

305. THE FUTURE OF IOS APPLICATION DEVELOPMENT: TRENDS AND BEST PRACTICES

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The paper examines the growth of iPhone Operating System (iOS) development, highlighting the convergence of advanced technologies like framework Swift User Interface (SwiftUI) and artificial intelligence with essential practices regarding security, privacy, and accessibility.

Mobile applications have become essential to everyday life in today's digital world, impacting entertainment, education, and communication. Because of its strong ecosystem, high user engagement, and strict security measures, iOS continues to hold a significant market share among mobile operating systems [1]. The methods and tools used to develop iOS applications (apps) are changing significantly as technology advances at a rate never seen before. Writing code is not the only aspect of developing iOS apps in the future. It involves adjusting to new paradigms that put efficiency, intelligence, and user privacy first.

The shift from imperative frameworks to declarative syntax is one of the biggest changes in recent years. Developers may create user interfaces for all Apple platforms with a single set of tools and Application Programming Interfaces (APIs) thanks to SwiftUI, which was introduced by Apple in 2019 [3]. It is anticipated that iOS development would be dominated by this trend going forward. Declarative development speeds up the development cycle with real-time previews, simplifies the codebase, and lowers the possibility of bugs. Industry research indicates that using SwiftUI allows teams to concentrate more on user experience and business logic than standard code [2]. Developers who master SwiftUI will possess a distinct advantage, as legacy systems are gradually modernised to fit this new standard.

The deep integration of Machine Learning (ML) and Artificial Intelligence (AI) into mobile applications is another important trend. On-device processing has become extremely efficient when Apple Silicon introduced strong neural engines. Because data does not need to leave the device, frameworks like Core ML enable developers to incorporate trained models into apps without endangering user privacy. iOS apps will grow more customised in the future. For example, health apps will offer more precise diagnosis based on past data, while e-commerce apps will forecast consumer preferences [4]. More contextual awareness and natural language processing will be possible thanks to the combination of SiriKit and unique machine learning models. Consequently, the ability to use intelligent features will become an essential requirement for high-quality iOS applications rather than a competitive advantage.

Additionally, Augmented Reality (AR) has the potential to completely change how people connect with one another. The accuracy of virtual reality experiences has significantly increased with the addition of LiDAR scanners to more recent iPad and iPhone models. As Augmented Reality Toolkit (ARKit) develops, programmers will be able to produce immersive navigation, retail, and educational experiences. The real and virtual worlds will probably converge in iOS development in the future. For instance, educational apps can superimpose historical data on real-world places, while furniture stores let customers see items in their homes. Given Apple's significant investments in spatial computing, as demonstrated by the release of the Vision Pro, iOS developers need to become proficient in 3D modeling and spatial design. This trend suggests that future apps will not be confined to a 2D screen but will interact with the user's environment.

Lastly, accessibility needs to be viewed as a fundamental aspect of development. For instance, iOS offers the VoiceOver feature, which gives users who have trouble reading screen content or who are visually impaired audible feedback, and the Dynamic Type feature [5], which enables users to change the text size to suit their preferences. Applications must be usable by people with a range of abilities from the very beginning, according to future best practices. An inclusive app shows a dedication to social responsibility and is a sign of professional growth.

In summary, the future of iOS app development will be defined by a combination of cutting-edge technology capabilities and strict ethical standards. While deeper user engagement and functionality are offered by the integration of AI and AR, the switch to SwiftUI promises increased efficiency. Developers will be in a good position to produce applications that are not just technologically sophisticated but also safe, inclusive, and user-focused. Those who can balance these technologies with creativity, continuous learning and adaptation will have the best chance of succeeding.

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