



Case Study



## Related technologies and the role of mobile app development life cycle

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**ABSTRACT**

The special components of the business are reviewed in regards to just how they have urged the extensive level of popularity of mobile phones and other smartphones and have actually improved electronic pc gaming, internet retailing, as well as social media. As significant rivals in this particular arena, Apple and also Google has actually sought to identify themselves in regards to their connections with application designers, varieties and also individuality of applications offered, in addition to the market places in which the applications are sold. This paper provides the related technologies and also the role of mobile app development life cycle.

**Keywords:** Mobile communication, App development, Technologies.

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### 1. INTRODUCTION

"A mobile application, brief for mobile phone application or simply app, is actually a software made to work on perspicacious phones, tablet computer systems and various other mobile phones" [1] An App makes sense or even is wanted if the target is to possess an active engagement with customers, or even to deliver an application that requires to operate more comparable to a computer plan than a website [2] Apps are actually available using circulation systems on concrete application retail stores.

There are free in addition to paid-for apps. There are a handful of applications that at first are accessible completely free, however, later a minimum cost is required to enjoy premium benefits. "The apples iPhone' powerful software, advanced user interface, and also powerful growth platform had steered an almost through the night explosion of applications". A lot of extensively made use of cell phones for mobile applications are Apple iPhone, BlackBerry, Android phone, or even Microsoft window Phone. For applications along with a rate, typically a percent, 20-30%, visits the circulation carrier and the rest most likely to the developer of the app [1] Depending on to mobile

statistics [2], the lot of apps mounted by the average perspicacious phone individual (Global) is 26. So this variety limpidly presents that applications are actually the expedient where consumers want to eat web content on cellphones.

Initially, mobile applications were actually offered for informative and productivity functions that included email, schedule, contacts, personal digital assistant, and also weather condition info. Along with the rapid zoom in the innovation and individuals' prospects, the developer carries outgrown into various other groups including mobile games, GPS, banking, ticket acquisitions, social networks, online video conversations, manufacturing plant computerization, site-based services, fitness apps and also just recently mobile phone medical apps [1].

An app may draw out information and also information coming from the net in an identical manner to an internet site, however it can easily likewise install the material to ensure that it may be made use of later in the lack of Internet connection which is actually a terrific perk [3] Thus apps that carry out not need to have internet link could be used "anywhere and anywhere" i.e. application may be utilized offline. A couple of negative aspects of

the level of popularity of mobile applications has actually continued to increase, as their use has actually ended up being much more prevalent across cellular phone customers. This is pellucid obvious coming from the varieties provided by [2] i.e. Overall predicted Mobile application downloads in 2013 is 102 billion and also the Overall predicted mobile application profits in 2013 \$26 billion. There are a number of internet sites as well as a handful of posts that have caught the studies of mobile phone apps in regards to the variety of designers growing annually, the number of apps boosting each year, profits produced coming from applications, the number of applications that are showing up on various systems as well as a lot of widely used applications on different platforms.

Few websites/articles explain in words regarding the variety of applications being actually erased, the number of customers deleting apps, the number of great apps vs poor apples, factors that attract users to delete applications, the aspects that create negative applications. There are minimal literary works on just how really good apps may be made excellent applications and also how negative apps can be amended to come to be excellent as well as terrific.

There have actually been some seminal studies on just how to strengthen apps [6] within this paper, our experts add to this job by offering the role of different aspects (designers, individuals, technical information,) planned of negative apps. The paper proceeds through offering the existing studies in the mobile phone apps industry and afterward continues with aspects that lead to lamentable applications, complied with by suggestions to surmount those factors.

## 2. NATIVE APPS VS. MOBILE WEB APPS

There are two main types of mobile applications: native and mobile Web. Native applications integrate directly with the mobile device's operating system and can interact with its hardware much like the software on a personal computer. Native applications are also capable of taking advantage of local APIs in order to maximize functionality while preserving efficiency.

