



United Nations
Economic Commission for Africa

World Engineering Congress
Tunis 2003



The role of engineers in ICT policy in Africa

Karima BOUNEMRA BEN SOLTANE¹
Economic Commission for Africa

¹ Karima BOUNEMRA BEN SOLTANE, Director, Development Information Services Division, United Nations Economic Commission for Africa. Tel: + 251 1 51 14 08. Fax: + 251 1 51 05 12. e-mail: kbounemra@uneca.org

The role of engineers in ICT policy in Africa

Karima BOUNEMRA BEN SOLTANE²
Economic Commission for Africa

Introduction

For the last decade, the world has been witnessing a real revolution propelled by advances in Information and Communication Technologies (ICTs) that are impacting people's lives as well as the social and economic development of countries. At the eve of the World Summit on the Information Society (WSIS), which will take place in Geneva in December 2003, we can safely argue that African leaders have an increased awareness of the prominent role that ICTs could play in accelerating the region's development. High-level political will and commitment are supporting Africa's entry into the Global Information Society. Compared to the early '90s, significant progress in mainstreaming ICTs in development policies has been made. In addition, more than 50% of African countries have embarked on a form of e-strategy. Stakeholders such as the media, academics, entrepreneurs, civil society organizations, private sector and diverse professional categories are contributing to the building of knowledge societies in Africa.

Despite this encouraging trend, a lot remains to be done so that "every man and woman, school child, village, government office and business can access information and knowledge resources through [ICTs]". This milestone, set for 2010 and stated in the African Information Society Initiative (AISI³), an action framework for Africa's entry into the Global Information Age, will only be realistically achieved through adoption of enabling policies and strategies and development of relevant and accessible ICT applications.

Worldwide, engineers have been instrumental in creating the information age since its inception. In Africa, we know that they can contribute effectively to the development of people-centred information-rich economies.

This paper presents some of the issues on the World Summit on the Information Society (WSIS) from a development perspective and from an

² Karima BOUNEMRA BEN SOLTANE, Director, Development Information Services Division, United Nations Economic Commission for Africa. Tel: + 251 1 51 14 08. Fax: + 251 1 51 05 12. e-mail: kbounemra@uneca.org

³ AISI, the African Information Society Initiative was adopted in May 1996 by the ECA Conference of Ministers responsible for economic and social development planning. AISI advocates for the adoption of National Information and Communication Infrastructure (NICI) policies in Africa and sets drafting guidelines. The NICI policies cover not only the technological aspects of infrastructure, but also the applications, information systems and human resources plans that are a necessary part of them. ECA, in the context of a wide partnership, has been working with African countries since 1996, to elaborate information and communication policies and develop programmes and strategies for their implementation. More information is available at: <http://www.uneca.org/aisi>

African point of view. It will also look at the role of African engineers in building the information society through their participation in the policy making process as well as their particular role in making Africa's Information Society a reality.

The Information society and the WSIS

It is in view of the tremendous challenges and promising perspectives generated by the growth of information and knowledge that the United Nations System reacted positively to the International Telecommunication Union's (ITU) call for a World Summit on the Information Society (WSIS)⁴. According to UN's Secretary General, Mr Kofi Anan, "This global gathering will be a unique contribution for all key players to develop a shared vision of ways to bridge the digital divide and create a truly global information society. It will be an opportunity to develop specific solutions and tools and adopt a realistic and viable plan of action".

WSIS is quite unique in that it is designed to take place in two phases: one in Geneva in December 2003 and another in Tunis in November 2005. It means that stakeholders are invited to participate in a process rather than an isolated event. The process yields more than the traditional declaration (that represents their vision of the global information society) and the corresponding Action Plans(s) (which describe how to achieve the goals set in the declaration). As a result, they will be better organized to start implementing the recommended activities, and assess their progress.

In the last two years, WSIS has brought together representatives from various sectors, including government, civil society, the private sector, international and intergovernmental organizations. It has established a real dialogue among the main actors in societies, especially at the country level. Given that the Continent is lagging far behind, and the digital gap is a sad reality, it is our expectation that this process will result in more effective impact and provide opportunities for those who are entering the information age to be real actors in the knowledge economy.

Africa and the WSIS

Although ICTs are now becoming widely accepted as tools to transform the path of development, a number of Africans are still not fully benefiting from the opportunities offered by the information society.

