

Web Based Student Registration and Exam Form Fill-up Management System for Educational Institute

Md. Tofail Ahmed

Department of Information and Communication Engineering, Pabna University of Science & Technology, Pabna, Bangladesh
E-mail: tofail.ru@pust.ac.bd

Md. Humaun Kabir and Sujit Roy

Department of Computer Science and Engineering, Bangamata Sheikh Fojilatunnesa Mujib Science and Technology University, Jamalpur-2012, Bangladesh
E-mail: {humaun, sujit}@bsfmstu.ac.bd

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Abstract: Registration of new students' academic information is essential for every educational institute to continue their education at every semester level and go through their whole student life. And this registration information is used when they do their form fill up of consecutive semesters. Nowadays, almost all educational institutes are using paper based registration and form fill up systems which is prone to many human errors and very time consuming for both students, teachers as well as other related administrative bodies. In this paper, we developed a web based application for academic purposes to control and save student registration and form fill up data that will be helpful for students, teachers and admin authority to make the process easier, less time consuming and error free. There are four main types of users who can use this system: student, department authority, students' hall authority and administrator. The student can submit their registration and form fill up information by using a web form. Moreover, he/she can download their admit card and registration form after the approval of the concerned authority. The students also can be able to do other module activities. The hall and department authority can use the system to approve the students' registration, semester examination form and to provide the students' attendance data. In addition, the department and hall authority has a choice to see all students' academic information. Moreover, the system administrator controls the system by managing (add, delete, update) student, hall and department authority, exam or registration date, subjects of a particular semester, notice board of the institute, module and programme data. The administrator can also add and remove the running and passed student data. The students also can pay their semester fees by using an online banking system.

Index Terms: Student Registration, Examination Form-Fill Up Management, Web Application, MySQL Database, ER Model, MD5, Online Payment System, Admit Card Generation.

1. Introduction

Information and communication technology (ICT) has improved tremendously in the last decade with the invention of different kinds of new technologies, such as IoT, artificial intelligence (AI), machine learning, 5G, e-commerce, e-learning, online based registration, application, and payment etc. In the underdeveloped/ developing countries, ICT has not been fully utilized in all sectors of education and most academic institutes follow the conventional registration and form fill-up methods. Some academic institutes automated a portion of education sectors like online-based admission test system, result processing system, intelligent attendance management system etc. In developed countries, education is greatly influenced by significant developments, including the increased use of information technology (IT) and the forces of globalization. The rapid progress in education impacts the significant development of those countries through the use of modern technologies. Implementing recent technologies and rapid increase in computers and internet facilities has brought enormous changes in several organizations of almost every sector. The application of ICTs in the education sector has brought about considerable improvements in administration, assessment, and management of various stages of academic and non-academic processes [1-2]. Recently, with the massive improvement of data processing, data collection technologies and the success of the internet, computing resources have become less costly, more powerful, more error-free and more available. The technological trend has

enabled cloud computing, in which resources are provided as general utilities on the internet in an on-demand style [3]. The education sector of the developed country has also taken advantage of these technological developments to improve the management of processes, especially in the area of learning, student attendance, assessment, and candidate registration [4-5]. ICT can be utilized as an integral component to improve productivity, efficiency and quality in learning, teaching and assessment [6-7]. Many academic and industry researchers are working in the ICT-based education sector to improve candidates' registration, exam form fill-up, learning, evaluation, attendance, and result processing etc. [8-12]. Authors in [13-14] conducted an exclusive study where they have explored and identified the challenges faced by examination bodies during the registration of candidates. These studies established the many problems associated with manual handling of registration and student records such as mismanagement of students' academic records, loss of data, concerns over the quality of entered data, duration of the processing of entries, security, time-consuming, more possibility to make errors, data redundancy, integrity constraints, and storage of data as well as the increase of costs. From the literature review, we found some common problems and most of the researchers focus on the students's registration, exam form fill-up management, security, storage, and management of data. There is no integrated educational management system. In this paper, we proposed an integrated and automated web based system with the implement of online candidate's registration system and form fill-up management system for semester-end examination with online payment facility.

