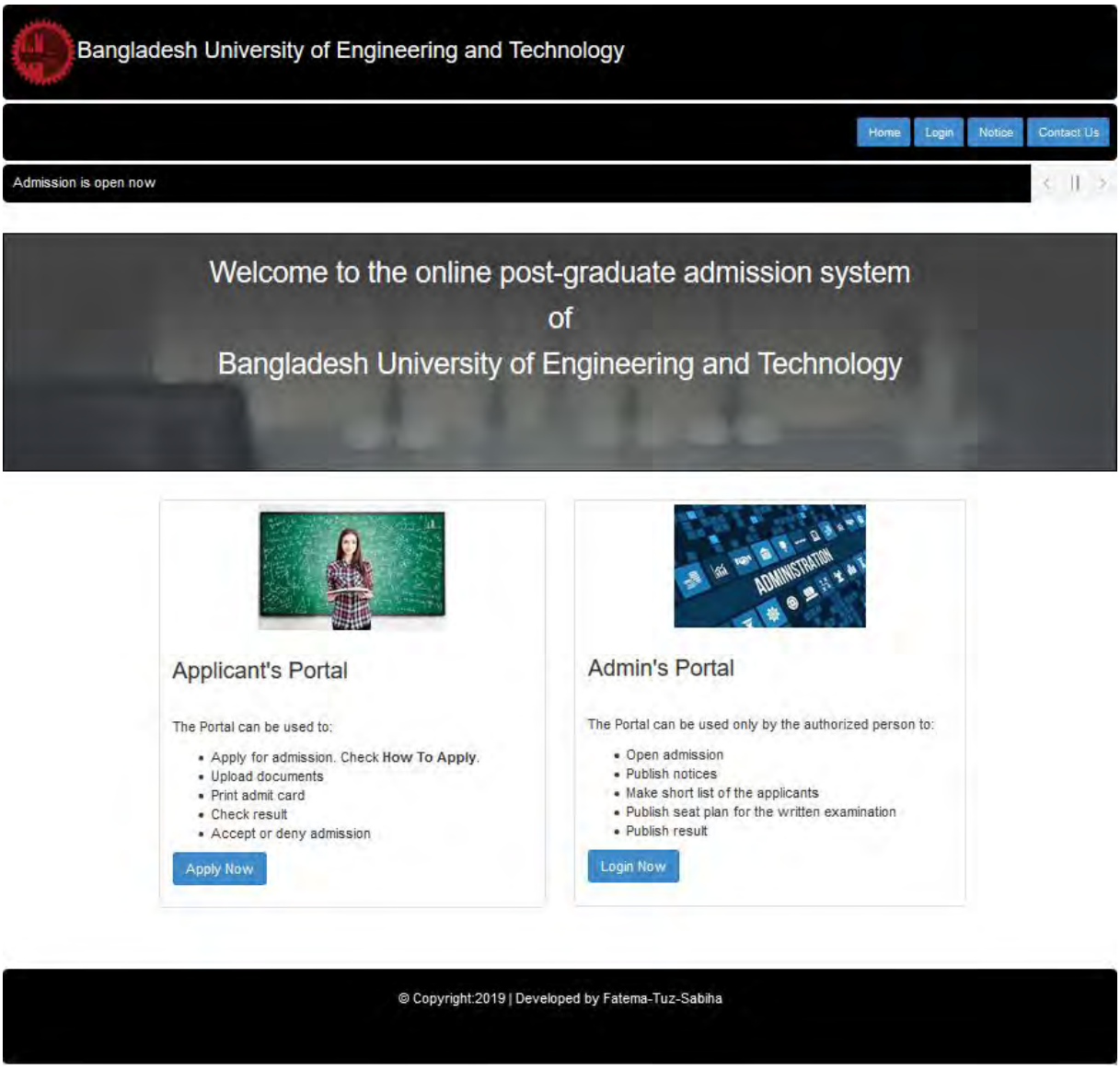


Fig-4.1: Front page of the software

ii. **Admin's profile:** An authorized person can login to the system as admin with a predefined username and person. He/she can change the password afterword. Fig-4.2 shows the profile page of the admin after a successful login.

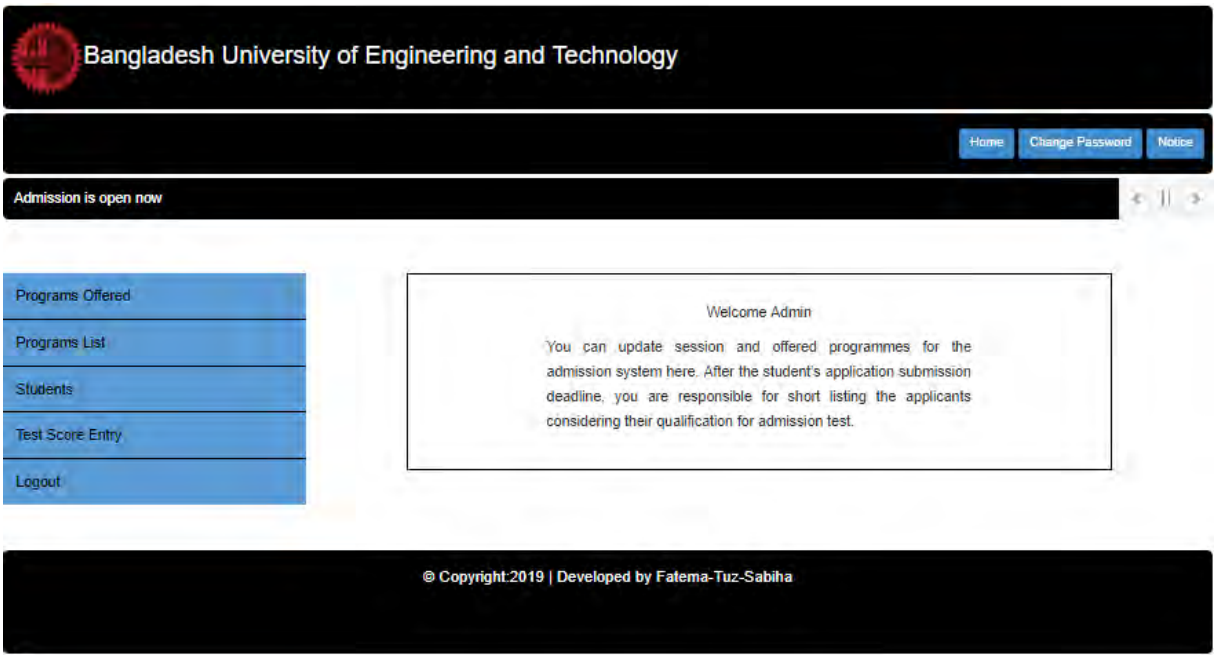


Fig-4.2: Admin‘s profile page

iii. **Programs and session declaration page:** The admin has to insert the session, programs to be offered for that session with deadlines to open admission. The fig-4.3 below depicts the ―Programs Offered" page where the admin can declare those in order to open admission.

