Course Portfolio

Selected Topics in MIS

MGIS 476

Level VIII

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Department of Management Information System

COLLEGE OF BUSINESS ADMINISTRATION

Jazan University, Jazan(KSA)

Course Syllabus

Course Name: Selected Topics in MIS				Course Code: MGIS 476	
Credit Hours	**3**		**Lecture**	**Lab**	**Total**
		Contact Hours	**3**		**3**
Track	◯ **Core** ◯ **Major** ◯ **Elective**				
Level	**VIII**		**Prerequisite**		

Course Description: This course highlights on the issues involved in the latest trend in Management Information System and Communication Technology.

Objectives: To familiarize the students with latest trend in Information System and development in the field of IT. To aware the students with the current technological innovation.

Learning Outcomes: After going through with this course, students are expected to develop a general awareness about the current technology being used in the field of IT and Management. The students can understand with the latest innovative skills being implemented in their day to day life to ease their life and their business operation.

Skills to be developed throughout the course: Students will develop their analytical and oral communication skills via case study work carried out in seminar session. Information technology and written communication will be developed when completing the written assignment which will also test students creative skills and their abilities to present theoretical information in practical situations.

Course Description

Selected Topics In MIS

Unit – I

Wireless Technologies:

Wireless Networks Concepts, 2G & 3G Mobile Network Technology, GSM, Services of GSM, Architecture of GSM, CDMA, Satellite System, Broadcast System, Digital Audio Broadcasting, WDM.

Unit – II

Wireless LAN:

Wireless LAN concepts, Infrared and Radio Transmission, Bluetooth, Wireless standards, Mobile IP, Tunneling and encapsulations,

Unit – III

Social Networking:

Introduction, Social Network and KMS, Social Network Analysis, Social Networking Merits, Social Network Issues.

Unit – IV

Cloud Computing:

Cloud Computing Introduction, Advantages and Disadvantages, Challenges and opportunities Cloud Architecture, Cloud Computing Characteristics, Cloud Service Models, Different Cloud Computing Layers, Cloud Computing Service Layers, Future.

Learning resources:

1. **Text Books:**

Author	Title	Publisher	Year
Alex Leon & Mathew Leon	Fundamentals of Information Technology	Vikas Publishing House Pvt Limited, Nov 1, 602 pages	2009
George Beekman, Eugene J. Rathswohl	Computer Confluence	Addison-Wesley	1999
George Beekman, Ben Beekman	Tomorrow's Technology and You	Prentice Hall PTR	2008

2. **E- Library Reserves**

   www.emaraldinsight.com/insight
   www.en.wikipedia/wiki/listof_management_topics
   www.geocities.ws/whitelotus/index.htm (most important)

3. **Internet**

   - Ebsco Business Source Premier: A database containing several hundred key business and management journals with full text articles updated daily.
   - www.decalibrary.org
   - www.ipl.org
   - www.lisa.lsbu.ac.in

4. **Journals**

   - Journals of product innovation
   - Harvard Business Review
   - International Journal of Project Management
   - Journal of Operation Management

Delivery and Teaching Strategy: (Lecture, online, Physical, blended self directed through CD, web based courses and DVD)

Methods of Instruction: It would be based on lecture, demonstration and assignment review. Questions are encouraged and participation is expected.

Assessment Strategy:

1. **First Mid Term Exam: 20 Marks to be held on…… Day, …….. Month, 20….**
2. **Second Mid Term Exam: 20 Marks to be held on…… Day, …….. Month, 20….**
3. **Attendance, Class Participation & Assignment: 10 Marks**
4. **Total: 100 Marks**

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Unit – I

Wireless Technologies

Wireless Network Introduction

Definition: A **wireless network** is any type of computer network that uses wireless data connections for connecting network nodes.

Wireless networking is a method by which homes, telecommunications networks and enterprise (business) installations avoid the costly process of introducing cables into a building, or as a connection between various equipment locations. Wireless telecommunications networks are generally implemented and administered using radio communication. This implementation takes place at the physical level (layer) of the OSI model network structure.

Examples of wireless networks include cell phone networks, Wi-Fi local networks and terrestrial microwave networks.

Wireless links

- ***Terrestrial microwave*** – Terrestrial microwave communication uses Earth-based transmitters and receivers resembling satellite dishes. Terrestrial microwaves are in the low-gigahertz range, which limits all communications to line-of-sight. Relay stations are spaced approximately 48 km (30 mi) apart.

- ***Communications satellites*** – Satellites communicate via microwave radio waves, which are not deflected by the Earth's atmosphere. The satellites are stationed in space, typically in geosynchronous orbit 35,400 km (22,000 mi) above the equator. These Earth-orbiting systems are capable of receiving and relaying voice, data, and TV signals.

1. ***Cellular and PCS*** *systems* use several radio communications technologies. The systems divide the region covered into multiple geographic areas. Each area has a

low-power transmitter or radio relay antenna device to relay calls from one area to the next area.

- ***Radio and spread spectrum technologies*** – Wireless local area networks use a high-frequency radio technology similar to digital cellular and a low-frequency radio technology. Wireless LANs use spread spectrum technology to enable communication between multiple devices in a limited area. IEEE 802.11 defines a common flavor of open-standards wireless radio-wave technology known asWifi.

- ***Free-space optical communication*** uses visible or invisible light for communications. In most cases, line-of-sight propagation is used, which limits the physical positioning of communicating devices.

Types of wireless networks

Wireless PAN

Wireless personal area networks (WPANs) interconnect devices within a relatively small area, that is generally within a person's reach. For example, both Bluetooth radio and invisible infrared light provides a WPAN for interconnecting a headset to a laptop. ZigBee also supports WPAN applications. Wi-Fi PANs are becoming commonplace (2010) as equipment designers start to integrate Wi-Fi into a variety of consumer electronic devices. Intel "My WiFi" and Windows 7 "virtual Wi-Fi" capabilities have made Wi-Fi PANs simpler and easier to set up and configure.

Wireless LAN

A wireless local area network (WLAN) links two or more devices over a short distance using a wireless distribution method, usually providing a connection through an access point for Internet access. The use of spread-spectrum or OFDM technologies may allow users to move around within a local coverage area, and still remain connected to the network.

Products using the IEEE 802.11 WLAN standards are marketed under the Wi-Fi brand name. Fixed wireless technology implements point-to-point links between computers or networks at two distant locations, often using dedicated microwave or modulated laser light beams over line of sight paths. It is often used in cities to connect networks in two or more buildings without installing a wired link.

Wireless mesh network

A wireless mesh network is a wireless network made up of radio nodes organized in a mesh topology. Each node forwards messages on behalf of the other nodes. Mesh networks can "self heal", automatically re-routing around a node that has lost power.

Wireless MAN

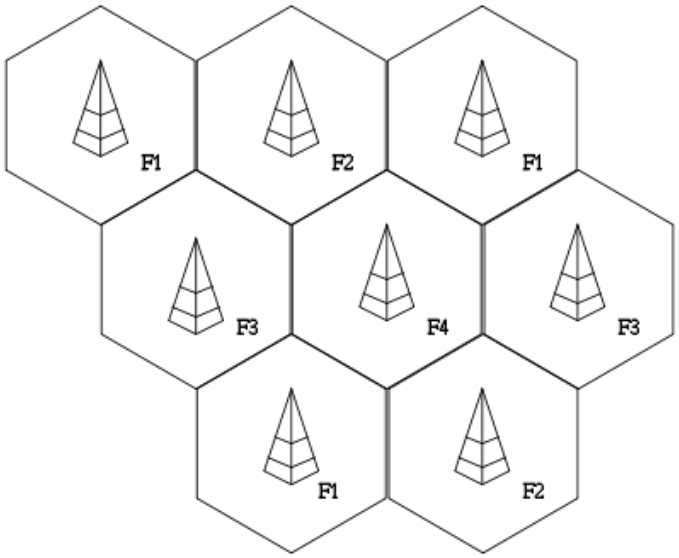
Wireless metropolitan area networks are a type of wireless network that connects several wireless LANs.

- WiMAX is a type of Wireless MAN and is described by the IEEE 802.16 standard.

