

WE BUILD FOR THE FUTURE: ACCESS, KNOWLEDGE AND HUMAN DEVELOPMENT

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1. Introduction

This paper is presented in the context of countries that either lie within or just above the category of least developed countries, giving a glimpse of the thinking and challenges we face in our continuing effort to improve the level of human development. We recognise the multi-faceted nature of the development challenge, and assert that the application of information and communication technology within a development context can pay large dividends, making a major contribution to the efforts.

The paper also captures the corporate thinking of Makerere University², one of the most prominent universities in Africa. Makerere recognises its role as an enabler for economic, social and political transformation, not only in Uganda, but regionally. Its strategic direction rests on the three pillars of training, research, and community outreach.

Makerere does not see an Africa where there is no hope, but an Africa where the various challenges and hurdles that lie in the path of human development create exciting opportunities for creative solutions that will lead to sustainable economic, social and political development. These challenges create the reason for being for institutions like Makerere University.

The paper starts by capturing the scene in Makerere, and then contextualising the development challenges vis a vis the digital divide. Examples of specific initiatives that Makerere University is involved in, aimed at creating networks of communities that will make a difference and have a significant impact on human development in the medium to long term, are given.

2. We Build for the Future

Makerere University, with a current student population close to thirty-five thousand (of whom three thousand are graduate students), is the oldest university in Uganda. It has nurtured a major percentage of the political, technocrat, and civil leadership in Eastern Africa and beyond right from the colonial days, providing a lot of the pioneer political independence leaders. It is a proud institution that was brought to its economic and academic knees by close to two decades of bad governance in Uganda, from 1971 to 1988. Starting at the beginning of the nineties, Makerere was able to rebound and rise even higher, to be once again an acknowledged leader among the regional universities. Makerere has an institutional intrinsic quality of resilience, and, through its graduates, has entrenched itself in the leadership fabric in the region. Survival, despite the challenges, was therefore a given. Its motto: “We build for the future”.

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“We build for the future” is the continuing call and challenge for Makerere University to look into the future so as to engage in discourse and research that will shape tomorrow, and also create today the human resource that will be relevant to tomorrow. It is therefore inevitable that in going out to harness the opportunities of information and communication technology within the context of its key pillars of education, research, and community outreach, Makerere should once again be in the vanguard, nationally and regionally.

3. The University Vision, and Makerere’s Vision of the Future

The Makerere University Vision is: *“To be a center of academic excellence, providing world-class teaching, research and service relevant to sustainable development needs of society.”*

What will the Uganda, and indeed the Africa of tomorrow look like? We see a continent whose people are empowered and enabled by good governance. We see educational and research priorities that address the real needs of the communities we live in, creating output that spurs sustainable human development. We see communities that are sensitive to the oneness with, and live as an integral part of sustainable environments. We see international business opportunities exploited for local benefit. We see social, economic and political equity and equality, where race, tribe, creed, gender, and physical impediments, are not barriers to opportunity. The discourse we engage in now, the education we provide, and the research we conduct must construct this future.

We must then prepare the African citizens of this future, people brought up in a many to many learning environment where the constraints of time and space are minimised, and where students develop through continental and global learning communities. This way, students will not only develop the critical self-led learning skills, they will also truly belong to the global community.

To work towards the vision, Makerere had to first reconstruct and transform itself into a networked entity that works as a whole.

4. The Recovery and the Transformation

At the beginning of the nineties, Makerere was almost a ghost university, kept alive only by the dedicated efforts of a few lecturers and administrators. The university was literally deserted by 4pm; all facilities were completely run down; there were less than 5,000 students; funding was insufficient; there was an acute shortage of staff.

Makerere started an internal renewal, rethinking and regenerating itself. The transformation concept changed the admission paradigm from exclusive to inclusive; the pedagogic approach from sieving to educating; the programmes from internally driven to

market driven; the income sources from totally government dependent to own initiative. Success was an increase in student numbers to twenty thousand in five years, leading to the chaos of change: the manual systems could no longer cope; academic and administrative management broke down; research, already driven to the ground during the years of bad governance, was paralysed. But, for the first time, Makerere had its own resources, albeit insufficient, and a plan to start addressing its challenges in a systemic fashion. Development partners, seeing that Makerere had started a positive transformation through its own efforts, gave generous support.

