

ST. LAWRENCE COLLEGE

(Affiliated to Tribhuvan University)

Chabahil, Kathmandu



A Final Year Internship Project Report

On

Web Application: Virtual School

At

NFS INNOVATIONS Pvt. Ltd.

[CSC-452]

For the partial fulfillment of Bachelor's Degree of Computer Science and Information Technology

Submitted to

Department of Computer Science and Information Technology

St. Lawrence College

Institute of Science and Technology

Tribhuvan University

Under the Supervision of

Mr. Deepak Thakur

Submitted by

Shiva Ghimire (5695/071)

MENTOR'S RECOMMENDATION

I hereby recommend that this report has been prepared under my supervision by **Shiva Ghimire** on “**Web Application: Virtual School**” in partial fulfillment of the requirements for the degree of BSc. in Computer Science and Information Technology, be processed for evaluation.

.....

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Chief Executive Officer

Internship Mentor

Infography Technologies Pvt. Ltd., Kathmandu

SUPERVISOR’S RECOMMENDATION

I hereby recommend that his report has been prepared under my supervision by **Shiva Ghimire** in partial fulfillment of the requirements for the degree of BSc. in Computer Science and Information Technology, be processed for evaluation.

.....

Mr. Deepak Thakur

Supervisor/ Lecturer

CERTIFICATE OF APPROVAL

We certify that we have read this dissertation work and, in our opinion, an internship report submitted by Shiva Ghimire is satisfactory on the scope and quality as a dissertation in the partial fulfillment for the requirement of Bachelors of Science in Computer Science and Information Technology.

Signature of Supervisor Mr. Deepak Thakur	Signature of HOD/ Coordinator Mr. Deepak Thakur
Signature of Internal Examiner 	Signature of External Examiner

ACKNOWLEDGEMENT

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The intern owes sincere gratitude to **Mr. Gaurav Kunwar** and **Mr. Sanjay Pokhrel** for their valuable suggestion, ideas and encouragement throughout this report. It was almost impossible to present this report in this form without their guidance and support.

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Finally, the intern would like to thank all who have directly or indirectly assisted to make this endeavor a success.

Shiva Ghimire

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ABSTRACT

Virtual School is a web-based application for students and teacher for enhancing learning and teaching process. This report introduces the process of creating part of a web application which is a data-driven website used by the admins, teachers, librarian, and students. This website has four major modules: admin module, student module, teacher module and librarian module. The major part of the admin module and minor part of student module are implemented by me and the implementation details will be introduced in the report. The implementation uses HTML and CSS which is an excellent markup and style sheet language for website designing.

The main motto of this application is to make learning, teaching and management processes of college and schools easier and convenient. In this system, lecturer can provide learning materials to students and student can submit assignments to college/schools online. It consists of students, administration, lecturer, librarian etc. as entity with their respective roles.

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CHAPTER 1: INTRODUCTION

1.1 Introduction to Internship

The internship is six credit (minimum ten weeks/180 hour long) as a part of the course requirement included in 'Bachelors in Science in Computer Science and Information Technology' a course affiliated by Tribhuvan University. The internship experience is expected to enable the students to assist in the resolution of complex problem. Main goal is to assist students in focusing their interests, thus aiding in their professional carrier. It gives students the opportunity to re-examine their career objectives and explore the variety of opportunities in the field of Computer Science and Information Technology. The broad objectives of internship are as follows:

- To test the interest in particular field before permanent commitment are made.
- To develop skills in the application of theory to practical work situations.
- To test the aptitude for a particular career.
- To know the value of time management and interpersonal skills.
- To develop skills and techniques directly applicable to the careers.
- To acquire in depth knowledge of the formal functional activities of a participating organization.

During author's internship period, author was introduced to the organizational structure and the professional world. Being the student of BSc. CSIT, author was interested in web-based application designing. Therefore, to enhance knowledge in the web-based application author joined Infography Technologies Pvt. Ltd. as an intern. After joining the company author was assigned for Admin dashboard and Add Teacher Form design. During internship period author was involved in the research and front-end development of Virtual School.

1.1.1 Introduction to Project

Virtual School is an in-house project web-based application for students and teacher for enhancing learning and teaching process. It is mainly targeted to colleges/schools. The system can be accessed through web. The main motto of this application is to make learning, teaching and management processes of college and schools easier and convenient. In this system, lecturer can teach, give lectures online, students can get learning materials and submit assignments and college/schools can perform different management activities through online. It consists of students, administration, lecturer, librarian etc. as entity with their respective roles.

Virtual school is based on online learning practice through internet technology. It is completely a new system that can be implemented inside/outside educational institution integrated with online learning system. Likewise, it can be implemented as a small educational institution like Tuition centers, Language classes, etc.

Virtual School will benefit the current education system of our country/region. It helps to overcome the drawbacks of old teaching methodology by embracing the Internet Technology for improvement in the education system. Virtual School is developed web-based system for making it more users friendly and easily accessible.

Virtual School will help the students to get information about lectures, exams, assignments, results, events and other various activities that are originated within the school. Also, the students can share notes, ask question to group or teacher, discuss about assignments and problems, even they are not present in the school or beyond the school time (9-5). Teachers can also track assignments of students, assign assignments, get notified about school events and teach students online even during off-school time. And the school management can track of students and teacher performance easily.

1.1.2 Scope and Limitation of Project

Scopes:

The study of the system virtual school has great scope and can make significant effect on educational system of the country. The adaptation of the system application by the educational institutions will not only increase efficiency of teaching but makes learning process more enjoyable and effective. Some of the scopes of this study are listed below:

- Virtual School is applicable in school, collages and other educational institutes.
- It helps students in learning, discussing about question and assignments as well as submitting them beyond the college hour.
- Teachers can help student in learning process from home.
- Administration can perform management activities easily and effectively.
- Discussion forum lets students to interact with each other to find solution about the problems.

Limitations: -

There are some limitations of this study. Even this web application cannot replace traditional teaching methodology totally, but this application can be an extension to the traditional teaching methodology. Some of the limitation of this study has been listed below:

- Cannot incorporate all schools/colleges and students.
- Should be deployed in each school/college individually.
- Cost may be high for implementation and maintenance.

1.1.3 Brief Introduction of Organization

Infography Technologies Pvt. Ltd. is an Information Technology company incorporated on March 28, 2017. The company has been established with the main aim to apply and leverage computing power as well as Information Technology solves the complex business, social and economic problems. The company segments include cognitive solution, technology services, solution and training. Since its establishment the company has been steadily moving forward to achieve its goal by applying the emerging technologies to various domains and provide unique and cost-effective solution.

