

MLearning Framework for Multiple Platforms

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Abstract— MLearning can be thought of as delivering eLearning on small form factor devices and it has the potential to do much more than deliver courses, or part of courses. It includes the use of mobile/handheld devices to deliver Education. MLearning Framework basically focuses on providing an environment that will help develop MLearning applications for the learners. The architecture of MLearning framework encompasses of system specifications and an actual working application based on Android 2.2(Froyo) and Android 2.3(Gingerbread) platforms. The MLearning framework will also import engineering learning content. The framework will also provide SD-card based MLearning. It will include Animated/Multimedia/2D/3D content. The framework will include Cognitive Science Research Implementations carried out by the prodigies in the field of education.

Keywords - Android, MLearning, Framework, Cognifront

1. INTRODUCTION

The world of training experience one or the other change every year. Right now it appears that mobile learning is all the rage. The application of information and communication technology to education and training, both in the corporate and public sectors has now become a huge business on a global scale. The world of mobile gadgets is converging with an always available Wi-Fi network [7]. This helps us to have an access to all sorts of information which fits in well with on-demand training. Learning is now possible with portable technologies that include handheld computers, MP3 players, notebooks and mobile phones. MLearning has now emerged as a new wave of development, based on the use of mobile devices combined with wireless infrastructure [1]. It focuses on the mobility of the learner, interacting with portable technologies and learning that reflects a focus on how society and its institutions can accommodate and support an increasingly mobile population. There is also a new direction in MLearning that adds to the mobility of the instructor [4]. The technological development makes possible the mobility of the instructor. The mobile learning & teaching environment facilitates innovations that can be conceptualized and designed, developed and deployed by educationists, which earlier were difficult to achieve because of lack of proper infrastructure, penetration, and availability of technology.

The remainder of paper is organized as follows: In section II we discuss MLearning Framework requirement. In section III gives detail of deliverables of MLearning.

2. LITERATURE SURVEY

In literature various learning approaches have been discussed in detail. The author Yu-Liang Ting in [9] has addressed that with the phenomenal progress of mobile network and portable device, distance learning has been changing from desktop computer to mobile device. Mobile learning is the use of mobile or wireless devices for learning while the learner is on the move. Based on the

characteristic and scenario of current mobile learning , challenging issues from the perspective of cognitive learning are addressed to reflect the fundamental needs for effective mobile learning. These addressed issues make it the need of the initiation for the requirement of academic evaluation and solid framework for the implementation of mobile learning. Thus, this has been the prominent inspiration for us to undertake the development of the M-Learning Framework for Multiple Platforms.

In [10] the authors have primarily focussed on how mobile learning is gaining a lot of interest in recent years mainly for its convenience and boundless way of learning. The author's have proposed that the mobile devices are used not only for the purpose of communication but also for surfing and accessing the content available on the Internet. The mobile technology also facilitates the purchasing goods, exchanging information, and organizing our everyday life. It extends e-Learning and removes space boundaries offering anytime anywhere learning experience. Mobile devices have the potential to be used as powerful learning tools in different learning contexts; however this poses new challenges that are associated with their ability to cope technically with the available multimedia learning material. A web-based framework accompanied with ontology and tuned to solve mobile-environment challenges, hence, making it a highly cross-platform solution. This strongly urges for the need of the M-Learning framework so that the e-learning content can be utilised to enhance the knowledge gaining process on the mobile platforms.

The authors in the [3] propose that the pervasive mobile technologies have led to the question that whether these mobile technologies can be efficiently used to enhance the learning experience and methodologies. This can be thought of as the mobile learning (M-Learning). The mobile learning can indeed be delivered with the awareness of the special limitations and benefits of mobile devices, so one cannot simply apply the known design requirements from E-Learning into the mobile learning context. The most impor-

tant feature of the mobile learning is to be able to facilitate the learner with ability to consume the learning as per the learners wish. This enhances the learning content to be pursued and delivered to the learner anytime and anywhere. Thus considering these design challenges encountered in the designing of the framework have been taken as an opportunity by us and we propose to build such a framework which will be able to satisfy the M-Learning application development demands so as to build the high quality learning applications. The framework will be developed with the main aim of reducing the developer's efforts and the amount of code required to develop the M-Learning application. Thus in turn minimizing the time of the application development process.

3. NEED OF MLEARNING FRAMEWORK

Mobile technology has been evolving at super-sonic speed over the past decade. According to Gartner's report, by the end of 2010, 1.2 billion will carry handsets capable of rich mobile commerce providing an ideal environment for the conversion of mobility and the web, new initiatives in mobile learning will continue in the future. The mobile learning applications can be used in schools too; the case covers the academic usage [8]. M-Learning, although related to E-Learning, it is distinct in its focus on learning across contexts and learning with mobile devices. Hence, there is an urgency to establish M-Learning framework to satisfy this blooming need area. As the hardware produces and the software used in the mobile phones is varied there is a need for a standard framework as well.

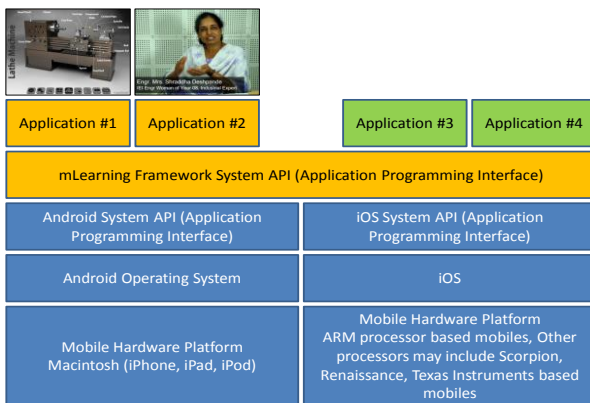


Fig.1: M-Learning Framework.

