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Contextualized Online Document Management System

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Abstract: This study aimed to develop an online document management system that could generate documents faster and more accurately. It covered the design, development, and evaluation of the system intended for course program accreditation. The Rapid Application Development (RAD) model of system development was used to emphasize the development cycle using a component-based construction approach. The contextualized online document management system was evaluated by the selected IT experts, accreditation task force, and office staff. It utilized a descriptive research design that employs a questionnaire to evaluate the functionality, efficiency, and usability of the developed system. The results revealed that the respondents consider the online document management system a highly acceptable software application. Thus, it is recommended for utilization during Online Course Program Accreditation for fast, easy access, and efficient document profiling.

Keywords: Document, Management, System, Online, Rapid application development (RAD)

1. Introduction

Technology has progressed since the middle of the 20th century for creating, organizing, copying, and disseminating construction documents, including bills, drawings, and specifications; however, the documents themselves have not [1]. Paper-based document storage competes with employees for space in an organization because it takes up more space than people do since it will rely on actual paper rather than electronic ones [2]. Document management systems have long been touted as the solution to numerous paper-related problems. They seem to offer the opportunity to exercise a high level of control over how paper documents are handled [1].

Organizing and classifying a large number of documents is difficult, and maintaining them requires a significant amount of effort. It is obviously extremely difficult for any institution's office staff to prepare documents for evaluation or accreditation because there are so many of them. Using a document

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management system, staff can receive an immediate response or retrieve information by providing web-based access to documents from anywhere. Furthermore, it saved time, effort, and money on document handling, organization, and distribution [3].

Furthermore, a typical document management system (DMS) consists of a repository containing the records and an engine that looks at them, which is capable of document storage, viewing, and retrieval, as well as advanced features such as version and access control. DMS gives users a space to store and share records with others in the network, as well as the capacity to rapidly retrieve information in an academic environment [1].

Several authors emphasized the importance of having an electronic document management system to alleviate the burden of retrieving, collecting, and disseminating large amounts of documents. In comparison, electronic document management is an efficient approach to facilitating record access, controlling information growth, lowering operating costs, and increasing organizational productivity [4].

This similar contention is the goal of this study, which is to create an online document management system (ODMS) for the institution to reduce problems associated with traditional filing systems during accreditation of the various colleges at Palompon Institute of Technology (PIT). The findings of this current research project may lead to the creation of an integrated online database to improve the in-house document tracking process and make it faster and more reliable.

This study aimed to develop and evaluate a contextualized online document management system (CODMS) to help PIT during Course Program Accreditation. This system is intended to help them manage, store, organize, and access documents online during accreditation. Specifically, it can: (1) display the main home page; (2) display the sub-menu home page of the College of Graduate Studies (CGS) and the College of Technology and Engineering (COTE); (3) view the different programs to be accredited; (4) access the documents by area; and (5) evaluate the developed system as to functionality parameters, performance efficiency, and usability.

2. Methods and Materials

2.1 Respondents

The study was conducted in PIT during the school year 2021-2022. The respondents were the accreditation task force, Information Technology (IT) Expert, and Staff of the College of Graduate Studies. Table 1 shows the frequency distribution of the respondents.

Table 1. Results of the User Acceptance Test

Respondents	Frequency
IT Experts	3
Direct End-Users	
• Accreditation Task Force	11
• Accreditation Staff	3
Total	17

2.2 Instruments and Measures

This study utilized a descriptive research design that employed a questionnaire to gather data from the respondents. The required features of the system were gathered and identified based on requirements stated by the target users. It will be used as the basis for the design of the proposed system. After which, it was subjected to evaluation by the IT experts from the institute.

The research instruments that were used in this study were a modified survey questionnaire from ISO/TEC/25010:2011 Systems and Software Quality Requirements and Evaluation (SQUARE)-System and software quality models [3].

The frequencies and percentages were employed for each of the items that were categorized and presented in tables with data and results treated using statistical measures: (a) A weighted mean was used to weigh the respondent's answer on the questionnaire that was intended to be administered. The researchers used the five-level Likert scale to determine the corresponding descriptive equivalent, which was quantified using a scale ranging from “Not acceptable” to “Highly acceptable”. For this analysis, “Not acceptable” was coded as 1, “Slightly acceptable” as 2, “Moderately acceptable” as 3, “Acceptable” as 4, and “Highly Acceptable” as 5.

2.3 System Development

The contextualized document management system was developed for the purpose of course program accreditation in the school, necessitating the use of developmental research design via the Rapid Application Development (RAD) model system development. Figure 1 depicts the RAD method of the system development process model, which focuses on the development cycle and employs a component-based construction approach. This allows the researchers to develop a contextualized document management system in the shortest amount of time possible. The system was developed using Pyramid, a Python Web framework.

