

10 MOBILE APP DEVELOPMENT TECHNOLOGIES TO WATCH OUT IN 2019



PREFACE

When Apple launched Swift for its iOS, macOS, watchOS and tvOS, it foresaw what most developers at that time didn't: that Swift will quickly overtake other programming languages as a general-purpose and multi-paradigm alternative to develop applications⁹. This compiled programming language was developed using open source LLVM compiler framework. In the beginning of 2018, Swift already overtook Objective-C in popularity thanks to its protocol-oriented programming⁹.

The increasing popularity of Swift can be attributed to the ease of catching software bugs and eliminating programming errors such as null pointers.

Here are some reasons¹⁰ why Swift quickly overtook Objective-C to develop iOS and macOS applications:

- As a programming language, Swift is enterprise-ready. It is specifically built with enterprise requirements in mind, and developing business apps on iOS is quick and easy.
- Mobile applications need to be cloud-ready, and Swift is particularly suitable for build applications that need extensive cloud support. Swift does not need a lot of coding, and is generally safe, making it the perfect solution for IoT-enabled mobile applications.
- Swift developer community is currently 33,000-member strong, and developers across the world find it easy to learn and execute, thanks to its foundation in C#. This also makes it easy for enterprises to train their in-house IT teams in Swift.

WHAT TO EXPECT IN 2019

Developers find it easier to work with Swift if they are building mobile apps for iOS simply because it was developed by Apple with iOS in mind. Building iOS apps using Swift feels intuitive and natural, making project turnaround time shorter.

FACTS & FIGURES

Swift 4.2.1 is the latest stable release, and was announced on the 30th of October, 2018⁹. Swift 5 will be launched in 2019, and is likely to feature support for machine learning¹¹ and enhanced ABI (Application Binary Interfaces) stability¹².

LAZY LOADING

Developers in recent months have begun to use lazy loading while developing applications. On-demand loading helps online content to load only the required section, while delaying the loading of remaining content until the user progresses to that area of the application or web page. Instead of loading all the content at once, lazy loading only loads content that the viewer is currently viewing¹³.

As an optimization technique, this will be used more widely in 2019. Lazy load will become a popular method to reduce bounce rates and enhance retention rates.

There are several benefits to lazy loading. Here are a few:

- Memory use is significantly reduced, which helps enhance storage capacities. This indirectly improves user experience as content automatically loads as one scrolls down a page or application.
- On-demand loading results in optimal use of space and time resources¹³, and one can avoid executing code unnecessarily. While infinity scrolling comes to mind when one thinks of lazy loading, lazy load works for finite scroll pages as well.
- When pages load quickly, bounce rates are reduced¹⁴. Quick page loading is also associated with higher user retention and user satisfaction.

WHAT TO EXPECT IN 2019 |

Though developers have used lazy loading for quite some time now, it will become a matter of necessity in 2019. With app development space becoming more competitive than ever, content loading will be a metric against which an application's performance will be judged more severely.

FACTS & FIGURES |

Customers expect pages to load in less than 2 seconds. In a recent survey, 47% of responders agreed that less than 2 seconds is a benchmark for slow-loading websites¹⁵.

If a page takes more than 3 seconds to load, 40% of the responders agreed that they would abandon it¹⁵.

NATURAL LANGUAGE PROCESSING

NLP is a subfield of artificial intelligence that analyses how humans use language, and teaches machines to understand and even communicate with humans. Virtual assistant technologies such as Siri and Cortana are known to use natural language processing (NLP) technology already, via semantic analysis. In recent months, developers have begun to use NLP to understand how people interact with applications, and how they can enhance user experience via different platforms.

Importance of natural language processing (NLP) technology is profound, and covers almost all areas of app development.

In 2019, NLP will help developers to build better applications in the following areas:

- NLP-based applications are increasingly being developed for medical and healthcare sectors¹⁶. This has helped analyze verbal outputs and make better diagnoses, while enhanced device controls have helped people with disabilities and other difficulties to lead more enriching lives.
- NLP can be used to fight spam and recognize hateful messages in blog comments and social media platforms. This also helps authorities to tackle issues related to harassment and virtual bullying.
- Currently, Siri and other NLP-based applications provide limited answers to simple questions. Starting from 2019, there will be more focus on developing applications that interact with humans in more enriching and complex ways, with the help of NLP¹⁶.

WHAT TO EXPECT IN 2019 |

NLP is going to become one of the most sought-after skills for mobile developers. This will require knowledge of semantic analysis, machine learning, and artificial intelligence. 2019 will see a sharp spike in demand for developers who specialize in NLP.

