

Development of a Web-Based Academic Time Management System

Zulkifli Mohamed Udin, Ahmad Suki Che Mohamed Arif, Azmi Md Saman
School of Information Technology, Universiti Utara Malaysia, MALAYSIA
[zulkifli, suki1207, azmi1326]@uum.edu.my

Abstract

The web-based application system is being widely used in managing organisation. This research paper reports on how web-based technology is used in developing an academic time management system. This prototype system, which is currently used in the School of Information Technology of Universiti Utara Malaysia, has showed significant improvement in time management. Through this web-based application, users could manage their time for traditional meetings, student consultations and lectures. Furthermore, this application would enable users to discuss things collaboratively, design projects and conduct meetings through the virtual environment. This research also discovered some constraints and limitations of the system. Finally, an avenue for further research is also identified.

1. Introduction

In the emergence era of Information and Communication Technology (ICT), the Internet has become a technology that is widely used as a tool to communicate between various locations. The used of web-based application which will enable users from any kind of machine and operating system to access the information has shown the tremendous improvement in the organisation [1]. Therefore, the capabilities to develop a web-based application are extremely valuable to the developers and organisations. The web-based application has several advantages compared to the conventional client-server system such as a capability to access, communicate and share data regardless the differences in machine platform, architecture, protocol and operating system [5].

There is an urgent need for the Universiti Utara Malaysia to find a better application in the time management for the academic staffs. Thus, this research is considered as a catalyst for other development in the web-based applications. Previously, it is hard for the administrators, students and top management to identify the available time of the academic staffs for some occasion such as for monthly academic meetings, committee meetings and student consultations. The times for these events are difficult to arrange due to the

differences in the staff timetable such as their lecture times, consultation projects and administrative works. These factors affected the performance and quality of works in this department. The activities that should involved all the staffs sometimes cannot be implemented due to these problems.

2. Research method

The objective of this study was to develop a prototype of web-based academic time management system, which can be used to improve the productivity and quality of works in the School of Information Technology (IT school), Universiti Utara Malaysia. This system has the capabilities in providing the best available time for all staffs in the specific time and date. Furthermore, this system would aid the management and secretary of academic committees to manage the information that related to the school or committees such as the announcement of events, events scheduling, virtual discussion and knowledge management.

The method that used in developing this prototype was a combination of two methods including Waterfall Method and Rapid Prototyping. These methods were appropriate for the development, which involved a systematic phase development [2]. Furthermore, both of the methods were chose because this system development involves many users with different needs and perspectives [3]. In addition, the time constraints were also taken into consideration while selecting these methods. Before the final decision was made, the other methods that have been investigated were DOD-STD-2167A, Spiral and Parallel. Moreover, Waterfall method and Rapid Prototyping will help to minimise the risks in choosing appropriate interfaces. In the programming part, Visual Basic and HTML were chosen as a programming language to develop the application due to its stability and ease to use [4].

3. Results and Discussions

After spending about four months in designing and developing, this research had produced a model and prototype of web-based academic time management systems. This application system is currently being used

573in the IT school and after two months evaluation periods, this system has shown the significant improvements in productivity and quality of works. In this evaluation period, researchers also discovered some limitations in this system and its have been identified as an opportunity for the future research to be carried out. Among the limitations were related to the issues of documents security, systems stability and connectivity.

Specifically, this system comprised of three main modules, which were Academician Information System (SMK-STM), Committee System (SJK) and Available Time System (SML). These three modules have its own sub-modules including the virtual meeting, time searching, event scheduling, managing knowledge, announcement of events and on-line staffs timetable.

3.1 Academician Information System (SMK-STM)

SMK-STM is a module where all the information that related to the academic staffs is organised. For example, the information on staff personal details, timetable, online lecture notes and research project are organised in this module. There are 2 main functions in this module, firstly, the function that related in managing the staff knowledge and secondly, the set up of virtual discussion rooms. In managing the knowledge of the academic staffs, this function has the abilities to search, collect and select the information based on appropriate conditions and requirements. In addition, the process of updating the knowledge could be done through the web browser. Users could input the relevance information to their profiles. Each user was assigned their own username and password to protect the data. Other users could access the related information or knowledge by selecting the appropriate staff name in the pull-down menu or by clicking the photo of the staff. The interface of this module is shown in Figure 1.



Figure 1. SMK-STM Query Interface.

This module also capable in providing the virtual discussion rooms that could be conducted among the staffs. The initiator could invite the participants either

through pull-down menu or by clicking the photo of the staffs. An acknowledgement message, which stated the discussion date and time, will be sent to the participants through emails. In this discussion room, the discussion members could share, access and work collaboratively. In addition, each participant was granted the permission by initiator to modify or update the related documents or resources. This function is widely used among the staffs specifically for research and development projects.

3.2 Committee System (SJK)

SJK or Committee System is a subsystem that used for school committee activities. This subsystem was developed to fulfil the requirements of users who involved in the school committees. The purpose of this subsystem was to manage the committee activities, set up the virtual meetings, allocate the suitable time for activities and manage the committee information. Figure 2 is an interface in SJK that used for time allocation in which each user is requested to fill up their time for a particular semester.

