WIRELESS TECHNOLOGY: USES AND AUTHENTICATION OF DATA COMMUNICATION

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ABSTRACT

Wireless technology can be used tremendously in Nigeria to achieve vision 20:2020 in the area of educational research, e-commerce, e-government, and so on There is need to embrace wireless technology in educational researches based on the fact that the bedrock of growth of any nation is centered on proper implementation of research works carried out by experts in various fields of endeavor. This paper dwelt on the meaning of laptop wireless internet access, wireless technology, educational research, wireless technology and wealth creation and explained what people need to know to use it safely, both in the home and in the office. The authors suggested the way forward at the end of the write-up for the government, the service provider and the end user to brace up to the challenges in using wireless technology.

Keywords: **Communication, Internet, Networking, WAP, Wireless Technology,**

1.0   INTRODUCTION

In recent years, wireless networking has become more available, affordable, and easy to use. Home users are adopting wireless technology in great numbers. On-the-go laptop users often find free wireless connections in places like coffee shops, offices, cyber cafe airports and so on. If one is using wireless technology, or considering making the move to wireless, such a person should know about the possibility of using it effectively for educational research, e-commerce, e-governance, and so on. Wireless-enabled laptop means the laptop/computer has built-in wireless adapter and it's active. Wireless enabled is a system normally on laptops which allows people to access the Internet via an existing Internet connection. For example; If one buys a laptop which is wireless enabled, and wishes to get on to the Internet, that is a possibility if the computer has the Internet or a wireless router. If one has neither of these items (a computer or a wireless router)

then he can buy a wireless router and then connect to the Internet wireless.

To enable wireless, check two things. Whether the wireless button on the laptop is turned on or turned off. The wireless button is found on the laptop's keyboard or on the side of the laptop. The wireless button will have an icon of wireless antenna. If the light on the wireless button is amber then it is turned off. If the light is blue then it is turned on.

Computer network, according to Curt (2004), is an interconnection of computers and computing equipment using either wires or radio waves over small or large geographic areas. Computer networks that use radio waves are termed *wireless* and can involve broadcast radio, microwaves, or satellite transmissions. Networks spanning an area of several meters around an individual are called *Personal Area Networks* (PANs). Personal area networks include devices such as laptop computers, personal digital assistants, and wireless connections. Networks that are a little larger

in geographic size – spanning a room, a floor within a building, a building, or a campus – are *Local Area Networks* (LANs). Networks that serve an area up to 30 miles – approximately the area of a city – are called *Metropolitan Area Networks* (MANs). Large networks connecting states, countries are called Wide Area Net works (WANs). The vision 20:2020 is aimed at placing Nigeria among the biggest 20 world economies by the year 2020. The Vision is for Nigeria to "have a large, strong, diversified, competitive and, technologically enabled economy that effectively harnesses the talents and energy of its people and responsibly exploits its national endowments to guarantee a high standard of living and quality of life for its citizens". The writers are advocating for wireless laptop empowerment as a mean of achieving vision 20:2020, that is, every family should have at least one functional internet enabled computer possibly wireless laptop for information, communication and technology advancement and educational researches. Based on this fact, it will be easier to improve technological awareness, reduce poverty rate, produce self sustained or self employed individuals, and easy to surf for information on the internet, buy and sell on the net right at ones home or office.

2.0   USES OF LAPTOP WIRELESS INTERNET ACCESS

Laptop Wireless Internet Access makes life easier. Laptop Wireless Internet Access puts the world at ones fingertips. If a person has a laptop, it only makes sense that he would use laptop wireless internet access. Laptops themselves can be used as a wireless tool, so why would someone want to plug a modem cord into a cordless machine? Laptop wireless internet access is affordable and easy to access.

With the growth of wireless technologies, laptop wireless internet access is becoming readily available in many markets. Large countries such as Nigeria currently offer laptop wireless internet access at several locations throughout their cities. These locations are known as hotspots. Hotspots send signals out to laptops allowing wireless internet access to the user. Typical example is, *Coal City WiFi (Wireless Fidelity)* – a six months free Internet service given to the people living in Enugu state by the current governor, *Bar. Sulivan Chime*, at the middle of 2009. With free access code(s), students, employees, businessmen and businesswomen in the state 'surf' through the internet without any form of restriction. Cyber cafes, MTN, Glo, Zain and other tele-communication outfits give or sell air time at an exorbitant rate before having access to the internet. It is usually referred to as pay-as-you-go kind of internet services. The tele-communication industry sell pre-loaded flash disk, which when connected to your laptop, can browse based on the credit facilities in the disks. The flash disk needs re-loading or re-charging after the expiration of the existing credit. In a cyber café that operate wireless services, all the need to do is to buy air-time and log in. you're free to down load on your laptop at will.

