

A Study : Mobile Computing

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ABSTRACT

Mobile computing is human-computer interaction which allows for 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 technology in which a computer is expected to be transported during normal usage which includes Mobile communication, Hardware, Software. In this paper, we will study about the concept of mobile computing which involves Mobile communication, Hardware, Software. In this paper, we will discuss about some portable computing devices.

Keywords: Mobile communication, Wireless network, Mobile Computing.

I. INTRODUCTION

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. Access to information sources worldwide is the wonderful invention of Internet. To change our perceptions of the Internet, different variety of wireless devices offering IP connectivity, such as PDA's, handhelds, and digital cellular phones. Use of wireless devices is the beginning to change basic usage of internet. Mobile computing offers many advantages. Confident access to the Internet anytime, anywhere will help free us from the ties that bind us to our desktops. It provide tools to us for internet availability to build new computing environment where we go. This is especially convenient in a wire-less LAN office environment, where the boundaries between attachment points are not sharp and are often invisible. In mobile networking, computing activities are not disrupted when the user changes the computer's point of attachment to the Internet. Mobile computing involves mobile communication, mobile hardware, and mobile software. Mobile Communication include ad hoc networks and infrastructure networks as well as communication properties, protocols, data formats and concrete technologies. Mobile hardware includes mobile devices or device components. Mobile software deals with the characteristics and requirements

of mobile applications. The essence of mobile computing is to be able to work from any location.

Mobile Communication

The mobile communication refers to the infrastructure to ensure that seamless and reliable communication goes on. These would include devices such as protocols, services, bandwidth necessary to support the stated services. At this stage data format is also defined. It protect from collision with other existing systems which offer the same service .

Mobile Hardware

Mobile hardware includes mobile devices or device components. Mobile hardware includes mobile devices or device components that receive or access the service of mobility. They would range from portable laptops, smartphones, tablet Pc's, Personal Digital Assistants. These devices will have a receptor medium that is capable of sensing and receiving signals. They are capable of sending and receiving signals at the same time, so these devices are configured to operate in full-duplex.

Mobile Software

Mobile software deals with the characteristics and requirements of mobile applications. Mobile software is the actual program that runs on the mobile hardware. It deals with the characteristics and requirements of mobile applications. This is the engine of the mobile

device. In other terms, it is the operating system of the appliance. It's the essential component that operates the mobile device.

II. METHODS AND MATERIAL

1. Classification of Mobile Computing

Since portability is the main factor, this type of computing ensures that users are not tied or pinned to a single physical location, but are able to operate from anywhere. It incorporates all aspects of wireless communications. With mobile computing one physical location has been eliminated. We hear of terms such as telecommuting, which is being able to work from home or the field but at the same time accessing resources as if one is in the office. The portability of these devices ensure and enable the users to access all services as if they were in the internal network of their company. For example, the use of Tablet PC and iPads. This new technology enables the users to update documents, surf the internet, send and receive e-mail, stream live video files, take photographs and also support video and voice conferencing. The use of iPads, tablets, smartphones, and notebooks, have pushed the demand for these devices. Modern day workers have such devices that enable them to carry out their work from the confines of their own location. These devices are configured to access and store large amounts of vital data. Executive and top management can take decisions based on ready information without going to the office. For example, sales reports and market forecasts can be accessed through these devices or a meeting can take place via video or audio conferencing through these devices. With such features being high in demand, manufacturers are constantly coming up with applications geared to support different services in terms of mobile computing. Mobile computing is not only limited to mobile phones, but there are various gadgets available in the market that are built on a platform to support mobile computing. They are usually classified in the following categories –

Personal Digital Assistant (PDA)

The main purpose of this device is to act as an electronic organizer or day planner that is portable, easy to use and capable of sharing information with your computer systems. PDA is an extension of the PC, not a replacement. These systems are capable of sharing information with a computer system through a process or service known as synchronization. Both devices will access each other to check for changes or updates in the

individual devices. The use of infrared and Bluetooth connections enables these devices to always be synchronized. With PDA devices, a user can browse the internet, listen to audio clips, watch video clips, edit and modify office documents, and many more services. The device has a stylus and a touch sensitive screen for input and output purposes.

