Contents:

• Introduction

• Different Mobile Operating Systems

• Android Mobile Operating System
Market Share of M-OSs:

Operating System Share: All Subscribers
Smartphone Subscribers, National, US

Q2 '09 (n=8195)  Q3 '09 (n=9935)  Q4 '09 (n=10326)  Q1 '10 (n=11288)  Q2 '10 (n=11799)

- Android OS
- Apple iPhone OS
- Symbian OS
- Palm OS
- Microsoft Windows Mobile
- Linux

Source: The Nielsen Company
Symbian OS:

- It is an OS designed for mobile devices and smartphones, with associated libraries, user interface, frameworks.

- In 2008, Symbian Software Limited was acquired by Nokia and made open source code in February 2010.

- Symbian OS was created with three design principles:
  - The integrity and security of user data,
  - User time must not be wasted,
  - And all resources are scarce.
Black Berry OS by RIM:

- It is the proprietary software platform made by Research In Motion for its BlackBerry line of handhelds.

- BlackBerry OS provides multi-tasking, and input devices particularly the trackball or touch screen.

- This OS was originally designed for business purpose.

- Covers 20.9% Market Share Sales Q2 2009.
iPhone OS by Apple:

- The **iPhone** uses an operating system called **iPhone OS**, which is derived from **Mac OS X**.

- Third party applications were **not officially supported** till release of iPhone OS 2.0 on July 11th 2008.

- iPhone focused on **Multi-Media** features.

- Covers **13.7% Market Share Sales Q2 2009**.
Windows Mobile by Microsoft:

• The **Windows CE** (Compact Edition) mobile operating system is widely spread in Asia.

• Windows Mobile allows third-party developers to write new applications for the platform.

• This OS supports various applications like games, MS outlook, MS office etc.

• It support both **touch screen and physical** keyboard configurations as in iPhone.
Android OS by Google:

- Android is an **Open Source**, Linux-derived platform backed by **Google**, along with major hardware and software developers like **Intel**, **HTC**, **ARM**, and **eBay** and many more that form the **Open Handset Alliance**.
Android is a software stack for mobile devices that includes an operating system, middleware and key applications.

Android is a software platform and operating system for mobile devices based on the Linux operating system and developed by Google and the Open Handset Alliance.
Google Acquires Android Inc:

- In **July 2005**, Google acquired Android Inc, which was a small **startup** company based in **Palo Alto**.

Open Handset Alliance Founded:

- On **5 November 2007**, the Open Handset Alliance was formed.
- **Google**, **HTC**, **Intel**, **Motorola**, **Qualcomm**, **T-Mobile**, **Sprint Nextel** and **NVIDIA** and many more were members and Android was released to market as an **Open Source OS**.
What makes Android special?

- A truly **open**, free development platform based on Linux and **open source**.

- A **component-based architecture** inspired by Internet mash-ups. **Parts** of one application can be used in another.

- **Automatic management** of the application **life cycle**. Programs are isolated from each other by multiple layers of **security**, provide **system stability**.

- High quality **graphics** and **sound**. Uses **OpenGL** for graphics and supports **MP3**, **MP4** etc for audio and videos.
Architecture of Android OS:
Linux Kernel:
- Android Architecture is based on Linux 2.6 kernel. Manage security, memory management, process management, network stack.
- CDMA and GPRS network support
- Bluetooth 1.2 and Wi-Fi support
- Digital audio support for mp3 and other formats
- Support for Linux and other third-party operating systems
- Java hardware acceleration and support for Java applications
- Qcamera up to 6.0 megapixels
- gpsOne – solution for GPS
- and lots of other.
**Libraries:**
- Native libraries written in C/C++, which are responsible for stable performance.

**Media Libraries** - based on PacketVideo's OpenCORE; the libraries support playback and recording of many popular audio and video formats like MPEG4, MP3, JPG, and PNG.

**Surface Manager** – Responsible for displaying 2D and 3D graphic layers from multiple applications.

**LibWebCore** - a modern web browser engine which powers both the Android and Chrome web browser applications.
Android Runtime:
- **Dalvik Virtual Machine.**
- Android gives an integrated tool “dx”, which converts byte code from .jar to .dex file which is much more efficient.

- Designed for Android running with **limited battery, CPU, memory and data storage.**
- As the result, it is possible to have **multiple instances** of Dalvik virtual machine running on the single device at the same time.
Application Framework:

- Written in Java language. It is a toolkit that all applications uses and are developed.

The **Activity Manager** manages the **life circle of the applications** and provides a common navigation back stack for applications.

The **Package Manager** keeps track of the **applications**, which are **installed** in the device.

**Telephony Manager** contains a set of API necessary for calling applications.

**Content Providers** was built for Android to **share a data** with other applications.

The **View System** generates a set of buttons and lists used in **UI**.

Application Layer:

- Here we have all the applications, which are used by the final user.
Application Building Blocks:

• Android application is a collection of components, of various kinds.

• The major building blocks of an application are:
  - Activity: User interface component, which corresponds to one screen at a time.
  - Intent Receiver: Wakes up a predefined action through the external event.
  - Service: A task, which is done in the background.
  - Content Provider: A component, which allows sharing some of the data with other processes and applications.
Application Life Cycle:

1. Activity starts
2. onCreate()
3. onStart()
4. onResume()
5. Activity is running
   - New activity is started
   - Your activity comes to the foreground
6. onFreeze()
7. onPause()
   - Your activity is no longer visible
8. onStop()
9. onDestroy()
10. Activity is shut down

- User navigates back to your activity
- Process is killed
- Other applications need memory
Advantages of Android:

- Open - Android allows access to core mobile functionality through standard API calls.

- All applications are equal - Android does not differentiate between the phone's basic and third-party applications.

- Fast and easy development - The SDK contains everything needed to build and run Android applications, including a true device emulator and advanced debugging tools.
Disadvantages of Android:

- **Security** - Making source code available to everyone is **unsafe**.

- **Incompetence** - Google’s dependence on hardware and carrier partners puts the final product out of their control.
Thank You!!!