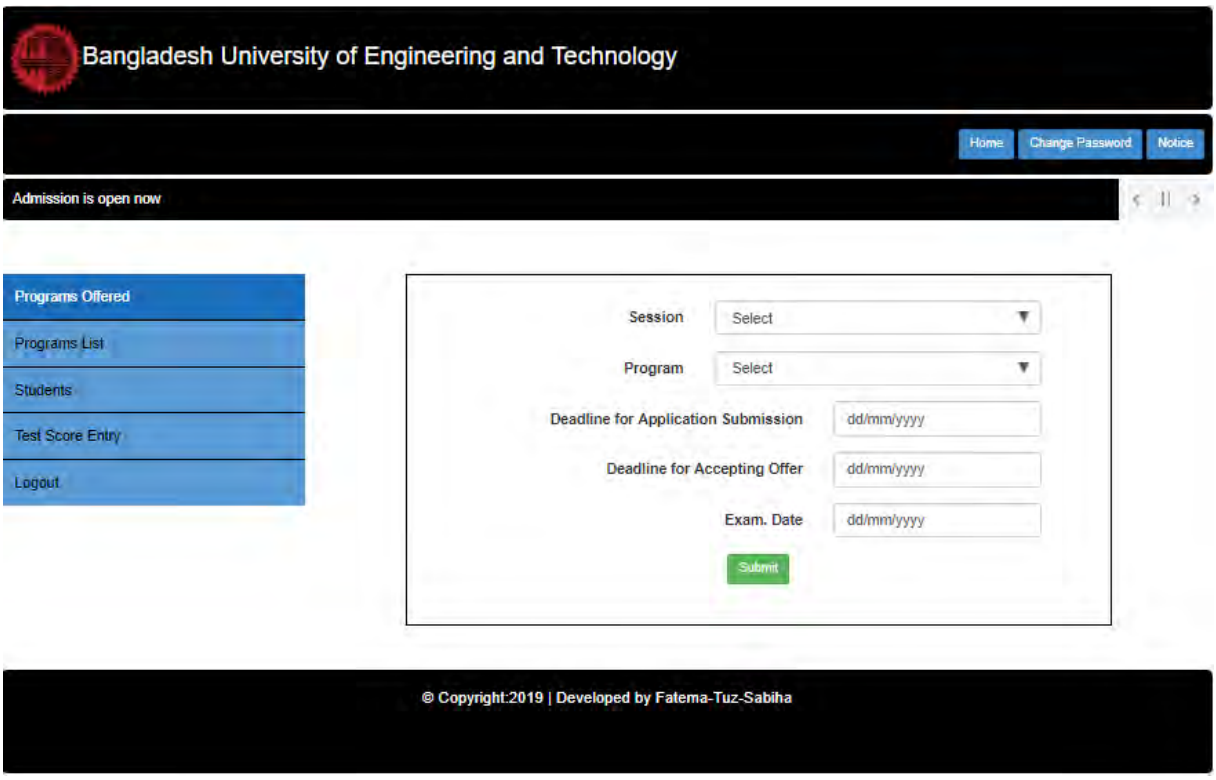


Fig-4.3: Programs and session declaration page

iv. **List of offered programs:** The declared programs will be shown with dates in –Programs List" (fig-4.4). The admin can delete or edit those fields.

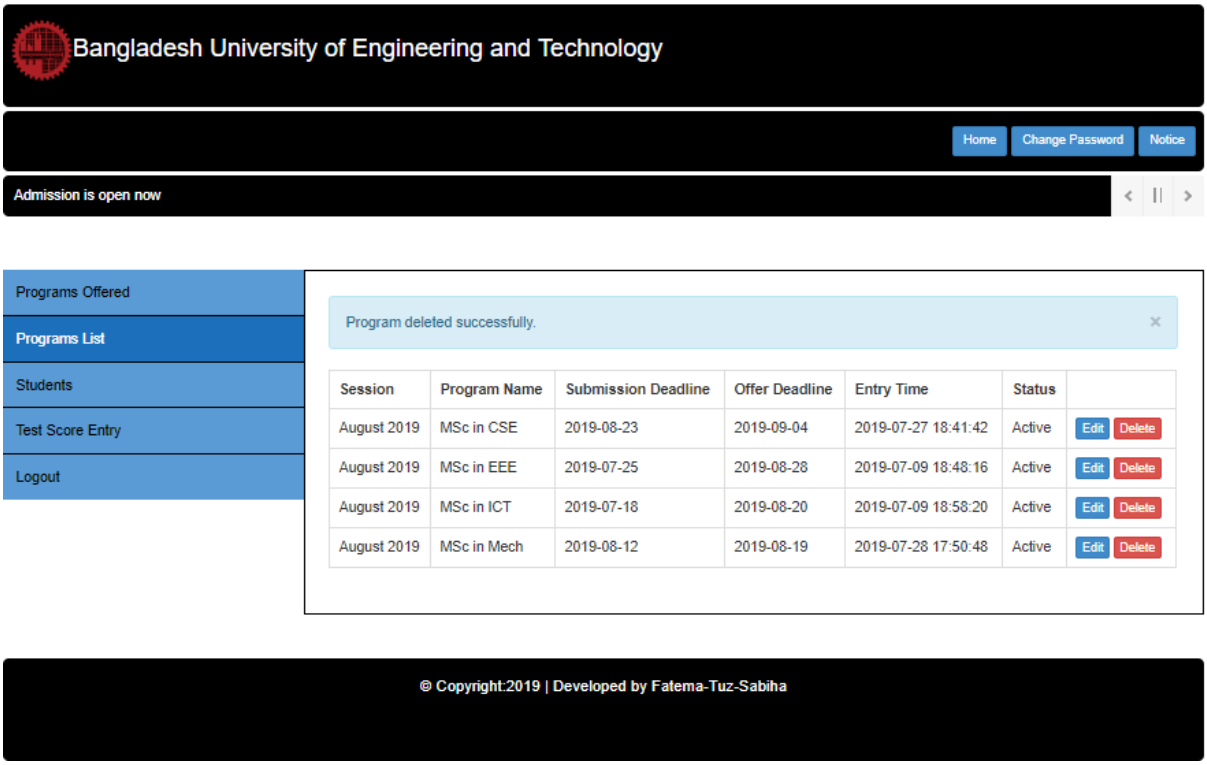


Fig-4.4: Programs list showing page

v. **Applicant's Detail for Evaluation:** Fig-4.5 reveals the page where all the submitted applications can be found by clicking on the registration no, which had been generated by the system upon signing up of the applicants. After evaluating those profiles admin can select qualified candidates for admission test. The admin has to add the room no for the admission test too. After clicking the submit button application status will be updated.