2. Literature Review

Many research articles are available in the literature on online registration management systems by using various programming languages. A few related works are described briefly in this paper. A student registration software is developed in [15] that manages the student's enrollment and enables the universities to supervise a growing number of services and reduce the work and costs involved in manual systems. In [16-17], authors investigated the manual student's registration methods using optical mark read (OMR) forms in the registration process. In these proposed systems, the problems are poor handling of registration forms such as storage difficulties, clerical errors, re-coding, editing, and re-scanning. The researcher reviewed, analysed and designed practical steps necessary to implement such systems to increase the efficiency of the colleges' and departments' records management in [18-20]. The implemented systems could reduce the work hours required to access student records and enable the staff to provide better service to students. In a study conducted in [21], there was a shortage of centralized database systems regarding reliable, scalable, and accessible information. A solitary database system was proposed in this paper based on a client-server distributed database for processing student records and exams. In [22], authors proposed "building a high-availability distributed application for a university student registration". Their system guarantees the consistency of atomic transactions with a positive outcome regarding the completed registration process. Besides, authors in [23] solve the problem related to the management of the exam activities with reduced errors resulting in the associated degree in Jordan. A remote registration system is proposed in [24] based on the distributed database to solve problems that both the staff and the students face during the registration period and speed up and improve system performance and throughput. In summary, technology plays an essential role in developing and growing various educational institutes independently to manage student information in their ways. To the best of our knowledge, no investigative research was conducted regarding the design and implementation of an integrated smart system for managing student registration, exam form fill-up, electronic notice board, alumni, electronic photo gallery, checking students form by authority, download admit card, registration card and security system to store data. From the higher education perspective, this situation is painful, problematic for students as well as authority. Therefore, a novel integrated system is proposed and implemented in this research to manage the issues for educational institutes like universities.

3. Problem Statement

To run a particular educational institution/ university smoothly, it is essential to fill the registration and form using digital technologies; the existing manual system will not ensure accuracy, dynamicity, and error-free. There are several boundaries in the existing manual registration and form fill-up management and monitoring system. Major disadvantages are mentioned briefly in this subsection. Firstly, students are currently using their registration and form fill up manually. For example, the student writes their information on the physical paper; they pass it to the administrator, department authority, hall authority and bank to pay fees. It is very time-consuming, problematic, and more possible to make errors for the student. The students submit the form to the department or hall. After receiving the student's form, the hall or department authority checks it manually, which is also problematic and time-consuming. Secondly, few educational institutes/ universities are currently using online-based registration systems for students. They are conducting their system by creating a website. Nevertheless, significant limitations of this type of system are that they only focus on student registration and do not add the checking system by the hall and department authority. The checking procedure of student registration forms is running in conventional ways, and the remaining portion is manual, which is not perfect with the current trend of technological evolution. Thirdly, it is true that few educational institutes/ universities are using student registration online, but forms filled up for every semester-end examination

remain manual. In this paper, we proposed an integrated web-based system to overcome these types of problems and limitations.

4. The Proposed System

The proposed new system framework based on web programming language considers the following disputes and limitations mentioned in the previous section. This section will discuss a complete procedure to overcome the existing registration limitations, fill out a form, and check the management system. It will be a fruitful, convenient, and less error-free and dynamic process for the students, hall /department authority, and administration to manage the student registration and exam form fill-up related all processes. Besides that, the student's registration/ form fill-up record will be preserved for a long time in the database that makes it easy for the administrator to access the database, and also, he/ she can quickly generate any query result of the student within a short time. The student's information record can be securely stored in the database, free from damage to the manual system. On the other hand, our proposed system is a user-friendly interface and more dynamic, which will help to guide each user to use it properly without any specific training. The main striking feature of our proposal is that we have introduced a new integrated system that combines two separate modules: student registration module, and exam form fill-up module. Our system will be capable of handling a large number of records within a short time. In addition, the administrator can give a specific user permission to access the database record to analyse for further use. This system removes the drawback of separate information management systems for students, teachers, authorities, and administrators. In our system, the student can complete their registration and semester end final exam form fill-up anytime from anywhere, and they can see/ delete/ update their registered information easily. In addition, they will get other facilities such as admit card and registration form download, can see the admit card and registration form processing report, can update their profile and private setting for example password, picture and more specifically they can delete/ update/ add the subjects which they have opted for semester final exam. The hall/ department authority can see the total registered students, the unchecked form submitted by students, accepted or rejected students, and the department authority can upload students' attendance data. A super administrator can securely monitor the entire system, which has authority to add students, remove students, add/ update/ delete semester subjects, and various issues.

5. System Analysis and Requirements

5.1 User Requirements

The user requirements can be determined to solve the problems that have been mentioned in section 3. There are four main types of users: students, department authority, hall authority, and administrators. All users must have to login to access the system, and each of them has to have different options available to them based on their account type. The use case diagrams shown in figure 1 to figure 4 clarify the available options for each of the different account types. There are nine use cases allocated for student users depicted in Fig. 1. ID verification means only verified student can apply for registration, add/ edit registration means student are enabled to do registration and after that they can edit their records, do form fill-up, edit form fill up info, add/ delete opted exam subject, admit/ registration card download, and upload payment slip. In the private setting they can update their profile/ password/ profile picture etc.

