**A Research On History/Evolution Of Mobile Applications**

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**Abstract –** We, now can see the rapid development of technology, including mobile communications, hardware and mobile software. The functionality of the mobile phone mostly depends on the software. In the current information and communication era [1-4], mobile applications are one of the most concerned and rapidly developing applications. At the same time, the development of mobile applications has changed significantly with the introduction of new software, service platforms and software development kits (SDKs). These changes have given rise to many new service platforms, such as Google's Android and Apple's iOS. This article provides information about the development of mobile applications, provides some statistics on past and present events, shows the relevant benefits of mobile device users, and shows how mobile applications affect society ethically.

**1. What are mobile applications?**

Mobile applications are software applications designed to run on mobile devices such as smartphones and tablets. This is the result of recent technological advances. The emergence of mobile applications is due to the convergence of advertising, information technology, the Internet and advanced technology. Additionally, mobile device manufacturers, mobile service providers, application developers, and many researchers in the field of information technology (IT) and data Information technology (IS) have been working on cellular communications for many years. However, the most interesting area of ​​research is the evolution of mobile applications [5].

**1.1 Using Mobiles to Process Payments.**

Mobile devices and smartphones can also be considered new ideas in the technology world. Compared to personal computers and laptops, smartphones have only been around for a few years. This situation leads to the proliferation of online mobile payment transactions. In this increasingly digital world, it is not surprising that money follows suit. Recent events suggest that digital currency in mobile wallets will soon replace cash and even credit cards. Nowadays, most products and services can be purchased online from laptops and mobile devices. It is easy to connect this system to our bank account and online payment system like Paytm.

SMS payment is currently one of the most popular payment methods using mobile phones to pay for goods, services and even people. To make SMS payments, users only need a mobile phone with SMS capability. Therefore, many experts believe that SMS payments will continue to be a promising area for mobile payments due to their convenience [6].

**1.2 Various Kinds of services offered by Different Mobile Applications.**

There are four specific services that can be performed using a mobile device.

•**Browser Access**: Applications we use from our local browser. For example, m.yahoo.com, www.google.com, m.redbus.in etc. Some app features require an Internet connection. For example, social applications (Facebook, Twitter), instant messaging (Skype), e-commerce (Flipkart), Internet speed test (Speedtest), etc.

•**Hybrid Apps**: You must have an app installed on your device; For example, social applications (Facebook, Twitter), instant messaging (Skype), e-commerce (Flipkart), Internet speed test (Speedtest), etc. Or you need to install the application on your device and the application will require internet to work. For example, some games can be played alone or with different players online (multiplayer). This category also includes medical apps where you can record your health and share it with friends or your doctor over the web.

•**Native Apps**: Applications installed on the device. For example, reminders, mini games, etc. [7]..

**1.3 Different Software For Developing Mobile Applications**

* Android Studio: Official IDE for Android development using Java and Kotlin.
* Xcode: Official IDE for iOS development with Swift and Objective-C.
* Flutter: Google's UI toolkit for building natively integrated mobile, web, and desktop applications from a single codebase using Dart.
* React Native: Facebook's framework for building native applications using React and JavaScript.
* Xamarin: Microsoft's framework for building cross-platform applications using .NET and C#.
* Ionic: An open SDK for developing hybrid mobile applications using web technologies such as HTML, CSS, and JavaScript.
* Cordova/PhoneGap: A framework for building cross-platform applications using HTML, CSS, and JavaScript.

**2. Goal Behind Building Mobile Application**

The goal of mobile application development is to create conditions in which the maximum number of users can use the application for the maximum amount of time. This means that the application being developed must be of appropriate quality and purpose to attract the attention of as many users as possible from around the world. In this regard, your application must meet the following requirements:

• Aligns with user goals.

• Ability to reach the majority of users.

• Ability to be safe.

• Must be user-friendly.

• Supports continuous improvement and collaboration [9].

**3. Mobile Technology Development And It’s Importance.**

**3.1 How do apps contribute to social development?**

Mobile applications can contribute to social development by helping solve problems such as: • Fast job search.

• Fast communication.

• Significant cost savings.

• Save time and increase productivity.

• Less power consumption due to less computer usage.

