



Tribhuvan University

Institute Of Engineering

Pulchowk, Lalitpur

Report On



Department of Electronics and Computer Engineering,
Pulchowk Campus

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Submitted To:

Department of Electronics
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Acknowledgement

No project is an ad hoc process. We need planning and systematic arrangement for an effective project. In our own accord, we were not ourselves enough to plan and complete this work. We could get the help in need that encouraged us in our plan and development of the project.

We are really grateful to our respected sir Dr. Aman Shakya for his suggestions and encouragement for doing this project. We would also like to thank Er. Manoj Ghimire for his valuable suggestion. We are grateful to Er. Mukesh Keshari for providing this project to us and helping through the plan and development till date.

We would like to express the vote of thanks to all our seniors and friends who directly or indirectly helped us in the project planning and development.

Abstract

Institute of Engineering (IOE), Pulchowk campus is the government owned engineering campus running under the affiliation of Tribhuvan University. Though being a leading engineering campus of Nepal, the management information system of Pulchowk campus is not efficient in relative to other similar major institutes around the world. Taking this factor into account, we, a group of 4 students of 064 BCT group are building an efficient management information system (MIS), for the department of electronics and computer engineering of Pulchowk campus with the permission of department.

The development of the MIS is completely on the basis of the requirements of the department of Electronics and computer engineering. We are consulting Mr. Mukesh Keshari, CIT Network Administrator who will help us by providing the requirement of department and developing the MIS for the Department.

The Project till developed is at the mid phase. After the project is fully developed it will be implemented as the newer version of the current web site of the department, www.doece.ioe.com.np . With the successful implementation of the project all the students and staffs of Electronics and Computer Engineering faculty will be benefited and there will be proper sharing of the resources.

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1. Introduction

A management information system (MIS) is a system or process that provides information needed to manage organizations effectively. MIS is usually focused on the integration of computer systems with the aims and objectives on an organisation. Here the organization is the department of engineering college in Nepal and our main objective is to have good Faculty information system (FIS) and other useful information academically required.

Institute of Engineering, Pulchowk Campus is the leading engineering campus in Nepal. IOE also has to run with the increase in competition and quality. Within IOE Department of Electronics and Computer Engineering is the department responsible for providing knowledge on different technology related to electronics and computer field. This fact makes that the DOECE must be well equipped with new technology. The foremost property that is responsible to make the department more efficient is the management information system of the department.

By developing the MIS (FIS as the main part) we can flow the information between students and staffs. As the user of the Information System (IS) is widely variable and can obtain or share information from anywhere MIS should be developed in web. Currently working information system of the department is www.doece.ioe.com.np . At present the IS doesn't contain many required information and hence not used by Staffs and Students. Due to the reasons stated above Department wanted a good MIS website and we have decided to develop a full MIS for the Department of Electronics and Computer Engineering.

MIS topic is vague for a department so the project is emphasized only to a portion listed below:

- 1. Human Resource Management:** It includes the data management of students, teachers and staffs.
- 2. Faculty Resource Management:** It includes the data about the faculties and faculty matter of the department such as syllabus, materials, tutorial, academic project, etc.
- 3. News Information Management:** It includes the flow of information of message, notice, new and events.

2. Objectives

- To develop an efficient and dynamic Management Information System required by the Department of Electronics and Computer Engineering of Pulchowk Campus.
- To implement the MIS developed as the newer authentic version of the web site of the department mentioned above
- To make the doece website user interactive with different features for different users.
- To decrease the cost of department in the field such as routine development, tutorial and lab sheet distribution.
- To help teachers to manage their time and conduct different activities such as project development, reference providing, assignment notice, assessment notice.
- To make documented and well organized project so that different features that would come across in the future can be added without the need to re-organise the system.

3. SYSTEM ANALYSIS

3.1. Existing System

The existing system in DOECE has the features which are more static. The MIS has the features of managing the data about the students and other professionals related to the department. In the current system, there are three levels of users, administrator, student and teacher. Administrator can manage the information about teachers, students and other staffs. Teachers can provide materials to the students. But those materials are public and students have to search their required material which is a tedious task. All the students, teachers and staffs have their personnel profile. They can log in the system and use the features provided by the system to them.

