Rest House Hybrid Mobile Application using Ionic Tool

Simran Sharma#1, Pawan Kumar#2

[1]*Department of Computer Science, BM Institute of Engineering & Technology (BMIET), Haryana, India*
[2]*Department of Computer Science, BM Institute of Engineering & Technology (BMIET), Haryana, India*

Abstract: *Mobile application development is used for constructing application software for small size devices that perform large types of computation for example mobile phones, notepads or tablets. Application developed using mobile application development concept is called mobile app. All the applications used in Mobile Devices are categorized into native applications or apps and web applications or apps. A web application for mobile phone is the web based version which is used by browser of mobile phone devices. A native application for mobile phone is designed for specific mobile devices and system software that device. There is another types of app used in mobile phones called Hybrid application or app. It combines the best features of both types of apps. Now the designer only develops hybrid application & it can be used in any types of mobile devices. It greatly reduces the cost of development and also it saves lot of time. In this paper we develop The Rest House App for the Indian Railways. Its main aim is to perform different tasks related to rest house of Indian Railway efficiently and perfectly. We uses Ionic tool for the app development because with this tool hybrid app is generated which can be executed on all the mobile platforms.*

Keywords: Mobile Computing, Mobile App, Web App, Native App, Hybrid app, Ionic Tool.

1. INTRODUCTION

Today is era of Mobile Computing. In this type of computing a user of any device need not to be in fixed location instead the user travel from one place to another without lost of connectivity. If we use our cell phone to send a text message, email someone, or reach the Internet, we are using mobile computing [1]. If we take our laptop computer to a coffee shop and use their wireless connection to reach the Internet or communicate with others, we are using mobile computing. Mobile computing means being able to use a computing device even when we are going to locations beyond the place where we usually use a desktop computer. This includes a variety of Internet-ready, wireless devices that are easy to carry with us.

When using mobile computing, researching on the Internet, or communicating with others when we are anywhere, you need three important things. They are a mobile device, a network connection, and special software applications, called apps. The number of mobile devices available is amazingly large and getting larger, and there are a couple of options that we will learn about for connecting to the Internet. We will also find that there are thousands of apps that have been created for most mobile devices. These applications can help us access information, be more productive, or enjoy games and other types of entertainment when using our device [2].

The sudden rise in smartphones and tablets penetration, the modern businesses can't afford to not offer mobile apps to their customers that run on different platforms. When it comes to developing an app with right features along with performance indicators and platform support, things can be complicated for any software development company. Developing multiplatform apps is need of today. An application which works same on all the operating systems is known as Hybrid App. Now the designer only develops hybrid application & it can be used in any types of mobile devices. [3][4].

In this work we develop The Rest House App for the Indian Railways. Its main aim is to perform different tasks related to rest house of Indian Railway efficiently and perfectly. It performs booking of rest houses for the officials, supervisors, passengers and staffs. We uses Ionic tool for the app development because with this tool hybrid app is generated which can be executed on all the mobile platforms.

2. TYPES OF MOBILE APPLICATIONS

In mobile computing a user of any device need not to be in fixed location instead the user travel from one place to another without lost of connectivity. If we use our cell phone to send a text message, email someone, or reach the Internet, we are using mobile computing. Mobile application development is used for constructing application software for small size devices that perform large types of computation for example mobile phones, notepads or tablets. Application developed using mobile application development concept is called mobile app

[5][6]. All the applications used in Mobile Devices are categorized into native applications or apps and web applications or apps. A web application [7] for mobile phone is the web based version which is used by browser of mobile phone devices. A native application [8] for mobile phone is designed for specific mobile devices and system software that device. There are another types of app used in mobile phones called Hybrid application or app [9]. It combines the best features of both types of apps. Now the designer only develops hybrid application & it can be used in any types of mobile devices. It greatly reduces the cost of development and also it saves lot of time.

Purpose of Hybrid app development

The fulminant rise in smartphones and tablets penetration, the trendy businesses can't afford to not supply mobile apps to their customers that run on completely different platforms. Once it involves developing associate degree app with right options together with performance indicators and platform support, things are often sophisticated for any computer code development company. Developing multiplatform apps is rigorous. Associate degree application that works same on all the operative systems is thought as Hybrid App. Hybrid apps allow developers to write code for a mobile app once and still accommodate multiple platforms.