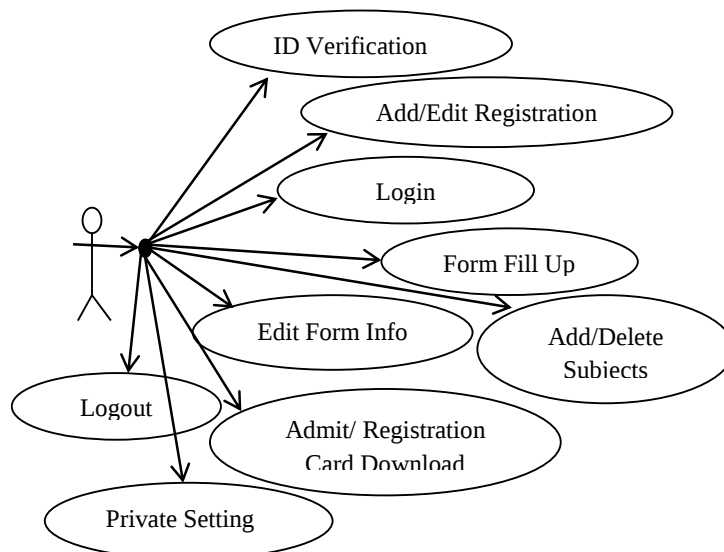


Fig. 1. Student use case diagram.

Fig. 2 shows that there are seven use cases allocated for hall authority users. The hall authority will check student-submitted forms, the authority can reject the student's form if there is any anomaly otherwise accept.

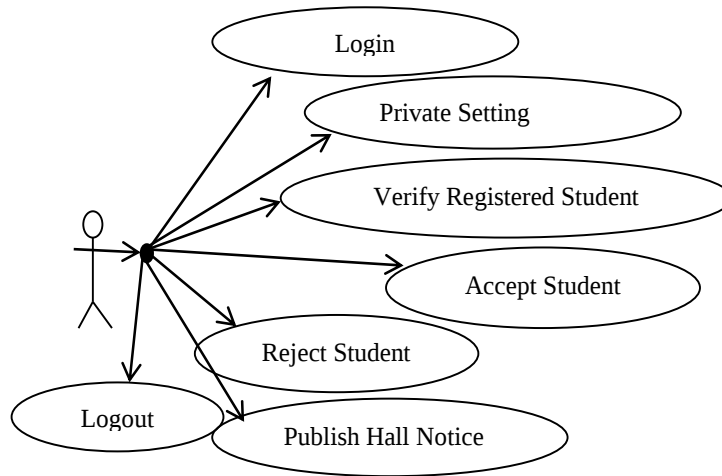


Fig. 2. Hall authority use case diagram.

There are nine use cases allocated for department authority users presented in Fig. 3. The most important case is to check the student's semester fees bank pay slip and upload the attendance data of each student. Nine essential use cases for administrator users shown in Fig. 4. The administrator will approve to the hall and department authority, set the starting and ending time of the form fill-up for a particular semester, manage all notice boards, basically, the administrator can control the whole system.

5.2 System Requirements

The system requirements determine the features and composition of the system, such as usability, compatibility, and system performance designations. It is essential to supply the users with a suitable online application. Hardwares are required to run the system, which are determined as follows: (i) server with good specifications, (ii) personal computer or laptop used to run the application, and (iii) internet access to connect to the server. Softwares are required to run the system, which are determined as follows: (i) server-side: install xampp server and MYSQL database or xampp built-in database to run the application, (ii) client-side: internet browser such as update version of Windows Edge, Google Chrome, Firefox etc.

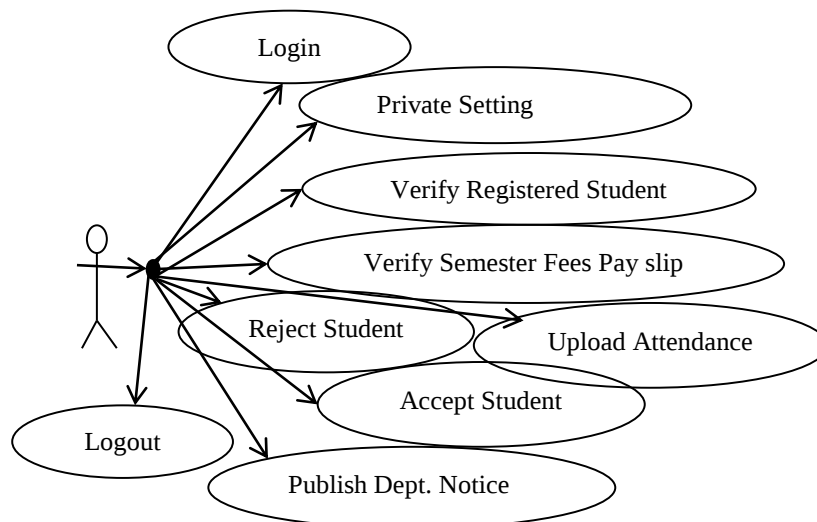


Fig. 3. Department authority use case diagram.

