Implementation of a Cross-Platform Mobile Application for Research Management System at MEC-Proof of Concept Study

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Abstract - *The research mainly focus on the designing a Cross-Platform Mobile Application for Research Management System. Currently, MEC is not having any mobile application where students or teachers allow submit their proposals online instead of filling paper forms. This study took at MEC for experimental object, used Ionic for development platform, - MySQL for backend database, Angular as development language and used PHP technology, then designed Web-based research management system for college. This paper mainly focus on the researcher to submit their proposals online instead of filling paper forms. It helps the related department to follow the approval process until the final approval and also staff can electronically submit applications and obtain the necessary approvals for conference attendance and also Staff and Students to submit their application online and attach evidence to get the award.*

***Key Words*:** Cross-Platform Mobile application development, IDE, Android development, iOS development, Research Management and research achievements.

1. INTRODUCTION:

This mobile App of Research Management system is intended for Middle East College as a way to reduce the efforts and time of both the faculty and students. Middle East College which is located in Muscat is a leading higher education institution that provides a range of opportunities for students to undertake such as undergraduate and postgraduate programs in fields of Engineering, Business and Technology.

The objective of this academic institution is engaging an academic research and community services. So in order to qualify as an academic institution they should have academic program, they should have research with college creating activities and then they might have to outreach to the community to serve the purpose and benefit of their faculty and students. To achieve better quality in registration process the institution needs a developed research management system from the current one which is a manual based one. This will save a lot of time and reduce the work load of the management.

2. AIM AND OBJECTIVES:

The main aim of this paper is to propose a proper way for managing research and innovation center in Middle East College by using Cross platform mobile application.

This paper includes many objectives as following:

- To provide opportunities for increased participation of faculty and students in versatile research.

- To develop the work flow of the management which will make it easy for the user to search, select and fill a form till they send it.

- To improve user management based on authority and rules.

- To provide flexible electronic models by giving chances for making changes in the data filled in by the user.

- To offer quick access and easy communication between the faculty by providing user friendly system and to make easy, effective decision making

3. CURRENT SYSTEM:

Currently, Middle East College is used manual system and wanted to create, design and implement a new mobile App that could make things easy for faculty and students.

The natural problem of existing system that I noticed was that students and faculty had to fill the different application forms by themselves that are need by them and had to get it signed by the different department and admins such as HR department, Accounts department, Associate and assistant department, deputy deans, the registrar and Dean. Also sometimes when the faculty or student wants the signature from any specific department, they don't find the officials. This leads to wasting their time. The current system in MEC does not have any option in research management system where staff and students can apply all the request letters in an efficient way.

The current system takes physical space that is needed to store documents. Whenever a mistake is made and if any changes or corrections have to be done the manual transactions needs to be redone rather than just updating which is not a very efficient way. A lot of time is taken and involves a lot of expense to produce the reports again.

4. LITEREATURE REVIEW:

In "Research Information management Developing tools to inform the management of research and translating existing good practice" Imperial College London 27 August 2010 has proposed a system to manage and develop a research for the academic and administrative staff. The aim of this system is recapitulate the review of the sector in executing a system of research management that has a goal of developing the fundamentals of research and also enhancing crushability and prestige. Also it aims to help researchers identify available funding opportunities. This system lets make reductions depending on those data and fulfills the requirements of institute, thus aids to concentrate on the schemes of the institution or quality of the research and increase benefits on the research conducted by the institute. Their system includes database, intuitive user-friendly interface, regular and automatic updates and flexible system. But they face certain challenges in the system such as: set of processes and activities by which research is managed, lack of shared standards in data across the sector which makes it difficult to define system requirement. Everyday functioning requirements refer to identifying application that are needed for the proper management of research grant. It requires devices to aid research and better training in executing system. The proposed application of the research management system will be useful for the users to manage all the research. [1]

Research Management System-Sultan Qaboos University: According to team member, Sultan Qaboos University on 22 June 2005 has develop a web based which serve the faculty members to publish the research. The Proposed system aims to assistant and upgrade the research management that led to serve the society. The proposed system have several functionality such as the faculty can make request for the local travel requisition, overseas travel requisition, publication submission, conference travel etc. All of this services lead to user satisfaction.[2]