3.2. Requirement of new system

The main purpose for the requirement of the new system is that the current system does not have more dynamic features which will make the new system more effective. From the broader view, these features are minute, but the current system lacks many such features. For example- it would be more efficient if a teacher can provide materials for the specific group of students so that only the targeted students can view the information or get the materials. From our own experience, we have found out that there is less number of students using the current system. This is due to the limited features offered by the current system. So a new system is needed which can provide many functionality for the students so that they can use the system. The other main problem of the current existing system is that there are some unfinished features in the system. For Example- there are certain links that do not work due to which the credibility of the system is hampered. The design of the site is also not perfect. The JavaScript applied to show sucker fish menu is not user friendly which is hampering the credibility of the current system. So a new system is required which has all the work finished and performing as a single unit with minimum faults so that the system will be more credible and more users and use the system with higher confidence.

4. SYSTEM DESIGN

4.1. Overall System View

The project will be developed with the web based and database approach.

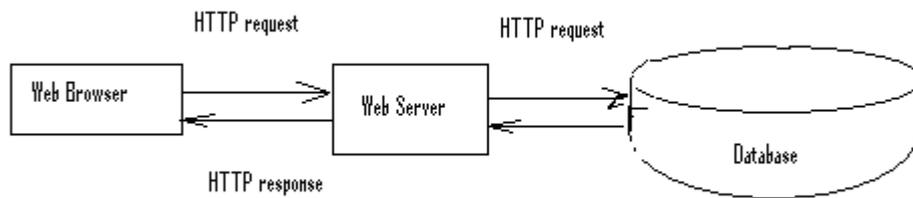


Fig. Basic System Architecture

4.2. Methodology

As *MIS* we developed is the web based management information system we could clearly have three distinct modules. These are the database design module, web page creation module and debugging and testing module. These modules stated go parallel for each type of division of project. In each division database design module is done first which is followed by webpage creation module and debugging and testing module. We followed the *spiral model*, an evolutionary software process model that couples the iterative nature of prototyping with the controlled and systematic aspects of the waterfall model.

4.3. Developments Tool Used

PHP

PHP is a scripting language originally designed for producing dynamic web pages. It has evolved to include a command line interface capability and can be used in standalone graphical applications. PHP is a widely-used general-purpose scripting language that is especially suited for web development and can be embedded into HTML. It generally runs on a web server, taking PHP code as its input and creating web pages as output. It can be deployed on most web servers and on almost every operating system and platform free of charge.

MySQL

MySQL is a relational database management system (RDBMS). The program runs as a server providing multi-user access to a number of databases. MySQL works on many different system platforms, including AIX, BSDi, FreeBSD, HP-UX, i5/OS, Linux, Mac OS X, NetBSD, Novell NetWare, Windows 95, Windows 98, Windows ME, Windows NT, Windows 2000, Windows XP, and Windows Vista. A port of MySQL to OpenVMS is also available.

JOOMLA

Joomla is a free and open source CMS or content management system for publishing content on the World Wide Web and intranets. It comprises a model–view–controller (MVC) Web application framework that can be used independently also. Joomla is written in PHP, stores data in a MySQL database and includes features such as page caching, RSS feeds, printable versions of pages, news flashes, blogs, polls, search, and support for language internationalization.

JQuery

jQuery is a cross-browser JavaScript library designed to simplify the client-side scripting of HTML. The jQuery library is a single JavaScript file, containing all of its common DOM (Document Object Model), event, effects, and Ajax functions. It can be included within a web page by linking to a local copy, or to one of the many copies available from public servers.

