

Lecture: 01

mobile computing : mobile computing is the technology that allows people to access services (data, voice, video) anytime, anywhere without being tied to a fixed link.

Main Concept :

① Mobile Communication

② Mobile hardware

③ Mobile Software

Wired vs Wireless ?

wired networks	wireless networks
High Bandwidth	low bandwidth
low bandwidth variability	High bandwidth variability
High power machines	Low power machines
High resource machines	Low resource machines
Need physical access	Need proximity
Low delay	Higher delay
Connected operation	Disconnected operation.

Mobile communication:

- * Refers infrastructure to ensure seamless and reliable communication.
- * No collision with other existing systems

Mobile Hardware:

- * Includes mobile devices or device components that receive or access the service of mobility.
- * Capable of sensing and receiving signals.

Mobile Computing Aspects:

User mobility:

— User communicate "any time, anywhere, with anyone"

— Ex: read/write email on web browser

Device portability:

— can be connected any time, anywhere to the network

Communication Device Characteristics:

- Fixed and wired
- Mobile and wired
- Fixed and wireless
- Mobile and wireless

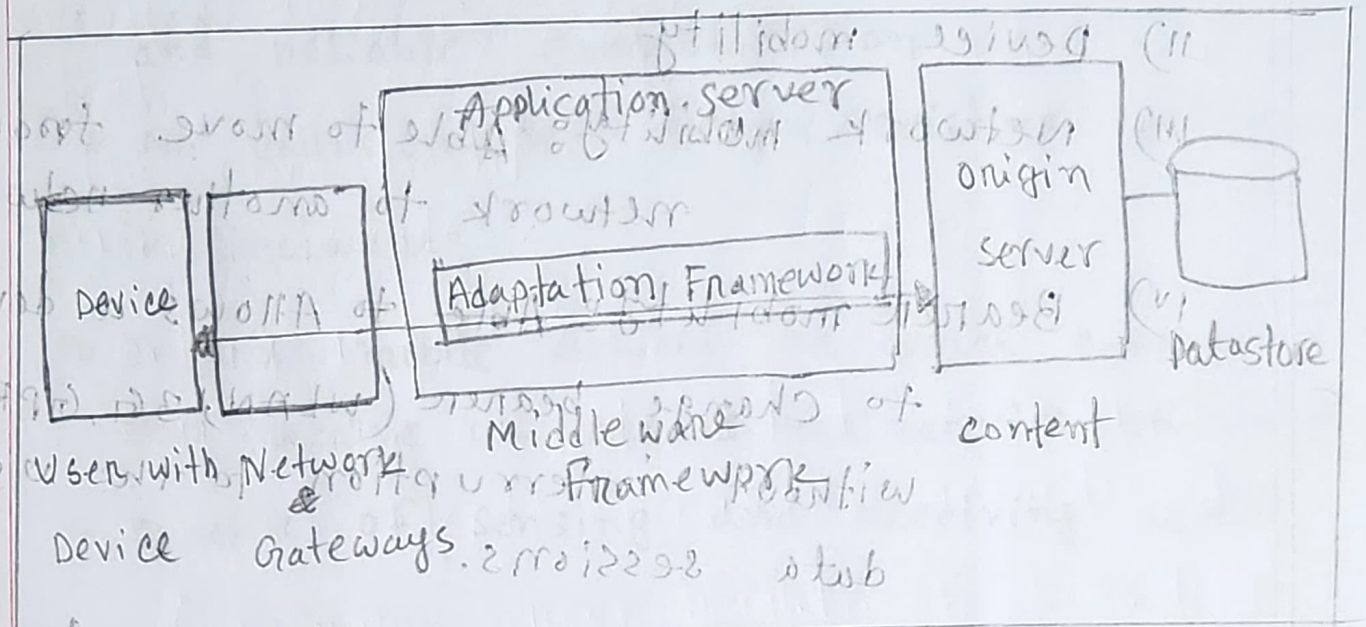
Mobile computing: function:

- i) User mobility
- ii) Device mobility
- iii) Network mobility: Able to move from one network to another network
- iv) Bearer mobility: Allows a device to change bearer (WLAN, 3G, GPRS) without interruption to the user's data sessions.
- v) session mobility: Able to move from one user-agent environment to another
- vi) service mobility: Able to move from one service to another

