Cross-Platform Development for an online Food Delivery Application

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Abstract—Popular use of various mobile operating systems like android and iOS, applications in these sectors are getting more significance than ever. Since each of these platforms requires different types of programming knowledge, developers need to spend much time and cost to build app for separate platforms. So, in order to mitigate these problems, web based solution can be used. Cross-platform development is useful because user can write their code in one language that can easily be compiled to multiple platforms, i.e. platform independency can be achieved. In this case, we use a food delivery application, where the application front end is developed using PhoneGap as well as AngularJS, jQuery mobile for optimum performance and backend is developed for web services using PHP, JSON and MySQL. We introduce approaches in the field of cross-platform app development using PhoneGap framework. A soultion to build applications for multi-platforms using PhoneGap framework which use web technologies HTML, CSS and JavaScript has been proposed. Thus, time as well as cost of developers will be reduced.

Keywords— App, Mobile application, Cross-platform, Multi-platform, web application, Android, iOS, PhoneGap, jQuery Mobile, AngularJS.

I. INTRODUCTION

Nowadays, in this era of ubiquitous computing, smart gadgets like mobile phones, tablet PC have become an out and out part and parcel in our everyday life. Perhaps the biggest appeal of these gadgets is the various functionality of different types of app. Therefore, application development for these devices is becoming a challenging issue due to multiple platforms for the development of application like android, IOS, Firefox OS, Tizen based Linux kernel etc. The most popular approach is based on programming language like object-c for Apple iPhone, Java for Android, C++ for Windows mobile etc. So, developers have to face the task of learning different programming languages which is not an easy task by any means. On the contrary, we can develop a cross platform application using framework like PhoneGap so that we can build apps which can be used at multiple platforms. In this paper, we will take into consideration of a food delivery mobile application for the android environment. Considering the other existing food delivery applications before, and our application front end focuses on easy navigation, quick log-in registration, bookmark favorite foods, historical order information, dynamic maps, Geolocation etc. which features are mostly absent in other existing food delivery applications. Back end focused on dashboard (chart), multi user, Ajax support, data-tables, and support multi filter, detail table. All the pages can be developed by using AngularJS, CSS, font awesome icons and HTML based on PhoneGap framework. For sending and receiving data between app and database server, JSON has been used. The paper presents architecture of the overall application, description of various technologies used in our application, pros and cons of our approach.

II. SIMILAR WORKS

A. Cross-platform vs Native Application

Cross-platform application is written based on only one code base supporting multiple platforms whereas native app is developed specifically for a mobile operating system. The comparisons of both the approaches are given below in tabular form.

TABLE I: CROSS-PLATFORM VS NATIVE APP

Decision Criterion	**Decision**	
	Cross Platform	***Native***
Quality of UX	Excellent	Not as good as cross platform
Apps quality	High	Medium
Potential users	Large - multiple platforms	Constrained to a specific platform
App developm ent cost	Low	High

B. PhoneGap

PhoneGap is a mobile app development framework by Adobe System, which is used to develop mobile applications for multiple platforms [1]. To develop apps using PhoneGap, the developer can be illiterate about native programming languages, only requirement are to be familiar with web-development languages like, HTML, CSS, and JavaScript. There is no doubt that PhoneGap is very instinctive for web developers. PhoneGap can access different types of device API like accelerometer, contacts, file system, and network connectivity, geo location, camera, notification etc.

C. jQuery Mobile

JQuery Mobile is a framework for developing mobile apps. It works on almost all smart phones device. JQuery Mobile uses HTML5 and CSS3 for laying out pages.

D. *AngularJS*

AngularJS is a powerful JavaScript based development framework which provides a complete client-side solution to create RICH Internet Application (RIA) [2]. Application written in AngularJS is cross-browser compliant. AngularJS automatically handles JavaScript code suitable for each browser.

E. *Font Awesome*

Font Awesome is a font and icon toolkit based on CSS and LESS [3]. Dave Gandy made it for use with the Twitter Bootstrap. Font Awesome gives you scalable vector icons that can be customized — size, color, shadow, and anything that can be done with the power of CSS.

Fig.1 Font Awesome icon

F. *HTML, CSS and Javascript*

All smart-phone devices support web standards including HTML5, CSS3, and JavaScript. These web standards are open, reliable and efficient. Cross Platform apps depend on these three standards.

G. *Ajax*

Ajax stands for Asynchronous JavaScript and XML [4]. Ajax can update a web page without reloading the page. Ajax send and receive data in the background.

H. *JSON*

JSON, or JavaScript Object Notation, is a minimal, readable format for structuring data. It is used to transmit data between a server and application (client), as an alternative to XML. JSON read data from a web server, and display data in application page.

I. *PHP and MySQL*

PHP is a server-side scripting language (the code is executed on the server). MySQL is a Relational Database Management System (RDBMS) that uses Structured Query Language (SQL) [5].

TABLE II: RESOURCE CONSTRAINTS

Component	Minimum
Processor	200 MHz
RAM	32 MB
ROM	100 MB

III. APPLICATION ARCHITECTURE

The application has three parts, these are: application (front end), admin (back end) and database.

A. *Front End*

The application sector used index.html as the whole page wrapping. We have retrieved data from database server via JSON to display food information on food page and send data to server so that we can authenticate user log-in and registration. User login and registration of the page is absolutely vital for the user to access the website. The page contains linking of others page of the application. We have added CSS and java scripts file in the head section.