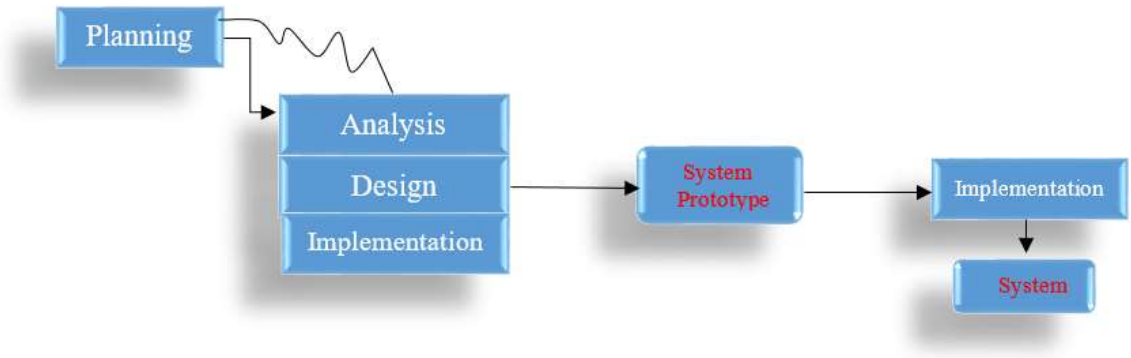

Figure 1. RAD Model of System Development Process

The interface was designed with prospective users in mind and focused on user friendliness and easy-to-use design. The application was created to be easier and more convenient to use for average computer-literate users. The researchers develop a possible solution to the problem, which includes planning, analyzing, and designing. System requirements were validated by conducting interviews with the intended users to gather the necessary information for the study. These data were evaluated, processed, and treated as study requirements, guiding developers as they created the prototype. Essentially, the prototype’s requirements were identified, and the researchers determined which features would be included in the application.

After system development, the system was subjected to quality tests on its functionality parameters, performance efficiency, and usability aspects. The developed software was evaluated with the help of a questionnaire given to the respondents. In this study, 3 IT experts, 11 accreditation task forces and 3 staff were the evaluators. The data that was gathered from the answered questionnaires was checked, classified, tabulated, and analyzed according to the research design described in IBM Statistical Packaged for Social Science (SPSS).

3. Results and Discussions

3.1 System Output

The Contextualized Online Document Management System was developed using a Python framework. One of the greatest advantages of this software is that it is an open-source scripting language, and you can download it for free. It is used all over the world, and it is faster than other scripting languages.

Figure 2. System Home Page

The system was developed to ensure its efficiency and user friendliness. The use of the application requires the user to open a browser and type the URL address of the web page for both admin, accreditation task force, and staff, as shown in Figure 2. The system contains different menus. Home, CGS, and COTE. Under the file menu is the sub-menu that displays the program to be accredited. The view sub-menu has different forms wherein the task force and accreditors can easily access and view the documents.

3.1.1 Display Sub-menu of the Home Page of CGS and COTE

Figure 3. Home Page of CGS

Figure 3 shows the sub-menu which is the home page of CGS and contains the different course programs to be accredited.

Figure 4. Home Page of COTE

Figure 4 shows the sub-menu which is the home page of COTE and contains the different course programs to be accredited.

3.1.2 View of the Different Course Programs to be Accredited

Figure 5. Course Program - PhD Ed. Educational Management Home Page

Figure 5 shows the home page of the Doctor of Philosophy in Educational Management, which shows the different areas. Figure 6 shows the home page of Master in Management, which shows the different areas.

Figure 6. Course Program - Master in Management Home Page

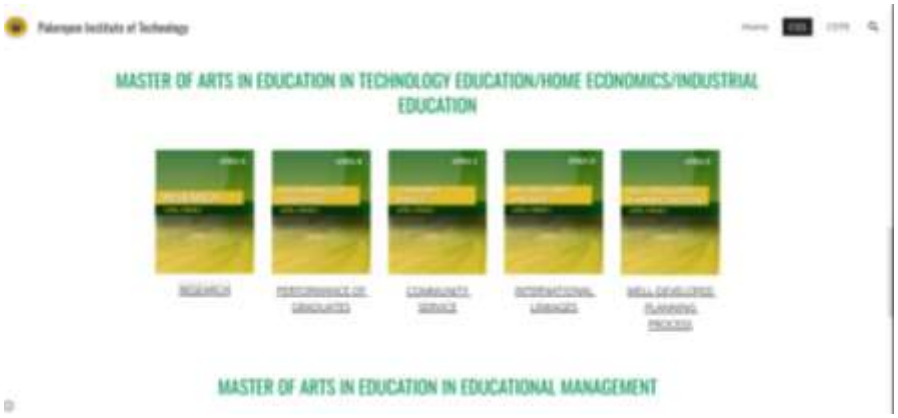

Figure 7. Course Program - Master in Management Home Page

Figure 7 shows the home page of the Master of Arts in Education major in Technology Education/Home Economics/Industrial Education, which shows the different areas to be accredited.

