EFFECTIVE WEB BASED PAPERLESS MEETING MANAGEMENT PROCESS FOR UNIVERSITY SYSTEMS IN SRI LANKA

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Abstract

At present computer-based systems are used by most of the universities around the world but then, these systems are still paper-based which involves physical paper occurrence. Currently, most of the universities are suffering obstacles in meeting management due to using paper-based or semi-automated systems. A survey is conducted that drafted some fundamental characteristics required to implement a successful paperless environment.

The paper describes the development of a prototype that can be used in a mobile environment and a web application using a barcode reading technique as an identification token of an attendee for a meeting. The gain in reduced work can in some cases be quite in-built and, in some cases, needs to be analyzed. During the development of the prototype, the author gained new knowledge in mobile operating systems as well as attendee -driven approach, which is important as the meeting industry attempts to reduce the use of resources by making it more attendee-driven.

This study was based on a total sample of 3 faculties in the university of General Sir John Kotelawala Defence University, Sri Lanka. The results of this study suggested that university tends to focus more on perceived convenience of use on conducting meetings and the analyze attendances have more influence on intention to use of meeting management system. The existence of a paperless meeting management system can be achieved presently than its application in the university system with committed efforts by management and decision-makers in the general university system in Srilanka.So, it could be concluded that providing more technological facilities with infrastructure would increase the positive attitude towards using meeting management system among university systems and behavioral intent to use.

***Keywords*— Paperless, Meeting management system, Attendee-driven approach**

I. INTRODUCTION

A typical meeting is led by a chairperson, and minutes which are the recorded deliberations of the meeting are generated at the end. Under the corporate legislation, two classifications of meetings are general meetings and special

or extraordinary meetings (Gershman et al., n.d.). These meetings require a quorum, the minimum number of members present to make them legally operative. Decisions are taken by the number of votes the assenting and dissenting parties can muster. In the past, before technology played a significant role in our lives, conducting a meeting was a challenging task(Bagire et al., 2015), (Masli et al., 2011). The major reason for this weakness was the underdevelopment in the field of telecommunication. Meetings could not be held punctually. Meetings held are not done effectively and efficiently due to poor communication channels among persons. In other words, a meeting with poor ICT interaction was a mere waste of time and energy. Currently, there is no any application software that schedules meetings for university systems. Presently, higher management gives instructions to the secretary wants to arrange a meeting.

The meeting management system provides several advantages to the universities over the traditional meeting systems. In Sri Lankan context meeting management enrolled into the university system to increase the access to higher communication and to improve the quality of communication than the manual process.

As meeting management is a technology-related system, the developers and the deliverers need to understand how the users observe and react to the meeting management systems. That will create a better understanding of how to design and deliver the meeting management approach to the users effectively and efficiently in order to increase the meeting experience.

The objective of this paper was to identify the available methods that used for holding a meeting and the problems encountered, available technologies for holding meetings in a paperless manner, Design the software solution to address research problems with available technology at present, conduct testing and evaluate and improve the system to meet all functional requirements identified.

The second section of this paper includes the background and motivation for this development. The third section discusses the research methodology. The fourth section summarizes the developed main functionality and the hypotheses which were going to test while the fifth section gives a summary of the data analysis and results. The last section includes the inferences and recommendations to the followers, limitations of this research, future directions and the final conclusion.

II. LITERATURE REVIEW

Through the review, it will be thought about regarding the procedure and available observes in what are the problems of conducting the meeting, technologies as well as what are the existing systems for meeting management.

Meeting has different interpretations and definitions according to the various scholars. Meeting meetings for solving problems or exchanging information it is important to gather for an organization that has analyzed and analyzed all the important decisions (Bagire et al., 2015), (MARUTHAIAH, n.d.).

By determination, each meeting the date and place, the system will participate in the system using JavaScript, CSS, and MySQL. Using a Meeting management system in an organization Can improve efficient timetable and resources for the meeting (Moldovan, n.d.),(Gershman et al., n.d.),(Md Sultan et al., 2009).