Wireless WAN

Wireless wide area networks are wireless networks that typically cover large areas, such as between neighboring towns and cities, or city and suburb. These networks can be used to connect branch offices of business or as a public internet access system. The wireless connections between access points are usually point to point microwave links using parabolic dishes on the 2.4 GHz band, rather than omni directional antennas used with smaller networks. A typical system contains base station gateways, access points and wireless bridging relays. Other configurations are mesh systems where each access point acts as a relay also. When combined with renewable energy systems such as photo-voltaic solar panels or wind systems they can be stand alone systems.

Cellular network



A **cellular network** or **mobile network** is a radio network distributed over land areas called cells, each served by at least one fixed-location transceiver, known as a cell site or base station. In a cellular network, each cell characteristically uses a different set of radio frequencies from all their immediate neighboring cells to avoid any interference.

When joined together these cells provide radio coverage over a wide geographic area. This enables a large number of portable transceivers (e.g., mobile phones, pagers, etc.) to communicate with each other and with fixed transceivers and telephones anywhere in the network, via base stations, even if some of the transceivers are moving through more than one cell during transmission.

Although originally intended for cell phones, with the development of smartphones, cellular telephone networks routinely carry data in addition to telephone conversations:

- Global System for Mobile Communications (GSM): The GSM network is divided into three major systems: the switching system, the base station system, and the operation and support system. The cell phone connects to the base system station which then connects to the operation and support station; it then connects to the switching station where the call is transferred to where it needs to go. GSM is the most common standard and is used for a majority of cell phones.[7]
- Personal Communications Service (PCS): PCS is a radio band that can be used by mobile phones in North America and South Asia. Sprint happened to be the first service to set up a PCS.

- D-AMPS: Digital Advanced Mobile Phone Service, an upgraded version of AMPS, is being phased out due to advancement in technology. The newer GSM networks are replacing the older system.

Global area network

A global area network (GAN) is a network used for supporting mobile across an arbitrary number of wireless LANs, satellite coverage areas, etc. The key challenge in mobile communications is handing off user communications from one local coverage area to the next. In IEEE Project 802, this involves a succession of terrestrial wireless LANs.[8]

Space network

Space networks are networks used for communication between spacecraft, usually in the vicinity of the Earth. The example of this is NASA's Space Network.

Different uses

- ✓ Wireless communication is used to meet many needs. The most common use is to connect laptop users who travel from location to location. Another common use is for mobile networks that connect via satellite.
- ✓ Some examples of usage include cellular phones which are part of everyday wireless networks, allowing easy personal communications.
- ✓ Another example, Inter-continental network systems, use radio satellites to communicate across the world.
- ✓ Emergency services such as the police utilize wireless networks to communicate effectively as well. Individuals and businesses use wireless networks to send and share data rapidly, whether it be in a small office building or across the world.

Examples of Wireless Communication System

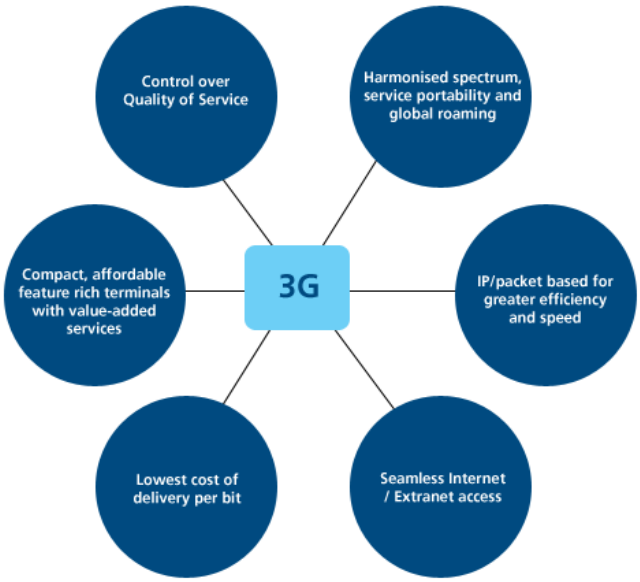
1. Cellular phones and pagers: provide connectivity for portable and mobile applications, both personal and business
2. Global Positioning System (GPS): allows drivers of cars and trucks, captains of boats and ships, and pilots of aircraft to ascertain their location anywhere on earth
3. Cordless computer peripherals: the cordless mouse is a common example; keyboards and printers can also be linked to a computer via wireless
4. Home-entertainment-system control boxes: the VCR control and the TV channel control are the most common examples; some hi-fi sound systems and FM broadcast receivers also use this technology
5. Remote garage-door openers: one of the oldest wireless devices in common use by consumers; usually operates at radio frequencies

2G & 3G Mobile Network

Second Generation (2G) technology was launched in the year 1991 in Finland. It is based on the technology known as global system for mobile communication or in short we can say GSM. This technology enabled various networks to provide services like text messages, picture messages and MMS. In this technology all text messages are digitally encrypted due to which only the intended receiver receives message. These digital signals consume less battery power, so it helps in saving the battery of mobiles.

The technologies used in 2G are either TDMA (Time Division Multiple Access) which divides signal into different time slots or CDMA (Code Division Multiple Access) which allocates a special code to each user so as to communicate over a multiplex physical channel. 2G networks are fairly basic in terms of functionality. They're intended to transmit voice data in real-time and not much else. Very lousy codecs are used to encode the voice data, compensating for the relatively low bandwidth of a 2G connection. As a direct result of this, it's hard to hear subtle intonation in someone's voice over a 2G cell phone connection. 2G networks can support other features but

they're limited by low bandwidth and slow speeds; features like internet connectivity are typically reduced to slowly loading very basic content; and even with modern Smartphone level hardware, it would be a real pain to try and download large apps. 2G as a standard is largely obsolete in the United States, and realistically you won't be getting a 2G plan unless you have old hardware which you specifically want to use. However, 2G still sees substantial use in developing nations like India due to its much lower cost of operation and use.



Third Generation (3G) technology 3G generally refers to the standard of accessibility and speed of mobile devices. It was first used in Japan in the year 2001. The standards of the technology were set by the International Telecommunication Union (ITU). This technology enables use of various services like GPS (Global Positioning System), mobile television and video conferencing. It not only enables them to be used worldwide, but also provides with better bandwidth and increased speed.

This technology is much more flexible as it can support 5 major radio technologies that operate under CDMA, TDMA and FDMA. CDMA accounts for IMT-DS (direct speed), IMT-MC (multi carrier). TDMA holds for IMT-TC (time code), IMT-SC (single carrier). This technology is also comfortable to work with 2G technologies. The main aim of this technology is to allow much better coverage and growth with minimum investment.

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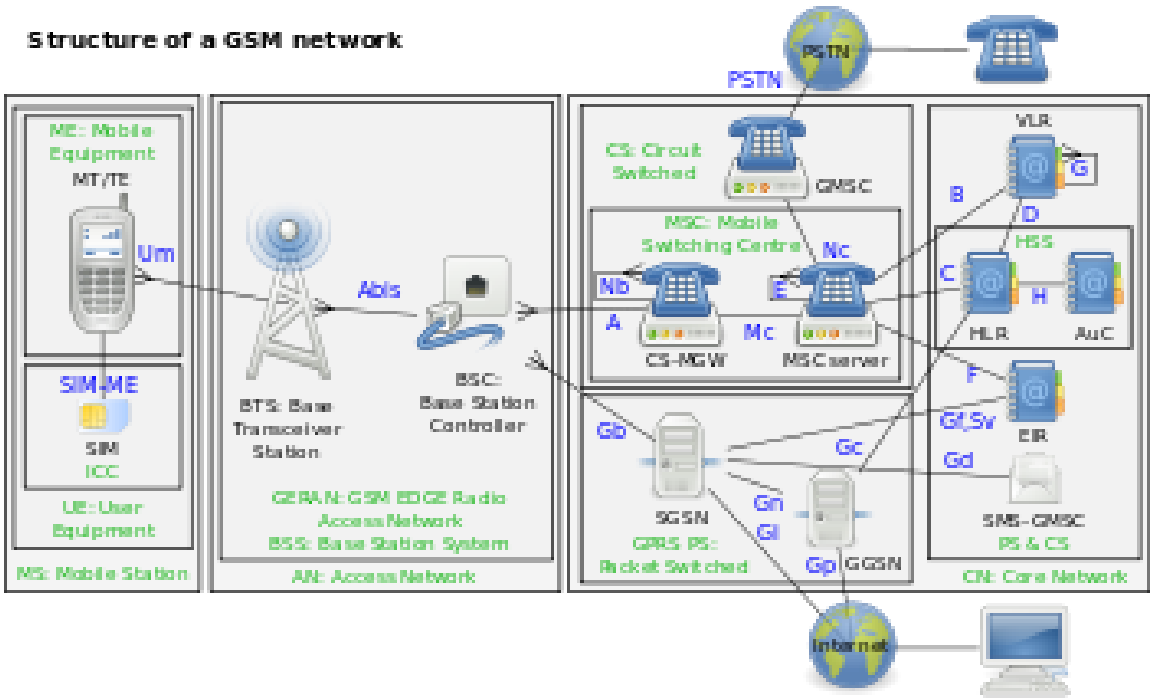
GSM (Global System Mobile)

(**Global System for Mobile Communications**, originally ***Group Spécial Mobile***), is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones. It became the de facto global standard for mobile communications with over 80% market share.



