

ITAO3D2 - MOBILE COMPUTING
for
5G Technology

Assignment - I

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1) Memory Management:

Mobile OS

Resource constraints: Mobile devices typically have limited RAM and storage compared to conventional system.

Garbage collection:

Mobile OS often employs aggressive garbage collection techniques to reclaim memory.

App Sandboxing: Each app runs in its own memory space to prevent interference and enhance security.

Conventional OS

Large memory Space:

Conventional OS can manage larger amounts of RAM and storage, allowing for complex application.

Virtual memory:

uses paging and segmentation to extend physical memory, allowing application to use more memory.

Less aggressive garbage collection:

Memory management is often less aggressive, as system can afford to allocate more resources.

2) Processor Management / Scheduling:

Mobile OS

Energy efficiency:

Mobile OS prioritizes energy efficient scheduling to extend battery life, often using techniques like dynamic frequency scaling.

Conventional OS

Complex Scheduling Algorithms:

Conventional OS can implement complex scheduling algorithms

e.g.: round robin, priority scheduling to manage multiple processes effectively.

Realtime scheduling:

Some mobile applications require real time processing, leading to specialized scheduling algorithms.

Limited multitasking:

Mobile OS may limit the number of active processes to conserve resources.

Full multitasking:

Supports extensive multitasking capabilities, allowing many applications to run simultaneously.

Less focus on energy efficiency:

While energy efficiency is important, it is not as critical in mobile OS.

Device Management

Mobile OS:

Hardware abstraction:

Mobile OS abstracts hardware components to provide a consistent interface.

Limited peripheral:

Mobile devices typically support fewer peripherals compared to conventional systems, on essential features.

Dynamic device management:

Mobile OS can dynamically manage device connections.

e.g.: bluetooth, wifi

Conventional OS:

Extensive peripheral:

a wide range of peripherals.

e.g.: printers, externals, drives

Static device management:

Device management is often more static, with less frequent changes in connected devices.

Complex device drivers:

Conventional OS may require complex drivers to manage h/w components.

File management:

Mobile OS

Simplified file

Mobile OS structure

Simplified

User file

4) File management:

Mobile OS

Simplified file system:

Mobile OS often uses a simplified file system structure, focusing on user-friendly access to files and media.

Cloud Integration:

Many mobile OS's integrate cloud storage solutions, allowing users to store & access files.

Limited file access:

Apps may have restricted access to the file system for security reasons, often using app-specific directories.

Conventional OS

Hierarchical file systems:

Conventional OS typically employs a more complex hierarchical file system, allowing for detailed organisation of files in directories.

Local storage focus:

Emphasis on local storage management, with extensive support for various file types formats.

Full file access:

Applications generally have broader access to the file system, allowing for more complex file operations.

5) Security:

Mobile OS

App Sandboxing:

each application runs in a sandboxed environment, limiting its access to system resources and enhancing security.

Conventional OS

User privilege:

Conventional OS uses user accounts and permissions to manage access to system resources, but may be more vulnerable to malware.

Frequent updates:

often receive frequent security updates to address vulnerabilities quickly.

Biometric authentication:

many mobile OSs incorporate biometric authentication e.g.: fingerprint.

Antivirus Software:

user often rely on 3rd party antivirus S/W for protection against threats.

Less frequent updates:

security updates may be less frequent compared to mobile OS, depending on the OS & vendor.

Other functions:

mobile OS:

Touch interface: for touch input and it is userfriendly.

Power management: Advanced power management to optimize battery.

Location services: Built in support for GPS & location-based services.

Conventional OS:

Multi user Support: often designed to support multiple users.

Extensive S/W Support: supports a wide range of S/W applications.

Customisation: More options like configuration is compared to mobile OS.

2) Easy to use!

Android OS:

Offers a customizable interface allowing users to tailor their experience. However, the variety of devices can lead to inconsistencies in user experience.

iPhone iOS:

Known for its intuitive and consistent user interface, making it easy for users to navigate and access features seamlessly.

Windows OS:

While traditionally more complex, recent updates have improved usability on mobile devices, focusing on a familiar interface for users transitioning from PCs.

Good App Store

Android OS:

The Google Play Store provides a vast selection of apps, including many free options, but may have varying quality due to its open nature.

iPhone iOS : The App Store is curated, ensuring high-quality apps in a secure environment, though it has stricter guidelines.

Windows 10s :

The MS has a smaller selection of apps compared to its competitors, which can limit options for users.

Good battery life

Android 10s :

Features like adaptive battery management iOS optimizes background processes to extend battery life.

iPhone iOS :

Known for efficient power management, iOS optimizes background processes to extend battery life, often outperforming Android in this area.

Windows OS :

Battery life can be less efficient on mobile devices, as it often runs more resource-intensive applications compared to Android 10s.

Data Usage & Organisation:

Android / iOS:

Offers flexible data management, control data usage per app, which is beneficial for limited plans.

iPhone / iOS:

Provides robust data organisation features, including iCloud integration for seamless access & backup, but can be less flexible in data management.

Windows / iOS:

Data organisation is similar to traditional PCs, which can be advantage for users familiar with windows, but may not be as optimized for mobile data management.