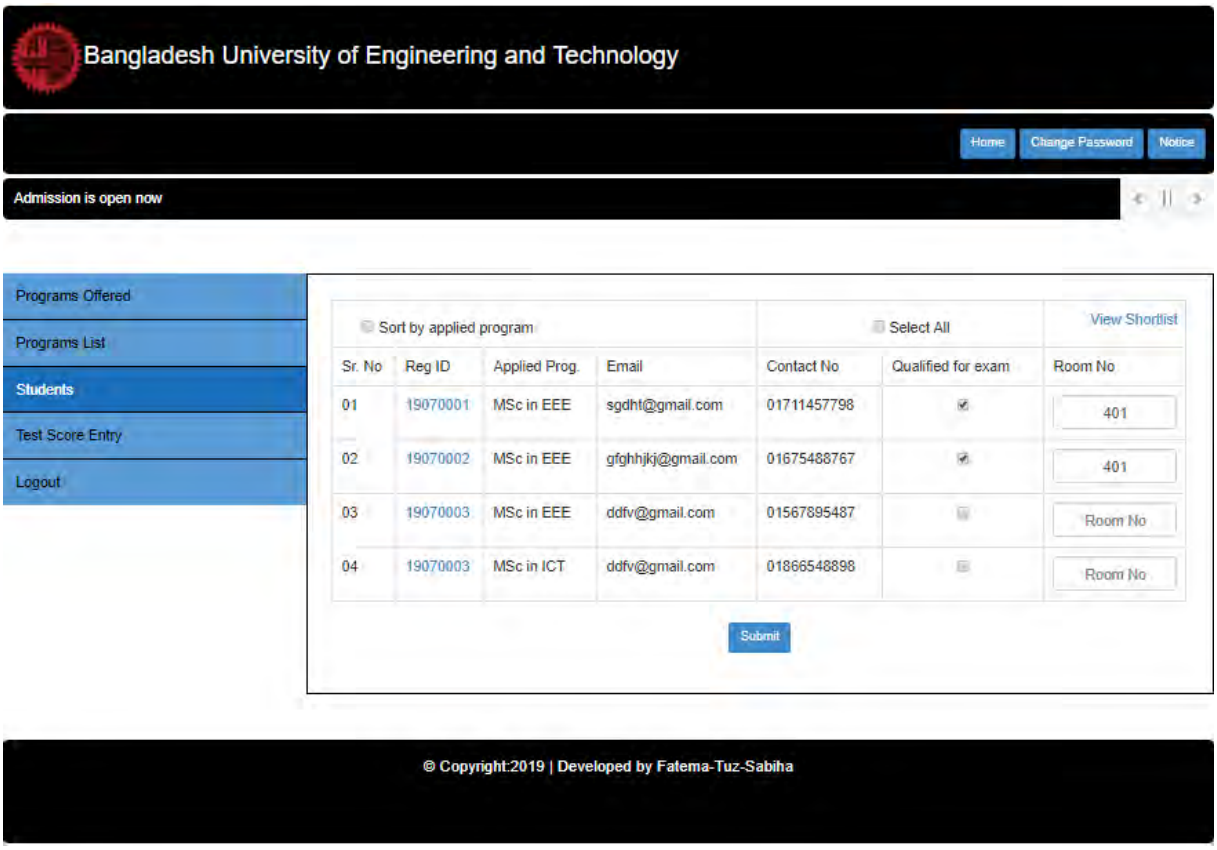


Fig-4.5: Page showing list of applicants

vi. **Test Score Entry:** In the page shown in fig-4.6, the admin will enter test scores to the system and by comparing the scores admin can select finally qualified applicants for admission.

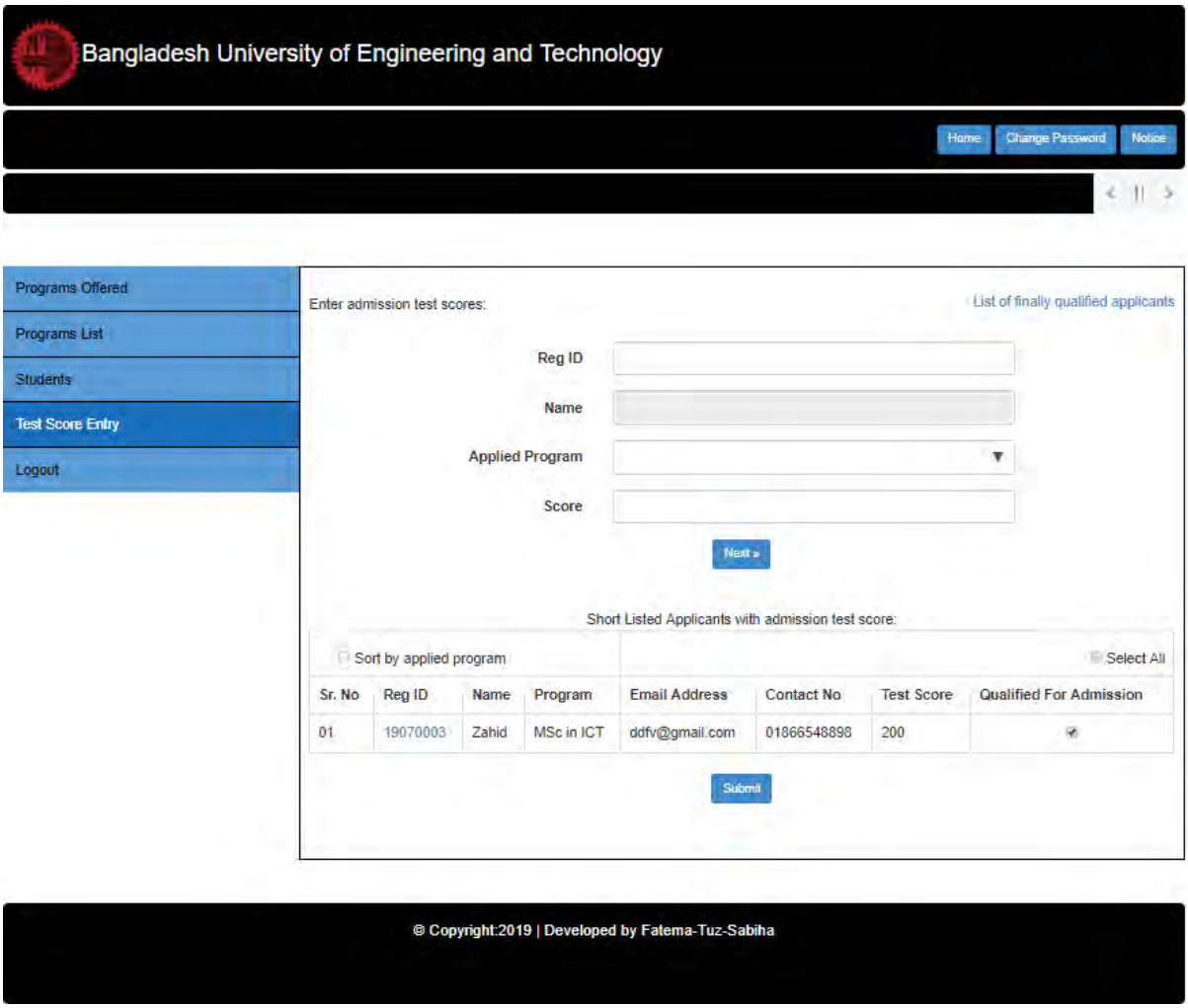


Fig-4.6: Page for admission test score entry

vii. Applicant's Sign Up Page: The applicants need to sign up first with the required information to get registered into the system. The sign up page is shown in fig-4.7. A successful registration will generate a registration ID for each applicant. To avoid unauthorized registrations, an applicant needs to provide transaction code of application fee payment as a proof during sign-up stage.

