



RAJSHAHI UNIVERSITY OF ENGINEERING AND TECHNOLOGY

FACULTY OF ELECTRICAL AND COMPUTER ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Lab Report

Admission Procedure System of Engineering Universities in Bangladesh

Submitted By:

Mustafizur Rahman (1603009)
Fatin Faiaz Isty (1603011)
Mrinmoy Mondal (1603012)
Riyad Morshed Shoeb (1603013)

Submitted To:

Dr. Md. Rabiul Islam
PROFESSOR
Emrana Kabir Hashi
ASSISTANT PROFESSOR

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1. Introduction

Students in Bangladesh applies for higher study in universities after completing higher secondary education. A lot of students have a great interest in studying engineering. To provide facilities for huge number of students, there are currently four engineering universities in Bangladesh.

1. Bangladesh University of Engineering and Technology abbreviated as BUET
2. Rajshahi University of Engineering and Technology abbreviated as RUET
3. Khulna University of Engineering and Technology abbreviated as KUET
4. Chittagong University of Engineering and Technology abbreviated as CUET

1.1 Bangladesh University of Engineering and Technology (BUET)

Founded in 1912, BUET is the oldest institution for the study of engineering, architecture and urban planning in Bangladesh. The university campus is located at the Palashi area of Dhaka, the capital of Bangladesh. With the construction of new academic buildings, an auditorium complex, a cafeteria and halls of residence, the university has continued to expand over the last three decades. It has a compact campus with halls of residence within walking distances of the academic buildings. About 9234 students are pursuing undergraduate and postgraduate studies. At present, BUET has eighteen teaching departments under five faculties and it has six institutes. Every year the intake of undergraduate students is around 1060, while the intake of graduate students in Masters and PhD programs is around 1069.

There are 624 teachers teaching in BUET. At the moment, out of the 446 active teachers, there are 264 teachers who hold PhD degree. The remaining teachers are engaged in their postgraduate studies in the USA, Japan and various parts of the world.

The history of this institution dates back to the days of Dhaka Survey School, which was established at Nalgola, in Old Dhaka in 1876 to train Surveyors for the then Government of Bengal of British India. As the years passed, the Survey School became the Ahsanullah School of Engineering offering three-year diploma courses in Civil, Electrical and Mechanical Engineering. In recognition of the generous financial contribution from the then Nawab of Dhaka, it was named after his father Knawja Ahsanullah. It moved to its present premises in 1912. In 1947, the School was upgraded to Ahsanullah Engineering College as a Faculty of Engineering under the University of Dhaka, offering four-year bachelor's courses in Civil, Electrical, Mechanical, Chemical and Metallurgical Engineering. In order to create Facilities for postgraduate studies and research, Ahsanullah Engineering College was upgraded to the status of a University in 1962 and was named East Pakistan University of Engineering and Technology. After the war of Liberation in 1971, Bangladesh became an independent state and the university was renamed as the Bangladesh University of Engineering and Technology.

Till today, it has produced around 30,686 graduates in different branches of engineering and architecture, and has established a good reputation all over the world for the quality of its graduates, many of whom have excelled in their profession in different parts of the globe. It was able to attract students from countries like India, Nepal, Iran, Jordan, Malaysia, Sri Lanka, Pakistan and Palestine.

The University is engaged in providing undergraduate studies, postgraduate studies and postgraduate research in all departments. In addition to its own research programs, the university undertakes research programs sponsored by outside organizations like European Union, UNO, Commonwealth, UGC etc. The expertise of the University teachers and the laboratory facilities of the University are also utilized to solve problems and to provide up-to-date engineering and technological knowledge to the various organizations of the country.

1.2 Rajshahi University of Engineering and Technology (RUET)

RUET is the prestigious public Engineering University and center of excellence offers high quality education and research in the field of engineering and technology. RUET is well balanced in urban and natural environment and convenience. RUET is the center of excellence to cultivate talented individuals who take the lead of such issues sharing their technical knowledge and experience is the most important duty of this university. RUET not only serves for the expectation of the public but also contributes to human society as a whole. The university comprises engineering and sciences departments' offers under-graduate and postgraduate degrees. Every year most brilliant students are enrolled for the undergraduate program through transparent and standard admission test. About 5000 students are pursuing their higher study in this green campus including under-graduate and postgraduate with over 200 prominent faculty members of diverse field of expertise. The university also receives a significant number of international students continuing their higher study in this campus. The faculty members and students (UG and PG) of this university are engaged with qualitative research work in multiple research fields and well equipped modern laboratory environment. The faculty members invest their most of the time in research activities jointly with foreign faculties beyond their regular academic duties. Every year, the university receives exiting number of research paper published by the students and faculty members in the world class high impact factor peer reviewed international journal. The graduates from this university is well enough to cope any challenge in the field of engineering, technology, research, leadership, management,

etc on demand of national and global needs. Many of the students and faculty members receive full funded international scholarships for their higher study and are appointed in world top rank universities as quality faculty members and researchers upon completion of the degree. RUET is committed to continue the progress and contribute to national and global development.

RUET is the 2nd oldest prestigious public Engineering University of Bangladesh, offers quality education and research in the field of engineering and technology. The university was established in 1964 as Rajshahi Engineering College with three Engineering departments namely Mechanical Engineering, Electrical and Electronic Engineering and Civil Engineering. The institute started with a Bachelor degree program and with a limited number of students (122) enrolled in three departments each year. Later it was converted to Bangladesh Institute of Technology (BIT), Rajshahi in 1986 to enhance the technical education. The institute was upgraded as Rajshahi University of Engineering and Technology (RUET) in September, 2003 to enhance the technical education and research. The university is financed by the Government through the University Grants Commission of Bangladesh. The university is an autonomous statutory organization of the Government of Bangladesh functioning within the "Rajshahi University of Engineering and Technology Act 2003". Currently, the university comprises 14 departments including engineering and sciences offers under-graduate and postgraduate degrees. In graduate level, M.Sc. Engg., M. Engg., M.Phil and PhD programs and research are continuing in a qualitative manner under the faculties. The medium of instruction and necessary assessment of this university is English.

1.3 Khulna University of Engineering and Technology (KUET)

KUET is one of the leading public universities of Bangladesh giving special emphasis in the Engineering and Technological Education and research. It is well known for offering very high quality educational, research and developmental programs in the major disciplines of engineering as well as basic sciences. It has a sober objective to achieve excellence in quality education, research and progression to address the present needs of the country as well as the South-Western region to make it as the "Center of Excellence".

Khulna University of Engineering and Technology (KUET), Bangladesh established in 1967 as Khulna Engineering College, started its long cherished journey in 3 June, 1974 after receiving special direction from the Father of the Nation Bangabandhu Sheikh Mujibur Rahman. Later to ensure the better academic and research capabilities and environment, it was converted to an autonomous institute called Bangladesh Institute of Technology (BIT), Khulna in July 1986. To meet the demands of the days in the academic and research arena, the institute was upgraded and renamed as Khulna University of Engineering and Technology (KUET) in September 2003.

KUET offers engineering education in both undergraduate and post-graduate levels, and also offers degree and conducts research in basic sciences at postgraduate level. At present, around 5240 students are studying in KUET in 20 Academic Department under 3 Faculty. From the academic session (2018-2019), total 1065 top graded students of the country are enrolled yearly in undergraduate level in 16 departments through very competitive, transparent and standard admission test. Besides, quality level graduate study and research in M.Sc, M.Sc Engg, M.Phil and Ph.D. Programs are running in its nourished environment. Students from foreign countries are also studying in this prestigious institute. Around 356 eminent, scholarly and diverse faculties are engaged in teaching at this university in various disciplines.

In an attempt to expand and enrich the teaching and learning capabilities of this university, recently two new departments are established and students have already been enrolled to start undergraduate study from the coming session. The Institute of Information and Communication Technology (IICT), Institute of Disaster Management (IDM) and Institute of Environment and Power Energy (IEPE) are also established recently to fulfill national and international demands through short courses, diploma, research and training program in various modern technological directions, especially in the sectors of Information Technology (IT) and Disaster Management.

The campus of this university stands at North-West corner of Khulna City Corporation, about 12 Km from the city center, in the midst of an impressive natural beauty having vast greenery spreading over an area of 101 acres land. It has a fresh airy campus and congenial atmosphere with several students' halls of residence. The academic buildings are not far from residential halls having a harmonious bridge in between them. The Physical infrastructure including Halls of residence, Academic Buildings and Institutes, Workshops, Library, Computer Center, Play grounds, Cafeteria, Auditorium, Medical Center, Bank, Post Office, ATM Booth, Guest House and Club, Mosque, Dormitory, Teachers and Staff quarters, Schools etc. are structured in a very planned way and are being improving day by day. In every year, about seven hundred students graduate from this university at different branches of engineering and technology. Then the graduates are distinguished themselves for up-holding their quality in engineering and technological excellence to meet the demands of the days. Many of them acquired leading distinction in profession all over the country as well as abroad. Despite, inherent limitations for being a Higher Education Institute (HEIs) of a Developing Country, KUET is highly motivated and aimed to take the leadership in the promotion of technological development and management of the nation by strengthening education and research environments.

1.4 Chittagong University of Engineering and Technology (CUET)

Chittagong University Of Engineering and Technology abbreviated as CUET, is one of the prominent and prestigious degree awarding institute in the engineering education of Bangladesh. This University was created out of Engineering College, Chittagong, that was established in 1968. The Engineering College , Chittagong , functioned as the Faculty of Engineering of the University of Chittagong. Though a Government Ordinance in 1986 the college was converted into an institution (BIT, Chittagong). In 2003 this institute of technology was converted into a public university. The honorable President of Bangladesh is the visitor of the institute. A Board of Governors headed by a Chairman appointed by the President is the policy making and administrative authority. There were three other similar Institutes of Technology in the country namely BIT Khulna, BIT Rajshahi and BIT Dhaka that are converted to Khulna University Of Engineering and Technology (KUET), Rajshahi University Of Engineering and Technology(RUET), Dhaka University Of Engineering and Technology (DUET).

CUET is unique and incompatible due to its proximity to Chittagong, the major sea-port and the beautiful Hill city of the country. The University is situated by the side of the Chittagong-Kaptai road some 25 kilometers off from the center of Chittagong City. The University is taking shape in about 171 acres land of magnificent natural settings comprising pristine hills, plane lands and takes with numerous specks of plants. It is playing a pioneering role for higher education, research and development in the field of engineering and applied sciences. Its graduates are among the leaders in

their respective fields.

CUET currently has 15 Departments under 5 Faculties, 3 Institutes and 2 Research Centers. There are now more than 4500 students studying in the university. There are 4 halls for the students. More than 200 faculty members, 100+ officers and 250+ office staffs are here in the university.

One of the prime objectives of CUET is to develop research links, partnership and collaboration programs for finding optimum technological solutions of problems and promote higher education and research. Thus, the university signed agreements with the University of Kassel, University of Stuttgart, Germany, the University of Ulsan, Korea, the Yamagata University, Saga University of Japan and Asian Institute of Technology, Thailand to accelerate the higher education and research activities. In addition, CUET joined with the International Forum of Strategic Technology (IFOST), a forum of 11 universities comprised of 8 nations and South East Asia Network for Disaster and Environmental Engineering (SEAN-DEE). Moreover, the university started program with joint collaboration with the IHE-UNESCO, Netherlands. The Earthquake Engineering Research Center (EERC), CUET started joint collaboration and research programs with the Institute of Earthquake Engineering and Engineering Seismology (IZIIS) of University St. Cyril and Methodius, Skopje, Macedonia.

1.5 World Recognition of the Engineering Universities

The corresponding positions of the engineering universities of Bangladesh in world ranking, according to Webometrics¹ Edition: 2020.2.4, are listed in Table 1.1. The overall world rankings of the engineering universities of Bangladesh in 2020, according to Scimago Institutions Rankings², is listed in Table 1.2.

Table 1.1: World Ranking of the Engineering Universities of Bangladesh according to Webometrics

World Rank	University	Presence Rank	Impact Rank	Openness Rank	Impact Rank
1760	BUET	4191	4067	1244	1786
3562	KUET	6801	8186	2480	3688
3576	RUET	15138	10485	3082	2687
3848	CUET	11840	9539	3009	3575

Table 1.2: World Ranking of the Engineering Universities of Bangladesh according to Scimago

World Rank	University	Best Quartile
793	BUET	Q1
806	CUET	Q1
822	RUET	Q3
838	KUET	Q3

¹<https://www.webometrics.info/en/asia/bangladesh%20>

²<https://www.scimagoir.com/rankings.php?sector=Higher%20educ.&country=BGD>

2. Problem Statement

System analysis involves examining the business situation through which it is determined how to find a solution for a problem or develop a system successfully. This activity involves breaking the total development process into smaller activities or phases that the actual task may be done in a smooth manner. In order that a successful system may be designed, developed and implemented, there is a great need and importance of defining a problem, so that the solution may be ascertained accordingly. This leads to the phase of system investigation. The phase of system investigation involves defining the problem clearly. In order that it may be done as conveniently as possible, an analyst or a consultant is invited, so that the user can define the problem of which, at a later stage, the solution may be ascertained. This phase involves determining whether there is a need for developing a completely new system or the existing system can be modified or improved. It is just a preliminary stage which describes the business system. In this way, preliminary investigation is the first step in the system development project.

System investigation includes problem definition in a more detailed way. It is important that it should be done in such a way that it can be ensured all essential points are covered up. It therefore leads to a stage in which there is a requirement of problem definition in a very clearer way. This necessitates interviewing and clarifying issues with the users. So, a system analyst needs to discuss with the users and prepare a written statement covering the objectives and scope of the problem. In this way, it becomes important to prepare a statement of objectives while understanding the problem and defining it clearly. After a thorough research of the candidate system, here are some problems that we found-

2.1 Distributed Admission Procedure System

The engineering universities conduct their admission procedure separately. So the students have to apply in either all of them or choose not to apply prior to the procedure even begins. So, applying

to the universities and then attending the admission tests become very costly.

Depending on the financial situation of Bangladesh, it is safe to assume that many of the applicants are actually from a financially challenged background. It should be the administration's duty to take care of that and make sure that eligible students are not being left alone due to the financial crisis.

Probable Solution: If the four engineering universities conducted the admission test together, then the students would have to apply only once and go to test once. It would save a lot of money and hazards for many families of students.

2.2 Application Cost

Once applied, no changes or cancellations can be made and no refunds are given. Once a student has completed the application, there is no chance of change. Since many do not have their own computer, most students fill out an application form a store that fills out university admissions forms. Shopkeepers usually do this in a lot of haste when filling out the form and doing the job carelessly. The shopkeepers do not give the students time to review the form properly for the purpose of higher income. This often leads to errors in the application form and the students become extremely frustrated as there is no opportunity to change the application form.

Probable Solution: The application website for each university should have a system so that students can modify their application within the deadline.

2.3 No Scope to Apply Online for Foreign Students

Passed from the foreign educational institutions and/or GCE 'O' / 'A' students are not be able to apply online. They have to apply manually. There is no opportunity to apply online for English medium students and foreign students. After downloading the admission form from the university website, it has to be duly filled, delivered to the registrar's office of the university and the receipt of the application form has to be received. In order to apply in this process, a foreign student has to come to Bangladesh and apply, which is very unreasonable. Besides, English medium students in Bangladesh also have to submit applications in the same manner which is both time consuming and cumbersome. Foreign students are reluctant to apply only for admission complexity. As a result, despite being able to provide quality education, there are very few foreign students in the engineering universities of our country.

Probable Solution: Online application needs to be started for English medium students and foreign students.

2.4 Application Fee Submission

Application fees can be paid only through "Rocket" where the country's most used mobile banking is "BKash". Most of the people in our country use BKash mobile banking. But all the engineering universities only allow students to pay the admission fee through Rocket. Due to not having their

own Rocket account, many students have to pay the fee through other people's account with extra money.

Probable Solution: Other mobile banking including "BKash" or other mobile banking systems should be added to pay the application fee.

2.5 Document Attachment Problem

During the exam, candidates need to bring some additional papers with the admit card like HSC admit card and registration card etc. and their photocopies. As different universities have different types of rules, the candidate becomes confused and in many cases they commit mistakes and don't bring the additional papers with. It creates frustrations and low downs their confidence. As a result, it creates a great impact on their exam.

Probable Solution: All the candidates care much about the admission admit card because it is common for all the universities and it is mandatory. So university authority can take all the necessary documents as virtual copies during the online admission registration. They can also attach the files with serial numbers and print out the copies with a serial number. This will remove all the confusions about what documents candidate needs to bring with him/her.

2.6 Exam Hall Finding

Most of the candidates who are coming to university for admission test have no idea about the university campus. So they become confused to find out the building. Sometimes they go to the wrong examination hall, can not find their seat and it is a great problem for the candidates. Most of the time, there is not enough time for the students to get familiarized with the university as all other universities take admissions in a very compact time.