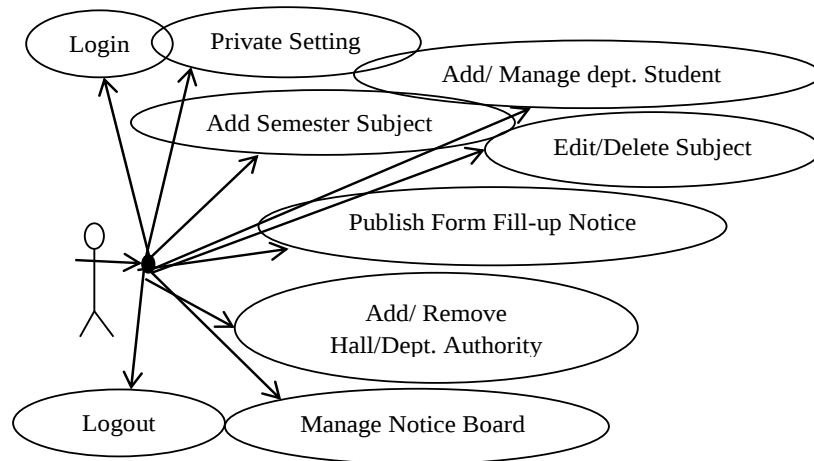


Fig. 4. Administrator use case diagram.

6. Web Application and DBMS Design

Several techniques and methodologies are used to develop this work. The web application is built using the following web developing languages: PHP, HTML, CSS, JavaScript, Ajax, etc., and the server type used to run this application is XAMPP. The database language used is MYSQL. Moreover, Sublime text is used as a programming editor tool. The XAMPP software stack is an open-source local host server that provides several functionalities through the software package it contains. HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets) are both client-side web programming languages which provides the structure of the page and the visual/ aural layout for various devices respectively. Besides, HTML can insert programs written in a scripting language such as JavaScript, which can affect the behavior and content of web pages. CSS describes how HTML elements are displayed on the screen, paper, or in other media and also make the website more attractive and beautiful to all users. PHP (Hypertext Preprocessor) is an open-source and platform-independent scripting language which supports different types of databases. In this work, Many PHP functions have been used to implement all logical functions, connect with the database, insert data from the user into the database, and fetch records according to user requirements. JavaScript (JS) is used as a client script language to provide dynamic web pages which actively communicate with users. In XAMPP, the MySQL database is created using phpMyAdmin. MySQL software provides a fast, multi-threaded, and robust SQL database server. MySQL is a full-featured relational database management software that used to store all the records of the students and other users. Another language, Ajax JSON implements a system for the basic need of pagination and search information based on user requirements. It makes the system more accessible, less time-consuming, and increases usability [25-26]. All information of users is stored in a database table. Some necessary tables are bellowed:

Table 1. Table of Semester Wise Courses

Sl.	Field Name	Data Type	Null	Description
01	Crs_Name	Varchar (150)	No	Store course name of particular semester
02	Crs_Code	Varchar (50)	No	Store course code
03	Credit	Float	No	Store course credit

Table 2. Student Registration Table

Sl.	Field Name	Data Type	Null	Description
01	Student ID	Int	No	Store roll number of the student
02	Stu_Name	Varchar (50)	No	Store name of the student
03	Stu_Address	Varchar (150)	No	Store permanent address of student
04	Stu_Session	Varchar (50)	No	This is the session name of student
05	Stu_Hall	Varchar (50)	No	Store hall name where they are allotted
06	Stu_Dept	Varchar (50)	No	Store department name of student
07	Stu_Phone	Varchar (50)	No	Store student/ guardian mobile
08	Stu_Pass	Varchar (50)	No	Store password of the student

Table 3. Table of Courses Opted for Examination

Sl.	Field Name	Data Type	Null	Description
01	Student ID	Int	No	Store roll number of the student
01	Crs_Name	Varchar (150)	No	Store course name opted for examination
02	Crs_Code	Varchar (50)	No	Store course code opted for examination
03	Credit	Float	No	Store course credit opted for examination

Table 4. Student Form Fill Up Table

Sl.	Field Name	Data Type	Null	Description
01	Student ID	Int	No	Store Roll Number of the Student
02	Stu_Name	Varchar (50)	No	Store Name of the Student
03	Semester	Varchar (50)	No	Store the semester in which the students want to form fill-up
04	Hall Status	Varchar (50)	No	Store the hall authority comments
05	Dept. Status	Varchar (50)	No	Store the Department authority comments
06	Payslip No	Varchar (50)	No	Store bank pay slip number
07	Payslip Img	Varchar (250)	No	Store bank pay slip image
08	Attendance	Varchar (50)	No	Store student attendance of semester

7. Implementation and Result

This sub-section refers to how the main parts of the system are being implemented. There are several interfaces that make up the entire system that are briefly described below.

7.1 Login Page

To fulfil the security resolution, each type of user has to login by entering user ID and password to access the system. Only authorized users can enter into the web application and any visitor user can view the login page on the institute main website shown in Fig. 5.

