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MOBILE ORGANIZER APPS: A GENERAL UNDERSTANDING STUDY AMONG THE UNDERGRADUATES OF UNIVERSITI SAINS MALAYSIA

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ABSTRACT

The usage of mobile organizers today is increasing with the advent of smart mobile phones and; the higher need for daily organizational skills. Most of the current research on mobile organizers highlights that most users rely on the application as an effective tool to manage their daily activities especially among university students. A mobile organizer application is software that acts as a personal assistant for users to help them manage their time and activities. From a Malaysian context, the usage of these applications among university students has not been explored in-depth. The aim of this paper is to initially explore the current usage of mobile organizers within a Malaysian university specifically Universiti Sains Malaysia. There are a number of requirements that a mobile organizer application should fulfil, in order to be effective for users. In order to identify these requirements, an initial survey was conducted in order to identify these requirements, which, would then be incorporated into the development of a mobile organizer suitable for Malaysian university students.

Keywords: mobile organizers, software, applications.

INTRODUCTION

The use of mobile phones has grown over the past few years globally [1]. As part of the growth, mobile organizer or web organizer is a common feature that is included in current smart mobile phones. The application assists users in organizing and scheduling their time and daily activities [2]. Depending on the model of the mobile phone, the characteristics and configurations of an organizer application will be different and varies in many ways. Users largely decide on how the usage of the organizer application depending on their current demand and personal requirements. However, the main purpose of an organizer application is mainly to help users in managing their daily activities. Nowadays, most of the mobile organizer applications developed have general characteristics and mainly utilises the Gregorian calendar. Previous research related to mobile organizers generally focused on enhancing the underlying architecture of the applications such as Vavoula and Sharples's KLeOS [3], Mirisaee and Zin's framework [5] and Al Tunaiji and Zemerly's MUSO platform [7]. As majority of the Malaysian citizens are Malays (63.1%) who are predominantly Muslims [8], the addition of the Hijri calendar within a mobile organizer is considered feasible. This is due to the lack of research related to the use of the calendar in current mobile organizers. Based on the total enrolment numbers of students (both local and international) in Malaysian universities [9], most of the students are a combination of Malaysian citizens and a large number of international students mainly from Iran and Indonesia [10]. As such, the main aim of the research is to build a better understanding on the general use of mobile organizers among Malaysian university students and identify any specific requirements among the Muslim students.

RELATED WORK

Current organizer systems

There are a number of researches conducted on mobile organizer systems within the area of education but we have selected three prominent researches, which are often utilised by other researchers. Vavoula and Sharples's KLeOS system [3] was designed to solve the problem of the need for supporting users to manage and organise their learning experiences and resources. The system was based on the Framework of Lifelong Learning (FOLL) [11] which focuses on areas such as supporting users in performing learning activities, supporting users in pursuing learning projects, aiding the user in synthesising learning, planning deliberate learning and managing semi-structured learning. The system requirements is effective in helping users especially for learning activities but the system only focused on the most common learning activities such as reading, writing, conversing, and searching activities. There was not much focus on the organizing capability within the system. The Context-Aware Wireless Organizer proposed by Mirisaee and Zin [12,13] is a software system, which acts as a personal assistant for university students in their daily activities. In their research through a survey, they managed to identify issues faced by students. The system is effective in a number of uses such as a GPS navigator, viewing different modes for their timetables, notifying changes in classes and the system also acts as short messaging service. The system overcomes the weaknesses which was prevalent in Jong-Pil *et al.*'s system [15] such as accessible through online and only supporting the Korean language. The limitation of their system was that it could only be accessed either through a website or through mobile PDAs. This level of inaccessibility could be overcome through mobile phone applications especially when

considering the number of mobile phone users especially among students within Malaysia is high [16].

Another research was conducted by Sugijarto *et al.* [17] where they proposed a solution aptly called the Student Mobile Organizer (SMO). It is an application to help university students in organizing their college and personal activities through a combination of several features such as calendar, reminder, course manager, exam schedules and a study manager. The limitation of this application is that the system was designed to run mainly on the Linux Ubuntu operating system, which limits the usability of the application on different OS or devices.