Smartphones

This kind of phone combines the features of a PDA with that of a mobile phone or camera phone. It has a superior edge over other kinds of mobile phones. Smartphones have the capability to run multiple programs concurrently. These phones include high-resolution touch screens, web browsers that can access and properly display standard web pages rather than just mobile-optimized sites, and high-speed data access via Wi-Fi and high speed cellular broadband. The most common mobile Operating Systems (OS) used by modern smartphones include Google's Android, Apple's iOS, Nokia's Symbian, RIM's BlackBerry OS, Samsung's Bada, Microsoft's Windows Phone. Such operating systems can be installed on different phone models, and typically each device can receive multiple OS software updates over its lifetime.

Tablet PC and iPads

This mobile device is larger than a mobile phone or a PDA and integrates into a touch screen and is operated using touch sensitive motions on the screen. They are often controlled by a pen or by the touch of a finger. They are usually in slate form and are light in weight. Examples would include ipads, Galaxy Tabs, Blackberry Playbooks etc. They offer the same functionality as portable computers. They support mobile computing in a far superior way and have enormous processing horsepower. Users can edit and modify document files, access high speed internet, stream video and audio data, receive and send e-mails, attend/give lectures and presentations among its very many other functions. They have excellent screen resolution and clarity.

2. Principles of Mobile Computing Portability

Devices/nodes connected within the mobile computing system should facilitate mobility. These devices may have limited device capabilities and limited power supply, but should have a sufficient processing capability and physical portability to operate in a movable environment.

Connectivity

This defines the Quality of Service (QoS) of the network connectivity. In a mobile computing system, the network availability is expected to be maintained at a high level with the minimal amount of lag/downtime without being affected by the mobility of the connected nodes.

Interactivity

The nodes belonging to a mobile computing system are connected with one another to communicate and collaborate through active transactions of data.

Individuality

A portable device or a mobile node connected to a mobile network often denote an individual; a mobile computing system should be able to adopt the technology to cater the individual needs and also to obtain contextual information of each node.

III. RESULTS AND DISCUSSION

1. Major Advantages of Mobile Computing

Mobile computing has changed the complete viewpoint of our day-to-day life. Following are the major advantages of Mobile Computing –

Location Flexibility

This has enabled users to work from anywhere as long as there is a connection established. A user can work without being in a fixed position. Their mobility ensures that they are able to carry out numerous tasks at the same time and perform their stated jobs.

Saves Time

The time consumed or wasted while travelling from different locations or to the office and back, has been cut down. One can now access all the important documents and files over a secure channel or portal and work as if they were on their computer. It has enhanced telecommuting in many companies. It has also reduced unnecessary incurred expenses.

Enhanced Productivity

Users can work efficiently and effectively from whichever location they find comfortable. This in turn enhances their productivity level.

Ease of Research

Research has been made easier, since users earlier were required to go to the field and search for facts and feed

them back into the system. It has also made it easier for field officers and researchers to collect and feed data from wherever they are without making unnecessary trips to and from the office to the field.

Entertainment

It's easy to access a wide variety of movies, educational and informative material. With the improvement and availability of high speed data connections at considerable cost, one is able to get all the entertainment they want as they browse the internet for streamed data. One is able to watch news, movies, and documentaries among other entertainment offers over the internet. This was not possible before mobile computing dawned on the computing world.

Streamlining of Business Processes

Business processes are now easily available through secured connections. Looking into security issues, adequate measures have been put in place to ensure authentication and authorization of the user accessing the services. Some business functions can be run over secure links and sharing of information between business partners can also take place. Meetings, seminars and other informative services can be conducted using video and voice conferencing. Travel time and expenditure is also considerably reduced.

2. Limitations

Range & Bandwidth

Mobile Internet access is generally slower than direct cable connections, using technologies such as GPRS and EDGE, and more recently HSDPA, HSUPA, 3G and 4G networks and also the upcoming 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.

Security standards

When working mobile, one is dependent on public networks, requiring careful use of VPN. 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.

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.

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.

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. (While this may seem obvious, there is considerable discussion about whether banning mobile device use while driving reduces accidents or not.) Cell phones may interfere with sensitive medical devices. Questions concerning mobile phone radiation and health have been raised.

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.

IV. CONCLUSION

Today's computing has rapidly grown from being holding to a single location. With mobile computing, people can work from the comfort of any location they wish to as long as the connection and the security concerns are properly factored. In the same light, the presence of high speed connections has also promoted the use of mobile computing. Being an ever growing and emerging technology, mobile computing will continue to be a core service in computing, and Information and Communications Technology.

V. REFERENCES

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