Development of File Management System for ECE Accreditation

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Abstract— **The pursuit of national accreditation is the goal of any university in the Philippines. Accreditation protects the interests of students, the learning institutions themselves and prospective employers by ensuring that the training programs offered have reached a degree that equals or exceeds requirements established by industry experts. Accreditation also requires a lot of time and effort by the faculty to be able to provide documents needed for the process. This study aims to develop a file management system for ECE accreditation to be able to make the process efficient and effortless for the faculty and accreditors.**

Index Terms— **file management system, document management system, accreditation**

I. INTRODUCTION

Enhancing education is a priority for countries all over the world. Undergraduate engineering programs are designed primarily to provide basic education by applying technological, science and mathematical expertise to achieve a desired goal, safely and efficiently. Such technical professions may take advantage of Accreditation services to enhance their academic quality [1].

Providing high quality education is the goal of every university. Accreditation plays a significant role in every university. Accreditation systems aim to be a management mechanism that enhances self-assessment, conducts a process of quality improvement and contributes to self-regulation. Accreditation process requires thorough documentation, time, effort, and full coordination of the faculty and students alike.

The principal role of the Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACCUP), Inc. is to accredit curriculum programs in the Philippines, especially for state universities and colleges [2]. Accreditation process involves detailed documentation of educational and administrative tasks that require careful coordination and preparation in order to compile, evaluate and report on time. Unfortunately, perpetual quality assurance systems focused on universities are rarely appropriate for these criteria and their related timelines [3].

II. RELATED LITERATURE

A study by K. G. Alberto, et al. aims to redefine the architecture of the Electronic Document Management System (EDMS) by adding basic components such as collection, storage, indexing and recovery, protection and archiving, and by introducing other features such as auto-segregation that distinguish the proposed system from other EDMS [4].

Another study by L.M. Assidmi proposes Lean Six Sigma methodology as a tool to identify and address waste in the process of producing the necessary documents for accreditation. Lean method maximizes educational value to students while minimizing waste. Simply, lean means creating more value for students with fewer resources [3].

A study by T. Miksa, et al., Summarizes the results of the Research Data Alliance working group on the Common Standards Data Management Plan to implement this vision. The paper outlines the outcomes of consultations and proof of concept methods that help: define information needs of the data management stakeholders; Defining the scope of the Common Data Framework for Machine-Activated Data Management Plans to allow for information sharing between systems; defining required resources and infrastructure components to facilitate automation of data management tasks [5].

Another study by L. Sui, et al., states that All kinds of ISO systems need to handle a large number of documents, so if these documents were handled by manual processing people would face a lot of trouble. This paper designs one type of ISO document management system to solve this problem. This program closely blends management definition and its function; it enables companies to benefit from ISO performance; it also provides companies with adequate guarantees from farther inspections [6].

III. METHODOLOGY

A. Responsiveness of the System

Responsive web design (RWD) is a technique used by the web developers in which a webpage can adapt depending on the type of device being utilized such as computer desktop, laptop, tablet or smartphones [7]. The significance of having a responsive web design are as follows: (1) it is accessible and easy to navigate since the web pages are compatible regardless of the device being used, thus, it will deliver an optimal browsing experience to the user. (2) it can help to load the website faster [8].

Fig. 1 Homepage

Figure 1 illustrates the homepage of the system using a mobile phone. The ECE-DMS landing page used to describe the system functions and context.
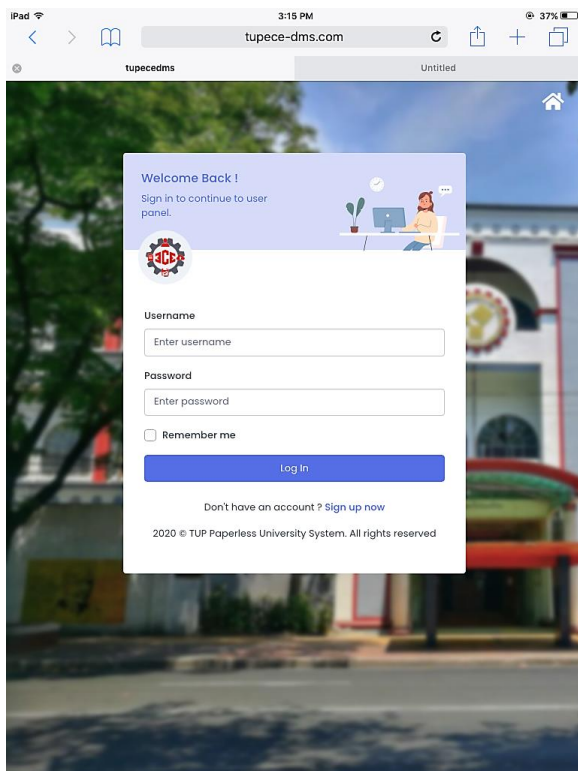

