*Challenges & Best Practices in Mobile Application Development: A Review*

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**Abstract- Now-a-days there is a rapid increase in mobile application development in industries. There are various challenges like acceptance of GUI, understand ability of the services delivered, compatibility with varying Smartphone architecture, ease of navigation, aesthetics and flow of controls and menu, portability, security, reliability, etc. that are to be considered with seriousness in order to avoid any kind of vulnerability or failure.Mobile applications are of great importance as they are providing various features which are of great use for us like-use of navigation for finding particular location, online shopping, online movie tickets booking, etc. There are various challenges that are to be faced during these applications development. In this paper, we will focus on covering up all those challenges and the best practices that can be performed in order to tackle those challenges.**

***Keywords- Mobile application, Mobile Application Development, development challenges, best practice.***

1. INTRODUCTION

Nowadays users are expecting from their mobile phones to function almost similar to that of a desktop computer systems. But due to complex methodologies of mobile application development, it makes it more

challenging than the desktop computer system. Mobile Application Development is a process of building up application software for mobile phones devices & for doing so development environment with specialized integration is used which are Android Studio or Eclipse is required. But while doing this, there are various parameters like OS, Processing Power, memory, compatibility, etc. are to be considered firstly. These apps should be interactive, easily downloadable through various platforms such as Google Play Store and iOS App Store.

There are various challenges like reliability, availability, security, robustness and usability which are of major concern while developing and deploying an application. There is a scarcity in the methodology adopted w.r.t the advancement in mobile application development due to lack in research methods and analysis about challenges that might occur during mobile application development process.

V. Rahimian and R. Ramsin[1] look through the challenges in mobile application development by considering the current state of mobile development techniques. Leigh Williamsons listed unique challenges for Mobile Application Development like- form factors, user input technology, usability and user interaction designs [2]. Similarly J. Dehlinger & J. Dixson found 4 major challenges for mobile application development engineerings.This challenges were found by them while creation of universal users interfaces, while trying to enable software reusability via various platforms, while context-aware designing mobile app and in agility balancing and requirement uncertainty[3].

This research paper focuses on the challenges faced during mobile application development & ultimate practices to overcome those challenges.

1. CHALLENGES WITH THEIR BEST PRACTICES IN MOBILE APPLICATION DEVELOPMENT

There should be more focus on “what not to do” rather than “what to do” while developing an application. Some of the challenges are discussed in this paper along with their best practices in order to overcome those challenges.

1. Improper Resource Estimation:

It occurs is the beginning phase of mobile application development. If the business is not aware of required requirements and resources, it will easily deviate. It is considerably challenging for few developers to analyse these requirements and resources.

BEST PRACTICES-There should be proper business plans and logics to be discussed in a and recorded according to customer’s requirements and feedbacks. This approach requires proper and better user communication, partial resource operations and repetition of assessments to be followed in each interval of time.

1. Scheduling of Time and Cost:

Due to low budget and funding there are many mobile apps projects which became unsuccessful. Many people think that developing a mobile application is not that costly, but it actually depends upon the application and its feathers. A developer working on a lower or limited budget tends to deliver a low quality product. This is similar w.r.t time too. If a developer isn’t given a proper time for developing an application, there is a high chance of getting an incomplete or poor quality product.

BEST PRACTICES-Proper plan should be made according to the appropriate time and cost over each activities to be executed. All the features or enhancements to be made are to be noted and accordingly necessary plans are to be made.

1. Selection of Target User:

Before developing mobile application, a group of target user is to be considered. Lack of analysis and foresight will make the application to be of lower value in the market. According to the target user interest the application is to be made. If there is lack in this selection, the development is already going in the wrong direction.

BEST PRACTICES-Users feedback is the best way to overcome this challenge. This will enable us to not all know the target user but also will tell us which feathers the target users are interested in. This will help us to know the features to be needed in our application.

1. User Interface:

User interface is one of the important things in mobile application development. The front end design should be compatible with all the devices screen resolution. Generally a developer forgets about user interface and focuses moreover the features to be needed. This makes the application hard for user to understand and handle, which indirectly reduces its value in the market.

BEST PRACTICES-Developers team should avoid using too many resources, rather analyse those resources and build up a simple and clear design for the mobile application.

1. Performance vs Battery Life:

Performance and Battery life is one of the main challenges for developers while developing mobile application. Developers generally focuses on better performances of an application, which generally ends up with mobile getting heated up due to lots of power consumptions because of application performances. This generally lets to user’s switching better and similar application which reduces the power consumption and heating of mobile phones.

BEST PRACTICES-Developers needs to consider the battery life applicable for most of the devices. According to that battery life, application performance should be decided, rather than just focusing over the performances and ignoring devices battery life.

1. Memory Space:

More the feathers, more the application size increases. Developers generally try to implement and integrate multiple features in one application, avoiding the main objective features. This lets to maximization of application size and application occupying lots of devices memory space.

BEST PRACTICES-The best way to overcome this challenge is to focus over the main objective features of an application, rather than adding too many features into it. While updating of an app, the old data should be completely replaced with the new data, rather than keeping unwanted old data attached to the new updated application which results in increase in application memory space.

1. Security & Privacy:

Importance of security and privacy is increasing day-by-day. There is a chance of device being used by an unauthorized user. This is the a bit challenging as there are many devices along with its operating system. Developers generally end up making the privacy terms and conditions complex to user understanding. Data transmission as well as servers of application should be preserved and protected for securing user data.

BEST PRACTICES- Privacy terms and conditions should be displayed to the user in proper and simple designs, using simple language, make it easy to access. Data transmission and servers of an application should be protected using appropriate security measures and guarantee user’s accountability.

1. Data Synchronization and Access:

Mobile devices are good enough to access data, either from the application or from the browser. Application built should be created which can keep track of data being accessed from application database and should understand the connection being built via database. If the connection is disconnected, it should be able to reconnect to its last existing data and update the application data accordingly.

BEST PRACTICES-Proper synchronization of data is necessary when we are dealing with application data being send via network. Encryption is the best possible way to overcome this challenge along with proper synchronization of data in order to update and access the application data.

1. Methods for Providing Input:

It is difficult to provide an input via a keypad to the user. Also not many users are good with using keypad keys efficiently. Hence providing a method for an input is not that easy challenge to deal with.

BEST PRACTICES-We can enable user to give proper input via using a touch gesture rather than keypad. This will make it easier and attractive for the users to use the application easily and efficiently.

1. Problems in Testing:

It is challenging for developers for testing mobile application because of various operating systems, platforms, it makes it very difficult to perform testing. Various factors like VPN dropping, wireless network connectivity, and application altering process are also to be considered while testing. It is necessary to find whether there is any problem with hardware of the device or with the network connectivity of that device by testing all of these above factors.

BEST PRACTICES-Testing is to be performed in every phase of development in order to avoid errors or problems in further phases. Testing should be performed on every platform and also in different locations for different browsers verifications. If all of these factors are accomplished we can say that the app is ready and effective for deployment process.

1. CONCLUSION

Mobile applications nowadays offer various functionalities that it has become a part of our life. There is a tremendous rise in mobile application which makes it more challenging to make a bug free, efficient, user-friendly and useful application. Developers should follow all the best practices discussed in this paper in order to overcome the challenges.

This paper has discussed real challenges and best practices generally occurred to mobile application developers. If this best practices are properly implemented for the given set of challenges, it will provide a best product from it.

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