Design and Development of Mobile University Student Guide

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Abstract—**The mobile phone market which was 4.08 billion users worldwide in 2012 grew by 6.3% in 2013 to 4.32 billion users. The mobile market grew by 5.1% to 4.55 billion users in 2014 and expected to grew more in next a few years.**

In this paper we are proposing an application for university student guidance called Mobile University Student Guide. Mobile University Student Guide is mobile application that connect students with the university systems to facilitate dealing with the university classes schedule, organize daily appointments within the campus, facilitate the communication of students with each others, facilitate the communication of students with their teachers, and notify the student of any new alert through the application.

> *Keywords—Android; Mobile; University; Communication*

I.   INTRODUCTION

A mobile application (or mobile app) is a software application or small program that resides or designed to run on Smartphone's, tablet computers and other mobile devices[2,3,4]. They are regularly offered during application distribution platforms, which are naturally operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store, and BlackBerry App World.

Mobile apps were firstly presented for broad production and information retrieval, as well as email, calendar, contacts, and weather information. But, community require the accessibility of developer tools flock quick growth into other classes, such as mobile games, factory computerization, GPS and location based services, banking, order tracking, and ticket purchasing. The explosion in quantity and diversity of apps made detection a challenge, which in turn led to the establishment of a broad range of review, recommendation, and foundation sources, together with blogs, magazines, and dedicated online app-discovery services. The reputation of mobile applications has continued to increase, as their usage has turn out to be ever more prevalent crosswise mobile phone users. A study, done in the year 2012, reported that through the previous quarter, more mobile subscribers used apps than browsed the web on their devices: 51.2% vs. 49.7% correspondingly. Researchers concluded that usage of mobile applications powerfully correlates with user context and depends on user's location and time of the day [6].

A.   Mobile Application Development

Mobile app development is the procedure in which app software is developed for low power hand-held devices. The applications can be pre-set up on mobiles throughout manufacturing, downloaded by consumers from diverse mobile software distribution platforms, or sent as web applications by means of server-side or client-side dispensation (e.g. JavaScript) to offer an "application-like" familiarity within a Web browser. Application software developers as well ought to consider a extended array of screen sizes, hardware stipulation and configurations since strong competition in mobile software and alterations inside each of the platforms. Mobile app development has been gradually on the increase, mutually in terms of revenues and jobs created. A 2013 market analyst states there are 530,000 direct App Economy jobs inside the EU 28 members, 61% of which are mobile app developers approximately [7].

B.   Benefits of a Mobile Application

Mobile app allows you to be aware of what is going on in your locality, to help you calculate currency exchange rates, social media communications, worming you about traffic information, offer you entertainment and you can know about special offers. There are over 200,000 mobile applications out there today performing a huge range of tasks. Apps tend to

be small, self-contained and focused on solving one unique task. [8].

C.   Research Objectives

The aim of this research is to have a mobile application that: facilitate communication between students and faculty, facilitate communication between students and lecturer, organize lectures schedule for the student and lecturer with notified of the date and place of each lecture, and the ease and speed of receiving and sending messages from student to lecturer or lecturer to student.

II.   RELATED WORKS

Android Application for Islamic University Gaza (Student Portal) displaying the courses' schedule and exams' schedule for students from anywhere and anytime, also notifying the students to student lectures' schedule and exams automatically, viewing the academic information and grades report (marks transcript) for the students, providing silence schedule because most of students forget their mobile phones in normal mode during the lectures, but by the intended application, mobile phones will be automatically switched to silent mode during the lectures. But this system depends on the university Web site directly[5].

A mobile Application for AlQuds Open University use the smart mobile technology to provide services for students. Students can examine their static data about the university without the need of internet, but it depends on the university Web site directly, furthermore, it doesn't include the main activates such as semester registration and announcement[5].

