

The Role of an Improved Online Research and Web Library in Supporting Online Platform for the Researchers

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Abstract The online research web and project library is an approach that will provide an online platform for the researchers with the library of projects, thesis of various disciplines. The study of emphasis share the experience gained from establishing a process and a supporting architecture for the role of an improved online research and web library in supporting online platform for the researchers. The architecture of the project that supports the web development team for the smooth implementation of web process is an area of focus. This online research web library System will allow the researchers to register themselves in order to submit their projects/thesis that can be searched by other researchers for the purpose of study. Furthermore, this architecture will also provide a productive mechanism of communication among the researchers that are in academies and industries so that the researchers of different fields can collaborate there work of mutual interest.

Keywords: MVC, three-tier architecture, research platform, UML use-case diagram, web engineering

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1. Introduction

The Online Research and web library is a web based application/platform for the users to accomplish their different categories and sized project via internet to allow the open source software development for the users. With the advent of web based applications many web technologies and programming languages emerged from CGI to PHP. To develop a standard web application in any of the programming language that supports construction of web based applications, a set of standards were being set in order to develop a web based application in which we have Model View Controller pattern.

This web application connects the different users from different part of the world so when ORWL is online it means that researchers from all institutions can collaborate their work through the ORWL platform and easily they can search the library of projects for which until now no application is available this functionality is also available in Online Research and Web Library along with the Research Web.

2. Research Objectives

To create the facility of searching and the projects/thesis of Bachelors, Masters and PhD, we need a Platform for the researchers of different fields to collaborate and work together. To prevent the plagiarism of projects/thesis and allow the students of different universities and institutes to collaborate their ideas and project work and to store properly Projects/Thesis and other items in order, and maintain their security and the details of Projects/Thesis so that the order can be placed on time. ORWAL establishes and promotes general understanding of the web's functions:

- Create information architecture for the library's website.
- Develop processes to make it easy to use, create, download, upload, link, browse and monitor information on the web.
- Develop necessary policies, standards and guidelines for accessing and using community web resources, and recommend solutions to the strategic directions for future development.

ORWAL System designed to get positive feedback or overall constructive criticisms about research to help others in the website experience. There are several challenges to the research library system. Digital technology is one, but also challenges coming from changes in the research system and the educational system especially the way of learning is achieving and teaching is

provided. More and more emphasis is put on research groups providing information and communication as part of their task. Public and private organizations are becoming more intensive users of information systems and this is a challenge to the research libraries. The research library has to become a global knowledge gateway. New research tactics making reforms and one example is the increase in interdisciplinary research.

Research now tends to be done as cooperative projects that work in groups or teams, and new differentiated demands for information appearance. Doctoral education as training for Research careers are expanding with the development of the Modern university system as well as the modern research library also developed as a mediator in the processes of knowledge creation and knowledge use. The library is a place for knowledge representation – through classification – for dissemination and for archiving. The research library has several types of users and usage. Some are directly aware of the functions of the library, but most of them are not. The researchers' paper in an e-journal, access to which is provided by a library, is not necessarily noticing the essential function of the library. Indirect usage is also important when a function is performed, which is based essentially on knowledge and information provided through the available services of a research library.

3. Background

Web Engineering: The World Wide Web has become a major delivery platform for a variety of complex and sophisticated enterprise applications in several domains. In addition to their inherent multifaceted functionality, these Web applications exhibit complex behavior and place some unique demands on their usability, performance, security and ability to grow and evolve. However, a vast majority of these applications continue to be developed in an ad-hoc way, contributing to problems of usability, maintainability, quality and reliability. While Web development can benefit from established practices from other related disciplines, it has certain distinguishing characteristics that demand special considerations. In the recent years, there have been some developments towards addressing these problems and requirements. As an emerging discipline, Web engineering actively promotes systematic, disciplined and quantifiable approaches towards successful development of high-quality, ubiquitously usable Web-based systems and applications [1]. In particular, web engineering focuses on the methodologies, techniques and tools that are the foundation of Web application development which supports their design, development and evaluation. Web application development has certain characteristics that make it different from traditional software, information system, or computer application development [2]. Web engineering is multidisciplinary and it encompasses contributions on diverse areas:

- Systems analysis and design
- Software engineering
- Hypermedia/Hypertext engineering
- Requirements engineering
- Human-computer interaction
- User interface and Information engineering

- Information indexing and Retrieval,
- Testing modeling and Simulation
- Project management-Graphic design and Presentation

Web engineering is neither a clone, nor a subset of software engineering, although both involve programming and software development. While Web Engineering uses software engineering principles, it encompasses new approaches, methodologies, tools, techniques, and guidelines to meet the unique requirements of Web based applications [3].

WWW (World Wide Web): In software Engineering, a web application is an application that is accessed via web browser over a network using Protocols like http, ftp etc. It is also a computer software application that is coded in a browser-supported language (such as HTML, JavaScript, Java, etc.) and reliant on a common web browser to render the application executable [2]. Web applications are popular due to the ubiquity of a client, sometimes called a thin client. The ability to update and maintain web applications without distributing and installing software on potentially thousands of client computers is a key reason for their popularity. Common web applications include webmail, online retail sales, online auctions, wikis, massively multiplayer online role-playing games and many other functions [2].

