Unit – 1 (Introduction to Mobile and Mobile Programming)

Introduction to Mobile

A mobile phone, cellular phone, cell phone, cellphone, handphone, or hand phone, sometimes shortened to simply mobile, cell or just phone, is a portable telephone that can make and receive calls over a radio frequency link while the user is moving within a telephone service area. The radio frequency link establishes a connection to the switching systems of a mobile phone operator, which provides access to the public switched telephone network (PSTN). Modern mobile telephone services use a cellular network architecture and, therefore, mobile telephones are called cellular telephones or cell phones in North America.

It's hard to imagine a world now without mobile, but there once was a time that we did not have such luxuries. It was not that long ago when desktop and stationary hardware ruled the industry. Times are changing now, and the focus has shifted mainly towards a mobile device populated world. A **mobile device** is a handheld computer or any other electronic device that is designed with portability in mind. Some of the most common mobile devices we use today include:

- Smartphones
- Tablets
- Laptop computers
- Smart watches
- E-readers
- Handheld gaming consoles

Mobile has become of such high demand that it now accounts for more than half of all the devices we use on a daily basis.

Features of Mobile

The features of mobile phones are the set of capabilities, services and applications that they offer to their users. All mobile phones are designed to work on cellular networks and contain a standard set of services that allow phones of different types and in different countries to communicate with each other. However, they can also support other features added by various manufacturers over the years:

- Roaming which permits the same phone to be used in multiple countries, providing that the operators of both countries have a roaming agreement.
- Send and receive data and faxes (if a computer is attached), access WAP services, and provide full Internet access using technologies such as GPRS.
- Applications like a clock, alarm, calendar, contacts, and calculator and a few games.
- Sending and receiving pictures and videos (by without internet) through MMS, and for short distances with e.g. Bluetooth.
- In Multimedia phones Bluetooth is commonly but important Feature.
- GPS receivers integrated or connected (i.e. using Bluetooth) to cell phones
- Push to talk, available on some mobile phones, is a feature that allows the user to be heard only while the talk button is held, similar to a walkie-talkie.
- A hardware notification LED on some phones
- Other features that may be found on mobile phones include GPS navigation, music (MP3) and video (MP4) playback, RDS radio receiver, built-in projector, vibration and other "silent" ring options, alarms, memo recording, personal digital assistant functions, ability to watch streaming video, video download, video calling, built-in cameras (1.0+ Mpx) and camcorders (video recording), with autofocus[dubious – discuss] and flash, ringtones, games, PTT, memory card reader (SD), USB (2.0), dual line support, infrared, Bluetooth (2.0) and WiFi connectivity, NFC, instant messaging, Internet e-mail and browsing and serving as a wireless modem.

Mobile Device Categories

Some of the most common mobile devices we use today include:

- Smartphones
- Tablets (Apple Ipad, Samsung Galaxy Tab)
- Laptop computers
- Smart watches (Apple Watch, Fitbit, Samsung Galaxy Watch)
- E-readers (E.g. Amazon Kindle, Cobo, Onyx)
- Handheld gaming consoles (E.g PlayStation Portable, Game Boy Color, WonderSwan Color, PSP Go, Mi2)

History of Mobile

Mobile phones, particularly the smartphones that have become our inseparable companions today, are relatively new.

However, the history of mobile phones goes back to 1908 when a US Patent was issued in Kentucky for a wireless telephone.

Mobile phones were invented as early as the 1940s when engineers working at AT&T developed cells for mobile phone base stations.

The very **first mobile phones** were not really mobile phones at all. They were two-way radios that allowed people like taxi drivers and the emergency services to communicate.

Instead of relying on base stations with separate cells (and the signal being passed from one cell to another), the first mobile phone networks involved one very powerful base station covering a much wider area.

Motorola, on 3 April 1973 were first company to mass produce the the first handheld mobile phone.

These early mobile phones are often referred to as **0G** mobile phones, or **Zero Generation** mobile phones. Most phones today rely on **3G** or **4G** mobile technology.