Major bottlenecks that constrain Africa's entry into the information society include:

- Limited infrastructure and access, associated with low quality of ICT services;

⁴ <http://www.itu.int/wsis/>

- Low literacy rates;
- Absence of relevant content, in particular in local languages;
- Institutional and financial constraints to produce, use and integrate ICT in broader economic areas;
- A persisting perception that ICTs have very little to do with development;
- Limited capacity for Research and Development (R&D), in African Universities, and marginally, at the local industry levels; and
- Limited participation in international ICT decision-making processes and governance systems, etc.

African countries are addressing these issues in the WSIS process and discussing the national, regional and global approaches that will ensure the continent's participation in the global knowledge economy by mainstreaming ICT into programmes aimed at achieving the Millennium Development Goals (MDGs⁵).

Africa's participation in WSIS started with the Africa Regional Preparatory Conference on the Information Society, which was held in Bamako in May 2002. Africa was the first continent to organise a Regional Conference in line with the framework of the Summit. Hosted by President Alpha Oumar Konare and with the participation of high-level Leaders, such as President Wade from Senegal, the Conference resounded a clear message that the African leadership is committed to the Continent's digital agenda. It also showed that expectations were quite high for the Summit to speed up the establishment of a sustainable Information Society in Africa.

Four main issues were at the centre of the discussions held during this regional forum: What Africa brings to the Information Society? What the Information Society brings to Africa? What Africa wants to preserve in the Information Society? How Africa would benefit from the Information Society?

Considered as one element of the AISI implementation plan, Bamako 2002 revisited the recommendations of the first African Development Forum (ADF '99⁶) and evaluated the progress made since then.

⁵ More information can be found at: <http://www.un.org/millenniumgoals>

⁶ In October 1999, ECA, with the support of its partners involved in the promotion of ICT, organised the first African Development Forum (ADF'99⁶) on "The Challenge to Africa of Globalisation and the Information Age. " The Forum examined prospects of ICT for development in Africa and the progress made since the launch of the African Information Society Initiative (AISII⁶) in 1996 by ECA. Some 950 participants called for commitment from the highest levels of leadership to applying ICTs to Africa's pressing social and economic problems targeting mainly four areas: (1) Creating the enabling policy environment, with a special emphasis on the ICT infrastructure and the regulatory framework, (2) Developing applications to support the educational process and meet the needs of Africa's youth, (3) Developing applications in support of the delivery of health care, and (4) Creating opportunities for electronic business and trade. For more information: <http://www.uneca.org/adf>

Further, the member States and Africa's bilateral and multilateral development partners renewed their commitment to realize the vision enshrined in the African Information Society Initiative (AISI).

As an outcome of the meeting, participants unanimously agreed on a set of principles and recommendations for developing a common African vision for an information society, known as the *Bamako Declaration* whose intention was to feed African perspectives into the Summit. A Task-force, known as the Bamako 2002 Bureau was established to carry out the major recommendations, coordinate and facilitate Africa's participation in the WSIS and liaise with the WSIS secretariat. The Bureau is chaired by Mali, with members from each sub-Region, civil society and the private sector. ECA is the Bureau's Secretariat.

The preparatory process to the Summit has created a positive momentum in several African countries, as it has encouraged national dialogue among major actors in an inclusive and participatory mode. In a number of countries, civil society organizations (CSOs) took the lead in organizing multi-stakeholder consultations that brought together in many cases, policy-makers, parliamentarians, academicians and the private sector. The consultations yielded the definition of Africa's priorities in the WSIS process.

At the regional and national levels, the United Nations Economic Commission for Africa (ECA) and its partners initiated a number of forums that opened up the process to different sectors, particularly those that have been identified by the AISI⁷. CSOs, Open Source practitioners, media organizations, academicians and others were offered the space to discuss virtually or face-to-face, the Information Society from their own perspectives. In addition, the Third Committee On Development Information (CODI 3, held in Addis Ababa in May 2003⁸) addressed one of the most challenging issues for Africa's development - information and governance.

At this point, it is fair to say that the different activities considered as preparatory to the WSIS (national, sub-regional and regional) organized in 2002 and 2003 generated tremendous mobilization and commitment at all the levels. Information on existing and planned activities has been exchanged and disseminated. Experiences have been compared, and many lessons have been learned. Some of this knowledge will be captured as ECA's contribution to Africa's digital resources on e-policies - in the African hub of the e-POL-Net. ePOL-Net is a G8 DOT Force project, led by Canada.

⁷ for more information, refer to AISI, Chapter III, Components of an African Information Society Framework, paragraph on 'addressing the obstacles'.

