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INFORMATION TECHNOLOGY IN THE UNIVERSITIES OF EAST AFRICA

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SOCIETY AND TECHNOLOGY

Technological civilization today is the most important guiding force for the future course of the society. The whole structure of the world of work in Twenty First Century is going to be determined by technological advances. The situation in Africa in this context is not likely to be different from industrialised world. The globalisation concept is increasingly being realised in Africa while the whole world as one multicultural society is bound to be the end result. Privatisation, Market economy and opening of erstwhile protected economic zones to international competition are being rapidly accepted. The impact of a decade's telecasts and other modern communication technology is much deeper than the impact of a century of colonialism. The television and internet have revolutionised the thinking and behaviour of man.

HIGHER EDUCATION IN EAST AFRICA

Education opportunities in East Africa were very limited and restricted to selected few during colonial days. It was easier for the sons and daughters of the Chiefs or other elite to get higher education as a matter of right. University education was free while parents were supposed to pay for their children at primary and secondary level. Precisely only rich could utilise the free

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higher education facilities. The age old system was not very easy to change all of a sudden at the time of independence because the politics was not yet in the hands of the common man.

In the beginning of the second half of Twentieth Century when other countries were busy changing the occupation based system of education to more rational career planning order to cater for the challenge of coping with innovations, the Africans were right at the climax of freedom struggle. When other countries in 1970s had gone ahead with introduction of computer technology in their education systems, many African countries were facing the most serious challenges of political complexities, military dictatorships and struggle for civil liberties. As they got settled, their concern was focused on expansion of educational opportunities. This was a correct approach. Very soon it was found that the size of expansion had reached the proportions far beyond what planners had envisaged in 1960s. Uganda now has ten universities while efforts are on to add another two. Eight years ago there was only one University in Uganda.[2]

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[2]   Professors World Peace Academy, Uganda Chapter is planning a seminar on 'Inter-University Cooperation in Uganda'. The aim of the seminar is to design a mechanism which will help Ugandan Universities cooperate in the fields of research, publications, information resource sharing, staff and students exchange etc and other initiatives for cooperative projects through active network in place.

AFRICAN RESPONSE TO INFORMATION TECHNOLOGY ADVANCEMENT

Africans have registered instant appreciation of information and communication technology. They have also registered its speedy acceptance and adaptation. In 1992, when American Association for the Advancement of Science published `Users Guide to Electronic Networks in Africa', it consisted of 48 pages. It's revised edition which was brought out in April 1996 was three times thicker in volume.

Electronic communication is being used in many organisations and institutions in Africa. Several African countries have already gained internet connection paving the way for Africans Information Highway. African universities are engaged in serious discussions over the issues and concerns in respect of internet and related activities like academic computer labs, library public access terminals etc. Many of these have already set up computer stations with free access to researchers, staff and students, inspite of the availability of limited technical support systems and shortage of suitably trained experienced personnel. These universities are also experiencing complexities of varieties of hardware, software and incompatibility arising out of these various varieties. The fast speed of development both on hardware and software side also poses problems sometimes, as the latest technology takes time to arrive or the new software arrives before the new hardware and vice versa. It is encouraging to note that the African users have never been discouraged by any such challenges. The other encouraging

factor has been the support and cooperation of the international community.[3]

INFORMATION TECHNOLOGY IN EAST AFRICAN UNIVERSITIES

The East African higher education institutions response to the challenges of information technology, in support of academic traditions of intellectual freedom and research may be gauged in the light of the following achievements:-

(a) University of Dar-es-Salaam (Tanzania) started a CD-ROM project in 1991, and installed an electronic mail node at the University Computer Centre in 1993. The University library was connected to EMail in 1995. Dar-es-Salaam University is busy finalising a Technology Information Policy which will guide and help govern the university operations including central administration, student administration, finance and the automation of university library system.

(b) University of Zimbabwe, Medical Library initiated the CD-ROM projects for MEDLINE literature searches, in 1988. The equipment and service was in place by 1989. The volume of searches from 1989-90 to 1995 went up by ten times. Undergraduate and postgraduate student users represent 36% and

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[3]   Assistance for improvement of the information technology scene in African Universities has come from various international institutions/organisations. The list is too long, however to mention a few: Unesco, Carnegie Corporation, National Research Council (U.S.), WHO, UNEconomic Commission for Africa, UNIDO, EC, ODA, USAID, American Association for the Advancement of Science, African Regional Centre for Technology, IDRC, Ford Foundation, British Council, Health Foundation of NewYork, Satel life of Cambridge, IBM Int. Foundation.