Basically, the system developed consists of three layers, Conference Management Dashboard, Conference Management Platform (operation), and the database layer. The operation of the Conference Management System consists of several modules which consist of participant registration, paper management, paper review manager, and the messaging module will be integrated with SMS to provide e-mail to short messaging (Md Sultan et al., 2009),(Leva, n.d.).

most meeting rooms or management system meeting in meeting rooms is basically based on a specific timetable. However, at times during the meetings, there are sometimes times when the meeting halls are frustrating since there is not always a specific date. PIR sensor fusion devices and Ethernet connectivity allows for scheduling meeting rooms and increasing the room utilization of the meeting room (L. D. Tran et al., 2016).

The agent represents each individual multi-representative system representative for one assignment of official delegations to assign delegates to his/her deletants. Multipurpose operators can coordinate their activities and find the solution for their users to meet the needs of their users (L. D. Tran et al., 2016) ,(Shakshuki et al., 2008).

The new hybrid multi-agent architecture tests the troublesome problems that are not generated by the non-programmers to verify the algorithmic functionality of the small representative agents of small representatives of multiple representative agents capable of running on small devices on the mobile device (Litayem et al., 2014). The algorithm is active and provides the operating system for the hood device (Halvorsen et al., n.d.).

Meet-me Representatives help mobiles to find time by using cell phones meet me Meeting Planning System The current implementation basically will review the timing of participation with the algorithm with an algorithm. The Meet- me prototype platform for Android developed(Flora and Chande, 2013)

Appear.in is one of the main meeting handling systems. This is a web-based system. Simple in its work. A large

number of participants can take part in one webinar. There is a free trial. Possible to record a video and can send it by references. Live chat can be handled properly("appear.in," n.d.).

This is the device on the internet for co-ordination to meetings and this is based on in the year 2007. Questions are asked to be determining the time and date you want to be met by the administrator. For the purpose, a user should be registered to the system. In the meantime, users of the system contact through the email.

There are about fifteen state universities in Sri Lanka, while there are about six semi-government universities, In addition there only sixteen higher education institutions in Sri Lanka.

According to the Meeting names data and information collected from the University of Ruhuna and Pasdunrata National College of Education). The summarized notes were given in the table (Table 1) below.

Table 1-Meeting Summary details of University meetings

	University meetings			
Name of the meeting	Department meeting	Faculty Board Meeting	Senate Meeting	Council
Purpose	Discussed about amendments	Discuss about subjects	Making and going for the future prosperity of the university.	To help students to cope with problems and work with low pressure
Scheduler	Management Assistant	Assistant Registrar	Registrar	Registrar
Head of the Meeting	Head of the Department	Dean	VC (Vice Chancellor)	VC (Vice Chancellor)
Participants	Lecturers	HOD, Lecturers	Deans, HODS, Lectures and Non-Academic staff	Lectures (councilor) and students
Type of meeting (Monthly/weekly or biweekly meeting)	bimonthly	bimonthly	One month	One month
Method of Inform about the meeting	By Email	By Email	By Email	By Email
Minute Distribution Method	Written document (Kind of report)	Written document (Kind of report)	Written document (Kind of report)	Written document (Kind of report)

Based on the literature study conducted, existing solutions were summarized and categorized
Into the following four:

- Full Federation
  - Full transparency between calendars on different Exchange servers.
- External calendars
  - External scheduling service as a complement to the Exchange server. Usually with individual accounts.
- Doodle solution
  - A standalone web application for polls regarding suitable times for meeting.

III. RESEARCH METHODOLOGY

a) Technology

It is necessary to use the new technological methodology for the system. It is very important to use acceptable tools to develop a productive system. The use of any unsuitable tools can solely end up in developing a system with unnecessary errors and faults and the use of those badly chosen technologies additionally can end up in crashed when the new system implementation. Badly chosen technologies which can be extremely advanced and complicated will enable manufacturing a system with top quality, however, these technologies may result in developing a system that spends lots of time and resources to perform a task that is anticipated by the system. It is very important to use an application programming language and the other necessary tools to develop a productive system. Therefore, these technologies and tools can help to develop the system among a minimum development time the most objective of developing this type of an application is to produce the users more efficient work system instead of doing manual approach. Because of that, we should use the most applicable tools available in the market to develop the system. Technological considerations - followed during the development of the system Efficiency and Performance Re-usability and flexibility object-oriented development support so according to the meeting management System java and android studio used to develop the mobile application as well as a web application. According to that requirement, the system has developed by using Java and using MySQL database to run on the Windows operating system. This chapter includes the details about the technologies that we are going to use to develop A web-based paperless meeting management system.

