Digital Library: A Web-Based Research File Management System

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ABSTRACT

In today's digital world, keeping data and having copies of documents was no longer a problem. This study aimed to create a web-based file management system for the Department of Education, Tagum City Division, to replace manual file and record administration with a dependable, efficient, and secure system. Design and development research highlighted the parallels between instructional design and scientific problem-solving strategies. The Digital Library was developed using Feature Driven Development, which prioritized quality at all stages because it was meticulously designed and tested after implementation until it was accepted. The webpages were designed to be distinct from the official DepEd RXI – Tagum City Division Official Website because this study was intended to be unrelated. This system was created to archive previously published research papers digitally, and it categorizes the research outputs to make tracking easier. The search filter was designed to help find a research output using keywords. The Teacher-Researchers and the Schools Division Research Committee can use saved files to conduct literature reviews and decide which research subjects to pursue. On this basis, the Digital Library might be used with Cloud Storage and Web Hosting to provide convenient and easy access to Teacher-Researchers outside the Division Office.

Keywords: digital library, file management system, design, and development, feature-driven development, governance

INTRODUCTION

The COVID-19 pandemic has prompted the government, private sector, and development organizations to create web-based resources and platforms to assist local businesses in surviving and thriving (Philippine Disaster Resilience Foundation, 2020). Due to social distancing practices and nationwide lockdowns, the Covid-19 pandemic has inevitably increased the use of digital technology (De' et al., 2020). While everyone is working to improve their service, they still lack a system to digitally provide a copy of teacher-researchers research output and keep track of the status of the research papers, which is a problem that requires a comprehensive solution.

A file management system is an application technique for storing data on a storage device. This technique eliminates the need for people to use traditional paper-based data management systems (Roomi, 2021). As data can be stored on servers worldwide, according to Wood (2021), using the File Management System to archive our papers properly without worrying about potential property loss is advantageous.

The file management system was designed to achieve the following objectives: to track the status of the research outputs quickly, store research outputs in one location digitally, and serve as a literature review resource and guide for teacher-researchers. It could be accessible via a local network, and for security reasons, only an Administrator could register the accounts of the Schools Division Research Committee members. The file management system would not include comments and discussions of any sort as it strays away from the main purpose of the research, and it minimized its account management to password changing due to the same reason above, as well as it aimed to focus only on managing the files of the users.

METHODS

Research Design

Design and development research, according to Richey and Klein (2014), seemed to be the systematic study of design, development, and evaluation processes to establish an empirical foundation for the development of instructional and non-instructional products and technologies, as well as new or improved models that govern their development. The software development process included implementing new features, analyzing requirements, and fixing bugs (Baltes & Diehl, 2018). The research design dictated the methodology used and how it was applied.

Research Materials

The system was developed using a set of hardware and software requirements. Table 1 lists the hardware and software requirements. The study's materials provided the technologies employed throughout the code implementation.

Table 1.

Hardware and Software Requirement

Category	Parameter	Requirement
Hardware	**Machine**	x86-64 (64-bit)
	CPU	Intel Core i7-7700HQ CPU @2.80GHz
	Memory	16 GB RAM
	Total Disk Space	256 GB
OS	**Operating System**	Windows 10
	Service Pack Level	Up to Date
Software	**Database Server**	Server: 127.0.0.1 via TCP/IP
	Web Server	PHP Version 7.0.9
	phpMyAdmin	Version information: 4.5.1
	MVC PHP Framework	Laravel Version 5.4
	Web Development	HTML5, CSS3, JavaScript, JQuery, Ajax, Bootstrap, JSON
	Programming Language	Python 3.6.4
	Hosting Service	GitHub, Google Docs
	Browser	Chrome Version 56.0.2924.87, Mozilla Firefox
	Text Editor	Sublime Text

The requirements were based on the laptop specifications of the researcher.

Research Technologies

This system used PHP for the database implementation. Various technologies were used to implement the system's web application features. These are GitHub, CSS, Bootstrap Framework, JavaScript, JSON, AJAX, jQuery, Google Drive, and Google Docs.

Software Development Model

Feature Driven Development (FDD) was used to develop the system as it emphasized quality at all steps since it was carefully designed and tested after implementation until approved. Figure 2 illustrated the step-by-step sequence of the Feature Driven Development, and it was the ideal approach to be used since the iterations delivered were feature after feature.

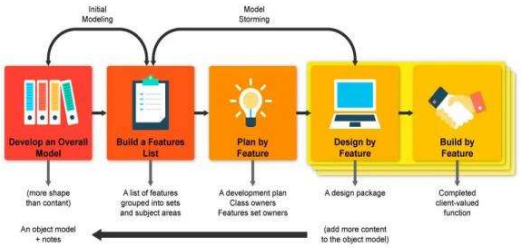

Figure 2. Feature Driven Development

Source: Feature driven development methodology – Custom web & mobile development company – New line technologies (2018).

Assumptions

Table 2 presented the assumption of this study. During the development of the File Management System, the Researcher made the following assumptions:

Table 2.

Assumptions

	Description
1	All the users were members of the School's Division Research Committee, who has the designation in the Department of Education, Tagum City Division.
2	The user's login information (username & password) would be created by the Division IT Officer of the Department of Education, Tagum City Division.
3	All the user's input values of the research file uploading were all right in terms of spelling, format, and validated.
4	All the guest users could be DepEd Employee or non-DepEd Employee, who were not a member of the School's Division Research Committee.