Current calendar related application

A research paper that focused on exploiting context for mobile user experience through the usage of mobile calendar applications was written by Lee [18]. The paper highlights a context-aware and context-adaptation approach to enhance mobile application functionality and usability via a mobile Gregorian calendar application. Aside from the basic scheduling functionality, the mobile calendar application also functions as an event notification for users. The application also provides additional details within the calendar application such as exchanging and scheduling meeting requests, tasks across the Internet retrieve the event information, and it contains several fields like summary, date-time, location and attendances/organizer. The limitation of this application is that it was designed to run on Nokia OS exclusively.

Context aware in ubiquitous environment related work

A context-aware system should be able to detect, interpret and respond to the context. Unlike a context-aware system, which is tightly coupled in a closed environment, an RFID-enabled supply chain context-aware solution for enhancing sharing in web services-based environments must be open and standard-based. A context-aware system uses context information and provides relevant services to users [19]. Some of the context-aware RFID systems proposed in earlier studies are a mobile guide system for exhibition and museums (MyGuide) [20] and a campus-based context-aware notification system (R-CCANS) which aims to deliver notifications to students [21]. R-CCANS is a context-triggered actions system, which acts autonomously when the context is detected (via tag ID and location ID) and processed. In a supply chain context, context-aware web services have also been included to enhance the construction-logistic supply chain and a context-aware payment for the supply chain [22,23]. The supply chain web service application increases efficiency and provides optimization for an RFID-enabled supply chain. The context-aware payment mechanism in a supply chain overcomes the potential bottleneck caused by ad-hoc transactions [23]. In addition, the overall processing time for invoice transactions has been improved. A context-based system for a smart hospital [24] and RFID-based campus [25] used both location and time context to enhance monitoring functionalities in the hospital and for

displaying personalized information of students on campus.

Methods, analysis and results

The initial step in developing a general understanding on the use of mobile organizers is to identify the current trends among Malaysian university students. The second step is to identify specific users' requirements from the students for the mobile organizer especially among Muslim students. A widely utilised data collection method is selected in order to achieve these aims. The data collection selection was made based on two reasons: 1) the basis of the required large data size of around 50 - 100 respondents as proposed by Bartlett, Korlik and Higgins [26]. We also considered the 2) general availability of students to be part of the research. By considering the two reasons, we decided to focus on utilising a survey method to capture the required data. The survey was conducted via online for easier accessibility and effective data analysis [27].

The survey is separated into three sections, which was derived from the research aims. The first section identifies the general user demographic within the university as an initial point of the research. The second section then assesses the level of smartphones usage among the users to identify the users both in terms of personal and study usage. The third section identifies the users' general perspective towards a mobile organizer and specific application requirements that they would like to use in their daily activities.

Section one: general demographic

The total respondents for the survey was50 where more than half of them was between the age of 22 – 25 (52%). This supports the previous numbers of mobile interest among young users as highlighted in Harris, Straker and Pollock's paper [28] and the annual report from the Malaysian Communications and Multimedia Commission [16]. There is a significant number of female respondents compared to the male respondents in the survey, which led to us to assume that our female respondents tend to rely more on mobile applications compared to their male counterparts. Most of the respondents consisted of second year students (50%) where the students are generally still adapting to their university environment [29,21].

Section two: level of smartphone usage among respondents

Based on the research data, 88% of the respondents are smartphone or have a mobile phone with web capabilities with only 12% having a basic mobile phone. The result highlights the vast popularity of smartphones among the young generation, which has quickly become the de facto device of social communication [30]. The respondents that answered Yes to whether they owned a smartphone or not was then asked to rate their daily online mobile activities usage. The survey highlighted that the majority of the respondents

utilized their mobile phones around 1 – 3 hours daily (37.2%) with the most usage focusing on accessing their social network accounts such as Facebook, MySpace and more (79.1%) shown in Figure 1. This result supports the growing number of mobile phone usage among Malaysia's younger generation shown in the annual report by the Malaysian Communications and Multimedia Commission [16]. The results of the number of hours spent on mobile activities related to their studies showed that most of the respondents are allocating around the same number of online hours (1 – 3 hours) for their studies as well. Majority of the online activities among respondents revolves around their self-studying time, accessing university emails and accessing class announcements or event notifications. Figure 2 shows the related activities commonly utilized among the respondents.
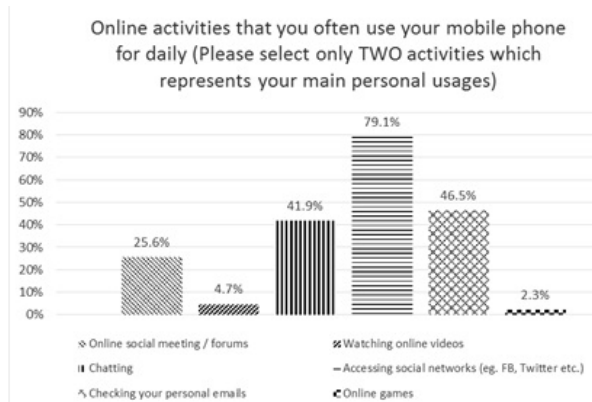