Other Resources (plugins)

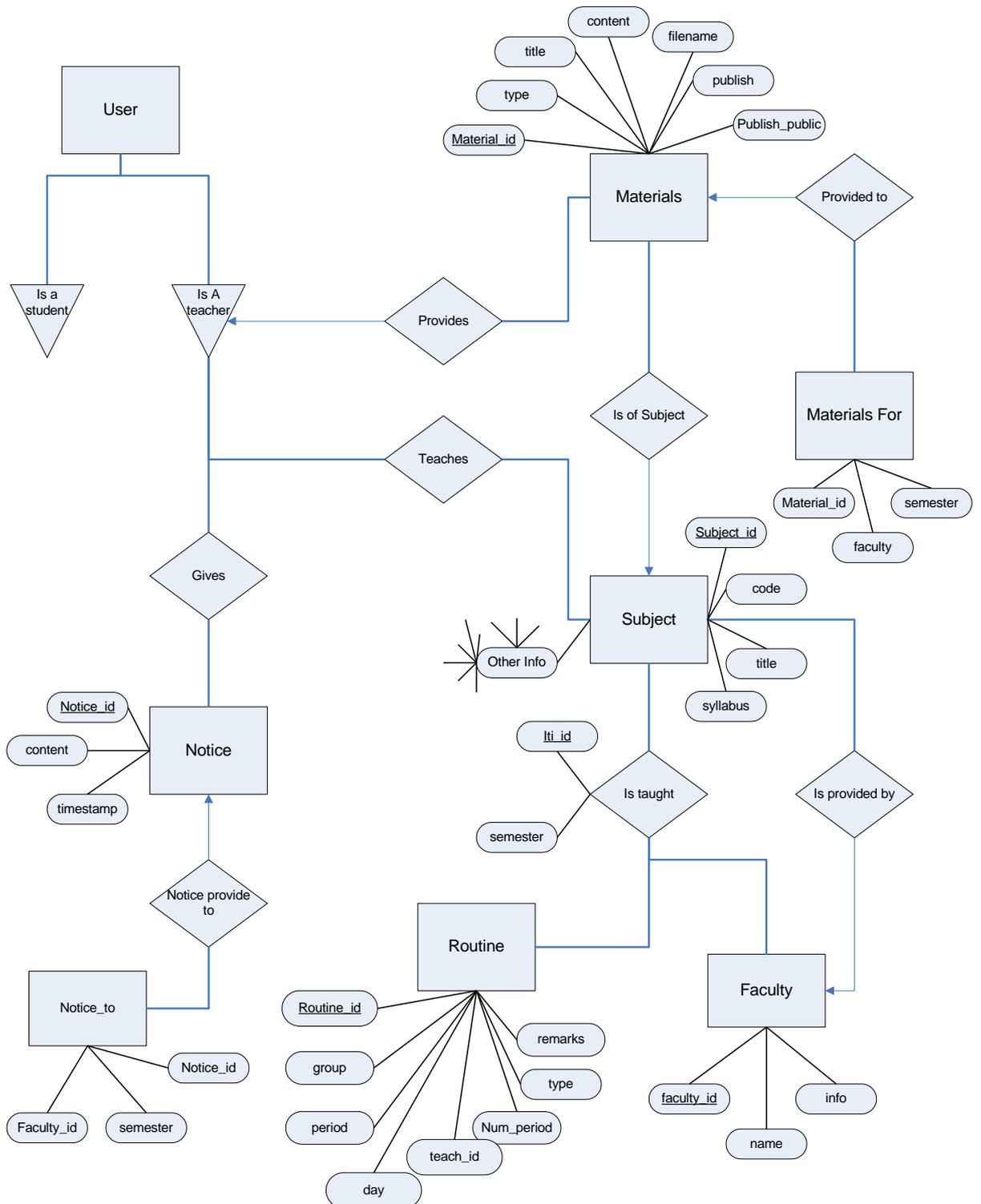
Apart from these major resources we may be using different plugins such as form builder, direct PHP, etc provided for JOOMLA for ease. Some of the plugins used are **Jumi** and **Superfish menu**.

IDE

The IDE used in the project is Dreamweaver CS 5 which has many facilities. In this version the syntax error are warned in the coding page too. So it makes ease in programming. The spry framework integrated in Dreamweaver CS 5 is an open source Ajax framework developed by Adobe Systems which is used in the construction of Rich Internet Applications. Unlike other pure JavaScript frameworks such as the Dojo Toolkit and Prototype, Spry is geared towards web designers, not web developers.

