

Developing applications for Mobile devices

What is Mobile Application?

A mobile application is a software application developed specifically for use on small, wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers. Mobile apps can come preloaded on the handheld device as well as can be downloaded by users from app stores or the Internet. You can find mobile apps on both feature phones and smartphones. The most popular smartphone platforms that support mobile apps today are Android, iOS, Windows Phone.



Need of Mobile Application

In fact, these days you'll notice that many small businesses you interact with in your everyday life have their own dedicated mobile app. In case you are still not sure why anyone would want to build their own mobile platform, here are the top several benefits of going down this path sooner rather than later.

1. Millions of users are using the Smartphone to access websites to have a glimpse of what their favorite companies are offering.
2. A mobile app is the most effective way to cater the needs of targeted customers.
3. Your business can be mercerized among masses with the help of mobile apps.
4. A mobile website not only fulfills the needs of customers but of the organization as well as the businesses across the globe.

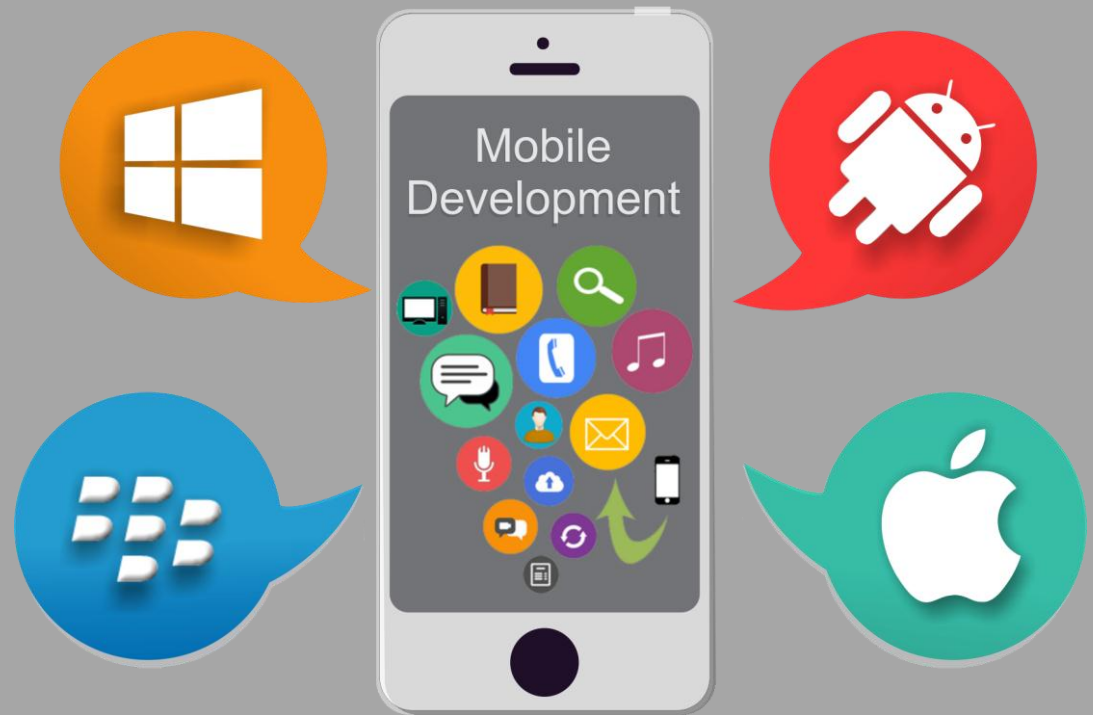


Mobile Application Platform

Mobile application platform refers to the development environment where mobile applications are designed, created and maintained. There are various mobile application platforms, and all of these platforms contain an integrated development environment and provide the tools that a developer needs in order to write, test, deploy, and manage mobile applications. Mobile application platforms are useful to developers because they are simple and easy to use.

There are many mobile application platform which are given below:

- iPhone
- Android
- Blackberry
- Windows
- symbians



Types of Mobile Application

Mobile app development is all the rage these days, with everyone from small business owners to large billion dollar corporations using them. There are several ways to build applications for mobile devices, each with strengths and weaknesses. Today we take a look at the main types of mobile app development and the differences between them. A mobile app can be made in various ways such as: Web, Native and Hybrid.



Types of Mobile Application

1. **Web App:** Mobile Apps are not downloadable from traditional app stores such as the Apple App Store or the Android Market. How these app work is they come from the website itself. The site is made to fit into any phone device, so the original coding suits all.
2. **Native App:** A Native App is downloadable app which is installed and run directly from on device. Native mobile app development is written specifically for the mobile device's operating system (iOS, Android, Windows OS...etc) and are always in that device's coding language. For each operating system, there needs to be a code specific to that operating system. Apple devices need their own code different from Android, and Android need different code from Windows etc. This means that when creating the app, software developers need to be fluent in all types of operating systems. This takes time and money.
3. **Hybrid App:** A Hybrid App is essentially an application which is developed using "open web" technologies and then packaged up into a fully native application. So a programmer should already be fluent in these open web scripts, which are then tailored for specific devices.

