"Archivez: A Multiplatform Research Paper Repository Management System with Real-Time Review and Evaluation for Baco Catholic, Inc."

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CHAPTER 1. INTRODUCTION

In this chapter, researchers will thoroughly examine the fundamental aspects of the project, thereby establishing a solid basis for the system that lies ahead.

Project Context

In the ever-evolving landscape of digital content, the need for a comprehensive and accessible repository system is increasingly vital. A digital repository is a mechanism for managing and storing digital content. Repositories can be subject or institutional in their focus. Putting content into an institutional repository enables staff and institutions to manage and preserve it, and therefore derive maximum value from it. A repository can support research, learning, and administrative processes. Repositories use open standards to ensure that the content they contain is accessible in that it can be searched and retrieved for later use. The use of these agreed international standards allows mechanisms to be set up which import, export, identify, store and retrieve the digital content within the repository. A repository system can be a shop window for stakeholders of the university. Its function is to store or catalog scholarly content such as research papers and journal articles. It can also be intended

to collect and preserve the research output of universities in digital form such as theses and special problems. Furthermore, Schopfel et al. (2019) observed that in a research university, there is a need for access to scholarly works since scientific communities require access to scientific information for research and teaching activities. A thesis repository system provides several opportunities for advanced learning because it can aid students in widening their interests in research. When research outputs materials availability is limited due to inaccessibility, this can lead to wastage of knowledge in the academic research community. For instance, the quality research project output of students suddenly ends when not digitally archived and shared to future researchers in a certain institution. Additionally, the efforts and ideas poured into the research work stops when it is not adequately shared to the online community of researchers as an additional knowledge realm for future researchers to collaborate and innovate.

As the number of distinct repositories that are managed by individual HEIs increases, the complexity of finding relevant research materials/ideas from widely dispersed online repositories also increases. The chances to collaborate with a certain researcher become slimmer to

nothing at all. Using the vastness of the web to obtain potential research areas from varied online digital repositories, a novice researcher can hardly locate relevant research ideas and to directly connect to other researchers with the same interests. Conversely, a readily available, publicly accessible online community of digital repositories offers immense advantages to novice researchers. It provides them with a fertile ground to browse, explore, and extract resource materials and ideas to formulate and advance their research projects with ease. Such an ecosystem not only promotes the dissemination of knowledge but also fosters collaboration, innovation, and a sense of connectedness among researchers, including high school students and alumni. By implementing a digital repository within a high school context, the aim is to empower the school and its stakeholders to efficiently manage and utilize digital resources. Such a repository serves as an invaluable resource, supporting diverse aspects of the educational ecosystem, including research, learning, and administrative processes. The repository's adoption of open standards ensures that the content it houses remains accessible, searchable, and retrievable, thus enabling its sustained use. Its primary function is to efficiently store and catalog scholarly content, such as research papers and journal articles

produced by students and faculty. Moreover, it has the capacity to collect, curate, and preserve the school's research output in digital form, which includes theses, special projects, and other scholarly endeavors. In light of these considerations, the development of a multiplatform research paper repository management system for high schools is a project of immense importance, as it bridges the gap in the educational landscape by providing an inclusive, accessible, and collaborative platform for research and scholarly endeavors within high school communities.

Objectives

The study aims to design, develop, and implement a Multiplatform Research Repository Management System tailored to the needs of high school and senior high students. This system aims to address the challenges students face in conducting research, creating well-structured theses, and archiving research papers, while fostering a culture of academic integrity.

Specifically, this study aims to:

- Allow users, including researchers and students, to submit research papers and theses to the system.

- Provide tools for document management, including metadata entry (e.g., title, authors, keywords) and version control to track revision and updates.
- Educate users on proper research methodologies, citation practices, and plagiarism awareness through a resource library.
- Offer guidance and resources that help students and researchers navigate the intricacies of scholarly work.
- Create an environment for collaboration and knowledge sharing among users such as students, alumni, and teachers.
- Facilitate interactions between users who share common research interests, thereby enhancing the spirit of community-based learning.
- Create a user-friendly interface to simplify the submission process of research papers, making it accessible and easy to both computer literate and non-literate users.
- Ensure that the Research Repository Management System is accessible across multiple platforms, including web browsers, mobile applications, and other devices.

