



# NSCET E-LEARNING PRESENTATION

**LISTEN ... LEARN... LEAD...**





# **COMPUTER SCIENCE AND ENGINEERING**

**IV YEAR / VII SEMESTER**

**CS8079 – HUMAN COMPUTER INTERACTION**

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# UNIT IV

# MOBILE HCI



# Mobile Ecosystem

The Internet is actually a complex ecosystem made up of many parts that must **all work together seamlessly**.

Mobile is an entirely unique ecosystem and, like the Internet, it is made up of many different parts that must all work seamlessly together.

# Mobile Ecosystem Layers

<b>Services</b>
<b>Applications</b>
<b>Application frameworks</b>
<b>Operating systems</b>
<b>Platforms</b>
<b>Devices</b>
<b>Aggregators</b>
<b>Networks</b>
<b>Operators</b>

# Mobile Ecosystem - Layers

## Operators

The base layer in the mobile ecosystem is *operator*.

Operators can be referred to as Mobile Network Operators (MNOs); mobile service providers, wireless carriers, or simply carriers; mobile phone operators; or cellular companies

Operators are what essentially make the entire mobile ecosystem work. They are the gatekeepers to the kingdom

# Mobile Ecosystem- Layers

They install cellular towers, operate the cellular network, make services (such as the Internet) available for mobile subscribers, and they often maintain relationships with the subscribers, handling billing and support, and offering subsidized device sales and a network of retail stores.

The operator's role in the ecosystem is to create and maintain a specific set of wireless services over a reliable cellular network

# Mobile Ecosystem Layers

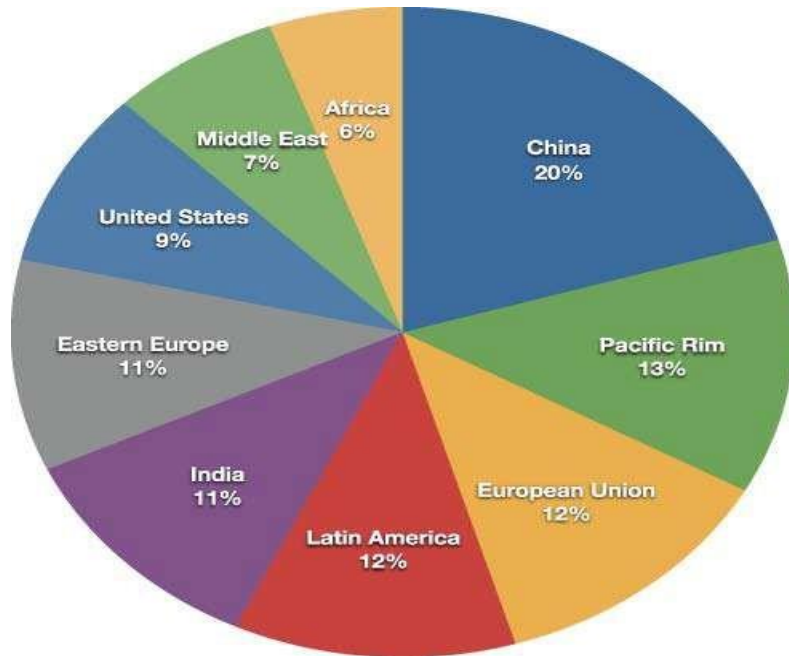
## Networks

- Operators operate wireless networks. Remember that cellular technology is just a radio that receives a signal from an antenna. The type of radio and antenna determines the capability of the network and the services you can enable on it.

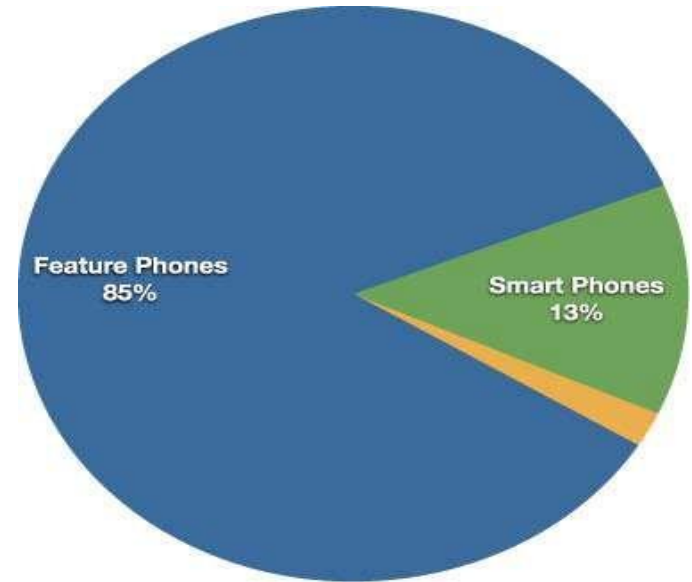


# Mobile Ecosystems - Layers

*Mobile devices around the world*



*Breakdown of devices*



# Platforms

- A mobile platform's primary duty is access to the devices
- To run software and services on each of these devices, you need a *platform, or a core programming* language in which all of your software is written.
- Like all software platforms, these are split into three categories: licensed, proprietary, and open source

# Platforms - Licensed

Licensed platforms are sold to device makers nonexclusive distribution on devices.

