Electronic Mail (Email) and Information Delivery in Ghana

M. Osei-Bonsu

ABSTRACT. The GHASTINET Pilot Project, begun in Ghana in 1991, was to develop and promote the use of email communication to facilitate resource-sharing between the universities and the research institutions. But the project failed due to poor telecommunication infrastructure and a lack of technical skills on the part of the operators. The email service using the FidoNet technology, and developed with support from IDRC/UNECA/CABECA and hosted by the Balme Library, University of Ghana, has opened up the door to many services for its users. The information revolution offers Ghana a dramatic opportunity to leapfrog into the future. The paper discusses existing Internet services and other internationally supported initiatives (including InfoDev and the Leland Initiative) embarked upon in Ghana. It is concluded that the various initiatives under way to get full Internet connectivity for educational, research and public sector organizations be coordinated so that Ghana can fully benefit from such assistance programmes. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworthpressinc.com]

INTRODUCTION

Electronic mail (often shortened to email or simply mail) is the most frequently used tool on the Internet. For many users, email is the only Internet service that they use, because they do not have full Internet connectivity. The importance of email cannot be overstated. It would not be an exaggeration to say that the global economy is now

M. Osei-Bonsu is Senior Assistant Librarian/Head of Cataloguing, G.S.T. Library, Kumasi with additional responsibility for the Email Service. E-mail: (mob@ust.gn.apc.org).

Journal of Interlibrary Loan, Document Delivery & Information Supply
Vol. 9(2) 1998
© 1998 by The Haworth Press, Inc. All rights reserved.
dependent on Internet mail. And on a very human level, the desire to communicate is the very basis of all computer networking—email allows people separated by great distances to talk and work together.¹

The Internet is an electronic communication network that provides access to electronic mail and electronic information resources (including computer files and databases) held in computers around the world. Internet technologies provide important new opportunities for the developing countries by providing the ability to disseminate and propagate information to meet national needs. This technology can also be adapted to the individual needs of developing countries by those who know how to define and catalogue these needs. Thus the overall approach is to facilitate the transfer of technology.²

On the Internet one can send and receive mail from anyone else who is also connected to the Internet. Essentially email is a letter or document composed, sent, received and read by means of computers. Most often email contains personal messages or information but email can also transport anything (picture, software program, audio sound, video, etc.) that can be stored as a simple text file. Ravi and Indra (1994) reported on an information server, bibserv that receives queries in predefined format by email and sends back the retrieved information or files by email.³ Klobas (1995) also reported that many of the university staff in Australia who use email service and the Internet have international networks of colleagues who could advise them on where to locate the data or files they wanted, and if necessary, what commands to use to get them.⁴

**EMAIL PROGRAM BASICS**

There are many electronic mail programs for each computer platform. Most email programs are fairly similar in their basic features: composing, sending, receiving messages. All email programs have some sort of system based on an Inbox, Outbox and Trash concept to organize the mail messages. Beyond the basic ability to send and receive mail, almost any email program has the following universally supported features: aliasing, folders, forwarding, reply, carbon copies (and blind carbon copies), and signature files.

**How Does Email Work?**

Email is based on the “store-and-forward” system for transporting mail (analogous to the snail-mail postal service). The mail (broken
into "packets," each numbered and labelled with the sender's and recipient's addresses) gets passed from one computer to another until it arrives at its destination. This delivery system is standardized by the Simple Mail Transfer Protocol (SMTP). There are millions of computers on the Internet running Transport Agents (such as UNIX-based sendmail) which work behind the scenes to see that mails are transported according to the SMTP protocol.

Email is designed to work with ASCII text. This means that email messages have to be in plain text and cannot incorporate formatting, font changes, etc., which are so common with word-processing. By encoding documents, non-ASCII (binary) files, such as word-processor documents (e.g., WordPerfect files) can be sent via email, and still retain formatting information (bold, italics, underlining, footnotes, etc.). This makes it useful for transferring drafts of manuscripts, thesis, etc., for publication or refereeing. The recipient then converts them back to original form. UUENCODE converts binary to ASCII, and UUDECODEx converts ASCII to binary.