Scope and Limitations

This study is limited to the aspects and factors of creating, designing, and implementing a Multiplatform Research Repository Management System. There are three users in the system: the students, the teachers and Research Instructor/Admin. The student can view and post their research, and the teacher can comment on the posted research. The system's design emphasizes multi-platform accessibility, ensuring that users can seamlessly engage with it through web browsers, mobile applications, and various devices. Furthermore, the study includes features related to efficient document management, encompassing metadata entry, version control, and document tracking. The study does not delve deeply into the management of large volumes of data, which could present a limitation in scenarios with substantial document uploads and interactions. Understanding these scope and limitations is essential for defining the project's boundaries and focus areas.

Definition of terms

To enhance clarity and facilitate comprehension, the following terminology is conceptually and operationally elucidated:

Theses and Research – the documents that will be uploaded, stored, collected, viewed, searched, and evaluated in the researchers' system.

Repository – the model that is implemented or used into the researchers' system that can capture, store, index, preserve and disseminate the school's research documents.

Management System – serves as the backbone for efficiently handling and facilitating the control and administration of the digital repository.

Multiplatform – refers to the capability of the researchers' system to ensure that it is accessible and usable by the users who may have different types of devices and operating systems.

Digital Content – refers to the electronic information, documents and resources that are created, uploaded, collected, and managed within the research paper repository system.

Alumni – serve as mentors or collaborators in the system and provide guidance on current high school students research projects.

Students – are both contributors and beneficiaries of the research paper repository system. The system supports their learning, research, collaboration, and academic development.

Scholarly Content – refers to the academic and research materials that are created and contributed in the research paper repository system.

Metadata – is essential for the effective management, organization, retrieval, and understanding of the scholarly content within the research paper repository.

Novice Researchers – are individuals which are mainly the students, they are new to the field of research and are just beginning to explore and engage in research activities, in other words they are the primary users of the research repository management system.

CHAPTER 2. REQUIREMENTS SPECIFICATION

This chapter outlines the specific requirements, features, and functionalities significant to the researchers' system development.

Hardware and Software Requirements

Hardware Requirements

Server/s – The developers will need servers since they provide data storage, processing, and security to the system. It centralizes data management, allows collaboration, and maintains data integrity and accessibility for the users.

Storage (SSD) – 256GB to 512GB SSD will be use by the developers to store and manage the system’s data and to access the data more efficiently. A 512GB to 1TB or larger is also recommended for a much quicker and better performance.

Memory (RAM) and Processor (CPU) – The developers will be using 8GB to 16GB RAM and an Intel Core i5 processor to provide a smoother performance in handling the system’s data. Recommended RAM and processors are 16GB to 32GB RAM or more and Intel

Core i5 processor or higher, for a much smoother performance.

Network Connectivity – The modem is the device used to access the internet and it provides 35 Mbps download speed. It is used by the developers because a stable and low-latency connection is essential to provide a fast and reliable network connection for the system. A download speed of at least 25-50 Mbps is recommended, this ensures smooth file uploads and downloads.

Mobile Devices – iOS and Android OS version 4.0 (API 14) and above will be used to test and try out the responsiveness and compatibility of the system in mobile devices enhancing its efficiency and flexibility.

Software Requirements

Visual Studio Code – A free and powerful lightweight code editor providing support to the researchers' system by conducting development operations like debugging, task running, and

version control. The required version is 1.83.1 or higher.

CodeIgniter 4 – An open-source PHP framework. Version 4 is the required version to develop the researchers' system.

MySQL – Version 8.0.30 or higher is required for storing and managing the system's structured data.

User Interface Templates – Samples are Bootstrap and Tailwind, they are ready-made web design composed of HTML and CSS along with other optional JavaScript plugins for easy customization of the system's UI.

Web browsers – Samples are Google chrome, Firefox, and Microsoft edge, etc. These are used to enable the system's access to necessary web-based contents and manage interactions with online services and resources.

Windows 10 and Windows 11 – Are versions of the Windows operating system that will be use for the researchers' system.

Laragon - A powerful development environment and server stack for building and managing the researchers' system. Version 7 to 8.2 is required.

phpMyAdmin – The latest version (currently 5.2.1) is required to be used for supporting a wide range of operations and managing the system's MySQL databases.