Definition: GSM is a TDMA based wireless network technology developed in Europe that is used throughout most of the world. GSM phones make use of a SIM card to identify the user's account. The use of the SIM card allows GSM network users to quickly move their phone number from one GSM phone to another by simply moving the SIM card. Currently GSM networks operate on the 850MHz, 900MHz, 1800MHz, and 1900MHz frequency bands. Devices that support all four bands are called quad-band, with those that support 3 or 2 bands called tri-band and dual-band, respectively. In the United States, Cingular operates on the 850 and 1900MHz bands, while T-Mobile operates only on the 1900MHz band.

Characteristics of GSM

- Communication

• mobile, wireless communication; support for voice and data services

• Total mobility

• international access, chip-card enables use of access points of different providers

• Worldwide connectivity

• one number, the network handles localization

• High capacity

• better frequency efficiency, smaller cells, more customers per cell

• High transmission quality

• high audio quality and reliability for wireless, uninterrupted phone calls at higher speeds (e.g., from cars, trains)

• Security functions

• access control, authentication via chip-card and PIN

Disadvantages

Disadvantages of GSM are:

• There is no perfect system!!

• no end-to-end encryption of user data

• no full ISDN bandwidth of 64 kbit/s to the user, no transparent B-channel

• reduced concentration while driving

• electromagnetic radiation

• abuse of private data possible

• roaming profiles accessible

• high complexity of the system

• several incompatibilities within the GSM standard

GSM Architecture

GSM is a PLMN (Public Land Mobile Network)

• several providers setup mobile networks following the GSM standard within each country

• components

• MS (mobile station)

• BS (base station)

• MSC (mobile switching center)

• LR (location register)

• subsystems

• RSS (radio subsystem): covers all radio aspects

• NSS (network and switching subsystem): call forwarding,

handover, switching

• OSS (operation subsystem): management of the network.

CDMA

Code division multiple access (**CDMA**) is a channel access method used by various radio communication technologies.

CDMA is an example of multiple access, which is where several transmitters can send information simultaneously over a single communication channel. This allows several users to share a band of frequencies (see bandwidth). To permit this to be achieved without undue interference between the users CDMA employs spread-spectrum technology and a special coding scheme (where each transmitter is assigned a code).

CDMA is used as the access method in many mobile phone standards such as cdmaOne, CDMA2000 (the 3G evolution of cdmaOne), and WCDMA (the 3G standard used by GSM carriers), which are often referred to as simply *CDMA*.

Difference Between CDMA & GSM

GSM and **CDMA** are competing wireless technologies with GSM enjoying about an 82% market share globally. In the U.S., however, CDMA is the more dominant standard. Technically GSM (**Global System for Mobile** communications, originally from *Groupe Spécial Mobile*) is a specification of an entire wireless network infrastructure, while CDMA relates only to the air interface — the radio portion of the technology.

Code division multiple access (**CDMA**) describes a communication channel access principle that employs spread-spectrum technology and a special coding scheme (where each transmitter is assigned a code). CDMA also refers to digital cellular telephony systems that use this multiple access scheme, as pioneered by QUALCOMM, and W-CDMA by the International Telecommunication Union (ITU), which is used in GSM's UMTS.

Comparison chart

	CDMA	GSM
Stands for	Code Division Multiple Access	Global System for Mobile communication
Storage Type	Internal Memory	SIM (subscriber identity module) Card
Global market share	25%	75%
Dominance	Dominant standard in the U.S.	Dominant standard worldwide except the U.S.
Data transfer	EVDO/3G/4G/LTE	GPRS/E/3G/4G/LTE
Network	There is one physical channel and a special code for every device in the coverage network. Using this code, the signal of the device is multiplexed, and the same physical channel is	Every cell has a corresponding network tower, which serves the mobile phones in that cellular

	CDMA	GSM
	used to send the signal.	area.
International roaming	Less Accessible	Most Accessible
Frequency band	Single (850 MHz)	Multiple (850/900/1800/1900 MHz)
Network service	Handset specific	SIM specific. User has option to select handset of his choice.

Satellite System

A satellite communication system basically consists of a satellite in space & many earth stations on the ground which are linked with each other through the satellite. Baseband signal from the users is transmitted to the earth station through a terrestrial network & is modified by an RF carrier at the earth & transmitted to the satellite. The satellite

receives the modulated RF carrier in its uplink frequency spectrum form all the earth in the downlink frequency spectrum,which is different from the uplink frequency spectrum.The bandwidth of a typical commercial satellite is 500 MHZ on both uplink & downlink.

Applications of satellite system

Radio&TV Broadcast satellites Broadband satellites transmit high-speed data and video directly to consumers and businesses. Markets for broadband services also include interactive TV & Radio programs .This technology competes with cable in many places ,as it is cheaper to install & in most cases ,no extra fees have to be paid for this service. Environmental Monitoring Environmental monitoring satellites carry highly sensitive imagers and sounders to monitor the Earth's environment, including the vertical thermal structure of the atmosphere; the movement and formation of clouds; ocean temperatures; snow levels; glacial movement; and volcanic activity. Large-scale computers use this data to model the entire earth's atmosphere and create weather forecasts such as those provided by national weather services in the U.S. and abroad.

Military Satellites: Many communication links are managed via satellite because they are much safer from attack by enemies. Satellites for navigation: The GPS(Global Positioning System) is nowadays well-known & available for everone. The system allows for precise localization worldwide, and some additional techniques, the precision is in the range of some metres. Almost all ships & aircraft rely on GPS as an additional to traditional navigation systems. Many trucks & cars come with installed GPS receivers.

Broadcast system

Broadcasting is one of the most imported applications of radio systems. Radio is the most effective medium for broadcasting audio & video. Broadcasting for large areas is done through satellite ,but for local programs within a country or state, broadcasting is done through terrestrial radio. The advantage of digital broadcasts is that they prevent a number of complaints with traditional analog broadcast. For television, this includes the elimination of problems such as snowy pictures, ghosting & other distoration. These

occur because of the nature of analog transmission, which means that perturbations due to noise will be evicted in the final output. Digital transmission overcomes this problem because digital signals are reduced to discrete values upon reception & hence small perturbations do not affect the final output.

Digital audio broadcasting

Digital audio broadcasting (DAB) was first deployed in the United Kingdom in 1995, and has become common throughout Europe. Digital audio broadcasting (DAB), also known as digital radio and high-definition radio, is audio broadcasting in which analog audio is converted into a digital signal and transmitted on an assigned channel in the AM or FM frequency range. DAB is said to offer compact disc (CD)- quality audio on the FM (frequency modulation) broadcast band and to offer FM-quality audio on the AM (amplitude modulation) broadcast band.