From Computer Science to application development, knowledge management and business process management, company helps clients to find the right problems to solve effectively. The team is differentiated by the imagination, knowledge and experience, across industries and technologies that company brings to every project they undertake. The other products developed by the organization are Krishaq, and Student Information management system.

Table 1: Organization Contact Details

Company Name	NFS Innovations Pvt. Ltd.
Location	Dillibazar, Kathmandu, Nepal.
Contact No.	01-4811982
Email	info@infographytechnologies.com
Website	www.infographytechnologies.com

1.1.4 Internship Duration

As per the requirement of the curriculum of B. Sc. CSIT. 8th Semester, the minimum requirement of internship period is 10 weeks/180 hours. It consists of different phase of training or tasks performed with a specific objective for each phase. Each phase shows the progress of intern in internship. It also consists of information about how and when interns will accomplish objectives of each task.

Table 2: Duration of Internship

Starting Date	25 th October 2018
Ending Date	25 th January 2019
Working Days	6 days a week
Working Hour	10:00 PM to 6:00 PM
Position	Front end Developer
Mentor	Mr. Sudeep Paudel

1.2 Statement of Problem

In college and schools, students get into trouble in getting notified about assignments, projects, events. Also, they encounter problem in having communication problem with teachers and others students regarding courses and assignments. Teachers also have problems in providing notes, lectures, and assignments to students of different levels in different interval of time. They also have problem in managing them. School and college administration have problem in managing events, libraries and other management activities within the school/college.

The reason for all these problems is there is no specific tool to manage all these activities of the school and colleges. This is the main motive behind developing a tool - a web-based application - to overcome these problems and difficulties.

1.3 Objectives

The objectives of this study about “Virtual School” is to provide a web-based system or portal along with a user-friendly interface for making teaching and learning process easier and more effective as well as various management processes of the schools and colleges.

The objectives of this project are:

- To make registration of every students and teacher through ID card system
- To make system accessible and reachable for everyone
- To perform assignment tracking
- To create an online teaching learning platform
- To create a discussion Forum
- To create notice and events for every user
- To assign different roles to different types of users

1.4 Roles and Responsibilities

As an intern I have worked on various projects and got to learn basics about many web development frameworks and languages. The activity that was assigned to me during the internship tenure was to develop a Virtual School using HTML and CSS and bootstrap for a client of the company.

Table 3:Task schedule during internship

Week 1	Understanding about the company’s environment and researching about HTML and CSS
Week 2	HTML and CSS practice
Week 3	Learning of bootstrap
Week 4	Requirement gathering about virtualschool
Week 5	Start to design forms for the user input
Week 6	Designing Admin Panel
Week 7	Design Student panel
Week 8	Testing of the module
Week 9	Deploy in system

1.5 Motivation

1.5.1 Motivation for choosing Inforgraphy Technologies Pvt. Ltd.

Infography is a group of young, motivated, and skilled people whose main goal is to provide their clients with an innovative solution regarding web development and software development. Whether it's a mobile application, a content-rich responsive website, its work is built for scale, performance and longevity.

As per the requirement of the Tribhuvan University (TU), the final year students of B.Sc. CSIT are required to complete a six credit (minimum ten weeks/180 hours long) internship as a part of the course requirement. Internship is one of medium that helps to break down the bars between the professional and the student life. Since, an internship is the course curriculum of TU, every student perusing BSc. CSIT need to do the internship in any area of their interest. So, the first motivation for choosing Infography was to fulfill my academic requirements. Besides this, working as an intern in the organization I also got the opportunity to work in real-time projects which motivated me to work more towards my area of interest.

1.6 Report Organization

Chapter 1: Introduction puts emphasis on Overview, Problem Statement, Objectives, Scope and Limitation of the project.

Chapter 2: Requirement and Feasibility Analysis the important sections such as, Requirement Analysis and Feasibility Analysis. Requirement Analysis explains Functional and Non-functional requirements of the project, and Feasibility Analysis explains why/how the project is practical to be implemented.

Chapter 3: System Design gives the design of the system developed so that it can be used during the project implementation.

Chapter 4: Implementation provides an indication of how the system is implemented, what tools / platforms have been used.

Testing clarifies the system workflow.

Chapter 5: Conclusion marks an end to the document by summing up the entire project and also opening the door further for research in improving the developed system. The lesson learnt is also included in this chapter.

CHAPTER 2: REQUIREMENT ANALYSIS AND FEASIBILITY STUDY

2.1 Literature Review

Virtual schooling was first employed in the mid-1990s and has become a common method of distance education used in K-12 jurisdictions. The most accepted definition of a virtual school is an entity approved by a state or governing body that offers courses through distance delivery most commonly using the Internet. While virtual schools can be classified in different ways, the three common methods of delivery are by independent, asynchronous or synchronous means. Presently, the vast majority of virtual school students tended to be a selected group of academically capable, motivated, independent learners. In most cases, virtual school has been beneficial for adult learners. This stems from the fact that research into and practice of distance education has typically been targeted to adult learners.

During the development phase of virtual school, several other similar applications and portals were visited and reviewed. Some of the applications like ‘School Binder’ were found very complex and complicated due to which the application was not very successful and taken down.

2.1.1 Similar Projects

Some of the currently running systems include K12 Online Education and Virtual SC. Both of them are quite similar to the Virtual School but both of them are unreachable for common Nepali students as they demand certain charges.

2.1.1.1 K12 Online Education

K12 Online Education is a web portal specifically for provide various online classes for the student from Kinder Garden level to grade 12. The K12 Online Education allows user to sign up for various classes that they provide which will definitely provide a fast communication between the teacher and the Student. By having a good online presence K12 Online Education is running very well, the online presence certainly helps students and parents find their preferred educational service easily through the website.

2.1.1.2 Virtual SC

Virtual SC is a supplementary online learning program, sponsored by the South Carolina Department of Education. It offers free, online courses to students in grades 7-12 that are already enrolled in, and sponsored by a South Carolina public, private or homeschool, or those enrolled in an Adult Education Program.

Their program does not have a daily attendance requirement and students can take an unlimited number of courses, as long as they are approved by their sponsor school. Courses are available 24/7 during each semester, so students can complete their Virtual SC coursework at times that fit their schedules. It has offered over eighty (80) rigorous course options for high school credit that are offered in either a fall, spring, summer or yearlong. Parents can create their own Virtual SC accounts to monitor student progress.

2.2 Requirement Analysis

Requirement analysis for this study has been done by first identifying key factors that will affect the project and key people who will be affected by the project. We captured them and categorized the requirement after which we interpreted the requirements.