Multipurpose Internet Mail Extensions (MIME) also allows one to send or receive a number of file formats via email. Some mail systems are MIME-compliant for both sending and receiving mail (e.g., Pine and Pegasus Mail), others (e.g., Elm) can receive MIME messages but cannot sent them.

**EMAIL IN GHANA**

Email service has been in Ghana for a little over six years. It began in June, 1991, immediately after the Training Workshop organized by the Ghana National Scientific and Technological Information Network (GHASTINET) in collaboration with the American Association for the Advancement of Science (AAAS), the International Development Research Centre (IDRC) and the Pan African Development Information System (PADIS). The Workshop was attended by 25 participants from sixteen (16) institutions in Ghana. It covered five days, of which all afternoons were devoted solely to hands-on practice.

The purpose of the Workshop was to introduce participants to electronic mail and train them in the essential techniques involved, and also to generate ideas on how the Ghana Project might be set up, implemented and supported financially. Initially the Project was to develop email communication between the three universities, GHAST-
into “packets,” each numbered and labelled with the sender’s and recipient’s addresses) gets passed from one computer to another until it arrives at its destination. This delivery system is standardized by the Simple Mail Transfer Protocol (SMTP). There are millions of computers on the Internet running Transport Agents (such as UNIX-based sendmail) which work behind the scenes to see that mails are transported according to the SMTP protocol.

Email is designed to work with ASCII text. This means that email messages have to be in plain text and cannot incorporate formatting, font changes, etc., which are so common with word-processing. By encoding documents, non-ASCII (binary) files, such as word-processor documents (e.g., WordPerfect files) can be sent via email, and still retain formatting information (bold, italics, underlining, footnotes, etc.). This makes it useful for transferring drafts of manuscripts, thesis, etc., for publication or refereeing. The recipient then converts them back to original form. UUENCODE converts binary to ASCII, and UUDECODE converts ASCII to binary.

Multipurpose Internet Mail Extensions (MIME) also allows one to send or receive a number of file formats via email. Some mail systems are MIME-compliant for both sending and receiving mail (e.g., Pine and Pegasus Mail), others (e.g., Elm) can receive MIME messages but cannot sent them.

EMAIL IN GHANA

Email service has been in Ghana for a little over six years. It began in June, 1991, immediately after the Training Workshop organized by the Ghana National Scientific and Technological Information Network (GHASTINET) in collaboration with the American Association for the Advancement of Science (AAAS), the International Development Research Centre (IDRC) and the Pan African Development Information System (PADIS). The Workshop was attended by 25 participants from sixteen (16) institutions in Ghana. It covered five days, of which all afternoons were devoted solely to hands-on practice.

The purpose of the Workshop was to introduce participants to electronic mail and train them in the essential techniques involved, and also to generate ideas on how the Ghana Project might be set up, implemented and supported financially. Initially the Project was to develop email communication between the three universities, GHAST-
INTERNET INDUSTRY IN GHANA

Ghana's Internet industry at the present time is dynamic, and includes three commercial Internet Service Providers, Network Computer Systems (NCS), AfricaOnline, and Internet Ghana. Different services are provided to customers at different rates, the highest providing 24-hour full Internet connectivity and browsing on the World Wide Web. The lowest subscription provides only email service, and this constitutes 70% of the service to subscribers.9

Opportunities are particularly promising for Ghana, which has a large demand for telematics services in its well developed public sector. The public sector has been building an extensive store-and-forward network with international connectivity, and full Internet services were introduced on August 25, 1995, by a private sector enterprise, Network Computer Systems (NCS), which has been providing a number of subscriptions to key public sector users. Ghana became the fourth sub-Saharan African country to connect to the Internet. Dial-up access was provided to subscribers and NCS applied for a top-down domain.