Fig. 5. Login page for all types of users.

7.2 Student' Registration Page

Fig.6 shows the registration form, by using this form students can submit their required academic information.

👤 Student Registration Form

Enter Your Information

Student ID:

Full Name:

Date of Birth:

Gender:
☐ Male ☐ Female

Email:

Department:

Phone:

Upload Your Image:
 No file chosen

Password:

☐ I accept the User Agreement

Fig. 6. Student Registration Page.

7.3 Student' Home Page

After login, the student will enter the home page. The Fig.7 shows the home page where all navigated page links will show on the sidebar. The student can access all navigated pages: Form Fill-Up, Notice-board, Private Setting, Edit Form Information etc. and also download admit card, registration form, registration guideline, and form fill-up guideline etc.

Welcome! Student Registration and Form Fill-Up Management System

Dashboard

Home > Dashboard

Dashboard »

Please download and read the following guidelines carefully before registration.

Registration Guideline
Click here! to download the registration guideline.

Exam Form Fill-Up Guideline
Click here! to download the Exam Form Fill-Up guideline.

For More Information
Visit our Website

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Fig. 7. Student home page.

7.4 Student Form Fill-Up Page

In the Form Fill-Up page presented in Fig.8, students can select the semester which he/she want to Form Fill-Up. When he/she selects a particular semester then all courses of that semester will display. He/she will select and submit his/her opted courses for examination with other information such as exam name (regular /referred /improvement/ special), exam type (B.Sc/ M.Sc/ BSS/ MSS etc.), Pay slip number, Payment date, Pay slip image etc.

Select Your Semester :
2nd Semester

Last Date: 2021-09-11

Student Types: Select student type

Exam Name: Select Exam Name

Name of Programme: Select Programme

Payslip No: Enter Payslip No

Payment Date : dd----yyyy

Payslip Image : Choose File No file chosen

Select Courses for Your Examination:

SI	Select	Course Title	Course Code	Credit
1	☐	Analog Electronics	ICE-1201	3.00
2	☐	Programming with C	ICE-1203	3.00
3	☐	Programming with C Sessional	ICE-1204	0.75
4	☐	Circuit Theory and Analysis	ICE-1205	3.00
Total Credits =				9.75

Submit **Reset**

Fig. 8. Student Form Fill-Up page.

7.5 Show and Edit Form Fill-Up Information Page

Fig.9 shows the submitted form of the student. He/she can see his/her form and also modify submitted data and information.

Your Form Fill-Up Information for Semester Final Exam

Student ID:	12115606
Name:	Tofail Ahmed
Semester:	2nd Semester
Student Type:	Regular
Exam Name:	Semester Final
Program Name:	B.SC Engineering
Payslip No:	1234
Payment Date:	2021-11-16
Payslip Image:	

Subjects Opted for Examination:

SI No.	Subject Name	Subject Code	Credits
1	Analog Electronics	ICE-1201	3.00
2	Programming with C	ICE-1203	3.00
3	Programming with C Sessional	ICE-1204	0.75
4	Circuit Theory and Analysis	ICE-1205	3.00
Theory=9, Sessional=0.75, Viva-voce=0, Project=0, Thesis=0;			Total Credits = 9.75

Fig. 9. Show and edit student Form Fill-Up Information page.

7.6 Download Admit Card

Fig.10 shows the admit card only, similarly students can download their registration form and other related forms and documents. The admit card and registration form will be generated after approval by hall and department authority. If their form is rejected then they will not be able to download their admit card and they need to contact the hall and department authority.

Admit Card

Name: Tofail Ahmed
Student ID: 12115606
Semester: 2nd Semester
Attendance in %: 78
Phone: 1722633140

Subjects Opted for Examination:

SL	Course Code	Course Title	Credit
1	ICE-1201	Analog Electronics	3.00
2	ICE-1203	Programming with C	3.00
3	ICE-1204	Programming with C Sessional	0.75
4	ICE-1205	Circuit Theory and Analysis	3.00

General Instruntron for Applicants

- 01 Every candidate should present themselves at the examination room thirty minutes before the start of the examination and present their admission letter at each attendance.
- 02 Any candidate arriving thirty or more minutes after the start of the exam will not be allowed to sit the examination.
- 03 Any candidate arriving thirty or more minutes after the start of the exam will not be allowed to sit the examination.
- 03 On entering the examination room, candidates must leave any bags and overcoats where instructed by the invigilator.
- 04 Candidates must sit in the appropriate seat.

[Print Admit](#)

Provost's Signature

Fig. 10. Download admit card and registration form.

7.7 Hall Authority Dashboard

After login, the hall authority can access the dashboard page. All the data and information related to the hall authority will be displayed in the dashboard shown in Fig.11.