2.2.1 Functional Requirements

By conducting the requirements analysis, we have listed out the requirements that are useful to restate the problem definition. Some of the functional requirements of the system 'Virtual School' are given below: -

- System must be able to take inputs from the users.
- System must be able to search the information that user ask/need.
- The student must be able to view events, notices, routines, results, submit assignments, download notes, ask question to teachers.
- The system administrator must be able to add, view, update & delete events, notices, routines, results, courses, students, teachers, other staffs.
- The librarian must be able to view events, notices, books status and issue books.
- The system administrator must be able to view records of students, teachers and other staffs.
- System must be able to give meaningful output to the users as per the given input.

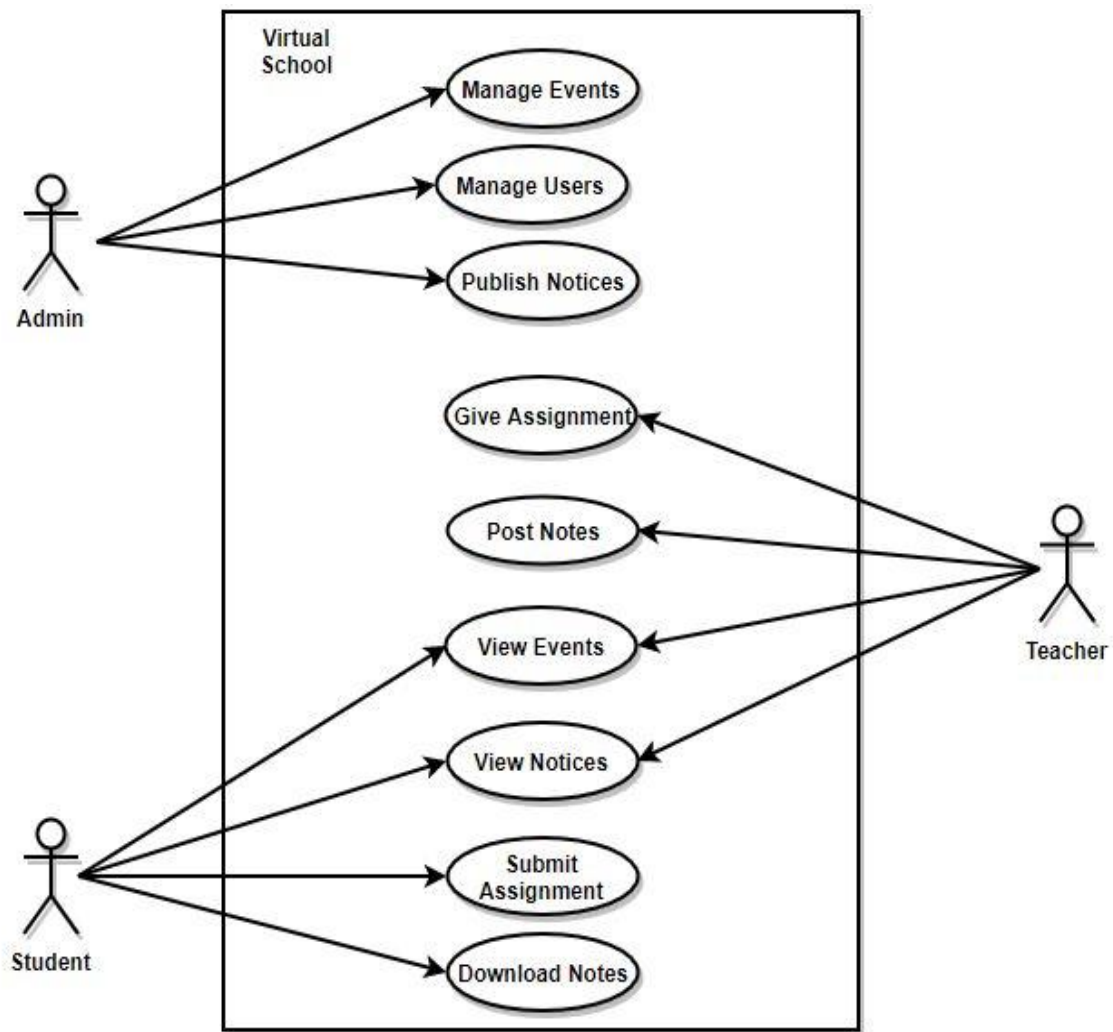


Figure 1:Use Case Diagram for Virtual School

2.2.2 Non-Functional Requirements

There are constraints on the services or functions offered by ‘Virtual School’ such as timing constraints, constraints on the development process, standards, etc. After conducting requirement analysis some of the non-functional requirements were found out. Some of them are listed that are useful to restate the problem definition are given below:

User Interface

- The system maintains an easy to use interface across all functionality and for all users.
- The client’s user interface is compatible with all commonly used browsers.

Scalability:

- The system is based on the number of users using the systems.

Security:

- The administrative is protected from unauthorized access.
- The database is protected from attacks and unauthorized access.
- All passwords are stored as a secure hash of the administrator password.

Portability:

- The system is run on a variety of web browsers including chrome, Mozilla Firefox etc.

Maintainability:

- There is a clear separation of back end and front end.
- There is a clear separation between the data access objects that map the database and the business logic code.

2.3 Feasibility Analysis

Virtual School uses simple development tools and uses no physical hardware devices. Beside this, it contains single database which is feasible and easy to develop and maintain. Web system for administration use only computers and internet.

2.3.1 Economic Analysis

The system Virtual School is economically feasible since it can be used through a single computer device having internet access. This application is economically feasible because this application is made using open source software and the time spend in the development of this application is 3 months.

2.3.2 Operational Analysis

The system can easily be developed under less operational effort and can be implemented under current technology. User with low technical knowledge may get deprive from the benefits that the system provides but rapid increase in use of smart device which made this system easily accessible to all level users.

2.3.3 Technical Analysis

Our system uses simple development tools and use no physical hardware devices. Beside this, it contains single database which is feasible and easy to develop and maintain. Web system for administration use only computers, and internet. On the other hand, web app uses personal data or existing Wi-Fi technology which is technically feasible.

2.4 Dataflow Diagram

The (Data Flow Diagram) DFD shows the flow of the data inside the system. DFD has its different level. The 0-level is for overall system data flow, 1 level DFD is display of flow of data between different components of the system.