Figure-1. The types of online activities conducted via mobile phones for daily usage.
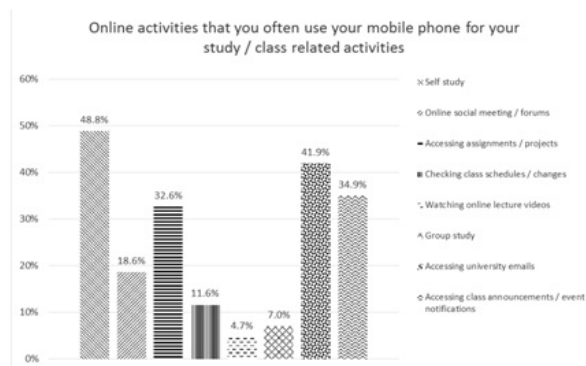

Figure-2. The types of online activities conducted via mobile phones for study related activities.

Section three: perspective of mobile organizer and specific requirements among respondents

A question on the likelihood of using a mobile organizer application in their daily activities found that about 84.4% of the respondents was quite open to the usage of the application. From the number of respondents, 55% of them prefer to use mobile organizer application to manage their daily life compared to other types of organizer such as the traditional planner-book. The result

shows that most of the users are more open to a mobile organizer application, which is easily accessible through their own mobile phones. When enquired about specific requirements that should be included in a mobile organizer application, most of the respondents preferred having the following capabilities (shown in Figure 3): 1) to access class announcements or event notifications, 2) to check class schedules or changes, 3) to access their university emails and, 4) to access the campus bus schedules.
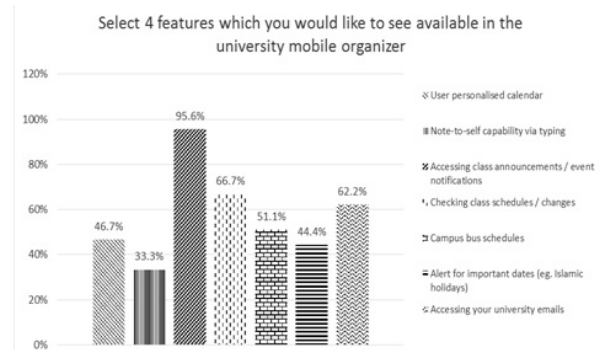

Figure-3. Responses on the capabilities suitable for the mobile organizer application.

Even though the feature of a user personalized calendar is not highly rated compared to other features, the survey included a question on the preferences among the respondents in relation to the calendar. This decision was made based on assumption that most of the mobile organizer currently available utilizes a Gregorian calendar. The survey shows that most of the respondents prefer having a combination calendar styles such as a Gregorian and Hijri calendars (68.9%). One of the main reason to have a combination of calendar type is the simplicity of tracking specific days, which are important for the users. For example, for Muslim users to track specific religious days such as Ramadan and for other users to identify public holidays and school holidays within Malaysia. The most highly accessed online activity among the respondents is accessing their social networks accounts which does support the assumption that the high usage of mobile phones among the younger generation is due to the constant need to be socially connected [16,14]. Previous research conducted on mobile organizers revolves around providing as many features, which some users may not find useful in their daily student activities. The results from the usage of online activities via mobile phones also showed a similar trend to personal usage where the respondents are spending around 1 – 3 hours daily for their studies. Most of the usage revolves around self-studying, accessing university emails and accessing class announcements or event notifications. As such, most of the respondents agreed that the use of a standalone mobile organizer application that is accessible via their own mobile phones is effective for their daily usage. In order to validate the initial user requirements that was identified through their usage, the respondents was also asked to select their top features that should be included in a mobile

organizer application. The top 4 features which was highlighted from the survey include the capability: 1) to access class announcements or event notifications, 2) to check class schedules or changes, 3) to access their university emails and, 4) to access the campus bus schedule. The result reaffirms the usage trend that was identified among the respondents especially in their daily mobile usage from the initial survey.

