

# Design and Implementation of a Document Management System with MVC Framework

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## ABSTRACT

In order to solve the sharing document problem of the organizations online technically, we described the methods and advantages of building the DMS based on MVC Framework, achieve document sharing and information exchange among the heterogeneous systems. According to this model, we established a CodeIgniter MVC framework of the PHP, and designed and developed the realization of the internal DMS platform in detail. In this paper, we try to solve “how to share and store documents easily”. A Document Management System (DMS) provides a centralized platform to store, retrieve, and track documents, improving productivity and reducing manual errors. This research paper explores the design and implementation of a robust DMS using the Model-View-Controller (MVC) architectural pattern.

**Keywords:** Document Management System, MVC Architecture, System Design, Implementation, Model, View, Controller, PHP.

## I. INTRODUCTION

Document administration is crucial within businesses since it provides the assurance necessary for the retrieval, usage, and protection of organization-valued data; Outdated file storage techniques plagued with issues, such as slow execution and haphazard arrangement, cause laborious work procedures. Beginning with a DMS guarantees correct filing systems, quick documentation retrieval, stamped version administration, and successful teamwork. Recognized as a potent design template by many developers, MVC makes software development more

manageable. MVC ensures maintainability by allocating tasks correspondingly among data management, UI, and business logic divisions. Enjoying various advantages like versatility and extensibility, applying View Model Controller (MVC) architecture to DMS results in robustness and easier regression testing.

## II. LITERATURE REVIEW

By synthesizing the collective body of knowledge on this topic, we gain vital understandings about how to leverage MVC Pattern for effective document

management processes. Conducted studies uncover the capacity of MVC frameworks to amplify document management processes by streamlining tasks, resulting in heightened organizational effectiveness and output. Literature illuminates vital factors influencing effective MVC integration within documentation frameworks — careful system contemplation.

Through scientific inquiry, improvements might enhance how documentation is kept track of and accessible social groups. Separating concerns through distinct responsibilities, the model manages document data and related operations while the view presents this information to users, and the controller ensures effective communication between these two components. Efficient updates and modifications become possible due to this division; user interfaces and data can undergo tranquil transformations without affecting other areas. This leads to less wasted time and resources; therefore, more efficient output and faster delivery follows.

A remarkable advancement realized through MVC design integration, streamlining user interface experiences concurrently boosts overall satisfaction levels with the documentation process growth. Decoupling through MVC enables tailoring UI based on individual preferences or necessities. By optimizing user experiences through customization, the system becomes more intuitive and adapted to unique clientele. Enhancing satisfaction among users and fostering increased adoption, the improved system boasts greater friendliness toward divers., clientele. By extension, it can be inferred from these sources that capturing user experiences via MVC designs leads to more reliable results regarding how well-document management suites serve the needs of end-users. [10]. The Model View Controller pattern was first coined in 1970s by Trygve Reenskaug. In MVC architecture the system is divided into 3 components each independent of one another. The application data is managed by model which is responsible for the storage and retrieval of data. The task of View is to present the model

visually to user and get responses. The controller is the core part acting between model and view [7]. It interprets the user requests and notifies view and model to make changes accordingly.

Model-View-Controller (MVC) is a software architectural pattern that separates an application's logic into three interconnected components: the Model, the View, and the Controller. The Model represents the data and business logic, the View is responsible for the presentation layer, and the Controller handles the user input and manages the flow of the application [2]. PHP, a server-side scripting language, has numerous MVC frameworks that simplify the development process by providing predefined structures and libraries. These frameworks enable developers to build secure, scalable, and maintainable web applications, reducing the effort required for repetitive tasks and promoting code reusability.

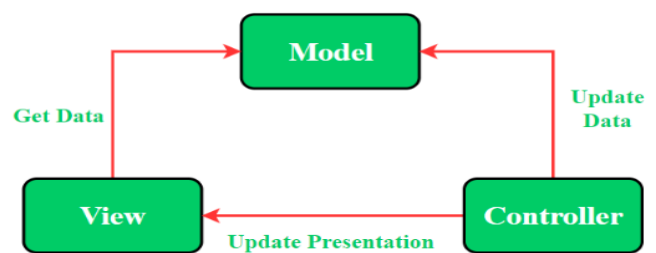


Fig. 1 Simple MVC Design

#### Advantages of MVC Architecture

- 1) Separation of Concerns: All the components of MVC are modularized (or generalized) which facilitates the reusability of business logic.
- 2) Developer Specialization and Focus: A web designer or user interface(UI) developer can work on designing web pages or UI without worrying about model or business logic. Also, the data administrator can work of model without being concerned about the UI.
- 3) Parallel Development by Separate Teams: The abovementioned tasks can be performed

simultaneously, resulting in lesser inter-dependency and better time utilization.