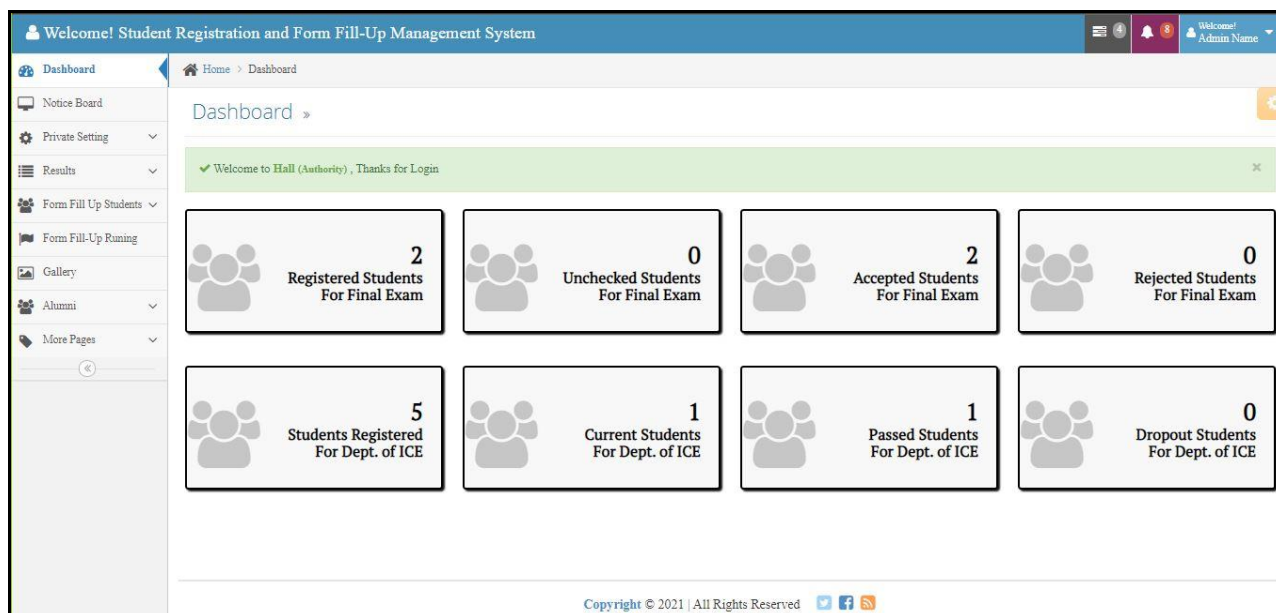


Fig. 11. Dashboard of hall authority.

7.8 Hall Wise Accepted/ Unchecked Students Information

When a student submits his/her registration or semester form fill-up form then the hall authority will see that student as an unchecked student. The all information of that student will be displayed to hall authority, after checking that information hall admin has the authority to accept or reject the form. Further if the student accepts he/she will get permission to download the admit card after the check of the department. If authority rejects the form then student will contact hall authority, after solving his/her causes of rejection authority will give permission from rejected student.

SL.No	Name	USN	Mail-Id	Phone	Accept	Reject
1	JONIR	12115620	jalal@gmail.com	1722633140	☒	☐

Fig. 12. Unchecked student shown to hall authority.

SL.No	Name	USN	Mail-Id	Phone	Accept	Reject
1	Tofail Ahmed	12115606	tofail.ru@gmail.com	1722633140	☒	☐
2	Md	12115608	tofa@gmail.com	895333333366	☒	☐

Fig. 13. Accepted registered students shown to hall authority.

7.9 Department Authority Dashboard

Dashboard of department authority shown in Fig.14 which is almost similar to the hall authority. The working principle is the same as what the hall authority. Department can see the unchecked/ accepted students, list from the dashboard. Two additional works have been added for department authority; firstly the department will check whether the student's payslip is correct or not, secondly upload semester end attendance data in percentage value depicted in Fig. 15.

