Cross Platform Applications with IBM Worklight

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Abstract: - There is a tremendous increase in users with an iPhone, Android-based phone, Smartphone and tablet computers. The mobile operating system companies provide more resources for the creation of applications as per the users requirement. But due to the use of various operating system, it becomes problem for developers to develop the application for each operating system individually. So this has been solved by the cross platform mobile application development tool using Single source code, "Build Once, Run many ", Platform independent, which provides more scope in less time. The applications created by IBM Work light which helps avoid developing same type of application separately. This paper aims at developing an app that makes user to remind and book tickets(travel, movie) recharges mobiles and send free sms.

Keywords—*Cross-Platform, work light ,Single source code, "Build Once, Run Many", Platform Independent.*

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I. INTRODUCTION

A smart phone is a mobile phone that offers a more advanced computing ability and connectivity than a phone with contemporary features. They are much more efficient in form factor, chip type, internal storage capacity, battery lifetime and operating system [1] [2].The mobile applications are used more than the calls. People use the applications as per their need. There are various mobile operating systems like Android, IOS, Blackberry, Windows, etc… Each operating system has its own specialization.The applications defer from one operating system to the other. So the customer needs to use more than one mobile operating system to fulfill their requirements. This problem was solved by the cross platform tool using IBM worklight studio. This helps developers to implement the application which would support more than one operating system.

It uses various languages such as HTML5,Java Script,CSS3 etc.
In this paper we will be dealing with the cross platform development o f " WORKLIGHT POSSE APPLICATION" which will provides user a weekly reminder to-do list to organize works and a posse

application which consists of all the apps in a place(apps to which do not want to install seperatly ie..sanpdeal app, shopclues app, cricinfo app, paytm app, railinfo app etc) which provide same user experience as native application.

MAIN OBJECTIVE

We are mainly targeting to create a hybride app which will be installing on the mobile devices of different operating systems.
1) Android
2) Blackberry
3) I-Phone &
4) Windows(7,8 and web app)

The main focus is to have single source code for all the mobile operating systems. In an era where application developers today aim to maximize target reach Cross platform mobile application shows us the path by truly providing a "Develop One Times, Deploy Any where Any time" solution.

MOBILE PLATFORMS AND APPLICATION DEVELOPMENT LANGUAGES

• iPhone
  Objective-C /C / HTML5
• Android
  Java /C / C++ /HTML5
• Symbian
  C /C++ /Java / HTML5
• Windows Phone
  C#/C++/Silverlight/ HTML5

As you can see one needs put lot of efforts and money to build the native app which build in native language supported by respective Mobile OS.
Ultimately the efforts (Money, Time etc.) put in to develop application will be more. E.g: X man-hrs required to build the app for IPhone. And we are targetingY mobile platforms which also include Android & Windows. SO total efforts roughly would be 3*X man-hrs. Again we would required skilled software developers in respective Mobile OS platforms. So we proposing to use HTML5 & jQuery Mobile with collaboration of PhoneGap which will help to have single source code and we can create native app targeting to different Mobile Platforms.

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TYPES OF MOBILE PHONE APPLICATIONS

There are various types of mobile phone applications: native applications, applications based on web technologies and hybrid applications.

Fig1: Types of mobile applications

*Table1 :*MAJOR MOBILE PLATFORMS [3].

	Apple os	Android	Blackberry	Windows phone
Language	Object ive c	Java	Java	C#,VB .NET
Tools	X CODE	Andr oid SDK	BB Java eclipse	Visual Stdio windo
Packing	.app	.apk	.cod	.xap
App store	Apple store	Google play	BB app world	Market place

Table 2:COMPARISON BETWEEN PURE MOBILE WEB APPS AND PURE MOBILE WEBSITES [4].

Feature	Pure mobile web Apps	Pure mobile websites
Tools and knowledge	Written entirely in HTML, CSS and JavaScript	Written entirely in HTML, CSS and JavaScript
Execution	installed" shortcut, launched like a native app	Reached by navigating to a website by way of a URL
User Experience	Touch-friendly, interactive UI	. Navigational UI between pages displaying static data
Performa nce	UI logic resides locally, making the app responsive and accessible offline	All code executed from a server, resulting in network-dependent performance

Table3: *COMPARISON OF NATIVE APP*

VS. HYBRID APP VS. WEB APP [4].