Fig. 2 Log-in Page

Figure 2 illustrates the ECE-DMS log-in page of the system using a mobile phone. It consists of field of text, including username and password that the user must fill in to sign-in to the account.
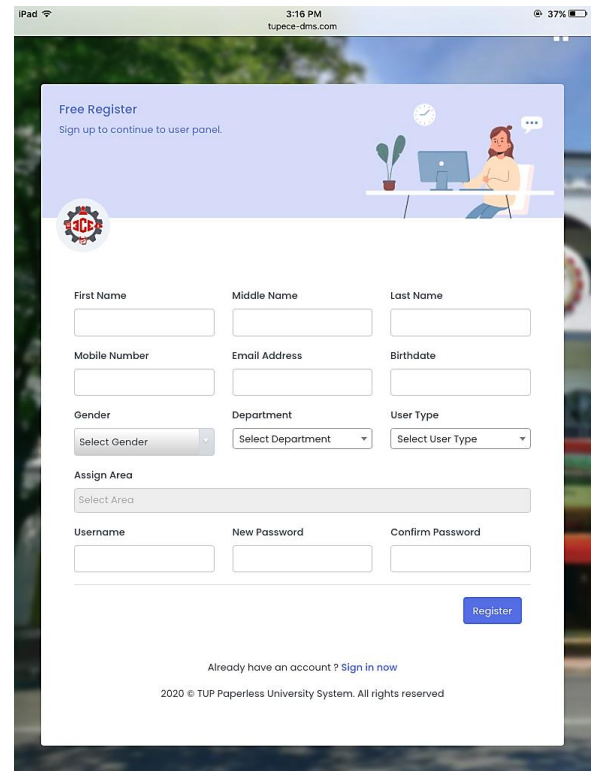

Fig. 3 Sign-up Page

Figure 3 illustrates the ECE-DMS sign-up page using a mobile phone. It requires user credentials and it will serve as a record for users. The admin is first to verify this detail until a user gets into the system.
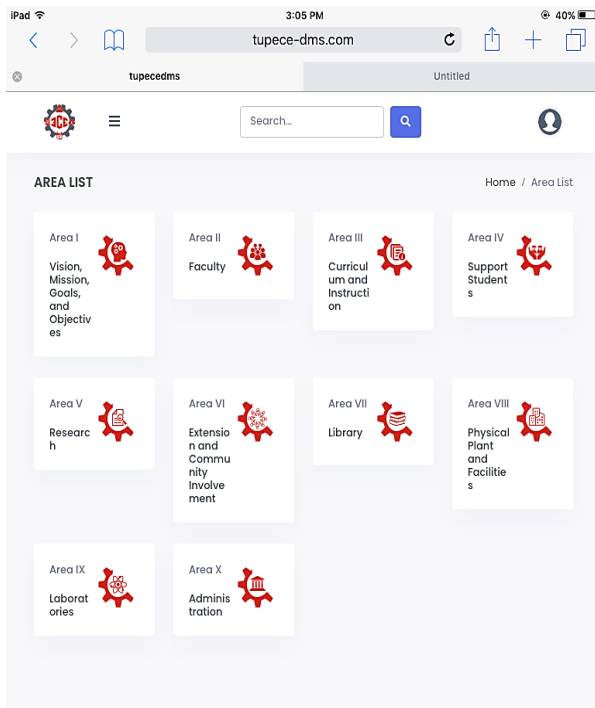
Fig. 4 Area List Page

Figure 4 illustrates the ECE-DMS area list page interface using a mobile phone. The area list shows a listing of all files uploaded in the particular area.
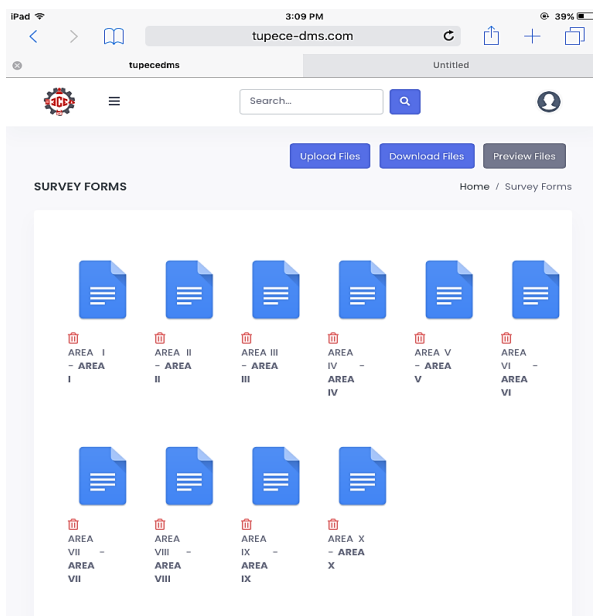
Fig. 5 Self-Survey Instrument Forms Page