Digital video broadcasting

Digital Video Broadcasting (DVB) is being adopted as the standard for digital television in many countries.. The DVB standard offers many advantages over the previous analogue standards and has enabled television to make a major step forwards in terms of its technology. DVB is now one of the success stories of modern broadcasting. The take up has been enormous and it is currently deployed in over 80 countries worldwide, including most of Europe and also within the USA. It offers advantages in terms of far greater efficiency in terms of spectrum usage and power utilisation as well as being able to affect considerably more facilities, the prospect of more channels and the ability to work alongside existing analogue services

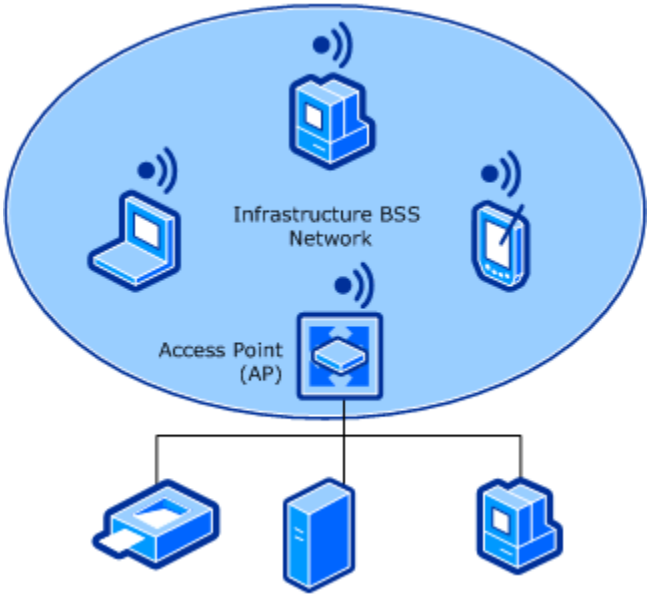
WDM

Wavelength division multiplexing (WDM) and wavelength routing are rapidly becoming the technologies of choice in network infrastructure that must accommodate unprecedented, accelerating demand for bandwidth. WDM Optical Networks: Concepts, Design, and Algorithms provides practicing engineers, students, and researchers with a systematic, up-to-date introduction to the fundamental concepts, challenges, and state-

of-the-art developments in WDM optical networks. The authors rely extensively on real-world examples and draw on the latest research to cover optical network design and provisioning in far greater depth than any other book. Coverage includes: WDM advantages: increased usable bandwidth, reduced processing cost, protocol transparency, and efficient failure handling

Unit – II

Wireless LAN



Wireless LAN (WLAN) provides network connectivity between devices, also known as stations, by using radio as the communication medium. Devices that communicate over the WLAN conform to the interfaces and procedures defined through the IEEE 802.11 standards.

ADVANTAGES

1. Degree of freedom for users within rooms,buildings etc.

2. Do not need cables ,wires.

3. Flexible for adhoc communication.

4. Allow for the design of small,indepentant devices such as small PDAs,notepads etc.

5. Wireless networks can survive disasters,eg, earthquakes or users pulling a plug.

DISADVANTAGES

1.Provide lower bandwidth due to limitation in radio transmission.

2. WLANs are limited to lower senders & certain licence-free frequency bands,which are not the same worldwide.

3.Air interface & higher complexity.

wireless Landscape

Wireless Technology	Transmission Distance	Speed
Bluetooth	33 feet	1 Mbps
Satellite	Worldwide	290ms latency
1G Analog cellular	Nationwide	
2G digital cellular	Nationwide	14 Kbps
2.5G digital cellular	Nationwide	384 Kbps
3G digital cellular	Nationwide	2-10 Mbps
WLAN 802.11b	375 feet	11 Mbps
WLAN 802.11a, g	300 feet	54/128 Mbps
Fixed broadband Wireless (BWA)	35 miles	1 Gbps
WAP	Nationwide	384 Kbps
WiMax 802.16 4G	10 miles	75 Mbps

Wireless Standards:

IEEE expanded on the original 802.11 standard in July 1999, creating the 802.11b specification. 802.11b supports bandwidth up to 11 Mbps, comparable to traditional Ethernet.

802.11b uses the same unregulated radio signaling frequency (2.4 GHz) as the original 802.11 standard. Vendors often prefer using these frequencies to lower their production costs. Being unregulated, 802.11b gear can incur interference from microwave ovens, cordless phones, and other appliances using the same 2.4 GHz range. However, by installing 802.11b gear a reasonable distance from other appliances, interference can easily be avoided.

Pros of 802.11b - lowest cost; signal range is good and not easily obstructed

Cons of 802.11b - slowest maximum speed; home appliances may interfere on the unregulated frequency band.

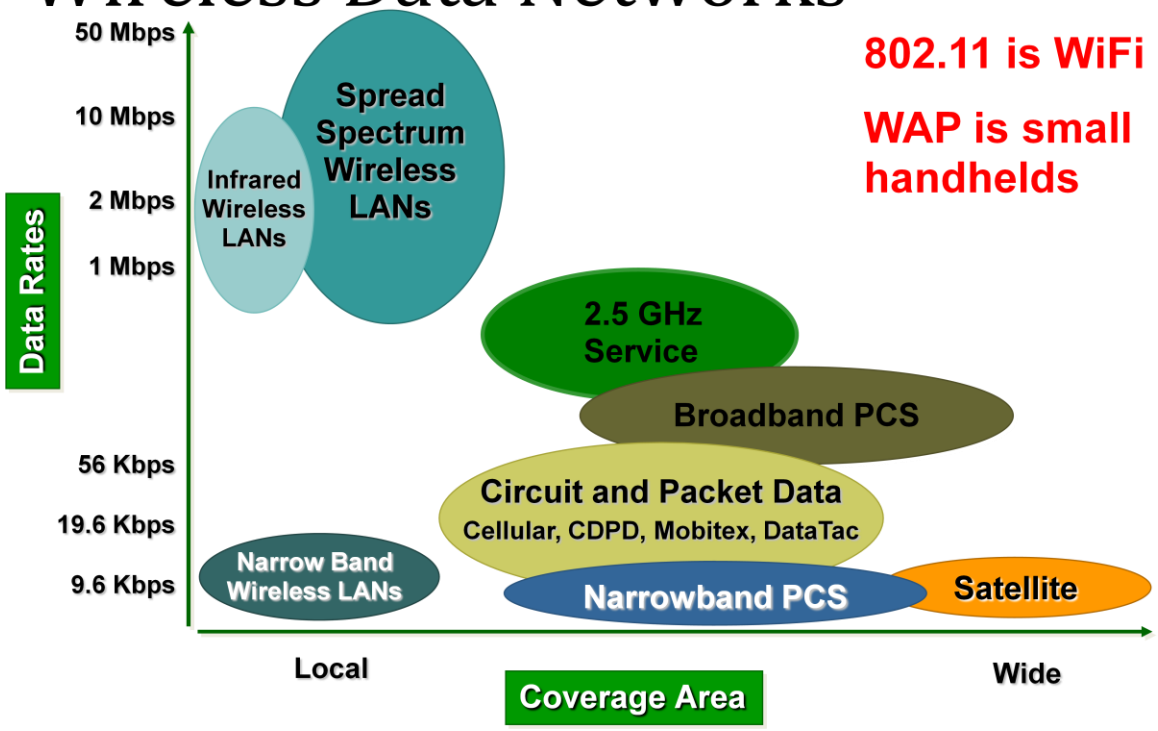
802.11g

In 2002 and 2003, WLAN products supporting a newer standard called 802.11g emerged on the market. 802.11g attempts to combine the best of both 802.11a and 802.11b. 802.11g supports bandwidth up to 54 Mbps, and it uses the 2.4 Ghz frequency for greater range. 802.11g is backwards compatible with 802.11b, meaning that 802.11g access points will work with 802.11b wireless network adapters and vice versa.