Probable Solution: We are now in an era of technology. Everything now is online. University authority can provide the virtual representation of the geographical location of the building, floor number, room number and the position of the seat in the online profile of the candidate.

2.7 No Scope for Online procedure to get admitted

In the admission day, all the students who want to get themselves admitted into the university, need physical presence. They need to submit their papers and deposit the money in the bank in line. It creates chaos and needs a lot of time. They need to stay in the campus for two or more days which is not possible for many students as they may not be able to afford the cost. On the other hand, international students also need physical presence. They need to travel to the campus for one or two days to submit the papers and deposit money.

Probable Solution: The universities should have an online system where the students can submit the digital copies of the required documents and verify them.

2.8 No Scope to Choose Subjects before Admission

All the Engineering Universities take subject choice form from the students right at the time of admission. So the students are in dark if they will be able to get admitted to their choice of dream. And the outcome may not be in favor of the student always. In that case the student has to migrate or cancel the admission. Both are time consuming, frustrating and costly.

Probable Solution: The Universities can create an online system where the students can select their choice before getting admitted.

2.9 Script Evaluation

The procedure of evaluating the exam script. There are strict rules so that teachers can evaluate the scripts properly and fairly, but due to very slight human error, the evaluation may vary from teacher to teacher. This is a very humane error that is in most cases unavoidable. How one person evaluates a script will differ from another. This error is not usually public, and for obvious reasons no administration will ever discuss this to unauthorized personnel. But it is an error that is mostly considered as an outlier, but in our analysis this can prove to be a fatal decisive factor in a student's admission. Given that many students are admitted to the university from the waiting list (which is the list of students who were out of the merits) we need to make sure that the evaluation is fair. We need to analyze, in this case, how the questions are set, what kind of questions, is there a possibility that that question can be solved in various ways and one of them ways can be non-existent from someone's view. We also need to analyze if there's any loophole in the strict guidelines given from the administration in the case of script checking.

Probable Solution: The universities can convert their admission test procedure to MCQ as they can automate the evaluation and it is also faster. KUET does this every now and then though, but the other engineering universities do not.

3. Initial Investigation

3.1 Information Gathering

3.1.1 Introduction

Information Gathering is the approach and manner in which information is gathered. It requires persons with sensitivity, common sense and a knowledge of what and when to gather and what channels to use in securing information. This is a necessary and crucial step to be performed. The more information is gathered about the system, the more probability to obtain relevant results. When performing analysis on a system, the analysts have to gain a clear concept of what happens 'under the hood'. Therefore, mastering the information gathering process is one of the ultimate goals of any system analyst.

Information gathering is also one of the most time-consuming tasks and that is why time management is very important. This is also a crucial step during the early stages of system analysis. So, a system analyst needs to collect as much as information as possible about the working system.

It relies heavily on the user to articulate information needs. The analyst examines all reports, discusses with the user each piece of information examined, and determines unfulfilled information needs by interviewing the user. The analyst is primarily involved in improving the existing flow of data to the user. This breaks down a problem into parts, which allows the user to focus separately on the critical issues. This method is ideal for making structured decisions, although it requires that users articulate their information requirements.

The success of a system depends largely on how accurately a problem is defined, thoroughly investigated and properly carried out through the choice of solution. User need identification and analysis are concerned with what the user needs, rather than what he/she wants. Not until the problem has been identified, defined and evaluated, the analyst can not find solutions and



Figure 3.4: Students during BUET admission test


**পৃষ্ঠা জ্যোতিষ্ঠি আমাদের পথ পদর্শক
রাজশাহী প্রকৌশল ও প্রযুক্তি বিশ্ববিদ্যালয়**
[RUET]

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তারিখ	সাচিক্রেট যাচাই বাহাই উগ-কামিটি বিএসসি ইঞ্জিনিয়ারিং অর্টি পরীক্ষা ২০১৭-২০১৮																																																																																		
<u>বিষ্ণু দ্রষ্ট স্নাতক/স্নাতীকে সমস্ত তথ্য বাস্তায় পূর্ণ করিতে হইবে এবং পছন্দকৰ্ম প্রত্যেক বিভাগে ডিম্ব ডিম্ব হইতে হইবে।</u>																																																																																			

Figure 3.5: Students choice form of RUET

exam or not. BUET provides prospectus for the students with detailed guidelines in their website¹.

¹<https://www.buet.ac.bd/>


রাজশাহী প�কোশল ও প্রযুক্তি বিশ্ববিদ্যালয়
 রাজশাহী-৬২০৪
 টেলিফোন নম্বর: (০৬২১)-৭৫০৭৯৮, ফ্যাক্স: +৮৮০-৭২১-৭৫০৯০৭
 E-mail: registrar@ruet.ac.bd, ওবেসাইট: www.ruet.ac.bd

স্থানক নং- ২৭০৮

তারিখ: ০৬/০১/২০২০ খ্রি।

ভর্তি সংজ্ঞান বিজ্ঞপ্তি

১ম বর্ষ মাত্রক কোর্সে ভর্তি সংজ্ঞান ৫ম তালিকা একাশ এবং গত ০৪ জানুয়ারি ২০২০ খ্রি তারিখ পর্যন্ত ভর্তিকৃত প্রার্থীদের প্রাথমিক বিভাগ বর্তন

২০১৯-২০২০ শিক্ষাবর্ষে রাজশাহী পুকোশল ও প্রযুক্তি বিশ্ববিদ্যালয়ে ১ম বর্ষ মাত্রক কোর্সে ভর্তির জন্ম গত ২৪ অক্টোবর ২০১৯ খ্রি: তারিখে অনুষ্ঠিত ভর্তি পরীক্ষার ফলাফলের ভিত্তিতে সারণী-১ এবং মেধাত্মক ৩৫০১ হতে ৩৫০৮ পর্যন্ত মোট ৩৮ জন ও আসন খালি থাকা সাথেকে ৩৫০৯ হতে ৩৮০০ পর্যন্ত মোট ২৬২ জন প্রার্থীকে ভর্তির জন্ম উপস্থিত হতে বলা হলো। এছাড়া অর্বিকল্পকার বিভাগে গত ০৪/০১/২০২০ খ্রি তারিখে উপস্থিত প্রার্থীদের মধ্য থেকে মেধাত্মক অনুযায়ী ২৭৮ এই ০১ (এক) জন প্রার্থীকে ভর্তির জন্ম নির্ধারিত করা হলো। ইহ ছাড়াও গত ০৪/০১/২০২০ খ্রি তারিখ পর্যন্ত ভর্তিকৃত ছাত্র/ছাত্রীদের প্রাথমিক তালিকা একাশ করা হলো।

সন্তুষ্ট প্রার্থীদের অর্থ বিশ্ববিদ্যালয়ে ভর্তির নিমিত্তে নিয়মিতিত কাপড়পত্রে জমা প্রদান করতে হবে:

- (১) এসএসসি অথবা সমমানের পরীক্ষার মূল সার্টিফিকেট,
- (২) এসএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট,
- (৩) এইচএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট,
- (৪) এইচএসসি অথবা সমমানের পরীক্ষার মূল রেজিস্ট্রেশন কার্ড,
- (৫) ভর্তি পরীক্ষার (হল পরিদর্শক কর্তৃক ছাত্র/ছাত্রীর প্রাপ্তিশীল)
- (৬) সর্বশেষ শিক্ষা প্রতিষ্ঠান প্রধান কর্তৃক প্রদত্ত মূল প্রশংসনগত,
- (৭) সত্যাপিত ব্যক্তিকে ০২ (দুই) কপি পাসপোর্ট সাইজের সদ্যাতোলা রঙীন ছবি (ফরমাল পোশাকে),
- (৮) উপজাতী/জন্ম জাতিসভা/মৃ-গোষ্ঠী প্রার্থীদের কেবে উপজাতী/জন্ম জাতিসভা/মৃ-গোষ্ঠী-এর সনদের মূল কপি।

অর্থ বিশ্ববিদ্যালয়ে একাডেমিক ভবন-৩ (জিসই ভবন)- এ নির্ধারিত কমিটির নিকট সনদসমূহ যাচাইয়ের জন্ম উপস্থিত হতে হবে। অন্য প্রতিষ্ঠানে ভর্তিকৃত প্রার্থীদের উক্ত শিক্ষা প্রতিষ্ঠান প্রধান (বিশ্ববিদ্যালয়ের কেবে বিভাগীয় প্রধান)-এর নিকট হতে এই মর্মে সার্টিফিকেট আনতে হবে যে, সে অর্থ বিশ্ববিদ্যালয়ে ভর্তি হলে তাকে ছাত্রপ্রদেশ দেয়া হবে এবং তার সনদপত্রসমূহ ফোট দেয়া হবে। ভর্তির জন্ম নির্ধারিত প্রার্থীদের সনদপত্র যাচাই-এর সময় ভর্তি ইচ্ছুক ছাত্র/ছাত্রীদের (১) শিক্ষা ন্টুচ, (২) ছাত্র/ছাত্রী নিবন্ধনকরণ ফরম, (৩) ভর্তি ইচ্ছুক ছাত্র/ছাত্রীর সনদপত্রাদি জামার ফরম ও (৪) তাদের বিভাগের পছন্দতম নির্ধারিত ফরম মোট ০৪ (চার) টি ওয়েব সাইট (www.ruet.ac.bd/admission) হতে ভাউন্লোড করে অবশ্যই যথাযথ ভাবে পুরণ করে সংযোগে আনতে হবে। বিভাগ নির্ধারণ মেধা ও পছন্দের জন্ম অনুসারে হবে। প্রাথমিক পর্যায়ে ছাত্র/ছাত্রীদেরকে যে বিভাগই প্রদান করা যোক না কেন ভর্তি প্রতিয়া সম্পর্ক হওয়ার পরে তাদের মেধা ও পছন্দের জন্ম অনুসারে বিভাগ নির্ধারণ চূড়ান্ত করা হবে।

সনদপত্রাদি যাচাইয়ের পর একই তারিখে বাহ্য পরীক্ষায় যোগ অন্বন্দিত হলে কর্তৃপক্ষের অনুমোদনক্রমে নির্ধারিত সময়ের মধ্যে প্রয়োজনীয় ফিস জমা প্রদানপূর্বক তাদেরকে ভর্তি হতে হবে। ভর্তির সময় সর্বমোট ১৮,০০০/- (আঠাশো হাজার) টাকা পার্শ্বে। কোন প্রার্থী নির্ধারিত সময়ের মধ্যে ভর্তি হতে বার্ষ হলে তার ভর্তির যোগাতা বালিল হয়ে যাবে এবং আসন খালি থাকা সাথেকে মেধা তালিকা হতে মেধাত্মক অনুযায়ী পর্যায়ের খালি/শূন্য আসনে ভর্তি করা হবে।

বিশেষ প্রটোকল :

- ১। অনব্যাপ্তাবশতই কোন প্রকার ভুলগতি বিশ্ববিদ্যালয়ের ভর্তি কমিটির সিঙ্কান্স মোতাবেক যে কোন সময় সংশোধনযোগ্য।
- ২। অর্থ বিশ্ববিদ্যালয়ের ক্যাম্পাসে হস্তসমূহে ছাত্র/ছাত্রীদের সীট খালি না থাকলে ছাত্র/ছাত্রীদের নিজ দায়িত্বে থাকা-খাওয়ার ব্যবস্থা করতে হবে।

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Figure 3.6: Admission notice from RUET after publication of admission test result

 <p>ঠাণ্ডী জ্যোতিতি আমাদের পথ প্রদর্শক রাজশাহী প্রকৌশল ও প্রযুক্তি বিশ্ববিদ্যালয়।</p>																																			
ছাত্র/ছাত্রী নিবন্ধনের ফরম																																			
অফিসের ব্যবহারের জন্য																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">নিবন্ধন সংখ্যা</td> <td style="width: 50%;"></td> </tr> <tr> <td>শিক্ষা বর্ষ</td> <td>২০১৯-২০২০</td> </tr> </table>	নিবন্ধন সংখ্যা		শিক্ষা বর্ষ	২০১৯-২০২০																															
নিবন্ধন সংখ্যা																																			
শিক্ষা বর্ষ	২০১৯-২০২০																																		
<p>১। ছাত্র/ছাত্রীর(বাংলায়) :..... (ইংরেজিতে IN CAPITAL LETTER) :.....</p> <p>২। (ক) ছাত্র/ছাত্রীর পিতার নাম :..... (খ) ছাত্র/ছাত্রীর মাতার নাম :.....</p> <p>৩। পিতার অবর্তমানে আইনানুগ অভিভাবকের নাম ও ঠিকানা :.....</p> <p>৪। জন্ম তারিখ (এসএসসি বা সমতুল্য পরীক্ষার সনদপত্র অনুযায়ী) :.....</p> <p>৫। শিক্ষা বৃত্তান্ত (এসএসসি বা সমতুল্য পরীক্ষা ইত্যাদি) :.....</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">পরীক্ষার নাম</th> <th style="width: 25%;">উত্তীর্ণের সন</th> <th style="width: 25%;">শিক্ষা প্রতিষ্ঠানের নাম</th> <th style="width: 25%;">সনদপত্র প্রদানকারী কর্তৃপক্ষ</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table> <p>৬। ছাত্র/ছাত্রী কোন বোর্ড/বিশ্ববিদ্যালয়/সমতুল্য প্রতিষ্ঠান হইতে কোন বৃত্তি, পদক বা পুরস্কার পাইয়া থাকিলে তাহার বিবরণ.....</p> <p>৭। স্থায়ী পূর্ণ ঠিকানা :..... ফোন নং:..... মোবাইল:.....</p> <p>৮। স্থায়ী পূর্ণ ঠিকানা :..... ফোন নং:..... মোবাইল:.....</p> <p style="text-align: center;">ছাত্র/ছাত্রীর পূর্ণ স্বাক্ষর</p> <p style="text-align: center;">******(অফিসের ব্যবহারের জন্য)***** ঠাণ্ডী জ্যোতিতি আমাদের পথ প্রদর্শক রাজশাহী প্রকৌশল ও প্রযুক্তি বিশ্ববিদ্যালয়।</p> <p style="text-align: center;">REGISTRATION CARD</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">CE</td> <td style="width: 20%;">EEE</td> <td style="width: 20%;">ME</td> <td style="width: 20%;">CSE</td> <td style="width: 20%;">ETE</td> <td style="width: 20%;">IPE</td> <td style="width: 20%;">GCE</td> <td style="width: 20%;">URP</td> <td style="width: 20%;">MTE</td> <td style="width: 20%;">ARCH</td> <td style="width: 20%;">ECE</td> <td style="width: 20%;">CFPE</td> <td style="width: 20%;">BECM</td> <td style="width: 20%;">MSE</td> </tr> </table> <p>ছাত্র/ছাত্রীর নাম :.....</p> <p>পিতার নাম :.....</p> <p>কে এই বিশ্ববিদ্যালয়ের ছাত্র হিসাবে নিবন্ধন করা হইল।</p> <p style="text-align: center;">নিবন্ধন সংখ্যা : <input type="text"/> শিক্ষাবর্ষ : <input type="text"/> ২০১৯-২০২০</p> <p>তারিখ : -</p> <p style="text-align: center;">১</p> <p style="text-align: center;">রেজিস্ট্রেশন</p>		পরীক্ষার নাম	উত্তীর্ণের সন	শিক্ষা প্রতিষ্ঠানের নাম	সনদপত্র প্রদানকারী কর্তৃপক্ষ																	CE	EEE	ME	CSE	ETE	IPE	GCE	URP	MTE	ARCH	ECE	CFPE	BECM	MSE
পরীক্ষার নাম	উত্তীর্ণের সন	শিক্ষা প্রতিষ্ঠানের নাম	সনদপত্র প্রদানকারী কর্তৃপক্ষ																																
CE	EEE	ME	CSE	ETE	IPE	GCE	URP	MTE	ARCH	ECE	CFPE	BECM	MSE																						

Figure 3.7: Student Information collection form of RUET

The students are provided with admit card from the BUET website, which the students have to bring to the exam hall in order to attend the exam. After the authority examines the answer sheets,