The NCS has 3200 subscribers and the number of subscribers continues to increase. By far the largest users are corporations (60%) with all manner of subscribers following second in use. Government is the third largest user followed by non-governmental organizations. NCS plans the commissioning of Points-of-Presence in all regional capitals; and has set up one in Kumasi. It also intends increasing the use of satellite channels. The bandwidth will be increased from 128KB to 384KB with the intent to obtain satellite downlink to IntelSat.10 NCS will also explore the use of radio and microwave links to radiate access.11
OTHER INITIATIVES

A number of initiatives (including the InfoDev Project and the Leland Initiative) supported by the US government and other national and international participating agencies, such as the World Bank, International Development and Research Centre (IDRC), International Telecommunication Union (ITC), UNDP, Physics Action Council (PAC) USAID, and Africa Internet Forum (AIF) have been embarked upon to put Ghana on the electronic information highways and to empower user institutions in Ghana to take advantage of improved access to global electronic information sources and to consolidate their demand in order to negotiate favourable access to the Internet.

FidoNet

Electronic mail service using the FidoNet and developed with support from the IDRC/UNECA CABECA project has been set up at the Balme Library of the University of Ghana which serves as the national host. It serves 180 points mainly in the university system but there are several users from other public sector institutions and NGOs in all nine regions of Ghana. Three of the points are themselves local hosts serving additional users. These are GHASTINET (Council for Scientific and Industrial Research, Accra), with 25 users, USTLIB (University of Science and Technology, Kumasi, with 33 users), and UCC (University of Cape Coast), with 20 users. Costs to the users are about US$50 for installation and US$20 per month; public sector users pay about half this amount. Mail is exchanged with the Internet by telephone calls to GreenNet in London which average US$300 per month.12

There are several FidoNet users, mainly development assistance organizations, who prefer to be polled directly by GreenNet even though this is more expensive. There is also a UUCP-based email system which functions by dial-up connection to a computer in South Africa; it is coordinated by the Association of African Universities (AAU) and includes nodes at the British Council and the University of Science and Technology (Vice-Chancellor’s Planning Office), Kumasi.

Leland Initiative

The Leland Initiative, a US government project administered by the US Agency for International Development (USAID), assists se-
lected African countries, including Ghana, to improve their Internet connectivity, and trains development institutions to use the Internet to achieve their organizational goals. The Leland Initiative began working in Ghana in May, 1996, and concentrated on awareness building—cultivating a general knowledge of what the Internet is and what it can do for the organization—and combining it with an assessment of 30 institutions as USAID partners. The assessment consisted of an examination of information use by the organization: what and how information is acquired and what and how information is disseminated.

USAID/Ghana also supports the implementation of pilot activities which ensure that Internet connectivity is available to the public. The USAID is supporting the University of Ghana, Legon, for the University to provide Internet services to the educational community. The support includes the provision and installation of hardware, and paying the fees associated with becoming an Internet Service Provider with its own domain. This will enable the university to offer services to other campuses and institutes.

Other pilot activities supported by USAID/Ghana include: (i) Internet and intranet connectivity to connect Ghanaian members of the West Africa Enterprise Network (WAEN), an international NGO with over 300 members in 14 West African countries, to their headquarters in Accra, including training for members and maintenance of the WAEN web site. WAEN provides research and information on trade and investment issues in Africa in order to increase regional and international trade and investment in Africa. WAEN intends assisting all its country offices in getting Internet access to strengthen their regional communications and (ii) Internet connectivity for each of the 10 regional offices of the Ghana Association of Women Entrepreneurs (Gawe), and training for members at each of these sites. The support includes the creation of the Gawe web site and its hosting fees for one year. Gawe is a non-denominational association of women manufacturers and exporters of non-traditional goods and services, and has 250 members countrywide. It is anticipated that the Internet will significantly increase export revenue to Gawe.
InfoDev