- Web Application

The programming language that is going to apply as the developing language for the system development turned into significantly trusted accuracy, performance. When considering all these technologies which can be associated with the A web-based meeting management system the

proposed system can be applied a web-based technology. The spring and hibernate Framework consist of the common language runtime and the Java class library. You can think of the runtime as an agent that manages code at execution time, providing core services such as memory management, thread management, while also enforcing strict type safety and other forms of code accuracy that promote security.

- Mobile Application

Android Studio provides the fastest tools for building apps on every type of Android device. World-class code editing, debugging, performance tooling, a flexible build system, and an instant build/deploy system all allow you to focus on building unique and high-quality applications.

SOAP web service used to connect the mobile application and web application. NetBeans used to create a reporting module as well as a bar-code reading technique used to calculate attendance.

- Database Selection

Wamp server supports the implementing of MySQL databases in it while giving the bunch of facilities towards managing databases in a robust manner. When it comes to the database design Using MySQL database is implanted and deployed it in the Wamp server itself. When it comes to the RESTFUL WEB API and the SOAP service both the API's are written in Native spring and hibernate framework. Since it springs and hibernates the framework it needed to be hosted in a Java supported environment chose the option to host it in the Microsoft IIS Manager. Java is run on the spring and hibernate framework and Tomcat application server.

b) System Architecture.

System architecture is divided into main three layers. They are Application Layer, Presentation Layer and the database Layer. (Figure 1 and 2.).

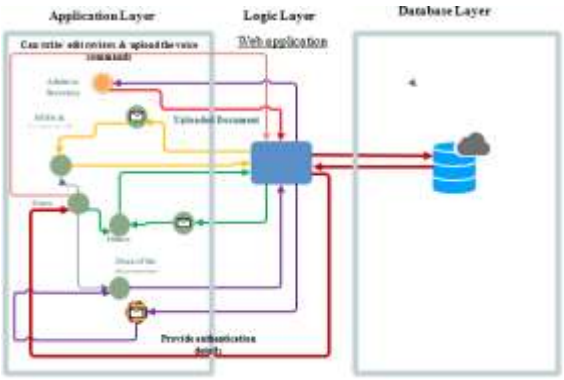

Figure 1-System Architecture

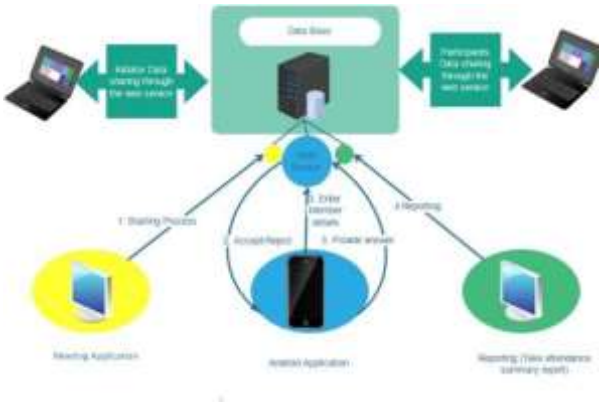

Figure 2-High-level Rich picture diagram

In the above mentioned (figure 3) high-level rich picture diagram shows the centralized database visible to relevant participants through web service. Web services will communicate among these various cross-platform applications in the form of XML data.

As a major component, the meeting schedule application of the proposed project will behave direct communication with the database. This is mainly due to the optimization issues of the meeting schedule application. Since because of this module exposes the database 15 directly usernames and password security are being applied at this end of the application.

Implementation of the android application will have the communicating media of a web service. Only the registered internal Participants will be able to do the calculate attendance through implemented in the media of bar-code.

Only the registered participants will be able to do the accept/reject meeting through the implemented android application.

c) Development Methodology

Dynamic Systems Development Method (DSDM) has been used as the development methodology throughout the research. It is an agile project delivery framework, primarily used as a software development method. It is a framework that embodies much of the current knowledge about project management. DSDM is a straightforward framework based on the best principles to start implementing a project structure. It is simple and extendible. DSDM was used because it delivers results of development are directly and they are even promptly visible. DSDM focuses on the frequent delivery of products. Iterative and incremental development in DSDM ensures convergence on an accurate business solution. This methodology holds reversible changes during development and there is Integrated testing throughout the life cycle. Since the users, that the means the initiator,

participants, and technical officer are actively involved in the development of the system, they are more likely to embrace it and take it on.

