The Development of Solat Jama' and Qasr Guidance for Mobile Phone

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Abstract – *Recently, mobiles phone user were offered with wide range of services other than telecommunication including audio video recording, applications and games. These services were available because of the increasing of processing power and the decreasing of cost. However, Islamic content applications for mobile phone are still lacking. This paper presents the development of an application which will guide its user on how to perform solat Jama' and Qasr using mobile phone. ADDIE model was employed as a development method of this application due to its generic and systematic approach to the instructional design process to produce effective product. Flash Lite technology was chosen due to its ability to support multimedia content on mobile devices. The new application developed in this paper show that mobile devices can be the best tools for Islamic content application due to its nature of mobility and muslim may need guidance on the go.*

Keywords: Mobile content, Mobile learning, Islamic content.

1 Introduction

Mobile learning seems to be promising and supportive in the learning and teaching process Mobile learning makes the most sense when seen in the context of amplifying personal productivity through a just-in time, just-in-place dynamic, integrating the functions that persons use most often. Learning using wireless mobile devices possesses unique features that include ubiquity, personalization (a device is a property of an individual) and convenience and location awareness [29], [14], flexibility [21] and mobility [16].

The ability to produce effective multimedia learning applications that is ubiquitous is very appealing. Mobility is one of the most energizing features, having an enormous impact of how communication is evolving into the future. Mobile phones are becoming more technically sophisticated, powerful processer and yet cheaper cost. They can play multimedia content; they have high quality colour screens; many models can now capture, edit, and play back video, audio, and photographs; many models can also run Flash-based interactive applications (through Flash Lite). They also have greater storage capacity, and networking connectivity with PCs the Internet with Bluetooth and WiFi.

It is estimated that there are over two billion mobile subscribers worldwide and that this figure is projected to grow close to four billion by 2010, which is 50% of the world's population. Penetration rate of mobile phones in Malaysia in the fourth quarter 2008 is more than 98 percent [12], [17], [23] and expected to be increased in the first quarter 2009 to 100 percent with almost 29,000,000 subscriptions [23]. Harnessing the use of these devices for multimedia guidance and learning resources which are known to engage and motivate learners could be a powerful way of providing guidance and learning materials to everybody who needs more flexible guidance and learning solutions because of other time demands in their life [7].

For muslims, mobile learning is one of the technological advantage to practiced their Islamic duties and obligations as they can seek for guidance on the go where they should perform their religious duties during all circumstances. One of the religious duties which could benefit from mobility and multimedia features of the mobiles phone is solat Jama' and Qasr. When travelling over long distances, one may shorten some prayers, a practice known as Qasr. Furthermore, several prayer times may be joined, which is referred to as Jama'. Qasr involves shortening the obligatory components of the Zuhur, Asar and Isha'a prayers to two raka'ah. Jama' combines the Zuhur and Asar prayers into one prayer offered between noon and sunset ant the Maghrib and Isha'a prayers into one between sunset and Fajr.

1.1 Motivation

Realizing the great opportunities offered by mobile content services motivates this research. However, significant challenges exist in deploying these services. Key among these challenges is the ability to quickly and

easily create, deploy, and manage content and applications on mobile devices. It is critical that content developers have the right tools that respond to the challenges of this complex and fast growing mobile market. Another factors motivate this project is limited Islamic mobile learning content development especially in Malaysia.

With such astounding figures and projections, led by the growing demand for mobile content services, it is of importance to study and develop Islamic mobile content services. Thus, our approach to developing Islamic mobile multimedia learning objects taps into the desire to seek for guidance anywhere and anytime.

1.2 Objective

The primary objective of this project is to develop a mobile learning especially for Muslims to perform Solat Jama' and Qasr. The conclusions drawn will enable to understand whether Muslims ready or not with the technological advancement in mobile content for guidance and learning. This will inevitably optimize the development of Islamic mobile content and application.

2 Related Work

Mobile learning (m-learning) is broadly defined as the delivery of learning content to learners utilizing mobile computing devices [22]. It is a new learning technique that can be used to encourage active learning. Most current learning applications are designed for use on desktop computers or laptops, which assume a fixed location. In order to increase learning flexibility, students should be enabled to learn at times and places of their choosing. In this paper, we focus on the use of mobile phones to support interactive mobile learning. Benefits of using a mobile phones for learning include: being able to use it anywhere and everywhere (e.g. on a bus, on a train, in a car, in a restaurant or on holiday); its compact size makes it easy to hold and use; and its use can relax the user (since they do not need to sit down at a desk) [7].