It underscores requisite territories demanding extra examination inside this scholarly domain [7]. By examining MVC architectures influence on document management systems regarding scalability and efficiency, we may uncover fascinating findings. How does MVC impact system responsiveness in situations where there are extensive document archives or numerous users simultaneously accessing the system? This knowledge might help developers make necessary choices while creating programs that run well under pressure. Integrating emerging tech like machine learning & natural language processing within MVC architectures holds significant promise inside document management systems [9].

Exploring methods for integrating these technologies within the MVC framework could significantly improve document classification, searching, and information retrieval functions, revolutionizing the realm of document management. To achieve effective MVC integration, rigorous evaluations and quantifiable assessments are crucial; therefore, they shape informed guidance grounded in thorough observation. Investigations into organizational elements, change management tactics, and training needs can illuminate a seamless migration process to an MVC-driven document management system.

### III. RELATED WORK

CodeIgniter: CodeIgniter is a lightweight MVC framework that is easy to learn and use. It has a small footprint and minimal configuration, making it suitable for small to medium-sized projects. CodeIgniter prioritizes simplicity and speed, making it an excellent choice for developers who prefer a straightforward framework[6].

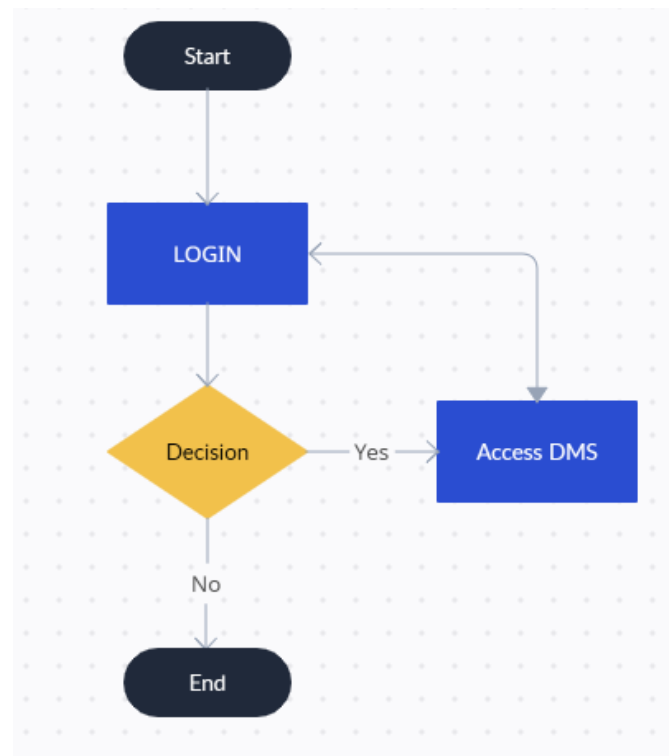
Document management systems are essential for organizations to efficiently organize, store, and retrieve digital documents. Traditional file-based systems often lack the necessary features to handle the

growing volume of documents and the need for collaborative work[2]. A DMS provides a centralized repository for documents, enabling version control, secure access, and efficient search capabilities.

The Model-View-Controller (MVC) architectural pattern is widely used in software development to separate the concerns of data, presentation, and business logic. The model represents the data and business logic, the view handles the presentation and user interface, and the controller manages the interaction between the model and the view. MVC promotes modular and maintainable code, as well as flexibility and reusability.

### IV. THE DESIGN AND IMPLEMENTATION OF THE DMS based on MVC

This is a high-level representation, and the actual implementation of a document management system in PHP would require creating corresponding classes, managing relationships, and possibly using a database to store the data.



This research paper focuses on a systematic approach to designing and implementing a DMS using the MVC architectural pattern. The methodology involves the following steps:

