Design of a Multifunctional Web Portal for College Departmental Activities

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Abstract - *Maintaining a Website has become indispensable for any large scale organization, especially colleges and universities, where it is required to keep track of various information and parameters of thousands of students, faculty, laboratory equipment, etc. We are living in an era where digitization of physical documentations and processes are taking an exponential rise. Keeping and maintaining online records have become vital. Services such as application or admission form filling, examinations and accessing information have all become online now. Thus, a Website has become an essential requirement. This paper aims to design and build a Web portal for the college department. This Web portal will consist of various interlinked web pages comprising of various kinds of information and activities catering to the needs of the department. Crucially, it serves to reduce the communication gap between the faculty and the students by providing various services and applications such as an open forum for discussion, sharing of class notes, event news, results and database of journal publications as well as generating timetables. We aim to accomplish this using the latest scripting technologies like HTML, CSS, java script and PHP.*

Key Words: - CSS, Database Management System, HTML, MySQL, PHP.

INTRODUCTION

A structured and organized collection of data and information is the need of the hour at any Department of an Engineering College. Activities in a Department can range from organizing lectures to hosting major State National Level Technical Contest. It can also mean hosting seminars, news of campus recruitments, filing up important forms, and the list goes on. But the major issue at hand is that disconnect between the staffs and students regarding the information or the news. The reason, by large, is the unavailability of a centralized online system, wherein all the information like updates, news, events, etc. can be accessed and used by all the students of the department at any given time any place in a uniform, equal and consistent manner. This paper is specifically focused to tackle such issue by designing a Web Portal exclusively for the Activities in the department. This Web Portal will not only host centralized data available to all its users, but also improve the Communication between the Staffs and the Students by easy and effective sharing of contents and information in the Portal itself. Eventually the documentation is maintained effectively and important tool at time of accreditation process.

A Web Portal is a collection of Web forms, Web pages, images, videos, text and other forms of digital assets that is hosted on one or several Web server. It is basically a Website and a part Web Application, as it would be providing services to its users, regarding the latest news, placement activities, and Gate-Pass facility. Users, in this case, are the staffs and students of the department only. This application provides information about the college and the Department itself and also provides the sharing of all the soft copies of lecture notes, all available useful e-books of each and every subject, all subjects old question papers, syllabus copies, practical titles and all the material that any student want during his engineering.

This Portal would be handled by an Administrator. The Faculty staff members can upload their notices on particular sections which will visible to all the students and Staffs equally. With the help of this web based application, a user can use a single account to access the notes. Faculty and student likewise can also post notes in pdf format, e-books, word documents, lecture videos and important notices through intranet gateways. Student also can to send feedback or suggestion using message facility or discussion forums.

The outline of the paper is given as: Section I describes basic information of web portal. Section II explains many aspects of development of a Web site in terms of Planning the Web site, designing its pages etc. Dataflow of Web Portal development is proposed in Section III. Section IV depicts structure of website. Certain forms are explained in Section V. Finally, paper is concluded in Section VI.

Literature Survey

The main idea behind this work is in the coding and the layout of each and every page which ultimately decides the outcome of the web site. The Design and Accessibility of a page is related to the Front-end of the Web site, which is an experience any user will have while navigating through the web site but the Coding part of it is something the Programmer has to diligently take care of, as it will dictate the robustness and the flow of the entire website.

A lot of issues arise when using various Scripting languages simultaneously to code certain part of the pages and their interoperability. Each language is powerful and unique in its own way. So, combing them to optimize the output is a challenge. Various issues such as Redundancy, Security issues, Code Optimization, effective modeling, etc. Here are some research papers which address the various issues and optimization techniques in the building and designing of a website using the various languages used to code them.

