KARNATAK LAW SOCIETY’S

GOGTE INSTITUTE OF TECHNOLOGY

UDYAMBAG, BELAGAVI-590008

(An Autonomous Institution under Visveswaraya Technological University, Belagavi)

###### (APPROVED BY AICTE, NEW DELHI)



*Course Activity Report on*

***“Mobile Operating Systems”***

*Submitted in the partial fulfilment for the academic requirement of*

**7TH *Semester B.E In***

***Information Science Engineering***

***Submitted by***

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|  |  |  |
| --- | --- | --- |
| **SL NO.** | **Batch member Names** | **USN** |
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Under the Guidance Of

N.V.Karekar

ASSISTANT PROFESSOR of ISE

Academic Year 2023-2024

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**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**



**CERTIFICATE**

This is to certify that the course project entitled “***Mobile Operating Systems***” is a Bonafede record of the Seminar work done by **Adarsh Kumbar** and **Samarth Awati** having **USN 2GI20IS002** and **2GI20IS034** under my supervision and guidance, in partial fulfilment of the requirements for the Outcome Based Education Paradigm in ISE from Gogte Institute of Technology for the academic year 2023-2024.

Faculty In charge Head of the Department

**Rubrics for evaluation of Course Project**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sl.No | Batch No.02 | | | |
| 1. | Project Title: **Mobile Operating Systems** | Marks Range | USN | |
| 2GI20IS002 | 2GI20IS034 |
| 2. | Problem statement(PO2) | 0-1 |  |  |
| 3. | Objectives of Defined Problem Statement (PO1,PO2) | 0-2 |  |  |
| 4. | Design/Algorithm/Flowchart/  Methodology (PO3) | 0-3 |  |  |
| 5. | Implementation details/Function/Procedures/Cl asses and Objects  (Language/Tools) | 0-4 |  |  |
| 6. | Working model of final solution | 0-5 |  |  |
| 7. | Report and Oral presentation skill (PO9,PO10) | 0-5 |  |  |
|  | Total | 20 |  |  |

**Mobile Operating Systems:**

**Android, iOS, and Beyond write in depth report for it**

***ABSTRACT***

*Abstract: Delving into the Mobile Operating System Landscape: A Comparative Analysis of Android, iOS, and Emerging Alternatives*

*In today's technology-driven world, mobile devices have become indispensable tools for communication, information access, entertainment, and productivity. These devices rely on mobile operating systems (OS) to manage their hardware, resources, and applications. The mobile OS landscape is a dynamic and ever-evolving ecosystem, with established players like Android and iOS firmly entrenched and emerging challengers like HarmonyOS, KaiOS, and Tizen vying for user attention. This report provides an in-depth analysis of the mobile OS landscape, comparing and contrasting the key features, strengths, and target markets of these prominent OSes.*

*Android: Openness and Customization at the Forefront*

*Android, with its open-source nature and vast app ecosystem, offers a versatile and customizable experience for users worldwide. Its openness allows device manufacturers and developers to tailor the OS to specific needs and markets, resulting in a wide range of devices and apps. Android's strength lies in its flexibility and adaptability, catering to users who value choice and personalization.*

*iOS: A Unified and Secure Experience for the Apple Ecosystem*

*iOS, developed by Apple, is known for its user-friendly interface, tight integration with Apple's ecosystem, and strong focus on design and security. It provides a unified and seamless experience across Apple devices, offering a streamlined and secure user journey. iOS's strength lies in its curated app selection, tight integration with Apple's ecosystem, and emphasis on security, appealing to those seeking a cohesive and secure mobile experience.*

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# INTRODUCTION

In today's technology-driven world, mobile devices have become indispensable tools for communication, information access, entertainment, and productivity. These devices, ranging from smartphones and tablets to smartwatches and wearable technology, rely on mobile operating systems (OS) to manage their hardware, resources, and applications. Mobile OSes serve as the foundation upon which the entire mobile experience is built, providing the core functionalities and enabling the interaction between users and their devices.

Just as different operating systems power various computers, mobile devices utilize a variety of OSes. Among these, two dominant players have emerged, holding the majority of the market share: Android and iOS. Android, developed by Google, is an open-source OS that offers extensive flexibility and customization for both device manufacturers and users. iOS, developed by Apple, is the exclusive OS for Apple devices, known for its user-friendly interface, tight integration with Apple's ecosystem, and strong focus on security and privacy.

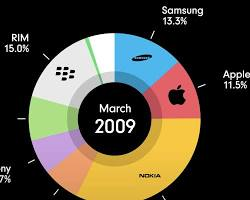
In addition to these two established leaders, several emerging mobile OSes are gaining traction, offering unique features and capabilities that cater to specific user needs or provide alternatives to the Android-iOS duopoly. Notable examples include Huawei HarmonyOS, a cross-platform OS aiming to unify the user experience across devices; KaiOS, a lightweight OS designed for low-cost smartphones in developing markets; and Tizen, an open-source OS primarily used on Samsung smartwatches and TVs.

