University Research Resource Journal
ISSN : 2581-3730
JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR
Volume 6, Issue 1 (January to March, 2023)

Mobile Computing and Enlightening Application

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Abstract :

In this research article We're talking about mobile computing. its types and contemporary trends, technological period A better understanding of human movement patterns would result from the most recent technology, mobile computing, which enables the transmission of data, speech, and video. understanding of numerous significant socioeconomic and urban planning challenges. Mobile computing, sensing, and cloud computing are all combined to create new apps that handle large amounts of data, identify popular tourist destinations, and estimate relative traffic volumes on city highways. The primary concepts of trends, technology, mobile communication, and mobile hardware are discussed in this essay.

Keywords : Bandwidth, Devices, Data Distribution, and Portable devices, wireless transmission.

Review of Literature :

It enables them to save their account credentials on the device and gives them mobile access to their accounts. People love banking on the go. Attackers are currently concentrating their efforts on mobile devices because their preferred data is readily accessible on these devices, where security concerns are addressed less attentively (Alimardani & Nazeh, 2018; Jin et al., 2020; Vaghela, 2020)

According to Malavolta et al. (2015), mobile devices have become the most widely used and vital expedient for human need in recent years due to its practicality, use, and accessibility.

Users have no time or space limits while obtaining various personal services using a wide variety of mobile computing resources in an internal or external location, according to Weiser M (1991).

Introduction :

With the use of a mobile computing environment, users can send data from one device to another without the need for a physical connection or cables. In other words, mobile computing enables the transfer of data, speech, and video via a computer or any other device that supports wireless technology without being attached to a fixed physical link. With this technology, data is transmitted wirelessly using mobile phones, laptops, and other wireless devices. A wide communication coverage diameter is made possible by mobile computer technology.

There are three main components of mobile computing:

1. Mobile Communication
2. Mobile Hardware
3. Mobile Software

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1. Mobile Communication :

Mobile communication refers to the application of technology that enables us to connect with people across distances without the usage of wires or cables. Our lives are made simpler by mobile communication, which also saves time and effort.

It provides High-capacity load balancing, Scalability, Redundancy, Roaming

2. Mobile Hardware :

Mobile devices or device components that can be utilized to access or receive the mobility service are referred to as mobile hardware. A receptor media that can send and receive signals is integrated into these devices. These devices could run in full duplex. They can simultaneously send and receive signals, in other words. It is not necessary for them to wait for one device to finish speaking before the other begins. Smartphones, laptops, tablet PCs, portable PCs, Personal Digital Assistants, and other devices are examples of mobile hardware.

3. Mobile Software:

Mobile software is a program that runs on mobile hardware. This is designed to deal capably with the characteristics and requirements of mobile applications. This is the operating system for the appliance of mobile devices. In other words, you can say it is the heart of the mobile systems. This is an essential component that operates the mobile device.

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Devices used in Mobile Computing :

Personal Digital Assistant (PDA) :

A personal Digital Assistant (PDA) is a mobile device used to function as a personal information manager or a personal data assistant. an electronic handheld organizer used in the 1990s and 2000s to store contact information, manage calendars, communicate by e-mail, and handle documents and spread sheets, usually in communication with the user's personal computer.

These devices can be constantly synchronized due to the usage of infrared and Bluetooth connections.

Smartphone :

A smartphone is a mobile device that combines cellular and mobile computing functions into single unit. Smartphones were created to offer more sophisticated connectivity and computing power than simple feature phones. these phones also feature high-resolution touch screens, web browsers that can access and display normal web pages, and high-speed data connections through Wi-Fi and cellular broadband and Smartphones include the most up-to-date features of computers, like several cameras, a sophisticated OS, and more RAM and ROM. These days, they are also constructed with some artificial intelligence characteristics, like waterproofing with IP67 and IP68 ratings, unlocking using fingerprint or facial recognition scanners, and countless other functions.

Tablet PC and iPads :

This portable device has a touch screen and can be operated by touching the screen and making motions on it, making it superior to a cell phone or a PDA. They are frequently soothed by the touch of a finger or a pen. They are typically lightweight records and are in record form. iPads, Galaxy Tabs, Blackberry Playbooks, and other devices are examples.

Users get access to high-speed internet, streaming video and audio data, receiving and sending emails, giving and attending lectures, editing and redoing log files, and many other features.

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Wearable Computers :

A type of computer known as a wearable computer can be worn by the user underneath, along with, or on top of clothing. They are small electronic devices also known as wearables, body- borne computers, or wearable tech. Smartwatches, digital fitness bands, and other devices are some examples of wearable computers.

It also includes wearables such as heart pacemakers and other prosthetics and behavioral modelling and sensory integration are included. systems for managing services in the healthcare industry electronic textiles

Current Trends in Mobile computing :

1) WIMAX :

WiMAX (Worldwide Interoperability for Microwave Access) is a wireless communications standard intended to deliver data rates of 30 to 40 megabits per second, with the most recent version enabling fixed stations to operate at up to 1 Gbit/s. It belongs to the fourth generation, or 4G, of wireless technology. WiMAX provides a metropolitan area network with a signal radius of around 50 km (about 31.07 mi), greatly exceeding the 30-meter wireless range of a typical Wi-Fi Local Area Network (LAN). WiMAX can provide data transfer rates that are higher than those of traditional cable modem and DSL connections, but because the capacity must be shared among many users, actual speeds will be lower.

