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Objective To understand the Wi-Fi technology and its applications in Indian business organisations Introduction In today’s high-tech world connectivity to networks is extremely important for organizations to survive. Networking is possible of various machines like computers, laptops, cell phones etc. This term paper talks of Wi-Fi, the wireless technology that allows internet connection to be broadcasted through radio waves. Its purpose serves directly to the users looking for internet access devoid of any cords or wires. What is Wi-Fi? Wi-Fi is a wireless technology brand that is owned by Wi-Fi Alliance Wi-Fi Alliance is a consortium of separate and independent companies agreeing to a set of common interoperable products based on the family of IEEE 802.

11 standards. Wi-Fi certifies products via a set of established test procedures to establish interoperability. Those manufacturers that are members of Wi-Fi Alliance whose products pass these interoperability tests can mark their products and product packaging with the Wi-Fi logo. How does Wi-Fi work? Radio waves are the keys which make Wi-Fi networking possible. These radio signals are transmitted from antennas and routers and are picked up by Wi-Fi receivers such as computers and cell phones that are equipped with Wi-Fi cards.

Whenever a computer receives any of the signals within the range of a Wi-Fi network which is usually 300 – 500 feet for antennas and 100 – 150 feet for routers, the Wi-Fi card will read the signals and thus create an internet connection between the user and the network without the use of a cord. Usually the connection speed is increases as the computer gets closer to the

main source of the signal and decreases when the computer gets further away. Many new laptops already come with a Wi-Fi card built in it. Wi-Fi cards can be external or internal, meaning that if a Wi-Fi card is not installed in the computer, one may purchase a USB antenna attachment and have it externally connect to the USB port, or have an antenna-equipped expansion card installed directly to the computer.

Laptops without a built in Wi-Fi card is usually installed the external way while PCs have it installed internally. Once a connection is established between the user and the network, the user will be prompted with a login screen and password if it is a fee-based type network. Though there’re also free-based network connections as well in some areas. Wi-Fi networking around the world is creating hot spots in cities where anyone with a laptop can wirelessly plug into the internet.

A hotspot is a connection point for a Wi-Fi network. It is a small box that is hardwired into the internet. There are many Wi-Fi hotspots now available in public places like restaurants, hotels, libraries and airports. The radios used for Wi-Fi communication can transmit and receive radio waves, and they can convert 1s and 0s into radio waves and convert the radio waves back into 1s and 0s.

Wi-Fi radios have a few notable differences from other radios: •They transmit at frequencies of 2. 4 GHz or 5GHz. This frequency is considerably higher than the frequencies used for cell phones, walkie-talkies and televisions. The higher frequency allows the signal to carry more data. •They use 802. 11 networking standards.

•Wi-Fi radios can transmit on any of three frequency bands. Or, they can “ frequency hop” rapidly between the different bands. Frequency hopping helps reduce interference and lets multiple devices use the same wireless connection simultaneously. As long as they all have wireless adapters, several devices can use one router to connect to the Internet. This connection is convenient and virtually invisible, and it’s fairly reliable. If the router fails or if too many people try to use high-bandwidth applications at the same time, however, users can experience interference or lose their connections.

Currently there are three forms of the 802. 11 standard proposed by the IEEE: 802. 11b, which came before 802. 11a, and then 802. 11g as its last form.

Here is a chart that represents the main differences of each standard. Standard802. 11b802. 11a802.

11g Speed11 Mbps54 Mbps54MbpsRange100-150 feet indoors27-75 feet indoors100-150 feet indoors Frequency2. 4GHz, a band already crowded with cordless phones5GHz, an uncrowded band2. 4GHz, still a crowd of cordless phones and microwaves AcceptanceHot spots are already established using 802. 11b.

Equipment is readily availableMore common in corporate and office environments. 802. 11g is compatible with the specs for 802. 11b, meaning it can be used on a network based on b or g versions. Wi-Fi in Indian enterprises: In business environments, increasing the number of Wi-Fi access points, by using more channels or creating smaller cells provides: ? upport

for fast roaming ? increased overall network capacity ? Wi-Fi enables wireless voice applications (VoWLAN or WVOIP).

LAN user segments like educational institutes and the hospitality industry openly embraced Wi-Fi. Other enterprises have been slower but many have found innovative ways to use Wi-Fi in their networks These include: ? LG Electronics India Ltd. , runs business-critical applications like an internal ERP system and Lotus Notes, and provides Internet access to its plant and executive employees through its Wi-Fi infrastructure. The 802.

1b solution was deployed in its 47 acre campus in Noida. Other than saving time and resources, Wi-Fi solution takes care of cable management, which is a hassle and cost-intensive area ? Sumul Dairy in Gujarat, which is a part of the Surat District Cooperative Milk Producers' Union Limited, deployed 12 Access Points (APs) in its two square Km (approx.) large campus and shares mission-critical data within the internal departments like the boardroom, veterinary department, by-products department, finished products sections, artificial insemination department, and the ERP servers. The company has benefited a lot in areas of cost, and reduction of monitoring and maintenance issues," says Satyen Naik, Assistant Manager (IS) of the company. ? P&O Ports in Navi Mumbai (near Mumbai) uses heavy moving cranes to load cargo on the ships and remote controls them with the use of Wi-Fi technology.

These cranes were earlier controlled from base stations more than 100 meters away, through wires which would at times get cut due to the movement of the cranes. To address the issue, The organization used 802.

1b technology to connect the cranes to the base stations. And now, the cranes enjoy unhindered movement in the port.

? Jindal Strips Limited, a part of a steel conglomerate in Haryana wanted to connect its Cold Roll Division with its HR and Administration Division. The two division’s offices were across the road, but had a railway track planted squarely in between them. The company first used optic fibre links, but they were not very useful because the roads were continuously dug up for repairs and the intense heat from the furnaces was too harsh on the fiber. The company deployed an 11 Mbps WLAN building-to-building bridge, omni-direction antenna, and other Wi-Fi equipment at the premises. The connectivity links are now always up, and allows the company to share vital business data without downtime.

? In the area of e-governance, the Guntur collectorate in Andhra Pradesh needed to be connected to the Andhra Pradesh State-Wide Area Network (APSWAN). This would help improve communication ties for better government back-office operations. Since leased lines were not easily available, the government decided to use WLAN links to transmit the necessary information. As of 2007 Wi-Fi installations can provide ? secure computer networking gateway ? firewall ? DHCP server ? intrusion detection system Other uses of Wi-Fi These include Internet and VoIP phone access, gaming, and network connectivity for consumer electronics such as televisions, DVD players, and digital cameras, MP3 phone, PDA etc. Advantages of Wi-Fi ? Wi-Fi allows LANs to be deployed without cabling for client devices, typically reducing the costs of network deployment and expansion.

Spaces where cables cannot be run, such as outdoor areas and historical buildings, can host wireless LANs ? Wi-Fi has become widespread in corporate infrastructures, which also helps with the deployment of RFID technology that can piggyback on Wi-Fi ? Wi-Fi is a global set of standards. Unlike mobile telephones, any standard Wi-Fi device will work anywhere in the world ? WPA(WiFi protected access) is not easily cracked if strong passwords are used and WPA2 encryption has no known weaknesses Disadvantages of Wi-Fi ? Spectrum assignments and operational limitations are not consistent worldwide ? Power consumption is fairly high compared to some other low-bandwidth standards ? Wi-Fi networks have limited range. ? Wi-Fi pollution, or an excessive number of access points in the area, especially on the same or neighboring channel, can prevent access and interfere with the use of other access points by others References: http://computer. howstuffworks. com/wireless-network4. htm http://nostarch.

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