Businesses and institutions are also jumping on the bandwagon for laptop wireless internet access. Having laptop wireless internet access in a business and school location will allow employees to meet with each other in different locations within the business environ or campus, without having to leave their computer behind. The ability to have laptop wireless internet access decreases wasted time and resources printing out files and documentation or relevant websites and since the employees can take their computers with them, all their files and internet resources are as close as a click of the mouse. The use of laptop wireless internet access in a business or office place is also said to foster creativity, allowing employees to work wherever they want within the business or campus environment.

Homes can also be a beneficial area for the use of laptop wireless internet access. Wireless networks in the home are easy to install and use. Laptop wireless internet

access will allow you to work in any room of your house, thereby reducing family interruptions and stress.

Whether work, play or home, laptop wireless internet access allows users the freedom and convenience of accessing the internet without having annoying cords in the way.

2.1 Authentic Wireless Generations

As with all technology progressions, the "next" upgrades must be in planning and development phases while its predecessors are being deployed. This statement holds true with all mobile telecommunications to date. It seems that it will also hold true for the next generations of wireless networks. The original analog cellular systems are considered the first generation of mobile telephony (1G). In the early 1980s, 1G systems were deployed. At the same time, the cellular industry began developing the second generation of mobile telephony (2G). The difference between 1G and 2G is in the signaling techniques used: 1G used analog signaling, 2G used digital signaling. As experience shows, the lead-time for mobile phone systems development is about 10 years. It was not until the early to mid 1990s that 2G was deployed.

Primary thinking and concept development on 3G generally began around 1991 as 2G systems just started to roll out. Since the general model of 10 years to develop a new mobile system is being followed, that timeline would suggest 4G should be operational some time around 2011. 4G would build on the second phase of 3G, when all networks are expected to embrace Internet Protocol (IP) technology.

Few years back, companies such as Ericsson, Motorola, Lucent, Nortel and Qualcomm came up with "3G-plus" concepts that would push performance of approved, though still emerging, standards beyond the current ones.

2.2 Why Wireless Technologies?

To support networking solutions that consumer electronic devices and appliances can plug into, Microsoft is working on a range of wireless technologies to enable a robust set of user scenarios for local area networks (LANs), personal area networks (PANs), and wide area networks (WANs). Windows provides extensive Native 802.11 support, which is the widely adopted standard for high-speed networking across wireless local area networks (WLANs).

Windows includes built-in support for Bluetooth wireless technology. Compatible hardware complies with the H:2 (USB) HCI specification for Bluetooth wireless technology. The hardware vendor does not have to provide a separate driver. Bluetooth L2CAP protocol drivers should use KMDF or a device-class-specific driver model such as AVStream. Drivers for RFCOMM devices should use UMDF.

2.3 Benefits of Wireless Application Protocol (WAP)

Wireless Application Protocol (WAP), is particularly useful in areas where telephone penetration is very poor especially through the wireless connection. The benefits of the new world of wireless communication are many and varied, it makes it possible for individuals to obtain information when, where and how they want it, which results in personal and business advantages: It makes transaction more convenient in a place where telephone penetration is very poor, It makes the delivery of multimedia services (voice, video, text and data) possible at speeds at least 60 times greater than the current digital telephone technology, It supports undeterred high performance computing both in office and at home, and lastly responds to the increasing power and portability of computing and entertaining devices.

3.0 APPLICATION OF WT RESEARCH IN EDUCATION

A lot of valuable time could be wasted if the researcher has not developed the skill for quick search for materials. For most researchers, the library is the most important source of materials. In most cases,

a researcher may need to read so many books, journals, reports and documents relating to the research focus. It may not be possible to cover all these book sources within the little time available. To save some time, some preliminary assessments are done of all the devices used for the classification of books and non-book material in the library. These include catalogue, index of journals, and bibliographies. These are standard devices that one would find in almost all libraries. Moreover, the researcher must be familiar with the classification schedules. These schedules indicate not only the arrangement but also the positions of each book in the library. These complexities call for automated or electronic library that will make the library easy and quick to search, (Itegboje and Okubote, 2000).

Research has many roles to play in education in Nigeria. Successive govern-ments in the country have always adopted ad-hoc approaches, which do not provide in-depth knowledge of the problem. The problems are also compounded by the frequent changes in educational policies most of which are based on weak and inadequate information base. The high cost or non-availability of books and some other educational materials, poorly remunerated teachers, curriculum deficiency, poorly equipped libraries and others, have not helped the educational sector either.