Information and Communication Technology was adopted as a strategic priority as a matter of necessity because manual systems and traditional processes could no longer cope. It was a do or die situation. We insist in Makerere that ICT is not about technology: It is about:

- Supporting a student centered many to many learning paradigm, generating the 21st century human resource;
- Enhancing the effectiveness and efficiency of student and staff research through access to local and international online resources;
- Enabling national and international research collaboration;
- Enabling efficiency of academic and administrative management of students.
- Enabling efficiency of administrative processes;
- Enabling cheap, efficient, timely communication

It is all about networking at the intellectual, the functional and the operational level.

Makerere was able to address (and continues to address) the challenge of integration of ICT services and systems in all aspects of the university through a systematic process of internal consultation, creating awareness and ownership; through the development of a clear ICT Policy and Master Plan owned by the stakeholders, thus reducing a very complex undertaking to sets of consistent and related activities that enabled internal resources and funds from development partners to be directed at different parts of the whole. Sustainability was recognised as a challenge even before implementation started, and implementation went hand in hand with an agreed formula of cost recovery to enable services to be sustained. Organisation wide computer literacy was seen as a pre-requisite to successful exploitation, and literacy programmes were designed as part of the implementation master plan. The need for continuing expert skills was similarly recognised, and the Directorate for ICT support was designed and established principally for knowledge support, with infrastructure support as just one of the assignments.

Table 1 gives some of the low level indicators and how they have changed over the last five years. These do not capture the transformative impact of ICT whose effects are now felt for example in the way people work, the way people conduct research (and the quality thereof), and in academic and administrative management.

Table 1
Low level ICT indicators from Makerere University

	INDICATOR	2000	2005
1	ICT literate staff	300	3000
2	Networked computers	300	2700
3	LANS	15(Poor)	40(Good)
4	Campus Backbone	None	16km Gigabit
5	Bandwidth (in + out)	192kbps	21Mbps
6	Email users	300 (dialup)	7,000 (Webmail)
7	Online journals	0	>8,000
8	ICT Internal budget	\$25,000	\$700,000

Makerere still faces a lot of challenges, but the direction is definitely up, and the attitude is positive. With the basic networking infrastructure in place, Makerere is moving on to the next stage in Phase 2 of its ICT Master Plan through which the real gains and transformative impact of ICT will be felt. Hot spots and hot zones are rolling out to create a hot campus. E-learning, with all its challenges and benefits, is rolling out. Makerere will become a fully networked campus, not just at the infrastructure level, but at all levels. It is evolving into a knowledge unit.

5. Creating the Uganda and Africa of tomorrow: the challenges

I will share here some thoughts I recently put to the Board of the Swedish Programme for ICT in Developing Regions (SPIDER) relating to poverty and the challenges of the digital divide.

5.1 The Challenge of Poverty

Entrenched poverty is a multi-faceted challenge, and the various facets have to be *simultaneously* addressed in order to achieve sustainable poverty reduction. These include, but are not limited to: promotion of good governance; ensuring functional literacy and numeracy; creating awareness of health issues and establishing health care systems and facilities; promoting and supporting activities that lead to the economic well being of individuals; ensuring food security; provision of access to utilities (water, sanitation, energy, transport); and timely access accurate relevant information. Regardless of what challenge is addressed, the last one, timely access to accurate relevant information is a common denominator. This in itself opens up the other major challenge we face: the digital divide.

The most visible facet of the digital divide is the access divide, and this often blinds people to the more challenging facets of the divide: the content divide, the cultural divide, the language divide, and the knowledge divide. In a truly networked world there would

be equity in all these aspects: where there is no equity, networking at the access level creates oppression and, in a rather contradictory fashion, greater underdevelopment.

Properly implemented, ICT provides an inclusive environment in which intellectual networking and community networking thrive, providing learning communities through which sustainable human development solutions can be formulated and actualised.