"Researcher Development-University of Stirling" A team from Stirling University has proposed a system of energetic research conducts and research related to society's needs. In this way they maintain exceptional quality standards in all research activity in the Stirling University. Their aim is to improve the research performance and develop its research income as set out in the research strategy (2015-2021). In this system you can find out about the support and advice available for research and knowledge exchange activity. Their system includes managing project research development and research systems. This system enables the staff and students to make significant contributions in conducting research that addresses economic and social benefits. This system provides advanced support mechanisms with a highly efficient online research infrastructure that focuses on improving ability to deliver, enhance and evidence impact. It is important for the proposed system to be flexible in order to advice availability for research and knowledge exchange activity. [3]

Research management in African Universities. According to (Johan Kirkland January 2013 and others the research management is very important as it can increase the impact of Universities on wider societies. African university which is funded by Carnegie Corporation of New York. The exercise showed that there was increased interest in research management of academic for more research undertaken. But there are issues for managing all the research works such as lack of resources and inexperienced staff and also for identifying funding sources and negotiating contracts and how efficiently these activities were run. It has related and helped other five universities to upgrade the quality of managing research. It aims to raise awareness and convert the awareness into organizational structures to enable to transform this awareness into practice. [4]

5. METHODOLOGY:

We have chosen a technique and I intend to use the proposed project Dynamic System Development because the Research Management System's needs to accomplish with time and the cost of this project is specified. This method will help to improve the quality of the proposed project and increase the performance for the application. Both the staff and students need to engage in this project for compiling the essential necessities needed for preparing and generating the application effectively. Moreover before the execution both business study and feasibility studies are carried out. Staff and students are given a user-friendly model for acquiring their comments and feedback so that they can be implemented in the original design. we found that DSDM would be appropriate for this project and identified that prototype model is inappropriate for the proposed project as time is set in this proposed project and it may incur wastage of time due to mending of the application. Even Spiral model is found inadequate for the proposed project as it is very expensive and involves complicated procedures. Also, JAD model is unsuitable for the proposed project since it demands a lot of time and commitment for scheduling and planning.
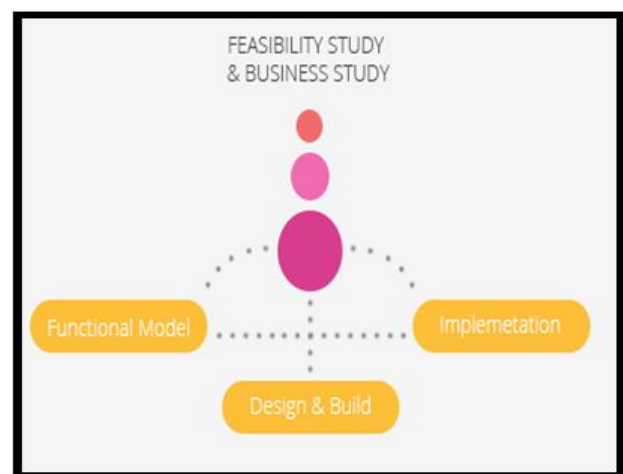

Fig -1: Dynamic System Development Model Methodology

6. DATA ANALYSIS:

After detailed scrutiny of the data assembled from the interrogation, we got a lot of information from the Dean Office. They told the objectives of Research Management System is always in academic institution is engaging an academic research and community services. So in order to qualify for any academic institution they should have academic program, they should have research with college creating activities and then they might have to outreach into the community and serve the purpose and benefit their faculty and students. To achieve better quality in registration process the institution needs a developed research management system from the current one which is a manual based one. This will save a lot of time and reduce the work load of the management.