The place of research in education can be examined at two levels: At micro level, research can generate ideas for improvement of the administrative setup in each institution. Research can produce ideas for the improvement of teaching techniques. Issues relating to the morale of members of staff and the welfare of students can be handled with the aid of research. Indeed research can serve as a very useful tool in improving the level of efficiency in the administration of schools.

Research can also tell a lot about the linkages between education and industry. This is an area that has been utterly neglected in educational research in Nigeria.

The feedback from such a research effort will go a long way in drawing attention to areas of curriculum that need to be revised as well as new programmes or courses needed for the constantly changing industrial sector. There is, in deed, an infinite scope for systematic research in education in Nigeria.

Research at the tertiary levels is very compulsory for the lecturers to be profitable because they are expected to pour out streams of knowledge to students who will jot down important points which will form the basis for later reading. Hence, the lecturer requires current and related books to direct their concept/focus to a related research work. The students too are not left out especially the postgraduate students who require related reference books to assist them in their research work.

4.0 THE INTERNET SERVICES

The world's largest computer net-work, connecting many campuses, states, regional, and national networks, the computers are mostly connected by the way of telephone lines. The Internet, include computers of all type of operating systems, but they all communicate a common standard protocol called TCP/IP (Transmission Control Protocol or Internet Protocol). This protocol breaks data streams into manageable chunks of data called datagrams, reorders the datagrams, reassembles them at the other end, and resends lost or damaged datagrams. This ensures minimal loss of data and very efficient transmission of data from one computer to another (Rasaki, 2008).

The internet is fast becoming the global information center due mostly to the introduction of graphical web browsers like Mosaic, Netscape and Internet Explorer facilities on the Internet. The Internet facilities as in (Rasaki, 2011), include:

Electronic mail: allows messages to be sent from a sender to the receiver over the internet. It is the most popular service of the internet.

Graphical World Wide Web: Offers a graphical web browsing facility to make the web a better place for both graphical and text information.

Internet Relay Chat: That allows hundreds of public and private 'chat Areas' with topics spanning various aspects of human interest. Usenet Newsgroups are forums for public discussions like Bulletin Boards and discussions areas of interest (Education, Politics, Sport, etc) and questions are entertained in these services.

File Transfer Protocol (FTP): It's an internet service that provides a system for transferring files between computers. FTP clients can either be dedicated FTP applications or built into Web Browsers. FTP stored directories of files using a hierarchical structure. Normally, a user is a client, and a company acts like the server.

There are many resources on the Web that can help people learn about new subjects. People can even take university courses and other classes on the Web. Web is an excellent source of research material. You can find reports, statistics, directories and much more. To browse or surf the internet for information or search the net, one needs a search engine tool, which are numerous now. They are:

Yahoo! URL: http://www.yahoo.com It is the most popular search engine and has links printing to various categories so that you can narrow your search. All you need to do is to type in keywords, and yahoo comes up with a list of top sites. It is the best when you are looking for the website of a popular company or association but not the best for remote sites.

Google URL: http://www.google.com This is another useful search engine that can be used to search for information in education, politics, government, commerce, health and so on. Several books, journals, magazines, encyclopedia and newspapers can be surfed here. English and other languages can be adopted in browsing for a particular topic of any field in Google site.

Alta Vista: URL: http://www.alta-vista.digital.com: It is very good for non-common sites or very far home page but at times too comprehensive for what is required.

Excite: URL: http://www.excite.com This is better because it lets you narrow your search to scan only web sites, UseNet newsgroups, types of content like classified ads or excite database or website reviews. You can search by concept or key word apart from its search engine. Excite's home page features the latest news headlines, stock quotes, sports scores, chat rooms and services.

The Internet 2 Contribution: URL: http://www.internet2.edu/htul: Internet 2 is a research and development advanced internet technology and applications vital to research and education missions of higher education. Over 170 U.S. Universities, working together with partners in industry and government, are leading the internet 2 project. Internet2 is not a physical network that will replace the Internet.

4.1   Safe Wireless Networking in Public Spaces

According to Rasaki (2011), accessing the internet via a public wireless access point involves serious security threats one should guard against. These threats are compounded by inability of one to control the security setup of the wireless network. What's more, one is often in range of numerous wireless-enabled computers operated by people one do not know. The following sections describe steps you can take to protect yourself.

Watch What You Do Online: Because user is likely to have an unsecured, unencrypted network connection when using a public wireless access point, user should be careful about what one do online—there's always the chance that another user on the network could be monitoring ones' activity. If one can't connect securely using a VPN (see "Connect Using a VPN" below), then consider avoiding: online banking,

online shopping, sending email, typing passwords or credit card numbers.