The goal is to create a common platform of development Application Programming Interfaces (APIs)

Following are the licensed platforms:

*Java Micro Edition (Java ME)*

*Binary Runtime Environment for Wireless (BREW)*

*Windows Mobile*

*LiMo*

# Platforms -Proprietary

- Proprietary platforms are designed and developed by device makers for use on their devices
- They are not available for use by competing device makers

They include

*Palm*

*BlackBerry*

*iPhone*

# Platforms -Open Source

- Open source platforms are mobile platforms that are freely available for users to download, alter, and edit.
- Open source mobile platforms are newer and slightly controversial, but they are increasingly gaining traction with device makers and developers
- Android is one of these platforms. It is developed by the **Open Handset Alliance**, which is spearheaded by **Google**

## Application Frameworks

- Application frameworks often run on top of operating systems, sharing core services such as communications, messaging, graphics, location, security, authentication, and many others.
- They are
  - Java, S60, BREW, Flash Lite, Windows Mobile,
  - Cocoa Touch, Android SDK, Web Runtimes
    - (WRTs), WebKit, The Web

# Application Frameworks

Application frameworks are used to applications, such as a **game, a web browser, a camera, or media player.**

Although the frameworks are well standardized. The largest challenge of deploying applications is knowing the specific device **attributes and capabilities.**

# Application Frameworks

- A common alternative these days is creating applications for only one platform, such as the **iPhone or Android**
- By minimizing the number of platforms the developer has to support and utilizing **modern application frameworks.**
- The time and cost of creation go down significantly



# Types of Mobile Application

## Mobile Application Medium Types

- SMS
- Mobile Websites Mobile
- Web Widgets Mobile Web Applications
- Native Applications
- Games
- Mobile Application Media Matrix
- Application Context
- Utility Context
- Local Context
- Informative Applications
- Productivity Application Context
- Immersive Full-Screen Applications
- Application Context Matrix

# Mobile Web Widgets

- Largely in response to the poor experience provided by the mobile web over the years, has been a growing movement to establish mobile widget frameworks and platforms.
- A **mobile web widget** is a standalone chunk of HTML-based code that is executed by the end user in a particular way.

# Mobile Web Widgets

## Pros

The pros of mobile web widgets are:

They are easy to create, using basic HTML, JavaScript knowledge.

They can be simple to deploy across multiple handsets.

They offer an improved user experience and a richer design, tapping into device features and offline use.

## Cons

The cons of mobile web widgets are:

They typically require a compatible widget platform to be installed on the device.

They cannot run in any mobile web browser.

They require learning additional proprietary, non-web- standard technique

# Games

The final mobile medium is **games**, the most popular of all media available to mobile devices. Technically games are really just native applications that use the similar platform SDKs to create immersive experiences

The reason games are relatively easy to port (“relatively” being the key word), is that the bulk of the gaming experience is in the graphics and actually uses very little of the device APIs.

# Games

## Pros

The pros of game applications are:

They provide a simple and easy way to create an immersive experience.

They can be ported to multiple devices relatively easily.

## Cons

The cons of game applications are:

They can be costly to develop as an original game title.

They cannot easily be ported to the mobile web

# Mobile Information Architecture

## What Is Information Architecture?

The structural design of shared information environments

The combination of organizations, labeling, search, and navigation systems within websites and intranets

The art and science of shaping information products and experiences to support usability and findability

An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape

# Mobile Information Architecture

## Facets of information architecture

*Information architecture*

*Interaction design*

*Information design*

*Navigation design*

*Interface design*

# Mobile Information Architecture

## Characteristics of Mobile Information Architecture

- Keeping It Simple
- Site Maps
- Clickstreams
- Wireframes
- Prototyping
- Different Information Architecture for Different Devices



# Mobile 2.0

Mobile 2.0,” borrowing from many of the same principles behind Web 2.0.

- Each of these principles serves to transform the Web into a more agile and user-centered medium for delivering information to the masses.
- Mobile development, under the bottlenecks of device fragmentation and operator control, is sorely in need of a little reinvention as well.

# Seven Principles Of Web 2.0:

- *The Web as a platform*
- *Harnessing collective intelligence*
- *Data is the next Intel inside*
- *End of the software release cycle*
- *Lightweight programming models*
- *Software above the level of a single*
- *Rich user experiences*

# Mobile Design Tools

- Mobile design requires understanding the design elements and specific tools
- The closest thing to a common design tool is Adobe Photoshop, though each framework has a different method of implementing the design into the application.
- Some frameworks provide a complete interface toolkit, allowing designers or developers to simply piece together the interface

# Mobile Design Tools

## Designing for the Right Device

- Now is the time to ask
- What device suits this design best?
- What market niche would appreciate it most?
- What devices are the most popular within that niche?

# Mobile Design Tools

## Designing for Different Screen Sizes

- Mobile devices come in all shapes and sizes
- It can be incredibly difficult to create that best possible experience for a plethora of different screen sizes.
- How you design each screen of content depends on the scope of devices you look to support

The good news is that the vast majority of mobile device screens share the same vertical or Portrait orientation

# Designing for Different Screen Sizes