Analysis the online survey

An online survey will be circulated to the students and staff and this is done to search for relevant data and opinions that will be useful for developing a research management system for MEC. The below given are analysis for each questions conducted in the survey

Chart -1: Results of online survey conducted at MEC

In this chart 1. .About 70% of faculty and student they favor to use mobile App because these days everything is done by the mobile.
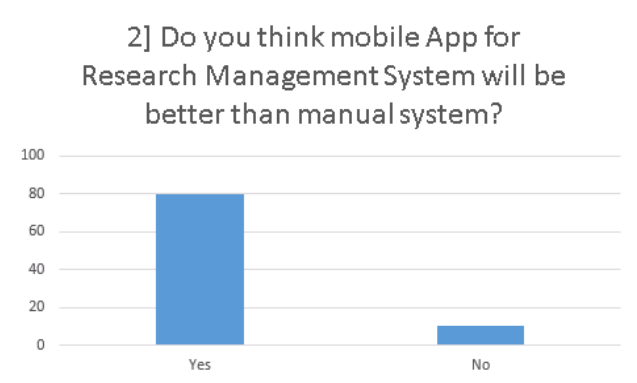

Chart -2: Results of online survey conducted at MEC

Based on this chart2. 80% from faculty and student need to use mobile App because the manual system is ineffectual to fill and apply a request letter or when they want to publish a research.
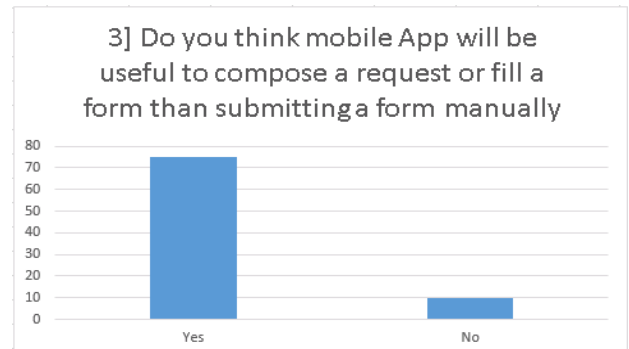

Chart -3: Results of online survey conducted at MEC

From chart 3. There are 75 % of students and faculty responded that the app will be useful because they think that there is no risk of missing the request form but 10% preferred the traditional way of submission.
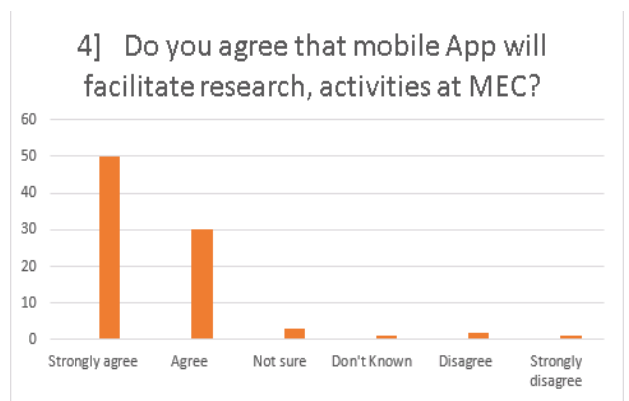

Chart -4: Results of online survey conducted at MEC

In chart 4. About 80% of students and faculty were confident that this app would facilitate research activities at MEC because for those things would be easier when using a mobile app than manual work, however only some of them disagreed to the question