Mobile Web applications are apps that run directly from an online interface such as a website. These

applications typically cannot manipulate a device's hardware and are limited to the web application's APIs rather than the programming packages found on the phone (Industry Innovations: A Mobile Applications Interview with Bob Evans). A mobile website is a series of web pages created for the sole purpose of being viewed on a mobile device's web browser. These pages are often created using HTML, but some operating systems such as iOS or Android are equipped with a website. These websites enable web page rendering that extends functionality far beyond that of a typical mobile Web application; they allow hardware manipulation, user interface scaling, and more.

Some applications are hybrids that combine the interface and coding components of a web-based interface with the functionality derived from native applications. This allows developers to update the application remotely while still affording a large amount of programming functionality. It also extends the number of platforms which can run the application, as their web-based nature ensures the application must not necessarily be platform-specific.

Currently, the two dominant operating systems - Google's Linux-based open-source Android Operating System and Apple's iPhone Operating System (iOS) - both support their own marketplaces where users can purchase mobile applications. Some apps are packaged with the operating system by default, but most apps must be downloaded manually from an app marketplace.

## 3. ROLE OF APP DEVELOPMENT LIFE CYCLE

Most of the studies and articles verbalize about the statistics of mobile apps in terms of revenues and the number of apps being developed, but very few or none of them talk about good quality vs low-quality apps nor the factors that cause low-quality apps nor the solutions to surmount those shortcomings.

What are the reasons for low-quality apps from the SDLC point of view?

- The first and foremost reason is that the app developers are not conforming to the development life cycle phases. Most of the app developers start developing the app

without accumulating requirements and without having a design.

- Lack of training and experience on the app development SDKs.
- Not enough testing is done. App developers are more fixated on functional aspects of the app and hence they sometimes ignore security and performance testing, which are the key components of any app.
- Poor maintenance.

Why do we need a software development life cycle and what happens if we do not use systematic approaches while developing the software product? The result is lower quality software products. A mobile application is nothing but a software product with a different level of complexity. One can apply the same conventional methods/methodologies (such as waterfall, iteration, agile, and scrum) along with different mobile app techniques and tools to design, develop, test and deploy a mobile application.

#### 4. RELATED TECHNOLOGIES

##### a) Unified Modeling Language (UML)

Grady Booch, Ivar Jacobson, and James Rumbaugh developed the "Unified Modeling Language (UML)" at Rational Software in the 1990s. Unified Modeling Language is an object modeling and specification language used in software engineering. In the field of software engineering, UML is considered as a standardized general-purpose modeling language according to ISO/IEC 19501:2005. The main advantage of UML is that it creates visual models of system/ object-oriented software-intensive systems. UML contains a large set of graphical representation techniques. Unified Modeling Language can be used in combination with various modeling components such as object modeling, data modeling, component modeling, and business modeling.

##### b) Mobile Unified Modeling Language (M-UML)

For modeling a mobile agent-based software system, UML cannot be used as it does not possess the mobility requirements. The mobile agents carry an executable code and data within themselves. An extension to UML has been defined by Kassem Saleh and Christo El-Morr for mobile agent systems,

which is known as Mobile Unified Modeling Language (M-UML). Mobile agents became more feasible due to the advancements in remote evaluation, process mitigation, distributed object computing, and mobility.

For a mobile agent-based system, M-UML can be well described by going through each of the UML diagrams and explaining the modifications and extensions that are required for describing the mobility aspects. In M-UML, the authors introduced two major extensions to the existing 2diagram and the other one is, represents the remote process/service with letter "R" at the top corner of the specified diagram (could be a Use case/Sequence/Class diagram).

##### c) Native Mobile Applications

Native application development is a target to a specific mobile platform. Native apps are developed through native programming languages. Developing Native apps improves the application performance and provides rich graphical User interface such as UI animations, 3D animations, etc. and also provides access to the device-specific features. To create the best user experience, native app development is a better choice.

##### Advantages of Native apps

**Performance:** Native apps are developed for specific platforms. We use objective-c in iPhone, java in android .so it has efficient utilization of device capabilities.

**Usability:** Each device has specific functionality and features in using native apps like accelerometer, multitasking, GPS location, etc. These features are easily accessed in native API.

**Built-in components:** native apps have the ability to work with built-in components camera, address book, geolocation, etc., often making them faster and easier.

**Security:** Native apps are associated with an AppStore.so the security and performance of app are improved. Native apps are easy to find and download for a user.