5.2 Combating the Digital Divide

The environment for full digital inclusion is defined by a set of straight As. A reduction in any of the As leads to increasing digital exclusion. These define the key fronts where the digital divide occurs, making it also a multi-faceted challenge. The key fronts:

- i) *Awareness* – of the potential and benefits of ICT. Such awareness must be to a level that will make people invest their own resources, even if limited, in the assurance of greater social and economic returns, creating an environment for sustainability. Awareness creates a willingness to change, to do things different;
- ii) *Ability* (or Capacity) across the board, covering required competencies and skills around ICT: visioning; policy formulation; laws and regulation; knowledge management; network design and implementation; information resource management; programming skills; commercial exploitation; computer literacy and user skills;
- iii) *Access* – to the communication channels. This ranges from the highways to the major roads to the feeder roads to the last access point (phone; PC; converged device, etc);
- iv) *Application* – in ways that lead to increased efficiency and cost-effectiveness, economic gain, transparency, etc. This captures the ability to integrate, translating data to information to knowledge that can be exploited by organisations for increased competitiveness, and communities for a higher level of human development.
- v) *Affluence*, which determines *affordability*. It is one of the contradictions of life that those who are more affluent can get everything cheaper. In the ICT area, this is magnified several times over. Makerere University, for example, has one of the lowest costs of bandwidth among African universities South of the Sahara – now \$1,500 per Mbps per month (plus 18% VAT). In Europe, institutions that are much richer pay less than \$50 per Mbps per month.

6. Makerere's Contribution

“Be the Change you want to see in the World” – Mahatma Gandhi

Makerere University has not stopped at visioning and dreaming. When your family is starving, the question of famine is not academic: you must do something about it. Following the words of Mahatma Gandhi, different units in Makerere are making a real contribution to leading Uganda and the region out of the divide trap and out of poverty.

The following examples, most of them based on the networked communities concept, illustrate some of the specific programmes and actions.

6.1 Awareness

One of the key initiatives Makerere University is involved in, supported by the Carnegie Corporation of New York and the World Bank, is Capacity Building for Decentralisation. Through this initiatives, called Innovations at Makerere (or I@mak), Makerere networks with the local government units in Uganda. Faculty are invited to submit proposals that support requisite capacities to address governance and development challenges for local government employees. Some of these initiatives have aimed at bring awareness of the potential of ICT to local governments, and guiding them in the process of exploiting the opportunities. At another level, Makerere University has worked with arms of central government in fora that are aimed at both creating awareness and starting the process of transformation supported by ICT. In all these initiatives, Makerere's credibility rests on the nationally visible changes, attributable to ICT, that have occurred in the university.

6.2 Ability

Makerere University is still the principal source of Uganda's human resource. Sustainable transformation supported by ICT will only be possible if such human resource possesses the requisite skills. Makerere University has got multiple entry points into the addressing skills gaps at all levels.

i) New undergraduate and post-graduate programmes

The Department of Electrical Engineering has, over the last five years, started specialised undergraduate programmes including telecommunications engineering and computer engineering. What was formally a support department, the Institute of Computer Science, also started offering specialised undergraduate degrees in different aspects of computer science, and it has now been restructured into the Faculty of Computing and Information Technology. All programmes extend to post graduate level. Outside these programmes, Makerere University has approved the requirement that all students admitted to Makerere take a credit-carrying course that will ensure a minimum level of computer literacy. This has not yet been fully implemented due to very high student to computer ratio, but is is gradually rolling out across the faculties.

ii) Specialist skills programmes

These include certification courses that impart specialised networking and software skills to students. One of the most popular programmes is the Cisco programme, leading to the Cisco Certified Networking Associate certification in a nation-wide programme that was established with key leadership from

Makerere University. Makerere itself has two centers, in the Department of Women and Gender (motivated by gender digital divide issues) and in the Faculty of Computing and Information Technology. The Cisco Certified Networking Professional Programme has also started. The network of institutions implementing CCNA form an online learning community in Uganda, linked to the international community of other Cisco academies.

iii) Networking among universities

The Faculty of Computing and Information Technology is leading a network of public universities in Uganda aimed at both creating human capacity and integrating ICT in the operations of the universities. The Faculty is also part of a network that is putting together a regional Masters programme in computer science. The immediate benefit is sharing expertise. The greater benefit is the synergy created by the joint working of people with different expertise on common challenges.