FACTS & FIGURES |

Google's technology is expected to become NLP-based, especially in the mobile space¹⁷.

NLP has been around since 1950, when Alan Turing published an article called "Intelligence"¹⁸.

REACT NATIVE

While many native developers have resisted using React Native to build native applications for Android and iOS platforms, the trend is going to change very quickly. React Native helps developers to build exciting applications using only JavaScript for both iOS and Android devices. React Native is built on ReactJS, which has given AngularJS a run for its money¹⁹.

What sets React Native apart is its ability to build effective apps in a short span of time, without having to code separately to build native applications. React Native comes with reusable components and native features can easily be integrated into an application thanks to its hybrid nature.

There are many reasons to choose React Native in 2019 and beyond. Here are a few:

- React Native is built on an open-source platform, though it is developed by Facebook. It is open-source²⁰, and building applications on it tends to be cost-effective.
- Applications built on React Native are not distinguishable from those that are built using Objective-C or Java.
- Projects can be completed quickly and helps businesses to save time and effort. It is also relatively easy to debug and is the perfect solution for projects that are cost-sensitive.

WHAT TO EXPECT IN 2019 |

It is important to note that while React Native eliminates the need to write native code, it is possible to combine Java, Swift or Objective-C code smoothly into React Native components²¹. This feature will make it acceptable for challenging projects.

FACTS & FIGURES |

React Native is the 14th most starred tool on GitHub, and is particularly liked by mobile developers²².

Developers swear by instant "Live Updates", which allow React Native applications to push updates to devices directly.

PROGRESSIVE WEB APPLICATIONS

User experience has quickly become the top priority for mobile developers across the world. In 2019, the focus shall remain on improving user experience. Progressive web applications will help developers to do just that.

Progressive web applications are websites that mimic the functionalities of mobile applications. These web applications come with capabilities such as working offline, push notifications, and access to device features that are only available to native apps otherwise. Progressive web applications bring the best of open standards of the web and a rich mobile experience.

With many users refusing to download new applications, and preferring to access information via Safari or Google Chrome, progressive mobile applications have a real gap to fill in 2019.

- PWAs bring the best of mobile to web browsers, in the form of push notifications and offline operation²³.
- PWAs enhance user experience by making websites feel like top-notch mobile applications that have been developed natively²⁴.
- PWAs do not need to be downloaded on devices, and a URL can be shared just like a website's link is shared.

WHAT TO EXPECT IN 2019 |

As people begin to experience technology fatigue, the frequency of downloading new applications will further reduce. 2019 will probably be the beginning of a reduction in the number of applications that are downloaded. Progressive web apps provide a solution to this scenario, and bridge the gap between mobile and web²⁵.

FACTS & FIGURES |

Progressive web apps are served over HTTPS, making data safe and secure²⁶.

Average mobile users now install only 0 applications in a month, and this necessitates focus on building mobile web apps²⁶.

ACCELERATED MOBILE PAGES

With more people using mobile browsers in comparison to using mobile apps, there is a real need to find solutions that make websites load quickly on mobile browsers. The solution to this problem is Accelerated Mobile Pages (AMP). AMP is an open source project resulting from collaboration between Twitter and Google.

It helps existing mobile-friendly web pages to load more quickly by following a minimalist approach. It eliminates JavaScript and other processes that may make a website slower. It renders existing mobile pages in optimized HTML, which helps increase the speed of a website. AMP may also activate lazy loading in order to load content that is being consumed by the viewer, instead of loading the page in its entirety.

Here are some clear advantages of integrating AMP into existing mobile pages:

- AMP gets rid of all distractions from your mobile page so that visitors can focus on what is important.
- Compared to regular mobile pages, AMP-enabled mobile pages are 6 times lighter in code, which results in quick loading.
- Ads are not removed completely, but are placed strategically so that click-through rates are actually enhanced.

WHAT TO EXPECT IN 2019 |

With people abandoning websites if they don't load in less than 3 seconds, AMP is a very important technology trend that mobile developers should focus on in 2019 and beyond²⁷. It is also a cost-effective solution to more expensive alternatives available at the moment.

FACTS & FIGURES |

Accelerated Mobile Pages Project is Google's answer to Facebook's Instant Articles²⁸.

There are more than 2 billion AMP pages across the globe, and 7% of web traffic is accounted for AMP pages²⁸.

LOCATION-BASED TECHNOLOGIES

Location-based technology is currently used across industry verticals such as healthcare, retail, restaurants/hotels, public spaces, transportation, etc. In the coming years, beacons, NFC, RFID, and other location-based technologies will grow in importance.