The project aims to help empower user institutions in the sectors of public concern—education, research, health, libraries and public information centres, and non-governmental organizations—in Ghana to consolidate their demand in order to negotiate favourable access for national and international telematics services and to be in a position to define and develop appropriate applications and local access infrastructure.\textsuperscript{15} The project also included a conference of national public sector to define priorities and formulate national policy recommendations, a pilot Internet service for 100 intermediaries and end-users in three priority fields, a sustainable national telematics demonstration and training centre, and technical training for about 70 Ghanaian specialists in developing telematics networks, servers and applications.\textsuperscript{16}

The project will be closely coordinated with other InfoDev projects aiming to promote Internet development and access in Africa, and with the efforts of the AIF (Africa Internet Forum) and USAID’S Leland Initiative to extend network access in Ghana. In addition, the project is proposed as a prototype for planned assistance to African countries in the telematics field under the United Nations system-wide Special Initiative on Africa. In this context it is expected to serve, through its methodology and results, as a useful model for other African countries.\textsuperscript{17}

The principal immediate beneficiaries of the InfoDev Project are the universities and research institutions of the Council for Scientific and Industrial Research (CSIR) which can take advantage of improved access to electronic information sources and electronic communications with national and international partners, as well as large service ministries such as agriculture, education and health. The project will provide needed assistance to establish a permanent national Internet training and demonstration centre at the University of Ghana (Legon, Accra) which will be developed with the full support of the University and the cooperation of NCS. One hundred pilot users who have received in-depth training in the project will be provided with Internet services and assisted for a period of one year to ensure that they can test and apply the acquired know-how in their work.\textsuperscript{18}

\textbf{INTERNET AND EMAIL}

"Internet" provides a general term for the connection of many computer networks running all types of operating systems so that they
could communicate cooperatively, using a common protocol, TCP/IP (Transmission Control Protocol/Internet Protocol). Most networks are independent structures created to serve different organizations. The Internet connects computers located at many universities, government and corporate research laboratories, and military institutions worldwide.

Email service allows a user to compose a memo, address it to a host computer on the Internet, and then "mail" it. Electronic mail (email) facilitates the exchange of email messages with anyone who has access to the Internet. It allows one to send and receive correspondence by computer, instead of putting a letter in the mail or using a fax machine. Email messages are not restricted to text only, but depending on one's email system, ASCII text or any binary file, such as graphic and audio files can be transferred.

In the real-time world of the Internet, messages are transferred more or less instantaneously and directly from sender to recipient. In sub-Saharan Africa, most email networks rely on a "store-and-forward" system which means that messages "hop" from one computer to another in a series of steps, whereby one computer "dials up" another computer with a modem and a phone line, usually at pre-set times during the day. The process can take minutes or hours but it means that messages can be delayed, sometimes for 24 hours or less. Email can also reach many places that ftp cannot; it can traverse networks which are not directly connected to the Internet, or networks which provide only email service. In addition, ftp cannot send a file to many recipients; but electronic mail can.²⁹

FidoNet is mostly used in sub-Saharan Africa, because it is a "low-tech" and low-cost way to meet communication needs. It does not require powerful computer hardware and it can tolerate poor telephone lines.

**What Does It Take?**

Email requires a microcomputer, a *modem*, and a telephone line. A modem is a device that allows data to be transferred via the telephone line. It connects the computer to the telephone line, and converts digital signals to analog signals (for transport over phone lines) and then back to digital at the other end (for use by the recipient computer). The name is derived from these functions, i.e., MODulate-DE-Modulate (modem). Modems come in different speeds. A fast modem
with error correcting and data compression support, may reduce the running costs. Although the speed of transfer is limited by the quality of the national telephone system, a modem with a minimum baud rate of 14000 or more will be ideal, since it can also take advantage of improvements in the telecommunication system. A direct telephone line is normally required for connection to the modem. One needs a printer too, if messages or files are to be printed. Any printer will do, a dot-matrix printer (with Letter Quality, such as Epson 1050+) being the least expensive to purchase and to maintain.