Functional Requirements

General (All Users):

1. Version Control is enabled for research documents to allow tracking of document revisions and updates.
2. Advanced research browsing and search function should enable all the users to efficiently browse, and search documents based on the search algorithm that considers various criteria including keywords, topics, authors, and dates.
3. Allow all users to view metadata for research items such as its title, author, keywords, and publication date.

Students:

Students should be able to:

1. Register with their name, email, and password.
2. Authenticate with their name, email, and password.
3. Validate their account using email address before logging into their account securely.
4. Reset their password if forgotten using the registered email id that they provided during their first registration.
5. View, add, and edit their user profiles and information.
6. Upload their research papers and add or write the metadata after completion of upload for research items including the title, author, keywords, and publication date.
7. Specify to which research instructor is in charge of the evaluation of their uploaded research paper.

8. View research papers uploaded or published in the system.
9. Assess the quality and relevance of research papers allowing other students to have the option to upvote recommended research papers to provide other users with personalized recommendations and influence recommendations.
10. Easily add citations in various citation styles (e.g., APA, MLA, IEEE) for the papers they cite or references.
11. Access and view relevant data analytics related to their activities and contributions.
12. Show the status of their uploaded documents, if they already had been evaluated, approved, and submitted by the research instructor to the admin or research coordinator for further evaluation before it is published into the system.
13. Used a bookmark function to save, efficiently manage, and revisit the specific research papers of interest.

Research Instructors/Teachers:

Research Instructors/ Teachers should be able to:

1. Register with their name, email, and password.
2. Authenticate with their name, email, and password.
3. Validate their account using email address before logging into their account securely.
4. Reset their password if forgotten using the registered email id that they provided during their first registration.
5. View, add, and edit their user profiles and information.
6. Access and review the research papers submitted by the students.
7. Write comments, give feedback, and engage in discussions about research materials submitted by the students for approval and evaluation.
8. Received the research papers of the students.

9. Evaluate and update the status of the students' research paper, if it already had been approved and submitted to the admin for further evaluation before it is published into the system.

Admin/Research Coordinator:

Admin/Research Coordinator should be able to:

1. Register with their name, email, and password.
2. Authenticate their account with their name, email, and password.
3. Validate their account using email address before logging into their account securely.
4. Reset their password if forgotten using the registered email id that they provided during their first registration.
5. View, add, and edit their user profiles and information.

6. Manage user accounts, roles, and access control, ensuring a secure and orderly environment.
7. Manage and monitor users, user accounts, and their research documents.
8. Evaluate the research paper and publish or upload it into the system.
9. Track students log document uploads, and engagement in the system.
10. Receive research papers that were approved by the research instructors.
11. Post or publish the students research paper into the system if it already has been approved.
12. Access comprehensive system-wide analytics with visual representation of key performance indicators, system usage trends, user accounts, documents uploaded and published in the system.

Non-Functional Requirements

Operational Requirement

1. The system should be able to operate seamlessly on various web browsers and devices, including desktops, tablets, and smartphones.
2. The system should be able to provide clear and user-friendly documentation or guidance to help users navigate and utilize its features effectively.
3. The system must log user activities, including document uploads and checks for auditing and monitoring purposes.
4. The system must adhere to data privacy regulations and maintain user data confidentiality.
5. The system must be able to enhance the user-friendliness of the system's interface, making it more accessible and appealing to a broad range of users.
6. The system's code and interface should comply with the web development standards and best

practices to ensure consistent operation across various platforms.

Performance Requirement

1. The system's web pages should be able to load within 2 seconds to provide rapid response times for previews, and when teachers review and comment on student research papers.
2. The system must be able to support at least 1000 concurrent users without significant performance degradation.
3. Search queries should be executed within 3 seconds, even when dealing with a large dataset of documents.
4. The system must maintain a 99.9% uptime percentage.
5. Users should be able to upload/download documents based on the internet speed and size of the file. Example is a 1MB file will be uploaded/downloaded per second if the internet speed is 5Mbps.

Security Requirement

1. User accounts must be secured with strong password requirements by using regular expression and data validation.
2. Encryption used is Hash type which involves message authentication. Data in transit and at rest should be encrypted to protect against unauthorized access.
3. Role-based access control must be implemented to ensure that users have appropriate permissions and access to system features.
4. Data must be protected from unauthorized modifications or tampering, only the intended users may access the protected data.
5. The system must comply with relevant data privacy laws and regulations.

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