Scope of Hybrid App

By means of enabling the developers to utilize different web technologies such as "HTML and JavaScript", they can target different platforms used for mobiles. We can perform this objective by coming up with program once as compared to native computer program wherever program is intended individually for various platforms of mobile devices. They'll focus additional on performance and options of the app instead of time spent on developing it and also the price concerned to try to therefore. It might be not wrong to mention that in future we are going to be seeing the hybrid applications are ruling the mobile app world. Additionally, the hybrid applications will be the need of every business organizations and it will be result as a part of every company.

Future of hybrid app

It would be not wrong to say that in future we will be seeing the hybrid applications will be ruling the mobile app world. Additionally, the hybrid applications will be the need of every business organizations and it will be result as a part of every company. The importance goes to extend day by day as currently for each work, mobile devices are used and technology is ruling the planet. Applications has turned the business operating easier.

In future, workers and members are tightened for the mobile application for each platform to induce the higher results and whereas seeing the low price entities can forced to choose the hybrid apps and therefore the trend of hybrid mobile app development can increase quickly.

	Native	Hybrid	HTML/Web
Cross-Platform/ Code Reusability	No	Yes	Yes
Development & Maintenance Cost	High	Low	Low
User Interface	High	Medium	Low
App Store Distribution	Yes	Yes	No
Offline Access	Yes	Yes	No
Native API Access	Complete	Partial-to-High	Low
Native Performance	Complete	Partial	Low

Figure 1: The comparative chart of three different types of applications.

Even numbers of organizations are searching for the framework of hybrid therefore the knowledge is additionally on a selected platform. The experts have stated that when it comes to developing an application the hybrid app will not only be the demand of the organizations but also of the mobile developers. The owners should understand this new technology and start utilizing it to enhance their business and it is a perfect marketing strategy at affordable price.

3. RESEARCH MOTIVATIONAL

The current Rest House Application is managed by railways at departmental and zonal levels. The current application supports manual booking and also it is not hybrid. It lacks the attractive features which Ionic platform provides. The current Rest House is a web – based mobile responsive application. On the completion of this project the application will be Hybrid and will function like all the native and mobile web apps.

It combines the best features of both types of apps. Now the designer only develops hybrid application & it can be used in any types of mobile devices. It greatly reduces the cost of development and also it saves lot of time. It is advantageous both for developers and business for constructing application which executed on various platforms in turns of time & cost saving.

As we can see from the graph in figure 2 below the number of downloads worldwide is in billions this represents the increase in the usage of apps.

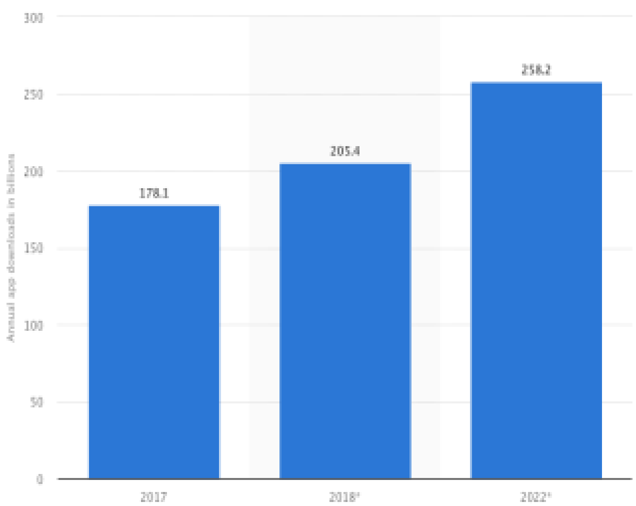

Figure 2: Number of apps downloaded worldwide.

4. PROPOSED WORK

The Rest House App will focus on the booking and the payment system for the Railway Officer's. The app will focus on the security and all the privacy regarding the content of the user. The app will ensure Token Based Authentication for more security. It will be based on all the essential and basic features of any application.

The app will be Hybrid which will make it work on all platforms whether it is Android, iOS or a Web App. The app will provide the location accessing facility, payment facility and also various other interesting features using Ionic + Angular platform. The app will deliver all the essential security and authorization methods to authenticate the users.

Basic features of our app are:

1) Supports Multiple OS with a single code: The Rest House App is enabled to support on different platforms and it is developed by the one particular source code.

2) Less Time consumption: The time will be consumed less to develop the app as for web and native a single source code will work along with this, the hybrid applications doesn't include the mobile web browser look as they have native hardware features. So it takes less time to develop.