With the number of IoT-enabled devices increasing, location sensors will aid in providing better maintenance support and collect important user data. However, what will be a cause for concern among mobile developers is how this data will be collected, and how regulatory compliance will be achieved with respect to consent.

Here are some applications of location-based sensors:

- Retail will make use of beacons more than anyone else, in order to help guide shoppers across aisles, and to communicate with them better on mobile apps in real time²⁹.
- Transportation and public services will use beacons and NFC to intercept security threats, and also to enhance utility services to commuters and users.
- Product maintenance support will be enhanced when IoT and location sensors are integrated, and when such data is communicated to manufacturers in real time.

WHAT TO EXPECT IN 2019 |

2019 will see a renewed focus on location sensors such as RFID, NFC, and beacons, though these were not as popular as one had expected them to be in 2018. The coming years will renew development effort to integrate location sensors into mobile development.

FACTS & FIGURES |

24% of shoppers in the UK have used in-store applications to make payments. Beacon-based mobile payments are integral to this experience³⁰.

Hailo is a taxi hailing app that uses beacon technology to deliver a seamless payment experience to passengers and drivers³⁰.

IONIC & APACHE CORDOVA

Ionic and Apache Cordova are important hybrid alternatives to native development³¹. Native development is time consuming, and costs way more than many projects can afford to spend. When a business wishes to develop applications at a lower cost, a hybrid solution such as Ionic or Apache Cordova comes to rescue.

Both Ionic and Apache Cordova are based on Cordova, and are essentially websites in the form of mobile apps. Though this is a trend that may not seem attractive, it is the only solution for many entry-level businesses that seek mobile applications for their target audiences.

Here are some important differences between Ionic and Apache Cordova, two important hybrid development platforms:

- Ionic is a heavier tool and may result in slow-loading times, while Apache Cordova is much lighter-weight³².
- Apache Cordova's forum is not very active, but Ionic's support forums are still active. Developers may find it easier to work with Ionic for this reason alone.
- Apache Cordova uses JavaScript, HTML5, CSS3 and JQuery Mobile, whereas Ionic uses Angular 4, HTML5, CSS3 and TypeScript³².

WHAT TO EXPECT IN 2019 |

The coming year may see a decline in the number of native applications developed, but many aspirational businesses will still desire to launch applications of their own. Cost-sensitive businesses in emerging economies such as India, Latin America, or even China will make use of hybrid solutions such as Ionic and Apache Cordova to launch inexpensive apps.

FACTS & FIGURES |

More than 1.3 million applications have been created using Ionic open-source SDK³³.

PhoneGap was rebranded as Apache Cordova by Adobe Systems after it purchased Nitobi in 2011³⁴.

XAMARIN

The need for cross-platform and hybrid app development frameworks is real. Developers are constantly seeking to find the perfect hybrid solution for a near-native experience. Xamarin is a popular choice for many developers, and will continue to be one of the most popular app development frameworks in 2019.

Its cost-efficiency and access to native APIs will continue to make it popular among both clients and vendors.

In addition, it provides many benefits when compared with other hybrid platforms. Some of them are:

- **Xamarin is probably the best platform to build a hybrid application that feels like a native iOS or Android app, without being one³⁵.**

Xamarin has a single code base and can be reused for different app platforms. In

- **other words, a developer only has to create a single app and reuse the code across platforms.**

- **Xamarin is the perfect choice when cost-efficiency is the primary factor. Not only does it eliminate the need for developing native apps, it is also inexpensive to work with Xamarin.**

WHAT TO EXPECT IN 2019 |

Xamarin has a large support community and being a C# based platform, it is easily learnable. The developer community is vast and members are always available to respond to queries. These and other advantages posit Xamarin as the preferred hybrid solution to develop mobile apps in 2019.

FACTS & FIGURES |

Microsoft acquired Xamarin in 2016 for an estimated price between \$400 million and \$500 million³⁶.

More than 1.4 million developers use Xamarin to build applications and serve their audiences better³⁶.

KEY INSIGHTS & PREDICTIONS FOR 2019

The way people use mobile applications has drastically changed. People tend to spend more time on applications they love, and use mobile browsers for everything else. When attractive native applications cannot be built due to financial and time constraints, hybrid solutions are desirable choices. Location-based technologies will continue to dominate app development, while ensuring mobile pages load quickly will be a top priority as well.

Here are some important trends that will dominate throughout 2019:

- Kotlin and Swift will remain popular programming languages
- Lazy loading, Accelerated Mobile Pages, and Progressive Web Apps will be technologies that will dominate mobile development
- Natural language processing and location-based technologies will improve user experience
- Hybrid solutions such as React Native, Ionic, PhoneGap, and Xamarin will provide affordable alternatives to native development

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