Feature	Native	Hybrid app	Web app
Development Languages	Native only	Native and web or web only	Web only
Code portability and optimization	None	High	High
Access device- specific features	High	Medium	Low
Leverage existing knowledge	Low	High	High
Advanced graphics	High	Moderate	Moderate
Upgrade flexibility	Low	Moderate	High
Installation experience	High	High	Medium

WHY WORKLIGHT STUDIO

Worklight is been chosen as the programming environment because it facilitates a large number of Hybrid Mobile App features. The Worklight Studio's capabilities and the software development kit (SDK) [1]of the Worklight offers the development of mobile and omni- channel applications (apps) throughout multiple mobile platforms, including iOS, Android, BlackBerry, Windows 8, Windows Phone and Java ME. The Worklight optimization framework fosters code reuse and delivers rich user experiences that match the styling requirements of each target environment. With such code reuse, Worklight software reduces costs of development, reduces time-to- market and provides strong support for your ongoing management efforts. Worklight software delivers integrated functional testing capability. For apps that are developed within Worklight software, developers or testers can record a sequence of actions on a mobile device. Once the recording has been captured, it becomes the basis of an intelligent, resilient and code-less test case that can be "played back" on demand on virtually any iOS or Android device or emulated iOS or Android device within the same OS family.

Development tools:-

1.Worklight Studio: With IBM Worklight, you can develop multiplatform s by using Worklight Studio, .

2.WorklightServer: The Worklight Server is a runtime container for the mobile applications you develop in Worklight Studio. It is not an application server in the Java Platform, Enterprise Edition (JEE) sense. It acts as a container for

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Worklight application packages, and is in fact a collection of web applications (optionally packaged as an EAR file) that run on top of traditional application servers.[6]

3.Worklight device runtime components: IBM Worklight provides client-side runtime code that embeds server functionality within the target environment of deployed apps This framework delivers a uniform bridge between standard web technologies (HTML5, CSS3, JavaScript).

4.Worklight Console: The Worklight Console is used for the control and management of the mobile organization, from managing deployed applications to collecting and analyzing user statistics. It assigns device- specific identifiers (IDs) to ensure secure application provisioning.

5.Application Center: With the Application Center, you can share mobile applications that are under development within your organization in a single repository of mobile applications. **[5]**

IBM Worklight environments[7]

You can build your mobile applications for different environments, such as: Mobile environments, which include iPhone, Pad, Android phones and tablets, BlackBerry 6 and 7, BlackBerry 10, Windows Phone 7.5 and Window Phone 8. Desktop environments, which include Adobe AIR and Windows 8.

Software Requirement:

1. OperatingSystems, Eclipse versions and SDKs supported by IBM Worklight.

2. Prerequisites of IBMWorklight 5.0.5:-Development tools: Eclipse 3.6.2/3.7.2/4.2

3. Java SDK: IBM Runtime Environment, Java Technology Edition 6.0/7.0

4. Javascript libraries; Jquery Mobile [4], Sencha Touch, jquery.

5. Databases: DB2 Enterprise Server Edition 9.7/Mysql 5.5/Apache Derby

Hardware Requirement
Detailed hardware requirements by operating system family.
Table 4 hardware requirements [7]

OPERATING SYSTEM	HARDWARE	REQUIREMENT
1. LINUX	Disk Space	Minimum : 150 MB
	Memory	Minimum : 2GB RAM
2.Mac OS	Disk Space	Minimun : 150 MB
	Memory	Minimun: 2GB RAM
3.Mobile OS	Disk Space	Minimum: 150 MB
	Memory	Minimun : 32MB RAM
4.Windows	Disk Space	Minimun: 150 MB
	Memory	Minimum: 2GB RAM

II.   LITERATURE SURVEY

The main aim of our project is to develop an application which would support various mobile operating system. We have implemented that application using the "IBM Work light Framework". This framework creates a language for different operating which would help developer to create the application properly. In this Project, we are developing a tool for TODOPosse Mobile Application. It provides user to store information about his reminders for aweek. It also helps user to book tickets (movie and travel),recharge mobile & send free sms.

This application fulfills all the requirements of the user & supports most of the mobile operating system & thus the name "Cross-platform TODOPosse mobile application".

III.   I SPLASH SCREEN

The user has to wait for 3 sec. for getting the starting page of the Application. The delay is being provided for displaying the LOGO for TODO

IV.   MODULE DETAILS

This app has two sections in it **1 TO-DO LIST**

HOME PAGE

This module displays a week view where we can change the type of view to day view and settings to change the priority.