<p style="text-align: center;">ঝুঁটি জ্যোতিই আমাদের পথ প্রদর্শক রাজশাহী প্রকৌশল ও প্রযুক্তি বিশ্ববিদ্যালয়।</p>	<p>ভর্তি ইচ্ছুক ছাত্র/ছাত্রীর সনদপত্রাদি জমার ফরম</p> <p>আমি, (ছাত্র/ছাত্রীর নাম).....</p> <p>পিতা : মাতা :</p> <p>ভর্তি পরীক্ষার রোল নং , অস্বীকৃত তারিখে আমার শিক্ষাগত যোগ্যতার নিম্নবর্ণিত সনদসূহ জমা দিলাম :-</p> <p>১। এসএসসি অথবা সমমানের পরীক্ষার মূল সাটিফিকেট</p> <p>২। এসএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট</p> <p>৩। এইচএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট</p> <p>৪। এইচএসসি অথবা সমমানের পরীক্ষার মূল রেজিস্ট্রেশন কার্ড</p> <p>৫। ভর্তি পরীক্ষার (হল পরিদর্শক কর্তৃক স্বাক্ষরিত) প্রবেশপত্র</p> <p>৬। সর্বশেষ শিক্ষা প্রতিষ্ঠান প্রধান কর্তৃক প্রদত্ত মূল প্রশংসনপত্র</p> <p>৭। সত্যায়িত ব্যক্তিরেকে ০২ (দুই) কপি পাসপোর্ট সাইজের রঙীন ছবি</p> <p>৮। উপজাতী/ন্যূন জাতিসভা/ন্যূন-গোষ্ঠী প্রার্থীদের ক্ষেত্রে উপজাতী/ন্যূন জাতিসভা/ন্যূন-গোষ্ঠী-এর সনদের মূল কপি</p> <p style="text-align: right;">..... ছাত্র/ছাত্রীর পূর্ণ স্বাক্ষর</p> <p>(উপরে বর্ণিত কাগজপত্রাদি জমাদানে ব্যর্থ হইলে ছাত্র/ছাত্রী এই ফরমের নিম্নাংশ পূরণ করিবে)</p> <p>আমি অঙ্গিকার করিতেছি যে, নিম্নবর্ণিত সনদসূহ আমি আগামী..... প্রিয় তারিখের মধ্যে অতি বিশ্ববিদ্যালয়-এর শিক্ষা শাখায় জমা দিব। অন্যথায় আমার এই বিশ্ববিদ্যালয়-এ ভর্তি ব্যক্তি বলিয়া গণ্য হইবে।</p> <p>১। ২। ৩। ৪।</p> <p style="text-align: right;">..... ছাত্র/ছাত্রীর পূর্ণ স্বাক্ষর</p> <p>*****</p> <p style="text-align: center;">ঝুঁটি জ্যোতিই আমাদের পথ প্রদর্শক রাজশাহী প্রকৌশল ও প্রযুক্তি বিশ্ববিদ্যালয়।</p> <p>নাম : ভর্তি পরীক্ষার রোল :</p> <p>অস্বীকৃত তারিখে অতি বিশ্ববিদ্যালয়ে ভর্তির জন্য নিম্নবর্ণিত সনদসূহ জমা প্রদান করিয়াছে :</p> <p>১। এসএসসি অথবা সমমানের পরীক্ষার মূল সাটিফিকেট</p> <p>২। এসএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট</p> <p>৩। এইচএসসি অথবা সমমানের পরীক্ষার মূল ট্রান্সক্রিপ্ট</p> <p>৪। এইচএসসি অথবা সমমানের পরীক্ষার মূল রেজিস্ট্রেশন কার্ড</p> <p>৫। সর্বশেষ শিক্ষা প্রতিষ্ঠান প্রধান কর্তৃক প্রদত্ত মূল প্রশংসনপত্র</p> <p>৬। সত্যায়িত ব্যক্তিরেকে ০২ (দুই) কপি পাসপোর্ট সাইজের রঙীন ছবি</p> <p style="text-align: right;">..... সভাপতি সাটিফিকেট যাচাই বাছাই উপ-কমিটি বিএসসি ইঞ্জিনিয়ারিং ভর্তি পরীক্ষা ২০১৯-২০</p>
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Figure 3.8: Form of students' certificate information

merit list is published in their website. They provides further notice (sample in fig: 3.3) for the students where they describe which documents the students have to present to authenticate their

ক্রঃ নং	বিভাগ/বিষয়	কোড	আসন সংখ্যা
সিডিল ইঞ্জিনিয়ারিং অনুষদ			
১	সিডিল ইঞ্জিনিয়ারিং (Civil Engineering)	CE	১২০
২	বিল্ডিং ইঞ্জিনিয়ারিং এবং বাণিজ্যিকশন ম্যানেজমেন্ট (Building Engineering and Construction Management)	BECM	৬০
৩	আগনীন এবং রিজিউলেন্স প্লানিং (Urban and Regional Planning)	URP	৬০
৪	আর্কিটেকচার (Architecture)	Arch	৪০
ইলেক্ট্রিক্যাল এবং ইলেক্ট্রনিক ইঞ্জিনিয়ারিং অনুষদ			
১	ইলেক্ট্রিক্যাল এবং ইলেক্ট্রনিক ইঞ্জিনিয়ারিং (Electrical and Electronic Engineering)	EEE	১২০
২	কম্পিউটার সায়েন্স এবং ইঞ্জিনিয়ারিং (Computer Science and Engineering)	CSE	১২০
৩	ইলেক্ট্রনিক্স এবং কমিউনিকেশন ইঞ্জিনিয়ারিং (Electronics and Communication Engineering)	ECE	৬০
৪	বায়োমেডিকেল ইঞ্জিনিয়ারিং (Bio-Medical Engineering)	BME	৩০
৫	মাটেরিয়ালস সায়েন্স এবং ইঞ্জিনিয়ারিং (Materials Science and Engineering)	MSE	৬০
মেকানিক্যাল ইঞ্জিনিয়ারিং অনুষদ			
১	মেকানিক্যাল ইঞ্জিনিয়ারিং (Mechanical Engineering)	ME	১২০
২	ইন্ডাস্ট্রিয়াল এবং প্রোডাকশন ইঞ্জিনিয়ারিং (Industrial and Production Engineering)	IPE	৬০
৩	লেডার ইঞ্জিনিয়ারিং (Leather Engineering)	LE	৬০
৪	টেক্সেল ইঞ্জিনিয়ারিং (Textile Engineering)	TE	৬০
৫	এনার্জি সায়েন্স এবং ইঞ্জিনিয়ারিং (Energy Science and Engineering)	ESE	৩০
৬	কেমিক্যাল ইঞ্জিনিয়ারিং (Chemical Engineering)	ChE	৩০
৭	মেক্ট্রোনিক্স ইঞ্জিনিয়ারিং (Mechatronics Engineering)	MTE	৩০

Figure 3.9: Seat distribution of students in various Departments of KUET

identity. After the authority gets all the information about the student they need and the admission fee is provided, the candidate is now a student of BUET.

Rajshahi University of Engineering and Technology, RUET

After the publication of HSC result, RUET publishes circular for admission in their website². They have some pre-requisites for the students to have before applying. Normally, the pre-requisites are different for HSC and GCE students as their curriculum is different. The applicants have to follow the rules to apply. After applying, students have to pay a fixed amount of money, depending on which category they want to apply (Engineering, or Engineering and Architecture). Once the process is completed, there is no way to cancel the application. Interested students have to apply

²<https://www.ruet.ac.bd/page/how-to-apply>

ডাকেট (DBBL Mobile Banking) এর মাধ্যমে আবেদন ফি প্রদানের পদ্ধতি:

Dial *322# from your mobile phone (if DBBL mobile banking is active)/DBBL agent phone and follow the steps bellow

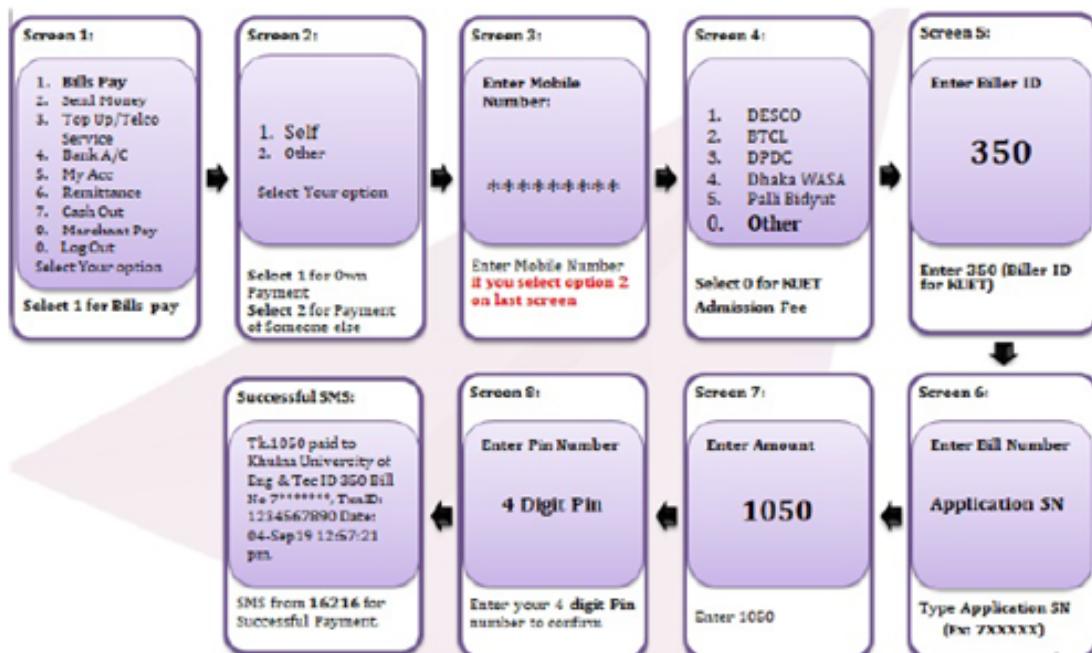


Figure 3.10: Procedure to pay fee for KUET admission test

বিদ্যা ভিত্তিক প্রশ্ন সংখ্যা ও নথিযোগ্য বিন্যাস নিম্নলিখিত			
বিষয়	প্রশ্ন সংখ্যা	মোট মাছরা	সর্বমোট মাছরা
গান্ধী	১০	১০০	
প্রকৃতিবিদ্যা	১০	১০০	
চালানুরূপ	১০	১০০	
ইঞ্জিনীয়	১০	১০০	৪০০

Figure 3.11: Admission test mark distribution for KUET

and pay within the given time and date. Students from abroad requires some extra procedures to follow to apply.

After the answer scripts are evaluated and merit list have been published, the authority calls for admission. The students have to follow a certain set of rules and bring some documents accordingly. The students are given the option to choose the departments they want to study, based on which, the authority then proceeds to allotment.

On the day of admission, the students are provided with some information form, which the students have fill up. These information is later stored by the administration for later. After a few days of processing all the students' information, the authority then publishes the students' allotment list.

২। ভর্তি পরীক্ষায় অংশগ্রহণের জন্য আবেদনের ন্যূনতম ঘোষ্যতা:

ক) প্রার্থীকে বাংলাদেশের নাগরিক হতে হবে।

খ) প্রার্থীকে ২০১৯ইং সালে উচ্চ মাধ্যমিক বা তার সমমানের পরীক্ষায় পাশ হতে হবে অথবা ২০১৮ইং সালের সেপ্টেম্বরের পরে ‘A’ লেভেল সার্টিফিকেট প্রাপ্ত হতে হবে।

গ) বাংলাদেশের যে কোন মাধ্যমিক ও উচ্চ মাধ্যমিক শিক্ষা বোর্ড / মাদ্রাসা শিক্ষা বোর্ড / কারিগরি শিক্ষা বোর্ড থেকে উন্নীর্ণ শিক্ষার্থীকে ২০১৬ অথবা ২০১৭ সালের মাধ্যমিক বা সমমানের পরীক্ষায় কমপক্ষে জিপিএ ৮.০০ পেয়ে পাশ হতে হবে অথবা সমমানের পরীক্ষায় কমপক্ষে সমতুল্য গ্রেড পেয়ে পাশ হতে হবে।

ঘ) বাংলাদেশের যে কোন মাধ্যমিক ও উচ্চ মাধ্যমিক শিক্ষা বোর্ড / মাদ্রাসা শিক্ষা বোর্ড / কারিগরি শিক্ষা বোর্ড থেকে উচ্চ মাধ্যমিক / আলীম / সমমানের পরীক্ষায় উন্নীর্ণ শিক্ষার্থীকে গণিত, পদাৰ্থ বিজ্ঞান, রসায়ন বিষয়ের প্রত্যেকটিতে আলাদাভাবে কমপক্ষে গ্রেড পয়েন্ট ৪.০০ ও ইংরেজি বিষয়ে কমপক্ষে গ্রেড পয়েন্ট ৩.৫০ পেয়ে পাশ করতে হবে এবং গণিত, পদাৰ্থ বিজ্ঞান, রসায়ন ও ইংরেজীতে মোট গ্রেড পয়েন্ট কমপক্ষে ১৭.৫০ পেতে হবে। ইংরেজী মাধ্যম / বিদেশী শিক্ষা বোর্ড থেকে সমমানের পরীক্ষায় উচ্চ বিষয়সমূহে কমপক্ষে সমতুল্য গ্রেড পেয়ে পাশ হতে হবে।

ঙ) প্রার্থী GCE ‘O’ লেভেল এবং ‘A’ লেভেল পাশ করে থাকলে তার ক্ষেত্রে ভর্তি পরীক্ষায় অংশগ্রহণের জন্য GCE ‘O’ লেভেল পরীক্ষায় পদাৰ্থ বিজ্ঞান, রসায়ন ও গণিতে পৃথক পৃথকভাবে কমপক্ষে ‘B’ গ্রেড পেয়ে পাশ হতে হবে। GCE ‘A’ লেভেল পরীক্ষায় পদাৰ্থ বিজ্ঞান, রসায়ন ও গণিতে পৃথক পৃথকভাবে কমপক্ষে ‘B’ গ্রেড পেয়ে পাশ হতে হবে।

৩। অনলাইনে ভর্তির আবেদন সংক্রান্ত:

ভর্তি পরীক্ষায় অংশগ্রহণের জন্য আবেদন ফরম কেবলমাত্র অনলাইনে পূরণ করা যাবে এবং আবেদন ফি রাকেট এর মাধ্যমে প্রদান করতে হবে। কোন ছাপানো ফরম বিক্রয় করা হবে না।

সকল আবেদনকারীর মধ্য থেকে HSC তে গণিত, পদাৰ্থ বিজ্ঞান, রসায়ন এবং ইংরেজীতে প্রাপ্ত মোট গ্রেড পয়েন্টের ভিত্তিতে প্রথম ১০০০০ (দশ হাজার) জনকে ভর্তি পরীক্ষার জন্য নির্বাচিত ঘোষণা করা হবে। তবে, ১০০০০ তম স্থানে একাধিক প্রার্থী থাকলে তুম্বানুসারে গণিত, পদাৰ্থ বিজ্ঞান, রসায়ন এবং ইংরেজি বিষয়ের HSC তে প্রাপ্ত গ্রেড পয়েন্টের ভিত্তিতে ভর্তি পরীক্ষার জন্য ঘোষণা প্রার্থী নির্বাচন করা হবে। সেক্ষেত্রে HSC তে গণিত, পদাৰ্থ বিজ্ঞান, রসায়ন এবং ইংরেজিতে একই গ্রেড পয়েন্ট প্রাপ্ত ১০০০০ তম স্থানের সকল প্রার্থী ভর্তি পরীক্ষায় অংশগ্রহণের সুযোগ পাবে।

আবেদন ফি প্রশ্ন - KA (ইঞ্জিনিয়ারিং বিভাগসমূহ এবং নগর ও অঞ্চল পরিকল্পনা বিভাগ) এর জন্য ১,০০০/- (এক হাজার মাত্র) টাকা (সার্টিস চার্জ সহ) এবং প্রশ্ন- KHA (ইঞ্জিনিয়ারিং বিভাগসমূহ, নগর ও অঞ্চল পরিকল্পনা বিভাগ এবং স্থাপত্য বিভাগ) এর জন্য ১,১০০/- (এক হাজার একশত মাত্র) টাকা (সার্টিস চার্জ সহ)।

দ্রষ্টব্য:

অনলাইন পক্ষত্বে আবেদনের সময় বিশেষ সর্তকর্তা অবলম্বন এবং নির্দেশনাসমূহ যথাযথভাবে অনুসরণ করার জন্য পরামর্শ দেয়া হল।

(I) নির্ধারিত তারিখ ও সময়ের মধ্যে যে কোন সময় অনলাইন পক্ষত্বে আবেদন করা যাবে।

(II) একবার অনলাইন পক্ষত্বে আবেদন করলে কোন ধরনের পরিবর্তন কিংবা তা প্রত্যাহার করা যাবে না এবং পরিবর্তন বা প্রত্যাহারের জন্য কোন টাকা ফেরৎ দেয়া হবে না।

(III) আবেদন ফি পরিশোধ সংক্রান্ত কোন সমস্যার সম্মুখীন হলে রাকেট এর Call Center- ১৬২১৬ নম্বরে সার্বক্ষণিক যোগাযোগ করা যেতে পারে।

Figure 3.12: Application procedure of CUET for session 2019-2020

Khulna University of Engineering and Technology, KUET

The admission test procedure of KUET is divided into four phases:

1. Application
2. Selection
3. Admission Test
4. Admission

The complete procedure takes almost 3 to 4 months.