Pallavi Yadav and Paras Nath Barwal have demonstrated the need of Responsive Designing using CSS3 and HTML5 in [1]. A modern website is a tool for any company to increase its visibility towards potential customers. It is common for companies, institutions, organizations and individuals to have websites to reach audience or customers. However, it is not enough just to be present on web and available through web search engines anymore. People are spending most of their time online and most of them are using handheld devices to access the Internet, so now websites need to be optimized for all these devices in order to provide the best user experience. Besides multiple resolutions and screen sizes, different web browsers and platforms, some differences also exist in the ways users input data in devices: using a mouse, touching the screen or making movements. Internet is accessible to anyone and anywhere. However, many websites are still not responsive; they are not optimized for different devices, mainly because of the technology used for website creation. Converting an existing website require lots of effort, money and time. While some web technologies are outdated (e.g. Flash) due to their incompatibility with different versions of the browser, new technologies, and www standards are in, the need of HTML5 and CSS3 for responsive designing of website is increasing rapidly.

According to Authors in [2], the Solutions regarding threat to session Management are varying, some are general while others are specific. All over the world Internet users are using web based systems that follows the client server paradigm. The web browser acts as the client for a web server that provides the service. These web based systems rely on the HTTP protocol for communication, but it is a stateless protocol. Over the last few years, the web has shifted from being a collection of pages containing static information to a dynamic and fully interactive platform. Where the Internet was once used only as an information repository, today it powers complex web applications, developed both to replace programs that used to run locally on a user's computer, and to provide whole new functionality that is possible only on the web. Most web applications handle user authentication via the concept of web sessions. These allow users to use a web application without having to enter their login credentials for every action taken. Unfortunately, web sessions have many security weaknesses. OWASP, a leading organization in the field of web application security, rates Broken Authentication and Session Management as the third most important web application security risk. A problem is that users of a web application have to trust the developer of the application to take the necessary security precautions. The web developer, on the other hand, may consider such precautions to be too difficult or too costly, leaving the users unprotected. Moreover, the web developer might not even know that his web application contains security vulnerabilities. To enable users to protect themselves against session attacks, regardless of the web applications being secure, a client-side tool offering protection against these attacks is needed.

Saurabh Walia and Satinderjit Kaur Gill have designed a Framework for Web based Student record Management in [3] exclusively for Colleges and Universities. The data framework is essential in gathering all information also data of all staff or part in one association to be in one spot. The framework is typically given extremely accommodating errand that will supplant the human as to keep it in record as the stock or different purposes. To outline a supportive framework with a specific end goal to make simplicity to the client, the framework is created by utilizing Xampp Server interfacing with database that is using 'PHP' language as the dialect or guideline of the framework. The proposed framework is a standalone framework. This framework centered on recording and updating the information. It is additionally given report on the other hand printed record to the client in the framework which will make the status of the student simpler to be checked. This new framework utilized database idea to store all the data which related with area application forms. This framework focused around database idea which is more solid. All learner information will be kept in a devoted database. By utilizing this database idea, a few issues, for example, information misfortune and harm could be stayed away from. This framework additionally focused to make a simple checking students' status. By utilizing this framework, staffs can check the students' status quicker in time contrasted with the current framework. Hence, the staff can lessen holding up time in place to check all the documents like some time recently. The other target is the issue that identified with looking and upgrading the information. Staffs can pursuit and upgrade the information methodically. This framework will give a few capacities, for example, looking and overhauling so as to help the staffs to control the information applications.

According to Peng Li and Eric Wohlstadter , Script InSight: Using Models to Explore JavaScript Code from the Browser View [4] the user interface (UI) is a key aspect of most Web sites. As Web browser programming standards such as JavaScript and the W3C Document Object Model (DOM) have matured, the implementation of UIs for many sites has seen a parallel increase in complexity. These rich Web applications have the advantage of providing a seamless and interactive experience for end-users. However, these applications also require more development effort to build and maintain than older Web UI. As the Web has become more interactive and complex, we are researching a more interactive, model-based approach for Web application

reverse-engineering and debugging. Most existing work on modeling of UI-intensive Web applications focuses on development but not specifically maintenance and debugging. For example, introduces a framework for the integration of presentation components in mashup applications.