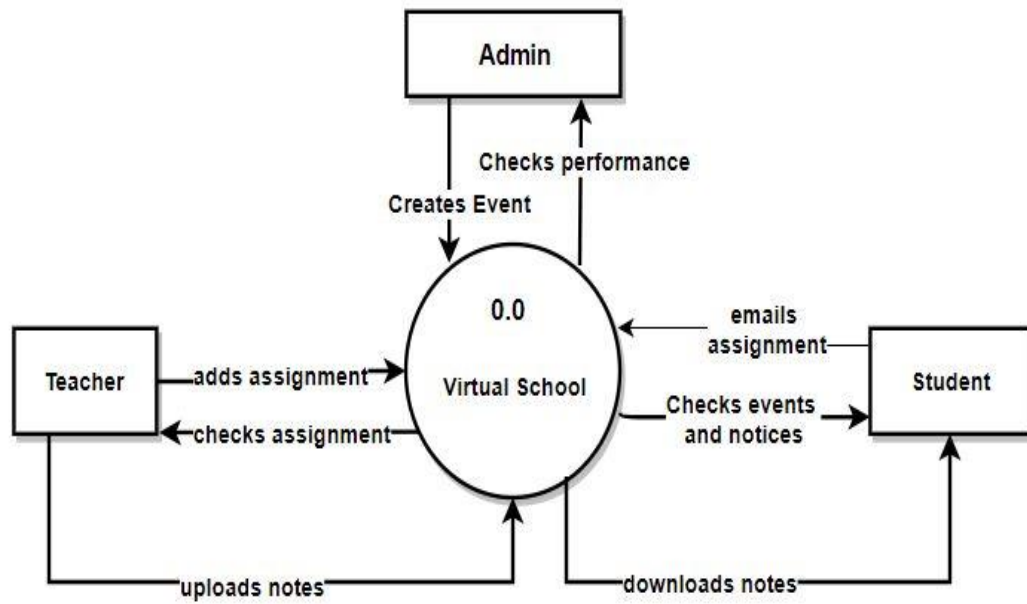


Figure 2:Context Diagram of Virtual School

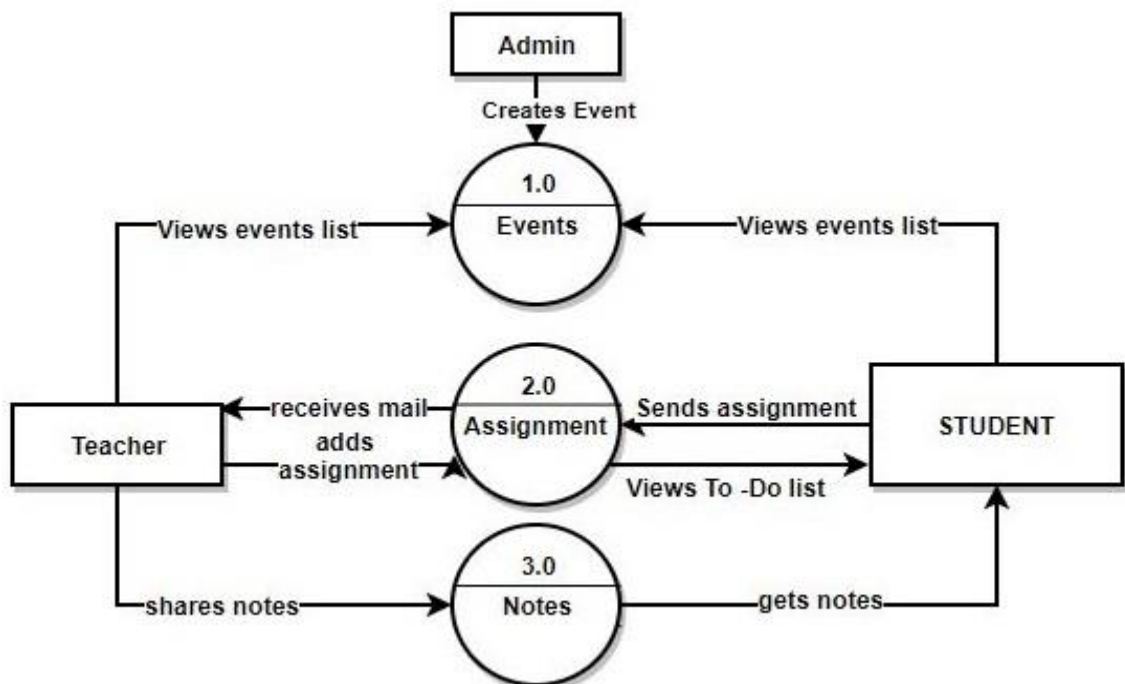


Figure 3: Level 0 DFD for Virtual School

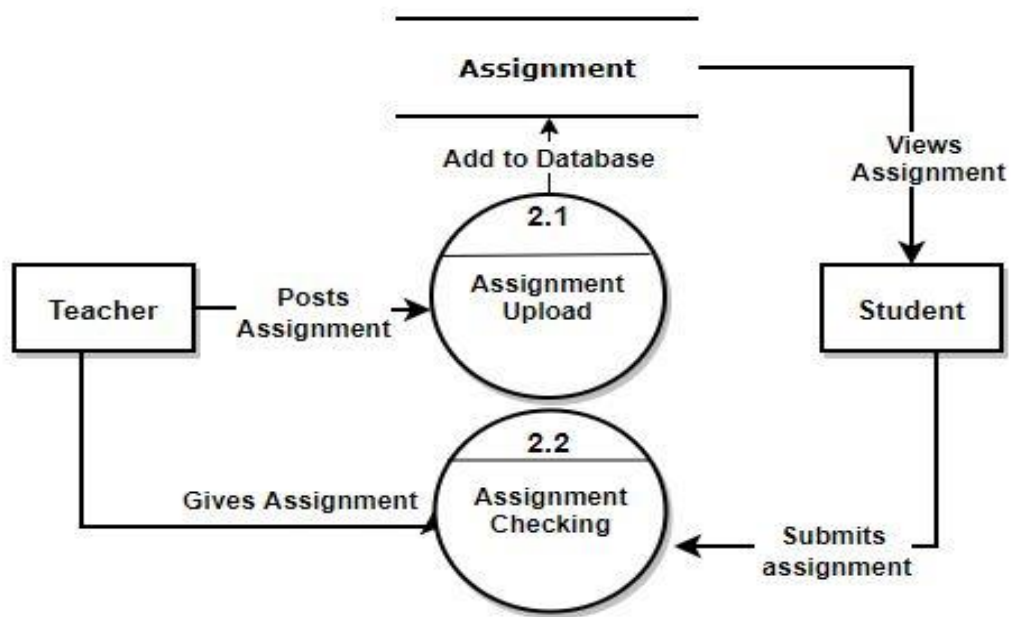


Figure 4:Level 1 DFD for Virtual School

2.5ER Diagram

The entity relationship model for the ‘Virtual School’ reflects the data model of the system. There are six entities altogether in the system. The brief description of data modeling is illustrated with diagram below.