In this first phase, students have to fill the application form within a fixed date provided by the university administration. It is a online process. Students do not need to go to the university to fill the form. They have to fill up the form as per given instructions. After completing the process, they have to collect the receipt of application, which they have to bring to the exam hall with them.

After applying, the students have to pay the fee for admission test, which can be paid through mobile banking. The university provides detailed information about how to go through the process. The students have collect the money receipt from the website for later purpose. After the selection process is done, only a fixed number of students can attend the exam. The list is published through

ধাপ ১ : অনলাইনে আবেদন ফরম পূরণ

- <http://web.cuet.ac.bd/admission2017/registration.php> অথবা <http://www.cuet.ac.bd/admission> এ প্রবেশ করতে হবে।
- ২) SSC এবং HSC এর Board/Institute, Passing Year, Roll No এবং Registration No. পূরণের পর Next বাটনে প্রেস করতে হবে।

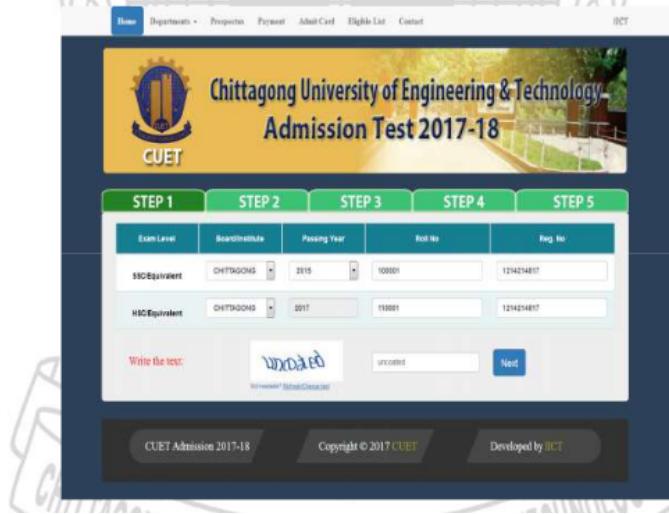


Figure 3.13: Step-by-Step guide for students about how to apply online in CUET

ভর্তি পরীক্ষার বিষয়সমূহ ও পাঠ্যসূচী নিম্নরূপঃ		
বিভাগ	বিষয়	পাঠ্যসূচী
গ্রুপ “ক” ইঞ্জিনিয়ারিং বিভাগসমূহ এবং নগর ও অঞ্চল পরিকল্পনা বিভাগ	গণিত	২০১৭ সালে অনুষ্ঠিত উচ্চ মাধ্যমিক পরীক্ষার পাঠ্যসূচী
	পদাৰ্থ বিজ্ঞান	
	রসায়ন	
গ্রুপ “খ” ইঞ্জিনিয়ারিং বিভাগসমূহ, নগর ও অঞ্চল পরিকল্পনা বিভাগ এবং স্থাপত্য বিভাগ	গণিত	২০১৭ সালে অনুষ্ঠিত উচ্চ মাধ্যমিক পরীক্ষার পাঠ্যসূচী
	পদাৰ্থ বিজ্ঞান	
	রসায়ন	
মুক্তহস্ত অংকন (Free-hand Drawing)-শুধুমাত্র স্থাপত্য বিভাগে ভর্তির ছাত্র-ছাত্রীদের জন্য প্রযোজ্য।		
(খ) “ক” গ্রুপের জন্য মোট ৬০০ নম্বরের ভর্তি পরীক্ষা এবং “খ” গ্রুপের জন্য মোট ১০০০ নম্বরের ভর্তি পরীক্ষা অনুষ্ঠিত হবে। প্রত্যেক গ্রুপের পরীক্ষার বিষয় এবং বিষয়সমূহের পূর্ণান্তর নিম্নবর্ণিত ছকে দেয়া হলো।		
গ্রুপ “ক”	গ্রুপ “খ”	লিখিত পরীক্ষার নম্বর
গণিত	গণিত	২০০
পদাৰ্থ বিজ্ঞান	পদাৰ্থ বিজ্ঞান	২০০
রসায়ন	রসায়ন	২০০
-	মুক্তহস্ত অংকন	৮০০
মোট নম্বর = ৬০০	মোট নম্বর = ১০০০	

Figure 3.14: Mark distribution of CUET admission exam

১৪। ভর্তির নিয়মাবলী :

ক) ভর্তির সময় জমা দিতে হবে :

- (I) সর্বব্রাহ্মত পূরণ করা ফরম। প্রার্থীকে নিজে ফরম পূরণ করতে হবে এবং একবার পছন্দত্ব দিলে তা পরিবর্তন করা যাবে না।
- (II) মাধ্যমিক বা সমমানের পরীক্ষার মূল / সাময়িক সনদপত্রের মূল কপি।
- (III) মাধ্যমিক বা সমমানের পরীক্ষার ট্রেডসৈটের মূল কপি।
- (IV) উচ্চ মাধ্যমিক বা সমমানের পরীক্ষার ট্রেডসৈটের মূল কপি।
- (V) উচ্চ মাধ্যমিক বা সমমান পরীক্ষা পাশের সাময়িক সনদ/শিক্ষা প্রতিষ্ঠান প্রধান কর্তৃক অদন্ত প্রশংসাপত্রের মূল কপি।
- (VI) উপজাতীয়দের জন্য উপজাতীয় সনদ পত্রের মূল কপি।

রাখাইন ও উপজাতীয় প্রার্থীদের বাংলাদেশের স্থানীয় বাসিন্দা এবং উপজাতীয়তার প্রমাণ স্বরূপ

- (১) যে কলেজ থেকে পাস করেছে সে কলেজের অধ্যক্ষ, (২) স্থানীয় পৌরসভা/জেলা পরিষদ/ইউনিয়ন পরিষদ এর চেয়ারম্যান এবং (৩) উপজাতীয় মোড়লের নিকট থেকে মোট ৩টি মূল সার্টিফিকেট দাখিল করতে হবে।

VII) সদ্য তোলা সত্যাগ্রিত ২(দুই) কপি পাসপোর্ট সাইজের বঙ্গিন ছবি।

১৫

খ) প্রার্থীদের নিরীক্ষা কমিটি থারা সনদপত্রের সত্যতা যাচাই এবং বিশ্ববিদ্যালয়ের স্বাস্থ্য কর্মকর্তা কর্তৃক স্বাস্থ্য পরীক্ষা করা হবে।

গ) স্বাস্থ্য পরীক্ষায় যোগ্য প্রমাণিত হলে রেজিস্ট্রেরের অনুমোদনক্রমে নির্ধারিত সময়ের মধ্যে প্রয়োজনীয় ফিস জমা দিয়ে মূল ট্রেডসৈট এবং মূল/সাময়িক সনদপত্রসমূহ অবশ্যই দুই বছরের জন্য জমা দিতে হবে। কেবলমাত্র ভর্তি বাতিলক্রমে দুই বছর উত্তীর্ণ হওয়ার পূর্বে উচ্চ সনদপত্রাদি ফেরতযোগ্য।

ঘ) নির্বাচিত প্রার্থীদের ভর্তি ও ক্লাশ শুরু সংক্রান্ত তথ্যাবলী ও বিজ্ঞপ্তি জানানোর জন্য আলাদাভাবে কোন প্রকার চিঠি পাঠানো হবে না। প্রার্থী নিজ দায়িত্বে বিশ্ববিদ্যালয় নোটিশ বোর্ড হতে ভর্তি ও পরবর্তীতে ক্লাশ শুরু সম্বন্ধে সকল তথ্য জেনে নেবে। বিশ্ববিদ্যালয়ের ওয়েবসাইট (<http://web.cuet.ac.bd/admission2017>) অথবা <http://www.cuet.ac.bd/admission> থেকেও এতদসংক্রান্ত তথ্য পাওয়া যাবে।

Figure 3.15: Admission rules in CUET prospectus

the website.

Admission test is held according to the provided date by the administration. In order to attend the examination, students must bring the necessary papers with them. There are some restrictions of what the students cannot bring to the exam hall. If any student does not follow that, he/she is not allowed to attend the exam.

A list will be published with the department allocation for the students. It will be according to merit. Students who want to get themselves admitted, have to deposit the required amount of money in the bank and submit it to the administration. Student must submit some papers according to the instructions of the authority. Student must pass the health check-up test. If there is any problem,

then the student will be get rejected. If there is any vacancy in any department, there will be a migration of department according to the merit and choice list.

Chittagong University of Engineering and Technology, CUET

After the publication of HSC result, CUET publishes circular³ for admission in their website⁴. They have some pre-requisites for the students to have before applying. Normally, the pre-requisites are different for HSC and GCE students as their curriculum is different. The applicants have to follow the rules to apply. After applying, students have to pay a fixed amount of money, depending on which category they want to apply (Engineering, or Engineering and Architecture). Once the process is completed, there is no way to cancel the application. They also have call center to help out students on any information. Interested students have apply and pay within the given time and date. Students from abroad requires some extra procedures to follow to apply. The circular includes some probable future dates of exam and admission so that the students can have an idea of how long the process will go on.

After the answer scripts are evaluated and merit list have been published, the authority calls for admission. The students have to follow a certain set of rules and bring some documents accordingly. The students are given the option to choose the departments they want to study, based on which, the authority then proceeds to allotment.

3.1.3 Overview of the existing system

Although there are some subtle differences, all the engineering universities follow the same methodology for their admission procedure. The authorities publish admission circular in their websites with all the detailed information. Students have to follow the rules to apply and pay a certain amount of fee for the exam. After some time, the universities announce the eligibility list and only those students can attend the exam.

After the exam is over, the teachers of the corresponding universities examines the sheets and based on that they publish merit list. With that, they also provide information about how to get admitted and which rules and regulations to follow for the students. The students submit required documents and fee, and the admission procedure is concluded.

3.2 Information Analysis

The information were collected from the Admission Circulars, Admission Notice after being selected and Information about the exams on the internet that are properly verified. We can see from these Circulars that a particular strategy is being followed by these Universities when it comes to admission. It was seen from the information we collected that 3 of them arrange written exams while only KUET arranges an MCQ exam. Otherwise the exam patterns are almost the same in every case for the other 3 Universities.

³https://www.cuet.ac.bd/notice/1565242099_Undergraduate%20Admission%20Circular%202019-20.pdf

⁴<https://www.cuet.ac.bd/admission>

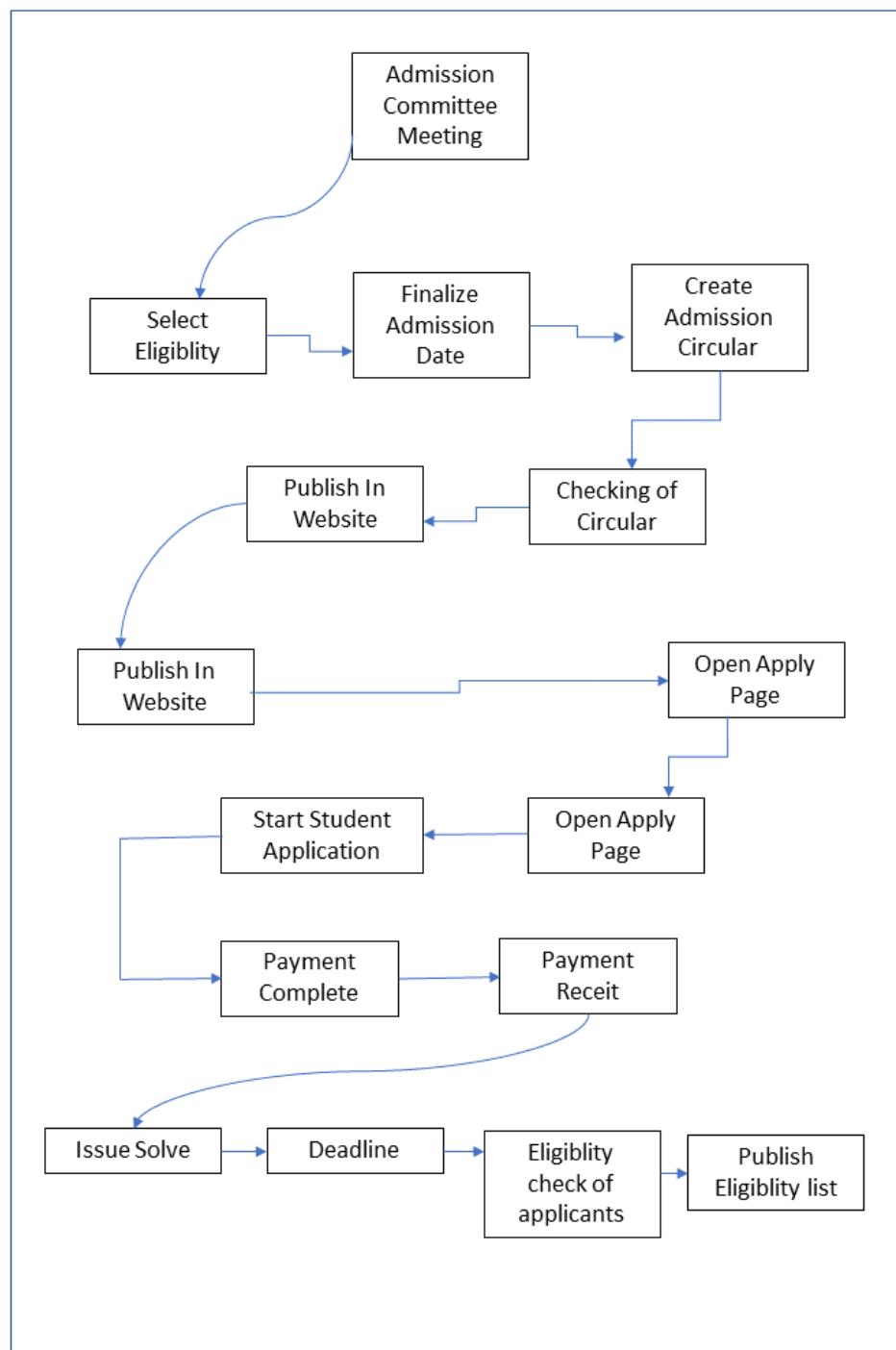


Figure 3.16: Data Flow Diagram of overall Admission Procedure of the Engineering Universities until Admission Exams

It is also visible from the information that all of them follow a very similar system for early application *i.e* application of those eligible within the criteria set by the authorities. From the information of H.S.C and S.S.C results in Bangladesh it is probable that more than 40-50 thousand

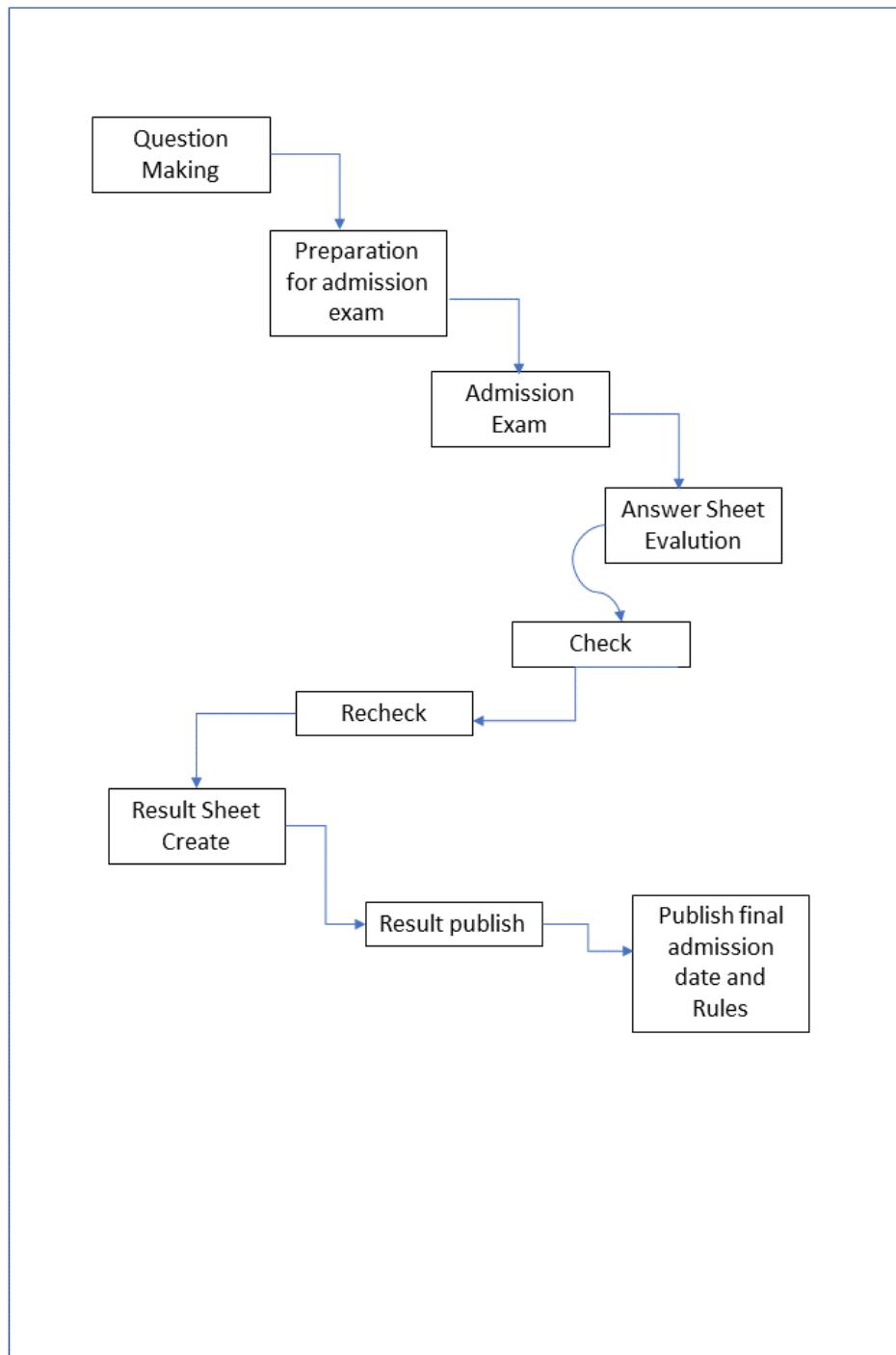


Figure 3.17: Data Flow Diagram of Admission Exams of the Engineering Universities

students apply for the admission program under the eligibility criteria, which means almost all of them have the proper eligibility to apply for the exam.