Mobile learning research is still at the early stage [13], and many researchers have been investigating ways of employing mobile devices in teaching and learning. It was not until 1996 and the release of the Palm Pilot and its instant access that many researchers got excited about the potential use of mobile devices in learning.

Majority mobile learning project have been focused on improving interactivity in the classroom [10],[20] or on increasing students' access to learning materials anywhere, anytime [6], [15], [9], [8], [28] and [5]. A smaller number of projects have focused on supporting on-the-job training in the field, largely for medical and nursing students in hospitals [18]. A few projects have included teaching students some aspect of mobile technology, such as programming PDAs or using stylus technology, usually in connection with ubiquitous delivery [8]. Occasionally projects have combined ubiquitous delivery with a focus on interactivity with a

single pedagogical focus. A small number of projects span more than one discipline area, for example in [25] where interactivity study in computer science and education.

The military and government sector is starting to fund mobile options more heavily and to look at research into both wearable computing and ways this can be used for knowledge management and for just-in-time. Example applications are Vcom3D for U.S. Army [27], Army Excellence in Leadership [4], and Secure Mobile Devices for the Military [12].

3 Multimedia Mobile Applications Development Technologies

At present, most popular technologies for the development of multimedia mobile applications are Adobe Flash Lite and Java 2 Micro Edition (J2ME).

3.1 Adobe Flash Lite

Flash Lite is the Adobe Flash technology specifically developed for mobile phones and consumer electronics devices. Adobe Flash Lite is a lightweight version of Flash Player suitable for the processing and memory capabilities of mobile phones and handheld multimedia computers. Flash Lite is emerging as a global phenomenon, enabling for the rapid and efficient development of rich user interfaces and delivery of rich multimedia content to mobile devices.

Flash Lite accelerates the delivery of rich content and browsing, and customized user interfaces. Even though it is a new competitor in the mobile industry, Flash Lite has developer and community support of over one million [1]. This growth is driven by the mature Flash authoring environment and rendering engine that delivers enhanced content and browsing, customized user interfaces and rich mobile experiences across devices [2]. Over 200 million Flash enabled devices had been shipped by the start of 2007 [3].

Actionscript is the foundation language used with Flash Lite and has support for 2D, 3D graphics including several widgets. Flash Lite uses a compressed file format called SWF, that can be reused by a player running on any system and enables faster download speeds of graphically rich applications. Flash Lite offers support for high end video manipulation as video clips can be embedded into animations using the Flash 8 Professional interactive development environment IDE) [26]. Flash Lite supports loading and parsing of XML data in Flash content enabling a wider range of interactive devices to communicate, thereby also enabling more interactive and content rich mobile data services to be offered [2]. Phone data access is also possible which provides the ability to locally store and retrieve relevant, application specific information such as preferences, high scores and usernames. This provides a much more robust development environment.

The Flash Lite authoring environment is integrated into the Adobe Flash Authoring IDE which initially, was solely for the development of desktop applications [26]. The Flash Authoring IDE contains all the relevant development tools, from design tools to a full featured ActionScript code editor, enabling for the efficient and rapid creation and deployment of content and interfaces to mobile devices. An estimated 500 million devices around the world are capable of playing Flash Lite content, with Nokia shipping around 150 million in 2008 alone [11].

3.2 Java Micro Edition (JME)

Java Micro Edition (JME) is an established mobile development platform from the Java Community and has an extensive number of developer community and support. JME uses subsets of Java Standard Edition components designed for desktop computers, and includes a set of technologies and specifications developed for smaller devices such as pagers and mobile phones. Eclipse and Netbeans are the main integrated development environments (IDE) available for JME. JME requires a Java Virtual Machine embedded on a device for it to run and is therefore not completely platform independent. It has support for 2D, 3D graphics and many widgets, and some limited phone data access varying according to the type of handset. JME has an average runtime speed due to Java byte code and includes flexible user interfaces, robust security, built in network protocols, Bluetooth APIs, and support for networked and offline applications that can be downloaded dynamically [19].