4.4. Database Design

The main features in our project which can be easily shown in ER-diagram is shown below. It mainly represent the materials, subjects, faculty, notice and routine.



5. Project Description

5.1. User Level in the System

There are 5 distinct user levels defined in the system. They are

- **Super administrator:**

These are the users which are allowed to the coding level access to the MIS. Super Administrator is primarily the administrator working in Joomla. They can bring on almost all changes in MIS from design of the MIS to the updating of the MIS.

- **Administrator:**

These are the users who are allowed for adding the data to database through form provided. In the MIS developed for the Department of Computer & Electronics Engineering Administrator is a person or a group of person who are authenticated to bring about any academic or other changes in the MIS that are related to the department.

- **Teacher:**

In the MIS teacher are also treated as a separate user level. As there are several features required by teachers which are unique to them such as providing tutorials, assignments a separate user level for teacher is developed. They are allowed to add the teaching materials required by them.

- **Student:**

This is the most important user level in the MIS. Since students access MIS more frequently, MIS has been developed for more easier and convenient access of students to the students. They can access MIS primarily to view their teaching materials and semester information. To make the learning academic more dynamic there are features such as forum discussions on various topics and uploading of information in the MIS.

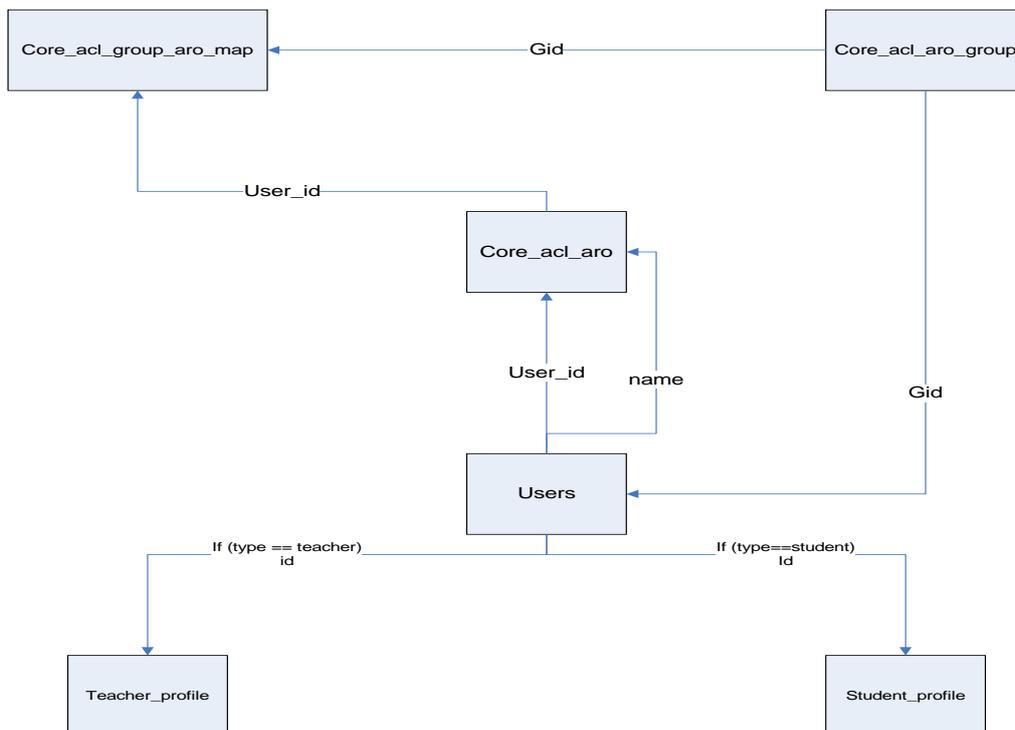
- **Staff:**

This user level is targeted for all the working staffs in the Department. They can access the privileges provided for registered level.

Apart from these levels public can also view the site and use the site in the way they are accessed to and obtain the information of the department.

5.2. New user creation process

When a user is created in Joomla, the data are entered in 5 tables. The attribute flow between these tables can be shown as:



5.3. Features Developed

Features available for different level of users are:

- **Super admin level**

Super Admin level is provided by the Joomla itself through which we can update our site in sense of coding and designing.