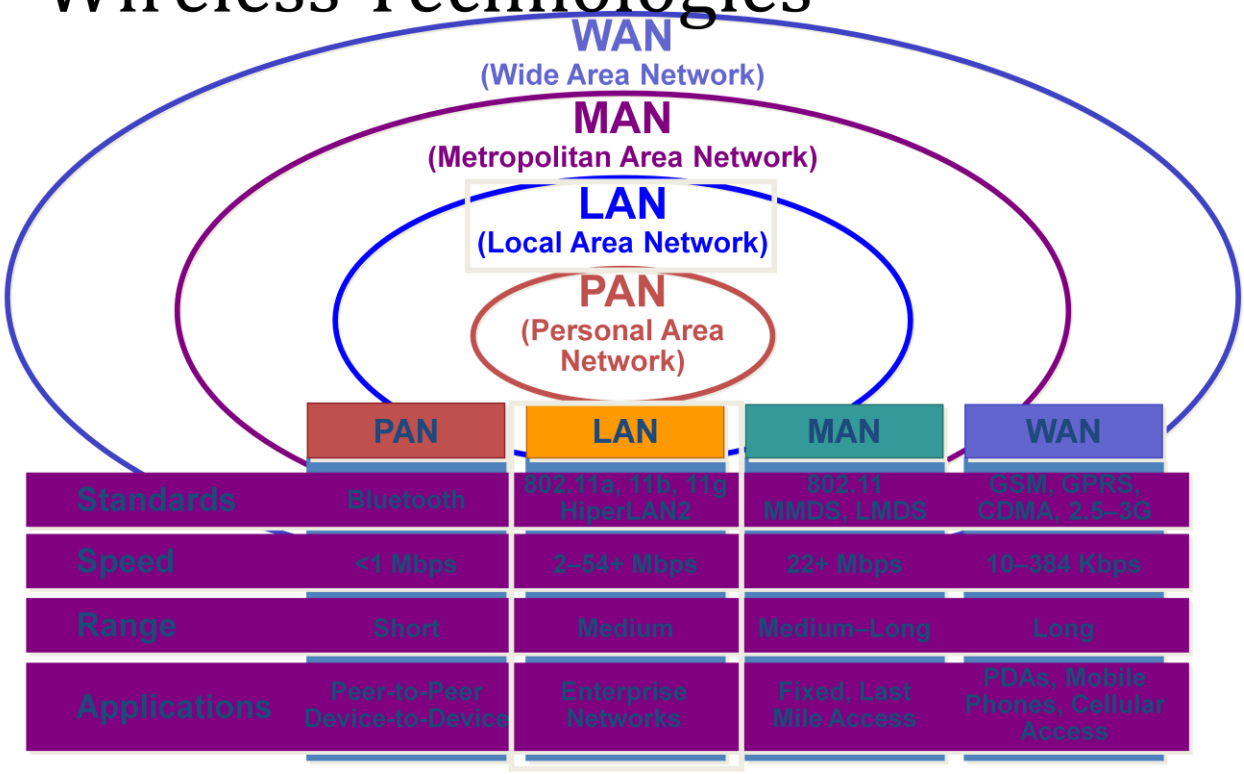
Pros of 802.11g - fast maximum speed; signal range is good and not easily obstructed.

Cons of 802.11g - costs more than 802.11b; appliances may interfere on the unregulated signal frequency

Wireless Data Networks



Wireless Technologies



Wireless

- Two of the most common point-to-multipoint systems are:
  - Wireless Application Protocol (WAP)
    - a system developed to send data to small handheld devices such as cellular phones, wireless e-mail handhelds, and PDAs.
  - IEEE 802.11
    - The 802.11 protocol has been standardized by the IEEE for wireless local area networks and has three versions currently in production, 802.11b, 802.11a, and the most recent 802.11g.

Bluetooth

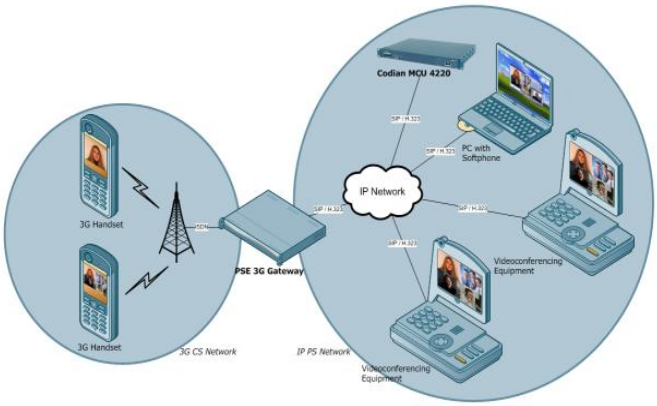
Figure 5-1 Bluetooth scenario

- Bluetooth wireless technology is a short-range radio technology.
- Bluetooth wireless technology makes it possible to transmit signals over short distances between telephones, computers and other devices and thereby simplify communication and synchronization between devices.
- The Bluetooth wireless technology comprises hardware, software and interoperability requirements.
- Transmits at up to 1 Mbps over a distance of 33 feet and is not impeded by physical barriers

Mobile IP

In IP networks, routing is based on stationary IP addresses, similar to how a postal letter is delivered to the fixed address on the envelope. A device on a network is reachable through normal IP routing by the IP address it is assigned on the network.

The problem occurs when a device roams away from its home network and is no longer reachable using normal IP routing. This results in the active sessions of the device being terminated. Mobile IP was created to enable users to keep the same IP address while traveling to a different network (which may even be on a different wireless operator), thus ensuring that a roaming individual could continue communication without



sessions or connections being dropped.

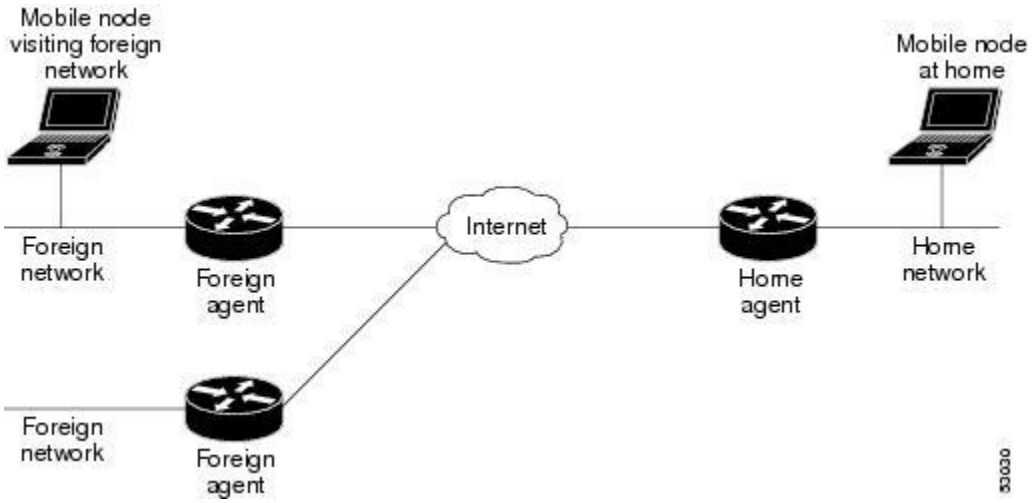
Because the mobility functions of Mobile IP are performed at the network layer rather than the physical layer, the mobile device can span different types of wireless and wireline networks while maintaining connections and ongoing applications. Remote login, remote printing, and file transfers are some examples of applications where it is undesirable to interrupt communications while an individual roams across network boundaries. Also, certain network services, such as software licenses and access privileges, are based on IP addresses. Changing these IP addresses could compromise the network services.

Mobile IP has the following three components:

•Mobile Node

•Home Agent

•Foreign Agent



The Mobile Node is a device such as a cell phone, personal digital assistant, or laptop whose software enables network roaming capabilities.

The Home Agent is a router on the home network serving as the anchor point for communication with the Mobile Node; it tunnels packets from a device on the Internet, called a Correspondent Node, to the roaming Mobile Node. (A tunnel is established between the Home Agent and a reachable point for the Mobile Node in the foreign network.)

The Foreign Agent is a router that may function as the point of attachment for the Mobile Node when it roams to a foreign network, delivering packets from the Home Agent to the Mobile Node. The care-of address is the termination point of the tunnel toward the Mobile Node when it is on a foreign network. The Home Agent maintains an association between the home IP address of the Mobile Node and its care-of address, which is the current location of the Mobile Node on the foreign or visited network.

Tunneling and Encapsulation

Encapsulation is required because each datagram we intercept and forward needs to be resent over the network to the device's care-of address. In theory, the designers might conceivably have done this by just having the home agent change the destination address and stick it back out on the network, but there are various complications that make this unwise. It makes more sense to take the entire datagram and wrap it in a new set of headers before retransmitting. In our mail analogy, this is comparable to taking a letter received for our traveling consultant and putting it into a fresh envelope for forwarding, as opposed to just crossing off the original address and putting a new one on.