4 Approach

We adapt ADDIE model [24] as the development approach in this project. ADDIE model is the generic process traditionally used by instructional designers and training developers. This acronym stands for the five phases contained in the model which are *analyze, design, develop, implement* and *evaluate*.
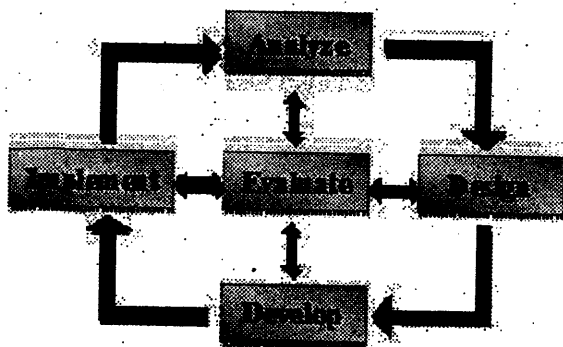

Figure 1. ADDIE Model [24]

4.1 Analysis Phase

In the analysis phase, instructional problem is clarified first. After that, the instructional goal and objectives are established. Main purpose of this application is to be used as guidance of performing solat jama' and qasr' for muslims while on travelling using mobile phones. To achive the desired result, the following tasks must be fulfilled:

- Inclusion of a brief explanation of solat jama' and qasr.
- Inclusion of help for users.
- Development of intuitive user interface.
- Support of information in Bahasa Melayu.

4.2 Design Phase

The design phase in ADDIE model deals with learning objectives, assessment instruments, exercises, content. subject matter analysis, lesson planning and media selection. The steps used for the design phase are:
  i. Create storyboards
  ii. Design the user interface
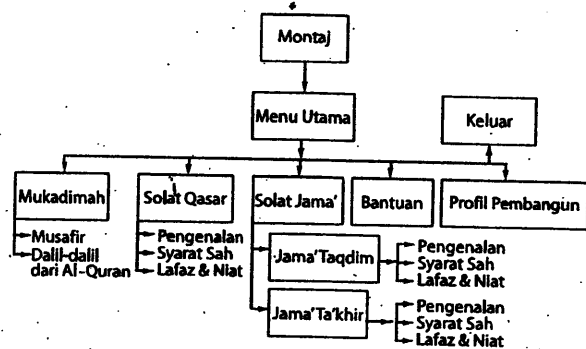 iii. Prototype creation

Figure 2. Navigation structure of the application

Figure 2 shows the navigation structure of the application while Figure 3 shows the user interfaces design of the application.
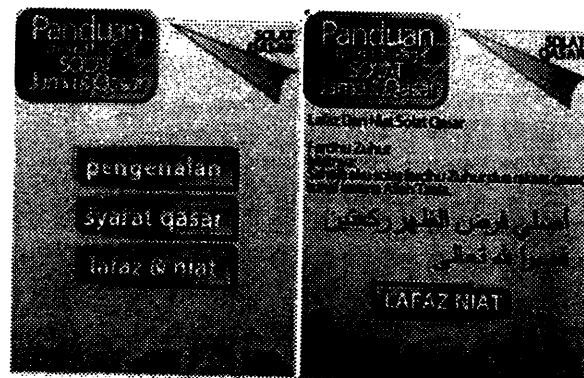

Figure 3. Samples of user interface

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4.3 Development Phase

The development phase is where the developers create and assemble the content assets that were created in the design phase. Programmers work to develop and/or integrate technologies. Testers perform debugging procedures. The project is reviewed and revised according to any feedback given.

In this phase, a prototype (refer to Figure 4) for the entire course is developed. A prototype gives an idea as regards to how and what the final product would look like. This can be regarded as the beta version of the project delivery.

Figure 4. First prototype

4.4 Implementation Phase

In the implementation phase, we ensure that the manuals, equipment, software and device are in place, and that the learning application is functional. It is essential to ensure that the application is delivered effectively to the learners. Basically, this phase encompasses a great deal of project management and logistics issues.

4.5 Evaluation Phase

The evaluation phase can be either formative or summative. Formative evaluation refers to the evaluation that is carried out across all the stages of the ADDIE model. Summative evaluation refers to the tests that have been designed and are undertaken to provide feedback about the application at the end of the course. It is the final checkpoint for the developed application. It is checked to what degree the project has been able to match and meet up to its goals and objectives. If the learners have been benefited by taking the course, if they have achieved the learning objectives by the end of the course, if the business goals associated with the course have been met are some of the few points of consideration during the evaluation stage in the project life cycle. This helps to measure the efficacy of the developed course and also identify the scope and opportunities to improve the performance of the learners after taking the course.