Even without interactive online capability, access to the simplest email, with the configuration sketched out above (computer, printer, optional, modem, telephone), will open up the door to many services. It will enable one to:

- Correspond with colleagues in Ghana, Africa, and overseas.
- Share information and data with individuals or groups.
- Keep in touch with the latest developments in one’s discipline.

**Advantages**

Email has several other advantages including: (i) It is cheaper than fax, since several documents, letters, etc., can be sent in the one call made to the sever or host, and faster than the regular (postal) mail. (ii) Because of security concerns on the Internet, many companies set up firewall machines, which prevent some Internet services from getting in or out. Email is the one service that is almost universally permitted. (iii) The security infrastructure for email is better than for any other service if one uses Privacy Enhanced Mail. (iv) Email can spread out the load on busy systems and network links because it handles messages sequentially. In comparison, an interactive service may overload a system or deny access if too many people are using it at once. (v) In general, email services require the least bandwidth, hardware and software from the information service provider.  

**ELECTRONIC MAIL AND INFORMATION PROFESSIONAL**

Whilst in its simplest form, the email stands as an electronic replacement for the traditional postal service, it also encompasses a
number of more powerful capabilities which can be of great use to the information professional. In its role as a substitute for postal communication, email provides an excellent opportunity for the rapid and cheap exchange of ideas, questions and answers. It facilitates fast document delivery, since email “letters” are delivered in moments rather than days, even to the other sides of the world. Email reaches people with any kind of Internet connectivity or UUCP link, plus all the people who dial in to other networks such as CompuServe, and AfricaOnline that have gateways to and from the Internet.

**BULLETIN BOARDS**

One of the more powerful uses of email is the creation of an electronic conference, or bulletin board. This is done by creating an electronic mailing list consisting of the addresses of a number of users who share a common interest. When a user sends a message for group discussion, the mail is automatically sent to all the subscribers (addressees). The subscribers can develop ideas on a topic over time without meeting. One major advantage of the electronic conference is the ability to involve far more people in the development of a common purpose than were involved before, to get user feedback and expert opinion from various sources, thus providing a global interest group in a given subject area or a topic.

**MAILING LISTS (LISTSERV)**

Electronic mailing lists, or Listserv, often called “lists” is a way of disseminating information, or even holding a discussion by email, by sending a single message to numerous recipients who comprise an identifiable interest group. A mailing list is a group of email addresses that can all be reached by sending a message to one address, the list address. Subscribers can have a discussion by sending messages to the list address (often called “posting to the list”); each message will be distributed to all the list’s subscribers. Even though most real work of administering a list is automated, each mailing list has an administrator assigned to it.

**Open and Closed Mailing Lists**

Not every list is immediately accessible to the public. Lists may be open or closed, which means that either all applications to join the list
are accepted automatically (open), or that applications to join are subject to approval by the list owners (closed). Closed lists are relatively few in number, and tend to concern either specific research-type projects with clearly-defined memberships. If one tries to join a closed list, one will receive a message from the server either referring him to a contact or informing him that his application has been passed on for vetting before he becomes a subscriber.

**Moderated vs. Unmoderated Mailing Lists**

Lists may be moderated or unmoderated. An unmoderated list simply echoes every contribution, however inappropriate, repetitive or banal, to every member of the list automatically. Some lists are moderated in order to make the subscription more exclusive (restricted to serious participants) and to protect the quality and integrity of a discussion group. Moderators often do some basic editing and organizing of messages, as well as protecting the list from inappropriate or unnecessary mail. Moderated lists have editors who vet incoming material and only pass on material deemed appropriate to the members. (The moderator or editor may be the same person as the list administrator, or it may be another person.) The majority of lists are unmoderated, as moderating a lists, particularly a busy one, is a time consuming, unpaid job. Moderated lists are amongst the best sources of information on the Internet in their subject areas, since one does not have to wade through dozens of trashy postings every day in search of the odd jewel.