Figure 3-Dynamic Systems Development Methodology (DSDM) Source: http://dsdmofagilemethodology.wikidot.com/

IV. IMPLEMENTATION

The Graphical User Interfaces have been designed using the Qt Designer tool. All the interfaces are associated with
a. jui file that carries the GUI components and a .java file which includes the java code of the interfaces. Some of the user interfaces have been given under this section.

In figure4 demonstrate main window of the meeting management system of Initiator`s. The window will be changed according to participant (HOD, Dean and others).

Figure 4-User (Initiator) Interfaces of Main Window

After the upload the meeting minute Dean or HOD approved before sending minute to participants. In this windows Dean can't approved the document he can pass the document to HOD. He can approve the document with reviews or without. And finally, he can send to the Initiator (Figure 5).

Figure 5-Review meeting minute

Approved minute forwarded to the participants (IN) (Figure 6). Selected Date, Participant According to the date and time also number of participant system select the meeting venue. According to the number of participants location is depend. During the meeting full discussion recorded using voice recording API (Figure 7). The recording Interface shown only initiators window. And Attendance mark Using barcode reader (Figure 7&8).

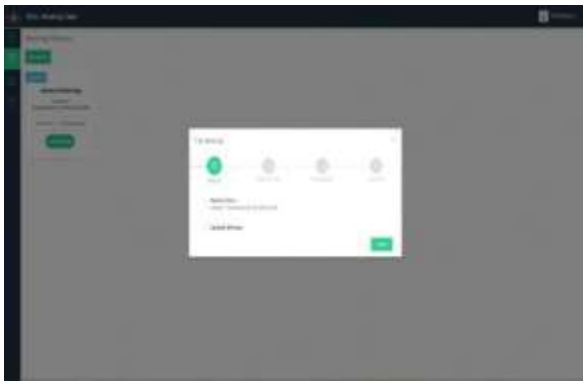

Figure 6-Upload reviewed minute

Figure 7-Voice recording and attendance display window

Figure 8-Bar-code ID

Android version which can display login participants (External) has the login meeting management system –

Figure 9-Login Interface of Mobile Interface

The system is the help of gaining from the supporting staff of the university in the process of the meeting. The meeting materials can be made more entertained if they are presented with audio, video, multimedia, etc. In order to accomplish the previously stated objectives, this development tested the following hypotheses:

H1- The proposed web-based system can improve the effectiveness and efficiency of the meeting schedule at the university.

H0- The proposed web-based system cannot improve the effectiveness and efficiency of the meeting schedule at the university.

V. EVALUATION

In this, the author describes an evaluation of our approach and the developed system while evaluating the objectives

achieved how the project deviated from its original

specifications and the circumstance identified during the time of the project.

The hypotheses were tested by collecting data using a survey method. The population of the study was the university two faculties on five departments of General Sir John Kotelawala Defence University, Sri Lanka.

The total sample size is 50. Responses were received from 38 staff, giving a response rate of around 75% (N=38).

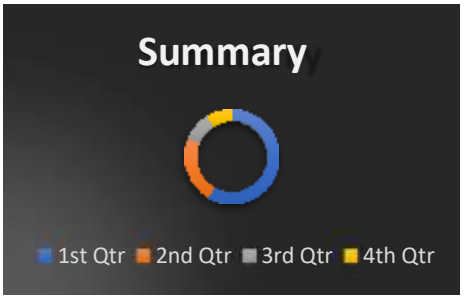

Figure 10-Evaluation matrix with the Total results obtained

VI. CONCLUSION

The research prototype was developed based on the Attendee-driven approach, after including the factors related to the research review.

With the improvements in the technology, there are so many enhancements that can be integrated to the solution which few of them are Replace Bar Coded Meeting ID with Contactless Card (NFC card), Push Notifications via SMS to participants.

The positive attitude makes them more behavioral intention to use meeting management system in universities. Finally, this research showed that all the suggested factors have somewhat effect except the experience towards using, to the behavioral intention to use a web-based meeting management system among universities.

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