PROPOSED WORK

Based on the results of the conducted survey, we are proposing an initial solution in the form of a standalone mobile organizer application aptly named the My Mobile Organizer (2MO). The application will include several features, which was identified through the survey. Figure 4 depicts the overview of the proposed system framework that would be implemented for the mobile organizer application based on a hybrid application approach (jQuery Mobile and Cordova). The hybrid approach allows the application to be developed as a website that is accessible on all mobile devices through jQuery Mobile while Cordova allows the application to be viewed as a native mobile application regardless of the mobile operating system type (ie. Android, iOS).
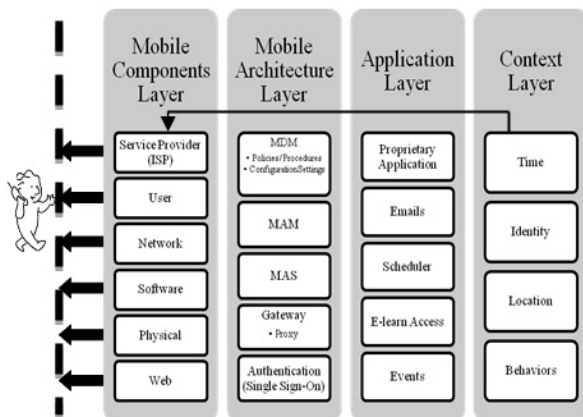

Figure-4. Proposed general overview of 2MO architecture.

The 2MO architecture includes the following:
i) Mobile Components layer – this layer consist of the players within a mobile based application running through wireless network. Essentially, several ISPs services and its network could support this application as long as the applications are securely stored within Mobile Application Store (MAS). User refers to mobile owners and softwares refer to various mobile operating systems that compatible and allow the execution of this application.
ii) Mobile Architecture Layer – the collections of services within this layer are mainly the middleware of any mobile architecture. It is important to ensure this middleware are in store in place with correct settings to allow the execution of the application. The function of each services is as mentioned below:

- Mobile Device Management (MDM) - MDM enforced policies and procedures.

- Mobile Application Management (MAM) - provides in depth distribution, configuration, data control, and life-cycle management for specific applications installed on a mobile device. It also provides authentication mechanism, command and control tool and diagnostic features, such as remote log-ins, reporting, and troubleshooting.

- Mobile Application Store- is a repository of mobile

- A Mobile Application Gateway - act as a network proxy, accepting connections on behalf of the application's network infrastructure, filtering the traffic, and relaying the traffic to mobile application servers.

- Authentication (Sign-on) - The proposed system would utilise a federated management identity standard or a single sign on (SSO) . SSO reduces costs as the need to scale proprietary solutions is eliminated while increasing the security capability of customising user accessibility across multiple systems using a single ID [32]. It removes redundant logins for the end-users by allowing them to access different systems through a single ID [31,32]. Informations such as announcements (class/events), academic calendar and the campus bus schedule would be remotely pushed through services which then being pulled by content aggregator to the standalone mobile application based on the user's SSO.

iii) Application Layer – this layer consist of the main 2MO application. The application provides a number of features based on the feedback collected during the initial survey sich as access to university email, updated class schedules, e-learning accessibility and university events notification.
iv) Context Layer – context aware identifiers and its triggers and conditions will be stored within the engine of the application. This context parameter mainly time, location, identity and behaviour are suitable for ubiquitous technology [33] such as the mobile architecture.

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CONCLUSIONS

As a conclusion, this research describes the proposed development of a mobile organizer application with suitable functionalities that meets the users' requirement of Malaysian students in a local public university. We have collected initial data to assess the general demographic, the current usage of smartphone among students and the perspective of utilizing a mobile organizer application in daily activities. At the same time, we have focused our research towards developing a succinct standalone mobile organizer application (My Mobile Organizer) which is build on a hybrid application approach. Such an approach allows the application to utilized on a wide variety of mobile operating systems. As part of our future work, we would like to develop a prototype of the mobile application with the selected features from the survey. We aim to develop the prototype and test the application with a number of users, which would allow us to identify any identifying features or arising issues. Additional enhancements on the application would be based on the results of our trial runs or tests with the users.

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