The Fig 1 of M-Learning framework for multiple platforms is the basic concept of our project. The bottom layer shown in the fig.1 is of the mobile hardware platform such as Macintosh may include iPhone, iPad, iPod etc. and ARM processor based mobiles, other processors may include Scorpion, Renaissance, Texas Instruments based

mobiles. The layer above mobile platform is related to different mobile operating system such as Android Operating System and IOS. The next layer is Android system API and IOS system API (Application Programming Interface) i.e. a particular set of code and specifications that software programs can follow to communicate with each other, it serves as an interface between different software programs and facilitates their interaction. M-Learning Framework API is the layer above the mobile OS API, this M-Learning Framework will develop reusable piece of code using which various vendors can develop number of M-Learning applications and end users can use them with ease of operation. The topmost layer is of the number of applications developed for M-Learning framework. One of the goals for the framework is to allow professors, educationists to convert their lecture material easily into M-Learning courses with least amount of programming.

4. DELIVERABLES OF MLEARNING FRAMEWORK FOR MULTIPLE PLATFORMS

Our project will deliver the set of include files, style sheets and libraries which includes the reusable piece of code for the developers to develop M-Learning applications.

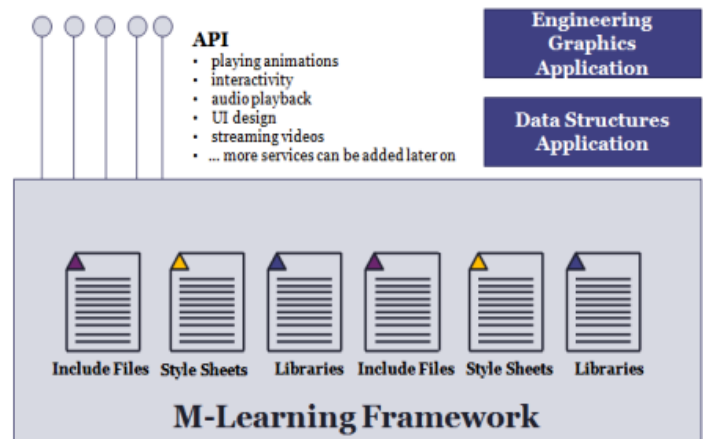


Fig.2: Project Deliverables.

M-Learning framework will provide the facility to interact with the animated 2D/3D contents, notes for personal use in audio and textual form can be created with the help of notes manager provided in M-Learning framework. Our project will also allow an end user to share the content using SCORM player i.e. Sharable Content Object Reference Model. It will also provide a feature of social networking interface for Twitter and Facebook. The ability to play content of learning from SD card as well as streaming source will be possible. The marker tool will be provided to highlight points in the content of a subject. The end user

er can bookmark the important points /pages/videos so that direct access to the particular point/page/video is available, Hyperlink is another feature in our project for accessing local or http data.

5. DESIGN PHILOSOPHY

Using mobile devices like phones, tablets, and laptops (with touch interface) has a very different set of challenges. The issue is not whether you have larger screen - but fundamentally they are different. Battery life, screen size, form factor, variations in keyboard availability and dynamically changing orientation (horizontal or vertical positioning done by user) present using set of issues to be dealt with. The sponsoring organization Cognifront develops teaching tools software as well as self learning aids for students. Keeping in mind vision of Cognifront, it was necessary to innovate the space where maximum number of users would benefit. Mobile devices including phones and tablets are the most prominent majority - and also have high projections for the future [5]. So it is imperative that we have to have good tools for content creation and dissemination. Teachers who are our prime focus must have some superb tools to create their MLearning modules. And students, who will eventually consume these modules, must have excellent tools to use these MLearning units. Out of this exact need, the idea of developing the MLearning Framework was born. This framework must be extremely portable, FREE to use and open source.

6. BENEFITS OF MLEARNING

A key benefit of MLearning is its potential for increasing productivity by making learning available anywhere, anytime [4]. Because mobile devices have the power to make learning even more widely available and accessible, mobile devices are a natural extension of eLearning [2]. MLearning is the power of learning that is truly "just-in-time" where you could actually access training at the precise place and time on the job that you need. Our project provides the reusable piece of code that will help the developers for developing multiple MLearning applications easily; one can also prepare audio or textual notes on move. The greatest benefit of this delivery is the combination of true interactivity coupled with portability.

7. RESULTS

We have developed the MLearning Framework as a reusable piece of code. Using this framework we developed multiple MLearning Applications and tested them on various versions of Android Operating Systems like Android

2.2(Froyo), Android 2.3(Gingerbread), Android 3.0(Honeycomb) and Android 4.0(Ice-Cream Sandwich). Also the applications were tested on various mobile devices and tablets having above mentioned operating systems of different form-factors (screen-sizes and resolution), manufacturers and different hardware specifications. The result is that these applications developed using the framework execute smoothly.

8. CONCLUSION

Identifying missing pieces in order to achieve a broader platform for MLearning and developing those pieces into a pragmatic framework is the central theme for this project. A key objective of our project is to improve the knowledge level of individuals by developing learning process that is time efficient. The MLearning framework is an abstract representation of the services and their interfaces that are used to construct an ELearning system in its broadcast sense, focused on the support of distributed electronic learning systems.

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