5 Result and Discussion

The work undertaken in this project successfully meets the objective of the project which is to develop a mobile learning application as a guidance for muslims on how to perform solat jama' and qasr. Flash Lite technology has been chosen as the development environment/platform for this project because of its rapid and efficient development of rich user interfaces and delivery of rich multimedia content to mobile devices.

5.1 Symbian Platform

The S60 platform is the world's most popular smartphone platform. It is implemented in a diverse range of devices and provides application and media developers with a consistent set of technologies and supported Flash Lite. Content developers have comprehensive support for audio, image, and video formats. In addition, Flash Lite can be used for animated content. Artists and graphic designers can create themes for S60 devices that can completely alter a device's look and sound.

5.2 Mobile Phones

While multi-touch and sensor-based technologies appear to be quite promising, for the experimentation we chose to use a more traditional, well tested phone. Namely, after making a survey taking into account both technical and functional factors, we chose Nokia's E51, a cellular phone conforming to Symbian's S60 platform, capable of video playback using the latest codecs and formats.

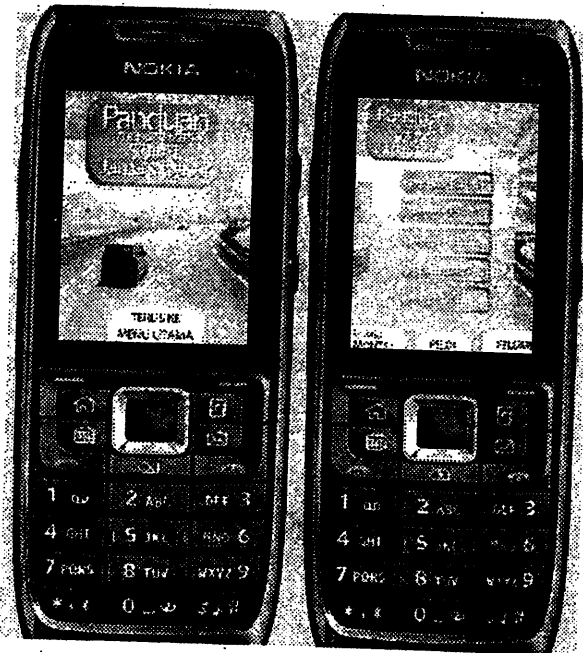The following Figure 5 and Figure 6 shows sample screen of the completed product.

Figure 5. Montage and main menu screen

Figure 6. Sub menu and "mukadimah" screen

5.3 Advantages

There are many advantages of mobile learning. One of them is the availability of the technology. It is also known that almost everyone owns a mobile phone. They use their mobile phones constantly, in every walk of life – except their learning and education. Most people of today are extremely competent in the use of mobile devices. They regard them as friendly, personal possessions, even fashion statements, in a way that no other technology is viewed. It is the work of the field of mobile learning to harness for education and training the vast availability of mobile devices.

Another advantage is the increasing processing power of mobile devices. It is clear that in a few years time a mobile phone will have the processing power of a computer of a few years ago, including access to the WWW, audio, video, email, SMS messaging. With the sufficient processing power of mobile phone, it may replace computer's role especially in education.

5.4 Issues and Challenges

The main challenges and concerns regarding mobile deployment still include screen size, battery life, costs, and security.

Screen size is the most frequently cited disadvantage for mobile learning – but it does not deter the news, sports and entertainment industries from sending text and graphics to phones today in most countries of the world. This is a permanent problem that the mobile learning industry has to address and overcome.

Battery life is another frequently listed problem for mobile learning. But it will be solved by further developments in wireless technologies.

With new device models and increased competition, these items continue to improve.

6 Conclusion

With the advancement of technology, leading to improved audio quality, voice is no longer a competitive factor in attracting and retaining customers in the mobile industry. However, to realize the full potential of mobile services, the right development tools need to be implemented. This ensures the quick and easy creation, deployment, and management of content and applications on mobile devices.

Although we continue to work with the tools and technologies available today, as researchers we also need to continue to follow and explore future capabilities for having access to information and communication methods available to us anytime and anywhere. So far we have focused on delivering multimedia content, and there are opportunities to combine this with the communication and networking capabilities of mobile devices to provide more holistic learning environments and collaborative and sociable learning experiences.

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