Abu Naser et.al. proposed a mobile application for helping academic staff and students in higher education institutions to access the following services effortlessly everywhere and any time. The application can work with android, IOS, and windows phone, The application supports the Arabic and English languages. The users of the application are Faculty members and student. The following services are provided by the proposed application: view the academic information, registered courses, transcript, courses schedule, exams schedule, study plan, and financial report. Also, remind students with lectures and exams schedule, academic queries, and receive complaints and suggestions[5].

Richardson et. al. presented proof of concept pilot study of a sample of a mobile text messaging used to help student services in the advanced education. The sample permitted students to contact administrative and evaluation information, in addition to permitting Faculty members the chance to send evaluation feedback, reminders and warning to class groups[1].

The existing android system can communicate between students and faculty, remind the student about lecture dates and places; but, does not have the service to set the alarm clock to wake up the student and teachers in time for the first lecture daily automatically.

III.   PROPOSED SYSTEM

Proposed university student guide application works on smart phones on Android platform. It can be used by students/ Lecturer. Fig. 1 shows the final use case diagram for USG app and fig. 2 shows the user interface of the USG app.
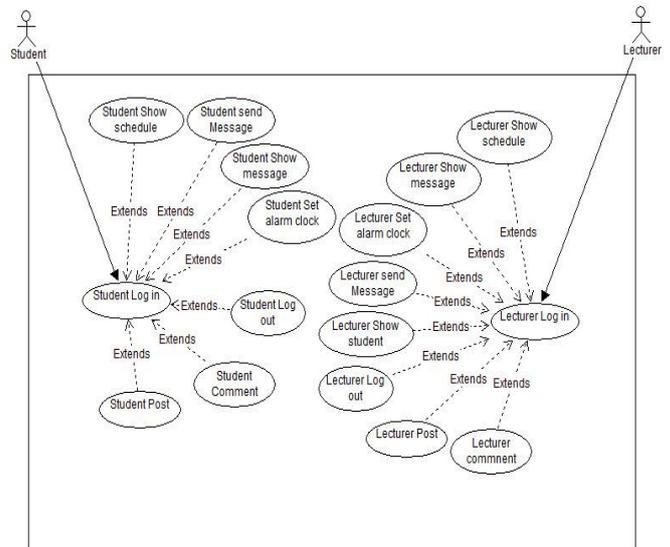

Fig. 1: *The final use case diagram for USG app.*

Fig. 2: *User interface of the USG application.*

IV.   DEVELOPMENT ENVIRONMENT

For developing Mobile Student University Guide, we used Java programming language, which is used for Android platform application. Eclipse is the editor environment for our project, we also used SDK Android with version 9.0 to offer an Android emulator with obligatory libraries to put up Android application and SQLLite [8,9,10,11,12] database, which is

lightweight database engine that provides a small storage size and needs small memory so it is suitable for Android application. Finally, other APIs were used[13,14].

V. TESTING

In order to ensure functioning of the system correctly and avoid the largest possible amount of errors, we tested the system so efficiently evaluate performance and to achieve the best results.

A. *System Testing Importance*

1. In this step of testing we check if the system meets functional requirement or not.

2. System Testing enables you to test, validate and verify both the application architecture and industry requirements.

3. Put the system in an setting like to the actual setting, and try to detect the errors until they are fixed before implementing it efficiently.

B. *Features to be Tested*

Features to be tested are functionality testing, usability testing, compatibility testing, security testing, performance testing, and use case testing.

C. *Test Deliverables*

The following points will be the results of the accomplished testing activities:

- Test Plan.

- Test Case Specification.

- Test Reports.

D. *Environmental Needs*

There are essentially three parts are needed to test the Mobile SUG system:

- Personal Computer or Laptop, Browsers, no need for Internet Connection.

- Mobile android platform.

- Free Testing Tools.

E. *Testing Activates*

Testing activities includes functionality testing, usability testing, compatibility testing, and security testing.

