Intranet-Based Electronic Document Management System for DHVSU Accreditation Using Python Django

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Abstract: - Nowadays, universities such as Don Honorio Ventura State University manually handle large amounts of accreditation files that do not have a centralized storage location. The researchers proposed a solution in the form of an intranet-based electronic document management system, as there is no currently available system at the university to store the files efficiently. The system uses the SDLC V-model for the development of the system to identify errors during the development stage. The program has three different account types: admin, faculty, and accreditor. The study was conducted at the Main Campus of DHVSU, where all the data for the study was collected. The researchers conducted the feasibility survey, unit testing, integration testing, system testing, connection testing, user acceptance testing, and expert testing to verify if the system is feasible and if it is working properly. The data shows that the faculty, accreditors, and administrators strongly agree that the system should be necessary for the university. The system passed unit, integration, and system testing, proving that the system is working as expected. The researchers ask the EcE faculty and six field experts to test the system and answer the questionnaires designed using ISO 25010. Both the experts and the EcE faculty strongly agree that the system performs properly and meets the requirements of the users. In conclusion, the system passed all the testing and proved that it can aid in storing and managing accreditation files.

Keywords: -- *Accreditation, Intranet-based, Accreditation, Faculty, Admin, Areas, Programs.*

I. INTRODUCTION

Nowadays, universities have varieties of personal and public records or files to handle. To prevent unauthorized access, it is necessary to keep these documents secure as they move from one office to another. The management strategy still relies on human physical management, which has shown that, if not properly managed, they are vulnerable to being lost, unmonitored, and taking a long time to [1]. A document management system is a way to automate manual processes. It is a system for managing data on a computer system and software to store, manage, and track electronic documents and electronic versions of paper-based information scanned in [2].

Employees can sort, access, and retrieve documents conveniently, which saves them time searching for files and allows them to be more productive. Systems for managing electronic documents can also symbolize the paperless office movement.

An intranet document management system is similar to an online file management system but limited to the range of the private network it was connected to. It provides a secure way of accessing organizational files that contains sensitive data. This method aids with the struggle of face-to-face accreditation as it provides access to authorities while limiting physical contact [3].

Different programming languages can be used to create a document management system, be it online or offline. Python, SQL, C#, R, and PHP are some of the languages that can be used in creating a database. Different researchers also compare the programming languages used today and a lot of them came to a consensus that Python has simpler syntax when compared to C and Java [4]. Furthermore, Python is one of the many open-source languages used in programming and

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has soared in popularity in recent years. The flexibility it has combined with the vast libraries allows it to be used on different platforms to generate the output of the user. This simplicity and reliability made Python a known name in the programming world [5].

The framework and libraries of Python and other programming languages add depth while shortening the number of lines on the main code. Django is one of the most used frameworks, it is an open-source, free web application framework built on Python. It helps programmers quickly build a feature-rich, safe, and scalable online backend [6].

Python cannot be used alone in creating a database. JavaScript fulfills all of those requirements as it is a necessary component in front-end website development. JavaScript is a famous scripting language used to create magic on sites to make the site interactive for the user. It is used to enhance the functionality of a website to run web-based software [7].

Additionally, to be able to add, access, and process data stored in a computer database, a database management system such as MySQL Server is needed. MySQL is currently the most used database management system for relational databases. The Oracle Corporation supports this open-source database application. It's a database management system that's effective, scalable, and easy to use when compared to Oracle Database and Microsoft SQL Server [8].