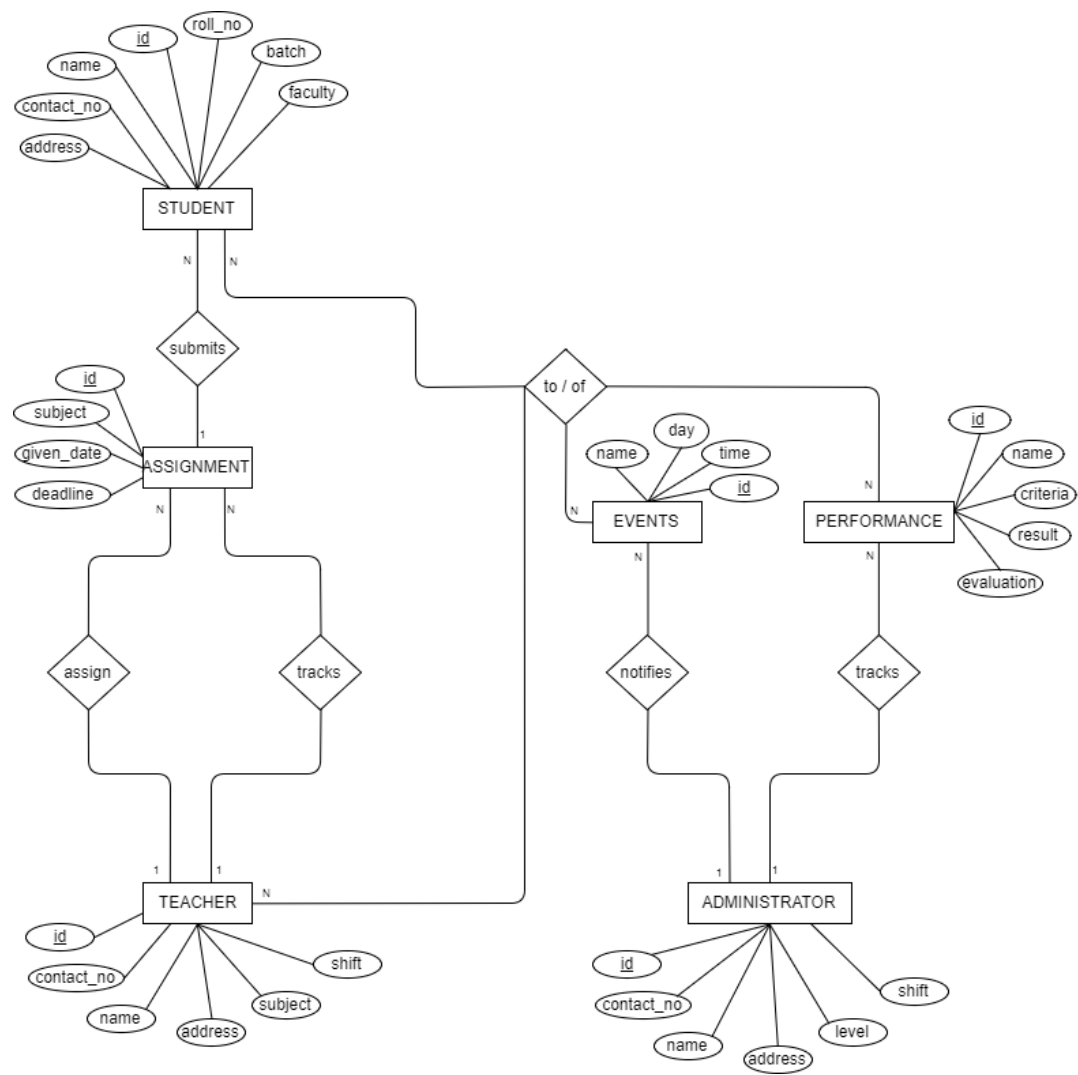


Figure 5: ER diagram of Virtual School

CHAPTER 3: SYSTEM DESIGN

3.1 System Design

During the process of system design various elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system were defined. After finalizing the user requirements, the architecture, components, modules, interfaces etc. were designed.

3.1.1 Database Schema Design

The database schema of a database system is its structure described in a formal language supported by the DBMS. The system Virtual School contains seven entities and single database.

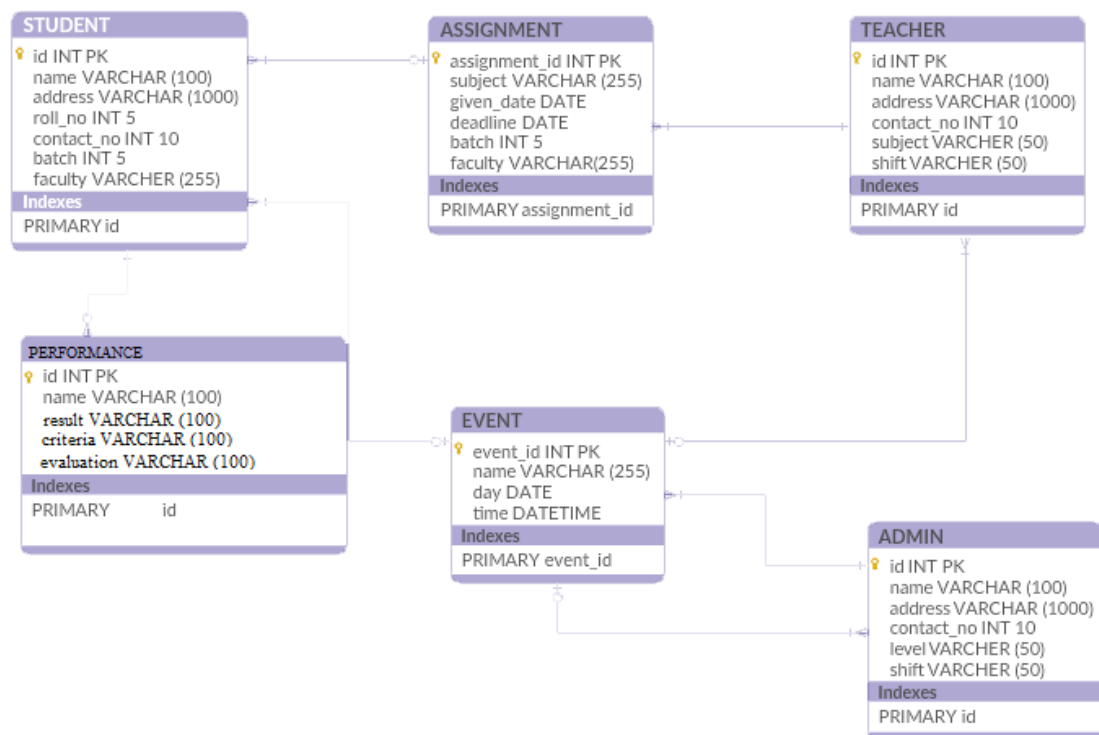


Figure 6: Database Schema of Virtual School

3.1.2 Interface Design

Interface design plays a vital role in generating interest of the user. It also helps in increasing usability of the any system. Hence for making our web application user-friendly and providing enhanced user experience to our users we have used effective and simple user-friendly interface design which will be immense help in achieving the objectives of the web application.

