

ISCA Notes Chapter 8- Part 2

Mobile Computing

- Mobile Computing refers to the technology that allows transmission of data via a computer without having to be connected to a physical link
- Mobile voice communication is widely established through the world and has a very rapid increase in the number of subscribers to the various cellular networks over the last few years

Components of Mobile Computing

Key Components of Mobile Computing are

- Mobile Communication:-refers to the infrastructure put in place to ensure that seamless and reliable communication goes on
- Mobile Hardware:- Includes mobile devices or device components that receive or access the service of mobility. They would range from portable laptops, smart phones, tablet PCs, and Personal Digital Assistants (PDA) that use an existing and established network to operate upon
- Mobile Software:-It is the actual programme that runs on the mobile hardware and deals with the characteristics and requirements of mobile applications

How mobile Computing Works?

- User enters or accesses data using the application in handheld computing device
- The new data are transmitted from the handheld computing device to site's information system
- Now, both systems have the same information and are in sync
- The Process work the same ways starting from the other direction

Benefits of Mobile Computing

- Provides Mobile workforce with remote access to work order details, such as work order location, contact information required completion date
- Enable Mobile sales personnel to update work order status in real-time, facilitating excellent communication
- Facilitate access to corporate services and information at anytime, from anywhere
- Provides remote access to the corporate knowledgebase at the job location
- Enables to improve management effectiveness by enhancing information quality, information flow and ability to control a mobile workforce

Limitations of Mobile Computing

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Insufficient Bandwidth	Mobile Internet access is generally slower than direct cable connections using technologies such as General Packet Radio Service(GPRS) and Enhanced Data for GSM(Global System for Mobile Communication)
Security Standards	When working mobile, one is dependent on the public networks, requiring careful use of Virtual Private Network (VPN). Security is a major concern while concerning the mobile computing standards
Power Consumption	When Power outlet or portable generator is not available, mobile computers must rely entirely on battery power .Compact sizes of mobile phones calls for expensive batteries
Transmission Interferences	Weather, terrain, and the range from the nearest signal point can all interfere with signal reception
Potential health hazards	People use mobile phones while driving are distracted from driving leading to accidents. Thus they are assumed to be more likely involved in traffic accidents. Cell phones may interfere with sensitive medical devices
Human Interference with devices	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

Issues in Mobile Computing

- Security Issues
- Bandwidth
- Location Intelligence
- Power Consumption
- Revising the technical architecture
- Reliability Coverage, Capacity and Cost
- Integration with legacy mainframe and emerging client/server applications
- End-to-end design and performance
- Business Challenges

Security Issues	Wireless networks have more security requirements than wired network. Number of approaches have been suggested • Confidentiality:- Preventing unauthorised users from gaining access to critical information of any particular user • Integrity:- Ensures unauthorised modification, destruction or creation of information cannot take place
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	• Availability:- Ensuring that authorised users getting the access they require • Legitimate:- Ensuring that only authorised users have access to services • Accountability:- Ensuring that the users are held responsible for their security related activities
Bandwidth	Bandwidth utilisation can be improved by logging(bulk operations against short requests) and compression of data before transmission
Location Intelligence	Mobile computer must be able to change the mode Infrared mode to radio mode as it moves from indoors to outdoors
Power Consumption	Mobile Computers rely on their batteries as the primary power source. Batteries should capable of long operation times
Revising the technical architecture	Mobile users are demanding and are important to the business world. Current communication technology must be revised to incorporate mobile connectivity
Reliability, Coverage, Capacity and Cost	Wireless network is less reliable, have less geographical coverage and reduced bandwidth
Integration with legacy mainframe and emerging client/server applications	Application development paradigms are changing, result has been huge inventory of applications using communication interfaces incompatible with the mobile connectivity have been accumulated
End to end design and performance	Since mobile computing devices involves multiple networks, and multiple application server platforms, estimates are difficult to achieve
Business Challenges	Business Challenges arise due to lack of trained professionals to bring the mobile technology to the general people and development of pilot projects for testing its capabilities

Green Computing

- Green computing is the environmentally responsible and eco-friendly use of computers and their resources.
- In broader terms, it is also defined as the study of designing, manufacturing/engineering, using and disposing of computing devices in a way that reduces their environmental impact.

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Green Computing Best Practices

- Develop a sustainable Green Computing Plan
- Recycle
- Make environmentally sound purchase decisions
- Reduce Paper Consumption
- Conserve Energy

Develop a Sustainable Green Computing Plan	• Involve stakeholders to include checklists , recycling policies, recommendations for disposal of used equipment • Encourage IT community for using the best practices • On- going communication about and campus commitment to green IT practices to produce notable results • Include power usage, reduction of paper consumption, as well as recommendations for new equipment and recycling old machines • Use Cloud Computing so that multiple organisations share the same computing resources
Recycle	• Dispose e-waste according to central , state and local regulations • Discard used or unwanted electronic equipment in a convenient and environmentally responsible manner • Manufacturers must offer safe end-of-life management and recycling options when products become unusable • Recycle Computers through manufacturer's recycling services •
Make environmentally sound purchase decisions	• Purchase of desktop computer, notebooks and monitors based on environmental attributes • Provide a clear, consistent set of performance criteria for the design of products • Recognising the manufacturer efforts to reduce the environmental impact of products by reducing environmentally sensitive materials • Use server and storage virtualization that can help improve resource utilisation, reduce energy costs and simplify maintenance
Reduce Paper Consumption	• Reduce paper consumption by use of e-mail and electronic archiving • Use of track changes feature in electronic documents, rather than redline corrections on paper • Use online marketing than paper based marketing • While printing, make sure to use both sides of the paper, recycle regularly, use smaller fonts and margins and selectively print required pages
Conserve Energy	• Use LCD Monitors than CRT Monitors