Types of Mobile Application

Different Types of Mobile Apps

Native Apps

- **Native apps** live on the device and are accessed through icons on the device home screen. Native apps are installed through an application store (such as Google Play or Apple's App Store)
- They are developed specifically for one platform, and can take full advantage of all the device features

Web Mobile Apps

- **Web mobile applications** are software programs that run directly from the web browser on mobile phones and tablets
- Some examples of popular web applications are popular social networks (the versions that are accessed through the browser), email and chatting applications, online mobile games, and cloud-based office applications

Hybrid Apps

- **Hybrid apps** are part native apps, part web apps
- Like native apps, they live in an app store and can take advantage of the many device features available
- Like web apps, they rely on HTML being rendered in a browser, with the caveat that the browser is embedded within the app

Mobile Applications

Mobile Applications can be found in any industry, they have been developed for:

Mobile Gaming (see [gameLOFT](#))

Mobile Banking (see [RBC](#))

Mobile Text, Presentation, and Spreadsheet (see [Microsoft Office Mobile](#))

Social Networking (see [Facebook](#))

Mobile News (see [Yahoo! Mobile News](#))

Location Aware Services (see [Loopt](#))

Mobile Application Development Challenges

Development of mobile applications provides for many challenges and obstacles that are not commonly found in the development of applications for desktop computers

The challenges faced by developers are found in:

- Heterogeneity of mobile devices

- Security

- Network

Challenge: Mobile Devices

Display/Screen Size

Mobile devices come in many different screen sizes

Consider the differentiating screen sizes between smartphones and cell phones

Smartphones offer the user a generally larger and higher resolution display screen, contrasted to cell phones which generally provide lower resolution and smaller display size

Challenge: Mobile Devices

Memory

Just as screen size differs from device to device, the amount of available memory and differs from device to device

Developers must create applications which have a minimal memory footprint on the device while being of service to the user

Memory must also be carefully managed during the execution of any mobile application as it can potentially render the phone unusable until termination of the application

Challenge: Mobile Devices

Processing Power

Another sign of the heterogeneity of mobile devices is the processing power

The CPUs differ from phone to phone and this must be taken into consideration by developers

Developers cannot create applications that require the user to wait an unreasonable amount of time for the service to load

Challenge: Mobile Devices

Input Devices

The input devices on mobile devices range from full QWERTY keyboards to three letter button inputs

This means developers must take into account how much text is required by the user to input into their application and what kind of difficulties they may experience based on their device

Challenge: Network

Transmission Errors

When creating mobile applications that utilize network connections there is a variety of issues that can effect the application

Wireless networks are exposed to interference which can alter the message received by the client or the server then what was originally sent

Applications must take into account these potential problems especially in financially sensitive services

Challenge: Network

Message Latency

Messages that are to be sent to clients or servers can be delayed due to a variety of reasons such as overloaded network nodes or servers, dead or turned off cell phones, distance to travel

Applications must take this into account so as to avoid sending servers or clients stale information

Challenge: Network

Bandwidth Usage

Wireless customers are forced to pay fees to access the wireless network and internet

While phones with WIFI capabilities allow for some users to have free connectivity at times it is important to keep messages to a minimum and compact

Applications that cost a lot to use will not be popular with many of the financially conscious users

Challenge: Security

Wireless networks by default are not as secure as wired networks, it is important to note that message can be intercepted when travelling through the air

Mobile applications must secure the sensitive data that is being transmitted over the air

There are different methods to implement security but it must be relative to the information we want to secure and the resources that we wish to use for securing it

Development Tools

From a software perspective there are several Integrated Development Environments (IDEs) that are available for use such as:

[Sun Java Wireless Toolkit for CLDC](#)

[Blackberry Java Development Environment](#)

[Metrowerks CodeWarrior Wireless Studio](#)

[Borland JBuilder with MobileSet](#)

NATIVE APPS



Binary executable files on the device.
Can access all API's made available by OS vendor.
SDK's are platform-specific.
Each mobile OS comes with its own unique tools
and GUI toolkit.

Different tools, languages and distribution channels associated with leading mobile operating systems

	Apple iOS	Android	Blackberry OS	Windows Phone
Languages	Objective-C, C, C++	Java(some C, C++)	Java	C#, VB.NET and more
Tools	Xcode	Android SDK	BB Java Eclipse Plug-in	Visual Studio, Windows Phone development tools
Packaging format	.app	.apk	.cod	.xap
App stores	Apple App Store	Google Play	Blackberry App World	Windows Phone Marketplace

* IBM, Native, web or hybrid mobile app development, 2012. IBM Software Thought Leadership White Paper

MOBILE WEB APPS



Use standard web technologies such as HTML 5, CSS 3 & JavaScript.