15% respectively of the total volume of users. A database of local health literature has also been created since 1991-92. EMail is being found easier and quicker to send search requests from outreach stations where search results are emailed by scanning copies of articles etc. The University of Zimbabwe acquired its first Internet link in 1991 via the UNINET gateway in South Africa, and second link in 1992 under the host name of MANGO (Microcomputer Access for Non-governmental Organisations). The University also has a well equipped Desktop Publishing Unit. University Computer Resource Committee insists that the computers added at the University should all be IBM or IBM compatible.

(c) University of Zambia started Health Net ground station at its Computer Centre in 1991, and subsequently started Fidonet EMail point. Internet connection came in 1995. In the same year a National Aids Resource Centre was established.

(d) University of Addis Ababa (Ethiopia) was connected in 1993 to the national electronic network, an IDRC project entitled "Computer Networking in Africa". The project was set up to assess the viability of networking between African institutions, to improve the exchange of scientific information within Ethiopia by establishing a working efficient and reliable electronic network that brings contact with other networks locally, regionally and internationally. Within two years, Addis Ababa University Chemistry Department had become the top user of the national laboratory. A

steering committee of the Addis Ababa University has been set up to promote the networking in the country and develop connectivity to the Internet.

(e) Makerere University Kampala Electronic Network (MUKLA), in Uganda began with IDRC funded ESANET (Eastern and Southern Africa Networking)Project in 1991, and became operational in 1992. The participating institutions of this project were all Institutes of Computer Science at Makerere University (Uganda), University of Nairobi (Kenya), University of Dar-es-Salaam (Tanzania), University of Zambia and University of Zimbabwe. MUKLA sought collaboration with HealthNet to facilitate further communication among health professionals within Africa and elsewhere. MUKLA had fifty users by the end of first year of operation. The second year registered 150 users. In January 1995, a user base of over 300 sites had been installed in Kampala and a few other towns outside the capital. This generated a need for setting up local access points in other towns, and the noble mission was started with Uganda Virus Research Institute in Entebbe.

Besides the universities, other sectors connected to MUKLA include NGO's, Govt. departments, Business Houses, and Research institutions. Besides EMail and fax service, MUKLA carries over 50 different conferences mostly from the Internet and APC networks, with a few specifically regional or local ones.

In addition to MUKLA and HealthNet already operational at Makerere University, there are other commercial companies like StarCom, InfoMail, Transmail, Infoma Net etc which have opened full IP access from Uganda giving full access to internet. Many more companies are also likely to come up soon to enjoy the privatisation environment of the country.

(f) Kenya Medical Research Institute's information system has very deep involvement of Kenyatta National Hospital which is a teaching hospital of the University of Nairobi. Eight research centres with about 500 researchers are interconnected in the system which was initiated in 1987. The United States International University enjoys a great deal of information technology provision and facilities for staff, students and researchers. Kenyatta University has implemented African Virtual University courses successfully. Similar programmes are seen in many other Universities of Africa.

SOME (EAST) AFRICAN NETWORKING PROJECTS

There are various other notable programmes and projects supporting education, training and research in this region.

AFRICAN INDEX MEDICUS
(AIM)

Initiated in 1993 by the Association of Health Information and Libraries in Africa (AHILA), the Health Foundation (Network) sponsored African Index Medicus is a very valuable source for

access to health information published in or related to Africa. W.H.O. has trained medical librarians from Uganda, Kenya Tanzania, Ethiopia, Cameroon and Ghana. Nigeria, Zambia and Zimbabwe and other Francophone and Lusophone African countries are partners in this decentralised project where individual participating national institutions are creating bibliographic data bases of nationally produced health information. They are all using CDS-ISIS software to facilitate merging of all information together and with other records emanating from international databases like WHOLIS, POPLINE etc. Further plans include creating files on health related researches, health information experts, resources and services etc. A sample file from database is available on internet from WHO gopher (gopher.who.ch) to give visibility to the project.[4]

REGIONAL INFORMATICS NETWORK FOR AFRICA
(RINAF)