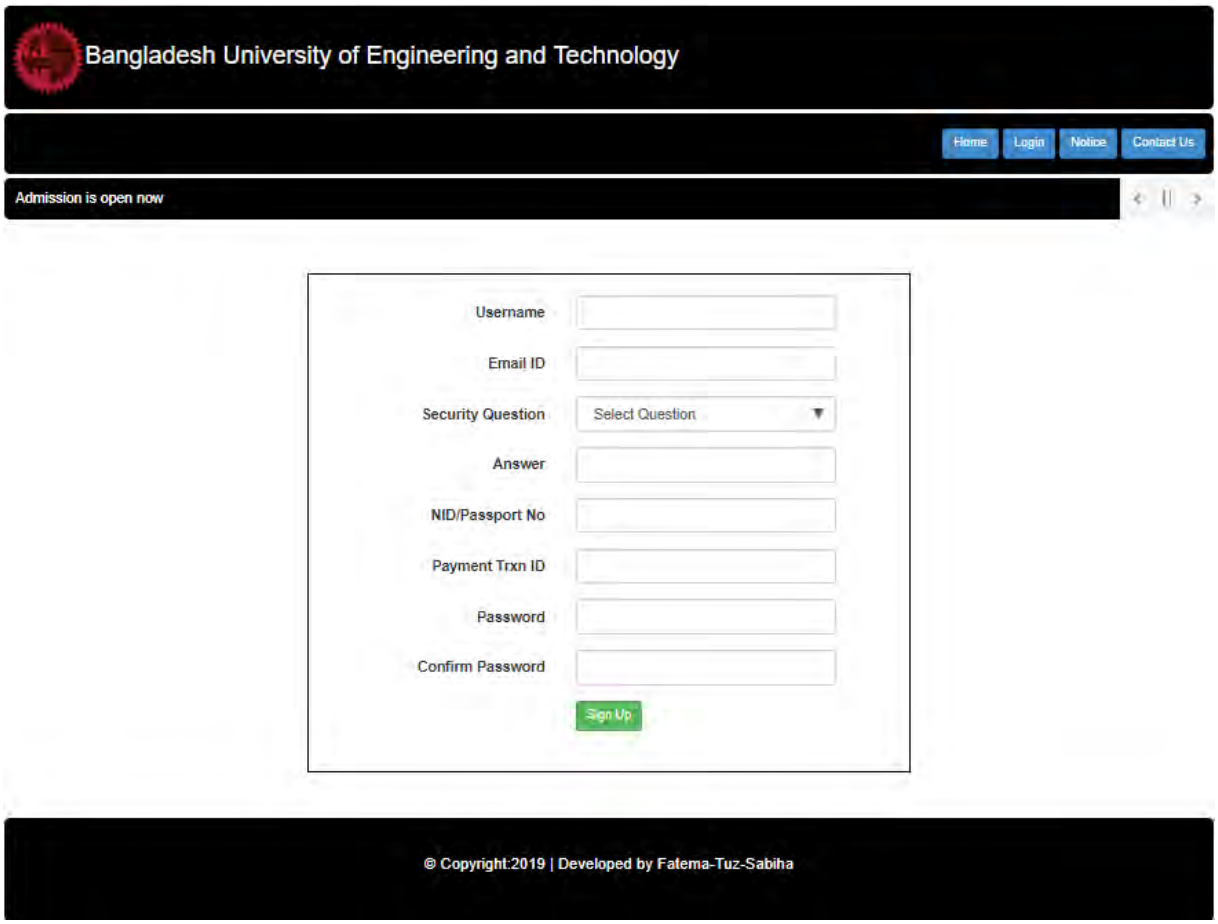


Fig-4.7: Applicant‘s sign up page

viii. **Profile of Applicant:** After login a welcome page will be shown to the applicant as the profile page (fig-4.8) with application status showing ―No application is submitted yet of your Registration ID”. The application status will be updated upon submission of application as well as selection by the admin. Applicants have the option to change their passwords.

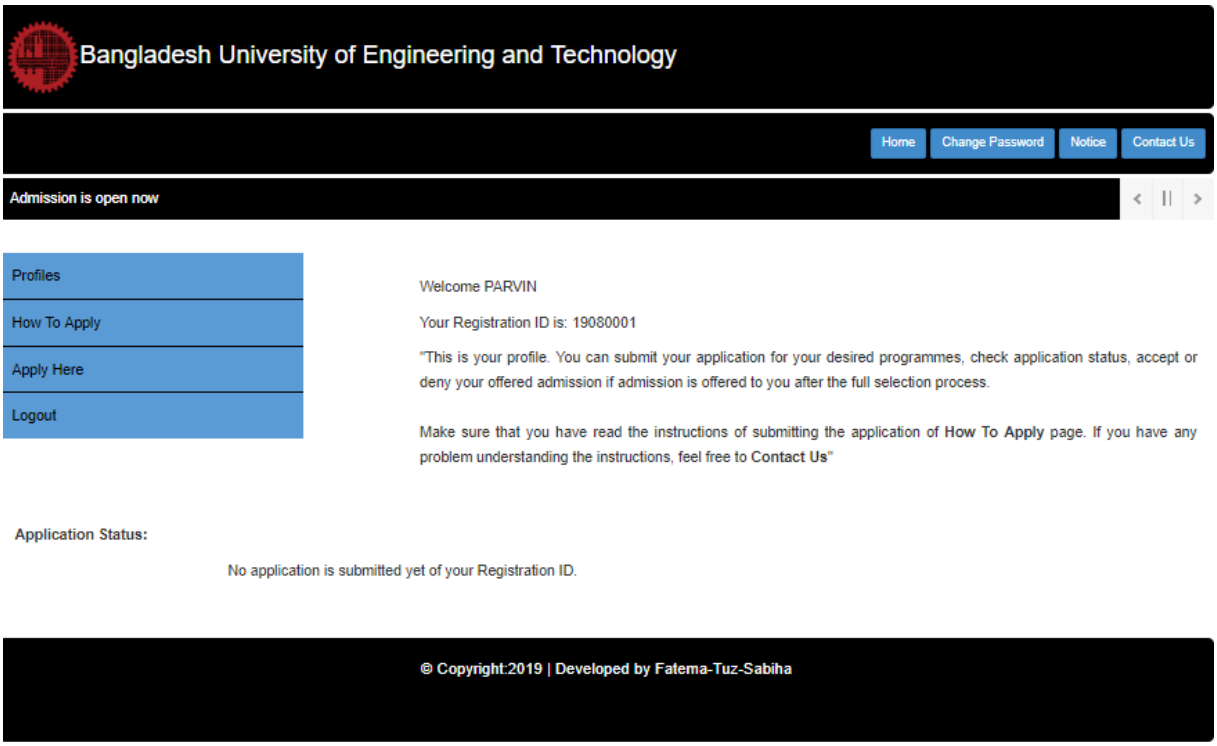


Fig-4.8: Applicant‘s profile page

ix. Application Page: The ―Apply Here" will link an applicant to the application form which will first show offered programs to select (fig-4.9). Then the page of personal details (fig-4.10), educational details (fig-4.11) and at last the page for uploading required documents (fig:4.12). These pages will be shown upon clicking the next buttons.