ADDING THE TASK TO BE DONE

This module helps the users to add the tasks to be done on the part of the day and set priority for it with colour

SETTINGS

This module helps the user to set the visible days of the week, set default view(days/weeks),sort items by time/ priority

The TO-DO logo on the top will navigate user to the posse app

2.POSSEAPP

POSSE APP HOME PAGE

This module has the segments like
1.book your tickets
2.recharge mobile 3.send free sms

i.BOOK UR TICKETS

It has linked with the original company providers which book online tickets. Has all three types like Movie tickets, travel tickets(bus tickets, train tickets),

ii. RECHARGE MOBILES

Here user can add his mobile number and can recharge immediately sms will be sent to the registered mobile number

iii SEND FREE SMS

This module uses way to sms server to provide sms service for the user

ABOUT US

The user can see the maker info

V.   CROSS-PLATFORM SOFTWARE LANGUAGE & ALGORITHM

LANGUAGES USED
   a)   HTML 5
HTML5, the 5th version of HTML, is the latest web technology with rich multimedia features and interoperability features for smartphones and tablets makes it compelling and doubtable. HTML5 web application can be accessed on mobile browsers and runs on different mobile platforms just like native applications. HTML5 provides offline support through local data and application caching without the need for internet connection.
   a)   JavaScript
JavaScript is used in lots of Web pages to improve design, validate forms, detect browsers, create cookies, and much more. JavaScript is popular scripting language on the internet, and works in all major browsers, such as Internet Explorer, Mozilla, Firefox, Netscape, Opera.
   b)   CSS3
Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation semantics (the look and formatting) of a document written in a markup language. Its common application is to style web pages written in HTML5 and XHTML, but the language can also be applied to any kind of XML document including XMLanguage, Scalable Vector Graphics and XML-based User interface Language.

Our mobile app basically targets different devices with varying screen sizes and also we target to run the same app for Desktop users in the form Web Application.

So to fit in on all these varying screen sizes we have to use Responsive Web design approach.
Its Elements are:
D Media queries D The fluid grid D Flexible images

WCF JSON SERVICE[8]
This module helps clients viz Mobile App and Web App for desktop users to fetch data from database and brings it to client application.
SO basically this service is the bridge between the client application and database server.
We have create JSON services because the
 data transferred over the HTTP is light weight so the performance of the application will be faster.

ALGORITHM STEP

1)   First user will enter the tasks that are to be done on that specified wee k.

2)   Then we will be using jQUery Mobile to request a WCF service by passing typed character to data basee and store the data.

3)   Stored procedure will store the information in SQL server

4)   User can now be navigated to the posse app contents

5)   There user can see book movie tickets.travel tickets Recharge mobile and send free sms

6)   User depending on his needs can surf and save through-
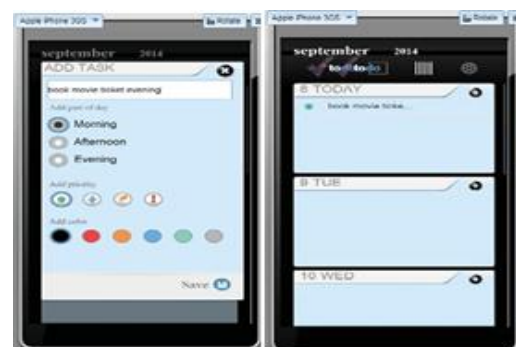
VI. GUI & SNAPSHOTS

Fig 1.splash screen

Fig 2:Home screen and add task

click on to do to navigate

Fig 3 navigate to posse app
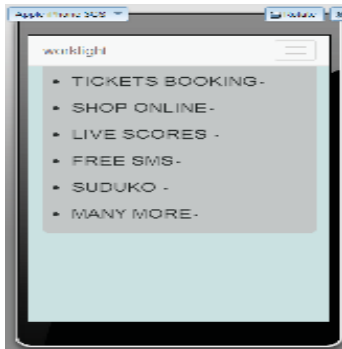
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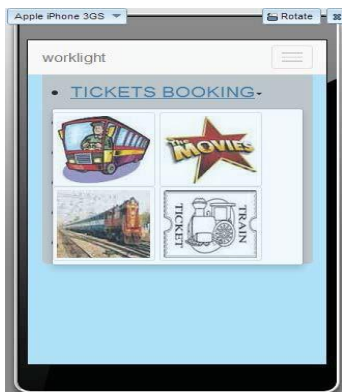*Fig 4:posse app home page*

