

Building the African ICT Infrastructure for Development: The Role of the African University – Part I

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1. INTRODUCTION

Africa had a late start in the race to acquire the information communication technologies (ICTs). This last place in the race, compared to other continents, has had tremendous implications in the development plans for the continent. For Africa, the race has been difficult from a late start to an insurmountable litany of problems that include; difficult in equipment acquisition, lack of capacity, limited research and development resources, and lack of investments in ICTs. But as I have pointed out in my previous writings, the wind of change has started blowing across the continent. The new African quest for technological acquisition is driven mostly by an unprecedented indigenous interest in technological development and the numerous and sometimes ambitious initiatives by NGOs and the donor community. The long awaited African technological dawn may be in sight. African leading universities and institutions, responding to an unprecedented interest in ICTs by young people, have set themselves on a quest to be the ICT incubators and jump start ICT education, research and build ICT capacity to help in the construction of the badly needed infrastructure. For these institutions and everybody else involved in the quest for technological advance, the race has picked up speed.

To maintain this new found exuberance for ICT and to speed up the process of ICT development and capacity building, African higher education institutions have set themselves an agenda to build research and development capacity that will create the ICT infrastructure capable of finding relevant ICT solutions capable of solving local problems and challenges.

The specific outcomes of this agenda are:

- Identifying local problems and challenges that need ICT solutions;
- Finding resources to build the needed research and development capacity;
- Developing relevant ICT solutions and best practices, both software and hardware, to solve these problems and deal with the challenges;
- Building the culture needed to promoting the use of these ICT tools and best practices to solve emerging local problems and challenges;
- Strengthening the newly developed ICT research capacity through continuous improvement like the setting up of African Research Academies; and
- Establishing an African Center of Excellence for innovative ICT Solutions for emerging economies for sustainable relevant ICT research and development of ICT solutions

2. AFRICAN HIGHER EDUCATION INSTITUTIONS WITH ICT FOR DEVELOPMENT

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There are several indigenous African institutions which have set themselves to this agenda. In a series of Editorial Reviews for this space, I will, in the next several issues of the IJCIR highlight these universities starting with Makerere University in Uganda.

Makerere University, also locally known as Harvard of Africa due to its historical and successfully sustained reputation in teaching and research on the continent, with the mission of providing innovative teaching, learning, research and services responsive to national and global needs, is striving to live to its reputation but this time in ICT. Makerere University is Uganda's premier institution of higher learning. With a student population of over 36,000, it ranks as one of the largest in East and Central Africa. It was first established in 1922 as the Uganda Technical College, opening with 14 day students studying Carpentry, Building and Mechanics. Very soon the college started offering other courses in Medical Care, Agriculture, Veterinary Sciences and Teacher Training.

By late thirties, the college was slowly developing into an institution of higher education, offering post-school certificate courses. It became a University College of the University of London and soon a College for the whole of Eastern Africa, offering courses leading to General Degrees of the University of London. The special relationship with the University of London ended in 1963 and on July 1, 1970, Makerere became an independent national University of the Republic of Uganda, offering undergraduate and graduate degree courses.

Established in 2005, the Faculty of Computing and IT (CIT) at Makerere University is a world-class faculty and a regional center of excellence in ICT. CIT's mission is to provide first class teaching, research and services in computing and ICT responsive to national and international needs. With over 6000 students seeking certificates, diplomas, undergraduate and graduate degrees including a PhD, CIT is one of the largest academic units of Makerere University. It consists of four academic departments, namely, Computer Science, Information Technology, Information Systems, and Networks. In addition to these four academic departments, it also has a department of innovation and software development. This department is hosting the national software incubation center as it moves towards providing software based solutions to local companies and public sectors. Among its first products is the EpyhandyMobile* – an open source software which enables the use of mobile phones to collect medical data from the remote areas of the country.

CIT emphasizes quality teaching and research. To this end, CIT has started several initiatives among which is the establishment of 10 research groups that include; Intelligent Systems & Pattern Recognition, Development Language Technology for African Languages, Network Systems, Mobile Computing & Communication, Software Engineering, Informatics and Visualization, Tools for enterprise architecture, System modeling and system dynamics, E-learning, and ICT for Sustainable Development. Other ICT projects CIT is involved in include:

- NPT Project on ‘Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda’
- EuroAfriCa-ICT ‘Connecting the EU & sub-Saharan Africa for ICT partnerships’
- OMEVAC (Open Mobile Electronic Vaccine Trials)
- AVOIR KEWL.NextGen E-Learning Proposal for African Universities
- Pan-African E-network Project
- Survey data collection using mobile phones
- Low-class Communities Income-generating e-business
- Outreach Action-driven e-business for rural and Art-craft Women Communities
- MTN Village Phone/Grameen Smartphone Trial
- OpenMRS
- Epihandy Mobile
- MobileHRS (Mobile Households Registration System)
- Heitml
- Creating Digital Content for Secondary Schools

Facility wise, CIT has the largest computing facilities in Africa, housed in 15,000 meters of space worth \$20million. Its two buildings can accommodate up to 10,000 students in one sitting. In the new building (Block B) alone there are: 6 computer labs each accommodating 700 students. There are

* <http://www.epihandy.com>

also four other smaller computer labs each accommodating 120 students. The buildings also boast of 8 small and 6 big lecture theatres.



Block B Facility at CIT

The Faculty currently has 3,000 computers and an assortment of other ICT equipment installed specifically to facilitate student learning. In Block B, the following teaching labs have been equipped; 700 sitter lab, 120 sitter lab, 350 sitter lab, 70 sitter lab with the rest of the computers located in Block A. There are four computing labs of 700 sitting capacity each yet to be equipped with computing facilities. In addition, CIT also has several fully equipped specialized labs designed for specific purposes including: Advanced Geographical Information Systems [GIS] Lab; Network and Systems Lab; Mobile Computing Lab; Computer Engineering Lab; Advanced Multimedia Lab; Pan African E-Network Tele-Education Labs; National Software Incubation Centre/Lab; E-Learning Lab; Online Networking Laboratory (iNetLab); and Cisco Academy Training Labs. Block A facility hosts the Regional University Centre and the Learning Centre of the Pan African E-Network Tele-Education project. The Pan African laboratories are equipped with tele-education studios and post production facilities, a data centre, a portal comprising the universal tele-education delivery software which incorporates the e-learning content management and digital library solutions as an integrated package. The laboratory connects Indian universities with over 100 universities in 53 African countries for the provision of shared educational materials and on-time delivery of lectures to all the interconnected universities and also serves the 53 countries of Africa.

To support research capacity for development, CIT started this journal, *The International Journal of Computing and ICT Research* (IJCIR) with a goal of providing a medium for ICT scholars and practitioners from around the world to publish original and cutting edge research in the field of computing and ICT, to create an environment that encourages ICT scholars, especially Africanists, to collaborate on projects that can result in African development, to bring African scholarship in ICT to the rest of the world, and to build the badly needed capacity in African scholarship. The Journal also has a sister annual conference, *The Annual International Conference on Computing and ICT Research*, which brings together ICT scholars from around the world for about a week of discussions and exchange of ideas. The conference proceedings are published as a series of books on *ICT and Development*.

All these activities highlight the efforts one of many African universities is doing to advance ICT capacity building for the development of Africa. In the coming issues of the IJCIR, we will have articles like this, written by African ICT scholars highlighting the roles their universities are playing to build and enhance the African ICT infrastructure in the development of Africa.

3. REFERENCES.

Launch of the Makerere University Faculty of Computing and IT Block B.
<http://monitor.co.ug/brochures/ICT-supplement.pdf>