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Development of e-Course File System in the Department of Engineering, Faculty of Engineering and Life Sciences, Universiti Selangor.

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Abstract

Course file is one of the important aspect assessed by either the MQA or EAC panels. Currently, almost all Malaysian universities and college universities are using a traditional method in their filing system and this affects the organisation, financially and environmentally. Using a quality assurance guideline and open source solution, this study proposed an online database management system to replace the manual method. The proposed systems will be useful to lecturers and will reduce the time used in processing documents.

Key-word: - e-Course file, filing, MQA and EAC.

1.0 Introduction

Malaysian Qualification Agency (MQA) is an accreditation authority responsible for monitoring and overseeing the quality assurance practices and accreditation of the national higher education institution. All Institutions of Higher Learning (IHL) are required to go through the accreditation process to assure quality in the field of teaching and learning and to achieve their qualification goals. Meanwhile, the Engineering Accreditation Council (EAC) is the only recognised accrediting body for the engineering degree programmes offered in Malaysia.

During the MQA or EAC visit, one of the compulsory documents to be submitted to the panel is the course file. A course file has all the information about the course offered every semester of each academic year and it also contains the course material that proves the implementation of teaching and learning. Not only the lecturers understood the given course details clearly but the students also benefited because the lecturers' various skills, such as cognitive, interpersonal, and communicative skills are being assessed regularly to improve their overall ability. In Universiti Selangor (UNISEL), the course files need to be documented by the respective lecturer within one month after the endorsement of students' assessment result. In the current practice, all IHL including UNISEL, prepare and submit hardcopy documents. However, this method involves high usage of stationeries and it is not environmentally friendly. Table 1.0 presents the A4 paper consumption by academic staff of the Department of Engineering for academic semesters of 2017. Statistically, the average usage for each semester by the department is approximately 45 reams.

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Table 1.0: A4 paper usage

Engineering Division	Academic year 2017		
	January 2017	August 2017	Percentage of difference
Civil	9	6	16.9%
Electrical and Electronic	19	24	48.3%
Mechanical	17	14	34.8%

Meanwhile, the following Figure 1.1 shows a heap of course file papers and damaged stationeries in 2016. According to the departmental practice, these records must be kept for five years before it can be disposed of.

Figure 1.1: Previous record

Therefore, to corroborate with UNISEL's cost-saving project, the main objective of this current paper is to develop a web-based data management portal namely e-Course file using open source tools (Hippel & Krogh, 2003). It is expected that this portal will reduce the stationeries budget and time consumption.

2.0 Database Management Systems

Some database management systems that were developed by UNISEL lecturers are the e-Appeal system (Nur Razia Mohd Suradi, 2013), K-PORTAL system (Subramaniam & Suradi, 2010) and (Suradi, Subramaniam, Hassan, & Omar, 2010), and also a barcode scanner for student attendance system (Subramaniam, Hassan, & Widyarto, 2013). These systems were designed to solve academic issues and to enable unknowledgeable user on the programming and graphic imaging tools to include material or modify the contents within a period of time (Yang, M. et al., 2008).

2.1 Course Files

All course material in the Department of Engineering, Faculty of Engineering and Life Sciences (FELS) are documented manually. Figure 2.0 and 2.1 depict some course files in 2017. These course files were created by Continuous Quality Improvement (CQI) and Course File Committee according to guidelines, such as course file format, course code, and different checklist that met the MQA and EAC requirements (Abdul Rahman, Juwairiyyah, Ab-Rahman, Mohammad Syuhaimi, Mohd Yusoff, 2015). The pink, yellow, green, and blue colour labels denote course file prepared by civil, electrical, electronic, and mechanical division, respectively.

Figure 2.0: Course files in the Engineering Department

Figure 2.1: Division course files

3.0 Methodology

There are two main stages involve in creating an e-Course file, namely the development and testing process. The development process starts by creating a checklist of the e-Course file, initiating the domain and graphical user interface (GUI). The checklist content is shown in Table 3.0.