Figure 5 illustrates the ECE-DMS self-survey instrument forms page interface using a mobile phone. It consists of downloadable self-survey instrument forms that can be used for accreditation
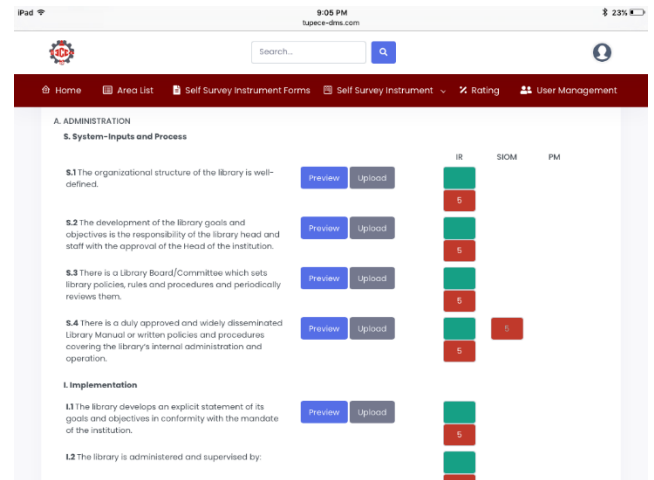
Fig. 6 Self-Survey Instrument Page under Area 7

Figure 6 illustrates the self-survey instrument page of the system using a mobile phone. All self-survey instruments are already integrated into the system, which can be evaluated systematically by the chairman and the accreditor.

Fig. 7 Area Rating Page under Area 7

Figure 7 illustrates the area rating page of the system using a mobile phone. The rating results for a particular area will be shown on this page.

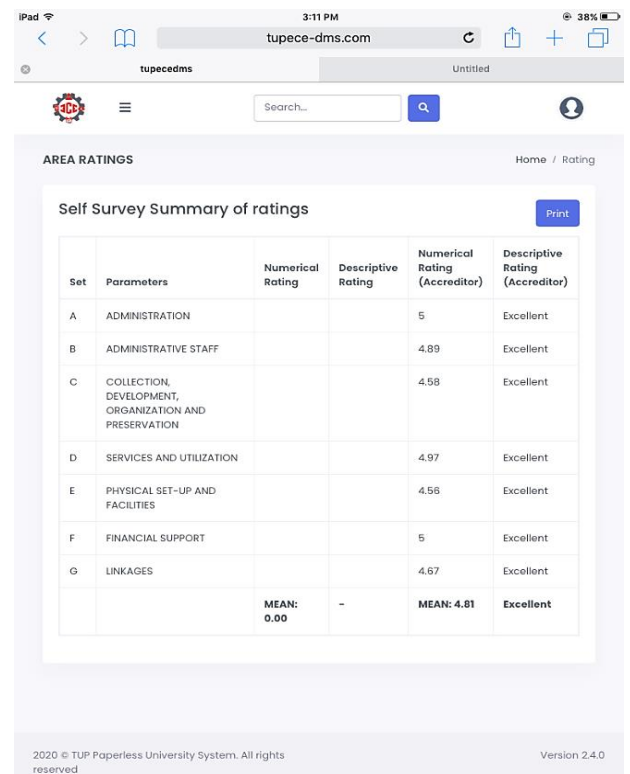**Fig. 8** Summary of Self-Survey Rating Page

Figure 8 illustrates the summary of self-survey rating page using a mobile phone. This page contains the ratings of all areas in the self-survey instruments.

B. Data Collection

The necessary data such as Self-Survey Instrument Forms, Outcomes-based Program Accreditation Survey Instrument, Evidences for benchmark statements under Area 6 and 7 and its Rating were obtained. The data obtained would assist the system's performance.