Web Development Process/Life Cycle: A web development process is a set of steps that is defined in order to fulfill any task. Same case applies in developing web application so in this process it helps in creating, fulfilling and managing tasks. A system development process can follow a number of standard or company specific webs, methodologies, modeling tools and languages. Software development life cycle normally comes with some standards which can fulfill the needs of any development team. Like software, web sites can also be developed with certain methods with some changes and additions with the existing software development process [10].

Let us see the steps involve in web site development.



Figure 1. Web Site Development Process Similar to Software Development Process

Web Application Model of Three-Tiered Architecture: Applications are usually broken into logical chunks called "tiers", where every tier is assigned a role. Traditional applications consist only of 1 tier, which resides on the client machine, but web applications lend themselves to an n-tiered approach by nature. Though many variations are possible, the most common structure is the three-tiered

application [9]. In its most common form, the three tiers are called presentation, application and storage/Data, in this order. A web browser is the first tier (presentation), an engine using some dynamic Web content technology (such as ASP, ASP.NET, CGI, ColdFusion, JSP/Java, PHP, Perl, Python, Ruby on Rails or Struts2, Visual Web Java Server Faces, Spring, Tapestry etc) is the middle tier (application logic), and a database is the third tier (storage).The web browser sends requests to the middle tier, which services them by making queries and updates against the database and generates a user interface [6]. For more complex applications, a 3-tier solution may fall short, and you may need an n-tiered approach, where the greatest benefit is breaking the business logic, which resides on the application tier, into a more fine-grained model i.e. creating a separate business logic tier or adding an integration tier that separates the data tier from the rest of tiers by providing an easy-to-use interface to access the data [6]. Many theories view a web application as two-tier architecture [9]. This can be a "smart" client that performs all the work and queries a "dumb" server, or a "dumb" client that relies on a "smart" server. The client would handle the presentation tier, the server would have the database (storage tier), and the business logic (application tier) would be on one of them or on both while this increases the scalability of the applications and separates the display and the database, it still doesn't allow for true specialization of layers, so most of applications will outgrow this model.

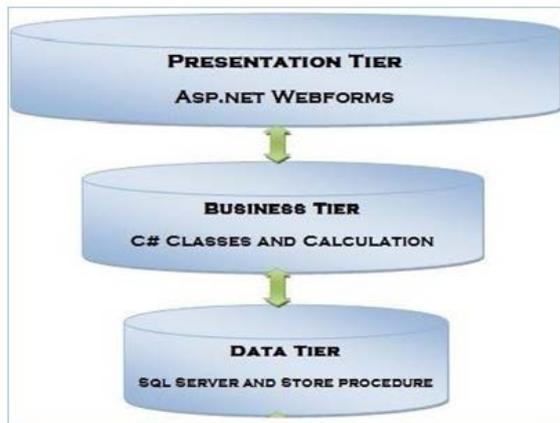


Figure 2. Shows 3-Tier Architecture for Web Applications

Model View Controller (MVC): In MVC, the model represents the information the data of the application and the view corresponds to elements of the user interface such as text, checkbox items, and so third, the controller manages the communication of data and the business rules used to manipulate the data to and from the model [4]. Figure 3 shows the typical MVC model.

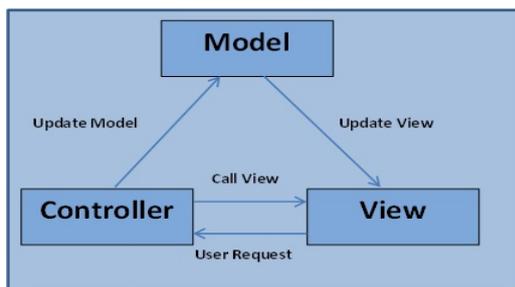


Figure 3. Typical MVC Model

MVC as A Design Pattern: MVC does not specifically mention the data access layer because it is understood to be underneath or encapsulated by the Model.

View: Renders the model into a form suitable for interaction, typically a user interface element. Multiple views can exist for a single model for different purposes.

Controller: Processes and responds to events, typically user actions, and may invoke changes on the model.