Landmarks in mobile history

Mobile telephony has a long history that started off with experiments of communications from and to moving vehicle rather than handheld devices.

1926: The first successful mobile telephony service was offered to first class passengers on the Deutsche Reichsbahn on the route between Berlin and Hamburg.

1946: The first calls were made on a car radiotelephone in Chicago. Due to the small number of radio frequencies available, the service quickly reached capacity.

1956: The first automated mobile phone system for private vehicles launched in Sweden. The device to install in the car used vacuum tube technology with rotary dial and weighed 40Kg.

It had a total of 125 subscribers between Stockholm and Gothenburg.

1969: The Nordic Mobile Telephone (NMT) Group was established. It included engineers representing Sweden, Denmark, Norway and Finland. Its purpose was to develop a mobile phone system that, unlike the systems being introduced in the US, focused on accessibility.

1973: Dr Martin Cooper general manager at Motorola communications system division made the first public mobile phone call on a device that weighed 1.1Kg.

1982: Engineers and administrators from eleven European countries gathered in Stockholm to consider whether a Europe wide digital cellular phone system was technically and politically possible. The group adopted the nordic model of cooperation and laid the foundation of an international standard.

1985: Comedian Ernie Wise made the first "public" mobile phone call in the UK from outside the Dicken's Pub in St Catherine's dock to Vodafone's HQ. He made the call in full Dickensian coachman's garb.

1987: The Technical specifications for the GSM standard are approved. Based on digital technology, it focused on interoperability across national boundaries and consequent different frequency bands, call quality and low costs.

1992: The world's first ever SMS message was sent in the UK. Neil Papworth, aged 22 at the time was a developer for a telecom contractor tasked with developing a messaging service for Vodafone. The text message read "Merry Christmas" and was sent to Richard Jarvis, a director at Vodafone, who was enjoying his office Christmas party.

1996/97: UK phone ownership stood at 16% of households. A decade later the figure was 80%. The explosion in growth was in part driven the launch of the first pay as you go, non-contract phone service, Vodafone Prepaid, in 1996.

1998: The first downloadable content sold to mobile phones was the ringtone, launched by Finland's Radiolinja, laying the groundwork for an industry that would eventually see the Crazy Frog ringtone rack up total earnings of half a billion dollars and beat stadium-filling sob-rockers Coldplay to the number one spot in the UK charts.

1999: Emojis were invented by Shigetaka Kurita in Japan. Unlike their all-text predecessors emoticons, emojis are pictures. The same year in the UK sees the first shots fired in a supermarket price war, with Tesco, Sainsbury's and Asda selling Pay and Go phones at discounted prices. For the first time, you could pick up a mobile phone for just under £40.

The first BlackBerry phone was also unveiled in 1999. Famous for its super-easy email service, BlackBerry handsets were seen as the ultimate business tool, allowing users to read and respond to emails from anywhere. This led to 83% of users reading and responding to work emails while on holiday, and over half admitted to sending emails on the toilet, winning the manufacturer the nickname CrackBerry.

2000: The all-conquering Nokia 3310 crash landed on shop shelves. Naturally it was unscathed and went on to sell 126 million units. Over in Japan, the first commercially available camera phone The Sharp J-SH04, launched in November 2000 in Japan.

2003: The 3G standard started to be adopted worldwide, kicking off the age of mobile internet and paving the way for the rise of smartphones. Honk Kong-based Hutchinson Wampoa owned Three brand offered the first 3G network connection in the UK among other countries.

Nepal was one of the first countries in southern Asia to launch 3G services. One of Nepal's first companies to offer the service, Ncell, also covered Mount Everest with 3G.

2007: The iPhone debuted. Solely available on O2 at launch in the UK and priced at a then eye-watering $499, Nokia CEO confidently dismissed it as little more than a 'cool phone' that wouldn't translate column inches into market share.

2008: The first Android phone turned up, in the form of the T-Mobile G1. Now dubbed the O.G of Android phones, it was a long way from the high-end Android smartphones we use today

2009: O2 publicly announced that it had successfully demonstrated a 4G connection using six LTE masts in Slough, UK. The technology, which was supplied by Huawei, achieved a peak downlink rate of 150Mbps.

