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## User Interfaces and the Applications for Mobile Devices

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**ABSTRACT:** Mobile devices consisting of cellular phones (CPs) are essential in our each day existence. A lot of work has been achieved to handle the troubles of designing and developing of GUI and packages for CPs. In addition, we present a bug look at and categorization of android specific insects that suggests an essential range of android bugs. We introduce a new method for checking out GUI. The new technique attention on producing set of movements to check the user interface.

**KEYWORDS:** User interface, Development application, UI design

### I. INTRODUCTION

Mobile devices are increasingly becoming integrated into various aspects of our daily lives. One area is in the educational sector, where mobile phones are being used as the platform for teaching and learning. However, unlike personal computers, the screen size and resolution restrict mobile phones in displaying content [1]. Learning by using specifically smartphones, is being integrated within existing education systems to support real-time communication and deliver learning materials.

For instance, smartphones are being used in many universities as a classroom tool to engage and support students in communicative, collaborative, supportive, and constructive activities. Additionally, mobile technologies enable individual learners to build data and construct understandings; in this they facilitate a change in the pattern of work activity/learning [2]. However, mobile applications used for educational purposes have a complex user interface (UI) with many hidden options. There is already a great interest in designing and developing attractive, user-friendly mobile applications to gain the acceptance of end user. Further, in order to be acceptable to a wider audience, the applications need to be both robust and of a very high quality [3].

Due to the significant diffusion of mobile technologies, most students today already own mobile devices. Hence, the technology is a strong contender to be the next “big thing” in educational platforms [4]. Mobile technology can deliver educational content in several ways. For instance, Wang et al. [5] reported that mobile phones could be used to deliver online courses to university students. In fact, the multitude of ways in which mobile technology can be used in the educational sector, prompted Prensky [6] to note that students will be able to learn “anything, if developers designed it right”. Also, the demand for learning anywhere and anytime has specified the need for a new type of electronic learning known as m-Learning to take advantage of mobile devices which are becoming increasingly popular [7]. M-learning is an education mode in which students can use mobile communication terminals to assist them in learning [8].

Many usability guidelines are used for designing desktop applications [9][10]. However, these guidelines cannot be utilized to design and develop m-learning applications, simply because neither addresses the aspect of mobility nor the obvious limitations of the mobile devices, like such as screen size, and the need for wireless connectivity [1]. There is a singular lack of reliable usability guidelines, specifically meant for designing and developing m-learning with userfriendly interfaces. While research conducted on the success factors of m-Learning clearly show that usability and related aspects are one the core requirements, the specific ways in which this can be addressed is are lacking [12]. In fact, usability has been less extensively covered than the technological aspects of the m-learning. Mobile technology can be successful as an educational platform only when the future research into the area of m-Learning includes fruitful



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discussion in of all the aspects of usability: – learnability, understandability, ease of use, effectiveness, and efficiency of mobile applications [13].

Mobile devices are an increasing number of becoming integrated into various components of our everyday lives. One area is inside the instructional region, wherein mobile phones are getting used as the platform for teaching and mastering. However, in contrast to personal computer systems, the screen length and backbone restriction mobile phones in displaying content [1]. Learning via the use of specially smartphones, is being integrated within present training structures to guide actual-time communication and deliver getting to know substances.

For instance, smartphones are getting used in many universities as a school room tool to engage and aid students in communicative, collaborative, supportive, and optimistic sports. Additionally, mobile technology enables people beginners to construct expertise and construct understandings; on this they facilitate a trade in the pattern of labour activity/studying [2]. However, mobile applications used for educational purposes have a complicated person interface (UI) with many hidden options. There is already an awesome hobby in designing and developing attractive, user-interface mobile applications to advantage the recognition of conclude user. Further, in order to be perfect to a much wider target market, the packages want to be both strong and of a totally excessive exceptional [3].

Due to the enormous diffusion of mobile technology, most college students these days already personal mobile devices. Hence, the technology is a robust contender to be the following “large issue” in academic platforms [4]. Mobile era can deliver academic content material in numerous ways. For instance, Wang et al. [5] said that cell telephones can be used to deliver on line publications to university college students. In truth, the multitude of ways in which mobile technology can be used inside the academic sector, induced Prensky [6] to be aware that scholars might be able to study “anything, if builders designed it right”. Also, the demand for studying anywhere and anytime has precise the need for a new type of digital learning referred to as m-Learning to take advantage of cell devices which might be becoming increasingly more popular [7]. M-learning is an education mode in which college students can use mobilecommunication terminals to help them in gaining data of [8].