iv) Training in ICT Policy and Regulation

Good ICT policy and regulation are key pre-requisites for the penetration of ICT services nationally, with real access for the often marginalised sections of society. Makerere University, through the Directorate for ICT Support, is currently responsible for the coordination of the NetTel@Africa³ Capacity Building Network for ICT Policy makers and regulators through training, peering, research, and community practices. This Network, jointly owned by the regulatory association in Southern, Eastern, and Western Africa, is now active in sixteen countries and twenty universities. The formal training component is based on an e-learning methodology where multiple lecturers and expert interlocutors from the field interact with students across Africa working in a common online learning environment. It leads to a postgraduate diploma and later to a Masters degree in ICT Policy and Regulation.

v) Software Development Skills

In addition to the formal training in the academic units, Makerere University, through the Directorate for ICT Support, is a node in the eight-university African Virtual Open Initiatives and Resources network, AVOIR⁴, aimed at bringing the expertise of African software developers together in addressing common challenges, and developing capacity at the same time. The flagship software is currently the Knowledge Environment for Web Based Learning (KEWL), an open-source online learning management platform that is used by the network universities as well as all universities in the NetTel@Africa network.

³ See <http://www.nettelafrika.org/> The link to the online learning environment, KEWL, can be accessed from the home page. Registration or guest rights are required to access the actual learning content.

⁴ See <http://avoir.uwc.ac.za/>

Makerere, with the support of IDRC, has also just started a software incubator aimed at networking the students in Makerere and the budding software industry in Uganda, with the long term objective of growing this industry.

6.3 Access

Access is about creating policy environments that will promote a combination of private and public private sector partnerships to ensure ubiquitous access. Makerere's role here is then in enabling research and policy analysis.

The Makerere Institute of Social Research conducted the baseline surveys that provided input to the formulation of the Universal Access Policy and Strategy, and more recently, together with the Directorate for ICT Support, the E-Usage Survey and Analysis for Uganda.

Partly to address the dearth of African related cases in the ICT sector, and partly to build policy research capacity, the Directorate for ICT Support is a node of the Research ICT Africa!⁵ research network. This is a network of African researchers based in universities in thirteen African countries. It seeks to fulfil a strategic gap in the development of a sustainable information society and knowledge economy on the African continent by building ICT policy and regulatory research capacity in Africa needed to inform effective governance. Key outputs to-date (like in the other countries in the network) include the Uganda Telecommunication Sector Performance Review; The Real Access to the Internet Survey (Uganda); the E-Usage Survey and Analysis; and Infostate. (All these have been key reference documents in the formulation of Uganda's new Telecommunication Sector Policy). The power of the network is the ability to carry out consistent research and present comparatives across Africa, leading to reliable conclusions and recommendations to regulators and policy makers

6.4 Application

Makerere itself has just started moving to the higher levels of being a knowledge organisation, and has not yet gone out much to initiate thinking or to support other organisations and arms of government. There are however still some examples of efforts in this direction:

- The first specific research, under the auspices of RIA!, has just started – a survey into how small and medium enterprises in Uganda are using ICT, and how it is impacting on their performance.
- Makerere, through DICTS and with infoDev support, has led the implementation of the Uganda Development Gateway, aimed at networking rural communities

⁵ See <http://www.researchictafrica.net/>

and improving their economic performance through peering and timely access to relevant information. This has moved beyond concept, and is now grappling with reality through creating the necessary front and back end applications that would support networking and timely access to relevant information through the now ubiquitous mobile phone signal. SPIDER has been approached to support this.

6.5 Affordability

Affordability is like poverty – multi-faceted. Makerere has not yet moved on a coordinated front that would impact on this facet of the digital divide, but the following must be recognised as positive steps in addressing this:

- Ensuring availability of competent technical and managerial human resource
- Capacity building for ICT policy makers and regulators with expected outcome of addressing affordability concerns.
- Reduction of the cost of software through the growing of a local software market.
- Putting on line and creating access to relevant content that would change communication expenditure to an investment

7. Conclusion

We build for the future. Makerere has moved to link its dreams to activities that will ensure the Uganda can overcome the impediments of the digital divide. This will enable other sectors (in which Makerere is also involved) to deliver more cost-effectively in ensuring that the people of Africa can break out of the cycle of poverty, and achieve sustainable human development. At the center of all the initiatives is the creation of networks of communities working together towards a higher level of human development.

It is early days yet, but the path is set, and it is leading in the right direction.

“If we are facing in the right direction, all we have to do is to keep on walking”
– *Buddhist expression.*