Fig 5:icons shows the type of ticket to book
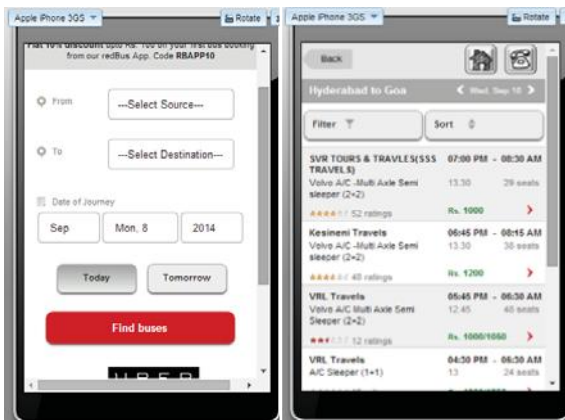

Fig 6:Navigation to bus tickets

Fig 7:select date and service provider
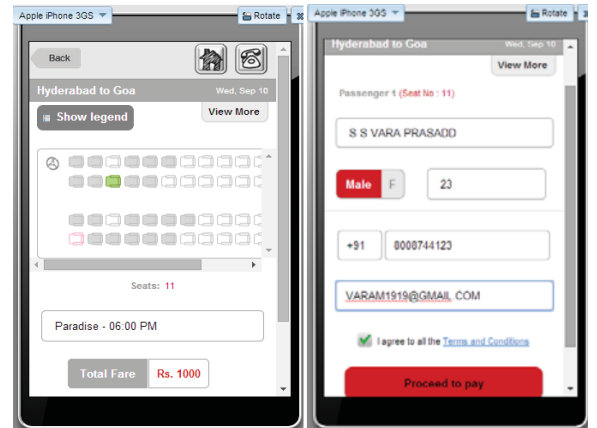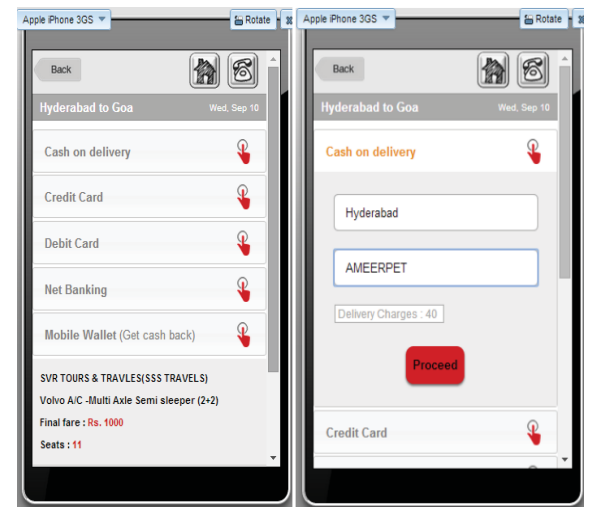

Fig 8: select seat and provide info
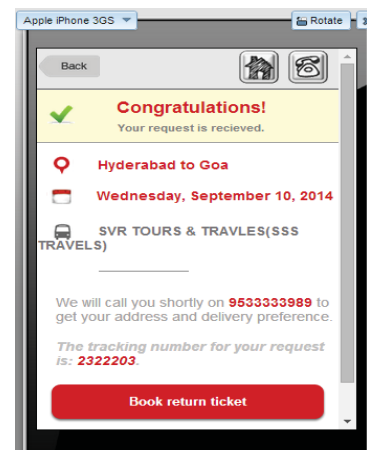

Fig:9 select payment options

Fig 10 :Finished booking with posse app

VII.   CONCLUSIONANDFUTURESCOPE

In this paper, we propose a cross-platform application development using Worklight framework. This paper introduces the design of TO-DO Posse app. The system is easy to deploy, safe and convenient to use. The practical value of mobility in teaching will be greater in the future

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because mobile devices are flexible, easy to use in real time. Worklight framework is used for cross-platform development of mobile apps for multiple plot-forms by using standard web development technologies. Therefore, it is concluded from this paper that Developing using a multiplatform framework is a strategic decision that should consider different tradeoffs: while it permits to follow a develop once time, deploy anywhere approach. The performance of the final product may not be as good as in a native application. There is still some future scope in this paper to make a posse app with reminder . We can also implement it for operating systems like mobile OS Symbian web Operating System and Firefox Operating System

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