II. METHODOLOGY

The figure below presents the conceptual framework of the study. The input shows the requirements for the system such as the target user and the related literature and study regarding the systems already present. The process includes the different phases necessary for the development of the system. The output presents the culmination of gathered data from the finished study.
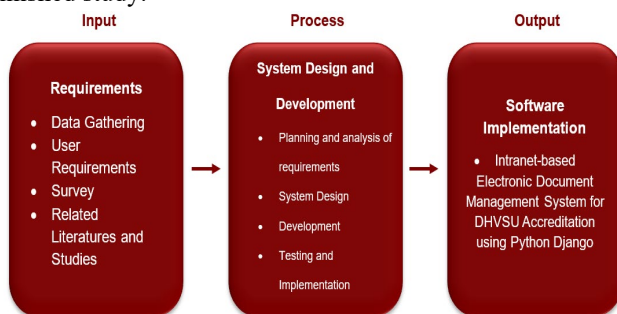

Fig.1. Conceptual Framework of Study

2.1. Research Design

This study aims to aid with the traditional accreditation system of the university that is not centralized. The researchers use a Descriptive type of research to gather the information necessary for the system. According to Bhat, A., the descriptive method focuses on the question that aims to understand the need rather than the reason behind it. This method was used since the researchers focus on gathering data using the surveys.

The researchers also used a Quasi-Experimental type of research in the study. According to Villegas, F., quasi-experimental research selects a group of people with similar agendas to lessen the group size of the study. The researchers choose a specific group of respondents for the study but pre-select which people under the group will answer the survey.

2.2. Methods Used in Developing the System

The research proponents used the V-model to develop the system as suggested by the Chair Panel. The V-model is one of the well-known models for developing a system that has specific requirements.
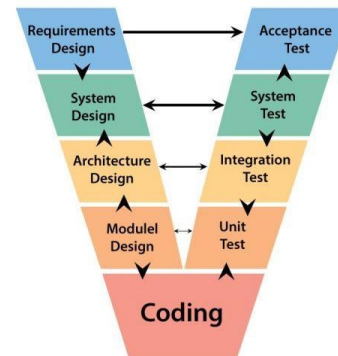

Fig.2. V-Model for the design and development of the system

2.3. Data Assessment

The researchers compiled the suggestions they received to set the starting point for the features of the system. The comments and suggestions are as follows:

- Match the design of the system with that of the university.
- There are three types of users namely: admin, accreditor, and faculty.
- The admin can view, edit, and export files from any area.

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- The accreditors have a particular area assigned under a specific program in which they can only view files and cannot make any changes to them.
- The faculty can only view and edit files in a particular area assigned.
- The accreditors and faculty may have two or more particular areas assigned.
- There should be a search bar to easily find the files.
- The Mastery Survey Instrument Form must be followed since it has the necessary list of requirements for accreditation.
- The system should be intranet-based unless the proponents can make sure that there is no chance of security breach since there are numerous files that contain the personal information of the people in the university.

2.4. Use Case Diagram

A use case diagram is a means to summarize details of a system and the users within the system. It displayed a graphic representation of how users interact with the system.

Fig.3. Use Case Diagram

Figure 3 illustrates the three users namely: the admin, the faculty, and the accreditors, and their type of access to the system. The admin account was already created during the development of the system. The admin has the authority to manage accounts for the faculty and accreditor. He can create as well as delete accounts. After logging in, the users will direct to their specific homepage. The admin has access to all the parameters of the system. From creating an account, the admin

also has the authority to add new folders for the colleges and also to add programs. The admin can access all the files uploaded by the faculty, he can search, upload, export, rename or even delete the files. On the other hand, the faculty has a particular area where he can upload documents. They also have the authority to search, rename, and delete files into their specific area. Lastly, the accreditor can just only view and search files of a particular area.

2.5. Data Gathering Procedure

The study entitled Intranet-based Electronic Document Management System for DHVSU Accreditation using Python Django was conducted at the main campus of Don Honorio Ventura State University. The respondents for the feasibility survey were the different faculty under the College of Engineering and Architecture while the testing of the acceptance system was done by the faculty of the Electronic Engineering Department. Different testing such as range and load testing will take place on the main building of the College of Engineering and Architecture.