We can see from here that the marks achieved in the H.S.C level plays a big role here. As most of the applicants are eligible, it is understandable that the administration has to introduce some kind of decision factor, which is definitely part of the system here. This whole criteria is introduced just for two factors, one of them is How Many Can Attend The Exam (This depends on the capability of the University) and How Many Seats They Have. So it is obvious that they introduce a measure to filter the applicants to choose the best ones, and the closest measurement strategy would be H.S.C examination which is supposed to be the benchmark of top students in the country. This is part of their System, from which we can see some anomalies which we will try to fix.

After choosing the possible amount of applicants, exam is organized. The answer scripts in 3 Universities that arrange written exams, are then evaluated by University Teachers. KUET uses Circle Fill-Up method so they take help of an extremely accurate machine to determine the marks achieved by the examine. The other 3 Universities with their written system and human evaluation, raised questions amongst us.

After that, Merit List and a Waiting List is provided. This is where we mention a very important aspect of these system. The Exam Date. It can often be seen that the exam dates are either set very closely between the Universities, or very further from each other. This happens almost every year. This is something that is seemingly out of the authority's hands. Which is why they introduce the aforementioned Merit List and Waiting List. If the students from the merit list decide to go somewhere else, then one of the seats will be empty which is then filled up from the waiting list.

After the lists are published, interested ones are requested to bring Attested Documents of their Certification and a Health Check-Up report to make sure they don't have any kind of physical problem that would be troublesome in near future. In some University, these check-ups can be done within the University Perimeter given they have the facilities.

From the information we gathered using our Information Gathering Tool, we now have a properly structured view of the System Design that is already in place. We also saw some anomalies regarding some of the system put in place, and we would like to address those in our design.

3.3 Conclusion

After all the information gathering and analysis, it is safe to say that all the engineering universities follow almost the same procedure, with some subtle differences. Although the procedures are quite good, but no system is 100% error-proof. We have found some issues that can be solved. In our future reports, we will present our solution.

4. Feasibility Study

4.1 Introduction

In the previous sections, we have gathered information about the admission procedure of all the engineering universities. After our initial investigation, we found some issues in the system that we have discussed in chapter-2. We have also discussed probable solutions for those issues. The next step is to determine exactly what the candidate system is to do by defining expected performance. Thus, a feasibility study is carried out to select the best system that meets performance requirements. This entails identification, description, and evaluation of candidate systems and selection of the best system for the job. After getting the user review of our analysis, we move forward to do feasibility analysis.

A feasibility study is an analysis that takes all of a project's relevant factors into account—including economic, technical, legal, and scheduling considerations—to ascertain the likelihood of completing the project successfully. A system's required performance is defined by describing its outputs in a user-acceptable format and at a higher level of detail than what was described in the initial investigation. This involves three steps - statement of constraints, identification of specific system objectives and description of outputs.

Constraints are factors that limit the solution of the problem. Some constraints are identified during the initial investigation and are discussed with the user. There are general constraints that might have a bearing on the required performance of a candidate system.

Once the constraints are spelled out, we, the analysts, proceed to identify the system's specific performance objectives. They are derived from the general objectives specified in the project directive at the end of the initial investigation. The steps are to state the system's benefits and then translate them into measurable objectives.

A final step in system performance definition is describing the outputs required by the user. An actual sketch of the format and contents of the reports as well as a specification of the media used, their frequency, and the size and number of copies required, are prepared at this point. Specifying exactly what the output will look like leads to an estimate of the computer storage requirements that form the basis for the file design to be undertaken in the design phase of the life cycle.

The goal of feasibility studies is to understand thoroughly all aspects of a project, concept, or plan, to become aware of any potential problems that could occur while implementing the project, to determine if, after considering all significant factors, the project is viable—that is, worth undertaking.

4.2 Statement of Constraints

Constraints are factors that limit the solution of the problem. Some constraints are identified during the initial investigation and are discussed with the user. There are general constraints that might have a bearing on the required performance of a candidate system.

As in our case, since we are working with the admission procedure system of the engineering universities of Bangladesh, here are the constraints we have found in the fact finding phase:

1. The universities always want to find the best students for them, and they are afraid that if they join the combined admission system, they might not get that.
2. For the payment of the application and admission, different universities rely on different banking systems. Even in some cases, they use different banking systems for application and admission.
3. The authorities are reluctant to rely on the traditional application and admission procedures, which is not only troublesome for the native students, it is also very problematic for the foreign students.
4. Some engineering universities require a lot documents to be brought to the exam hall, which is not feasible.
5. In the current system, the students have to apply and participate in every universities separately, which causes them to travel too much. This takes their focus out of study as they have to be more aware of traveling long distances in limited time, and also, it is very troubling to travel to new places and immediately find any place to stay.
6. The admission procedure is totally offline, so the students have to travel to corresponding areas again, which is not only costly, it is also tiring.
7. The students has no scope to choose their favorite departments before getting admitted, which causes many students huge disappointment.

4.3 Identifying the Characteristics of the Candidate Systems

Here in this section, we will see a table of characteristics for the candidate systems we have in our concern. This table summarizes the characteristics of the 4 candidate system we have in place to find out the best candidate system out of them.

Table 4.1: Overview of the Characteristics of the Existing System

Characteristic	Candidate System I (BUET)	Candidate System II (RUET)	Candidate System III (KUET)	Candidate System IV (CUET)
Distributed Admission Procedure	No (But willing to)	No	No	No
Scope to Apply Online for Foreign Students	Medium	Low	Medium	Low
Application Fee Submission through Mobile Banking	Yes	Yes	Yes	Yes
Document Attachment Problem	Low	Severe	Medium	Severe
Exam Hall Finding Problem	High	Low	Low	Medium
Scope for Online Procedure to get admitted	None	None	None	None
Scope to choose subject before Admission	None	None	None	None
Exam Type	Script	Script	Multiple Choice Question	Script

4.4 Feasibility Considerations

To do a feasibility study, we need to consider the economic, technical, and behavioral factors in system development. Here we discuss the major cases in our analysis-

Economic Feasibility: Economic analysis is the most frequently used method for evaluating effectiveness of a candidate system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that are expected from a candidate system and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system. Otherwise, further justification or alterations in the proposed system will have to be made if it is to have a chance of being approved.

In our case, the universities have to renew their procedures as the admission procedure is once in a year, economically there will not be much of a difference for the universities. But the applicants will be highly benefited highly as they will have to travel a lot less, which will also be lot less stressful for them. So, clearly the benefits outweigh the cost.

Technical Feasibility: Technical feasibility centers around the existing computer system (hardware, software, etc. and to what extent it can support the proposed addition. This involves financial considerations to accommodate technical enhancements. If the budget is a serious constraint, then the project is judged not feasible.

The universities already have servers of their own. They have to build a distributed system among their servers, which if built once, it will only need to be maintained each year. This will also help to maintain the load on the servers and the users will also get their expected output much faster.

As for the payment methods, the universities in the combined procedure can contract with more banking systems. The banks will have to use less processing power too, as they will have to perform less transactions.

Behavioral Feasibility: People are inherently resistant to change, and computers have been known to facilitate change. An estimate should be made of how strong a reaction the user staff is likely to have toward the development of a computerized system. It is common knowledge that computer installations have something to do with turnover, transfers, retraining, and changes in employee job status. Therefore, it is understandable that the introduction of a candidate system requires special effort to educate, sell, and train the staff on new ways of conducting business.

As the banks will have to perform less transactions, that means they will gain less profit from the updated system. So, they might cause trouble without helping in the cause.

Also, some employees from the universities, who are connected to the admission system, may revolt as this will make them adapt to new technologies and methodologies.

4.5 Feasibility Study of the Candidate Systems

Here we are working with 4 separate Universities in 4 different regions. If you look closely in the map of Bangladesh, these 4 Universities are spread out across Bangladesh to help out the most talented students of Bangladesh. This plan was initially taken so that the University system doesn't become centralized and that students from all over the country have access to better education without depending on the Capital of Bangladesh, Dhaka. As we'll dive into it now, we'll clearly see how this difference in region affects the feasibility of the solutions we have for the Admission Systems. Depending on the region, it's people and the technicality of things, the solutions might have different sorts of feasibility for different Universities.

Bangladesh University of Engineering and Technology

BUET (Bangladesh University of Engineering and Technology) is one of the prestigious Universities of Bangladesh. This University is in Dhaka, the capital of Bangladesh. So it's in the Middle region of Bangladesh, right at the heart of the country. It is one of the oldest Institutions in this country. For years this has been the pinnacle of Engineering education in this country. Many fellow researchers and engineers have come from this University, so it holds a special place in the hearts of Bangladeshi people.

Because of the distributed admission system, BUET can conduct its admission process separately. Their pattern of admission is laid out in a way that the brightest students from all over the country come here to attend this examination and only a few get the chance to get admitted to this University. That's why we have to consider this University in a very different manner. First of all, almost ALL of the brightest from around the country come here to get admitted. This kind of attention can not be seen in the case of other Universities. The other 3 Universities are in 3 regions, and of course, Dhaka, being the heart of Bangladesh, has a different kind of importance to people. So, in the case of BUET, the Feasibility of our solutions have to be considered well, and some of the solutions we have worked out may not even work well in the case of BUET.

Rajshahi University of Engineering and Technology

RUET (Rajshahi University of Engineering and Technology) is a University situated in the Divisional city of Rajshahi, Bangladesh. Rajshahi is a city situated North-West of Bangladesh. It is the second oldest Engineering Institution in Bangladesh. So it does have a historical importance. Also Rajshahi being a very prominent Divisional City of Bangladesh, is very attractive to a lot of people.

Although there is the fear of Political Interference which unfortunately used to plague the educational system of Rajshahi. But these days the situation is much more stable than they used to be. The RUET authority is great at doing their jobs although they lack manpower.

Khulna University of Engineering and Technology

KUET (Khulna University of Engineering and Technology) is situated in Khulna, South-West side of Bangladesh. Khulna is also a Divisional City of Bangladesh. Although being a coastal area, the commodities are not as available as Dhaka or Rajshahi. Which is why many students don't want to come here.

But that situation is slightly changing. KUET actually has massive academic success, and they have one of the lowest amount of time needed to graduate. This aspect of this University is certainly attractive to many students who want to go abroad for higher studies. The KUET authority's strict plans and stable structure has allowed it to grasp this success even being in a backward place.

Chittagong University of Engineering and Technology

CUET (Chittagong University of Engineering and Technology) is situated in the port city of Bangladesh, Chittagong. Being in one of the most prominent cities of Bangladesh, it is expected that many students will be attracted to the Engineering Temple here. But in reality very few are. Chittagong itself, geologically, is in a very rough position. CUET is very far away from the actual city, which puts it in a very awkward position for the student to find necessary commodities easily.

4.6 Findings

In Chapter 2, we have identified through our research the solutions we can bring to the problems that arise. We will be discussing their feasibility here. Here is what we have found-

Distributed Admission Procedure System:

In this problem, our solution was to unify the admission process of the universities, in the case that Distributed Admission Procedure is causing problems. BUET has mostly no problem with the unified exam system. In 2020, it was them who suggested a unified admission system with all of the other universities. If a unified admission system is agreed upon, every University will have no problem with the resources as too much of it won't be required. Students can sit in the exam from their respective region, which will be less time consuming and financially less hurting. The other 3 Universities, RUET, KUET, CUET should have no problem as they have to organize the exam only for the regional students. It's Economically Feasible. They have the Technical Feasibility as well to go with it as they've been doing this for years. The only problem it seems is the Behavioral Feasibility. It depends on the administration to make such a decision. If they think it's not beneficial to their policy, then no matter how feasible this solution may be, it won't be utilized properly. So Economic Feasibility is good, Technical Feasibility is good, but Behavioral Feasibility is questionable.

Application Cost:

In this case, we had found a problem with Information Updating within the given schedule. The problem was, students who don't have access to a computer will have to go to a computer shop who are fairly busy and might mess up the information given to the authority. Currently there is no system in place where after submission you can change the wrong information. Our solution was to put in a system where students can do just that.

From our research, BUET, RUET, KUET, CUET being a government funded university, has the financial ability to build such a system. It is possible for them to get government sanction for a system like this. So on the question of Economic Feasibility, BUET, RUET, KUET, CUET are able to introduce a system that we have proposed. So our solution has Economic Feasibility. Now, our solution requires updating information virtually. This has some problems. Whenever data update is done, we need a system in place that confirms that the information that students put in is actually legitimate. This is a big issue, as Identity Theft has been a huge problem in the past. We have to introduce a system that can make sure these information are not fake or forged. This requires technical expertise. Technical expertise is something that most Universities lack even today. But this can be overcome as many third party companies have that expertise and can provide. So this can be Technically Feasible, given that there is Behavioral Feasibility. This requires the administration to feel the necessity of this system. We think only some of the 4 administrations will be willing to take such a step, so there is a problem with Behavioral Feasibility.

No scope to apply for Foreign Students:

There are many Foreign Students who want to come to Bangladesh and study in these universities. But there aren't any robust systems in place for them to apply for admission. We proposed a fully online admission system where these people can apply and get admitted online.

All of the 4 Universities have the economic stability to put a system like this in place. Already online admission systems are available so they can easily do it. There are many third party companies

who would happily do that. It depends on the administration. Whether they see this system as a probable solution or not, is upto them. So it's hard to find Behavioral Feasibility here.

Application Fee Submission:

We proposed that instead of standing in long lines in the banks, we can utilize the mobile transaction methods available in our country. Here all of the 4 Universities should have no Economic or Technical problem as Mobile Transactions are so famous in this country and it makes more sense to do payments using Mobile Banking like bKash, Nagad, Upay. It has Economic and Technical Feasibility. The only problem is Behavioral Feasibility as we are not sure if the administration will introduce this or not.

Document Attachment Problem:

We had suggested that the Admit card should be the only hard copy students must bring, the other documents should be provided virtually. It doesn't have any Economic problem, but does have a Technical problem. For the documents to be real, you need attestation from government officials. If submitted virtually, it is hard for the administration to make sure it is not a forged document. So it does have a Technical Feasibility problem. Also, it depends on the people of administration.

Exam Hall Finding:

We have suggested a robust system using which examinees can easily find their exam hall. This system can be easily put in place as the Universities have all the technical and economical abilities to do so. Recently most of them have tried to introduce a system for easier finding of exam halls. So our solution of "Virtual Representation of the Geographical Location" should be very feasible as it is not Technically challenging for the authorities. Also because authorities are doing everything to make this easier, our solution will most likely be feasible to them.

No Scope for Online Procedure to get Admitted:

We have seen that there is no way of getting admitted online in case a student is living far away and has bad communication methods. For this we have given a solution, and that is to make the admission process completely online. From our point of view, Technical or Economical Feasibility is there, because a system like this will not put economic pressure on these Universities. It's rather a technical and behavioral problem. Technically, there are difficulties such as Rigidity of the Documents, Forging of Admission etc. Behaviorally, we are not sure if the administration will take this idea into consideration or not. It may vary from authority to authority.

No Scope to Choose Subjects Before Admission:

We had suggested that Universities should introduce an online subject choice system so that students have an easier time choosing their subject. Technically this is tough to implement because universities have a method, where you can choose a subject based on merit. But this can be overcome by introducing a system where the top most meritorious student can choose it first, then the others can. But it is not yet sure whether or not the administration will like this idea.

