

# THE WEB OPTION AND RESEARCH IN PHYSICS

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## ABSTRACT

Various options and opportunities offered by the web to the study and practice of physics have been reviewed. Rather than work individually the web provides the option of working as a team. Rather than go from place to place in search of physics information the browsing technique of the web is seen to provide the option of obtaining any kind of information across the globe from one's office or workstation. Websites are seen as global reservoir of ordinary and expensive information, pricelessly accessible by the privileged and less privileged. Favoured as well is the option of passing physics instructions across the web rather than the classroom alone. The web is seen to have broken the restriction imposed by distance on global communication so that all kinds of physics materials can be shared across the globe. Study shows that the web has a lot of options and opportunities for the broad field of physics.

**KeyWords:** Web, Physics-information, Website, Option, Globe

## INTRODUCTION

The Internet is a worldwide interconnection of computers and computer network using common network standards (Orimalade, 1999). It has no doubt revolutionized the information age by breaking the restriction imposed by distance on global communication. With its interactive features the Internet does not only expose you to where the information is but offers you the opportunity to access and retrieve it on real time basis (Babbage et al. 1996). The information base of the Internet is sustained by a set of Host computer "servers" called Websites. All kinds of information can be sent and received across the net.

It is both amazing and absorbing browsing through the Internet and getting information. This is made possible by a collection of standards and protocols called World Wide Web (WWW) (Tesar, 1996). All kinds of information such as physics texts journals and graphics could be sought and obtained.

Equally amazing is the complementarity, which seem to exist between physics as a broad field and the international network. While the indispensable principles of physics in areas of waves and communication are applied both to

achieve and sustain the international network, the network in return contributes options for enhancements in physics research, studies and practice. The "feedback" to physics is therefore positive.

This paper therefore aims at reviewing the various options offered to physics as a broad field by the web.

## COMPUTER COMMUNICATIONS

It is necessary to begin by looking at the skeletal buildup of the Internet with respect to a typical Local Area Network (LAN) or Wide Area Network (WAN). Computer communications can be implemented by linking two computers directly by a cable or through a LAN or by the use of telephone via a modem (Babbage et al, 1996). A LAN may contain two or hundreds of personal computers. An office LAN can be joined with LANs in other offices forming a larger network. Such inter-link of LANs over a wide area eventually gives rise to a wide area network. A LAN requires software to manage network operation. In a typical LAN there exists one or more computers that function as network "Server" maintaining the files

used in the network and controlling shared peripherals (Babbage et al, 1990). Computer communication is done in various modes such as Bus-organized communication system (Nwachukwu, 2000).

Fig 1 shows the organization of a typical University WAN in accordance with the visions of National University Commission (NUC)

(Abdulkadir, 1995). Such a WAN may have one or two backbone computers that serve the various LANs.

Faculty LANs may be linked by telephone lines or optic fibres while the main backbone links the campus to the outside world by means of wireless. To hook up to the Internet, the backbone is linked via dedicated lines to a Hub such as the one