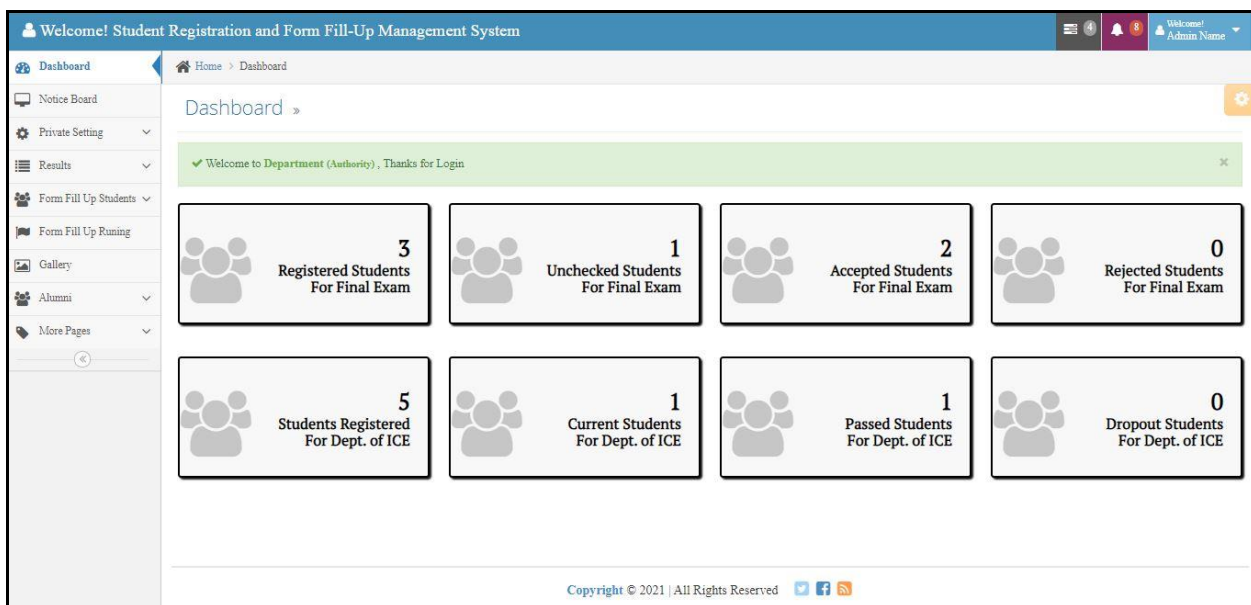


Fig. 14. Dashboard of department authority.

Upload Attendance

Student ID:

Student Name:

Semester:

Attendance %

Fig. 15. Upload students' attendance data to the system by department authority.

7.10 Admin Dashboard

The whole system has to be controlled by the administrator. There are multiple functions assigned to admin authority and the admin dashboard is depicted in Fig.16. Major functions are to modify (add/delete/update) each semester's courses, add new students to the department, manage (delete/update/reset forgotten password) students' data and information, give access to other authority, publish form fill-up notice, and other activities etc.

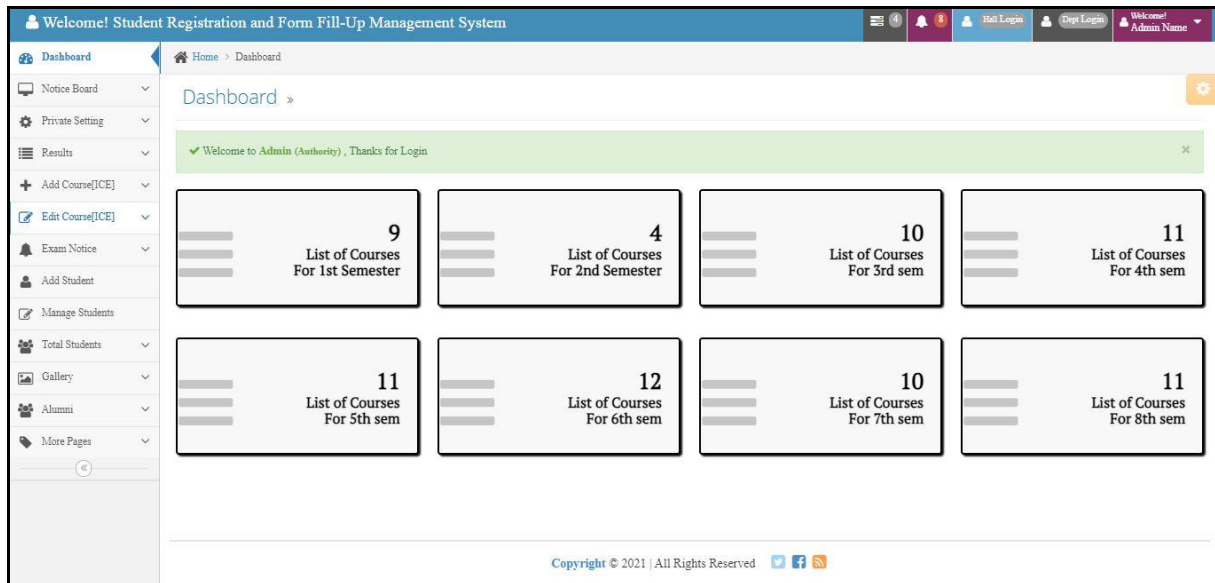


Fig. 16. Dashboard of Admin authority.

7.11 Manage Semester Wise Course List

The administrator can update/delete/add each semester's courses shown in Fig. 17 and 18. If the department changes any course for any particular semester in an academic year then the authority can change the semester course database record. It is very necessary because students select their opted courses from that course database record while they do their form fill-up.