The default encapsulation process used in Mobile IP is called IP Encapsulation Within IP, defined in RFC 2003 and commonly abbreviated IP-in-IP. It is a relatively simple method that describes how to take an IP datagram and make it the payload of another IP datagram. In Mobile IP, the new headers specify how to send the encapsulated datagram to the mobile node's care-of address. In addition to IP-in-IP, two other encapsulation methods may be optionally used: Minimal Encapsulation Within IP, defined in RFC 2004, and Generic Routing Encapsulation (GRE), defined in RFC 1701. To use either of these, the mobile node must request the appropriate method in its

Registration Request and the home agent must agree to use it. If foreign agent care-of addressing is used, the foreign agent also must support the method desired.

The encapsulation process creates a logical construct called a tunnel between the device that encapsulates and the one that decapsulates. This is the same idea of a tunnel used in discussions of virtual private networks (VPNs), IPSec tunnel mode, or the various other tunneling protocols used for security. The tunnel represents a conduit over which datagrams are forwarded across an arbitrary internetwork, with the details of the encapsulated datagram (meaning the original IP headers) temporarily hidden. In Mobile IP, the start of the tunnel is the home agent, which does the encapsulation. The end of the tunnel depends on what sort of care-of address is being used:

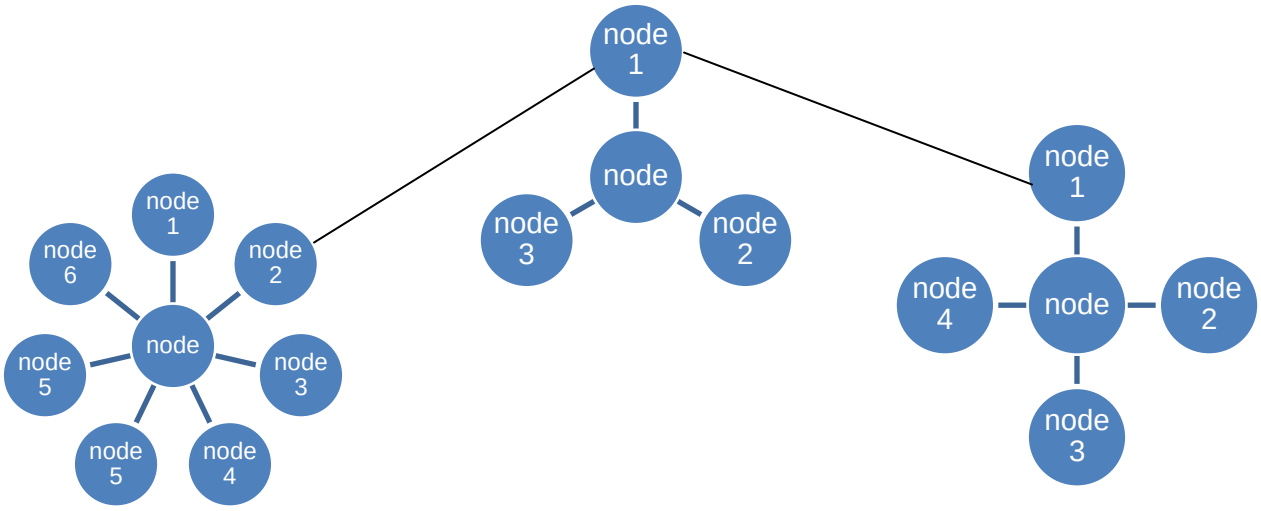
Foreign Agent Care-Of Address: The foreign agent is the end of the tunnel. It receives encapsulated messages from the home agent, strips off the outer IP header and then delivers the datagram to the mobile node. This is generally done using layer two, because the mobile node and foreign agent are on the same local network, and of course, the mobile node does not have its own IP address on that network (it is using that of the foreign agent.)

Co-Located Care-Of Address: The mobile node itself is the end of the tunnel and strips off the outer header.

Unit – III

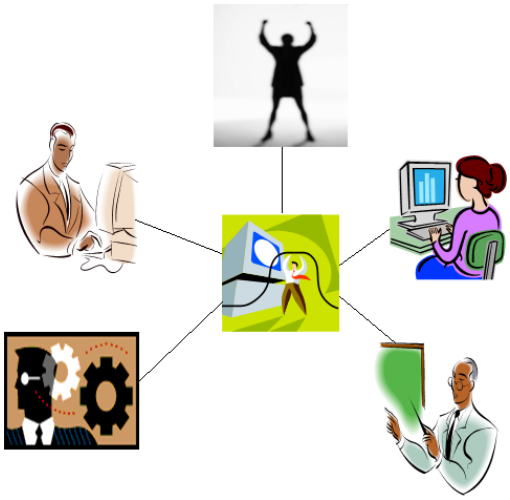
Social Networking

What is a Network?

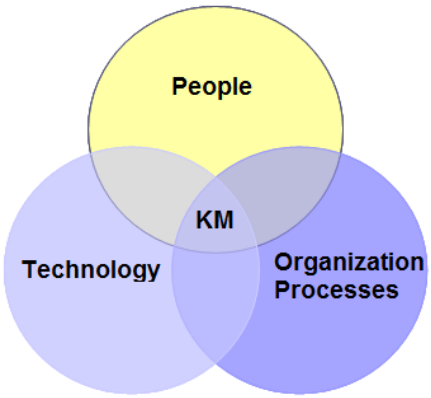


Web Definition: A set of nodes, points, or locations connected by means of data, voice, and video communications for the purpose of exchange.

A **social network** is a description of the social structure between actors, mostly individuals or organizations. It indicates the ways in which they are connected through various social familiarities ranging from casual acquaintance to close familiar bonds.



Social networks and KMS

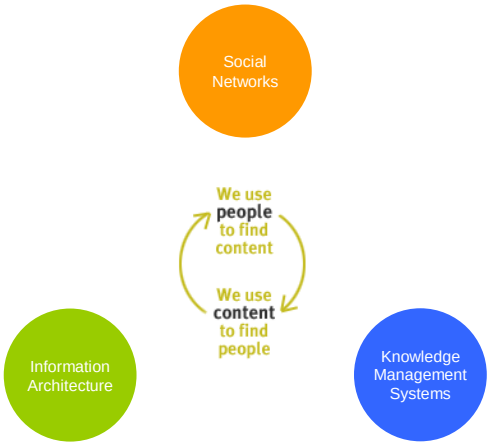


Knowledge Management involves people, technology, and processes in overlapping parts.

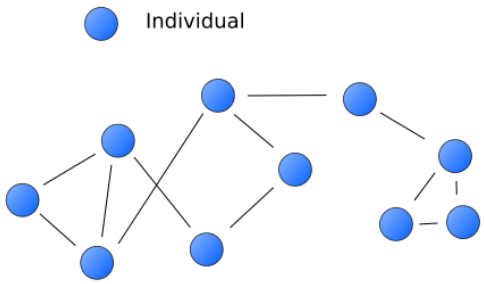
Importance of Social Networking

What ties Information Architecture, Knowledge Management and Social Network Analysis more closely together is the reciprocal relationship between people and content.

Social networking has become one of the most important parts of our daily life as it enables us to communicate with a lot of people. Social networking sites are created to assist in online networking. These sites are generally communities created to support a common theme.



Since the creation of social networking sites such as MySpace, LinkedIn, and Facebook, individuals are given opportunities to meet new people and friends in their own and also in the other diverse communities across the world. By doing so, individuals can become friends or fans of the profile, and will be updated on current



events, specials, and other essential information that the masses would like to share. In earlier days people cannot think about social networking because, in those days science was not so advanced, but due to advancement of technology over the period of time people has become very much accustomed to this particular method of socializing . It is also is a platform where our creations and thoughts are presented to a huge lot of masses. Social networking is very informative, entertaining and it also aware us about various situations or events which are going on in the society or in the world at large. Social networking facilitates us to also enhance our viewpoints as it enables us certain interactive learning activities also. Thus, to summarise social networking sites are the most important and unstrained parts of human lives in the modern times.

