THE DEVELOPMENT OF I-TACWIM FOR ACADEMIC CALENDER MANAGEMENT IN POLYTECHNIC

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ABSTRACT

The need for automated and intelligent technology is a need nowadays. Even in the academic system, these technologies such as mobile apps and intelligent web system is essential for effective communication. However, the method of dissemination of information regarding academic calendar in Polytechnic is conducted conventionally thru hardcopy or downloaded document from institutional portal. The conventional method was found less practical in use which the lecturers often faced problems in their daily academic activities. Thus, namely as i-TACwim aims to design and develop an intelligent academic calendar that able to distribute real-time information regarding academic activities. The application also serves to send notifications to users according to important dates related to the International Standards Organization (ISO) procedures. This project applies repetitive development process adapted from agile Model consists of six phases. The development of this project is using Yii2 Framework PHP of the system and interface, MySQL Server for the database and Firebase as the technology used for push notification. As a result, the i-TACwim application is a need and consider as an alternative to manual academic calendar to be used as the polytechnic intelligent academic calendar among the polytechnic community. User acceptance pilot testing will be conducted via questionnaire to form in order to show the capability and deliverables of this project.

Keywords: *i-TACwim, Academic Calender Management, Polytechnic*

RESEARCH HIGHLIGHTS

- i-TACwim application using mobile devices and web-based technology is a need and is seen as an alternative to the manual academic calendar for polytechnic community;
- The use of push notification technology via a firebase framework is applicable to a real-time alert system;
- i-TACwim established a real-time information distribution regarding academic activities.

GRAPHICAL ABSTRACT

Figure 1 indicates the flow of the design and the development of i-TACwim.

Fig. 1. Framework for i-TACwim (adapted from Jamaluddin et al. (2017))

Research Objectives

In every research, the terms 'research aim', 'research objectives', 'research questions' and 'research hypotheses' tend to have precise meaning, therefore defining the core objectives is the crucial task (Thomas & Hodges, 2010). The objectives need to be specific and relect to the main issues on what the resarch will be done (Khoo, 2005). Thus, in this reseach, i-TACwim aims to simplify the used of academic calender among polytechnic staff where all the information are ready and been notified in anytime. The objectives of this research is to design and develop an intelligent academic calendar that able to distribute real-time information regarding academic activities for the use among polytechnic staff. Hence, i-TACwim been proposed as an application that serves information regarding academic calender and to send notifications to users according to important dates related to the International Standards Organization (ISO) procedures.

Methodology

This reseach is objectives is to design and develop an intelligent academic calendar that able to distribute real-time information regarding academic activities for the use among polytechnic staff. In order to achieve the objective, i-TACwim was designed and developed base on Agile Model. Most of researchers (Ashishdeep et al., (20016), Rahimian & Ramsin, (2008) and Jeong et al., (2008) stated that Agile Model is the most suitable model for mobile applications development because of it follows a combination of iterative and incremental approach where rapidly have a good level of suitability to adapt any changes in the project. There are six (6) phases in Agile model called Requirement, Design, Development, Testing, Deployment and Review. In requirement phase, an exploratory study was carried out using a questionnaire to 30 polytehnic lecturers to determine the problem that had been faced using academic calender and to gain lecturers view agains which media usage that are suitable nowadays. The data from 30 respondents collected via questionnaires were analysed through descriptive analysis. In the design phase the prototype was design based on two main module that is Administrator module as shown in figure 2 which is to develop and update and academic calendar, add a new status for user, develop a notification and sent the notification to the user. The second module is the end user module as shown in figure 3 which is to display received notification, choose and display academic calender, update and display user status. In the development phase, each module been developed using YII2 Framework PHP of the system and interface, MySQL Server for the database and Firebase as the technology used for push notification. Wong (2012) indicated that the usage between the app and website version was about the same, therefore the administration module were developed using website version and end user module were developed using apps version. In the testing phase, the first trial of the prototype is tested among developer itself to check its correctness and the final application is developed fulfilling all the requirements pointed in trial version. As for the deployment and review phase, acceptance test will be conducted to the real user the ensure that all the required features are incorporated in the application.

Fig. 2. Flowchart of module Administrator in iTACwim

Fig. 3. Flowchart of End user module in iTACwim

Results

Table 1 shows the result of descriptive analysis collected from 30 respondents from five departments in Politeknik Muadzam Shah via 10 closed-ended questions.