Following steps have been followed for designing convenient interface design:

- Navigation of the web application is simple and easy to follow.
- Menu is positioned at the top and to the left.
- User profile, notifications and messages are positioned at the top and to the right.
- Photo, images and texts are selected and organized in way that they enhance the readability of the users.

For the purpose of making the web application user friendly we have used Html5 which is markup language, CSS, JS and bootstrap as the front-end framework.

3.1.3 Process Design

The activity of determining the workflow equipment needs and implementation for a particular process. Process design typically uses a number of tools including flowchart, data flow diagrams, ER diagram etc.

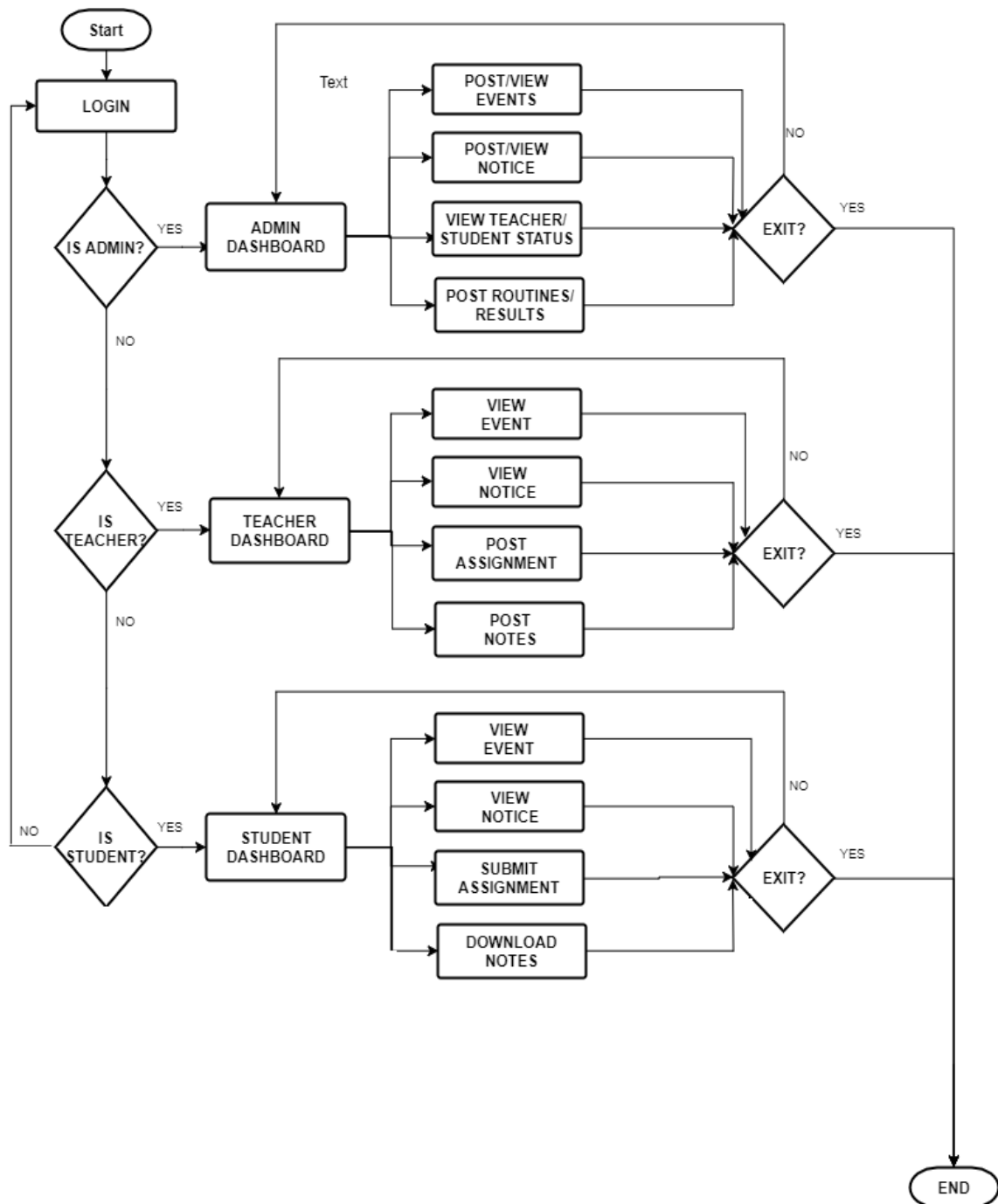


Figure 7:Flow Chart of Virtual School System

3.1.4 Sequence Diagram

The sequence diagram defines manner in which the system is operating. The admin, teacher, librarian and student logs in and registers to the system application. The application verifies user and thus user can perform and view only accessible contents. The

admin is responsible for adding and modifying the events, courses, students, teachers and other staffs in the system as well as manage them.