2) Near Field Communication:

Smartphones and other similar devices can communicate with each other wirelessly using Near Field Communication (NFC), a set of standards that allows them to be brought near together or within a few centimeters of each other. Applications for contactless purchases, data exchange, and streamlined Wi-Fi setup are all currently available or under development. A "tag" is an unpowered NFC chip that allows for communication between NFC devices.

3) High Refresh Rate Display:

The number of times the screen is updated per second is referred to as the refresh rate. The smoother the display, the higher the refresh rate. Currently, many high-end smartphones and laptops have displays with refresh rates of 90Hz, 120Hz, or 144Hz. While some of them use LCD panels and some use Amole'd or OLED panels, Amole'd displays look much better than LCD displays. But this fast battery drain is caused by the high refresh rate display. This may be the explanation for Apple's decision to buck the trend in their most recent iPhone models.

4) 5G:

5G is the fifth-generation technology standard for broadband cellular networks wherein small geographic regions known as cells are used to divide the service area. A local antenna within the cell serves as the connection point for all 5G wireless devices to the Internet and phone network. The latest networks offer faster download rates, which could eventually reach 10 gigabits per second (Gbit/s).

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5G has higher bandwidth and can thus connect to more different devices, improving the quality of Internet services in crowded areas.

Applications of Mobile Computing :

1) Replacement of Wired Networks :

For remote sensors, trade exhibitions, or in old buildings, wireless networks can also take the place of wired networks. It is frequently impractical to link remote sensors for weather forecasts, earthquake detection, or to give environmental data due to financial considerations.

2) E-Governance :

Governments are updating their rural areas using a variety of communication options. Governments are connecting rural areas with head quarter offices for monitoring to give health, education, safety, farming, weather forecasts, and many other related information to governance.

3) Tourism :

The largest industry in every nation is tourism. Most tourist destinations are located far from populated areas. In this situation, wireless communication is essential for maintaining connectivity for tourists. They seek out travel services, hotel services, meal services, etc. and stay in constant communication with friends and family.

4) Credit card verification :

Mobile computing is the safest technique of credit card verification. When customers use their credit cards to make purchases at malls and other small businesses and pay their bills, a network must be established between the POS terminal and the bank's main computer.

The card's credentials must be immediately checked over a secure wireless network if they match, the transaction can proceed if not, it is rejected. As a result, transaction times are expedited, and the POS network is put under less stress.

5) Global Positioning System (GPS) :

The Global Positioning System (GPS) is a satellite-based navigation system that provides location and time information in all conditions, everywhere on or near the Earth, when there is a clear line of sight to four or more GPS satellites. The GPS program adds demanding tools to customers, both commercial and civil, all around the world. The foundation of improving the world's air traffic control, navigation, and location services is GPS.

Security and Thread Issues with Mobile Computing:

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1) Denial of Service (Dos) attacks : is a cyberattack where the goal is to temporarily or permanently interrupt the services of a host connected to a network to make a computer or network resource unavailable to its intended users. The usual method for committing denial of service is to overwhelm the targeted machine or resource with excessive requests to overwhelm the system and prevent some or all valid requests from being satisfied and Users cannot benefit from using its service because of the slow network it causes.

2) Eavesdropping : It states that if the wireless network was not secure enough, the attacker may log on and view sensitive data. It is also possible to accomplish this if the data is not encrypted.

3) Spoofing : In this security vulnerability, the attacker pretends to be another user's authorized account and tries to gain access to private information and unauthorized services.

Forced De-Authentication :

In this security problem, the attackers convince the mobile user or endpoint to disconnect and reconnect to receive a new signal. They place their device between the mobile device and the network throughout this process to steal information or commit fraud.

Benefit of mobile Computing :

- Connectivity
- Better Communication
- Increased Collaboration with your team
- Remote Work
- Reduced operational costs and saved time
- Increased operational costs and saved time
- Increased productivity.

Limitations :

- Bandwidth :

Transmission rates for wireless devices are still quite low as compared to desktop systems, although they are constant growth. Researchers work towards low-overhead communication protocols that are more effective.

- Security Standard :

In addition to being easier to take, portable electronics are also more vulnerable to eavesdropping on radio interfaces. Encryption, authentication, and other security measures for wireless access must always be effective and user-friendly.

- Network Issues :

Discovery of the connection-service to destination and connection stability

Conclusion :

Data, voice, and video transmission are all possible with mobile computing. But as computing has advanced, people can now work from anywhere while maintaining connections and security measures thanks to mobile computing. The ability to playback audio and video recordings while travelling is now made available by mobile computing. There is a wide selection of videos, academic books, and conversational stuff. With the introduction and use of pricey high-speed data partners One can discover all the enjoyment they want when looking up flood information online. News, films, and television are just a few of the online entertainment alternatives. This configuration didn't exist before mobile computing concern the fundamentals of computing.

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