Features of HTML 5 – Advanced UI components, access to rich media types, geolocation services & offline availability.

Increasing popularity of HTML 5 in rendering engines such as WebKit.

Runs on a standalone mobile web browser.

Installed shortcut, launched like a native app.

UI logic resides locally; makes the app responsive and accessible offline.

ADVANTAGES:

- Multiplatform support.

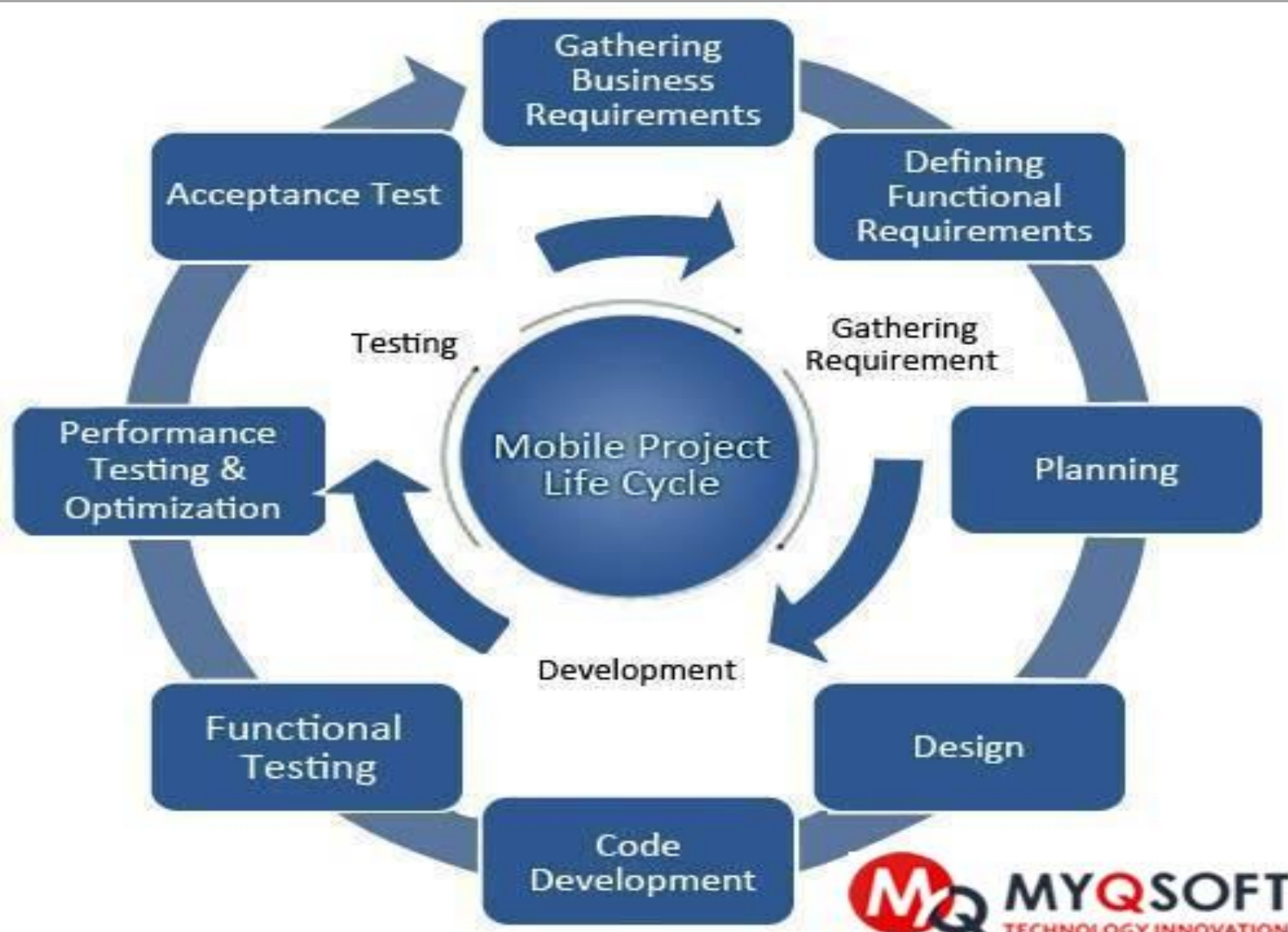
- Low development cost.

- Leverage existing knowledge.

DISADVANTAGES:

- Limited access to OS API's.

Mobile App Development Life Cycle



As per Gartner's research, more than 80 % employees will use tablets instead of laptops in later years.