Regional Informatics for Network for Africa was conceived by the Inter-governmental Informatics Programme (IIP) of Unesco in 1985, and was officially launched in 1992 in Senegal, with financial and technical support from Italy. The objective of the project is "to remedy the isolation of research and development institutions in African countries and facilitate dialogue between researchers, academics and industrialists". The RINAF structure

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[4]   Bridge builders: African experiences with information and communication technology. Washington: National Academy Press, 1996. p.45-46.

has regional and national networks---regional networks being in Algeria, Senegal, Nigeria, Kenya and Zambia. The national networks would be developed in each country around the national node. The first phase was to provide equipment and training to the regional nodes. Algeria regional node is based at the Centre de Recherche sur I'Information Scientifique et Technique (CERIST), Senegal regional node at the Centre National de Documentation Scientifique et Technique (CNDST), Kenya regional node at Moi University, Zambia node at the University of Zambia, and Nigeria node at Ile-Ife. (Due to unreliable telecommunication facilities the location of Nigeria node is likely to be changed)[5]

AFRICAN NETWORKING INITIATIVE

(ANI)

ANI is an interagency project jointly founded in 1995, by UNESCO, IDRC, International Telecommunication Union and UN Economic Commission for Africa. The initiative aims at promoting the development and implementation of national and regional telematics policies in Africa. The first activity of the initiative was the African Regional Symposium on Telematics for Development held in Addis Ababa in April 1995. It was attended by representatives of 39 African countries. Later in May 1995 the Conference of African Ministers responsible for planning and economic development supported the idea and decided to set up a high level working group

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[5]   A.C.U. Bulletin of Current Documentation, No.127 (February 1997). p.32.

of African experts to develop the plan of action and mobilising resources. The report of the working group has recommended formulation and development of a national information and communication infrastructure (NICI) in every African country.[6]

HARNESSING INFORMATION TECHNOLOGY FOR DEVELOPMENT

Initiated by the World Bank, UNESCO, UN Economic Commission for Africa, International Telecommunication Union, and United Nations Commission for Trade and Development, this programme was launched in March 1996. The objective is to cooperate with African countries in building telematic policies, networks and applications to support national priorities.

THE SUSTAINABLE DEVELOPMENT NETWORKING PROGRAMME
(SDNP)

Developed by the UNDP, the SDNP is aimed at strengthening the numerous international efforts towards eradication of Africa's information isolation. The plan is to set up national SDNPs which will combine electronic communication, face to face meetings, and other means of communication sources and users of information on sustainable development.

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[6]   United Nations Economic Commission for Africa. Africa's information society initiative (AISI): An action framework to build Africa's information and communication infrastructure. Addis Ababa: Uneca, 24 April 1996.

BIBLIOGRAPHIC SEARCH SERVICE, LIBRARY OF CONGRESS

NAIROBI

The Library of Congress office in Nairobi (Kenya)indexes selected periodicals from 24 eastern and southern African countries. A pilot system has been put in place to allow email search of the Library of Congress periodical index (Quartery index to Periodical Literature, Southern and Eastern Africa) containing more than 15,000 records.

NATIONAL EDUCATION STATISTICAL INFORMATION SYSTEMS (NESIS)

The NESIS programme of the working group on Education Statistics (Association for the Development of Education in Africa) was established in 1991. The aim of the programme is "to strengthen sustainable education statistical information systems in sub-saharan Africa, in support of policy makers' needs for relevant quantitative information". Twenty one participating countries of NESIS have formulated national action plans and thirteen are hosting pilot projects which address problems in data gathering and analysis, and five countries have tested initial products.[1]

ELECTRONIC NETWORKING AND DISTANCE EDUCATION

Higher education institutions are facing serious challenges posed by pressure of increased student population, shortage of good teachers, rising cost of books resulting into limited library stocks, out moded methods of teaching and learning, lack of quality

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[1]   ADEA Newsletter, vol 9, no.2, April-June 1997. p.1.