WhatsApp also launched that year, letting customers send and receive calls and messages via the internet. The messaging system now has 1.2 billion users sending more than 10 billion messages a day. Which makes it 50% more popular than traditional texting.

2010: Samsung launched its first Galaxy S smartphone. Usurping former Android giants, HTC, the Samsung Galaxy S range is still the most popular Android brand.

2012: When text messages first arrived, most people didn't think they'd catch on. Ten years later, Britons were sending a billion messages per month. In 2012, British text volume reached its highest point, with 151 billion sent in the UK alone.

2016: The Pokemon Go app launched worldwide. The free augmented reality game uses the smartphone camera and location to show Pokemon characters in the real world. The aim of the game is to travel to different locations to collect as many Pokemon as possible, leading countless gamers to walk into lamp-posts in their quest to catch 'em all.

2017: The Nokia 3310 had a revival, sporting a fresh version equipped with basic web browsing, a colourful screen and even a camera. Despite this, it still retained our favourite features from the original 3310, including the iconic design, super-long battery life and even an updated version of Snake. Needless to say, it stole the show at the Mobile World Congress (MWC) tech expo and was one of the biggest hits of the year.

2017 and beyond:

Modern-day smartphones are pretty unrecognizable from the analogue bricks we used to cart around.

The likes of 2017's iPhone X and Samsung S8 have brought us stunning all-screen fronts that are perfect for watching videos and playing games. Meanwhile their face-scanning technology enables you to unlock your device just by looking at it.

Professional dual-lens cameras are now becoming standard on high-end smartphones while the handsets themselves are becoming ever more durable, with impressive waterproofing and tough Gorilla Glass screens.

Yet despite all this, Nokia's 2017 revival of its old classic, the Nokia 3310, was perhaps the most talked-about phone of the year, heralding in a wave of nostalgia for older, simpler devices.

Mobile Brands

- SAMSUNG
- APPLE
- HUAWEI
- NOKIA
- SONY
- LG
- HTC
- MOTOROLA
- LENOVO
- XIAOMI
- GOOGLE
- HONOR
- OPPO
- REALME
- ONEPLUS
- VIVO
- MEIZU
- BLACKBERRY
- ASUS
- ALCATEL
- ZTE
- MICROSOFT
- VODAFONE
- ENERGIZER
- CAT
- SHARP

- MICROMAX
- INFINIX
- ULEFONE
- TECNO
- BLU
- ACER
- WIKO
- PANASONIC
- VERYKOOL
- PLUM

Mobile Models

- Honor 30i
- Oppo A32
- Huawei MatePad T10s LTE
- Huawei MatePad T10s
- Huawei MatePad T10 LTE
- Huawei MatePad T10
- Motorola Moto E7 Plus
- Motorola Razr 5G
- Gionee M12 Pro
- Motorola Moto G9 Plus
- Poco M2
- Realme 7i
- Huawei Y9a
- Poco X3 NFC
- Motorola Moto G9 Play
- Tecno Camon 16 Premier
- TCL 10 Tab Mid
- TCL 10 Tab Max

- Huawei Enjoy 20 Plus
- Huawei Enjoy 20

Popular Models

- Realme X2 Pro
- Redmi K20
- Realme X3
- Samsung Galaxy Note 10 Lite
- Samsung Galaxy S20
- Realme 6 Pro
- OnePlus Nord
- OnePlus 8
- iPhone 11
- Samsung Galaxy S10+
- iPhone 11 Pro Max
- Mi 10
- Redmi Note 8
- Redmi Note 9 Pro
- Redmi 9 Prime
- Samsung Galaxy S10
- Vivo X50
- Oppo Reno 4 Pro
- OnePlus 7
- Samsung Galaxy M31
- Huawei P30 Pro
- Redmi Note 8 Pro
- Redmi K30 Pro
- Huawei P30 Pro

Mobile Platforms

iOS

iOS, an operating system from Apple, was originally developed for the iPhone. Later it was extended to support iPod Touch, iPad and Apple TV. Apple's App Store contains more than 500,000 applications and boasts more than 25 billion downloads collectively. It holds the reputation of intelligent UI creator which is based on the concept of direct manipulation, using multi-touch gestures.