Script Evaluation:

We had suggested that because human error is involved in Script Evaluation, it is prone to mistakes. Which is why we have suggested an MCQ system for all of the Universities. From our study, it seemed possible for every university to introduce this system so in our study, it looked feasible Economically and Technically. But the idea of Script Evaluation is still a dear idea for most of the authorities. It is not clear why, but most of them want to stay within this system even though we have clearly mentioned the human error problem. But authorities seem to love the idea of partial marking and script checking, so Behavioral Feasibility, not so much.

4.7 Conclusion

So, from our feasibility study on the current system, it seems that it is possible to move forward with the combined admission system. In the later chapters, we will further discuss about the costs to design the proposed system. Then we will move on to the final design phase.

5. Cost Benefit Analysis

5.1 Introduction

In business today, it's essential to get the most out of every idea, option, and investment. To accomplish this, many organizations - from large enterprises to startups and small businesses - use cost benefit analyses to help make important decisions. Using a cost benefit analysis can help teams identify the highest and best return on an investment based on the cost, resources, and risk involved.

A cost benefit analysis is a process by which organizations can analyze decisions, systems or projects, or determine a value for intangibles. The model is built by identifying the benefits of an action as well as the associated costs, and subtracting the costs from benefits. When completed, a cost benefit analysis will yield concrete results that can be used to develop reasonable conclusions around the feasibility and/or advisability of a decision or situation.

Organizations rely on cost benefit analysis to support decision making because it provides an agnostic, evidence based view of the issue being evaluated without the influences of opinion, politics, or bias. By providing an unclouded view of the consequences of a decision, cost benefit analysis is an invaluable tool in developing business strategy, evaluating a new hire, or making resource allocation or purchase decisions.

The purpose of cost-benefit analysis in project management is to have a systemic approach to figure out the pluses and minuses of various paths through a project, including transactions, tasks, business requirements and investments. The cost-benefit analysis gives you options, and it offers the best approach to achieve your goal while saving on investment.

Despite its usefulness, cost benefit analysis has several associated risks and uncertainties that are important to note. These risks and uncertainties can result from human agendas, inaccuracies

around data utilized, and the use of heuristics to reach conclusions.

Much of the risk involved with cost benefit analysis can be correlated to the human elements involved. Stakeholders or interested parties may try to influence results by over- or understating costs. In some cases, supporters of a project may insert a personal or organizational bias into the analysis.

On the data side, there can be a tendency to rely too much on data compiled from previous projects. This may inadvertently yield results that do not directly apply to the situation being considered. Since data leveraged from an earlier analysis may not directly apply to the circumstances at hand, this may yield results that are not consistent with the requirements of the situation being considered. Using heuristics to assess the dollar value of intangibles may provide quick, “ballpark-type” information, but it can also result in errors that produce an inaccurate picture of costs that can invalidate findings.

For projects that involve small- to mid-level capital expenditures and are short to intermediate in terms of time to completion, an in-depth cost-benefit analysis may be sufficient enough to make a well-informed, rational decision. For very large projects with a long-term time horizon, a cost-benefit analysis might fail to account for important financial concerns such as inflation, interest rates, varying cash flows, and the present value of money.

Alternative capital budgeting analysis methods, including net present value, could be more appropriate for these situations. The concept of present value states that an amount of money or cash in the present day is worth more than receiving the amount in the future since today’s money could be invested and earn income.

One of the benefits of using net present value for deciding on a project is that it uses an alternative rate of return that could be earned if the project had never been done. That return is discounted from the results. In other words, the project needs to earn at least more than the rate of return that could be earned elsewhere or the discount rate.

However, with any type of model used in performing a cost-benefit analysis, there are a significant amount of forecasts built into the models. The forecasts used in any cost benefit analysis might include future revenue or sales, alternative rates of return, expected costs, and expected future cash flows. If one or two of the forecasts are off, the cost benefit analysis results would likely be thrown into question, thus highlighting the limitations in performing a cost-benefit analysis.

In addressing risk, it’s sometimes helpful to utilize probability theory to identify and examine key patterns that can influence the outcome.

5.2 Cost Benefit Categories

In developing cost estimates for a system, we need to consider several cost elements. Here, we discuss some of the most important categories for our analysis.

5.2.1 Hardware Costs

This is the cost for buying necessary equipment. Determining the actual cost of hardware is generally more difficult when the system is shared by various users than for a dedicated stand-alone system. We need to buy these things from market. This is tangible cost.

Computers:

The whole system is largely dependant on computers. Computers will be needed to set the questions and maintain the website as well, recording the documents, data about the exam procedure etc.

Data Server:

Every Institute have their own server, which they currently use for individual admission procedure. So, they do not need to buy any more server for the centralized admission procedure. All they have to do now, is to establish communication between the servers. In this case, now that we have multiple servers running, the applicants can now access the website with more ease.

OMR scanner:

If the examination is held in Multiple Choice Question type questions, then we need to evaluate the question by machine. Human checking will take a lot of time and checking will not be accurate compared to machine.

Paper:

Students need to write the answers in the paper or fill up the OMR sheets and also questions papers. The exam authority have to provide it. There is a lot of cost in printing the questions if it is written exam because every paper is printed with questions. They will need a press to print them.

5.2.2 Personnel Costs

It includes benefits for the invigilators' and staff benefits, which the universities already pay, but for the centralized admission, there will have to be some changes.

Teachers payment:

Teachers will evaluate the papers if it is a written exam. Teachers will have to be paid extra money for evaluating the answer sheets.

Staff payment:

Staff needs to maintain the whole system. They need to help the teachers. They are also paid.

Invigilators payments:

To check whether any student is doing unethical procedure in the examination room, there need invigilators. They check whether the actual student is present in the examination.

5.2.3 Facility Costs

This includes wiring, flooring, acoustics, lighting, and air conditioning. Even though these costs are treated as one-time costs and are incorporated into the overall cost estimate of the candidate system in system analysis, since the admission procedure is a recurring process, the authorities will have to be aware of these costs every year. To execute the examination properly, the campus needs to be modified. Extra seats are provided, lights, fan, air conditioner maintenance needed. If the examination hall is far from the entry points, authority will have to provide transport system for the

examines. As all the universities have their own transportation facility, this should not be much costly.

5.2.4 Operating Costs

It is associated with the maintenance and administration of a business on a day-to-day basis. Operating costs include direct costs of goods sold and other operating expenses. But in our case, this cost is to operate the exam procedure. Here, we explain some costs of this type.

Online banking:

The whole transaction system is online. So committee has to contract with different mobile banking operators. They charge for this. But the universities already have to contact with different mobile banking operators. In centralized procedure, the universities have to contact each operators once. So, individual cost is reduced, and the committee can contact multiple operators, which will help the students go for more options.

Transportation of invigilators:

As the invigilators will be shuffled to maintain transparency, there will be a cost for their transportation.

Website:

There will be a cost to maintain and operate the website.

5.3 Costs and Benefits Classification

Costs and Benefits can of various classes. Here, we discuss the costs' and benefits' tangibility or other classes of our candidate system.

5.3.1 Tangible and Intangible Costs and Benefits

Tangible costs are those which we can measure and we can not measure intangible cost. In our analysis we ignore intangible cost as it has no physical impact on cost-benefit analysis. Tangible benefit is also ignored because this is not a business.

5.3.2 Fixed or Variable Costs and Benefits

Some costs and benefits are constant, regardless of how well a system is used. Fixed costs (after the fact) are sunk costs. They are constant and do not change. Once encountered, they will not recur. Servers, computers, OMR scanner buying and their depreciation are fixed. Paper price, teacher, staff payment, online banking rate, transportation cost etc. are variable costs as it changes time to time.

5.4 Cost Benefit Evaluation

Decisions are made through Cost Benefit Analysis by comparing the value (using different evaluation method) of the program or project's costs with the value of its benefits. Decisions are based on whether there is a net benefit or cost to the approach, i.e. total benefits less total costs. As our candidate system is not a business so there is no profit. We use net benefit analysis for our evaluation purpose.

Table 5.1: Cost Benefit Evaluation for the Candidate System (using imaginary values)

Cost Type		Amount
Hardware Costs	Servers	1000000
	Computers	500000
	OMR Machine	500000
Personnel Costs	Teacher Payment	1000000
	Staff Payment	300000
	Invigilator Payment	250000
Operating Costs	Maintainance	250000
	Online Banking Operators	100000
	Invigilator Transportation	50000
	Website and Database	1000000

5.5 Conclusion

In terms of values, cost-benefit analysis might be understood to be the maximization of one overarching or super value. Such a value could be an economic value like company profits, or the value of the product to users but it could also be a moral value like human happiness. In case of our candidate system, the admission procedure is not a profitable business. It can not be said that money is irrelevant here, instead the cost for the candidate system should decrease than it is right now. But student satisfaction would definitely increase. With that in mind, we now focus on the candidate system design.

6. System Design

6.1 Introduction

Systems design is the process of defining elements of a system like modules, architecture, components and their interfaces and data for a system based on the specified requirements. It is the process of defining, developing and designing systems which satisfies the specific needs and requirements of a business or organization. Core activities in system design and development include developing system-level technical requirements and top-level system designs and assessing the design's ability to meet the system requirements.

A systemic approach is required for a coherent and well-running system. Bottom-Up or Top-Down approach is required to take into account all related variables of the system. A designer uses the modelling languages to express the information and knowledge in a structure of system that is defined by a consistent set of rules and definitions. The designs can be defined in graphical or textual modelling languages. System-level technical requirements describe the users' needs, and provide information for the finished system to meet legal restrictions, adhere to regulations, and inter-operate or integrate effectively with other systems.

We can say that system design ranges from discussing about the system requirements to product development. System development creates or alters the system so that the processes, practices and methodologies are changed to develop the system. A systematic approach is needed to manage the system requirements and design methodology. System design can be classified as logical design and physical design. The logical design represents the abstract data-flow, while the physical design represents the system's input and output processes. It specializes in developing great artwork by saving time and effort. This helps in creating plans for information systems. It is used to solve internal problems, boost efficiency and broadcast opportunities. It also is the foundation of any business. It contributes a lot to successfully achieving the required results and makes working easier and simpler.

The system analysis and design benefit business whether used for specific projects or across the full scope of business operations worldwide. Today, more and more businesses must find ways to compete globally. System analysis and design are important in situations where the involvement of a large information system is needed. Thus, the scope is very much bright and in demand.

System-level technical requirements are a critical precursor to and foundation of system design and development. A top-level system design is generally under the stewardship of the government team and represents the government team's independent projection of the way a system could be implemented to meet requirements with acceptable risk. The primary reason for developing a top-level system design is to provide a technical foundation for planning the program. It is a critical factor for any system designer's technical approach to meeting the customer's needs. A top-level system design developed early in an acquisition program can be used to assess system feasibility and provide some assurance that the implemented design will satisfy system requirements. Done early in a program, a system design effort can be a powerful basis for developing fact-based projections of cost, schedule, performance, and risk, and it can provide the foundation for subsequent contractor design efforts.

The purpose of the System Design process is to provide sufficient detailed data and information about the system and its system elements to enable the implementation consistent with architectural entities as defined in models and views of the system architecture. Generic inputs include architecture description of the parent system and system element requirements. Generic outputs are the description of the design characteristics and design enablers necessary for implementation.

6.2 Design Process

Every year not more than 15,000 unique students can attend engineering university admission test. But in this procedure, more than 40,000 students will attend the examination.

We have construct a central committee .This committee will take all the decisions. It will have the supreme power to take and change any decision. There will be a head of this committee. This head will be changed every year .Teachers from all the institutions must be present in this committee.

Every institution has its own website. Applicants will get confused that which website they might follow. To remove this problem, there will be a central website only for this admission process. All the updates and procedures will be published here. This website will be connected with a central database that will also be connected with Govt. central database which has the educational information of the students.

Steps:

Central committee will make some rules and regulations for the whole exam. They will decide the cut mark of the HSC examination to attend the admission test exam. All the rules and regulations will be published in the website and public newspaper. There will be form fill up section in the website. This section is connected with the national database server that has the information of the students. Student must log in into the website. When a student will submit his/her HSC roll

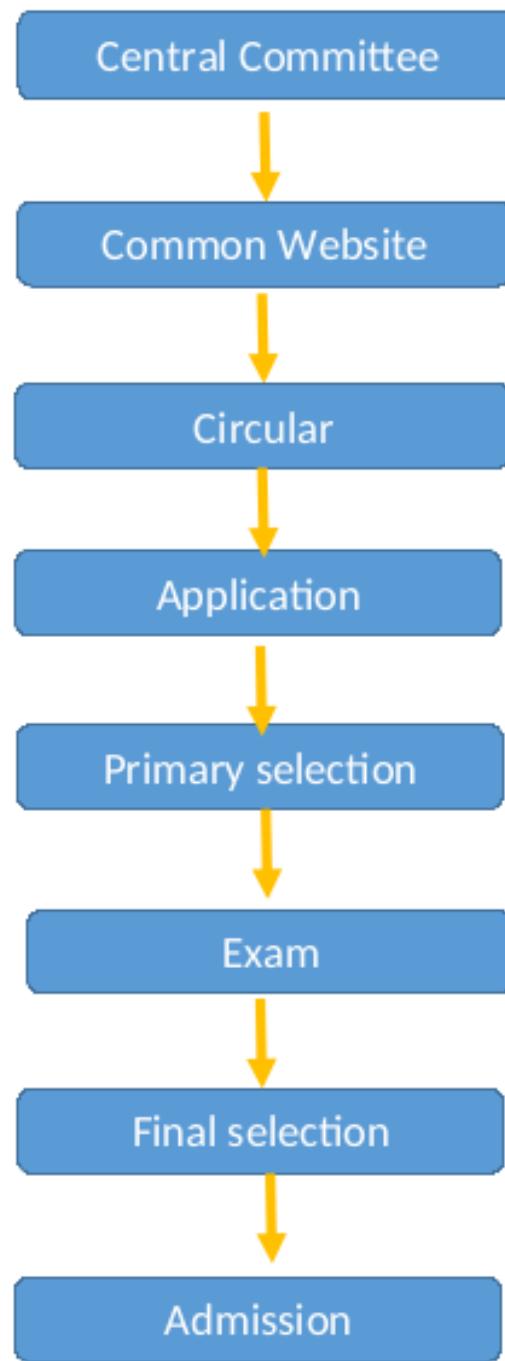


Figure 6.1: Block Diagram of the Overall Proposed System

and registration number in the website he/she will be logged into the website. Here they will automatically see all their required information. There will be also some extra information fields. Students must fill them.

Student must select the venue to attend the exam. This venue will be distributed according to the vacant of the venue. This will be done as first come first serve method. Once venue is allocated, no

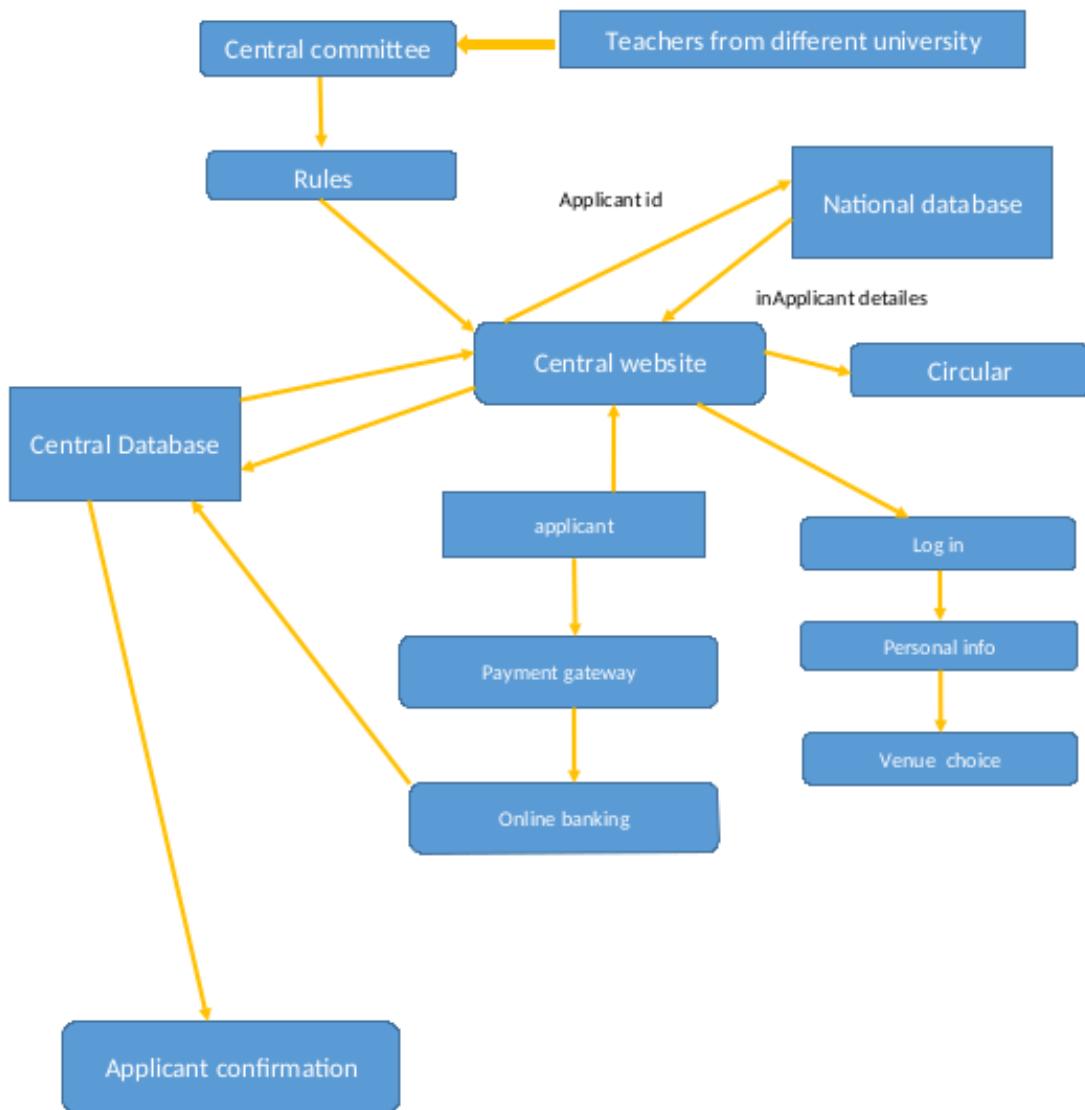


Figure 6.2: Data Flow Diagram for the Database of the Proposed System

one can change it. It will be fixed.