3) Portable content: The content on the app is moveable and it requires a native harness to work on the platform.

4) Distribution on app store: Few software provides the hybrid applications framework and similar as native applications.

5) Offline access: It will work offline also. It doesn't require internet connection.

6) Affordable price: The similar code can be utilized for the multiple operating systems for the multiple platforms. The developer doesn't have to develop the various versions for the Android and IOS or the web apps. Therefore the value and attempts both are minimized for the expansion process.

7) Exclude API: The development excluded API development process as it is linked with web, so it doesn't require API integration.

The basic modules included in our app are shown in figure 3 below.

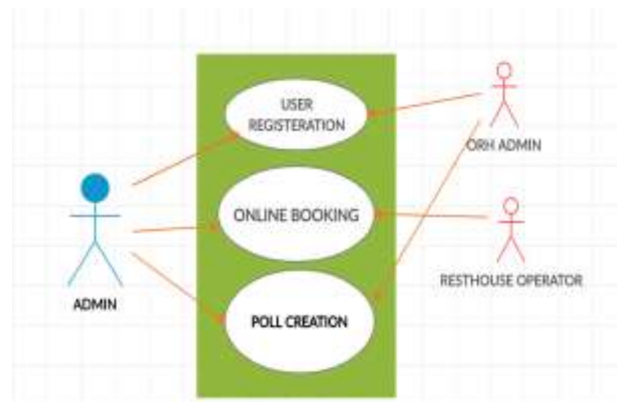

Figure 3: The basic modules of app

The application is a railways app for the Indian Railways which will be built using the Ionic- Angular for the frontend and Spring Boot and MySql for the backend.

The backend operates on the user login and user sign up part where a user is authenticated and secured using the concept of token based authentication. A user is provided a token if he/she successfully logs or if he/she successfully registers himself/herself on the application. The authentication token is a mark of security which links to the database and authorize any user to access the application. This is a secure way since it reduces the risk of any unauthorized authentication and protects the sensitive data. It becomes more secure because the token expires each time the user's session expires.

The user's password is stored in a encrypted form using encryption algorithms which again is a plus point in terms of security.

The frontend will focus on the entire look and appearance of the application making it reliable for all platforms, providing all the basic modules for the Railways app. The application will be easily downloaded from any store it will work efficiently on all platforms with a single code which makes it less time consuming.

5. PROPOSED TOOL

The sudden rise in smartphones and tablets penetration, the modern businesses can't afford to not offer mobile apps to their customers that run on different platforms. When it involves developing any application with right options together with performance indicators and platform support, things will be difficult for any software system development company. Developing multiplatform apps is demanding. An application that works same on all the operation systems is understood as Hybrid App. Hybrid apps enable developers to write down code for a mobile app once and still accommodate multiple platforms. One of the popular tool used for designing cross platform development software is the Ionic tool [10].

Ionic [10][11] is one of the popular for designing cross platform development software. It uses Hyper text Markup Language version 5.0 framework for designing the applications along with user interface style elements of native applications. Ionic framework has large variety of capabilities for designing hybrid application that works on cross platform mobile devices.

Capabilities of Ionic Framework:

Basic features of Ionic frame work are described below [12]:

1. Expertise in advanced technologies such as CSS, HTML, AngularJS, javascript components.

2. Support for angular material design.

3. Wrapping Angular Framework.

4. The Ionic Framework is easily maintainable.

5. Scalable

6. Eay to read.

7. Open source and free.

5. RESULT AND ANALYSIS

Figure 4 below shows the registration process of rest house rooms.

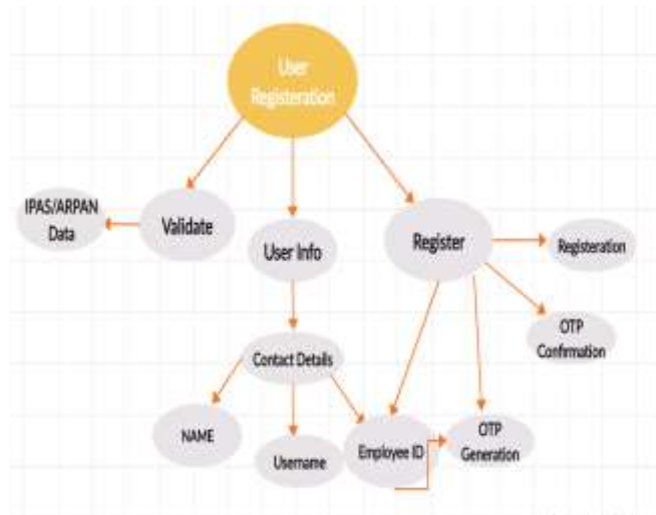

Figure 4: The registration process.