Android

Android is a Linux based mobile operating system developed by the Open Handset Alliance led by Google. Android boasts large community of developers writing applications extending the functionality of the devices. It has 450,000 apps in its Android Market and download exceeds 10 billion count.

BlackBerry OS

BlackBerry OS is developed by Research In Motion (RIM) for its line of smartphones. This operating system is known for its native support for corporate e-mail through MIDP allowing complete wireless activation and synchronization with Microsoft Exchange and Lotus Domino. Accordingly to one research approximately 45% of mobile developers were using the platform at the time of publication. It provides BlackBerry API classes for developers to write applications.

Windows

A successor to Windows Mobile platform, Windows Phone, is a mobile operating system launched by Microsoft in late 2010. This mobile OS is targeted at consumer market. With this new operating system Microsoft offered new user interface, Metro, integrating the operating system with third party and other Microsoft services, and controls the hardware on which it runs.

Symbion OS

Symbian is a discontinued mobile operating system (OS) and computing platform designed for smartphones.

Mobile Programming (Mobile App Development)

Mobile application development is the process of creating software applications that run on a mobile device, and a typical mobile application utilizes a network connection to work with remote computing resources.

HTML5

HTML5 is the ideal programming language if you are looking to build a Web-fronted app for mobile devices. Although it makes various data types simple to insert, accounts for different screen sizes, rationalizes input parameters, and even levels the browser playing field, the problem with HTML5 is that it is still a proposed standard. Currently supported in a lot of different ways by a lot of different browsers, HTML5, from the cost-efficiency point of view, has the advantage of building on the current version of HTML- making the learning curve much shallower than that for a completely new language.

Objective-C

The primary programming language for iOS apps, Objective-C was chosen by Apple to build apps that are robust and scalable. Being a C-language superset, it does have a number of functions that precisely deal with graphics, I/O, and display functions. Moreover, as part of the Apple development framework, Objective-C is fully integrated into all iOS and MacOS frameworks. However, it's now slowly being replaced in the Apple ecosystem by a more powerful language called Swift.

Swift

Swift is the latest programming language to foray into the Apple ecosystem, mainly considering its prevalence in writing code for Apple's latest APIs, Cocoa and Cocoa Touch. Even though it is a language written to work along with Objective-C, the Cupertino company is making it obvious for iOS developers to turn to Swift for complete programming. Designed to eliminate the likelihood of many of the security vulnerabilities possible with Objective-C, it's time for mobile app developers to turn

to Swift, as many businesses are looking to hire Swift developers with expertise in developing cutting-edge mobile apps using this language.

C++

This is the most appropriate and robust programming language when it comes to building mobile apps for Android and Windows- and, mainly for low-level programming, it's still the go-to language on platforms for mobile app developers. As a powerful programming language, C++ allows mobile apps to be developed for practically every purpose on every platform that exists. It might not be super chic or trendy, but it dominated the programming world even before the smartphone revolution.

C#

The most coveted programming language for Windows Phone app development, C# does the trick for Microsoft that Objective-C does for Apple. Although a Windows Phone platform couldn't emerge as the game-changer in the mobile application development industry, for loyal Microsoft users, C# makes the perfect programming language to build the robust Windows Phone apps.

Java

Java programming language is one of the most preferred languages when it comes to Android app development. An object-oriented programming language developed at Sun Microsystems (now owned by Oracle), Java can be run in two different ways: either in a browser window, or in a virtual machine that can do without a browser.

This flexibility tends to mean a lot when it comes to re-using code and updating software. Although Java does not have much to do if you are considering iOS development, it certainly can be on your chosen list when it comes to mobile applications across platforms, i.e. cross-platform apps.