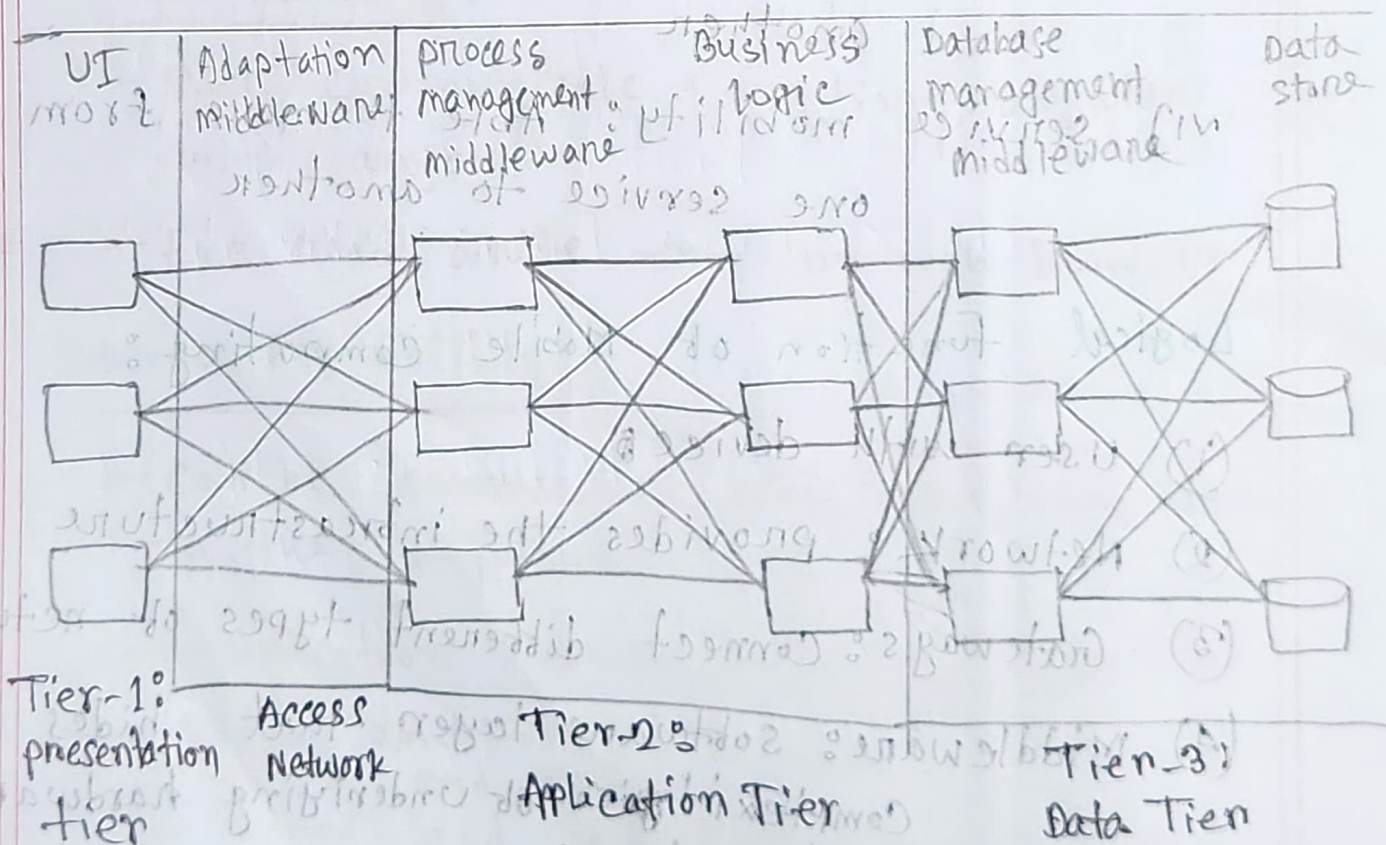
Logical function of Mobile computing:

- (1) User with device
- (2) Network: provides the infrastructure
- (3) Gateways: Connect different types of networks
- (4) Middleware: software layer that hides complexities of underlying hardware and network.

(b) Content: The actual services and applications delivered to the user. (1)



Mobile Computing Architecture:



presentation layer (UI) :

- * presents data to the user
- * permits data manipulation and data entry
- * Requests the data from Business layer

Business Logic layer :

- * Acts as the server for client requests from workstations according to Business rules fetch or insert data through the Data Layer.
- * Determines what data is needed.

Data Access Layer :

- * made up of the DBMS that provides all the data for the above two layers.

Examples of context :

- * Identity
- * Location
- * Date/Time
- * Environment
- * Browsing history etc.

Context-aware Computing:

Context-aware computing refers to systems that can sense, interpret and respond to the environment in which a device or user operates.

Working procedure:

- * Uses sensors to detect context.

- * System adapts behavior accordingly

(eg., auto screen brightness, phone disabling touchscreen during calls etc)

Benefits:

- * Reduces user effort

- * Provides smart environments

- * Enhances usability and user experience

Examples of context:

- * Identity

- * Location

- * Date/Time

- * Environment

- * Browsing history etc.

Context :

Context is any information that can be used to characterize the situation of an entity.

Types of context:

- (1) Time context (current time, day of week etc)
- (2) Physical context (location, temperature, etc)
- (3) User context (characteristics, habits, history, etc)
- (4) Computational context (user input, network status, etc)
- (5) Structural Context
 - * Telephone directory: including a name, address, and a 11-digit number
 - * collection of these records shows an interrelationship thus defines a context
- (6) Temporal Context
 - * defines the interrelation between time and the occurrence of an event

Classification :

(1) External (physical)

* Context that can be measured by hardware sensors

* Ex: Location, Light, sound, movement, temperature, touch etc

(2) Internal (logical)

* Mostly specified by the user

* Ex: The user's goal, tasks, work context, business processes, the user's emotional state etc.