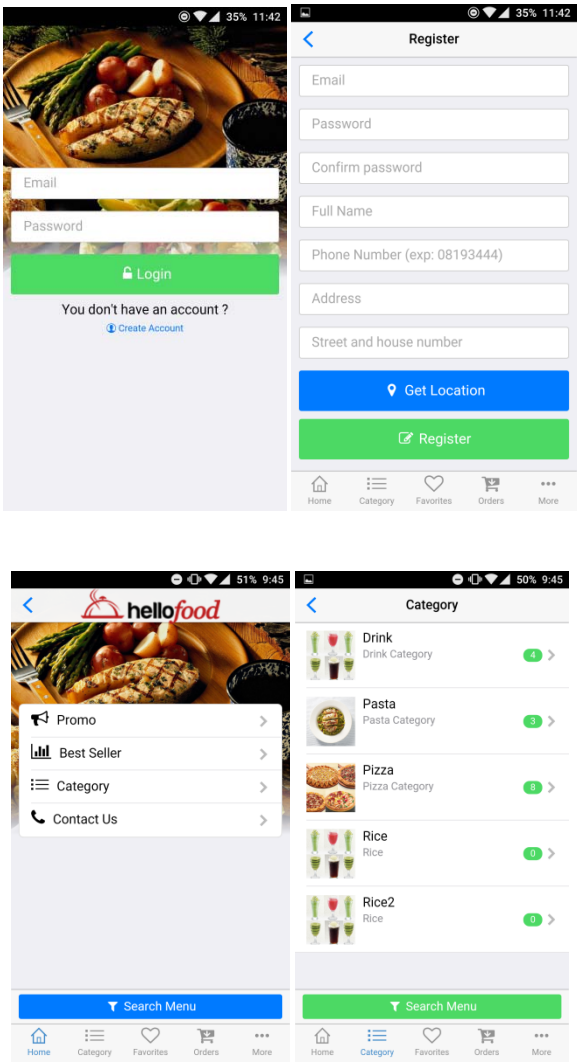

Fig.2 Application Screenshot

The app.js contains the web service URL and database token [6].

```
//Set your token database
var token = 'a8B6c4D4e8F0';
//Set url service app
var serviceApi= domain.tld/app';
var GetServiceApi = serviceApi+'index.php/';
```

Fig.3 Service App Connection

Explain

B. Back End

All the data of the application cab be updated from back end. Back end contains admin log-in system and different types of navigation task. We have used MySQL database. We need to define the database hostname, database username, database password to establish the connection. Token is used for authenticating users to the database system.

```
$db['default']['hostname'] = 'localhost';
$db['default']['username'] = 'root';
$db['default']['password'] = '';
$db['default']['database'] = 'test';
$db['default']['dbdriver'] = 'mysql';
$db['default']['token']    = 'a8B6c4D4e8F0';
```

Fig.4 Connection of database

C. Database

The database contains different types of table like; category, menu, message, register, user etc. All the log-in credentials is secured with md5 encryption [7]. We have used SSL (Secure Sockets Layer) which is a standard security technology for establishing an encrypted link between a server and an application [8]. First a browser or application service attempts to connect to a website that is secured with SSL, then the browser request the server identity. Server sends a copy of SSL certificate to the browser and browser check is trusted or not. If so browser sends a message to the server, the server sends a digitally signed acknowledgement to start an SSL encrypted session. Encrypted data will be shared between the server and browser via https protocol.

The data dictionary of the most important schemas is given below:

category(category_id,category_name, category_image, category_img, category_dec)
menu (menu_id, menu_category_id, menu_name, menu_price, menu_disc, menu_image, menu_img, menu_esc)
message (message_id, message_name, message_email. message_phone, message_value, message_timestamp)
promo(promo_id,promo_title,promo_desc,promo_img,promo_image,promo_end_date,promo_status)
register(register_id, register_email, register_password, register_name, register_address, register_street, register_phone, register_type, register_date)
setting(setting_id,setting_name, setting_address, setting_telephone, setting_email, setting_img, setting_images, setting_website, setting_tax, setting_latiude, setting_longtiude, setting_delevary_fee)

Fig.5 Database table and entities

Among these tables, Category table contains the food category information like food category name, image, description etc. Menu table has the food menu info like food menu name of food, prices of the food, images, descriptions etc. Message table holds the messages between the application user and system admin. Promo table covers the promotion information like promotion status, end date etc whereas Register table comprises of all the registered user information like user name, email, address, password etc. Last but not the least, Setting table encompasses the data about the food store setting like store name, website, contact phone no etc. that is maintained by system admin. System admin is eligible to update all the information of these tables.

Fig.6 Sample md5 encryption

MD5 stands for Message Digest algorithm 5. MD5 is widely used in cryptographic hash function in order to ensure security. This algorithm takes up a random data as input and generate a fixed size hash value as output. The input data can be of any size or length but output hash value will be fixed always. Though two random input data will be of same size and type, these will never produce the same MD5 hash. Thus, it will identify the uniqueness of the messages. If there is a change in the input value of the file, the hash will be changed by almost 50%, meaning that the data is corrupted.

IV. Conclusions and future work

We have tested the well-known applications for feasibility study named Foodpanda, Hungrynaki which are commonly used in Bangladesh. We have used HTML, CSS, JavaScript based PhoneGap framework, which is well known .With the simple way of developing, we have made the application in a short time and it also outperforms other applications in terms of cost benefit analysis. The application can run in various platform as well as browsers with the minimum developer effort. It can be considered to be one of the greatest advantages. The application works well in real device rather than simulator. The application is built only for android platform which can be extended in future.

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