⁸ The Committee on Development Information (CODI) is one of the seven subsidiary bodies of the Economic Commission for Africa, established in 1997 by the twenty-third meeting of the Conference of African Ministers responsible for Economic and Social Development and Planning. As a subsidiary body of the Commission, CODI provides policy and technical guidance for the sub-programme "harnessing information for development". For more information: <http://www.uneca.org/codi/>

All the activities aimed at creating digital opportunities in Africa will converge to strengthen the ICT component of the New Partnership on Africa's Development (NEPAD). It is important to recall that the main goal of NEPAD is to form the basis for spurring growth and eradicating poverty on the Continent.

NEPAD differs in its approach and strategy from most of the previous plans and initiatives set up in support of Africa's development, although the issues to be addressed basically remain the same. The general objective is to provide an impetus to Africa's development by bridging existing gaps in priority sectors to enable the continent to catch up with the developed world. In that regard, NEPAD is constructed within core principles, including long-term objectives and expected outcomes. One of its core areas is infrastructure (that includes ICT). It is expected that existing and emerging national and regional ICT-based programmes and activities will gain from this new strategic platform that expresses the strong political support that is required to move the African agenda forward more efficiently.

Since 2002, UN organisations that are implementing programmes in Africa have been collaborating more closely in full support of the NEPAD Plan of Action. ECA is coordinating the ICT sector.

Partnership and coordination mechanisms for ICT in Africa

Partnerships established in support of ICT activities have been powerful instruments in advocating and facilitating the implementation of Africa's digital agenda. A number of programmes and projects with supportive mechanisms have proliferated, which is a positive development for the continent, as it is a reflection of an increasing interest in the sector.

Nevertheless, their sustainability and integration into the overall fight against poverty, illiteracy and endemic diseases (just to mention some of Africa's main problems), require a more organized and coordinated environment.

Strengthening the existing collaborative processes will undoubtedly optimise the scarce financial and human resources at this stage of the information society in Africa.

Among the most important coordination mechanisms that have been set up and that are relevant to the African region include the following:

ATAC, the African Technical Advisory Committee

The African Technical Advisory Committee (ATAC) was established within the institutional framework required for implementing the AISI and was

requested by resolution 812 (XXXI) of the ECA Conference of Ministers. Since 1997, ATAC has been operating as a strategic and conceptual Advisory Committee for ECA. It ensures that AISI activities are based on local realities and address actual needs. It also suggests modalities for implementing and assessing the impact of the Initiative.

ATAC members act as advocates of the AISI both in the Africa region and elsewhere. They advise major partners on ICT for development activities and suggest ways and means of resource-mobilization. ECA acts as the Secretariat for ATAC. Through CODI, ECA reports on ATAC activities in its Annual Report to the United Nations Economic and Social Council.

Partnership for ICT in Africa (PICTA)

The Partnership for Information and Communication Technology in Africa, (PICTA) defines itself as an informal group of donors and executing agencies committed to improving information exchange and collaboration around ICT activities in Africa. Established in 1997⁹, it built on the work of the African Networking Initiative (ANI) and the African Internet Forum (AIF). It was set up to assist in development, follow-up and coordination of the implementation of the AISI. Members comprise institutional partners from the United Nations system, bilateral and non-governmental organizations and representatives from the private sector, involved in implementing AISI projects and programmes in Africa.

Current major joint-programmes include the SCAN-ICT project, development and implementation of National Information and Communication Infrastructure (NICIs) or national e-strategies, publication and dissemination of outreach materials on ICT4D activities, ePOL-Net Africa and the AISI media award, just to mention a few.

The Global Knowledge Partnership (GKP)

The Global Knowledge Partnership (GKP) is a worldwide network of organizations committed to harnessing the potential of ICTs for sustainable development. GKP is the world's first multi-stakeholder ICT for Development (ICT4D) partnership at the global level, with members comprising governments, donor agencies, private sector companies, civil society, networks and international institutions. The members of the network share information, experiences and resources to fully realize the potential of ICTs in development processes. GKP is one of the most important outcomes of the first Global Knowledge conference that took place in Toronto, Canada, in 1997. Its activities were further strengthened after GKII, the second Global Knowledge conference that was organized in Kuala Lumpur, Malaysia, in 2000.

⁹ PICTA inaugural meeting 'the donor and executing agency meeting on IT for development in Africa' was held from 16 to 18 April 1997, in Rabat, Morocco. The next PICTA meeting will be organised in Tunis, on 16-17 October 2003, as a side event of the WFEO congress on the Digital Divide.

ECA, one of the founding members of GKP and acting as the African hub, has recently been elected as a member of its Executive committee. GKP and ECA organized in 2002 and 2003, the GKP Africa day.