7. SYSTEM DESIGNING:

Use case Diagram

This application can be accessed by different operators such as deanship, admin, staff and students. The diagram shown beneath displays the operators as well as different use case and their relationship. Both students and staff can login into this application to perform the different services such view about RMS, apply the application forms, view their status and publish research. The dean ship can approve or reject the request letter for the student and staff. They also, can generate report and review the proposed registration.
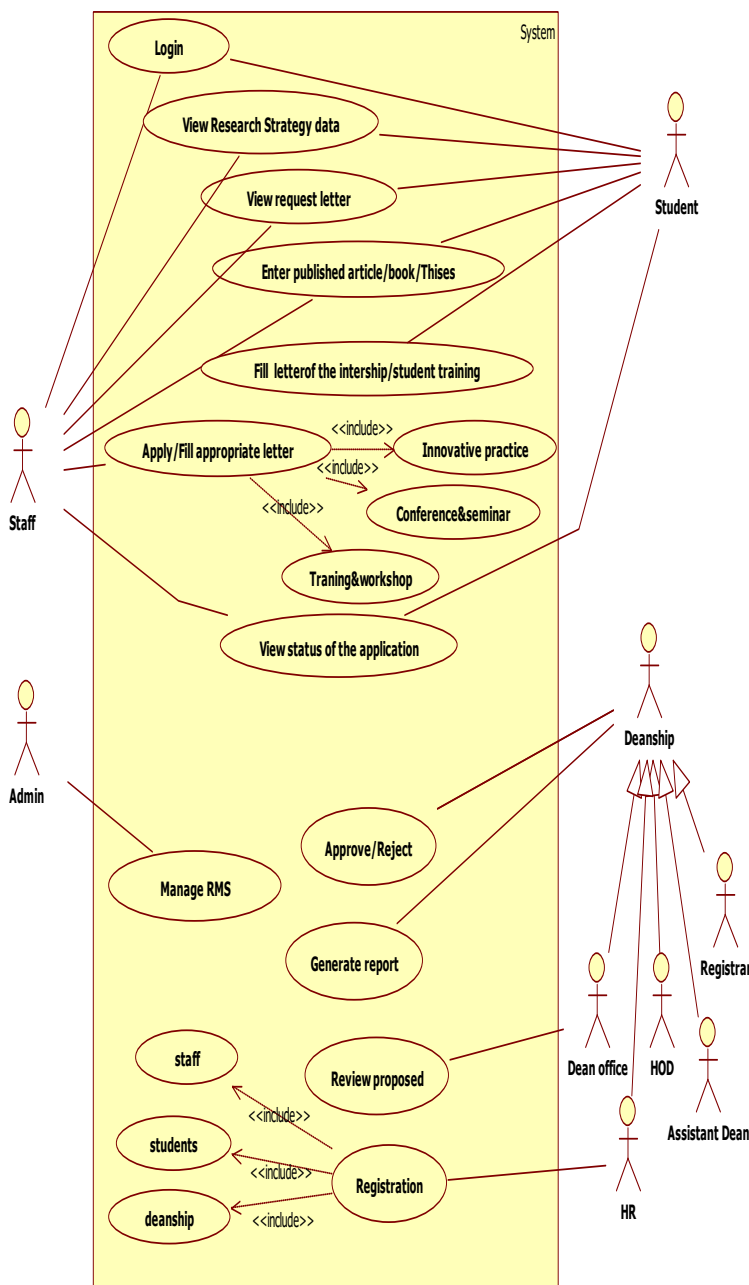
Fig -2: Use case diagram

Fig -3: Login page

From figure 3, the Login page: the staff and students can access this application by using the particular username and password if it valid will can using this App otherwise they can press get help.
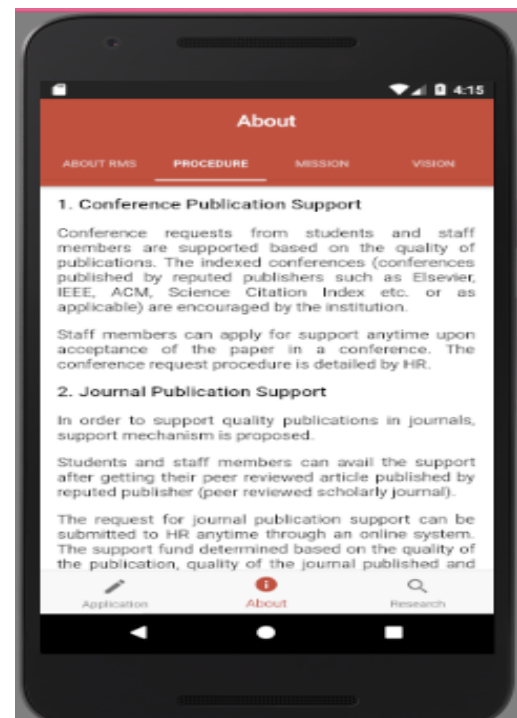

Fig -4: About the RMS

8. Application Design

This part shows some interface of the application such as login page interface, about the RMS interface, application forms for the staff and conference & seminar interface which is created by using the ionic platform. This platform allows the users to use different platform such as Android, IOS and Windows.