1st Semester Courses:					
SL.No	Course Title	Coursre Code	Credit	Update	Delete
1	Fundamental of ICT	ICE-1101	3.00		
2	Fundamental of ICT Sessional	ICE-1102	1.50		
3	Basic Electronics	ICE-1103	3.00		
4	Basic Electronics Sessional	ICE-1104	1.50		
5	Applied Electricity and Magnetism	ICE-1105	3.00		
6	Applied Electricity and Magnetism Sessional	ICE-1106	0.75		
7	Differential Calculus and Geometry	MATH-1101	3.00		
8	Bangladesh Studies	HUM-1101	3.00		
9	Viva-voce	ICE-1107	0.75		

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Fig. 17. Semester wise course information.

Home > Dashboard

Dashboard »

"Add Courses to 1st Semester"

Course Name

Course Code

Credit

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Fig.18. Add Courses.

7.12 Manage Students

When a new admitted student is going to complete his/her registration process on the website. At first the admin takes little information such as ID, Name, Email and temporary password and then admin verify the data. After verification, students are allowed to complete their registration process by providing related all data. Student management (add/delete/update) page is shown in Fig.19.

Admitted Student's list of Department

Student's List of Department

Display records Search:

SL.No	Roll	Name	Session	Status	Passed ?	Update	Delete	Reset Pass
1	12115607	MD. JALAL UDDIN	2019-2020	Running	✓			
2	12115608	MD. TOFAIL AHMED	2019-2020	Running	✓			
3	12115606	MD. TOFAIL AHMED	2019-2020	Running	✓			
4	12115609	MD. TOFAIL	2016-2017	Running	✓			
5	12115610	MD. AHMED	2015-2016	Running	✓			
6	12115612	MD. KAMAL	2022-2023	Running	✓			
7	12115613	MD. KAMAL AHMED	2017-2018	Running	✓			
8	12115620	MD. JONIR UDDIN	2015-2016	Running	✓			

Showing 1 to 8 of 8 entries

Previous **1** Next

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Fig. 19. Manage students' data by admin.

7.13 Publish Form Fill-Up Notice

Form Fill-up starting and ending date of a particular semester will be published by admin presented in Fig. 20. According to the published notice, the concerned students will do their exam form fill-up.

Dashboard »

Add Exam Date for Form Fill-Up

Start Date: dd-yy-yyyy

End Date: dd-yy-yyyy

Semester: 1st Semester

Reset Start Final Exam Form Fill-Up

Schedule of Running Semester Final Form Fill-Up

SL.No	Start Date	End Date	Semester	Status	Delete
1	2021-08-25	2021-09-11	2nd Semester	running	
2	2021-08-03	2021-10-08	1st Semester	running	

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Fig. 20. Publish form fill-up date by admin.

8. Conclusions

In this research, an integrated, reliable, fast, less error, and well-organized unique web based system has been developed to check, control and manage the whole procedure of students' registration and exam form fill-up in educational institutes like universities. A dynamic DBMS system is also integrated with the web application that will store the whole data and information of students, concerned authorities and administrator. Our implemented database is capable to handle large academic organization and offers to the hall/ department authority and administrator storing data in easier ways and it can be saved in electronic format (excel, pdf) as well as printed on paper to save as hard copy. This system will reduce time consumption, working load of authorities, and overcome the drawbacks of paper tracking and file maintenance. Finally, it will enlighten the institutes/ universities by the touch of technology.

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Authors' Profiles



Md. Tofail Ahmed received his B.Sc. Engineering and M.Sc. Engineering degree in Information and Communication Engineering from the University of Rajshahi, Bangladesh, in 2015 and 2016, respectively. Currently, he is working as a Lecturer in the Department of Information and Communication Engineering, Pabna University of Science and Technology, Pabna-6600, Bangladesh. He has written many research papers in various international journals. His research interests include Web Application, Wireless Communications, Signal & Image Processing, and Software & Database Systems.



Md. Humaun Kabir received his B.Sc. Engineering and M.Sc. Engineering degree in Applied Physics and Electronic Engineering from the University of Rajshahi, Bangladesh, in 2014 and 2016, respectively. Currently, he is working as a Lecturer in the Department of Computer Science and Engineering, Bangamata Sheikh Fojilatunnesa Mujib Science and Technology University, Jamalpu-2012, Bangladesh. He is a member of IEEE. He has written many research papers in various international journals. His research interests include Web Application, Communication & Signal Processing, and IoT.



Sujit Roy is a Lecturer in the Dept. of Computer Science and Engineering at Bangamata Sheikh Fojilatunnesa Mujib Science & Technology University, Jamalpur-2012, Bangladesh. He obtained his B.Sc.and M. Sc. degree in Computer Science and Engineering from Jatiya Kabi Kazi Nazrul Islam University (JKKNIU), Trishal, Mymensingh, Bangladesh. He has written many research papers in various international journals. He has research interest on Cloud Computing, Image Processing, Data Mining, IOT, Internet and Web Application and Wireless Communications.

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