When the fill up is complete he/she has to pay the required money to confirm the process. Online payment system will be applicable here. A central online banking number will be provided in the website. When a student will pay the money, he/she will get a pin code. The website page will be redirected to a new page for the personal information of the student. Every time to enter this page, student has to submit the pin code. Otherwise the page will not opened. All the information about the exam, result, admission will be provided through the page. So the pin code is very important.

Top 40,000 students will be selected to attend the main examination. Students, who are not selected will be refunded. This selection process is according to the rule of the central committee. Students will be sorted according to their merit position in the HSC exam.

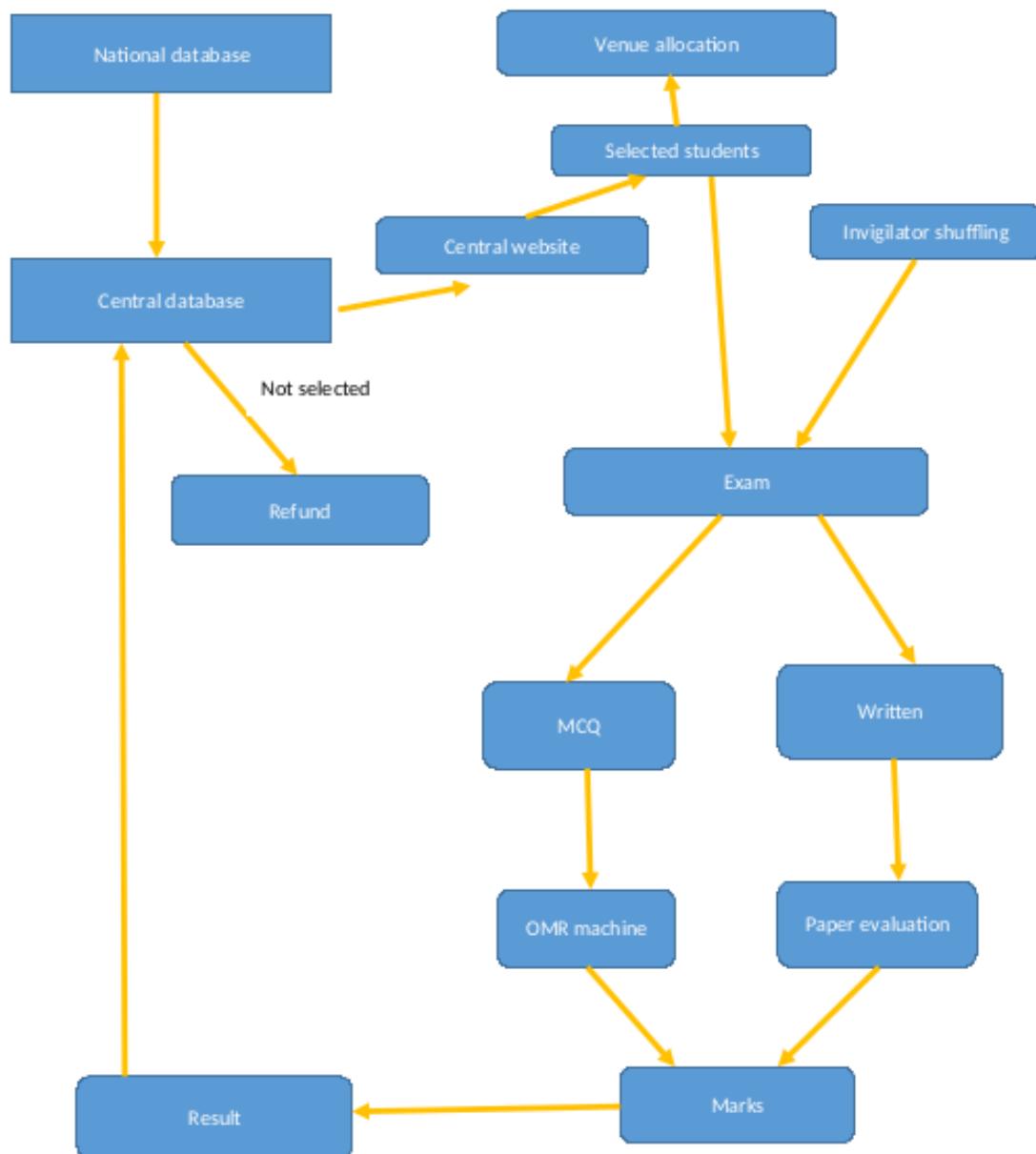


Figure 6.3: Data Flow Diagram for Student Selection in the Proposed System

Admit card will be provided in the website. Student can download it from his/her personal id in the website.

To keep transparency, invigilators will be shuffled in these universities. That means , in every exam room there will be 4 invigilators. This 4 invigilators will be from the each 4 universities. So there is no chance of cheating.

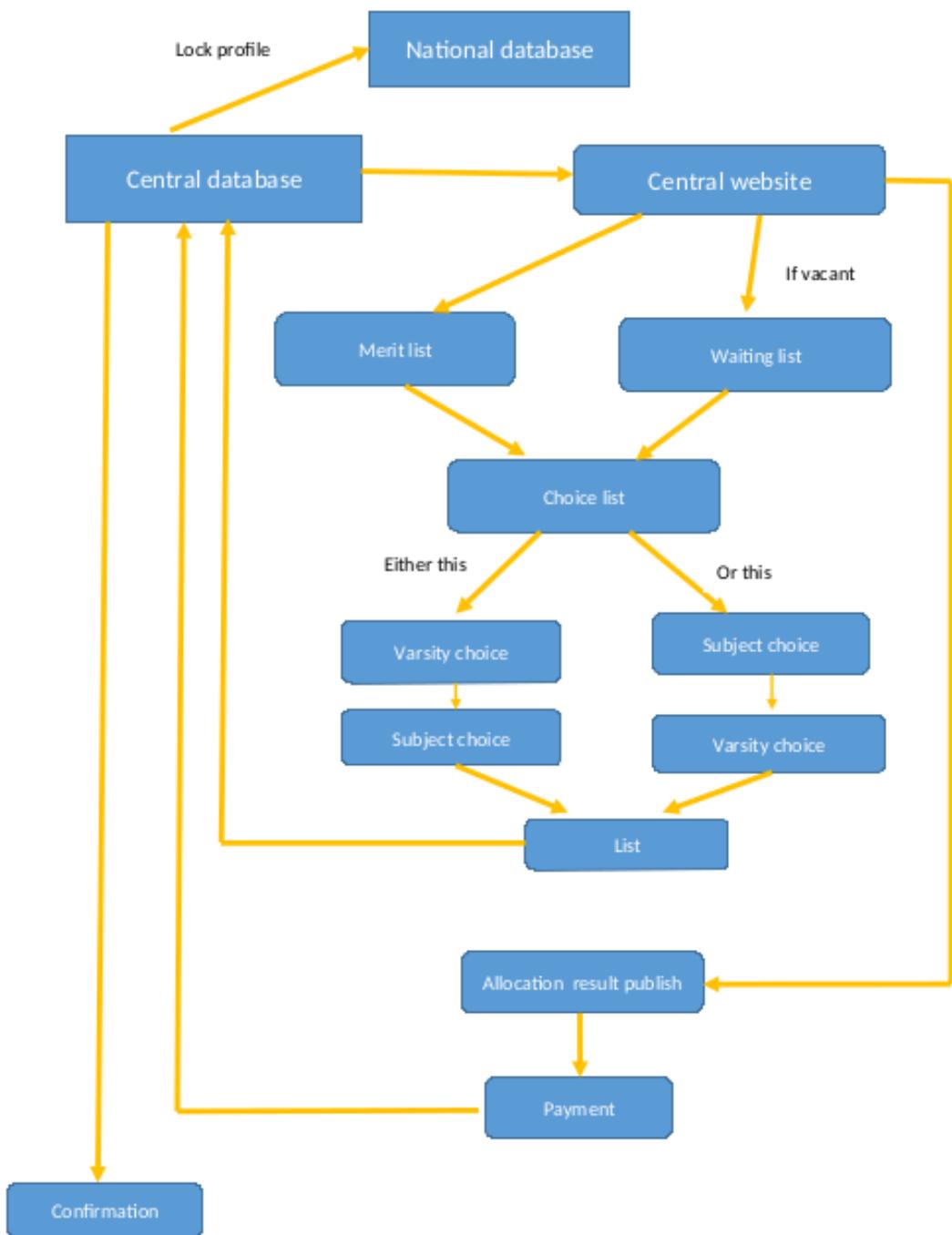


Figure 6.4: Data Flow Diagram for Payment in the Proposed System

The central committee will decide whether the exam will be in Multiple Choice Question (MCQ) format or in written format or in both format. All the procedures of the MCQ will be done in front of the all members of the selected faculties from all the four universities. If it is written, answer sheets will be evaluated by four teacher, one from each university. So there is no chance of cheating. All the counting of marks will be also done by four teacher, one from each university.

Mark will be saved in the central database. According to the mark, the result will be published in the website. All the students will get their positions.

A merit list and a waiting list will be published in the website. First the applicants of the merit list have to submit their information. There will be two option to choose the subject and varsity.

First one is university priority. If any student has priority of a specific university then he/she must choose it. In this method he/she will get allocated according to varsity first, then subject.

Second one is subject priority. Some students have priority to a special subject. University does not matter to them. This option is perfect for them. In this method, he/she will get his/her desired subject then the university.

All the procedure will be done according to merit list. The first one will get the most priority. Everything will be done according to vacant of the seats.

Once varsity and subject is allocated, the list will be published in the website. Student must pay to confirm their seats. This will also be an online payment method. Once a student confirms the payment, his/her seat will be allocated in that position.

And also most important thing is that, when he/she will confirm, his/her all the certificates will be locked in the Govt. national database. He/she will not able to withdraw the certificates without the permission of the allocated university.

If any student don't admits, the seat will be updated according to the auto allocation method. Any student can stop the auto allocation.

Once the merit list is admitted, then admission of the waiting list will be held according to the vacant seats.

6.3 Database Design

The database is the combination of some data that is processed and organized in such a way, to obtain a connection or relation between the data and can be used jointly by multiple users applications. In a simple, database (the database) can be expressed as organizing data with the help of computers that allows data to be accessed easily and quickly. In this case, the definition of access can include data acquisition and manipulation of data such as adding and deleting data.

In the fast development of information technology, it's time for an organization or company whether small, medium and large scale use of information systems based on the database to help its operations. With a good database system of an organization will be able to manage and monitor

operational activities so they can take quick and appropriate steps if a problem occurs. So a good database system would bring rapid progress in the organization or a company.

6.3.1 Database Schema

All the engineering universities have their own database for the admission procedure, but that will have to be changed for a centralized admission procedure. Here, we present a possible database schema design for that purpose.

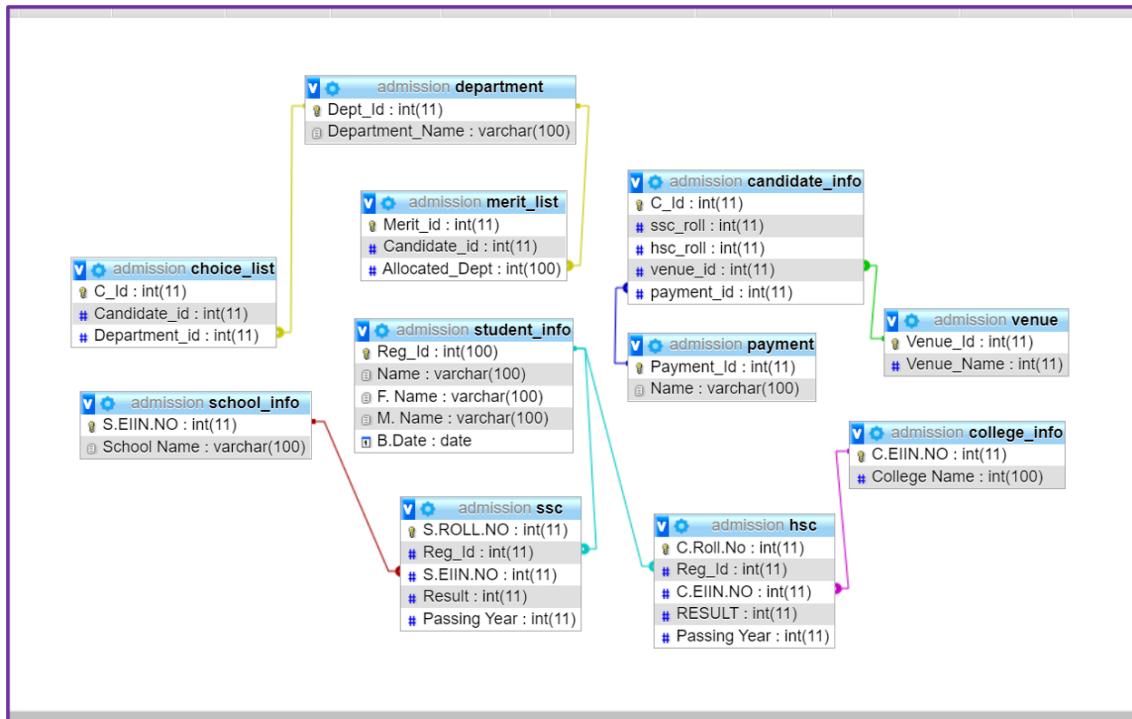


Figure 6.5: Database Schema for the Candidate System

6.3.2 Database Tables

This table represents the final outcome of combining all the tables in the database. It includes the students' name, his/her school and college, venue for admission test, payment method by which the candidate paid fee, and the his/her result in admission test.

Reg. Id	Name	School Name	College Name	Venue	Payment Method	Admission Result
16101	M. Rahan	P.M.M.H.S	U.H.S.C	RUET	BKASH	119
16102	Nasif Khan	D.G.B.S	J.C.C	BUET	BKASH	20
16103	Shohan Khan	B.Z.S	DCC	CUET	BKASH	19
16104	Saiful Islam	C.Z.S	DC	BUET	ROCKET	440
16105	Rahul Roy	F.Z.S	RC	KUET	NAGAD	1130

Figure 6.6: Candidates' academic information gathered from database tables

This table is the result of a query that collects the candidates' personal information, *i.e.* name, father's and mother's name etc.

Reg. Id	Name	F. Name	M. Name	Venue	Payment Method
16101	Mustafizur Rahman	MD. Kawsar	N. Begum	RUET	BKASH
16102	Nasif Rayhan	Hasem Ullah	Rahima Khatun	BUET	BKASH
16103	Shohan Khan	KD. Kahn	Sarmin Akter	CUET	BKASH
16104	Saiful Islam	Rifat Hossain	Hasina begum	BUET	ROCKET
16105	Rahul Roy	KM. Roy	Sriti Roy	KUET	NAGAD

Figure 6.7: Candidates' personal information gathered from database tables

"school_info" Table

This table contains information about all the schools in the country, *e.g.* School name, its EIIN No. The EIIN No is the primary key for this table, which is also a unique key.