Moreover, this report explores the potential integration of external travel booking systems, seamlessly connecting Salesforce with travel service providers, and simplifying the travel booking process. By incorporating approval processes into the travel management system, organizations can establish robust governance, ensuring adherence to travel policies and budgetary constraints.

Salesforce's sophisticated reporting and analytics capabilities allow businesses to gain valuable insights into travel efficiency, expenses, and the impact of travel on sales performance. By harnessing this data-driven approach, organizations can make informed decisions, optimize resource allocation, and enhance overall sales effectiveness during travel.

Market Share of Mobile Operating Systems (2023)

* Android: 71.5% , iOS: 26.9% Others: 1.6%



## 

## **2.Android: A Platform for Innovation and Customization**

## Android is an open-source mobile operating system (OS) developed by Google. Its open-source nature means that it is freely available for modification and distribution by anyone, which has fostered a thriving ecosystem of developers who create new apps, themes, and other customizations for Android devices. This openness has allowed Android to evolve and adapt to the ever-changing needs of users, making it one of the most innovative and customizable platforms in the world.

## **Key Features of Android that Drive Innovation and Customization:**

## Open-source architecture: Android's open-source nature allows developers to freely modify the source code to create new features and functionalities. This has led to a wide range of innovative apps and customizations that would not be possible on a closed-source platform.

## Vast developer community: Android has a large and active developer community, which is constantly creating new apps, themes, and other customizations. This large community of developers helps to ensure that Android remains a vibrant and innovative platform.

## Wide range of device options: Android is available on a wide range of devices from different manufacturers, which means that there are more opportunities for developers to create custom experiences. This diversity of devices also helps to drive innovation, as developers need to adapt their apps and customizations to work on a variety of hardware configurations.

## Support for third-party app stores: Android allows users to install apps from third-party app stores, which gives them more freedom to choose the apps that they want to use. This also helps to promote innovation, as it allows developers to reach a wider audience and experiment with new ideas.

## **Examples of Android Innovation and Customization:**

## Custom launchers: Android launchers are the home screens that provide the main interface for accessing apps, widgets, and settings. There are a wide range of custom launchers available for Android, which allow users to personalize their home screens to match their preferences.

## Custom themes: Android themes allow users to change the look and feel of their devices, including the colors, fonts, and icons. There are a vast number of custom themes available for Android, which can give users a unique and personalized look.

## Custom ROMs: Custom ROMs are modified versions of the Android operating system. They often include new features, enhancements, and customization options that are not available in the stock Android software.

## **OS: A Unified Experience with Focus on Design and Security**

## iOS is a mobile operating system developed by Apple exclusively for its devices, including iPhones, iPads, and iPod touches. It is known for its user-friendly interface, tight integration with Apple's ecosystem, and strong focus on design and security.

## **Comparing the Mobile OS Landscape**

## **Key Features of iOS that Drive a Unified Experience with Focus on Design and Security:**

## Closed-source architecture: iOS is a closed-source platform, meaning that Apple has complete control over the development and distribution of the software. This allows Apple to maintain a consistent user experience across all iOS devices and ensure that the software is optimized for specific Apple hardware.

## Curated app selection: The App Store, the official app store for iOS, is curated by Apple, meaning that only apps that meet Apple's guidelines can be distributed. This helps to ensure that apps on iOS are high-quality, safe, and secure.

## Tight integration with Apple ecosystem: iOS is tightly integrated with other Apple products and services, such as iCloud, iMessage, and FaceTime. This allows users to seamlessly share data, communicate, and access their files across all of their Apple devices.

## Strong focus on design: Apple has a long history of focusing on design, and this is reflected in the user interface of iOS. iOS is known for its clean, minimalist design that is easy to use and navigate.

## Regular software updates: Apple regularly releases software updates for iOS, which help to fix bugs, improve performance, and add new features. This commitment to regular updates helps to ensure that iOS devices are always up to date with the latest security patches.

## **Examples of iOS' Unified Experience with Focus on Design and Security:**

## Human Interface Guidelines (HIG): Apple's HIG provides a set of guidelines for developers to ensure that their apps look and feel like native iOS apps. This helps to create a consistent user experience across all iOS apps.

## App Review Process: Apple's App Review Process is a rigorous process that all apps must go through before they can be distributed on the App Store. This process helps to ensure that apps meet Apple's standards for quality, safety, and security.

## Sandboxing: iOS uses sandboxing to isolate apps from each other and from the system. This helps to prevent apps from accessing each other's data or from harming the system.