• Improving IT infrastructure in developing countries.

• Entertainment.

**3.2 Necessity of Mobile Applications**

These days, almost 80% of people go online through mobile devices. Most of these people prefer mobile apps because they are easy to use and allow them to complete tasks immediately. Users are increasingly relying on mobile apps for simple tasks such as booking movie tickets, checking sports results, buying and selling, or other everyday activities. These tasks can be accomplished with one click. Mobile apps available in app stores are more likely to convert visits into business. This helps increase sales speed [10].

**4. Advantages, disadvantages and problems of mobile application evolution**

**4.1 Advantages**

* Improved user interface: The mobile app features a smooth, responsive interface tailored for mobile devices.
* Offline Access: The app can run without an internet connection, providing offline access to its content and features.
* Performance. Native apps are optimized for performance on specific platforms, providing a faster and more stable experience.
* Push Notifications: Applications may send push notifications to provide users with timely updates and information.
* Device integration: Apps can easily integrate with device features such as camera, GPS, and sensors to extend functionality.
* Personalization: Apps can provide personalized content and settings based on user preferences and behavior.

**4.2 Disadvantages**

* High development costs: Developing and maintaining apps for multiple platforms (iOS, Android) can be expensive.
* Device fragmentation: Supporting a variety of devices with different screen sizes, OS versions, and hardware capabilities can be difficult.
* Regular updates: Applications need to be updated frequently to fix bugs, add features, and ensure compatibility with new OS versions.
* Performance issues: Apps that are not properly optimized can cause slow performance, crashes, and excessive battery drain.
* App Store Approval: Apps must adhere to strict guidelines and undergo review before they can appear on the App Store, which can delay release.
* User Acquisition: Gaining visibility and downloads in crowded app stores can be difficult and expensive.

**4.3 Problems of mobile Application Evolution**

* Rapid changes in technology: Keeping up with constantly evolving technology and OS updates is not easy.
* Security issues: It is important to ensure robust protection against cyber threats and data breaches.
* Compatibility issues: Supporting a wide range of devices and OS versions creates fragmentation.
* High competition: Standing out in a crowded app market requires significant marketing effort.
* User expectations: Meeting users' high expectations for performance, design, and functionality requires a lot of effort.
* Resource limitations: Limited development budgets and resources can limit application quality and innovation.

**5. Major Producers of Mobile Applications in the World**

The United States is the world's largest producer of mobile applications, especially thanks to the technology hub of Silicon Valley. The region is home to major companies such as Apple, Google and Facebook, which not only develop their own applications but also provide platforms (iOS and Android) that host millions of applications created by developers around the world. The United States leads the way in innovation, investment, and the number of startups developing mobile applications. Additionally, strong infrastructure, access to venture capital, and technology entrepreneurship culture contribute to the company's dominance in the mobile app market. This ecosystem fosters a continuous development cycle, with new applications emerging regularly to meet diverse user needs and market demands.

China is also actually a major mobile app producer and has a significant impact on the global mobile app market. Chinese companies such as Tencent, Alibaba, and ByteDance (creator of TikTok) are at the forefront of mobile app development. China has a large and rapidly growing user base, encouraging innovation and large-scale application production. The unique characteristics of the Chinese market, including widespread adoption of mobile payments and integration of various services into a single ‘super app’ such as WeChat, further highlight China’s leading role in mobile app production and development. Therefore, China is a powerhouse in the mobile app industry comparable to the United States.

**6. Conclusion**

The evolution of mobile apps is a dynamic and innovative process that fundamentally shapes the way we interact with technology and the world around us. From their early days as basic utility applications to today's complex, feature-rich platforms, mobile applications have revolutionized communications, commerce, entertainment, and productivity. Key milestones include the emergence of smartphones, the creation of app stores, and the emergence of cross-platform development environments. Continued advancements in mobile technology and rising user expectations have led to innovation and diversification in app offerings. Challenges such as device fragmentation, security concerns, and fierce competition remain, but the industry's adaptability and resilience ensures continued growth and development. Looking to the future, new technologies such as artificial intelligence, augmented reality, and 5G are poised to further expand the reach and influence of mobile apps, further cementing their essential role in modern society.

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