S. EIIN. NO	School Name
110101	Patarhat Muslim Model High School
110102	Dhanmondi Govt. Boys School
110103	Barisal Zilla School
110104	Chittagong Zilla School
110105	Faridpur Zilla School

Figure 6.8: "school_info" table

"college_info" Table

This table contains information about all the colleges in the country, *e.g.* College name, its EIIN No. The EIIN No is the primary key for this table, which is also a unique key.

S. EIIN. NO	College Name
3001	Uyayn Higher Secondary College
3002	Jhenaidah Cadet College
3003	Dhaka City College
3004	Dhaka College
3005	Rahshahi College

Figure 6.9: "college_info" table

"ssc" Table

This table contains information about the candidates' result in his/her Secondary School Certificate (SSC) exam. It has "S. Roll No" as the key, and each entry can be uniquely identified with the "Reg. ID".

S. Roll. No	Reg. ID	S.EIIN.NO	RESULT	Passing Year
139001	16101	110101	5.00	2014
139002	16102	110102	5.00	2014
139003	16103	110103	5.00	2014
139004	16104	110104	5.00	2014
139005	16105	110105	5.00	2014

Figure 6.10: "ssc" table

"hsc" Table

This table contains information about the candidates' result in his/her Higher-secondary School Certificate (HSC) exam. It has "C. Roll No" as the key, and each entry can be uniquely identified with the "Reg. ID".

C. Roll. No	Reg. ID	C.EIIN.NO	RESULT	Passing Year
153001	16101	3001	5.00	2016
153002	16102	3002	5.00	2016
153003	16103	3003	5.00	2016
153004	16104	3004	5.00	2016
153005	16105	3005	5.00	2016

Figure 6.11: "hsc" table

"student_info" Table

This table records personal information about the candidates. It has "Name", "Father's Name", "Mother's Name" and "Birth Date" as fields, and "Reg. ID" as the primary key.

Reg. Id	Name	F. Name	M. Name	Birth. Date
16101	Mustafizur Rahman	MD. Kawsar	N. Begum	21-09-1997
16102	Nasif Rayhan	Hasem Ullah	Rahima Khatun	24-01-1998
16103	Shohan Khan	KD. Khan	Sarmin Akter	1-08-1997
16104	Saiful Islam	Rifat Hossain	Hasina Begum	7-05-1998
16105	Rahul Roy	KM. Roy	Sriti Roy	23-07-1997

Figure 6.12: "student_info" table

"venue" Table

This table contains information about the venues for the admission exam, which is the four engineering universities, but the list can be expanded in case of further need.

Venue Id	Venue Name
1	Rajshahi University of Engineering & Technology(RUET)
2	Bangladesh University of Engineering & Technology(BUET)
3	Khulna University of Engineering & Technology(KUET)
4	Chittagong University of Engineering & Technology(CUET)

Figure 6.13: "venue" table

"payment" Table

This table contains the payment methods available to pay the fee for application and admission.

Payment Id	Name
1	BKASH
2	NAGAD
3	ROCKET
4	SURE CASH

Figure 6.14: "payment" table

"department" Table

This table contains information about the available departments in the universities, from which the students from the merit list can choose their favourite department for admission.

Dept. Id	Department Name
1	Computer Science and Engineering(CSE)
2	Electronics and Electrical Engineering(EEE)
3	Mechanical Engineering(ME)
4	Civil Engineering(CE)
5	Electrical and Computer Science Engineering(ECE)
6	Electrical and Tele-Communication Engineering(ETE)
7	Chemical and Food Processing Engineering(CFPE)

Figure 6.15: "department" table

"candidate_info" Table

This is the table that binds all the tables in the database together. It contains "Student Id", "S. Roll No", "C. Roll No", "Venue Id" and "Payment Id", all of which are foreign keys.

Student Id	S. Roll. NO	C. Roll. No	Venue Id	Payment Id
2021001	139001	153001	3	1
2021002	139002	153002	2	1
2021003	139003	153003	1	1
2021004	139004	153004	1	2
2021005	139005	153005	3	3

Figure 6.16: "candidate_info" table

6.4 Conclusion

In this chapter, we have presented our solution to the current problems. In the previous chapters, we have analysed the problems, discussed feasibility of our proposed solution, and analysed the cost and benefits the proposed systems may provide. We are hopeful that this new system will help new students get admitted to the university and department of their choice with only a proportion of hassle they have to go through now.

7. Project Scheduling

7.1 Introduction

A comprehensive process of designing a project schedule that outlines the project phases, tasks under each stage, and dependencies is known as project scheduling. It also considers skills and the number of resources required for each task, their order of occurrence, milestones, inter-dependencies, and timeline. Project managers use project schedules when planning their projects as well as while executing them. In many industries, such as engineering and construction, the development and maintenance of the project schedule is the responsibility of a full-time scheduler or team of schedulers, depending on the size and the scope of the project.

The project schedule is the tool that communicates what work needs to be performed, which resources of the organization will perform the work and the time-frames in which that work needs to be performed. The project schedule should reflect all of the work associated with delivering the project on time. Without a full and complete schedule, the project manager will be unable to communicate the complete effort, in terms of cost and resources, necessary to deliver the project. It involves analyzing the resource availability and implementing the scheduling technique to ascertain timely delivery while maintaining the resource health index. Many project managers successfully generate the right schedule, yet most of them find it challenging to manage the resources intelligently. It can cause delays and discrepancies in the deliverable as their talent pool is responsible for executing these tasks. Thus, they must master each aspect of project scheduling.

Many projects can benefit from project scheduling tools, or project scheduling software that allows stakeholders to easily visualize their project scheduling process. Which project scheduling software you choose depends on your project scheduling methods, but you should ensure the ability to produce Gantt charts easily and efficiently. The right scheduling techniques in project management can zero in on individual tasks, as well as zoom out to see the bigger picture of the project milestones that need to be met.

A project schedule tells what needs to be done. It lists out each of the different tasks that need to be accomplished in order for a project to be considered completed and it gives detailed information about the resources needed for that project and when it needs to be completed. The schedule needs to give a great deal of information for it to be useful and for everyone involved in that project to know what they're supposed to be doing. The more detailed a project schedule is the more efficient and effective it is.

Project scheduling is just as important as cost budgeting as it determines the timeline, resources needed, and reality of the delivery of the project. Project managers that have experience are better able to properly dictate the tasks, effort and money required to complete a project. Stakeholders measure projects by how well they are executed within the project constraints or baselines. Schedules and budgets are interlocked, and most likely an increase in one causes an increase in the other.

7.2 Network Diagrams

To visualize the tasks and relationship of our candidate system's design scheduling, we have chose Activity on Node, among the existing techniques for designing a network diagram, as this will be helpful in calculating the expected time and standard deviation for each task, and the whole project.

7.2.1 Activity on Node (AON) with Critical Path

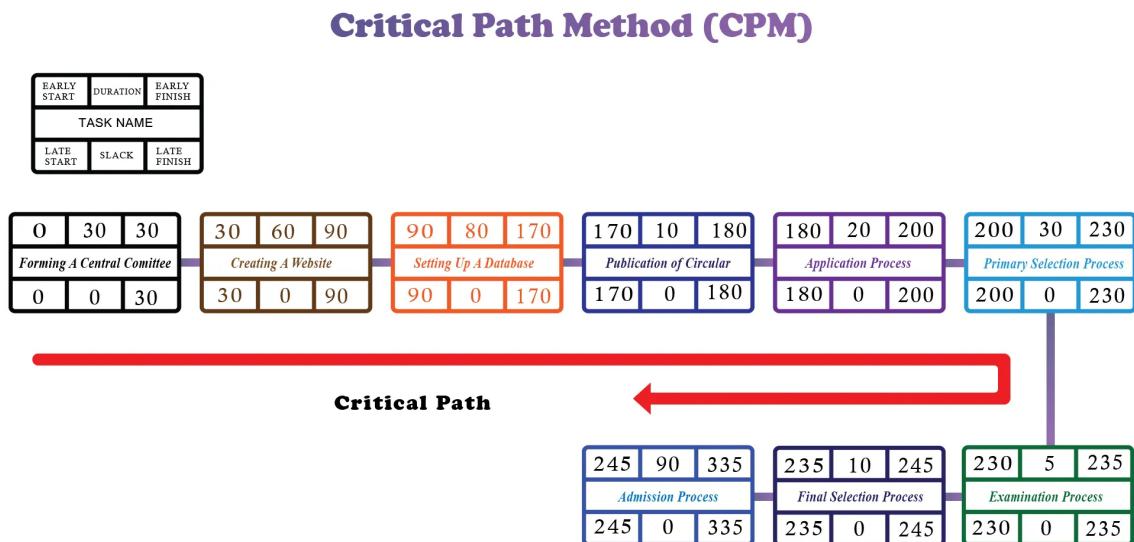


Figure 7.1: Network Diagram (CPM) for the Candidate System

7.2.2 Program Evaluation and Review Technique (PERT)

Standard Deviation for each task

Forming a Central Committee

$$a = 10$$

$$b = 31$$

$$m = 25$$

$$t_e = \frac{10 + 4 \times 25 + 31}{6}$$

$$= \frac{141}{6}$$

$$= 23.5$$

$$si_1 = \frac{31 - 10}{6}$$

$$= 3.5$$

Creating a website

$$a = 45$$

$$b = 65$$

$$m = 55$$

$$t_e = \frac{45 + 4 \times 55 + 65}{6}$$

$$= \frac{330}{6}$$

$$= 55$$

$$si_2 = \frac{65 - 45}{6}$$

$$= 3.33$$

Setting up a database

$$a = 60$$

$$b = 81$$

$$m = 75$$

$$t_e = \frac{60 + 4 \times 75 + 81}{6}$$

$$= \frac{441}{6}$$

$$= 73.5$$

$$si_3 = \frac{81 - 60}{6}$$

$$= 3.5$$

Publication of circular

$$\begin{aligned}
 a &= 9 \\
 b &= 15 \\
 m &= 12 \\
 t_e &= \frac{9+4 \times 12+15}{6} \\
 &= \frac{72}{6} \\
 &= 12 \\
 si_4 &= \frac{15-9}{6} \\
 &= 1
 \end{aligned}$$

Application Process

$$\begin{aligned}
 a &= 5 \\
 b &= 15 \\
 m &= 10 \\
 t_e &= \frac{5+4 \times 10+15}{6} \\
 &= \frac{60}{6} \\
 &= 10 \\
 si_5 &= \frac{15-5}{6} \\
 &= 1.667
 \end{aligned}$$

Primary selection

$$\begin{aligned}
 a &= 21 \\
 b &= 28 \\
 m &= 25 \\
 t_e &= \frac{21+4 \times 25+28}{6} \\
 &= \frac{149}{6} \\
 &= 24.833 \\
 si_6 &= \frac{28-21}{6} \\
 &= 1.167
 \end{aligned}$$

Examination process

$$\begin{aligned}
 a &= 5 \\
 b &= 15 \\
 m &= 10 \\
 t_e &= \frac{5+4 \times 10 + 15}{6} \\
 &= \frac{60}{6} \\
 &= 10 \\
 si_7 &= \frac{15 - 5}{6} \\
 &= 1.67
 \end{aligned}$$

Final Selection Process

$$\begin{aligned}
 a &= 7 \\
 b &= 14 \\
 m &= 12 \\
 t_e &= \frac{7+4 \times 12 + 14}{6} \\
 &= \frac{69}{6} \\
 &= 11.5 \\
 si_8 &= \frac{14 - 7}{6} \\
 &= 1.167
 \end{aligned}$$

Student admission

$$\begin{aligned}
 a &= 75 \\
 b &= 90 \\
 m &= 80 \\
 t_e &= \frac{75+4 \times 80 + 90}{6} \\
 &= \frac{485}{6} \\
 &= 80.833 \\
 si_9 &= \frac{90 - 75}{6} \\
 &= 2.5
 \end{aligned}$$

Standard Deviation for whole project

$$\begin{aligned}
 s_{cp} &= \sqrt{s_i^2 + s_i^2 + s_i^2} \\
 &= \sqrt{(3.5)^2 + (3.33)^2 + (3.5)^2 + (1)^2 + (1.667)^2 + (1.167)^2 + (1.67)^2 + (1.167)^2 + (2.5)^2} \\
 &= \sqrt{12.25 + 11.0889 + 12.25 + 1 + 2.778889 + 1.361889 + 2.778889 + 1.361889 + 6.25} \\
 &= \sqrt{51.120456} \\
 &= 7.15
 \end{aligned}$$

7.3 Charts

Among the various tools to show the charts for project scheduling, we chose to use Gantt chart for our system design for it is more understandable.



Figure 7.2: Gantt chart of Project Scheduling for Admission Procedure System of Engineering Universities of Bangladesh

7.4 Conclusion

Now that the activity network representation has been processed out, resources are allocated to every activity, Gantt chart and PERT have been developed, the candidate system can be designed by the developers.

8. Conclusion and Observations

The Engineering Universities are the most prominent institutes in the country, providing quality education to thousands of students from every corner of the country every year. Every year after the publication of result of Higher-secondary School Certificate exam, students always eye for these universities. But the distributed exam process has been causing the students to pay more money and spend a lot of time for the admission exam. Since every university have limited quota, students face with the hardship of a extreme competition, and due to this, many talented students cannot get the chance pursue their dream.

Our goal was to make the overall system of the organization such as admission, information flow, cash flow centralized by getting the engineering universities together for the admission, to make the organization worth admitting by making system more attractive to the students. People expect quality from the organization, and this includes meeting their needs. We generally focused on creating enough opportunities for students to develop and realize their creative potential as well as making things easier and less costly for the students by improving different parts of the whole system. We have also considered improving students access to information for the admission procedure, and using the existing resources to decrease system design cost by a lot.

We designed the such a way so that the system should comply with the demands and needs of the students regarding open access to information about admission, and make the whole process easier for them. We observed and recorded the varying aspects of the organization systematically. In observing we were able to see what works well and what could be improved. By analyzing present condition and problems of the organization, we found out new requirements for the organization which is needed to fulfilled to meet our goal. We have tried our best to find out every problem in the organization and developed a viable solution to these problems, according to which we have proposed to update that system. We proposed the new candidate system design with DFD and ER diagram. In out new design of the system, we proposed to make the system more online-based,

database designs were also mentioned. We suggested to consider multiple choice question in admission exam as processing these are more quicker. And a new fully functional centralized website is also suggested.

Though we proposed out new candidate system with all features and functions specified clearly, considering all significant factors, such as economic, technological, legal and scheduling factors, some areas can be emphasized more in the future to make the project fully successful. Some requirements of the project are lengthy processes which may become difficult to put into action considering the time constraints.

The behavior and mentality of the staff of the organization is also a concern. Over the years, even though there has been a rising demand for such a centralized admission process, the authorities of the universities have failed to create such a system. Staffs in the organization are professional enough to assist in fulfilling the requirements inside the organization like website development, installing and updating databases. The universities together have enough manpower and resources to implement the system.

To ensure the success of the system, careful and often extensive planning is required. High involvement and commitment are also required on the part of employees to spend the time required on the projects to ensure that they understand the strategic plan. Using effective use of the resources, the system can be smoothly implemented.

We hope, implementation of our proposed structure with clarity and dedication, will play an important role in solving an existing problems and help the students pursue their dream with lesser obstacles faced

Bibliography

- [1] *BUET*. URL: <https://www.buet.ac.bd/web/#/about/1>.
- [2] *CUET | Chittagong University of Engineering and Technology*. URL: <https://www.cuet.ac.bd/history>.
- [3] *Feasibility Study And Its Importance in Project Management*. URL: <https://www.simplilearn.com/feasibility-study-article>.
- [4] *Feasibility Study Definition*. URL: <https://www.investopedia.com/terms/f/feasibility-study.asp>.
- [5] *KUET | Khulna University of Engineering & Technology*. URL: https://www.kuet.ac.bd/index.php/welcome/about_kuet.
- [6] Elias M. Awad. *Systems Analysis and Design*. 2nd Edition. Galgotia Publications; ISBN: 978-8175156180.
- [7] *Problem definition in system analysis and design - Businessandfinance Blog*. URL: <https://businessandfinance.expertscolumn.com/problem-definition-system-analysis-and-design>.
- [8] *RUET-Rajshahi University of Engineering & Technology*. URL: <https://www.ruet.ac.bd/>.
- [9] *System Design and Development | The MITRE Corporation*. URL: <https://www.mitre.org/publications/systems-engineering-guide/se-lifecycle-building-blocks/system-design-and-development>.
- [10] Joe Weller. *An Expert Guide to Cost Benefit Analysis | Smartsheet*. URL: <https://www.smartsheet.com/expert-guide-cost-benefit-analysis>.
- [11] *What is Systems Design? Definition of Systems Design, Systems Design Meaning - The Economic Times*. URL: <https://economictimes.indiatimes.com/definition/systems-design>.