**Value to Information Seekers**

Mailing lists are extremely valuable to information workers: (i) They provide lots of up-to-date information and discussion on topics of one’s particular interest, thus providing a free current awareness service. There are a lot of very knowledgeable and committed people who make contributions to mailing lists, and information spreads like wild fire on the net—it is often the place one gets to hear things first. (ii) Lists give one immediate access not to just one or two experts but often to hundreds, and also allow one to cast a net for help or information with a minimum of effort and often to find the exact answer one was looking for when conventional means proved useless. (iii) Mailing lists are also good for distributing information from people; discussing
a project among several participants, and exchanging questions and answers with other users of a product or service, or perhaps company technical-support personnel. Generally library-oriented lis-link (Listserv) frequently contains cries for help from people with information problems, and it is quite acceptable nettiquette to make such requests, so long as they are in line with the list’s interests. Internet mailing lists provide a list of people who are only too willing to invest considerable time in providing users with the most copious answers, asking nothing more in return than that one should also consider helping another user in like fashion if one has the knowledge and opportunity. Mailing lists work because of this cooperative spirit and the reciprocal efforts of their members, each contributing as he or she can.

NEWSGROUPS

Another neglected aspect of email as an information resource is the newsgroup. In many ways, newsgroups are similar to mailing lists, in that they are supported by servers, and provide groups of like-minded people with a common interest to exchange information on their chosen topic. The big difference between a newsgroup and a mailing list is that mailing lists actively disseminate information, whilst newsgroups do so passively. If one joins a mailing list, all contributions are sent to him automatically. With a newsgroup, one must look to see what is available at any moment in time, and actively select what one wants to see. This “passivity” is perhaps one of the major reasons why newsgroups are often not thought of as useful information resources; it is far easier to miss things in a newsgroup than it is on a mailing list.

However, perhaps the biggest reason for the frequent exclusion of newsgroups as a serious information resource is their unpopular image of being frivolous, irreverent, temporal and (therefore) unimportant. Newsgroups certainly provide a more volatile arena than mailing lists on the whole, but most of the strengths of mailing lists are equally true of newsgroups—once one finds the right ones.

DOCUMENT DELIVERY VIA ELECTRONIC MAIL

New information technologies continue to offer great opportunities to help developing countries access scientific and technical informa-
tion from the industrialized world with greater ease and at a lower cost. In recent times the technology of email has offered a fast and relatively inexpensive means of document delivery, a task that has always posed a major problem for Ghana and many developing countries. The university libraries in Ghana are involved in inter- and intra-institutional lending programmes and they are thus developing plans to exploit the Internet as a document delivery medium; and the University of Ghana, Legon has been selected as the site.

A training programme organized under IFLA/DANIDA Project in Interlibrary Lending and Document Delivery for six Ghanaian librarians from the five universities and GHASTINET brought the participants to major facilities in Europe (the United Kingdom and Denmark). It also equipped them with skills to search the Internet and to gain experience in the use of electronic media in the handling of interlending and document delivery.23,24

FILE TRANSFER PROTOCOL (FTP)

File Transfer Protocol as the name implies, is the fundamental method of transferring data around the Internet. Before the development of some of the more user-friendly tools, such as Gopher, World Wide Web (WWW), FTP was the key method by which data was exchanged.

File Retrieval Using Email

Email can be used to request and receive files from FTP by using FTP application gateways called ftptmail and bitftp. Ftpmail and bitftp may be used to request files from any FTP server on the Internet. Ftpmail is a type of email file server which permits sites that are not directly on the Internet to get FTP'ed files through email. One sends an email message to this server, telling it which file to send. Upon receiving this message, the server makes an anonymous FTP, gets the file and sends it back to the user who requested through the email. Ftpmail enables one to request and retrieve files even if the server is on another network (like BITNET) or over a UUCP connection.25,26 Standard UNIX (without MIME-extensions) can deliver only text files. But file servers can encode non-text files (pictures, sound, executable programs, and so on) into plain ASCII text with a program
like UUENCODE. The recipient uses a program like UUDECODE to extract the original file from the encoded message. Archie services are also available via email. These are discussed fully below.