Table 3.0: e-Course file Checklist

Criteria	Description
Course information	Syllabi of the subject
Teaching timetable	Lecturers' timetable
Lecture materials	Lecture notes, question and answer scheme of course assessment
Final examination	Moderation form, question and answer scheme of final examination
Course analysis	Student grade analysis and course lecturer assessment result

Next, the e-Course file domain will be created by the Centre for Information, Communication and Technology (CICT) and then the GUI approach is selected. GUI-based requirement gathering approach is used in gathering the requirement from the Department of Engineering. This refers to creating mockups of user interfaces and augmenting the partial designs (Moore & Shipman, 2008). GUI-based requirement gathering is an effective approach to getting adequate requirements compared to questionnaire-based requirement gathering approach (Moore & Shipman III, 2000). Through the GUI-based requirement approach, the possibilities of gathering non-relevant requirement can be eliminated. A prototype of the e-Course file system will be created and used as the requirement gathering tool. The functionality of this system is gathered with the use of this prototype. Hence, it helps the user to specify the functionality of the system as well as the user interface of the application. Apart from the prototype approach, the object-oriented design approach is used to design the functionality of the system. The object-oriented approach is selected as the design approach for this system development for a number of reasons as follow (Mukherjee, 2016):

- Better modelling for real-world application
- Software reusability during the development of a software system

Upon the successful requirement gathering, the system is constructed using the web scripting language and web programming language.

4.0 Results and Discussion

The portal is currently in the testing stage. Figure 4.0 depicts a screenshot of the website that has been successfully created and it is accessible to the academic staff at ecoursefile.unisel.edu.my.

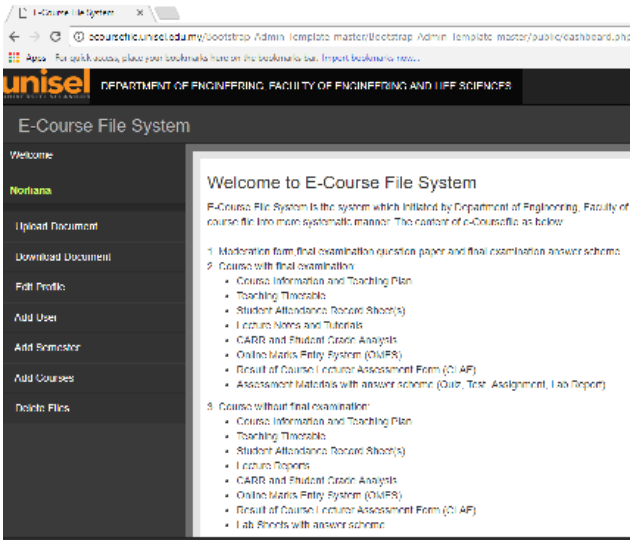

Figure 4.0: Screenshot of the e-Course file website after log in

This e-Course file website is found to be the easiest method compared to other similar web-based data management system such as Microsoft Access. This is because the portal can be accessed from anywhere and at any time as long as there is an internet or wireless connection. The portal uses PHP web programming, MySQL database and Apache as the web server that are well-known for their stability and robustness. Microsoft Access has a limitation in which the cost to enable it access from the web is higher. Additionally, the Microsoft Access database would eventually run slower as the database grew when too much data are collected and stored as compared to the PHP and MySQL databases. The e-Course file system applies the concept of responsive design, which means the layout of the web is appropriate for both desktop and mobile-based platforms. Thus, it allows the system to be used on multiple platforms. The user access to the system is controlled by using the user access level whereby certain numbers were used to control the user level. Two types of users created to use the system as described below:

a) Content provider

Content provide or in this case the course owner shall upload, view, and download a document. Figure 4.1 shows a screenshot of a page that was accessed by an academic staff who played a role as the content provider. For instance, if a lecturer or content provider wants to upload a document, he or she needs to choose the file from his or her local storage, choose the semester, the course, and also the file category.