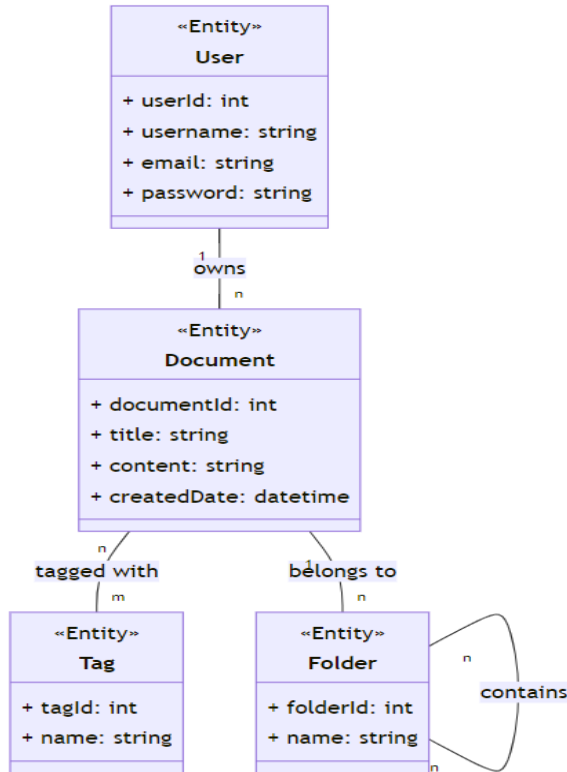


Fig. 2 Design Pattern for MVC with class

1. Requirements Gathering: Understand the specific needs and requirements of the organization in terms of document management. This step helps in identifying the functionalities and features that the DMS should encompass.
2. System Design: Based on the gathered requirements, design the system architecture, data models, user interfaces, and the interaction flow between the components. The MVC pattern facilitates clear separation of responsibilities, ensuring a modular and scalable design.
3. Implementation: Develop the DMS using appropriate technologies and frameworks that support the MVC architecture. Implement the models, views, and controllers, ensuring proper data management, user interface rendering,.

Here are some screenshot of the actual system build in MVC framework:

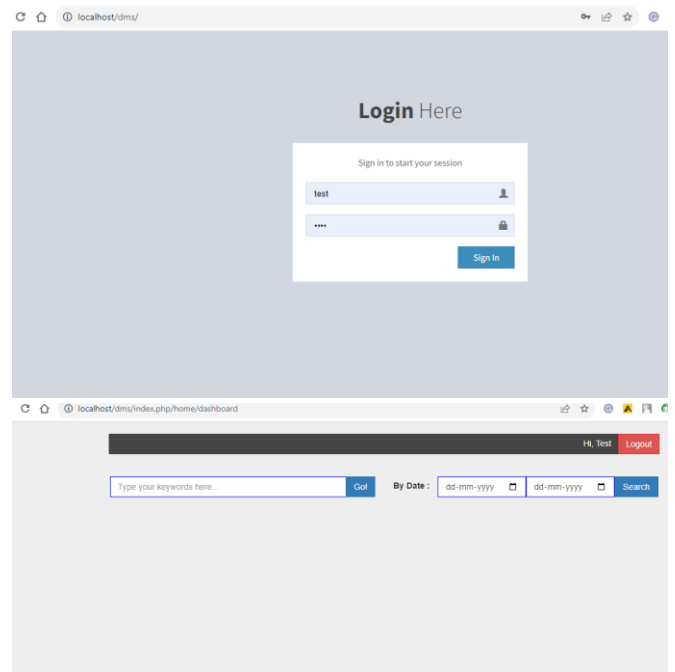


Fig.3 : User Panel

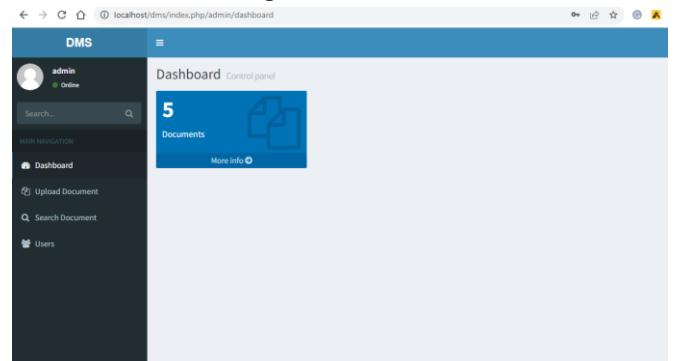


Fig 4: Admin Panel

Document management is responsible for adding, deleting and modifying the data in the resource positions, and responsible for the consistency of the data in proxy server and resource positions. Resource management should notice update status of the data in the resource positions to each server.

## V. CONCLUSION

This research paper has explored the design and implementation of and exploring the written word discovers advantages and hindrances connected to

MVC documentation setup creation. By means of these processes, society can greatly reap benefits; specifically, improved organizational efficacy will lead to increased usefulness for end-users. Key areas of research going forward involve expandability, efficiency enhancements, and techniques; empirically examining deployment methods also holds promise. Paper provides a comprehensive guide to design and implement a Document Management System (DMS) using the Model-View-Controller (MVC) architecture. It will cover the design considerations, component design, implementation process, testing strategies, and a real-world case study of a successful DMS implementation. By following this guide, developers can create a scalable and user-friendly DMS that meets the needs of modern organizations.

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