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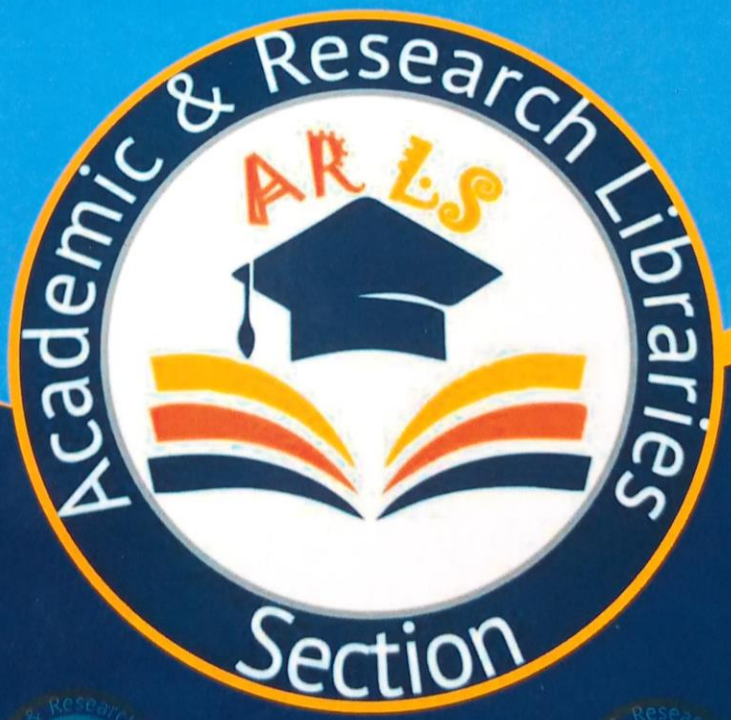

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THE EFFECT OF WIRELESS INTERNET CONNECTIVITY: ACCESSIBILITY AND USE OF LIBRARY RESOURCES AMONG UNDERGRADUATE STUDENTS IN UNIVERSITY LIBRARIES IN NIGERIA

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Abstract

This paper explored the available wireless internet connectivity in the university libraries and the importance of the wireless connectivity to users of the library. The researchers defined the concept of internet, wireless connectivity, type of networking to include amongst others; Wireless personal area networks (WPANs), wireless local area network (WLAN), wireless mesh network, Wireless metropolitan area networks (PMAN), Wireless wide area networks (WAN), etc Importance of wireless connectivity in university library was identified namely; low cost, ease of implementation, broadening access to library services, boundless and dynamic. The paper concludes with the factors affecting the use of Wireless Connectivity in University Libraries as follows; poor financing, technical know-how, hardware and software issues and Epileptic Power outage. Recommendations were proffered.

Key words: *Internet, Wireless Connectivity, Databases, Bandwidth, E-resources*

The Concept of Internet (International Network Technology)

According to Ameh (2012), the International network is a network of linked computers which are located at different points all over the world that provides easy communication between persons and organizations no matter where they are located. The Internet is used mostly in obtaining information. The major functional advantage of the Internet stems from its willingness to share information with others so that everyone might benefit. The international network

is a global system of interconnected computer networks that use the standard internet protocol suite (often called TCP/IP, although not all applications use TCP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, academic, business, and government networks, that are linked by a broad array of electronic, wireless and optical networking technologies. The international network carries an extensive range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support E-mail (Kenneth, 2012).

Onwukanjo and Halima(2020) posit that the Internet is a communication super highway that links, hooks and focuses the entire world into a global village, where people of all races can easily get in touch, see, or speak to one another and exchange information from one point of the globe to another. It is the largest network in the world that allows computer users to communicate and access electronic databases with ease. The Internet also has a role to play in the library, which is the hub of research activities in a university.

The internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location. The Internet represents one of the most successful examples of the benefit of sustained investment and commitment to research and development of information infrastructure. Beginning with the early research in packet switching, the government, industry and academic have been partners in evolving and deploying this exciting new technology (Onwukanjo and Halima, 2020).