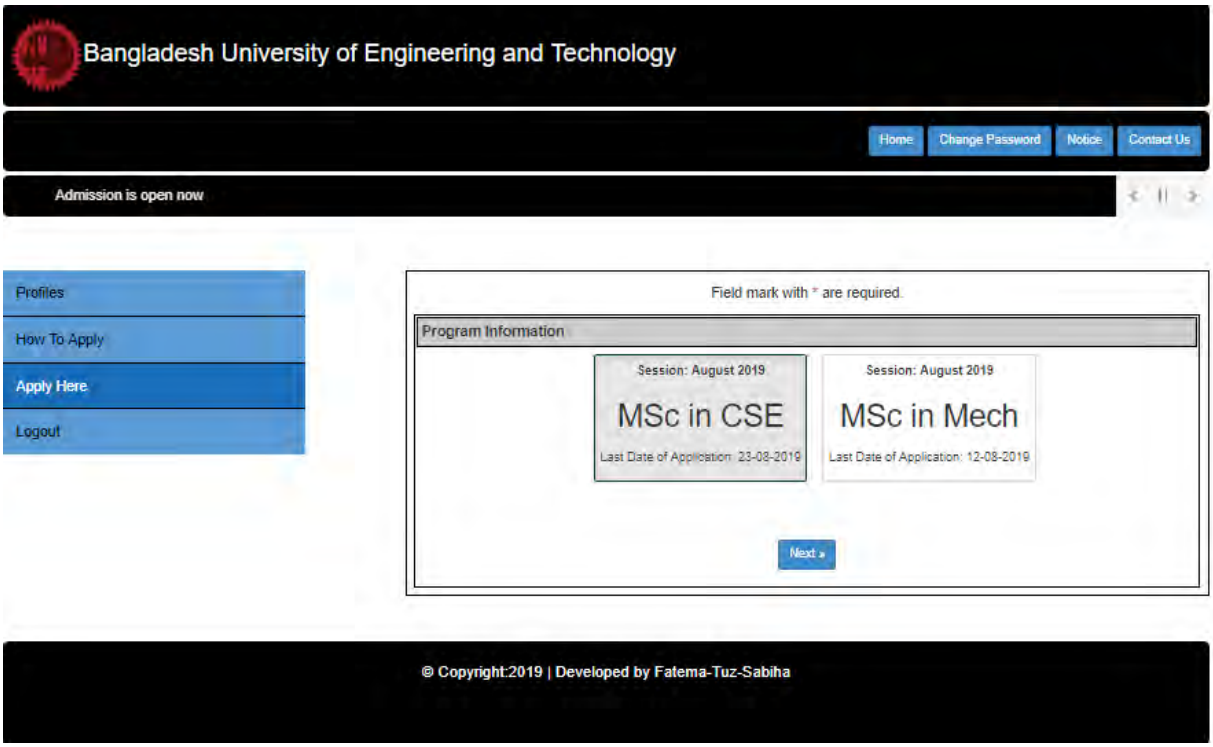


Fig-4.9: Application page with offered programs shown to the applicant

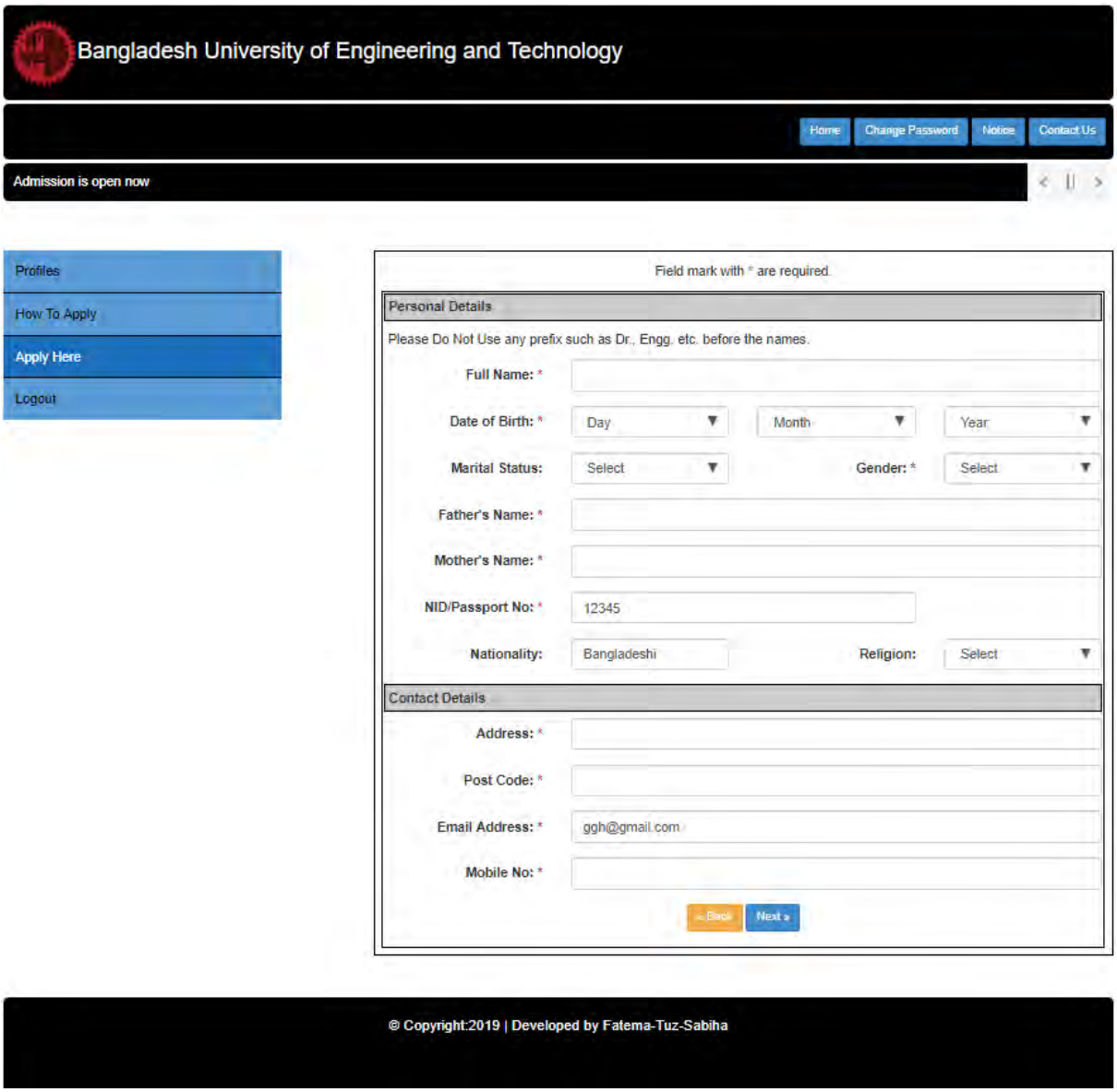


Fig-4.10: Application page with personal information

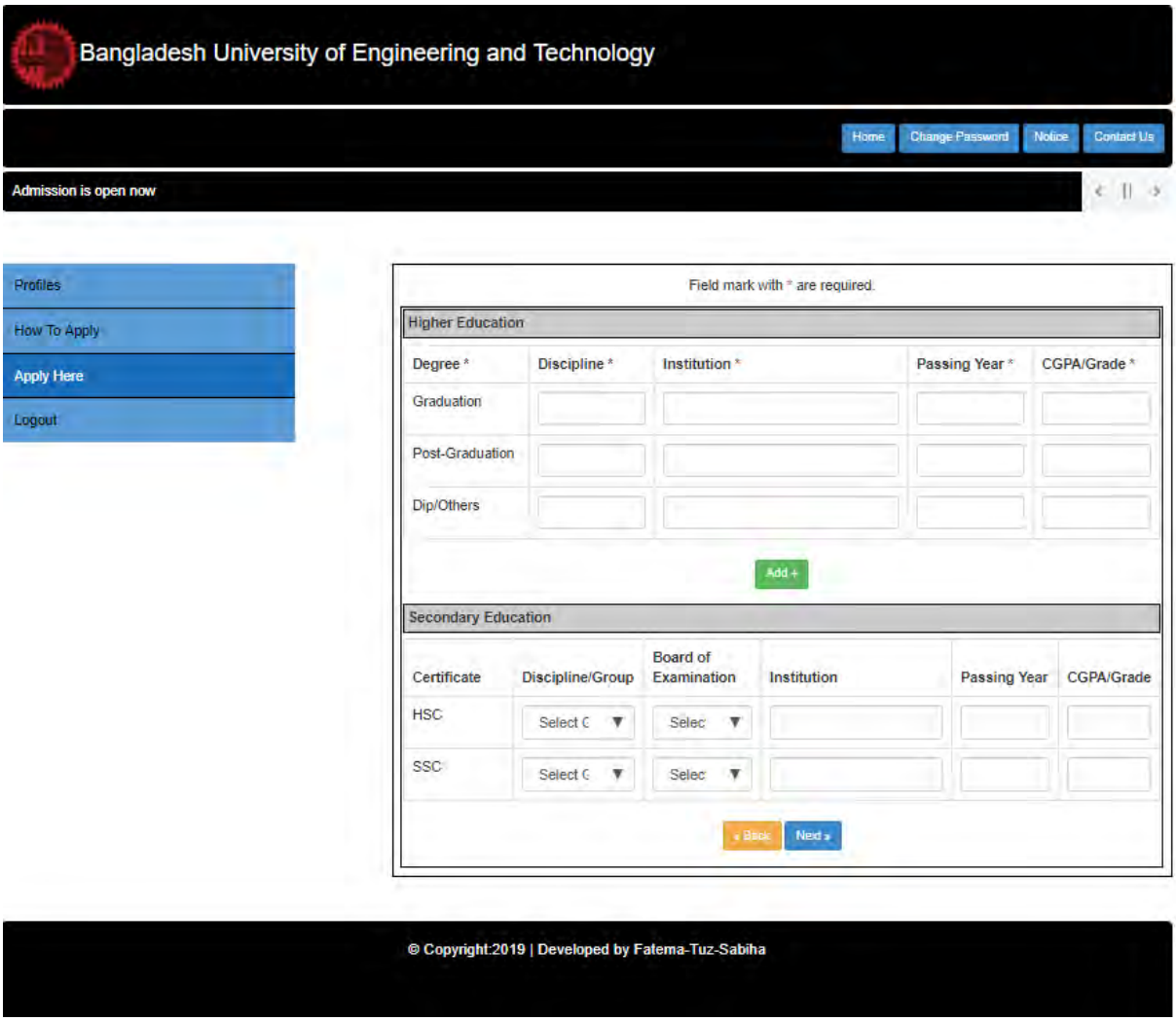


Fig-4.11: Application page with educational details

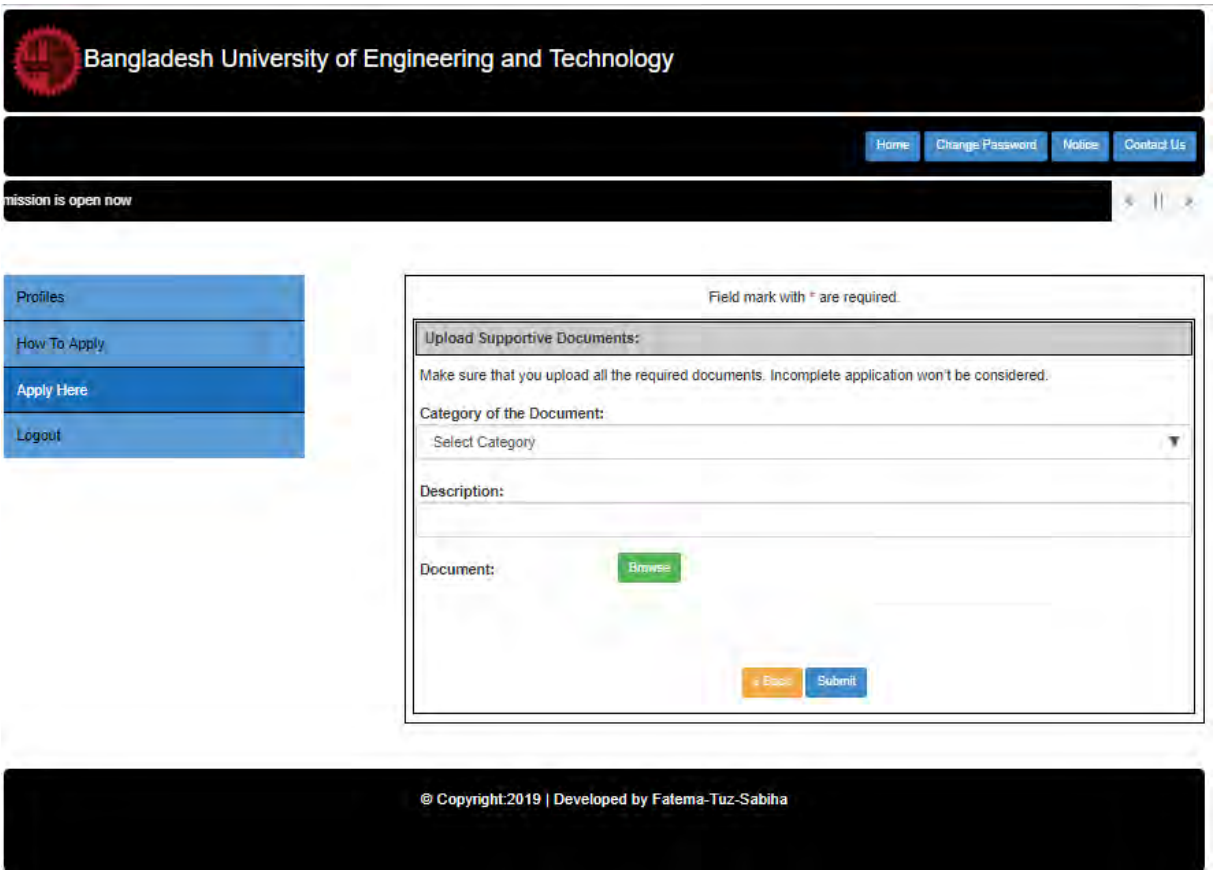


Fig-4.12: Application page to upload documents

x. **Admit Card and offered admission**: An applicant will get an admit card to be sited (fig-4.13) for admission test if he/she be qualified for the first round. There is an option to print it out. The page which shows the admit card is shown in fig-4.14. After the admission test if the applicant be qualified then he/she will get the admission offer (fig-4.15). The offer needs to be accepted to get a roll no for final admission before the deadline exceeds. Upon acceptance a roll no will be generated (fig-4.16).