teaching material, and demand for use of new technology. The formal universities have other problems of inaccessibility and outdated curricula. A University which is not able to adjust with social demands and market needs cannot survive in present day enlightened environment.[8] Democratisation of education implies extended opportunities and part-time education possibilities. The answer lies in non-conventional Distance Education which has been made easy and effective by the communication technology. Lectures can be televised, lecturer and student face to face contact is replaced by EMail exchanges, questions may be asked and assignments can be submitted using Email. Large collections of library materials can be accessed electronically. The potential of communication technology is on increase, everyday. `Open universities', `Universities of the Air' and Institutes of Distance and Continuing Education are becoming more and more popular. The Central Radio and TV University of China had an enrolment of one million students in 1992 and the University of South Africa had 50,000 registered students in the same year.[9] Tanzania and Zimbabwe have history of correspondence schools dating back to 1950s and 1960s respectively, mainly focusing on teachers training through conventional correspondence and without full use of information technology. They both have established Distance

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[8] Makerere University, Kampala (Uganda) has introduced thirty five new programmes in 1997.

[9] Information and Communication Technologies in Development. A Unesco Perspective. Paris: Unesco, 1996. P.7

Education Centres. Uganda has an Institute of Adult and Continuing Education at Makerere University, which runs undergraduate degree courses leading to Bachelor of Commerce and Bachelor of Arts.

AFRICAN VIRTUAL UNIVERSITY (AVU)

The participants in the World Bank supported African Virtual University Project in Sub-Saharan Africa are Uganda, Zimbabwe, Tanzania, Kenya, Ethiopia and Ghana. The AVU prototype phase is the first phase to test if the project is viable for successful implementation in Africa. The first phase is to begin by 1st October 1997. The objectives of the integration of AVU into formal universities are to grasp the concept of African Virtual University and later develop quality and relevant courses on national basis. The project will help expand enrolment levels at universities. The participants will acquire equipment availed by the programme and tap the benefit of networking programmes developed to link all universities participating in the project. The other activities will involve resources sharing, staff exchange, co-editing of study material etc.

The first seminar of the African Virtual University training series was telecast live from Virginia Polytechnic Institute (U.S.A.) on 14 August 1997 and was viewed at following three centres in Uganda where AVU has its satellite monitoring facilities:

(1) Makerere University Institute of Adult and Continuing

Education.

(2) Uganda Martyrs University, Nkozi.

(3) Institute of Teacher Education, Kyambogo.

AFRICAN EXPERIENCE

Numerous information technology programmes networking initiatives and other related efforts are underway throughout East Africa, with cooperation and support of international agencies, NGOs and friendly nations. While East African countries move forward to take leading positions in the development of information technology networks on African continent, it is important to take note of their difficult experiences which slow down the speed of achievement and deserve urgent attention of the national govts and other concerned authorities. These difficult experiences include:

(a) Lack of comfortably dependable training at different levels.

(b) High telecommunication tariffs.

(c) Poor teledensity.

(d) Absence of realisation and appreciation of the fact that investment in information and communication technology does not bring immediate returns.

(e) Insufficient provision of resources for maintenance, quality control, continuing development and training as components of any project.

(f) Education sectors inability to stand as a major customer and partner in information technology application and

service development.

Although business sector seems to be more susceptible to technology application needs than education sector, yet the track record of last seven years gives us sufficient confidence for the bright future of education and research field. In 1990, out of 106 Sub-Saharan African University and research libraries in 28 countries, only 48 had computers and 16 out of these had CD-ROM units. In 1992, AAAS survey of 31 research libraries showed that 19 of these were using CD-ROM. In 1993 at an information technology workshop in Zimbabwe, 17 University libraries from 11 African countries informed the participants that all their libraries were using CD-ROM except one.[10]

INTER-INSTITUTIONAL COLLABORATION

Increased acceptance and adaptation of information technology in African universities is paving the way for active inter-institutional collaboration where participating institutions may set up research coordination mechanisms. They can easily exchange information on active as well as abandoned research projects. They can maintain researchers profiles to facilitate identifying appropriate experts for any projects. They can enter into collaborative researches. They can cooperate on joint publication

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[10] Alfred Kagen. Access to appropriate electronic documents (Paper presented at IFLA Anglophone Africa Seminar on Government information and Official Publications, University of Zimbabwe, 15 -18 December, 1994). 10p.

work. They can exchange information on curriculum issues. This will be the most meaningful and effective use of information technology.

There is a need to formalise an African network for education and research as part of a global network which can be facilitated through a programme like WORLD UNIVERSITY FEDERATION on the lines of other similar federations viz Family Federation, Women's Federation and Youth Federation.