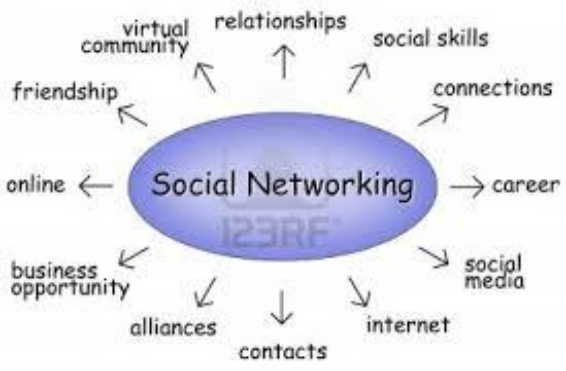
Social Network Analysis

- Social network analysis [SNA] is the mapping and measuring of relationships and flows between people, groups, organizations, computers or other information/knowledge processing entities.
- The nodes in the network are the people and groups while the links show relationships or flows between the nodes.

Social Network is measured in terms of:

1. **Degree Centrality**: The number of direct connections a node has. What really matters is where those connections lead to and how they connect the otherwise unconnected.

2. **Betweeness Centrality:** A node with high between ness has great influence over what



flows in the network indicating important links and single point of failure.

3. **Closeness Centrality:** The measure of closeness of a node which are close to everyone else. The pattern of the direct and indirect ties allows the nodes any other node in the network more quickly than anyone else. They have the shortest paths to all others.

Why internet is popular mean for social networking

- The Internet is powerful because it bridges distance at a low cost
- When people first meet online they tend to “like” each other more
- Less stressful than face-to-face meeting
- Superficialities aside people focus on communicating their “selves”

Security issues

- Malicious Banner ads
- Adware
- Phishing attacks
- Customizable scripts


Welcome to LinkedIn - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address https://www.linkedin.com/home
Go Links
Search Web My Web Mail My Yahoo! Personals Games Music Sign In
LinkedIn
Already a user? Sign In
Lost your invitation?
Find out more
Start searching now
See how it works
Find People
Clients, partners, sales leads and experts
Find Jobs
Top jobs and the most reputable candidates
Find Services
Recommended services and new customers
And find them through the people you know and trust
With LinkedIn, you find the people, jobs and services you need through the people you know and trust, while you strengthen and extend your existing network.
Take our tour
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Join Today
In the News
See all articles about LinkedIn
TIME
Forbes
U.S.News
Privacy Policy | Copyright Policy | About LinkedIn | Customer Service/FAQ
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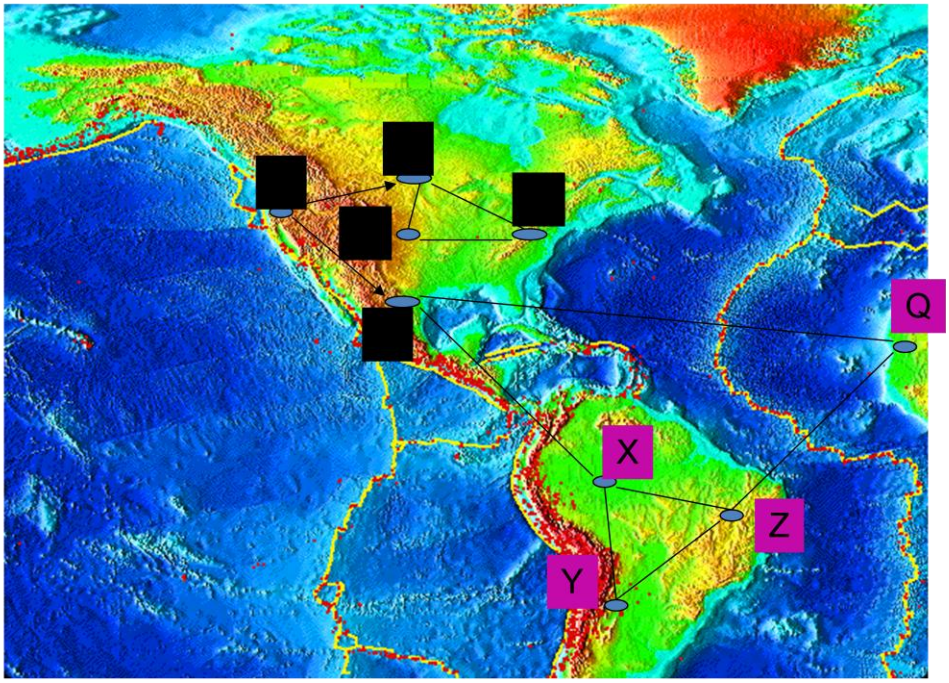
Geographic Information Modeling



Key Players

Unit – IV

Cloud Computing

Introduction

The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

Cloud computing is a phrase used to describe a variety of **computing** concepts that involve a large number of computers connected through a real-time communication network such as the Internet. In science, cloud computing is a synonym for distributed computing over a network, and means the ability to run a program or application on many connected computers at the same time.

The phrase also more commonly refers to network-based services, which appear to be provided by real server hardware, and are in fact served up by virtual hardware, simulated by software running on one or more real machines. Such virtual servers do not physically exist and can therefore be moved around and scaled up or down on the fly without affecting the end user, somewhat like a cloud.

In common usage, the term "the cloud" is essentially a metaphor for the Internet. Marketers have further popularized the phrase "in the cloud" to refer to software, platforms and infrastructure that are sold "as a service", i.e. remotely through the Internet. Typically, the seller has actual energy-consuming servers which host products and services from a remote location, so end-users don't have to; they can simply log on to the network without installing anything. The major models of cloud computing service are known as Software as a Service, Platform as a Service, and Infrastructure as a Service. These cloud services may be offered in a Public, Private or Hybrid network. Google, Inc. is one of the most well-known cloud vendors.

Characteristics of Cloud Computing

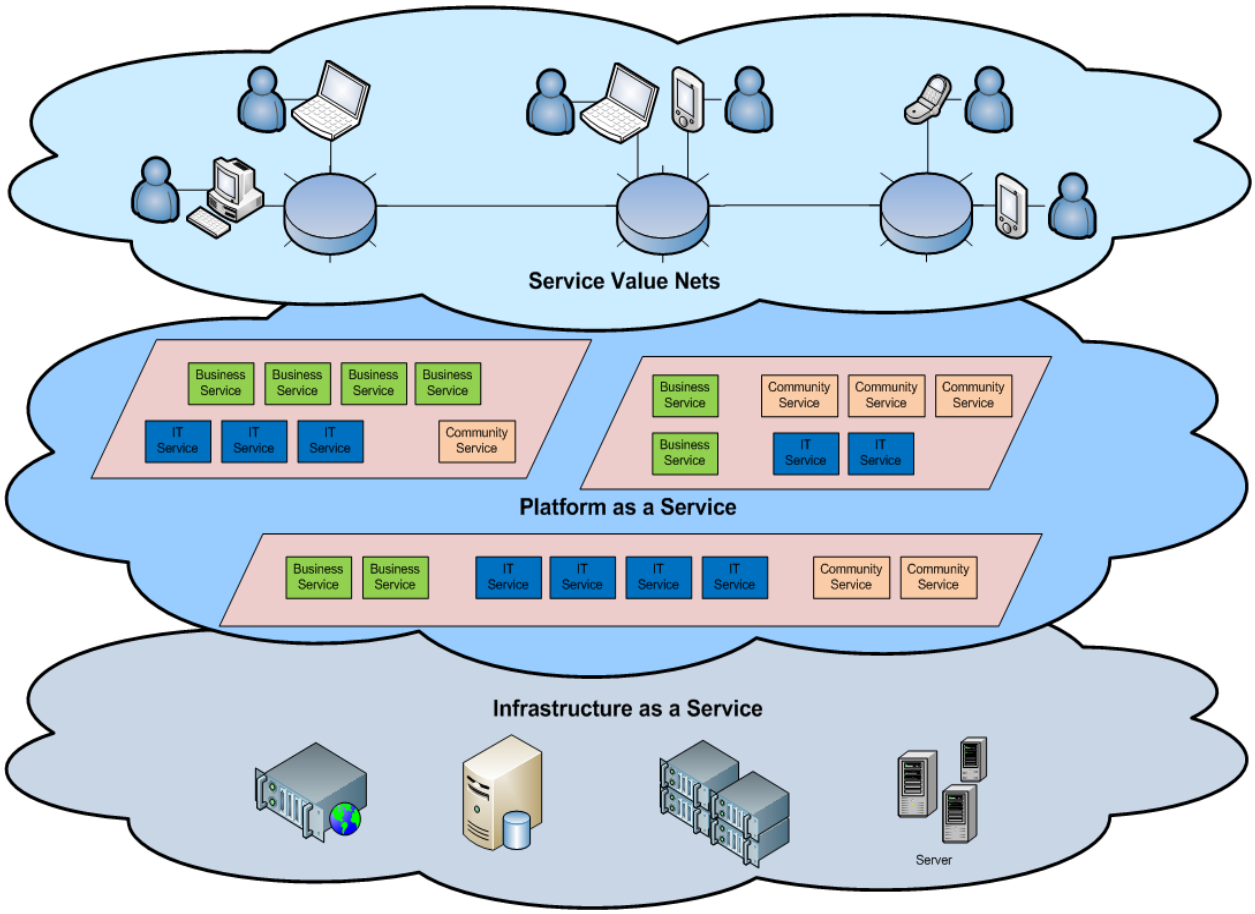
- **Remotely hosted:** Services or data are hosted on remote infrastructure.