The researchers used survey questionnaires as the main tool for gathering data for the study to prove if the system is needed and if it is operational and meets the objectives of the proponents.
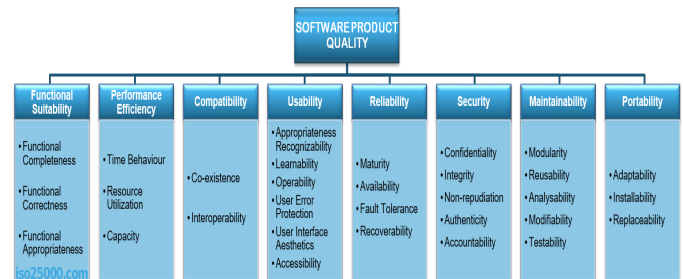

Fig.4. ISO 25010 (ISO 25000 Software and Data Quality)

The researchers use ISO 25010 as the base for creating the testing questionnaires for the system. The proponents choose only the appropriate ones for the testing of the system. The five characteristics selected were Functional Sustainability, Performance Efficiency, Usability, Security, and Reliability. The researchers also use former research questionaries using the same ISO when creating the questions for testing.

The researchers created a request letter to obtain permission to survey the College of Engineering and Architecture. The approved letter has the signature of the proponents, their adviser, the Research Design 2 instructor, the Chairperson of

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the department, and the Dean of the College of Engineering and Architecture.

The researchers also included the Data Privacy Act of 2012 on the questionnaires pledging the information of the respondents will not be clicked and the data shall only be used for its intended purpose.

The proponents use Slovin's Formula to find the sample respondents from the CEA faculty. This is necessary to obtain a proper range of respondents without asking every one of the professors to answer the survey.

The Likert Scale and the weighted mean were necessary to generate questionnaires that can be measured using a linear scale. This allows the researchers to gather the information produced on the surveys.

$$WM = \frac{\Sigma WV}{N}$$

where:
WM = Weighted Mean
WV = Weighted Value
$\sum$ = Symbol for the summation process
N = Number of respondents

Table.1. 5 Point Likert Scale

Rating Scale	Point Values
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Table.2. Equivalent Value of Weighted Mean

Weighted Mean	Descriptive Rating
4.21 - 5	Strongly Agree
3.41 - 4.20	Agree
2.61 - 3.40	Neutral
1.81 - 2.61	Disagree
1 - 1.80	Strongly Disagree

III. RESULT AND DISCUSSION

3.1. Survey

The researchers of the study surveyed with varying questions that match the respondents' field: the faculty of the College of Engineering and Architecture, the In-House Accreditors of the University, and the Head of the Quality Assurance Department. The survey was for the feasibility of electronic document management for accreditation for the university. The results are as follows.

Table.3. Feasibility Response of the Admin

Survey Questionnaires for Admin	x	Interpretation
1. Do you find manually handling accreditation files difficult?	4	Agree
2. Is there any instance of file loss?	4	Agree
3. Is proper management of documents efficient when storing, monitoring, and organizing accreditation files?	5	Strongly Agree
4. Is developing a Document Management System necessary to allow administrators, faculty, and accreditors convenient access to accreditation files?	5	Strongly Agree
5. Does implementing a Document Management System in DHVSU Main Campus help in managing accreditation files?	5	Strongly Agree
6. Do you think a document management system will boost the efficiency of the university?	5	Strongly Agree

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7. Do you prefer the use of Portable Document Format or .pdf for a document management system?	5	Strongly Agree

8. Do you prefer the use of Portable Document Format or .pdf for a document management system?	4.569	Strongly Agree

Table.4. Feasibility Response of the Faculty

Survey Questionnaires for Faculty	x	Interpretation
1. Do you find it difficult to manage physical files?	4.655	Strongly Agree
2. Is there any instance of file loss?	4.655	Strongly Agree
3. Do you find it difficult to find the latest copy of a file?	4.448	Strongly Agree
4. Do you think that a file management system can aid in managing tons of files needed for accreditation?	4.828	Strongly Agree
5. Do you find it difficult to keep track of the files necessary for accreditation?	4.810	Strongly Agree
6. Do you think that the university needs a file management system for accreditation-related purposes?	4.672	Strongly Agree
7. Do you think a document management system will boost the efficiency of the university?	4.440	Strongly Agree