**User experience:** we use graphics and animations. So it provides best user experience

##### Disadvantages

**Platform dependent:** we have to develop separate apps for each and every platform. So it is platform dependent.

**Increased development time and cost:** each platform supports specific language and environment. It is more expensive and takes more time.

**Higher maintenance:** more developers required to maintain the applications.

**App store restriction:** native apps are distributed through app stores. it provides strict content guidelines.

**d). Hybrid Applications**

Hybrid apps are developed using html5, css3JavaScript, and kept into a native container like the phone gap. These native containers run the web application code and package it into an app. By developing hybrid apps same code will be reused across different mobile platforms. If we want to develop simple applications in limited time hybrid app is a better choice

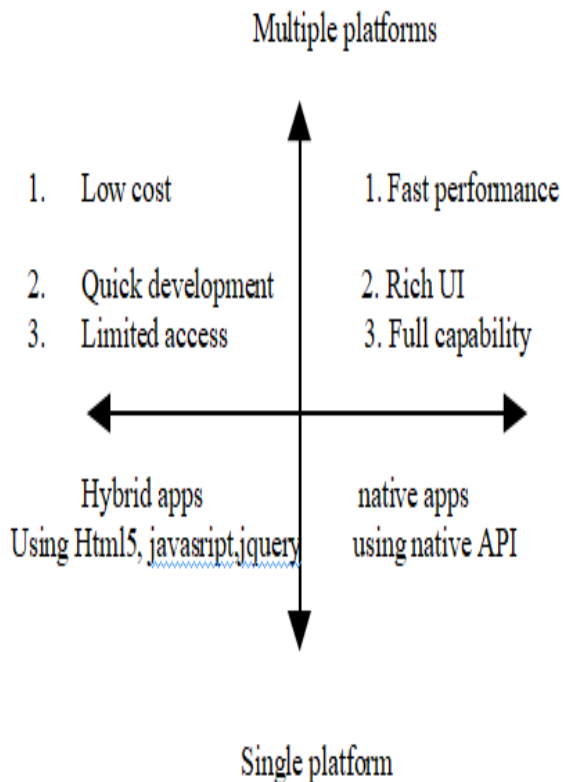


Fig. 1: Native and Hybrid apps features

**Advantages of Hybrid apps**

**Budget limitation:** the development cost is very less compared to native apps.

**Quick development:** hybrid apps are developed using simple web technologies like html5, JavaScript, jquery. so it is easy to develop

**Disadvantages of Hybrid Apps**

**Poor performance:** the hybrid app UI rendering is very slow compare to native.

**Technical limitations:** it does not have complete access to device built in features. The UI options are limited.

**5. COMPARISON**

Table 1: Native vs Hybrid apps

	<i>Native</i>	<i>Hybrid</i>
<b>Features</b>		
performance	high	low
UI look and feel	rich	Normal
cost	high	low
platform	dependent	independent
security	high	Low
<b>Built-in components</b>		
camera	Full access	limitation
graphics	support	limited

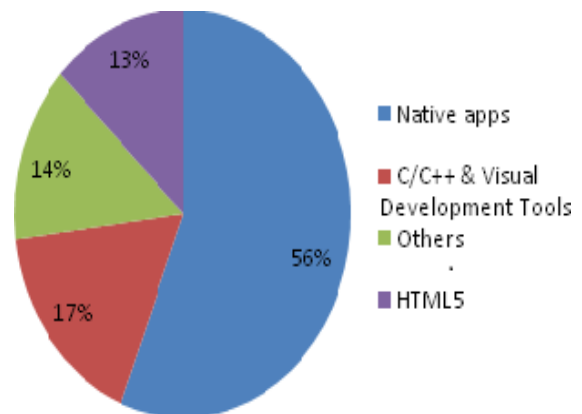


Fig. 2: Comparison of application development

**6. CONCLUSION**

The choice of developing mobile applications depends on the requirements of the application and business considerations. A hybrid app is preferred for simple UI and short timelines with a low cost. Native apps are preferred for rich UI animations and access to device-specific features with more security. This paper has provided the related technologies and also the role of mobile app development life cycle.

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