– **Ubiquitous:** Services or data are available from anywhere.

– **Commodified:** The result is a utility computing model similar to traditional that of traditional utilities, like gas and electricity - you pay for what you would want.

Cloud Architecture

Cloud architecture, the systems architecture of the software systems involved in the delivery of cloud computing, typically involves multiple cloud components communicating with each other over a loose coupling mechanism such as a messaging queue. Elastic provision implies intelligence in the use of tight or loose coupling as applied to mechanisms such as these and others.



Cloud Computing Advantages

Cloud computing is basically a resource that you can utilize online to maintain your business's platform while you worry about other basic assets about your business. It basically changes how online developers meet their criteria for their IT software. Cloud computing is always advancing and changing each year so that it will work better for personal uses and business uses. The three main technology platform strategies that you will find taking advantage of the cloud computing strategies include, Platform as a Service: PaaS, Software as a Service: SaaS, and Infrastructure as a Service: IaaS. There are other services online that use cloud computer, but the three that are mentioned are just the main methods that are used. There are various tools and features that users will be able to track when using the cloud computing resource. These features/tools would include better for personal uses and business uses.

Cost Effective

There is no need for users to invest their time and money into using stand alone servers which would be a bit complicating to use compared to the cloud method. It is a cheaper way to maintain the software and it will save time, as the developers keep track of updates and maintain your programs while you use it. There is no need for replacing capital expenditures on a regular basis. The cost of using cloud resources is very economical for resources such as centralized, real estate, bandwidth, and power. Users will also save money on software updates, management costs, and data storage costs.

Speed & Scales

There is no need to purchase and setup hardware manually when using the cloud computing method. Depending upon their needs the user can quickly scale up or scale down.

Innovation

Users can now pay closer attention to the innovation process because they don't have to manually manage other resources. Cloud computing produces a faster development pace for prototype and testing phases. Projects at which users have to watch over for progress on a regular basis will benefit the most because of this advantage.

Convenient

Since overheads are low when sharing the same infrastructure the services are available to use immediately. Payments are only billed for the times that the service is being utilized. You can easily check the cost of the bill because the service provider will make them available online for you to view.

Location

Areas that have lower overheads are able to utilize this service and take advantage of the benefits as well. Many different websites are able to be set up in the case of a disaster recovery which helps the companies to cut costs in different ways.

Multiple Users at one time

Cloud computing is not only cost effective, but utilizing it also helps to cut back on global wastes. It is environmentally friendly since it is shared by multiple users. The down time is cut in half and the resources are stretched.

Flexible

There is a high rate of flexibility when using cloud computing because people can opt out of using it whenever they want too. This is also one of the main reasons people love to use this method. Service level agreements are what cover the costs in this case. If the correct quality is not provided then has to pay a penalty cost.

Device Diversity

The cloud computing method can be accessed through various different electronic devices that are able to have access to the internet. These devices would include and iPad, smartphone, Laptop, or desktop computer.

Lots of Storage Space

When you use the internet with the cloud services then your company will have lots more room to store the files and data that they need to store.

Customize Settings

Last but not least, you will enjoy the fact that cloud computing allows you to customize your business applications. This is a great benefit because the world of online business is very competitive.

Some Examples of Cloud Computing

Cloud Computing Disadvantages

1. **Possible downtime.** Cloud computing makes your small business dependent on the reliability of your Internet connection.

2. **Security issues.** How safe is your data? Cloud computing means Internet computing. So you should not be using cloud computing applications that involve using or storing data that you are not comfortable having on the Internet. That being said, established, reliable cloud computing vendors will have the latest,

most sophisticated data security systems possible as they want your business and realize that data security is a big concern.

Switching to the cloud can actually improve security for a small business, says Michael Redding, managing director of Accenture Technology Labs. "Because large cloud computing companies have more resources, he says, they are often able to offer levels of security an average small business may not be able to afford implementing on its own servers"

3. **Cost.** At first glance, a cloud computing application may appear to be a lot cheaper than a particular software solution installed and run in-house, but you need to be sure you're comparing apples and apples. Does the cloud application have all the features that the software does and if not, are the missing features important to you?

4. **Inflexibility.** Be careful when you're choosing a cloud computing vendor that you're not locking your business into using their proprietary applications or formats. You can't insert a document created in another application into a Google Docs spreadsheet, for instance. Also make sure that you can add and subtract cloud computing users as necessary as your business grows or contracts.

5. **Lack of support.** In These Issues Need to be Resolved Before Cloud Computing Becomes Ubiquitous, (OPEN Forum) Anita Campbell writes, "Customer service for Web apps leaves a lot to be desired -- All too many cloud-based apps make it difficult to get customer service promptly – or at all. Sending an email and hoping for a response within 48 hours is **not** an acceptable way for most of us to run a business".

Cloud Computing Opportunities and Challenges

The use of the cloud provides a number of opportunities:

- It enables services to be used without any understanding of their infrastructure.
- Cloud computing works using economies of scale:
  - It potentially lowers the outlay expense for start up companies, as they would no longer need to buy their own software or servers.
  - Cost would be by on-demand pricing.
  - Vendors and Service providers claim costs by establishing an ongoing revenue stream.
- Data and services are stored remotely but accessible from “anywhere”.

- **In parallel there has been backlash against cloud computing:**
  - Use of cloud computing means dependence on others and that could possibly limit flexibility and innovation:
    - The others are likely become the bigger Internet companies like Google and IBM, who may monopolise the market.
    - Some argue that this use of supercomputers is a return to the time of mainframe computing that the PC was a reaction against.
  - Security could prove to be a big issue:
    - It is still unclear how safe out-sourced data is and when using these services ownership of data is not always clear.
  - There are also issues relating to policy and access:
    - If your data is stored abroad whose policy do you adhere to?
    - What happens if the remote server goes down?
    - How will you then access files?
    - There have been cases of users being locked out of accounts and losing access to data.

Cloud Computing Service Model

	Services	Description
Application Focused	Services	Services – Complete business services such as PayPal, OpenID, OAuth, Google Maps, Alexa
	Application	Application – Cloud based software that eliminates the need for local installation such as Google Apps, Microsoft Online
	Development	Development – Software development platforms used to build custom cloud based applications (PAAS & SAAS) such as SalesForce
Infrastructure Focused	Platform	Platform – Cloud based platforms, typically provided using virtualization, such as Amazon ECC, Sun Grid
	Storage	Storage – Data storage or cloud based NAS such as CTERA, iDisk, CloudNAS
	Hosting	Hosting – Physical data centers such as those run by IBM, HP, NaviSite, etc.

Different Cloud Computing Layers

Application Service (SaaS)	MS Live/ExchangeLabs, IBM, Google Apps; Salesforce.com Quicken Online, Zoho, Cisco
Application Platform	Google App Engine, Mosso, Force.com, Engine Yard, Facebook, Heroku, AWS
Server Platform	3Tera, EC2, SliceHost, GoGrid, RightScale, Linode
Storage Platform	Amazon S3, Dell, Apple, ...

Future of Cloud Computing

1. Many of the activities loosely grouped together under cloud computing have already been happening and centralised computing activity is not a new phenomena
2. Grid Computing was the last research-led centralised approach
3. However there are concerns that the mainstream adoption of cloud computing could cause many problems for users
4. Many new open source systems appearing that you can install and run on your local cluster

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