Table 1. Percentage score of User views toward Academic calendar

Item	User View	Percentage
1	I often (more than 5 times references) refer to the academic calendar in helping my teaching and learning process every semester	86.67
2	I do have problems on referring to the academic calendar when there is no Lecturer Record File with me.	70.00
3	I do miss important dates involving the ISO 9001:2015 standard of Quality Management System	63.33
4	I am always aware of important dates in the calendar of the academic adopted as a guide to perform all the academic activities.	56.67
5	I am expecting committee member of quality unit to remind the important dates related actions in the ISO 9001:2015 standard of Quality Management System	90.00
6	I do wrongly refer to the academic calendar, if there is more than one version of academic calendar (e.g. Academic calendar of 14 and 16 Weeks).	63.33
7	A copy of the academic calendar distributed by the quality unit to all involved occurs before the teaching and learning session start`	90.00
8	I believe with the development of mobile technology nowadays able to further facilitate access to the information of the academic calendar	100.00
9	I am only interested in the information pertaining to my responsibilities in the academic calendar (example: The Head of the Program only see the information under his responsibilities)	76.67
10	I think the existing academic calendar is effective to the improvement of the quality management of teaching and learning especially to the lecturer	80.00

The data from the item 1,5,7,8,10 are above 80% showed are mostly agreed the need of academic calendar in their daily teaching and learning activities. From the table, item 5 shows that 90% from the respondents are agreed that they need assistant to remind them on the important dates that relates to their daily academic activity as most of the respondents were relied to the quality units to remind them. Item 8 shows 100% of the respondents are agreed that mobile technology are able to further facilitate access to the information of the academic calendar.

Findings

The data suggests that with the development of mobile technology nowadays able to further facilitate access to the information of the academic calendar. Moreover, in order to aware of the important dates in the academic calendar, a reminder of important dates related actions in the ISO 9001:2015 standard of Quality Management System is a must. Thus, i-TACwim were designed and developed to simplify the process of distribute real-time information regarding academic activities on academic calendar. Furthermore through i-TACwim, the push notification technology used in this apps is the main factor to replace the curent practice applied in the academic quality procedures. Hence, it will be able to increase the quality of teaching and learning activities especially to the lecturer.

Fig. 4. Interface for End user's sign in

Fig. 5. Interface for End user's welcoming sign

Fig. 6. Interface for End user's update their profile

Fig. 7. Interface for End user's calendar

Fig. 8. Interface for End user's calendar notification

Fig. 9. Interface for End user's calendar notification

Fig. 10. Interface for Admin's Display for Calendar Notification page

Fig. 11. Interface for Admin's Display for Manual Reminder Page

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Author's Biography

Raja Norhafiza binti Raja Rosly is an information technology's lecturer at Politeknik Muadzam Shah Pahang and currently is a PhD candidate at Institute of Technology Management and Entrepreneurship, Universiti Teknikal Malaysia Melaka. Her research focuses on designing and implementing Massive Open Online Courses, TVET lecturer pedagogical knowledge development, and more specifically on how MOOCs usage impact technological, pedagogical content knowledge impact to the TVET lecturer.

Zareena binti Rosli is an information technology's lecturer at Politeknik Muadzam Shah, Pahang and currently is a PhD candidate of Information Technology at Faculty of Information Communication and Technology, Universiti Teknikal Malaysia. She conducts research to investigate the effect of virtual reality learning to improve mathematical word problem solving for students with autism spectrum disorder. She is particularly interested in research area of educational technologies and interactive media.

Noor Muzlinda binti Mat Hashim is an information technology's lecturer at Politeknik Muadzam Shah and currently is a Master of Science candidate at East Coast Environmental Research Institute, Universiti Sultan Zainal Abidin. Her research focuses on designing, developing, implementing model for the

quality of rain water based on chemical content of rainwater, and develop an IoT Rainwater Harvesting Quality Monitoring System that can analyze rainwater quality based on rainwater quality model to obtained rainwater quality monitoring.

Aishah binti On is a lecturer in the Department of Information Technology and Communication at Politeknik Muadzam Shah, where he has been since 2017. She received a Bachelor of Information Technology (Information Management) from UUM in 2003, and an M.Sc. in Computer and Information Engineering, from IIUM.