C. Integration of Self-Sruvey Instruments Forms

Fig. 9 AACCUP's Accreditation Files

Figure 9 shows the Outcomes-Based Program Accreditation Survey Instrument for Electronics Engineering. The survey instruments are program specific. These are tools used as guide to the accreditors for rating. The self-survey instrument consists of ten areas and benchmark statements under each criterion. Each area is divided into different parameters and each parameter is divided into three indicators such as the System-Inputs and Processes, Implementation and Outcomes. The benchmark statements are specific standards based on specific policies and good practices. The survey instrument has provision for rating of each benchmark statement, section mean, and the area mean. Area means are summarized for computing the grand mean using weighted average and each of the areas is evaluated in the context of some parameters.

D. The Survey Instrument

Table 1: Context of Parameters for Areas 1 and 2

Area	Parameters	Number of Parameters
Area I. Vision, Mission, Goals and Objectives	A. Statement of Vision, Mission, Goals and Objectives B. Dissemination and Acceptability	2
Area II. Faculty	A. Academic Qualification and Professional Experiences B. Recruitment, Selection and Orientation	8

| | C. Faculty Adequacy and Loading
D. Rank and Tenure
E. Faculty and Development
F. Professional Performance and Scholarly Works
G. Salaries, Fringe Benefits and Incentives
H. Professionalism | |

Table 2: Undergraduate Teacher Education program for the remaining areas

Area	Title	Number of Parameters
Area III	Curriculum and Instruction	6
Area IV	Support to Students	5
Area V	Research	4
Area VI	Extension and Community Involvement	4
Area VII	Library	7
Area VIII	Physical Plant and Facilities	10
Area IX	Laboratories	4
Area X	Administration	8

E. The Rating System

Table 3: Rating System

Area	Weight	Area Mean	Weighted Mean
I. Vision, Mission, Goals and Objectives	2		
II. Faculty	8		
III. Curriculum and Instruction	6		
IV. Support to Students	5		
V. Research	4		
VI. Extension and Community Involvement	4		
VII. Library	7		
VIII. Physical Plant and Facilities	10		
IX. Laboratories	4		
X. Administration	8		
Over Total	58		
Grand Mean			

Descriptive Rating			

- Weighted Mean = Area Mean x Weight Value

- Grand Mean $= \frac{\text{Sum of Weighted Means}}{\text{Sum of Weights}}$

Table 4: Scale used for the Descriptive Rating

1 – 1.49	1	Poor
1.5 – 2.49	2	Fair
2.5 – 3.49	3	Satisfactory
3.5 – 4.49	4	Very Satisfactory
4.5 – 5.00	5	Excellent

Table 5: Required Ratings for the Award of Accreditation Status

Type of Survey	Required Ratings	Accreditation Status
a. Internal Survey Visit (Preliminary)	Grand Mean ≥ 2.50 None among the areas is rated less than 2.00	Candidate Status
b. 1st Survey Visit (Formal)	Grand Mean ≥ 3.00 None among the areas is rated less than 2.50	Accredited Level I
c. 2nd Survey Visit (First Resurvey)	Grand Mean ≥ 2.50 None among the areas is rated less than 2.00	Accredited Level II
d. 3rd Survey Visit (Second Resurvey)	Grand Mean ≥ 2.50 None among the areas is rated less than 2.00	Accredited Level III

F. Technology Overview

The technology used to implement this system are for the database, the researchers used MySQL Workbench. Node.js for the JavaScript platform, Git for the source code, Laravel Framework for the composer, Bitbucket/Gitlab for the repository and AWS for the web hosting.

G. System Overview

ECE- Accreditation Document Management System can simplify the process of acquiring, evaluating and presenting of information required to show compliance with the requirements of AACCUP. The ECE-DMS provides a framework for any platform to present the accreditation data and also generate the rating of self-survey instruments based on the chairman and accreditors' interpretation. The system will measure this in a systematic manner using the integrated self-survey instrument forms and the provided data. In addition, the system contributes in organizing the accreditation process in ECE department and in promoting a paperless system.

IV. Conclusion

The researchers conclude that the results obtained offer relevant information for the accreditation which aims to efficiently and sustainably improve quality. The Accreditation process includes comprehensive documentation of educational and administrative events, requiring meticulous preparation and planning in order to compile, evaluate and report on time. Researchers of this paper developed another work process for the accreditation activities to ensure: easy, transparent, wherever possible, easily accessible and academic fraud free accreditation procedure to ensure quality of engineering education in particular for the Electronics Department of Technological University of the Philippines – Manila and this would enable both the faculty and the accreditors to store and coordinate data quickly, rather than manually.

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