- **Admin level**

Administrator in the MIS is provided with features of managing faculty subject and routine. This includes, adding new subject according to the updated curriculum, adding teachers for the different subjects and managing routine for different subjects that are taught by different teachers. Managing routine is dynamic in MIS. The administrator is provided with the flexible feature for slotting periods for different classes.

- **Teacher level**

In the current trend of the Department, it is difficult for the teacher to provide materials. So to address this, in the MIS developed teachers can upload all the teaching materials from his account and the materials will be seen by the students to which teacher intends to provide the material. As discussed earlier the routine in MIS is dynamic. Teachers can view their personnel routine from in their profile. This makes easier for the teacher to manage time according to the routine.

- **Student level**

The students can view all the materials that are provided by the teacher. If a teacher uploads a material like assignment or tutorials for a group of class (batch or faculty) then the students belonging to that group will have access to the material provided by the teacher. Students are also notified about updates of material. Students can also view routines of their class. After administrator manages the routine and publish it, then the specific routine will be viewable for the specific students.

- **General**

The general features are the features that are provided to the general public. Information about DOECE such as the establishment information, objectives of department, organization structure, different publication and message from HOD can be obtained. Human resource information such as teacher, staff and student are displayed through which public can view their profile. The information to be provided is given by the individual users. New and Events related to the department are also published in the site. Public can be updated by viewing these information.

5.4. Some Snapshot related to features for different user level

DOECE	About DOECE
Programme	Objectives
Teacher	Historical Managemnet
Students	Message From HOD
Staffs	Organization Structure
News	
Events	
Semester Details	
Publication	
Quick Link	
Useful Link	
Feedback	

Administrator Menu	
Create User	
Academic Entry	Add faculty
New News entry	Add Subject
New Event Entry	Add is taught
Display Faculty	Add teach
Display Subjects	Add routine
System	
Import	
Run Query	

Student Menu
Student home
View Material
Student Routine
Veiw Profile
Edit Profile
Search Material

Teacher Menu
Home
Add Material
Vew Material
Search Material
Teachers Routine
Veiw Profile
Edit Profile
New Notice

5.5 Security

i) No access to directory list:

This is the basic level of security where an outsiders cannot see the directory list of the files saved in server through URL of directory. If they can see the file list then they can download and obtain important information.

ii) Joomla page security

Joomla provides a level of security where it authenticates each and every page, modules, component we have created in Joomla. If the user does not fulfill the authentication priority, then he cannot access the pages, component or modules. In our project there are five levels of users' public, student, staff, teacher and admin in front-end.

iii) No access to pages through URL

Each page we created is imbued with Joomla. If any one frauds our page without using Joomla environment, then they cannot access our pages. All these pages require Joomla environment before it displays.

iv) Cross Site Request Forgery

We have also included a token system to protect from Cross Site Request Forgery (CSRF). CSRF involves the creation of false form from another site redirecting it to our url for intruding into our database. This type of forgery can be controlled by use of token variables which are hidden fields in form which is checked when the form is submitted for forgery test.

5.6. Problem Faced

- Embed PHP code in Joomla

The problem was faced as the fact that Joomla doesn't default support the php coding. But we were able to solve this problem by using the plugins.

Solution: Used Joomla plugin: Jumi

- Create ACL (Access Control List)

In Joomla 1.5 there are limited Access Control List like public, registered, author, editor, publisher, backhand administrator and super administrator. There is no any way to create custom ACL like student, teacher, and staff in the site. This is the main drawback of Joomla version 1.5. Joomla 1.6 has addressed the problem and added this new feature but it is just released and not recommended for official project. Hence we could not add it. The problem was solved manually by adding ACL in Joomla database as well as in Joomla coding.

Solution: Added access groups manually

5.7. Further Development

- Enhancement in developed pages
- Project
- Beta test of the site.

6. Conclusion

We suppose that the project will be a very useful one for Department purpose and we hope that there will be good flow of information through this system. We obtained full cooperation, necessary resources and guidelines and we almost completed our task as mentioned in submitted proposal and made the project the best and effective one.