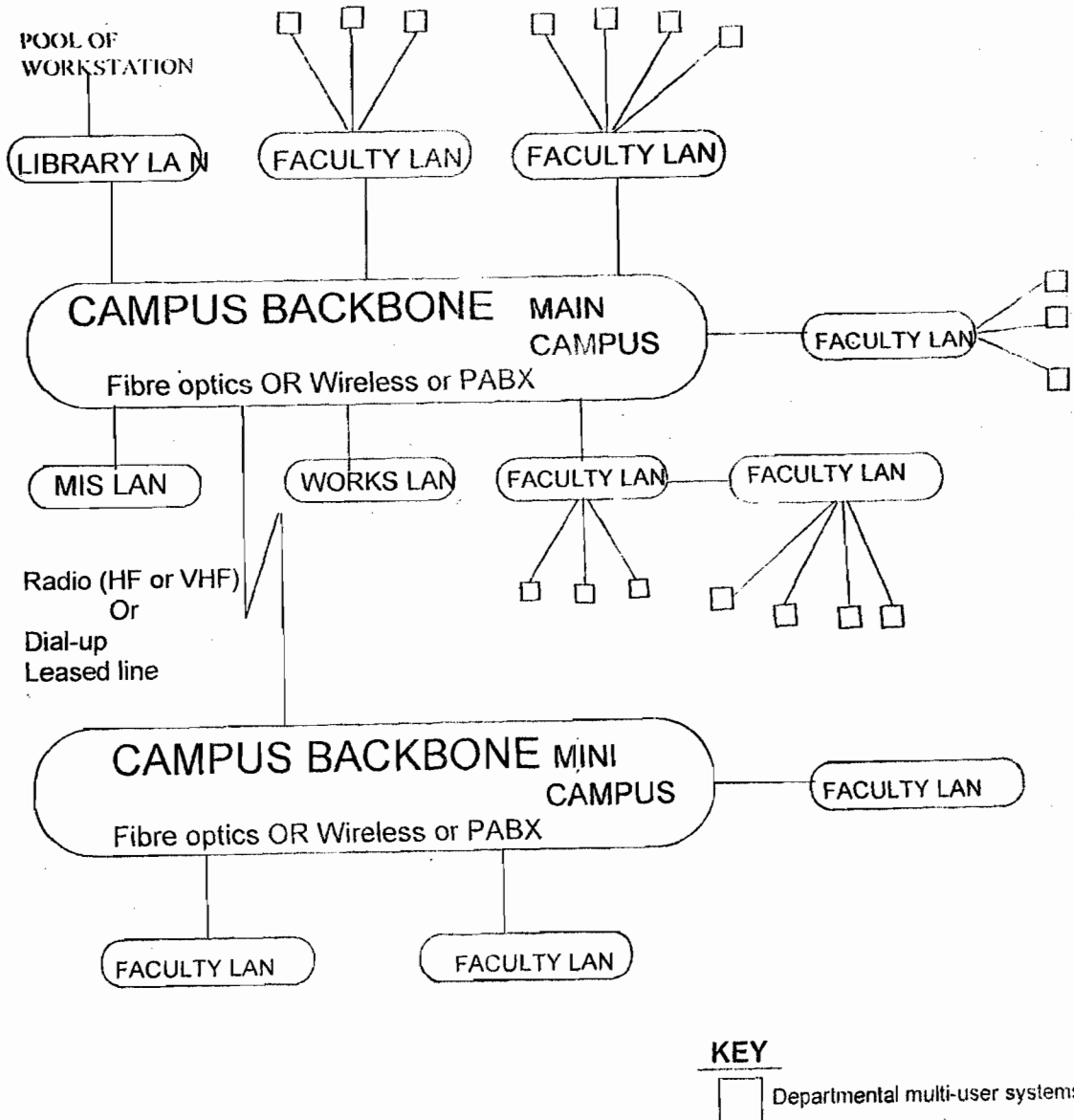


Fig 1: Typical University Wide Area Network, (Adopted from Abdulkadir, 1995)

installed by NUC at Abuja (Abdulkadir, 1995). The Hub is linked via wireless to a gateway in Italy while the gateway is linked to communication satellite via microwaves. This makes worldwide communication possible.

To obtain Internet services one has to get connected through an Internet Service Provider (ISP). To the prospective user such questions as: How does information get into the net? Or how is information sought? And how is information received from the net? Are important. To answer these questions we consider them one after the other.

### **GETTING INFORMATION INTO THE WEB**

Websites are the information store-house of the Internet. On request they store and display information in interconnected "Pages". Page linkage is accomplished by means of Hypertext Markup Language (HTML) which hyperlinks one page to another by keywords or phrases that are highlighted (Tesar, 1996). Websites are scattered around the net all over the world and each has a definite "Website address" by which it is identified. New ones are being created. Storable on web pages are texts, data, journals, pictures sound etc. (Orimalade, 1999).

### **LOCATING INFORMATION IN THE WEB**

To search for information in the net one needs a special software package called "Browser" (Tesar, 1996)

A web browser contains the basic software that enable a user to find, view and send information over the Internet.

This includes software used for sending and receiving e-mail messages as well as read messages from news groups. The Microsoft internet Explorer is a good example of a browser. To access a website its address should be known. Browsing is further facilitated by a set of tools that keep track of all the Websites called web search engines (Orimalade, 1999). Examples of such engines include Excite, Infoseek, Yahoo and Lycos.

### **GETTING INFORMATION OUT OF THE WEB**

Facilities of the net enable located information to be downloaded, copied or printed. However, how fast a web page travels from the website to your computer depends on a number of factors such as transmission speed of your modern, size of the page file, Internet traffic, server-boardrate and the type of linkage cables.

### **DISCUSSION**

Access to Ethernet makes information sharing a natural feature (Agbasi, 1993).

The web creates opportunity for creating a large physics database across the globe for research, education and practice of physics. Rather than work independently, this provides the option of working as a team. Physicsts all over the world who have relevant information on discoveries and inventions can send same into the websites so that students, lecturers and others can have access to them.

Since no particular institution, organization or country is in control, the web option ensures access to all kinds of physics information without the usual official protocols or bottlenecks.

Rather than move from campus to campus or country to country in search of physics research materials, web facilities provide the option of browsing and locating any kind of physics information in the comfort of one's room, office or campus. Physics texts journals publications and data can be located.

The web provides facilities for downloading located physics texts publications and other materials which could be copied, printed and made use of in one's workstation.

Videotex, a facility of the net can be applied in the teaching of physics by specialists across the net (Geoffrey et al 1993). Videoconferencing and telepresence made possible by the web can be used for on-line physics and allied discussions across the net. Thus the teaching of physics will no longer be restricted to the classroom especially now that the clamour for distance education is on the increase.

The web supports sharing (Nwachukwu,

1993), therefore the message services of the web such as e-mail can be used in sending and sharing physics materials such as data, graphics on real time basis. The web also provides on-line shopping (Babbage et al 1996) which provides the option of shopping or selling of physics materials over the net without passing through the commodity market.

## CONCLUSION AND RECOMMENDATIONS

Various options and opportunities offered by the web to physics as a broad field have been reviewed. The web encourages co-operation and sharing of academic and other resources. Thus the less privileged physicists, students and professionals who do not have relevant materials for their work can get them. In these hard times not many organizations or countries can foot the bill of obtaining such expensive information as satellite data on space exploration but by invoking the appropriate web facilities they can be obtained freely.

This paper recommends that physicists should form cooperate groups with the aim of using web facilities to enhance their work. Nigerian Universities and research Institutions should go network according to the visions of NUC. This will create opportunities for bodies like Nigerian Institute of Physics (NIP) and Nigerian University Physics Series (NUPS) to benefit from the Websites of advanced institutions like International Centre for Theoretical Physics (ICTP) and Rutherford Laboratories. Also Nigerian Institute of Physics should create a website to enable our local professionals sell their ingenuity to international community.

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