System Development

The block diagram of proposed work of Website Development is shown in Fig. 1.
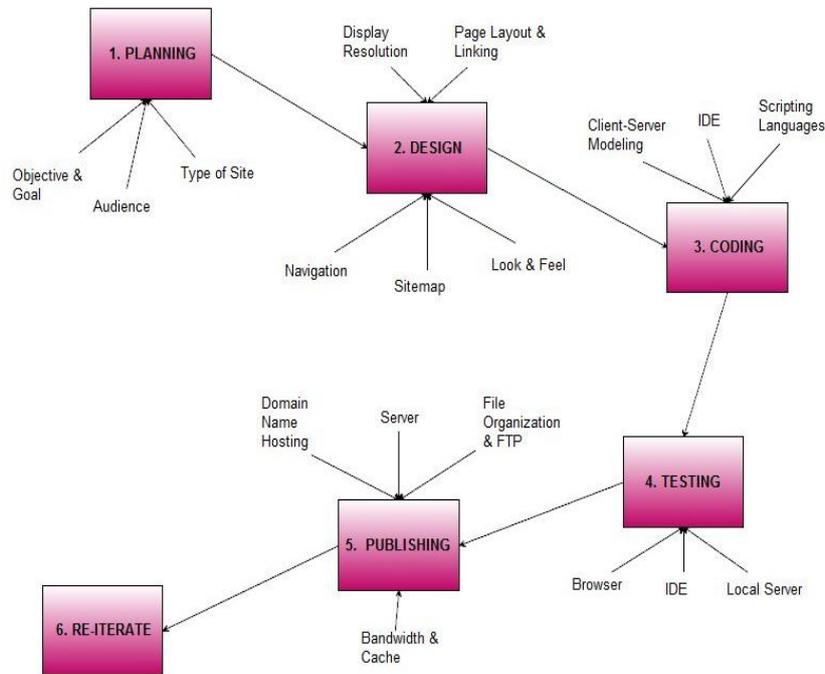
Fig. - 1: Proposed Dataflow of Web Portal Development

This system comprises of six blocks which are described as:

1. Planning: The significance is to make sure to understand that what user is being asked to do before the start! This can be seen from the point of view of both graphic design and functionality. The best idea is to make at least some sketches at the start to play with ideas, and then see if user can work out which pages should link to each other.

2. Design: This tries to provide a solution to match the requirements. It should also take into account what is possible with the various technologies that are available. Sometime hand coding, although more precise, can simply not be fast enough to meet a deadline!

3. Coding: This is the part where one start writing your HTML code. Hand coding is slow but precise and usually easier to follow. Generated script and HTML form an application can sometimes be non-standard.

4. Testing: After Spending some time on the code it is essential to check what it looks like. If, developed using an editor then use the browser at the page. An IDE can show the preview of a page.

5. Publishing: When one is satisfied with the output, it's time to upload and publish it to the Internet for Universal access.

6. Re-Iterate: If one feels like improving the pages or add more content or just change the layout, the same procedures have to be followed.

Website Structure

The Structure of the Web Portal can be divided up into four components, namely: Client side, Server side, Database & User Role.

4.1 Client Side

The Client side deals with the actual Web Pages which will be accessible to the User on his/her machine. The Web Pages need to be dynamic and responsive. For this Purpose we would be implementing HTML & CSS along with java script. The pages will be coded in HTML, the CSS will give design and structure to the page and java script will enhance the dynamic functionality of the page [5-8]. Login Page is shown in Fig. 2.