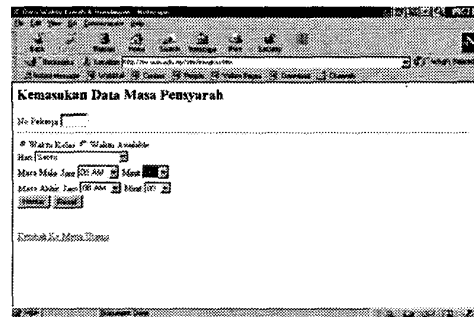


Figure 2. SJK Time Allocation Interface.

This recorded time will be used when the committee plans to schedule their activities. By utilizing the search engine in this subsystem, it will suggest the best time for any specific activity. Furthermore, this subsystem allows users to work collaboratively among committee members, particularly when they need to share the same resources and plan to provide the common decision. By utilizing this subsystem, the school committee could work together and this would minimise the procedures in making the decisions for the school.

3.3 Available Time System (SML)

The functions that available in this subsystem are used for accessing, arranging and providing an available time for any activities whether it was organised by the school management, school committee or staffs. Users could query the staff available time through browser by selecting the interface as shown in Figure 3.

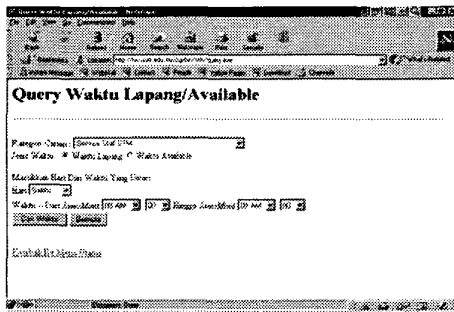


Figure 3. SML Query Interface.

In the process of making query, users could make selection whether to specify the condition or not. The engine in this subsystem will look into the condition before providing any solution. Based on the observation

during the evaluation period most of the users provide the conditions in order to receive the best solution from the system. In addition, about 90% of school activities will include all academic staffs that available on that time. This scenario showed the significant differences before and after implementing this system.

Generally, the process of this system is based on the model that shown in Figure 4. This model explains the basis on how the system works through six activities or steps. These activities would enable users to access the information in the data sources through the web browser and these data will be appeared based on the user preferences. Users could also personalise and customised the appearance of the data that accessed from the data sources. Furthermore, this system enables the users to retrieve the historical data to view the time management trends for academic staff in this school.

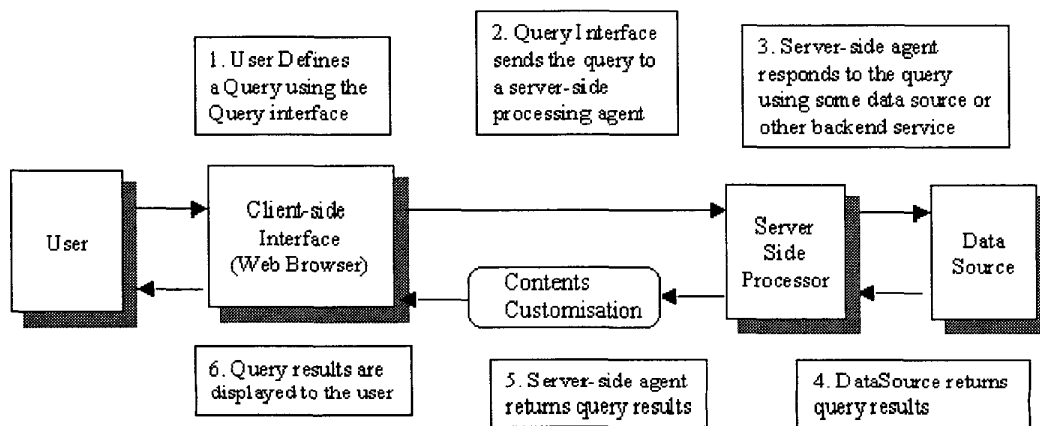


Figure 4. Web-Based Application Model.

4. Conclusions

This system still needs improvements to overcome the limitations in order to optimise the functionality of the system. The aspects or issues related to security, stability and system connectivity should be a domain for the next research. In addition, the utilisation of other technologies such as XML, Portal, and Intelligent Agents should be also considered as avenue for further research to improve the performance and functionality of this system. Even though this system has some limitations, researchers believe this system will be a stepping stone for other web-based applications specially for e-university project in Universiti Utara Malaysia. We would recommend that this system could be used as a basis to develop other collaborative applications on the web technology. Moreover, it also could be used as a model to other researchers in developing a web-based collaborative system for higher academic institutions, which has the same processes and activities. Researchers also believe, in

order to get an effective web-based application system, the processes of activities should be taken into consideration. In other words, the process innovation or process redesign should be implemented before the web-based application development process embarks, in order to gain the competitive advantages in term of cost effective and efficiencies.

5. References

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