4. ORWL UML Use-case Modeling

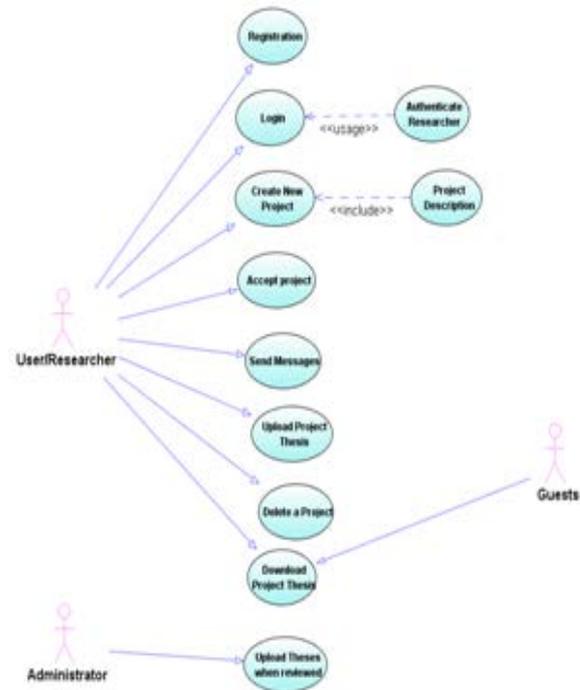


Figure 4. Use Case Diagram of ORWL

High - Level Software Architecture of the ORWL System

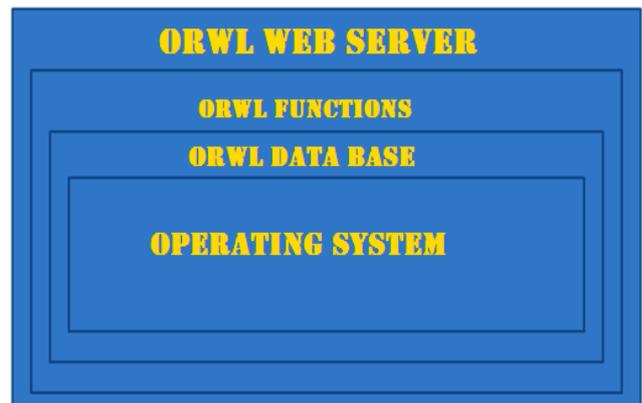


Figure 5. High Level Software Architecture of the (ORWL) System

5. Model Context Diagram of (ORWL) System

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. A data flow diagram can also be used for the visualization of data processing (structured design). It is common practice for a designer to draw a context-

level DFD first which shows the interaction between the system and outside entities. This context-level DFD "exploded" to show more detail of the system being modeled. The sponsor of a project and the end users will need to be briefed and consulted throughout all stages of a system's evolution. With a dataflow diagram, users are able to visualize how the system will operate, what the system will accomplish, and how the system will be implemented. The old system's dataflow diagrams can be drawn up and compared with the new system's dataflow diagrams to draw comparisons to implement a more efficient system.

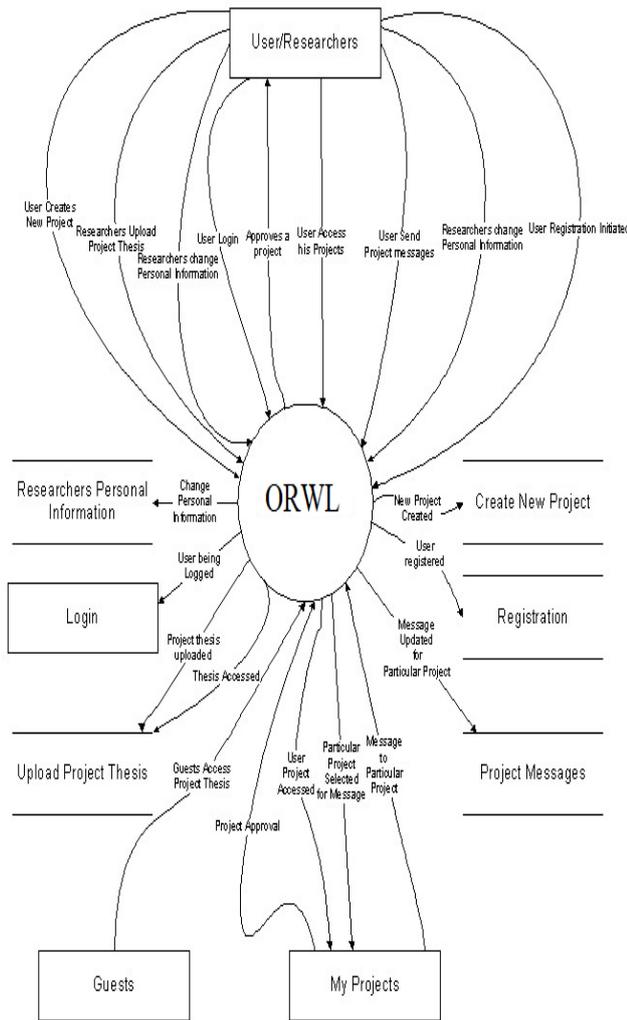


Figure 6. Shows Context (DFD) of the ORWL System

6. Conclusion and Future Work

6.1. Conclusion

We have designed and developed the online research web and project library that facilitates the researchers

including Bachelors, Masters and PhD students. ORWL is secured and allows the researchers to get access on the projects/thesis database by providing user friendly graphical user interface. The researchers can easily view, download and upload their research projects/thesis. ORWL is a nice platform for researchers to share their research so that other researchers can get benefit from it.

6.2. Future Work

There can be a lot of future work into the website a search facility can be provided to search the library of projects, more up gradation to be done in performance and efficiency as well as feedback should be enhanced along with the messaging system and a lot more future work can be decided. Although we have succeeded in creating a fully functional public resource computing web, there are several features that could be added or further developed.

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