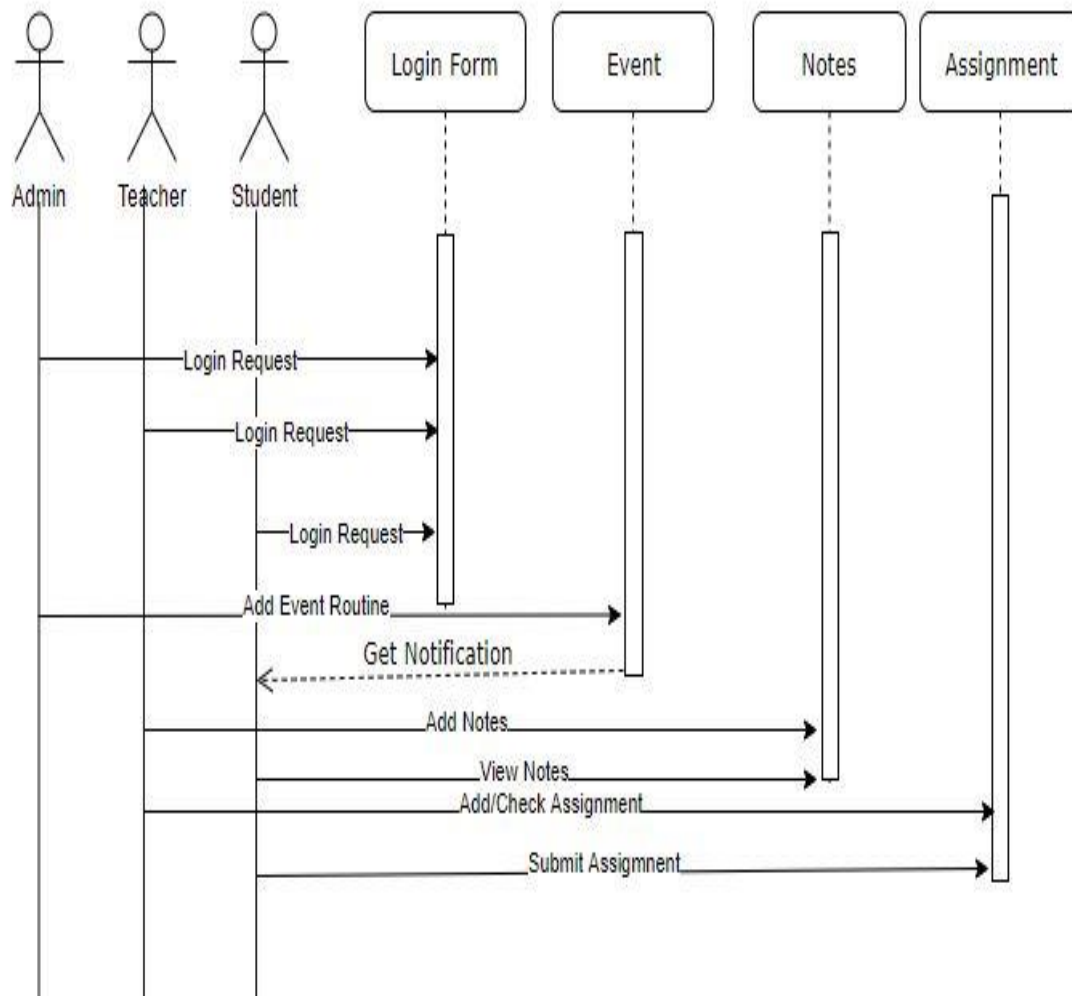


Figure 8:Sequence Diagram of Virtual School

3.1.5 Input Output Design

The login page of the system will provide three options to access, which includes logging in as admin, teacher or as a student. After that, the user is privileged accordingly to use the system. Processing is hidden from the user and output is displayed informing various details to the user.

Table 4: Input Output Design of Virtual School

Input	Process	Output
Inputs required by Virtual School:Username/Email or Password	Checks in if user is making valid requests and then checks the status of user and provides them privilege accordingly.	If the request is valid then the user gets logged in to their dashboard and if request is invalid login is denied.
As an admin user adds event.	An event gets created and database table 'event' is filled with new entry	All the users of the system are able to view added events
As a teacher, user add notes and assignment	Database tables notes and assignment gets new entry respectively	Students are able to view about notes and assignment.
As a student, user sees events, assignment lists and submits them.	Assignments are uploaded to the system and saved them.	Assignment is received by teacher.

CHAPTER 4: IMPLEMENTATION AND TESTING

4.1 Implementation

There are five major tasks in this phase; coding, testing, installation, documentation and training. The purpose of this phase is to convert the physical system specifications into working and reliable software and hardware, document the work that have been done and provide help for current and future users.

4.1.2 Tools Used

We have used various tools throughout the project. For Front end design, for diagrammatic representation of database schemas, flow diagrams, Activity diagrams, for documentation purposes etc.

Front end

HTML (Hyper Text Markup Language) was used to present whole information to the browser is done with the help of HTML.

CSS (Cascading Style Sheets) was used in this system to give style to webpages.

Bootstrap framework to design forms and table.

Back end

MySQL was used to maintain database.

PHP was used for web development by back end developer.

Documentation Tools

Microsoft Word was used for documentation process.

Draw.io was used for designing of:

Text Editor

Sublime Text editor is the text editor used for coding purpose.

4.2 Testing

After the code was developed in the coding phase, the codes were tested to check whether or not it complied with the requirements and that the code actually solved the needs that were addressed in the requirements phase. Testing has been done for the individual activities of the project. Errors that occurred were corrected and further debugging was performed. In testing phase, various units, modules, interfaces were tested. This phase consumed 40-50% of development efforts. Different types of testing methods like unit testing, system testing was conducted.

4.2.1 Unit Testing

The basic unit of software that is testable is known as a module or unit. After the coding of modules, they were tested, made error free and debugged. In this way we carried out the unit test. Some of them are listed on the table.

Table 5: Unit Testing of Virtual School

Test Case	Test Data	Expected Result	Observed Result
1. Login	1. User name: Valid Username 2. Password: Valid Password	User successfully logged in.	User logged in Successfully
2. Teacher roles Checking	1 Username: teacher 2 Password: password	Route to: teacher.php	Routed to :teacher.php
3. Admin roles checking	1. Username: admin 2. Password: admin	Route to :admin.php	Routed to: admin.php
4. Student roles checking	1. Username: student 2. Password: password	Route to: student.php	Routed to: studnet.php

4.2.2 System Testing

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. After the working modules were integrated to form a complete system, it was tested again.

Table 6: System Testing

Test Case	Test Data	Result
Login Test	a) Username="admin" password="admin" b) Username="teacher" password="password" c) Username="student" password="password" d) Username="Random- Name" password="Random Password"	a) Logged in as admin b) Logged in as teacher c) Logged in as student section d) Login Failed
Admin Activity Test	a) Clicked on "Add New Event" b) Clicked on "Add Student, Teacher, Librarian Link" c) Clicked on Add Course Link	a) "Add new Event" page was displayed b) Student, Teacher, Librarian information form was displayed c) Course Detail filling form was displayed.
Teacher Activity	a) Clicked on "Add New Notes" button b) Clicked on "Add Assignment" link.	a) Add Notes page was displayed b) Add Assignment page was displayed
Student Activity	a) Clicked on "Menu List"	a) Menu List was displayed

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Virtual School can be used to overcome education problems in Nepal. Since, the system is totally web based; it is focused on distance learning. The adaptation of the system application by the educational institutions can increase efficiency of teaching and also makes teaching-learning process more enjoyable and effective. It helps students in learning, discussing about question and assignments as well as submitting them beyond the college hour. Teachers can help student in learning process from home. Administration can perform management activities easily and effectively. In country like Nepal, this system is more applicable where students are deprived of learning resources. Usually, teachers avoid going to rural areas for teaching. In such places implementation of this system would definitely aid students to get highly qualified teachers.

