

ASSIGNMENT - 01

ITA0302

Mobile Computing

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(1) Apply the special constraints and requirements in  
Mobile OS vs conventional OS

(i) Memory Management:

Mobile operating system must manage memory much more aggressively than conventional OS. Due to the limited RAM available in mobile device, mobile OS continuously optimizes memory usage by killing background processes and compressing memory. Power conservation is also critical. In contrast, conventional OS have access to ample memory resources and use techniques like virtual memory management, paging and swapping without major concern for battery usage.

(ii) Processor Management / Scheduling:

In mobile OS processor management is focused on minimizing power consumption. They use real-time scheduling to maintain a responsive user experience and often employ CPU throttling to extend battery life. Conventional OS, however, prioritize high performance and multitasking, with scheduling designed for speed and efficiency rather than power saving.

### (iii) Device management:

Device management in mobile OS is complex due to the need to handle a wide range of integrated sensors such as GPS, accelerometers, and gyroscopes. These systems also manage multiple wireless communication like WiFi, Bluetooth, and cellular networks while maintaining low power consumption. In conventional OS, device management is more focused, dealing mainly with peripherals like printers, scanners, and keyboards with less emphasis on battery efficiency.

### (iv) File management:

File management in mobile OS is usually sandboxed meaning each application has isolated storage areas to ensure security and stability. Access to system files is restricted, and users often rely on cloud storage for extended storage. Conversely, conventional OS provides users with full access to the file system, external storage devices, and advanced file management tools like NTFS or ext4 file systems.

### (v) Security:

Security is a top priority in mobile OS which uses methods such as secure boot, app sandboxing, strict permission systems, and biometric authentication like fingerprints and face recognition. Regular security patches are pushed to devices to counter threats. Conventional OS, although secure, and rely heavily on password-based security.

## v) Other functions:-

Mobile OS are designed to be highly energy-efficient and provide seamless communication (calls, SMS, data) and optimize the interface for touchscreens. They are tightly integrated with app stores for easy application management. Conventional OS focus on delivering maximum performance, supporting complex multitasking are optimized for keyboard and mouse interface with broader hardware compatibility.

(2) Justify the Mobile operating systems functions and features in Android OS, iPhone OS, and Windows OS.

### i) Ease of use:

Android offers high levels of customization and flexibility, making it a favourite among users who like to personalize their devices. However, this flexibility can sometimes make Android seem complicated for beginners. iPhone's iOS is renowned for its simplicity and intuitive design, making it extremely easy for anyone to use, including those unfamiliar with smartphones. Windows Mobile OS provided an easy-to-understand interface that felt familiar to Windows PC users but it lacked the overall and smoothness of i-

### iii) Good App Store:

Android's Google Play Store has a massive selection of applications and is open to developers worldwide, resulting in a broad app ecosystem. However, the open policy sometimes leads to inconsistencies in app quality. In contrast, Apple's App Store is highly curated, with strict quality control standards that ensure users receive secure and polished applications. Windows Phone had significant drawbacks in this area, as the Microsoft Store had limited selection of apps compared to Android and iOS.

### iv) Good Battery Life:

Android's battery life can vary widely between different manufacturers and models. Recent Android versions have introduced features like Doze mode and adaptive battery optimization, improving performance. iOS devices, however, are known for excellent battery life achieved through tight hardware-software integration and restricted background activity control. Various mobile devices delivered average battery performance but struggled to keep up with the advancements seen in Android and iOS.

## iv) Data usage and organization:

Android provides strong data management features including data saver modes, detailed data usage tracking and cloud storage integration through Google Drive. iOS excels in data organization with its Files app and seamless iCloud integration, although it restricts user control to maintain system security. Windows Mobile attempted to mirror the Windows desktop environment for file organization and incorporated OneDrive for cloud storage but lacked the smooth experience offered by Android and iOS.