**INIT-1**

**Mobile Computing**

**Chapter-1: Introduction to Mobile Communications and Computing:**

**1.Introduction to Mobile Computing:**

Mobile Computing is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link.

Mobile computing is a generic term that refers to a variety of devices that allow people to access data and information from wherever they are.

**The Benefits of Mobile Computing**

* **Connectivity:** You can stay connected to all sources at all times.
* **Social Engagement:** You can interact with a [variety of users](https://www.thebalance.com/how-to-develop-a-social-media-policy-1919167) via the Internet.
* **Personalization:**You can tailor your mobile computing to your individual needs.

**Mobile Devices**

"[Mobile device](https://www.thebalance.com/keeping-mobile-devices-safe-from-cyber-threats-4122471)" is a generic term used to refer to a wide range of devices that allow people to access data and information from anywhere at any time, from those that fit in your pocket to laptops that can help you stay connected. They include cellphones and other portable devices. Mobile computing can use cellphone connections to make phone calls, as well as to connect to the Internet. They include:

* Laptops
* Smartphones
* Tablets
* Wearable computers, such as the Apple Watch

**2.Mobile Computing Novel Applications:**

**i) Vehicles**

Today’s vehicles already comprise some, but tomorrow’s cars will comprise many wireless communication systems and mobility aware applications. Broadcast information are received via digital audio broadcasting (DAB) with 1.5 Mbit/s. For personal communication, a universal mobile telecommunications system (UMTS) phone might be available offering voice and data connectivity with 384 kbit/s. For remote areas, satellite communication can be used, while the current position of the car is determined via the global positioning system (GPS).

**ii) Emergencies**

Vital information about injured persons can be sent to the hospital from the scene of the accident.

Wireless networks are the only means of communication in the case of natural disasters such as hurricanes or earthquakes. In the worst cases, only decentralized, wireless ad-hoc networks survive.

**iii) Business**

With wireless access, the laptop can be turned into a true mobile office, but efficient and powerful synchronization mechanisms are needed to ensure data consistency.

At home, the laptop connects via a WLAN or LAN and DSL to the Internet. Leaving home requires a handover to another technology, e.g., to an enhanced version of GSM, as soon as the WLAN coverage ends. Due to interference and other factors, data rates drop while cruising at higher speed.

Trains already offer support for wireless connectivity. Several more handovers to different technologies might be necessary before reaching the office.

No matter when and where, mobile communications should always offer as good connectivity as possible to the internet, the company’s intranet, or the telephone network.

**iv) Replacement of wired networks**

In some cases, wireless networks can also be used to replace wired networks, e.g., remote sensors, for tradeshows, or in historic buildings. Due to economic reasons, it is often impossible to wire remote sensors for weather forecasts, earthquake detection, or to provide environmental information. Wireless connections, e.g., via satellite, can help in this situation.

**3. Limitations of Mobile Computing:**

1. **Range and bandwidth:** Mobile Internet access is generally slower than direct cable connections, using technologies such as [GPRS](https://en.wikipedia.org/wiki/GPRS) and [EDGE](https://en.wikipedia.org/wiki/EDGE), and more recently [HSDPA](https://en.wikipedia.org/wiki/HSDPA), [HSUPA](https://en.wikipedia.org/wiki/HSUPA), [3G](https://en.wikipedia.org/wiki/3G) and [4G](https://en.wikipedia.org/wiki/4G) networks and also the upcoming [5G](https://en.wikipedia.org/wiki/5G) network. These networks are usually available within range of commercial cell phone towers. High speed network wireless LANs are inexpensive but have very limited range.
2. **Security standards:** When working mobile, one is dependent on public networks, requiring careful use of [VPN](https://en.wikipedia.org/wiki/Virtual_private_network). Security is a major concern while concerning the mobile computing standards on the fleet. One can easily attack the VPN through a huge number of networks interconnected through the line.
3. **Power consumption:** When a power outlet or portable generator is not available, mobile computers must rely entirely on battery power. Combined with the compact size of many mobile devices, this often means unusually expensive batteries must be used to obtain the necessary battery life.
4. **Transmission interferences**: Weather, terrain, and the range from the nearest signal point can all interfere with signal reception. Reception in tunnels, some buildings, and rural areas is often poor.
5. **Potential health hazards:** People who use mobile devices while driving are often distracted from driving and are thus assumed more likely to be involved in traffic accidents.[[1]](https://en.wikipedia.org/wiki/Mobile_computing#cite_note-1) (While this may seem obvious, there is considerable discussion about whether banning mobile device use while driving reduces accidents or not.[[2]](https://en.wikipedia.org/wiki/Mobile_computing#cite_note-2)[[3]](https://en.wikipedia.org/wiki/Mobile_computing#cite_note-3)) Cell phones may interfere with sensitive medical devices. Questions concerning [mobile phone radiation and health](https://en.wikipedia.org/wiki/Mobile_phone_radiation_and_health) have been raised.
6. **Human interface with device**: Screens and keyboards tend to be small, which may make them hard to use. Alternate input methods such as speech or handwriting recognition require training.