Our implementation of Railway rest house begins with registration process of user.

The registration process involves the user or client details, validate the user's entry for invalid data or format. An OTP of registered mobile number is send and wait for the OTP confirmation. After successful confirmation the registration is done for the user.

After registration, the user can login the system with given credentials for booking of rooms of railway rest house. In case user forgot the password it can be regenerate it by using OTP process. For booking of room user need to specify the area, room type, Date and number of days. The operator then checks the availability of room and then allotted to the client if room available otherwise display the non-availability message.

Figure 5 below shows the booking process of rest house.

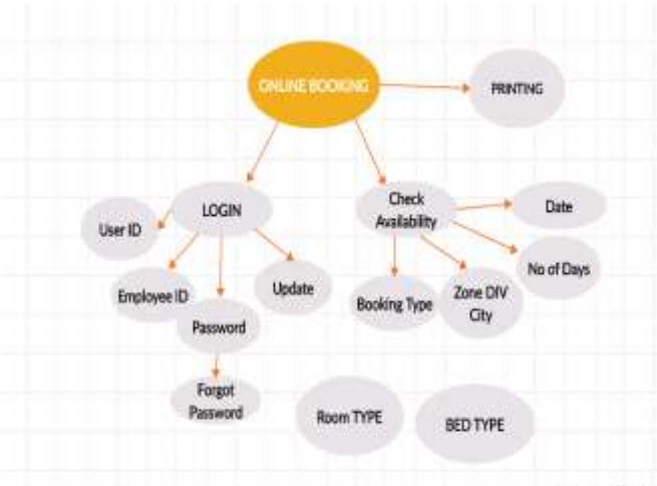

Figure 5: The booking process of rest house.

The rest house operator maintains the complete operation of rest house. The operator check the availability of rooms on user's request, allot the room for the duration required by client, set the status of room booked. After cancellation of room the operator again set the room status to available. The operator also maintains the payment process for the room booking.

Figure 6 below shows the rest house operator process.

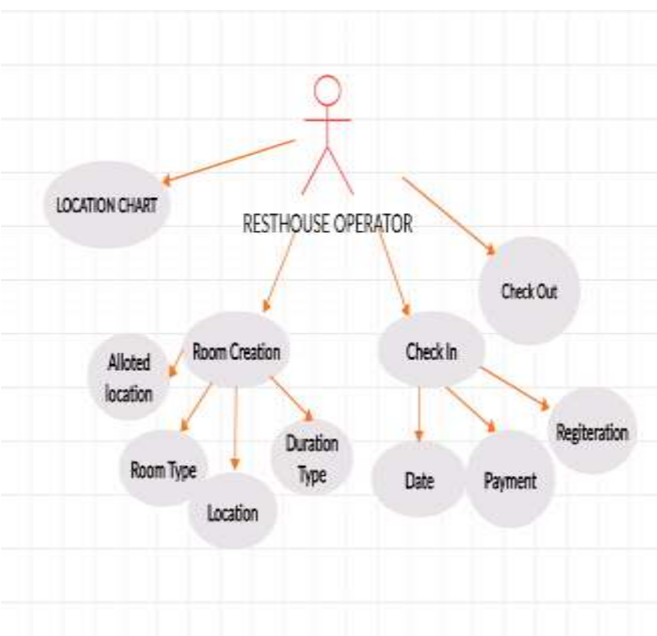

Figure 6: The rest house operator process.

When creating apps for different smartphones and operating systems, the development, implementation and programming requires time because each machine is based on a different programming language. This implies that companies must use different authority or firms to develop applications for each platform.

The current Rest House Application is managed by railways at departmental and zonal levels. The current application supports manual booking and also it is not hybrid. It lacks the attractive features which Ionic platform provides. The current Rest House is a web – based mobile responsive application. On the completion of this project the application will be Hybrid and will function like all the native and mobile web apps.

It combines the best features of both types of apps. Now the designer only develops hybrid application & it can be used in any types of mobile devices. It greatly reduces the cost of development and also it saves lot of time. It is advantageous both for developers and business for constructing application which executed on various platforms in turns of time & cost saving.