In figure 4, which showing information for the Research Management System and some procedure to using this APP, mission and vision for the staff and student when they enter this App.

Fig -6: Application page for the staff

In figure 6, showing the application form for the staff which about training & workshop. The staff should fill all the required data then can send it and wait for the request result.
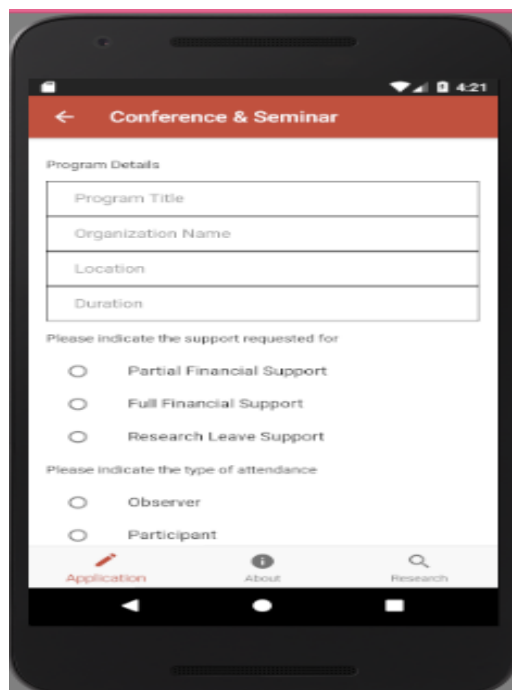

Fig -5: Application form of Training & workshop

From figure 5, this is application forms for the staff: here the staff can choose any application form such as Training & workshop, conference & seminar and innovation practice

Fig -4: Application form of Conference & Seminar

In figure 5, showing the application form for the staff which about Conference & Seminar. The staff should fill all the required data like the data of the program then can send it and wait for the request result.
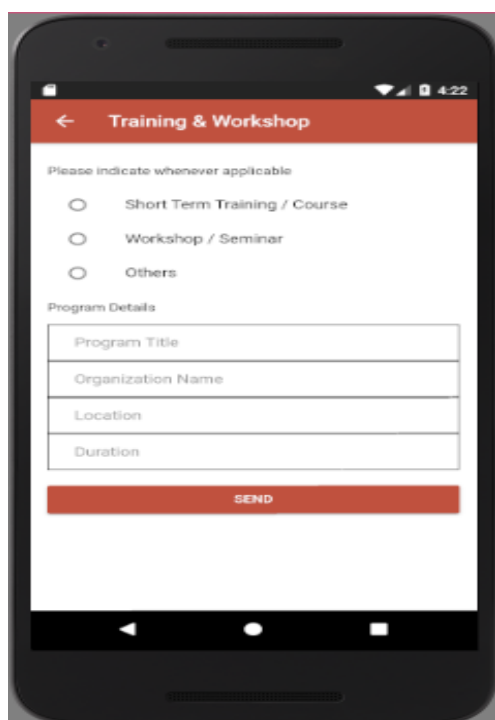
9. CONCLUSION

The major benefit of using smart mobile application for the Research Management System is to meet the needs of the users this application which lead to easier way to confirm the request in short time without any effort from the student and staff. It is also more useful to publish a research when they have a smart and good design for the interface.

In the future this application can be more extended to include other different colleges to publish the research. Moreover addition of other languages like Arabic language may help in attracting more users to use this application.

The suggestions for the future work involve improvement of functionality and quality in order to offer more functions to the application by meeting the needs of all users. Furthermore, the users are able to select their choices from the menu. For instance the selection of any application forms. Once the required option is chosen they need to fill in the form with their requirements and deliver it to the management and receive the results without any delay. Also, add chat option will assist in clarifying the answers needed for staff and students by the manager. And this application is capable of linking different colleges located in various countries.

ACKNOWLEDGEMENT

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