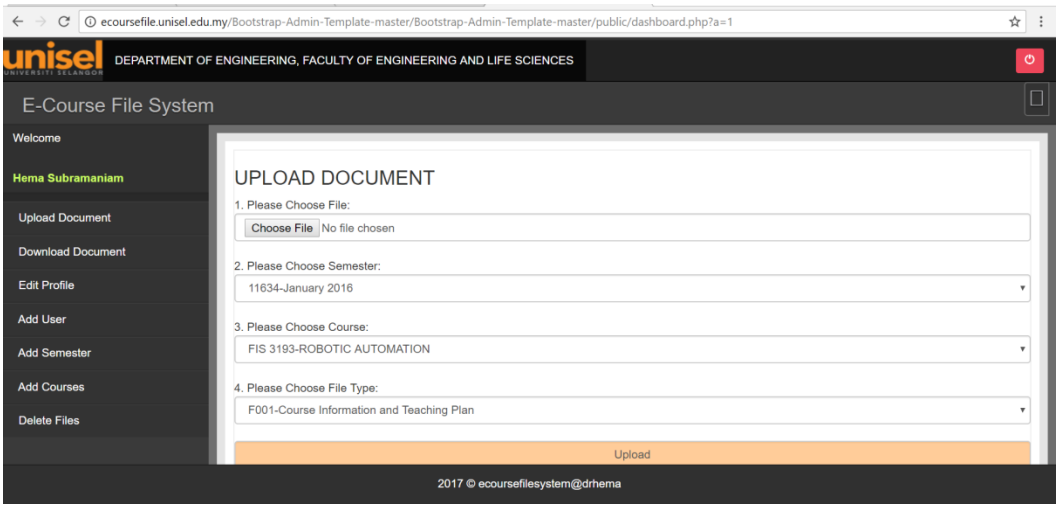

Figure 4.1: User interface for content provider

Once all the information is captured, the system is able to store the document at a specified course for future retrieval.

b) Administrator

As for the administrator, they will be able to add new users, new semesters, and new courses based on requests and needs of the department. Figure 4.2 indicates the interface that allows a user or the administrator to add a new semester.

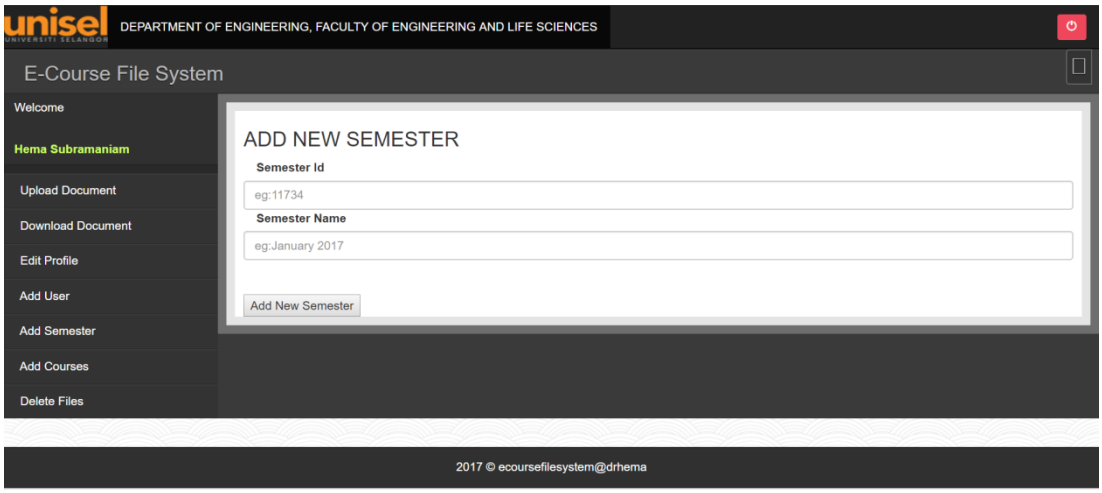

Figure 4.2: User interface for administrator

Since the e-Course file website can be accessed using any computer and phone device, the system will reduce time allocated by academicians to prepare course file-related materials and simultaneously will decrease administrator staff's workload to check for the course file format. Nevertheless, the team encountered several challenges while developing and implementing the system. First, the user can only upload portable document format files with maximum of 2 megabytes per upload. Next, training on how to use the portal must be given to all lecturers before the system can be fully functional. In the future, the user interface can be improved further to make it more user-friendly and more established.

5.0 Conclusion

The e-Course file portal functions as an online database management system for the academic staff to record teaching and learning materials for accreditation purposes. Furthermore, this portal offers an environmentally friendly filing system. Currently, we are in the process of implementing the new system and anticipating feedback from the lecturers to improve the system further.

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