Figure 7 below shows the benefit of using hybrid app as compared to native app.

Figure 7: The benefit of using hybrid app as compared to native app.

It is absolutely precise to say that in the time ahead we are going to see that the hybrid applications will be ruling the mobile app world. Additionally, the hybrid applications will be the requirement of every business corporation and it will outcome as a part of every company. The importance is going to expand day by day as now for every work mobile devices are used and the mobile technology is reigning the world. Application has turned the corporation tasks easier.

In the days to come, staff members will be desiring for the hybrid mobile application which will work on every platform to get the better outcomes and while seeing the low cost entities will forced to opt the hybrid apps and the trend of hybrid mobile app development will increase rapidly. Many organizations are searching for the hybrid framework so the data will be also on a particular platform. The experts have stated that when it comes to developing an application the hybrid app will not only be the demand of the organizations but also of the mobile developers. The owners should understand this new technology and start utilizing it to enhance their business and it is a perfect marketing strategy at affordable price.

6. Conclusions

Mobile computing means being able to use a computing device even when we are going to locations beyond the place where we usually use a desktop computer. Mobile application development is used for constructing application software for small size devices that perform large types of computation for example mobile phones, notepads or tablets. Application developed using mobile application development concept is called mobile app. All the applications used in Mobile Devices are categorized into native applications or apps and web applications or apps.

A web application for mobile phone is the web based version which is used by browser of mobile phone devices. A native application for mobile phone is designed for specific mobile devices and system software that device. There is another types of app used in mobile phones called Hybrid application or app. It combines the best features of both types of apps. In this paper we develop The Rest House App for the Indian Railways. Its main aim is to perform different tasks related to rest house of Indian Railway efficiently and perfectly.

REFERENCES

[1] C. Mascolo, "The power of mobile computing in a social era," IEEE Internet Computing, vol. 14, pp. 76–79, 2010.

[2] Sajid Umair, Umair Muneer, MOBILE COMPUTING: ISSUES AND CHALLENGES, Conference Paper · December 2015

[3] Harleen K. Flora, Xiaofeng Wang, "An Investigation into Mobile Application Development Processes: Challenges and Best Practices", I.J. Modern Education and Computer Science, 2014.

[4] Kelvin Sung, Arjmand Samuel, "Mobile Application Development Classes for the Mobile Era", ITICSE '14, June 21 - 25 2014, Uppsala, Sweden.

[5] Leigh Williamson, "A mobile application development primer. A guide for enterprise teams working on mobile application projects". IBM Whitepaper. 2012.

[6] Pelletier, J., 2013. Mobile App Manual: The Blueprint. Withinsight.

[7] D. Sin, E. Lawson, and K. Kannoorpatti, "Mobile Web Apps – The Non-programmer's Alternative to Native Applications," in 2012 5th International Conference on Human System Interactions (HSI), 2012, pp. 8–15.

[8] Techopedia 2018. Native Mobile App [accessed 15 March 2018]. Available at: https://www.techopedia.com/definition/27568/native-mobile-app

[9] Panhale, M. 2016. Beginning Hybrid Mobile Application Development. California: Apress.

[10] Grifith, C. 2017. Mobile App Development with Ionic: Cross-platform Apps with Ionic, Angular & Cordova. California: O'Reilly Media.

[11] Khanna, R., Yusuf S., & Phan, H. 2017. Ionic: Hybrid Mobile App Development. Birmingham: Packt.

[12] Ionic 2018. All about Ionic [accessed 05 March 2018]. Available at: https://ionicframework.com/ about

[13] William Jobe, "Native Apps vs. Mobile Web Apps", iJIM – Volume 7, Issue 4, October 2013

[14] Charland, A., & Leroux, B. (2011). Mobile application development: Web vs. native. Communications of the ACM, 54(5), 49-53.

[15] Minh Huynh, Prashant Ghimire, Donny Truong, "Hybrid App Approach: Could It Mark The End Of Native App Domination?", Issues in Informing Science and Information Technology Education , Volume 14, 2017

[16] Shruthi Sasidaran, "Survey on Native and Hybrid Mobile Application Development Tools", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 6, Issue 9, September 2017

[17] Pavel Smutny, "Mobile development tools and cross – platform solutions", Carpathian Control Conference (ICCC), 2012