Connect Using a VPN: Many companies and organizations have a Virtual Private Network (VPN). VPNs allow employees to connect securely to their network when away from the office. VPNs encrypt connections at the sending and receiving ends, and keep out traffic that is not properly encrypted. If a VPN is available, log onto it any time one needs to use a public wireless access point.

Disable File Sharing: File sharing in public wireless spaces is even more dangerous than it is at wireless network. This is because a user and wireless-enabled laptop are likely to be even closer to other wireless computers operated by unknown people. Also, many public wireless networks feature peer-to-peer networking in which other computers will attempt to connect directly to ones laptop. To leave file shares open in this kind of environment is to invite risk. To prevent attackers from gaining access to sensitive files, one should disable file sharing when connecting to a public wireless access point. Consult the help file for operating system to learn how to disable file sharing.

Be Aware of Your Surroundings: When using a public wireless access point, one should be aware of what's going on around. Are others using their computers in close proximity? Can others view ones screen? Is laptop near a window through which someone, using binoculars, could get a view of the screen? If any of these conditions exist, then sensitive data might be at risk. Consider whether it is essential to connect to the internet. If an internet connection is not essential, disable wireless networking altogether. If one needs to connect, use caution and follow the steps noted above.

4.3 Wireless Technology and Wealth Creation

Wireless technology systems improve the living standard of humanity based it application on the following areas: e-education, e-governance, e-commerce, e-payment, etc.

Experts in all fields like science, medicine, law, engineering, humanity, agriculture, education, telecommunication, art, astronomy and so on empowered themselves with the use of wireless technology systems to enhance their productivity which on the long run boost their income.

For instance the medical doctor uses his expert system based wireless laptop to diagnose patience in the hospital to identify simple or complex symptoms and prescribes necessary test or drug. This reduces casualties and hasting up the time required to attend to patients.

Lots of unemployed youths have been empowered with the use of wireless technology systems due to the fact that we now have so many self employed telephone operators, repairers, vendors and even cyber café operators, computer vendors, software engineers, website designers, hardware engineers, IT trainees/consultants.

Educational researches are now enriched with the advent of internet facility that gives opportunity to researchers to have access to current books, journals, news-letters, newspapers.

Majority of home appliances like telephone, satellite, etc are technologically manufactured to improve the living standard of the humanity.

Federal government adopts e-payment system since 2009 to eliminate ghost workers, missing large sum of money on transit or to unscrupulous officer, delay payment of staff salary, contractors, service provider, and so on.

Bank transactions have improved tremendously via the use of e-payment like automatic teller machine (ATM), wireless transfer system and credit card system.

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Without wireless technology, the idea of global computing would have been impossible because it will require wiring the computer systems in the worlds together before information and communication could take place. This could have been highly expensive and cumbersome. The benefit of learning through the web also cannot be over-emphasized. Lots of information on education and research that can not be readily gotten from either lecturer or books from the library is massively available on the internet. The user-friendliness, low-cost and the ease of downloading the much information call for total acceptance of the internet into every community. Study through the Internet is the order of the day, since it looks unsurpassed for now, as an excellent medium of learning and research.

Also, the president of Information Technology Association, (ITAN), of Nigeria (Jimson Olufuye), has said that it will be a waste of resources to invest heavily towards the realization of Vision 2020, without giving priority to the development of Information and Communication Technologies, ICT. It might be plausible to envision a Nigeria in 2020 where all citizens are digitally prepared to compete in the data-centric world."

Wireless access technology, quite apart from the fact that it will permanently change the way people live and work. If implemented in Nigeria will revolutionalise commerce between Nigeria and the rest of the world.

5.2 Recommendation

This conference paper will be incomplete without the following recommendations:

(1) Hardware and Software manufacturers should continue to mass produce so as to reduce the price of the computer systems for laymen to avoid.

(2) Internet service providers (ISP) should cut down their tariff or access cost and improves on the services rendered to the users.

(3) The state-of-the art visual library and up-to-date relevant books for students, researchers, teachers and interested users should be provided and maintained regularly in Nigeria schools.

(4) Divulging password, credit card number, and other secret code to people carelessly should be avoided completely to eliminate loss of vital information and money to hoodlums.

(5) Computer users of wireless Laptop should avoid unnecessary or unvetted download of data, voice, video, text, and document to avoid downloading computer virus into their laptops.

(6) The use search engines on the internet combine with up-to-date traditional libraries give quality research work in every field of human endeavor.

(7) Government at all levels, MDGs, ETF, NGOs, philanthropies and other private organizations should continue empowering Nigerians in the areas of IT training, computer systems (both desktops and laptops) and Internet connectivity.

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