The Internet is very useful in obtaining information for research. Oketunji (2012) in a study on the impact of the Internet on research reported that the Internet contributed significantly to the ease of research through downloading materials. It is commonly believed that researchers and students in Nigerian higher education institutions are battling the problem of inadequate and out-of-date materials. The only way to pursue knowledge is through research and the Internet is having a profound impact on the research process and dissemination of information (Patra, 2008). The Internet has spread technological literacy and given people all over the world fast access to vast resources. Internet use is directly affecting people, ideas, and behavior. Internet has an impact in many areas, including higher education, where it heralds the development and implementation of new and innovative strategies. Scholars can communicate with each other, as well as accessing news groups, library catalogues, bibliographic databases, and other academic

resources.

Concept of Wireless Networking:

According to Asif (2018), the term wireless networking refers to technology that enables two or more computers to communicate using standard network protocols, but without network cabling. Strictly speaking, any technology that does this could be called wireless networking.

Wireless networking in the view of Chigbu and Dim (2012) defined as any type of computer network that is not connected by cables of any kind. It 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. Wirelesstelecommunications networks are generally implemented and administered using a transmission system called radio waves.

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. Wireless Fidelity (Wi-Fi) PANs are becoming commonplace as equipment designers start to integrate Wi-Fi into a variety of consumer electronic devices. Intel"My Wi-Fi" and "virtual Wi-Fi" capabilities have made Wi-Fi PANs simpler and easier to set up and configure. (Asif, 2018)

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 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 (Denise and Charles, 2008).

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 pointmicrowave links using parabolic dishes on the 2.4 GHz band, rather than unidirectional 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 (Rasaki and Agbasi, 2011).

Mobile Devices Networks

With the development of Smartphone's, 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.
- 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. (See Wikipedia encyclopedia)

Wireless Services

Wireless operations according to Boggs, and Arabasz (2012) permit services, such as long range communications, that are impossible or impractical to implement with the use of wires. The term is commonly used in the telecommunications industry to refer to telecommunications systems (e.g. radio transmitters and receivers, remote controls, computer networks, network terminals, etc.) which use some form of energy (e.g. radio frequency (RF), acoustic energy, etc.) to transfer information without the use of wires. Information is transferred in this manner over both short and long distances.

Common examples of wireless equipment include:

- Infrared and ultrasonic remote control devices
- Modulated laser light systems for point to point communications
- Consumer Two way radio including FRS Family Radio Service, GMRS (General Mobile Radio Service) and Citizens band ("CB") radios.
- The Amateur Radio Service (Ham radio).
- Air band and radio navigation equipment used by aviators and air traffic control
- Cellular telephones and pagers: provide connectivity for portable and mobile applications, both personal and business.
- Cordless computer peripherals: the cordless mouse is a common example; keyboards and printers can also be linked to a computer via wireless using technology such as Wireless USB or Bluetooth
- Cordless telephone sets: these are limited-range devices, not to be confused with cell phones.
- Satellite television: Is broadcast from satellites in geostationary orbit. Typical services use direct broadcast satellite to provide multiple television channels to viewers. (Arnold, 2019)

The Importance of Wireless Connectivity in University Library:

The foremost benefit of wireless networking is its comparatively low cost. Because no physical lines or circuits are directly involved, the only ongoing cost usually incurred is associated with the maintenance of the wireless equipment, which is generally modest.

A second benefit of wireless connectivity is the ease of implementation. Unlike wired networks, which often involve structural issues and the procurement of third-party services that delay implementation, wireless networks can often be installed in a matter of a few hours.

Wireless networking is also highly mobile. Access points and client devices may be moved with ease and at little cost, whereas the physical reconfiguration of wired networks tends to be costly and time consuming and commonly results in significant losses of productivity and/or service. Wireless networks will also play an important role when the primary networks fail.