1. Functionality Testing

The first stage headed for functional testing is to grasp the requirements of application. We refers to requirements specification and explores the application being tested.

2. Usability Testing

The main objective of this testing activity is to ensure that the intended users of the system can implement all system functions in an efficient and effectiveness way.

To recognize user interaction points and easy access points to assist developers to comprehend the user outlook with the mobile application.

To perform the usability testing, two users were chosen to see the system to assess the usability of its functions. The results are as shown in table 1.

Table 1: Usability Testing

Usability Features	User1	User2
App Design		
App design is simple	Yes	Yes
The main menu clearly defines the structure of the app	Yes	Yes
The logo is a clickable link to the main menu	Yes	Yes
Navigation		
Links are obvious and self-explanatory	Maybe	Yes
All links are active	Yes	Yes
All links lead where expected	Yes	Yes
All links clearly indicate their destinations	Yes	Yes
Display Elements		
All display elements are visible and legible	Yes	Yes
Colored elements are on appropriate backgrounds	Maybe	Yes
Color or size is used to distinguish elements	Yes	Yes
Important elements are visually isolated	Yes	Yes
Page Titles		
Page titles describe each page effectively	Yes	Yes
Page titles are short and meaningful	Yes	Yes
Page titles do not all start with the same word	Yes	Yes
Page titles use headline styles	Yes	Yes
Text		
The text uses standard colors	Yes	Maybe
Type is aligned right	Yes	Yes
Lines of text are short enough for easy reading	Yes	Maybe
The spacing between words, sentences and paragraphs is sufficient.	Yes	Yes
Functions		
The main functions can be easily accessed	Yes	Yes
All functions are done correctly	Yes	Yes

3. Compatibility Testing

The main objective of this testing activity is to make sure that all functions of the application are successfully running on different platforms. Table 2 shows the compatibility testing carried out.

Table 2: Compatibility Testing

Platform	Version	Design	Funco nality	Perform ance
Mobile				
Android	4.4.2	Yes	Yes	Yes
Web				
Internet Explorer	11.0.9600.17358	Yes	Yes	Yes
Google Chrome	40.0.2214.111m (64-bit)	Yes	Yes	Yes

4. Security Testing

Services of security testing principally addresses diverse threats to information security when it comes to mission critical app. We closely work together with our clients during the development lifecycle and facilitate them to recognize and get rid of important security risks.

Industry standard security testing exercise were applied, that permitted and improved our clients in developing extremely secured app (see fig. 3).

Fig. 3: *Chart of Security Methods*

Password hashing were adopted, that is one of the fundamental security considerations that should be made when developing any application that receives passwords from users. Not including hashing, any passwords that are saved in ones application's database can be stolen if the database is compromised, and then right away used to compromise not only your application, but as well the accounts of your users on other services, unique passwords were not used.

Using a hashing algorithm to the passwords of your users before saving them in the database, you compose it unlikely for any attacker to decide the original password, whilst still being able to contrast the resultant hash to the original password provided one day.

It is significant to remember, though, hashing passwords simply guards them from being compromised in your data storage, however, it does not automatically protect them from being grabbed by malicious code inserted into your application.

Hashing algorithms for instance: SHA1 and SHA256 are considered to be very swift and well-organized. By modern techniques and computer gear, it turned out to be trivial to brute force the production of these algorithms, with the intention of determining the original input[10].

Given that, how rapidly a modern computer can turn round these hashing algorithms, numerous security experts powerfully propose against their use of this type of hashing.

VI. CONCLUSION

In this paper, we presented the design and implementation of a mobile application called Mobile Student University Guide , with which mobile users can get valuable information on different services of the university and guide students/teachers . Mobile Student University Guide allows the organization of lectures schedule for the student and teacher through the addition of materials through the application, and notify them of the date and place of the lecture during the post-it notes on a mobile message, and also provide an opportunity for communication between the student and the teacher of material added through the application.

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