Virtual School application cannot solely change the educational system but could make some influence. It can surely be the major factor for improving educational status of Nepali rural areas.


5.2 Lesson Learnt

In this internship period intern got chance on refining skills and experience on developing a project using frameworks. This intern project has successfully heightened management skills, learnt to schedule and complete. During this internship period the intern has worked on other websites development using core PHP languages. The intern got chance to learn basics of git, SEO and Django app development and deployment in NGINX servers as well.


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APPENDIX



Sign in to start learning





☐ Remember Me

[Forgot Password ?](#) [Register](#)

Figure 9:Login Page

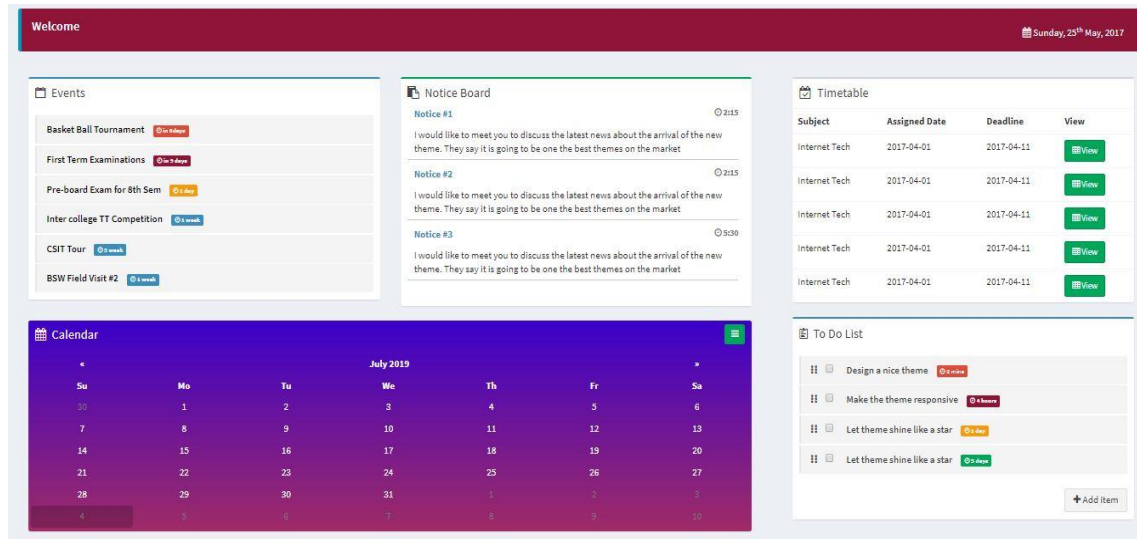


Figure 10: Student Dashboard

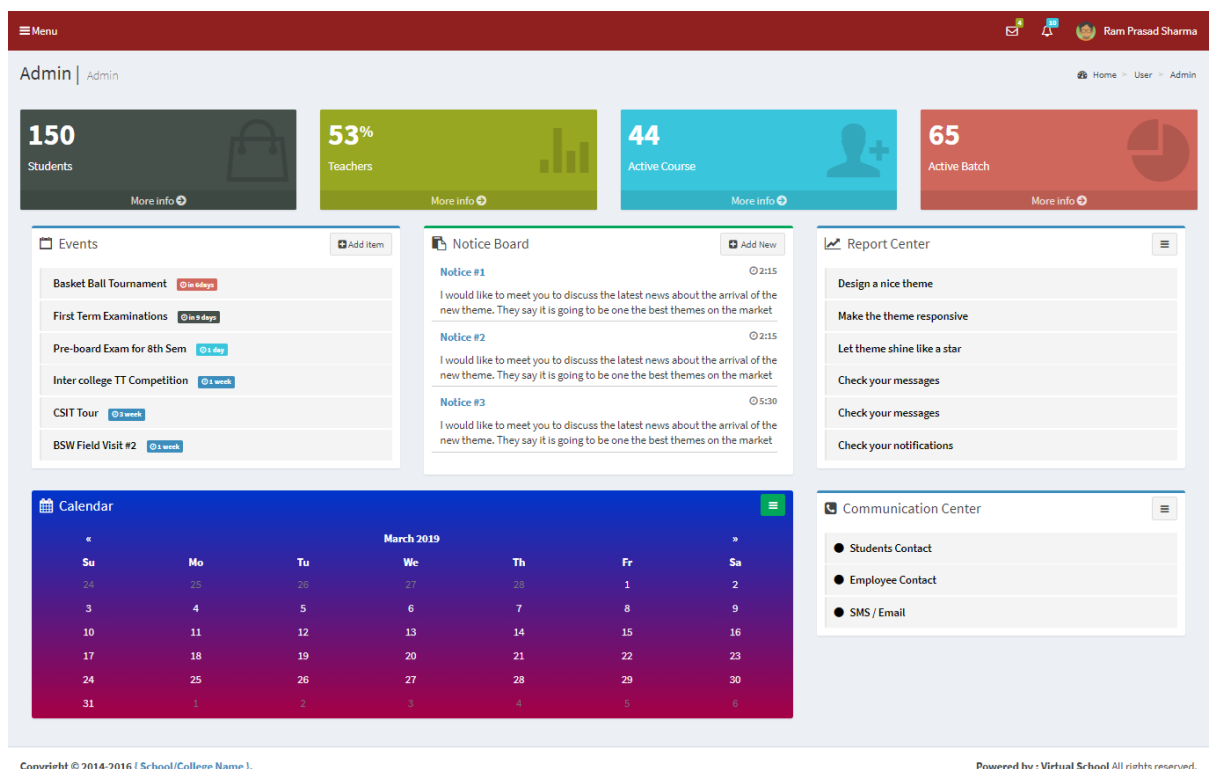


Figure 11: Admin Dashboard

Menu

10

Shyam Bakhrel

Teacher | Teacher

Home > Admin > Teacher

The teacher name field is required.
The email field is required.
The mobile field is required.

Add Teacher

Basic Info

Teacher Name

Enter Student Name

Department

CSIT

Email

Enter Email

Mobile

Enter Mobile No.

Address

Enter Mobile No.

Image

Choose File

No file chosen

Add

Reset

Teacher List

Show10▼entries

Search:

SN	Teacher Name	Mobile	Department	Actions
1	abc	9844249654	CSIT	<div><div></div><div></div><div></div></div>
2	Shyam Bakhrel	9844249654	CSIT	<div><div></div><div></div><div></div></div>

Showing 1 to 2 of 2 entries

Previous

1

Next

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Figure 12: Admin Dashboard – Add Teacher Form