Many usability pointers are used for designing laptop applications [9][10]. However, these guidelines cannot be applied to design and increase m-learning programs, in reality due to the fact neither addresses the thing of mobility not the obvious barriers of the mobile devices, like consisting of screen size, and the need for wireless connectivity [1]. There is a singular loss of reliable usability guidelines, specially meant for designing and growing m-mastering with user-friendly interfaces. While research performed at the achievement elements of m-Learning honestly display that usability and related aspects are one the center necessities, the unique approaches wherein this can be addressed is are missing [12]. In reality, usability has been less notably covered than the technological aspects of the m-learning. Mobile learning may be a hit as an academic platform simplest when the destiny research into the region of m-Learning consists of fruitful dialogue in of all of the elements of usability: – learnability, understandability, ease of use, effectiveness, and efficiency of mobile packages [13].

## II. RELATED WORK

In this section we discuss literature that offers with the usability and summarize a selection of the most relevant findings. To start, within the ISO 9241-eleven (1997) [16] standard, usability is described as “the extent to which a product can be used by specified users to achieve targeted goals with effectiveness, performance and delight in a specific context of use”. However, ISO/IEC 9126-1 (2001) [17], states that usability is “the functionality of the software program product to be understood, discovered, used and attractive to the consumer, while used underneath certain situations.” [18], on the alternative hand, emphasize that there is an extraordinary deal of literature to be had that addresses usability, person interface design, and associated subjects for mobile devices. A mobile application should be developed and designed with appreciate to user technological capacity, talents, and language proficiency. This forces developers to be very careful with design issues that allows us to maximize the extent of usability with all of its sub-traits.

Ziefle and Bay [19] exhibit that consciousness of user interface structure is one of the most important issues regarding mobile phones. On the other hand, Jarvela et al. [20] studied how to help users take part in collaborative mastering using

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smartphones. The researchers utilized a mobile lecture interaction tool to inspire students in higher schooling to participate in a class dialogue. This tool enabled members to ask and answer questions, in addition to rate classmate queries. The essential reason of this survey becomes to get student remarks at the usability of the device. The comments showed that mobile tool with a high degree of usability will truly growth their engagement in discussions. Mobile era permits the users to talk immediately; this characteristic plays a critical role in a successful m-Learning surroundings. However, usability troubles are observed to be critical factors within the inexperienced users' high satisfaction stage with the cooperative getting to know available through the device.

The Mobile System Analysis and Design (MOSAD) application [21] is mobile software used as a revision device for the System Analysis and Design (SAD) path at University Technology Petronas. The researchers' fundamental intention became to layout m-Learning software that lets in college students to review and read notes for the duration of their spare time, and extra importantly, to assess this application through thinking about a few layout issues that could be changed to enhance its usability.

After the utility turned into designed, a heuristic assessment became finished to degree its stage of usability. Many assessments had been carried out, and the cause of those exams changed into to get hold of remarks from individuals so the extent of usability of this utility can be decided. The results imply that adding some features to the layout will be beneficial and will improve the general usability of the utility.

### III. PROPOSED ALGORITHM

The heterogeneity of mobile devices requires that the software be customized and tailor-made for every tool [14]. Mobile device has dispensed information on account that facts and data manipulating are placed on server, software common sense positioned on server and presentation positioned on mobile devices as shown in Figure 1. The display length and the operating surroundings are two important differences amongst wireless devices. These differences require the utility to be adapted especially for each tool. That section describes two strategies for presenting software tailoring; utility tailoring answers are needed because of the boom in availability and the popularity of mobile devices.

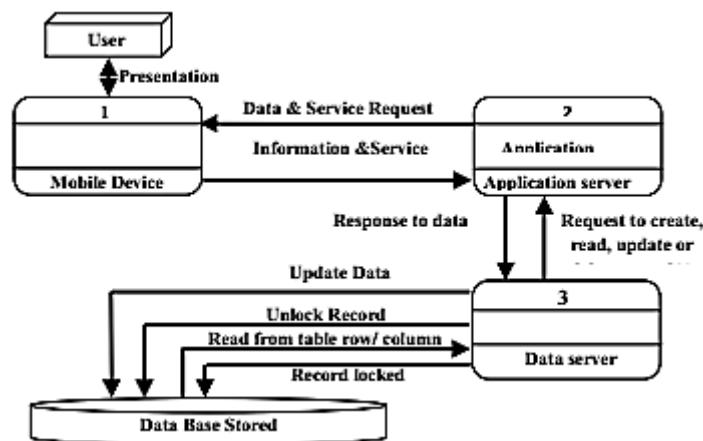


Fig. 1: Distributed Data of mobile devices and server

That segment could be offered an especially dependent Voice XML document or VXML as enter to an XSL transformation. The transformation produces J2ME source code. Java servlets are used to bring together the ensuing code and package deal it with respect to a specific device as proven in Figure 2. This first technique works properly for users who have programming level in and are relaxed with editing XML files as the following [14]:

**Voice XML:** VXML allows users to engage with the Webthru voice commands. It is also used for applications presenting computerized answering offerings. VXML gives a regular structure that has been standardized

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by way of the WorldWide Web Consortium. Some of programs not the use of voicethen the shape of VXML tags are used as the muse forthe enter record that specifies the details of the mobile utility. VXML uses tags including <prompt> tag, <item> tag and <field>tag. One Voice XML file presents asingle input for manytranslations.

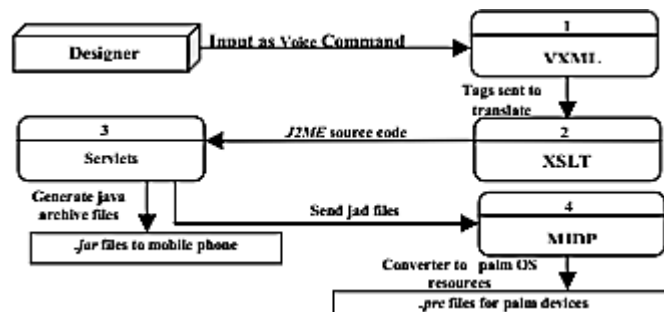


Fig. 2: logical data flow of VXML solution

**XSLT**: mean eXtensible Stylesheet Language Transformation ofVoiceXML, XSLT translates VXML to J2ME also; XSLT canbe applied to the VXML document. XSLT is a metamorphosislanguage that consists of a fixed of rules for reworking a supplytree right into a result tree. The XSLT allows output to be directed to3 necessary translation documents, the translations needed are: onefor J2ME, one for MF report and closing for JAD record.

**J2ME**: is a collection of Java APIs for growing software program on resource limited devices including PDAs, mobile telephones anddifferent client home equipment see Figure 3. Java is remote from rest of the device to make improvement less difficult and improvessafety and it's far crucial to have digital execution surroundings [15]. J2ME solves part of the utility tailoringhassle via addressing "the desires of the working device anddisplay screen sizes" as shown in Figure 4. Screen length hassle issolved via the usage of J2ME's high degree APIs, which allows tool topick the way to show objects inclusive of buttons and textual content onto thedisplay screen. The low degree API requires programmers to believable for the whole thing this is displayed at the display. Highdegree APIs cast off the display screen length dilemma from theprogrammer and vicinity the responsibility on the cell device.Many cell gadgets are able to the use of J2ME, but require thecode to be packaged particularly to run in each different cellsurroundings then J2ME programs by myself are not enough forporting the code to special mobile devices [14].



Fig. 3: J2ME as part of some devices.

**The servlet**: it accesses the command line once more to finish the tailoring procedure, to supply a utility for a mobile phone. Servlet should collect, pre-confirm, and generate a Java Archive(JAR), report of the J2ME code. To produce a Palm application,extra steps ought to be taken which includes the servlet should start theMIDP for the Palm OS converter, this software can run from the command line to convert the JAD document to the Palm OSResource Collection file PRC. Then utility is ready to be deployed on a Palm tool.

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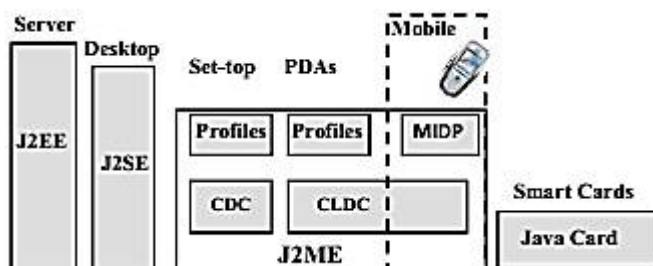


Fig. 4: J2ME and MIDP

## IV. CONCLUSION

One of the demanding situations is to design accurately user interface for multiple tool. We illustrated two strategies to development of the utility both of them trusted end person and subsequently the XHTML is right manner to triumph over problems with mobile devices and an everyday Web browser. In addition, we presented a bug have a look at and categorization of android-unique bugs that indicates an important quantity of android bugs.