Table.5. Feasibility Response of the Accreditors

Survey Questionnaires for Accreditors	x	Interpretation
1. Do you think that finding a specific part of an area is difficult when viewing it on a physical copy?	4.4	Strongly Agree
2. Is it a hassle to handle a large amount of accreditation files?	4	Agree
3. Does developing a Document Management System necessary to allow convenient access to accreditation files?	4.6	Strongly Agree
4. Do you think a document management system will boost the efficiency of the university?	4.4	Strongly Agree
5. Do you think that the pros of an intranet-based document management system outweigh the main issue it has which is the risk of being hacked?	3.8	Agree
6. Do you prefer the use of Portable Document Format or .pdf for a document management system?	5	Strongly Agree

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3.2. Testing Phase

Table.6. Unit Testing Results

Unit Testing	Remarks
Admin	Pass
Faculty	Pass
Accreditor	Pass

The unit testing verifies if each of the features of the accounts is working individually. This allows the researchers to check if there are errors in the system.

Table.7. Integration Testing Results

Integration Testing	Remarks
Admin	Pass
Faculty	Pass
Accreditor	Pass

The integration testing checks if the features that are related to each other are working properly. This was done to verify if the features of the system are connected rather than just working individually. The result of the test shows that all the features of each account are working as intended.

Table.8. System Testing Results

System Testing	Remarks
Load Test	Pass
Portability Test	Pass
Response Time Test	Pass
Range Test	Pass
Functional Test	Pass

System testing is a series of tests that aims to simulate the working operation of the program. It consists of different tests that may appear in real-use scenarios; this provides the researchers with information that can aid in validating the operations of the system.

Table.9. Acceptance Testing Results

Acceptance Testing	$\bar{x}$	Remarks
Functional Suitability	4.84375	Strongly Agree
Performance Efficiency	4.729167	Strongly Agree
Usability	4.71875	Strongly Agree
Security	4.791667	Strongly Agree
Reliability	4.6875	Strongly Agree

Acceptance testing is the test that validates if the need of the target users is met. This requires the actual users to use the product before it can be approved for deployment. The result of the testing shows that the end users approve of the features and function of the system itself.

Table.10. Expert Testing

Expert testing	$\bar{x}$	Remarks
Functional Suitability	4.67	Strongly Agree
Performance Efficiency	4.44	Strongly Agree
Compatibility	4.75	Strongly Agree
Usability	4.42	Strongly Agree
Reliability	4.75	Strongly Agree
Security	4.46	Strongly Agree
Maintainability	4.67	Strongly Agree
Portability	4.56	Strongly Agree

Expert testing is another process that requires the aid of field professionals to validate if the system fits the ISO standards. The respondents strongly agree that the system is up to international standards.

IV. CONCLUSIONS

The researchers gathered information through observation, surveys, evaluations, and comments. The researchers concluded the following:

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- The proposed Intranet-based Electronic Document Management System for DHVSU Accreditation using Python Django is proven to be both a feasible and efficient way of managing accreditation-related files for the university; this was concluded using the data from the previous chapter.
- The ¬developed document management system can only be accessed within the private network of the CEA Main Building.
- The system can store and manage pdf files for accreditation that can only be accessed by authorized users namely, the administrator, the faculty, and the accreditors.
- The system provides a place for the faculty and other accreditation personnel to conveniently store documents related to the university accreditation as the system presents another way of storing data.
- The system benefited the university especially the accreditation-related personnel of the university by providing another way of presenting the files to the accreditors.

Recommendations:

The results of the findings and conclusion of the study lead to the following recommendations below regarding the thesis entitled "Intranet-based Electronic Document Management System for DHVSU Accreditation using Python Django.

- Make the system easier to deploy while having access to different file types such as Word and Excel.
- Adjust the accounts to allow the faculty to access other areas, and the said accounts can be transferred to other areas rather than being deleted.
- Increase the coverage of the testing of the system to provide cover for more users.

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