The introduction of wireless data communication is revolutionizing many jobs and services, much as the introduction of desktop computers did fifteen years ago. This developing technology offers great potential for broadening access to library services in ways never before conceived. Wireless data communication may be the next logical step in the evolution of library information systems. Just as many librarians were unfamiliar with the potential of desktop computers in the early 1980s, we again find ourselves on "the outside looking in" when it comes to wireless data communication. (GSM) (Fatoki, 2005).

In addition, the world is now boundless but is still bound. It is boundless because people can access information about the world in speeds that could not have been thought of in the past. The world is still bound because interconnection is still dependent on location as well as scope of connection. Wireless networking removes the binding wires that were essential earlier to connect to the Internet or join a local network. Right now, with new technologies, working is much more relaxed and in a sense, unbound.

Apart from libraries even offices, Schools, cafes, public places, uses wireless networking. This makes interconnection more dynamic, and is not bound by the number of slots that can accommodate at a time. By just being in a zone where the wireless connections are, people can experience connecting in the most convenient places. People can do work outside the office and students can literally have a library access from anywhere. The appeal of wireless networking/connectivity is truly amazing and it covers a wide variety of aspects. Although there are some limitations, most of the time, the connections are reliable enough for a great Internet experience.

Networking is dependent on topology. This means that a connection could be limited only to a room and it could also be as extensive as a whole university environment or outdoor location where people/students mingle. The simplest kind of wireless networking is WPAN, which is typified by Bluetooth technology where an individual can use wireless devices like connecting Bluetooth headphones to the computer/laptop or mobile phone.

The WLAN is famous as Wi-Fi and many people benefit from this kind of connection. In a bigger scale the WMAN is an interconnection of WLAN points. For outdoor and wider areas, the WWAN is used. Networks of business branches as well as public Internet access can be done in this method. People have embraced the amazing benefits or importance of the wireless networking/connectivity from its inception during the world war and now, because it is becoming more commonplace around the world, people are now awaiting a new form of wireless connectivity to virtually improve the access to information and to address the vulnerability issues of the more prominent wireless technologies.

Factors affecting the use of Wireless Connectivity in University Libraries:

Problems that are encounterred in providing information services such as the use of wireless connectivity in Academic library are similar to that encounterred by a computer-based or network system.Oyedun (2006) identified problems associated with computer-based system as the following:

- Developing countries like Nigeria has poor economy and so cannot finance the use of computer. This has similar effect in libraries.
- The technical know-how is still low and insufficient to take care for the operational need, i.e. Library staff does not have the needed level of computer knowledge to manage and update the application.
- There are hardware and software problems, in relation to cost and spare parts (to host the server).
- Power outage is another significant problem in the libraries.

Strategies

Based on the above identified problems, the following strategies are proffered;

1. There is need to improve the economy of the country and also provide adequate finance for the universities to provide more computer facilities.
2. The university libraries should take deliberate step to train the library staff to have the requisite level of computer knowledge to manage and update the computer applications in the library.
3. There is the need for the university libraries to update the hardware and software of the library and in relation to spare parts (to host the server).
4. The issue of erratic power supply should be addressed, there should be creation of policy and guide for the use of wireless networks.

If these solutions are applied and implemented University library will have an

effective and reliable wireless connectivity system.

Conclusion

In conclusion there are many effectiveness of wireless communicationfor fast and convenient utilization of information resources by students, the challenges of wireless connectivity such as inadequate power supply to the institution, Limited and expensive internet bandwidth, slow speed of wireless network, inadequate number of ICT professionals, inadequate funding and poor internet connectivity are the challenges facing wireless connectivity in University libraries. The solutions to the challenges of wireless connectivity such as adequate funding, systems upgrade, evaluation of automation facilities, adequate training of library staff by management of University library, involvement in inter-connectivity to facilitate resource sharing, the issue of erratic power supply should be addressed, there should be creation of policy and guide for the use of wireless networks. If these strategies proffered are applied adequately, effective and efficient accessing and utilization of electronic resources in University libraries would become the order of the day which would be a positive achievement.

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