## REFERENCES

- [1] Wang, S. & Dey, S. (2013) "Adaptive mobile cloud computing to enable rich mobile multimedia applications", IEEE Transactions on Multimedia, pp 1-14.
- [2] Lobo, D., Kaskaloglu, K., Kim, C. & Herbert, S. (2010) "Web usability guidelines for smartphones a synergic approach", International Journal of Information and Electronics Engineering, vol. 1, No1, pp 33-37.
- [3] Black, M., & Edgar, W. (2009) "Exploring mobile devices as grid resources: Using an x86 virtual machine to run boinc on an iPhone", In 10th IEEE/ACM International Conference on Grid Computing, Washington, DC, USA, pp 9-16.
- [4] Traxler, J. and Leach, J. (2006) "Innovative and sustainable mobile learning in Africa", In 4th IEEE International Workshop on Wireless, Mobile and Ubiquitous Technology in Education, Los Alamitos, USA, pp 98-102.
- [5] Wang, M., Shen, R., Tong, E., Yang, F., & Han, P. (2005) "Mobile learning with cellphones and pocket-PCs". Springer-Verlag Berlin Heidelberg, New York, pp 332-339.
- [6] Prensky, M. (2005) "What can you learn from a cell phone? Almost anything!", The Innovate Gateway 1 (June/July). Available at: <http://www.innovateonline.info/index.php?view=article&id=83> (last accessed 7 July 2014).
- [7] Jin, Y. (2009) "Research of one mobile learning system", International Conference on Wireless Networks and Information Systems, Guiyang University, China, pp162-165.
- [8] Han, M. (2011) "New technology of distance learning in China", International Conference on Computer Science and Service System (CSSS), Nanjing, China, pp 517-519.
- [9] Raza, A., Capretz, L.F. & Ahmed, F. (2012) "Users' perception of open source usability: An empirical study", Engineering with Computers, Springer, vol. 28, No 2, pp 109-121.
- [10] Raza, A., Capretz, L.F. & Ahmed, F. (2012) "An open source usability maturity model (OS-UMM)", Computers in Human Behaviour, Elsevier Science, vol. 28, No 4, pp 1109-1121.
- [11] Ting, R. (2007) "The advanced mobile learning practices: learning features and implications", the 7<sup>th</sup> IEEE International Conference on Advanced Learning Technologies, (ICALT), Taipei, Taiwan, pp 718 -720.
- [12] Chang, V. (2006) "Web service testing and usability for mobile learning", In Networking, International Conference on Systems and International Conference on Mobile Communications and Learning Technologies (ICN/ICONS/MCL), University of Southampton, UK, pp 2-21.
- [13] Parsons, D. & Ryu, H. (2006) "A framework for assessing the quality of mobile learning", 11<sup>th</sup> International Conference for Process Improvement, Research and Education (INSPIRE), UK, Southampton Solent University, pp 17-27.
- [14] J. Karvonen, J. Warsta, Mobile Multimedia Services Development Value Chain Perspective. Third International Conference on Mobile and Ubiquitous Multimedia, 2004.
- [15] M. Kontio, Designing mobile user interfaces: An architectural approach to working in mobile environments. 2004.
- [16] ISO FDIS 9241-11 (1997) Ergonomic requirements for office work with visual display terminals (VDT's), Part 11: Guidance on Usability specification and measures.
- [17] ISO/IEC, ISO/IEC 9126 in practice: what do we need to know? [Online] Available at: <http://www.essi.upc.edu/~webgessi/publicacions/SMEF%2704-ISOQualityModels.pdf>.
- [18] Zhang, D., & Adipat, B. (2005) "Challenges, methodologies, and issues in the usability testing of mobile applications", International Journal of Human-Computer Interaction, vol. 18, No 3, pp 293- 308.
- [19] Ziefle, M., & Bay, S. (2006) "How to overcome disorientation in mobile phone menus a comparison of two different types of navigation aids", International Journal of Human-Computer Interaction, in press, vol. 21, No 4, pp 393-433.
- [20] Jarvela, S., Naykki, P., Laru J., & Luokkanen, T. (2007) "Structuring and regulating collaborative learning in higher education with wireless networks and mobile tools", International Journal of Educational Technology & Society, vol. 10, No 4, pp 71-79.



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[21] Wahab, A. Osman, & Ismail, H. (2010) "Engaging children to science subject: a heuristic evaluation of mobile learning prototype", 2nd International Conference on Computer Engineering and Applications (ICCEA), Shah Alam, Malaysia, pp 513-516.

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