Ethical Considerations

The researcher took steps to ensure that respect, beneficence, and justice were observed according to the standards set by the Department of Education, Tagum City Division Ethics

Review Committee. Other ethical issues such as plagiarism, fabrication, falsification, conflict of interest, deception, observation authorization from an organization or location, and authorship were observed throughout the investigation.

RESULTS

The web pages presented below were made unidentical to the official DepEd RXI – Tagum City Division Official Website as these systems was planned to be connected.

Index Page

When a guest user opened a web browser and clicked the 'home' button, the first page displayed the index page. This page allows the guest user to type in the search key that s/he wants to use, leading them to the Search Result Page.

Figure 3. Index Page

Search Results Page

This page displayed all related research that matched the guest user's search key. The search algorithm checked to see if the search key was in the Research Title, Research Keywords, or Research Abstract. The Year, Research Category, Research Type, and Research Agenda may all be filtered by the guest user using the filters on the left side of the browser, as shown in Figure 4.

The Research View Page in Figure 5 will display all the information about a particular research output, including the DOI, Journal Title, Researcher's details, Research Abstract, and so on once a guest user has desired to view specific research.

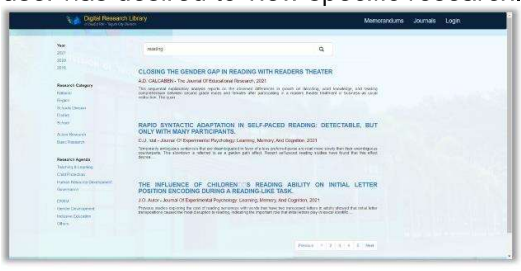

Figure 4. Search Result Page

Figure 5. Research View Page

Log-in Page

The user must provide their username and password on the login page, as shown in Figure 10. After that, they can utilize the system by clicking the login button. If s/he forgets to type input or enters an erroneous password, clicking the login button will result in an error.

Figure 10. Log-in Page

Home Page

After the user successfully logs in to the system, the Home Page will be displayed automatically on the browser. The user could do such works as adding & updating new users (only applicable to Admin User), researchers, research outputs, journals, and division memorandums by clicking its icon as shown in Figure 11.

Figure 11. Home Page

Users Feature

Figure 11 shows how only the Admin User could see the Users Symbol on the Home Page. The Users List page displayed all the Users added to the database by the Admin User. There are three options in each user that the Admin

User can perform; (1) Update the User information, (2) Reset the Password of the User, (3) Delete the User from the database.

By clicking the 'update' option, the Admin User might change each User's information. If a user forgets their password, the Admin User can reset the User's password, which will be changed to the default password. When the user logs back into the system, the system will prompt the user to change their password to one that they prefer. If the Admin User selects the 'delete' option, the User information will be permanently removed from the database.

The Admin User can create a new user by filling out the necessary information and clicking the 'Add User' button at the top of the Users List.

Researchers Feature

The Researchers List page will appear in the browser after clicking the Researchers icon from the Home page. The Researchers List page displayed all the Researchers added to the database by the User. Each researcher has two options that the User can perform; (1) Update the Researcher information, and (2) Delete the Researcher from the database.

The User might change each Researcher's information by clicking the 'update' option from the Researcher List Page. If the user selects the 'delete' option, the Researcher's information will be permanently removed from the database.

The User can add a new Researcher by filling out the necessary information and clicking the 'Add Researcher' button at the top of the Researchers List.

Research Feature

The Research List page will appear in the browser after clicking the Researches icon from the Home page. The Research List page displayed all the Researches added to the database by the User. There are two options in each research that the User can perform; (1) Update the Research information, and (2) Delete the Research from the database.

Figure 18. Research List Page

By clicking the 'update' option in Figure 19, the User might change each Research's information. If the user selects the 'delete' option, the Research information will be permanently removed from the database.

Figure 19. Update Research Information Page

The User can upload a new Research by filling out the necessary information and clicking the 'Add Research' button at the top of the Researchers List.

Figure 20. Upload Research Page

DISCUSSION

This chapter presents a discussion of the results, conclusion, and recommendation.

Easy Tracking of the Status of the Research Outputs

The Digital Research Library has been developed to digitally store previously accepted, conducted, and used research publications. It supports the review and approval of research output by the Schools Division Research Committee (SDRC).

The system divides the research outputs into categories to make tracking easier.

Digital Storing of Research Outputs in One Location

The Digital Research Library will save time and effort by manually reviewing each research paper. The system's filters can help efficiently locate a research output by using keywords or searching for a specific name.

Serving as Literature Review Resource and Guide for Teacher-Researchers

Viewing the stored files of the research outputs would aid the Teacher-Researchers in doing a literature review without signing into the system. It will also assist Teacher-Researchers and the SDRC in determining which research topics to pursue.

Conclusion

The study has developed a web-based information system for the Tagum City Division of the Department of Education that makes it easier for the Schools Division Research Committee (SDRC) to review and approve the content of research outputs by storing previously accepted, conducted, and used research papers digitally. As research outputs are digitally saved in the system, all an organization's records can be centralized for quick access and save time and effort by eliminating the need to review each research paper manually. It helped teacher-researchers who are preparing a research paper by viewing the stored files of the research outputs and would aid them in doing a literature review.

Recommendations

Further, the Digital Research Library is recommended using Cloud Storage & Web Hosting for convenient and easy access for the Teacher-Researchers who are away from the Division Office. A mobile integration teacher-researchers have a smoother experience accessing its features. The researcher recommends additional features that span a broader scope. Since the said system only handles document and report handling for conducted, submitted, disseminated, and utilized research outputs, it would be preferable if guest users could post any discussions on a specific research output page. Teacher-researchers could upload their outputs to the system.

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