## Secure Enclave: iOS devices have a Secure Enclave, a dedicated chip that is designed to protect sensitive data, such as fingerprints and passwords.

## **Emerging Mobile OSes: Beyond the Duopoly**

## While Android and iOS dominate the mobile OS market, with a combined market share of over 98%, several emerging OSes are gaining traction, offering unique features and capabilities that cater to specific user needs or provide alternatives to the established duopoly. Here are some of the notable emerging mobile OSes:

## Huawei HarmonyOS: Developed by Huawei, HarmonyOS is a cross-platform OS that aims to unify the user experience across smartphones, tablets, wearables, and other smart devices. It is based on the open-source Linux Foundation LiteOS, and it includes features such as distributed and cross-device communication, multi-language support, and cloud-based services. HarmonyOS is gaining significant traction in the Chinese market, and it has the potential to challenge Android and iOS in the future.

## KaiOS: KaiOS is a lightweight OS designed for low-cost smartphones, targeting developing markets with limited internet connectivity and data usage. It is based on the open-source BSD operating system, and it includes features such as web browsing, voice calling, text messaging, and basic apps. KaiOS has been adopted by major mobile carriers in developing countries, and it is seen as a potential solution to the digital divide.

## Tizen: Tizen is an open-source OS developed by the Linux Foundation and Samsung, primarily used on Samsung smartwatches and TVs. It is based on the Linux kernel, and it includes features such as device management, multimedia playback, and cloud-based services. Tizen has the potential to be used on a wider range of devices, such as smartphones and tablets.

## **These emerging mobile OSes offer a variety of advantages over Android and iOS, including:**

## Cost-effectiveness: Emerging OSes are often less expensive to license and develop than Android and iOS, making them more attractive to device manufacturers in developing markets.

## Customization: Emerging OSes offer more flexibility and customization options than Android and iOS, allowing device manufacturers and developers to tailor the OS to specific needs and markets.

## Targeted focus: Emerging OSes often target specific user needs or market segments, such as low-cost devices or developing markets, which can give them a competitive advantage in those areas.

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## **Comparing the Mobile OS Landscape**

## **Android vs. iOS:**

## Android and iOS are the two dominant mobile OSes, offering a wide range of features and capabilities. Android is known for its open-source nature, flexibility, and vast app ecosystem, while iOS is known for its user-friendly interface, tight integration with Apple's ecosystem, and strong focus on security and privacy.

## **HarmonyOS:**

## Huawei HarmonyOS is an emerging cross-platform OS that aims to unify the user experience across devices. It is gaining traction in the Chinese market and has the potential to challenge Android and iOS in the future.

## **KaiOS:**

## KaiOS is a lightweight OS designed for low-cost smartphones in developing markets. It is a simple and affordable option for users in these markets.

## **Tizen:**

## Tizen is an open-source OS primarily used on Samsung smartwatches and TVs. It has the potential to be used on a wider range of devices in the future.

## 

## **CONCLUSION:**

## The mobile operating system (OS) landscape is a dynamic and ever-evolving ecosystem, with established players like Android and iOS firmly entrenched and emerging challengers like HarmonyOS, KaiOS, and Tizen vying for user attention. Each OS brings its unique strengths and capabilities to the table, catering to specific user needs and market segments.

## Android, with its open-source nature, vast app ecosystem, and device compatibility, offers a versatile and customizable experience for users worldwide. iOS, on the other hand, prioritizes a unified and secure experience, tightly integrated with Apple's ecosystem, appealing to those seeking a streamlined and secure user journey.

## Emerging OSes like HarmonyOS, KaiOS, and Tizen are carving out their niches by addressing specific market needs and offering unique advantages. HarmonyOS, with its cross-platform capabilities, aims to unify the user experience across devices, appealing to those seeking a seamless transition between smartphones, tablets, and wearables. KaiOS, with its lightweight design and affordability, targets developing markets, bridging the digital divide by providing essential mobile services. Tizen, primarily used on Samsung smartwatches and TVs, demonstrates potential for expansion into smartphones and tablets, offering an alternative to the established duopoly.

## As mobile technology continues to advance, the mobile OS landscape is likely to diversify further, driven by innovation, user demand, and technological advancements. Emerging OSes, armed with their unique strengths and targeted focus, could potentially challenge the dominance of Android and iOS, leading to a more competitive and diverse mobile ecosystem.

## The future of mobile OSes lies in their ability to adapt to evolving user needs, embrace emerging technologies, and cater to diverse market segments. Whether it's Android's openness and customization, iOS's unified and secure experience, or the niche-focused offerings of emerging OSes, the mobile OS landscape promises to remain a dynamic and exciting arena for innovation and user choice.

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