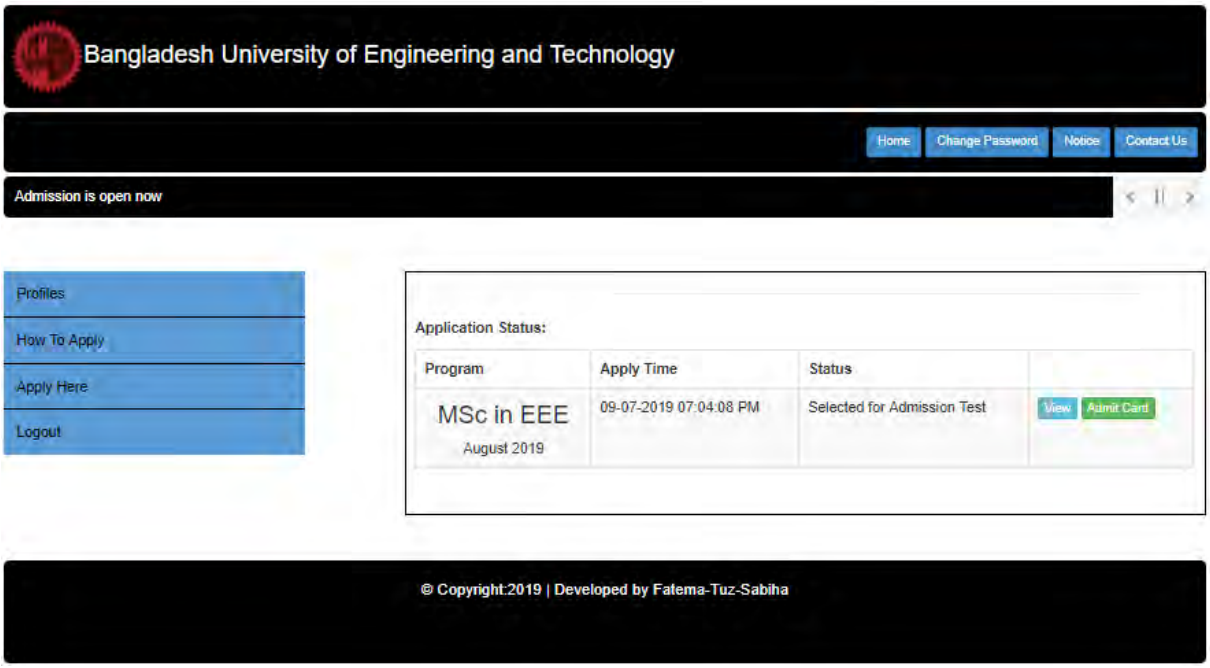


Fig-4.13: Updated status of selected applicant for admission test

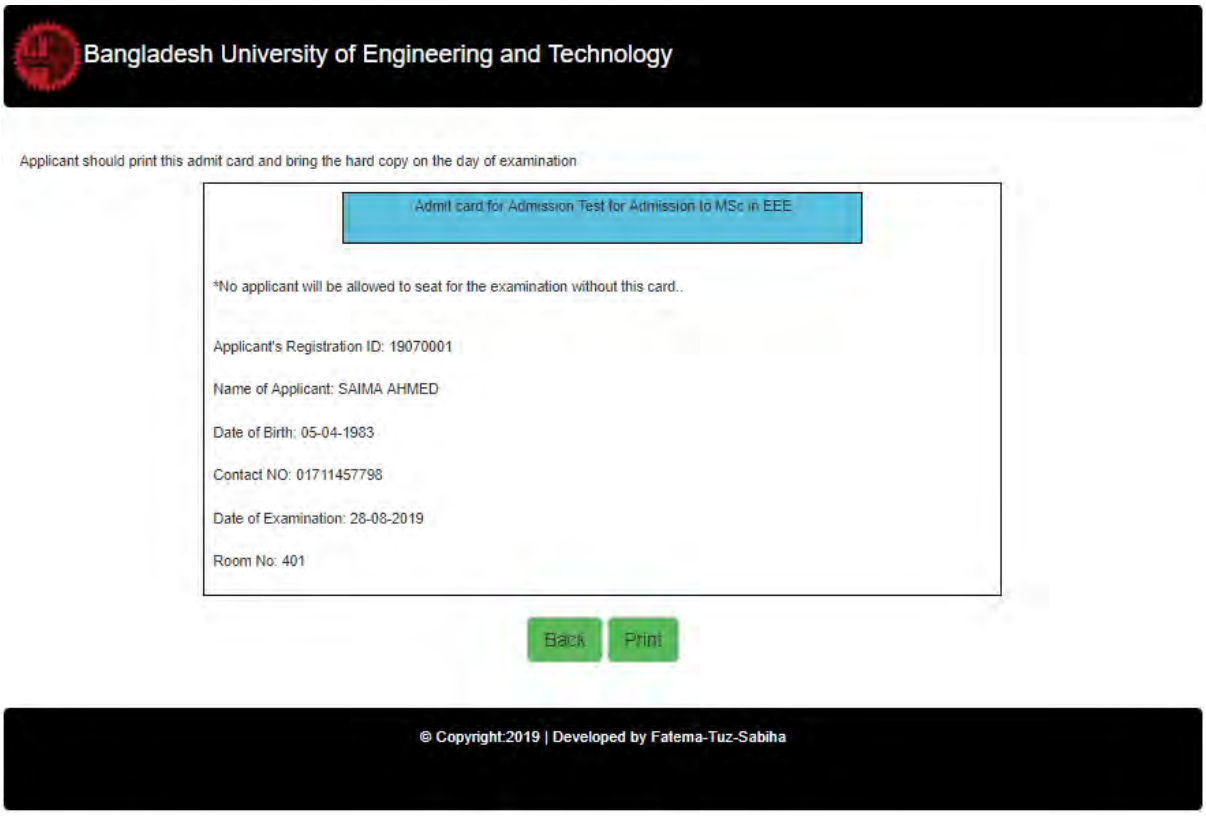


Fig-4.14: Generated admit card by the system

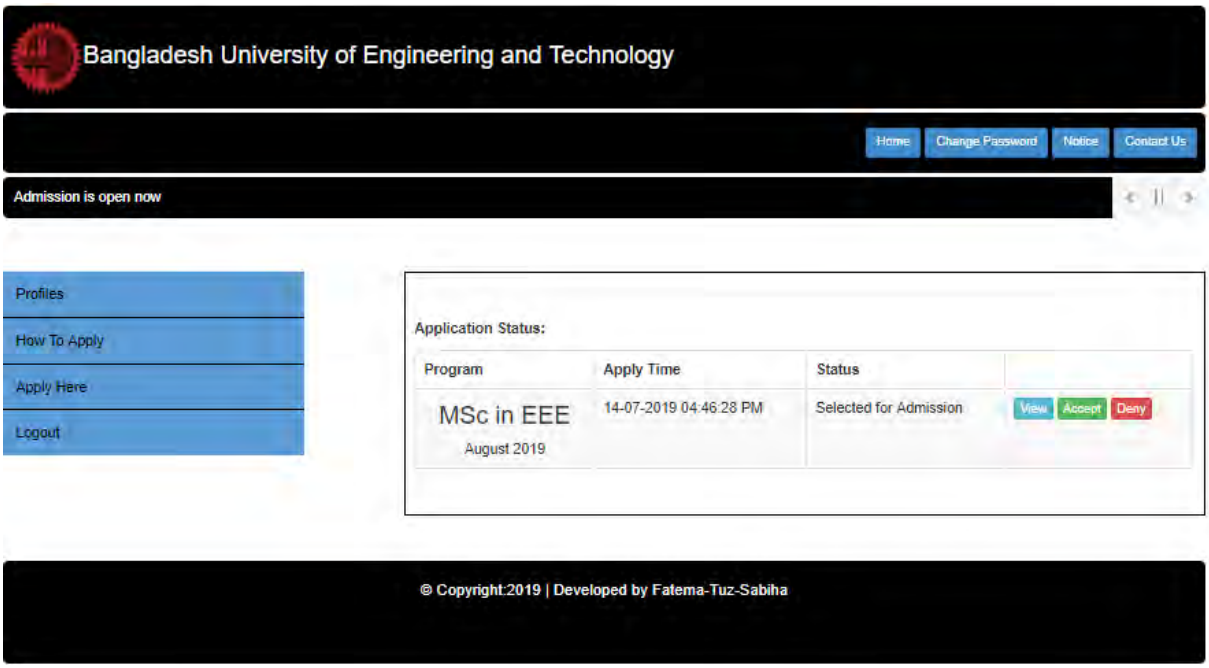


Fig-4.15: Updated status of selected applicant for admission

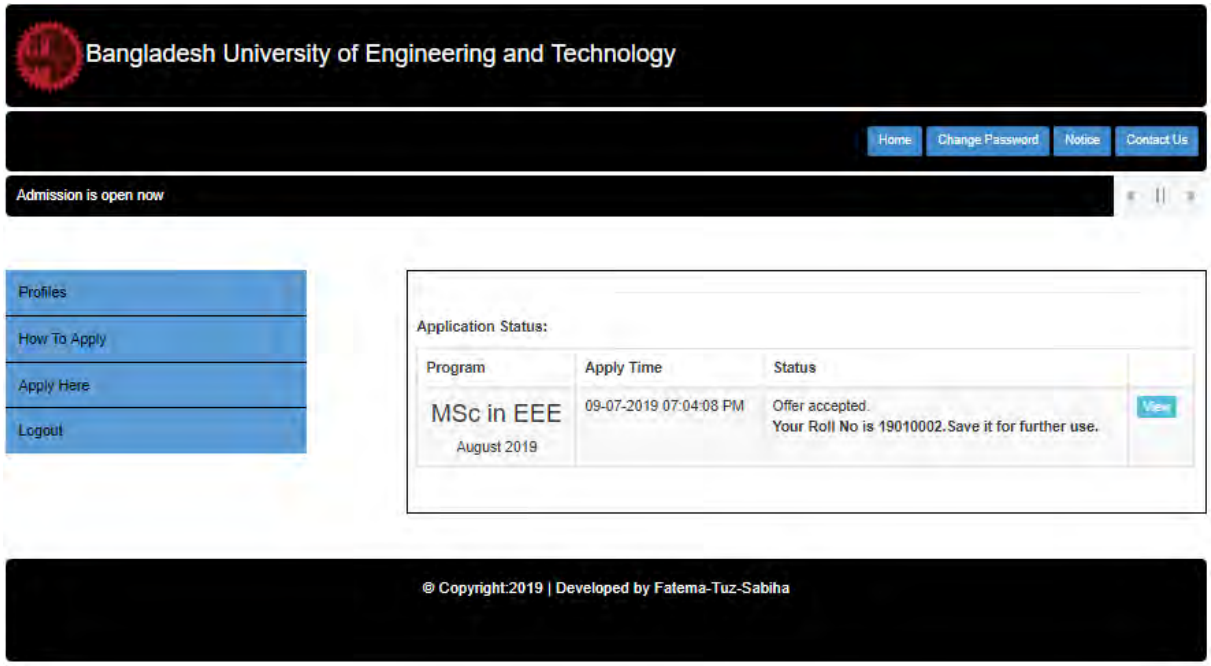


Fig-4.16: Generated Roll No upon accepting offer

4.4 Chapter Summary

This chapter mainly focused on the implementation of the project. Here the probable inputs, outputs, system generated reports and findings have been pointed out. Finally some screenshots of the output of the implemented system are shown.

CHAPTER-V
Conclusion and Recommendation

5.1 Project Summary

The proposed project is to design and implement an online based admission system of an institution or department of a university. The overall summary of the project in brief is described as follows:

5.1.1 Strengths of the Project

The proposed automated system provides a number of benefits over the existing manual systems. Some of these are given below:

- Online application system for admission
- Requirements, application procedure are displayed
- Printable admit card is generated
- Seat plan for written admission test is displayed
- Status view and possible required reports
- User friendly and location independent system
- It is easy for the administrator to add or remove subjects to offer for each declared session
- This system reduces the paper work and the physical labor
- It is easy to store and retrieve any information when necessary
- In summary, the system will reduce the functional complexity.

5.1.2 Limitations

The proposed system has some limitations as listed below:

- Application fee deposit process is done manually
- Online admission test is not included
- Evaluation of the applications is not done by the system but the administrator
- There is time constraints to complete the whole process

5.1.3 Challenges

The major challenges to implement the proposed system are as follows:

- Adaptability

- Security and support
- Control
- Upgrading

5.2 Conclusion

With the advancement of society, a huge increment of educational institutions and students are seen worldwide now-a-days. Globalization has made the world become a small village. People are traveling from one side of the world to another just for the purpose of being educated in a different culture and better ranked institutions. A web based admission system of an institution can come out of a traditional manual system to more easy, less time consuming and globally accessible digitalized admission system. It can facilitate both the applicants as well as the organization.