**USING ARCHIE BY ELECTRONIC MAIL**

Archie is a system which allows one to search indexes to locate files that are available on public servers. It is the place one should start if one is searching for programs, data or text files. Currently, Archie indexes about 1200 servers and 2.5 million files. One asks it either to find filenames which contain a certain search string or to suggest files whose description contains a certain word. It returns the actual filenames that meet the search criteria and the name of the servers on which those files reside. The desired files can be downloaded with anonymous FTP.

Archie can be accessed in multiple ways. It is simplest to use Archie through TELNET, using a public-access client. Email access is also quite effective and useful if one is connected to some other networks that provide only electronic mail access to the Internet. While it is less convenient than an interactive session, one may be forced to use email if one’s network might not allow him or her to contact Archie via TELNET. This would be the case, for example, if one’s only connections to the outside world are through UUCP or Bitnet. Many of the servers that Archie indexes provide access through ftpmail for those networks which cannot do ftp.

**SENDING SEARCH PROFILES TO FRIENDS OVERSEAS**

In view of the present Ghanaian situation, where many libraries and information seekers have only email access and do not have direct access to the Internet, information professionals and users could send search profiles to friends or colleagues in Europe who have direct access to the Internet for them to do searches based on their profiles for them. Data retrieved may be downloaded and sent to them as files by email. These files could be read by any word processing program. In this way email users, such as libraries and researchers may be able to get abstracts and even full-text documents sent to them as files.
INTERLIBRARY LENDING AND DOCUMENT DELIVERY

In the area of resource-sharing, and with particular reference to Interlibrary Lending and Document Delivery, libraries in even developed countries, make use of email in making enquiries about documents they require, before placing orders for them. On the local scene email is being used in a similar manner. University and research libraries make enquiries about documents they wish to borrow under the ILL or make formal requests to borrow them by email.

Academic and research libraries in Ghana have also been making requests to the British Library Document Supply Centre (BLDSC), Boston Spa, for photocopies of periodical articles and other documents required by their users. Such requests are paid for with the BLDSC coupons and take up to a month for documents requested to be received through the postal service. The BLDSC now has an additional automated requests facility—ARTE-mail—which allows files of ART requests to be sent to BLDSC via electronic mail and confirmation of receipt will be returned in the same manner. All one needs to access ARTE-mail is an electronic mail system with access to the Internet or JANET (Joint Academic Network) and a billing account.

Libraries in Ghana may take advantage of this facility by opening a billing account with BLDSC, using BLDSC coupons purchased locally from the British Council. These coupons could be returned to the BLDSC, Boston Spa, for the purpose of opening a billing account. This is the system of payment for all automated requests. Once this is done, requests for photocopies could be accelerated by sending them through ARTE-mail, which is a “store-and-forward” system.

CONCLUSION

The Internet is an electronic communication network that provides access to electronic mail and electronic resources (including computer files and databases) held in computers around the world. Electronic information resources use information technology to deliver information. To enable academic and research libraries in Ghana to derive maximum benefit from the Internet, telecommunication infrastructure in the country should be improved.

Electronic mail like the FidoNet, currently being used by the academic and research libraries in Ghana, is a “low tech” and low-cost
way to meet communication needs; since it does not require powerful computers and it can tolerate poor telephone lines. It, however, opens up the door to many services, including sending and receiving documents, accessing ftpmail servers to obtain files, corresponding with colleagues in Ghana, Africa and overseas for information which enables one to keep up-to-date in one’s specific discipline. Through the use of email one can also get lots of information through subscribing to appropriate liservs in one’s areas of interest, and also access Archie sites.

It is necessary that the various initiatives underway to get full Internet connectivity (including InforDev and the Leland Initiative) be coordinated so that Ghana can fully benefit from such assistance programmes. The three Internet Service Providers currently operating in the country should also provide cheaper rates for academic and research libraries, so that they can access Internet resources for the benefit of their users.

REFERENCES