3.1.1.3 Access the Document by Area

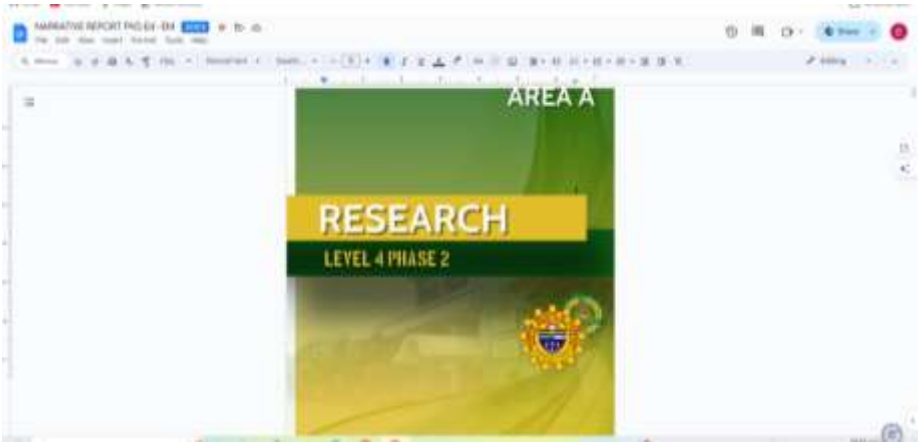

Figure 8. Area A - Research Home Page

Figure 8 shows the home page of Area A- Research, which contains the documents regarding the research of the Doctor of Philosophy in Education major in Educational Management.

3.2 System Evaluation

3.2.1 Evaluation of the Developed System as to Functionality

Table 2 presents the respondents' evaluations of the functional aspects of the developed system. As shown, functional completeness got a weighted mean of 4.6, followed by functional correctness of the developed system with a weighted mean of 4.6, and lastly, the functional appropriateness got a weighted mean of 4.7. In general, the developed system got an overall weighted mean of 4.7, which denotes highly functional.

Table 2. Evaluation of the Respondents in Terms of Functionality

Functionality Aspects	Mean	Description
Functional completeness. System has the capacity to provide all the functions specified by the users	4.6	Highly functional
Functional correctness. The system generates the desired results	4.6	Highly functional
Functional appropriateness. System has the capacity to perform the necessary functions, task , and objectives specified by the user	4.7	Highly functional
Overall Mean	4.6	Highly functional

The result implies that the developed system was fully utilized during the online school academic accreditation because it provided all the functions specified by the users and generated the desired results. Further, this also suggests that the system possesses the relevant standards and works for which it was intended, which is confirmed by the results of the evaluation and with other related findings from the study of Bani Ahmad *et al.* [2] that a cloud database would be the most effective method for processing this kind of data or activity.

3.2.2. Evaluation of the Developed System as to Performance Efficiency

Table 3 shows the performance efficiency aspects of the developed system. As shown, the developed system got an overall weighted mean of 4.8, which denotes “Highly Efficient” with mean scores of 4.8 for Time Behavior, 4.8 for Resource utilization of the developed system, and 4.8 for capacity, respectively.

Table 3. Evaluation of the Respondents in Terms of Performance Efficiency

Performance Efficiency Aspects	Mean	Description
Time Behavior. The response and processing time in performing the required functions.	4.8	Highly Efficient
Resource utilization. The ability to display the required document expected by the system.	4.7	Highly Efficient
Capacity. The maximum level is provided	4.8	Highly Efficient
Overall Mean	4.7	Highly Efficient

It suggests that the respondents were satisfied with what the system could do under a specified condition. In the study of Orioque [5], the characteristics of software engineering standards from ISO/IEC 9126 Product Quality Standard, which include performance efficiency, were enumerated. They emphasized that a system needs to evaluate its capability to exhibit the required performance with regards to the number of resources needed to satisfy the needs of the users in a specified context of use [8].

3.2.3 Evaluation of the Developed System as to its Usability

Table 4 presents the respondents' evaluations of the usability aspects of the developed system. As shown, appropriateness got a weighted mean of 4.6, followed by learnability of the developed system of 4.6, operability got 4.6, user interface aesthetics had got 4.7, and accessibility got 4.7.

In general, the developed system got an overall weighted mean of 4.7, which denotes "Highly Usable".

Table 4. Evaluation of the Respondents in Terms of Usability

Usability Aspects	Mean	Description
Appropriateness. Recognizes the user's needs.	4.6	Highly Usable
Learnability. The system is easy to manipulate.	4.6	Highly Usable
Operability. The system generates easily	4.6	Highly Usable
User interface aesthetics. The system is easy to navigate and pleasing to the user	4.7	Highly Usable
Accessibility The system can access anytime, anywhere regardless of the device used	4.7	Highly Usable
Overall Mean	4.7	Highly Usable

The findings showed that the developed system requires effort, is easy to use, and is easy to understand. In other words, the developed system is user-friendly and exceptionally valuable to the respondents. According to Nielsen [4], "usability is a quality attribute that assesses how easy user interfaces are to use and incorporates learnability, effectiveness, and memorability". The findings suggest that the system is easy to navigate and user-friendly.

4. Conclusion

The online document management system was developed based on the required specifications of the software as perceived by the users. The researchers ensured its simplicity, accuracy, and convenience. It is confirmed by the findings that the respondents rated high on functionality, performance efficiency, and usability. Thus, the researchers highly suggest utilizing the developed system during online school academic accreditation for easy control of supporting documents, fast access, and efficient profiling of office records.

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