The web based software has been developed using Hypertext Preprocessor (PHP) as the dynamic scripting language. In the front end of the software, HyperText Markup Language (HTML5), jQuery and Cascading Style Sheets (CSS3) have been used. For responsive and attractive design, Bootstrap, library of CSS has been used. MySQL has been used as the database. This system acts as an easy communication between the candidates who want to apply for an admission and the authority who can offer educational degrees.

The developed system is a user-friendly system in many aspects. The online system reduces the paper works and physical labor. One of the most noticeable advantages of this proposed automated system is the easiness of the storage and retrieval of any information when necessary. It is able to store a huge amount of information in a short time span and retrieve it anytime too. The system also provides information and guidelines for the applicants.

5.3 Recommendation

There are some important observations regarding the developed web based system for food products quality certification. The recommendations are stated below:

(i) Power and data backup for smooth performance.

(ii)Maintenance, supports and security issues

(iii)Java programming language can be used instead of PHP programming due to its platform independency.

(iv)In this software, there is no way to pay fees online through the system. So, payment option can be added for better performance.

(v) The written admission test is considered to be conducted manually but for more accessibility, online admission test can be introduced to the system.

(vi)This software is only tested for some medium scale scenarios. If anyone wants to implement it in a large-scale, Oracle can be used instead of MySQL for better performance.

5.4 Future Work

Possible future work related to the developed system are outlined below:

- Mobile Apps
- Call center and query options
- Fully electronic payment system
- Online admission test conduction and its screening
- System upgradation based on user needs and demand analysis
- Field scrutiny and piloting
- Implementation in broad scale

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