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	• Develop thin client strategy, which are smaller, cheaper and simpler for manufacturers to build than the traditional PCs or notebooks and most importantly use about half the power of a traditional desktop PC • Use notebook computers rather than desktop computers wherever possible • Power down the CPUs and other peripherals during extended periods of inactivity • Employ alternative energy sources for computing workstations, servers, networks, and data centers; and • Adapt more of Web Conferencing offers instead of travelling to meetings in order to go green and save energy
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Bring Your Own Device (BYOD)

- Bring your own device (BYOD)— refers to the policy of permitting employees to bring personally owned devices (laptops, tablets, and smart phones) to their workplace, and to use those devices to access privileged company information and applications

Advantages of BYOD

- **Happy Employees:-** Employees love to use their own devices when at work. Also reduces number of devices employee has to carry
- **Lower IT Budgets:-** Employees would involve financial savings to the organisation since employees would be using the devices already possessed by them
- **IT reduces support requirement:-** IT department need not have to provide end user support and maintenance for all these devices
- **Early adoption of new technologies:-** Employees are generally proactive in the adoption of new technologies that result in enhanced productivity
- **Increased employee efficiency:-** Efficiency of employee is more when he works on his own device

Emerging BYOD threats

- **Network Risks:-** As BYOD permits the employees to carry their own devices, the IT practice team is unaware of the number of devices connected to the network. Network visibility is of higher importance
- **Device Risks:-** Loss or stolen devices can result in enormous financial and reputational loss to the organisation as device may hold sensitive corporate information
- **Application Risks:-** Employees phones and smart devices that were connected to the network were not protected by security software

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- **Implementation Risks:-** The effective implementation of the BYOD program should not only cover the technical issues mentioned above but also mandate the development of a robust implementation policy

Social Media, Web 2.0 and Web 3.0

Social Media

- Social Network is usually created by a group of individuals, who have a set of common interests and objectives

Web 2.0

- Web 2.0 is the term given to describe a second generation of the World Wide Web that is focused on the ability for people to collaborate and share information online
- Components of Web 2.0 for social networks
 - **Communities:-** Online space formed by group of individuals to share their thoughts, ideas and have a variety of tools to promote social networking
 - **RSS-generated syndication:-** RSS (Rich Site Summary) is a type of web feed which allows users to access updates to online content in a standardised, computer-readable format
 - **Bloggng:-** Blog is a journal, diary or a personal website that is maintained on the internet and is updated frequently by the user
 - **Wiki:-** Wiki is a set of co-related pages on a particular subject and allow users to share content
 - **Usage of Ajax and other technologies:-**
Ajax (Asynchronous JavaScript And XMLHttpRequest) is a set of Web development techniques using many Web technologies on the client side to create asynchronous Web applications
 - **Folksonomy:-** Folksonomy is the system in which users apply public tags to online items, typically to aid them in re-finding those items
 - **File Sharing/Podcasting:-** Facility helping the users to send their media files and related content online for other people of the network to see and contribute
 - **Mash-ups:-** A mashup, in web development, is a web page, or web application, that uses content from more than one source to create a single new service displayed in a single graphical interface

Types and Behaviour of Social Networks

Types of Social Networks

- **Social Network Contacts:-** Networks formed to keep contact with friends and family.
E.g. Facebook and Twitter

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- **Study Circles :-** Social network dedicated to students, where they can have areas dedicated to student study topics
- **Social Networks for specialist groups:-** Specifically designed for doctors, scientists, engineers, members of corporate industries. E.g.-Linkedin
- **Networks for Fine arts:-** Social networks dedicated to people linked with music, painting and related arts
- **Police and Military Networks:-** Though not on a public domain, operate much like social networks on a private domain due to confidentiality of information
- **Sporting Networks:-** Social Networks dedicated to people of sporting fraternity and have gamut of information related to this field
- **Mixed Networks:-** Social networks that have a subscription of people from all of the above groups and is a heterogeneous social network serving multiple types of social collaboration
- **Social Networks for the Inventors:-** Social network for people who have invented the platform of social networks
- **Shopping and Utility Service Networks:-** Present world of consumerism has triggered people to invest in social networks, which will try to analyse the social behaviour and send related information for the same to respective marts and stores
- **Others:-** There are multiple other social networks, which serve huge number of the internet population in multiple ways

Applications of Web 2.0

- Social networks built on Web 2.0 concepts have become so cost affordable and easy to use that more and more people are migrating to this wave
- Web 2.0 finds applications in different fields, some of which are as follows
 - **Social Media :-** It provides a fundamental shift in the way people communicate and share information. It offers various tools and platforms that could be used by the users to share their data, perspectives and opinions among other user communities
 - **Marketing:-** Collaboration with the business partners and consumers can be improved by the companies by utilizing the tools provided by Web 2.0 paradigm. Consumer oriented companies use networks such as Twitter and Facebook as common elements of multi channel promotion of their products
 - **Education:-** Web 2.0 technologies can help the education scenario by providing students and the faculty with more opportunities to interact and collaborate with their peers

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Web 3.0

- Web 3.0 also known as Semantic Web, describes sites wherein the computers will be generate raw data on their own without direct user interaction
- The two major components of Web 3.0 are as follows
 - Semantic Web:- This provides the web user a common framework that could be used to share and reuse the data across various applications, enterprises and community boundaries
 - Web-Services:- Software system that supports computer-to-computer interaction over the internet. For example- the popular photo-sharing website Flickr provides a web service that could be utilized and the developers to programmatically interface with Flickr in order to search for images