4.2 Server Side

The Server end deals with Server hosting the web pages. Since, this is a Dynamic Website; a Server should be capable of handling User requests. PHP programming language will be used to script and code the Server [5-8].
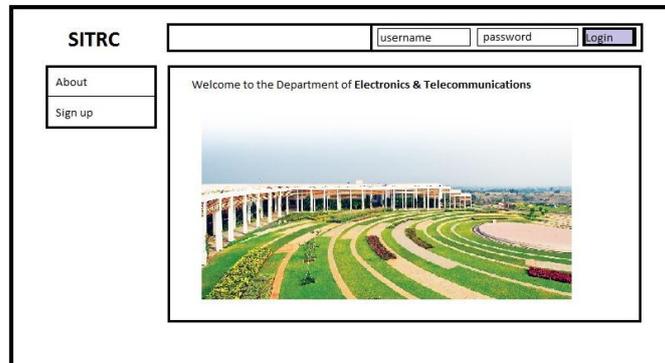
Fig. - 2: Login Page of Website

4.3 Database

Since, Our Web Portal will be an interaction of User Profiles; the data of the registered Users have to be stored on a database for Application, Management and Security Purposes. MySQL is an effective tool for Database Management System (DBMS).

4.4 User Roles

Three User Roles will be implemented in this Web Portal. They are a) Administrator, b) Staff, c) Student. Each User Role will have varying degrees of Functions, facilities and Services at his/her Realm. The task of Approval of New Registrations, Posts, Gate Pass, etc. will be subject to Staff, while the Administrator may share some of the Responsibilities. Whereas, Student will have the facility to post materials, access information and request for Gate Pass at his/her Realm. The user profile page is shown in Fig. 3.
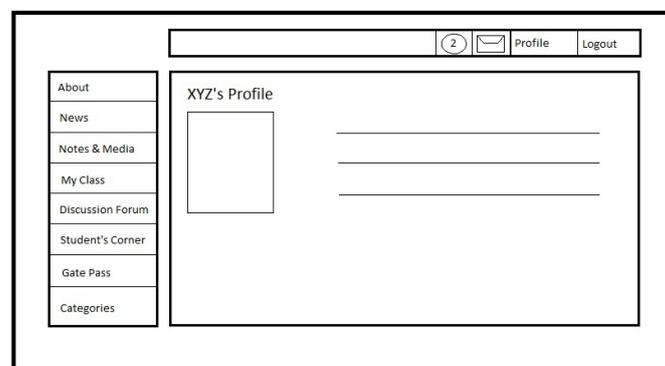

Fig. - 3: User Profile Page of Website

Performance Analysis

A short code on a user registration form has been implemented with its validation. This is built this using HTML and java script. The registration form is a simple HTML form, whereas the validation procedure is implemented using java script.

5.1 Form Validation

Form validation normally used to occur at the server, after the client had entered all the necessary data and then pressed the Submit button. If the data entered by a client was incorrect or was simply missing, the server would have to send all the data back to the client and request that the form be resubmitted with correct information. The user registration form is shown in Fig. 4.

Fig. - 4: User Registration Form

This was really a lengthy process which used to put a lot of burden on the server. JavaScript provides a way to validate form's data on the client's computer before sending it to the web server. Form validation generally performs two functions.

5.2 Basic Validation

First of all, the form must be checked to make sure all the mandatory fields are filled in. It would require just a loop through each field in the form and check for data. Otherwise error message displayed as shown in Fig. 5.

Fig. - 5: Error Message

Let us see how to do a basic form validation. In the given form, we are calling validate () to validate data when on submit event is occurring. The given code shows the implementation of this validate () function.

5.3 Data Format Validation

Secondly, the data that is entered must be checked for correct form and value. Our code must include appropriate logic to test correctness of data. Now we will see how we can validate our entered form data before submitting it to the web server. An email address must contain at least a @ sign and a dot (.). Also, the @ must not be the first character of the email address, and the last dot must at least be one character after the @ sign.

CONCLUSION

In this paper, significance of web portal with its potential is discussed. We designed effective and efficient Web Portal for a College Department, keeping in mind all the various activities and applications associated with it using the latest scripting and designing technologies like HTML, CSS, java script and PHP. Pages developed are in an systematic and user centric manner. Website maintained various user profiles and provide secure authorization and authentication of different user roles.

Timetable Generator is one of the proposed applications the we are looking to in near future to incorporate in our Web Portal. A Timetable Generator app would make the organizing and allocation of subjects according to their respective staffs and time slots much easier for the faculties. It will be easier to allocate and design timetable using this application.

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