The ICT Task Force of the United Nations¹⁰

The challenges of globalisation, the proliferation of non co-ordinated ICT initiatives and thus the need for coherence, synergy and complementarity, the need to take into account developing countries voices in digital divide related issues and the effective participation of the private sector and the civil society in ICT development activities are among the main justifications for the creation of the UN ICT Task-Force by the UN Secretary General. The Task-force offers a forum, where the development communities and partners interact in their quest to mobilize worldwide support for the objective of attaining the Millennium Development Goals through the use of ICT. The African Stakeholders Network (ASN), acting as the African regional node of the Task Force is meant to ensure that UN efforts to bridge the digital divide in Africa are better co-ordinated, more inclusive and reflective of the significant efforts already underway to develop an African information society.

The Role of engineers in building the Information Society

It has been repeatedly said that building the information society is not about technology, hardware or even software. It is about people's lives- providing them better living conditions. This statement is particularly true when we consider the situation in Africa. As stated in the AISI, the vision for an information society aims at supporting and accelerating socio-economic development across the region.

"Driven by critical development imperatives, it focuses on priority strategies, programmes and projects which can assist in the sustainable build up of an information society in African countries (...)"

As a result, one may conclude - too hastily, - that the engineers' role is limited in this context. Yet this is not the case. Worldwide, engineers have taken an active part in the information revolution since its inception. The rapid progress made by humankind in the last few centuries is to a large extent, due to innovation through engineering. Therefore, African engineers have a crucial role to play in building Africa's information society.

First, they need to actively participate in the process aimed at formulating a vision for the African Information Society and setting up an enabling environment for the deployment of ICTs in various sectors.

¹⁰ <http://www.unicttaskforce.org/>

Second, and most importantly, they can participate in translating this vision into realistic programmes by delivering solutions that are technically viable, commercially feasible and economically and socially sustainable. To achieve this, African engineers need to be proactive in some of the following areas:

- Finding the right language to express what the information society is about;
- Translating the vision into realistic programmes, based on viable technological solutions;
- Valorising research and innovation activities; and

Finding the right language

Although some progress has been achieved, ICT-related issues are too often understood from a limited “technological” aspect. The economic and societal dimension of ICT-based activities are not very well integrated in political or even intellectual debates and corresponding programmes. This is mainly because the impact of ICTs and the opportunities they offer are not well explained and articulated. The contribution of engineers at the policy level is to express the vision of the Information Society in a way that can be understood by everyone, from grass-roots communities to high-level decision-makers, from illiterate farmers living in rural areas, to holders of advanced degrees, living in capital cities.

Because of the specificities of their profession, and their mastery of complex technical issues, engineers can help the wider public in understanding the implications of the Information Society. Through dialogue, national and regional associations of engineers can help to better articulate the relationship between the technicalities and the social and economic benefits of ICTs. They can indeed act as intermediaries, who would improve the interaction among policymakers, the academia, the business sector, the media and the wider public.

Campaigns to popularise engineering and technology as part of the policy process could include:

- Consultation and recommendations during the policymaking process, to demonstrate how ICTs and engineering affect the economy, politics and society;
- Sensitisation workshops and seminars to make use of the knowledge, experience and research;
- Establishment of an engineering network to promote regional and international exchanges;
- Setting up of multidisciplinary networks of cooperation among companies, academic institutions and research bodies; and
- Making the engineering profession more attractive to the African youth, with particular emphasis on young women.

Translating the vision into realistic and sustainable programmes

ICT-based projects and initiatives have recently mushroomed in various sectors such as education, health, business, governance etc. Many of them have been limited to pilot phases or intended to serve as demonstration projects. This has generally been due to two reasons, lack of resources, financial or human and irrelevance of the proposed solutions.

The challenge now is to ensure that future dynamics of the Information Society do not stop at preliminary stages. To achieve sustainability, efforts should be consolidated in order to assess the real needs in particular settings and to innovate when selecting the right technologies for specific and context-based requirements.

This issue is particularly important, as Africa's realities are as diverse as the Continent itself. Issues of access, resources and human capacity are some of the obstacles that hinder the deployment of the information society in the region. Consequently, African engineers need to be actively involved in the design of practical and economically viable solutions to complex technological and economical problems. They must assume a more prominent role as innovators and problem-solvers for the best affordable solutions to the many challenges faced by Africans.

They can be instrumental in translating the vision of the Information society into action - not just any action. Their responsibility is to ensure that the national e-strategy implementation Plans reflect the development priorities and local realities of their countries. They can identify 'adapted technologies' and move from the rather limited concept of low-cost technologies that has been promoted as *the* solution for developing countries. As an example, what would it mean to launch a telemedicine programme? Is it to fully wire the country with high-speed communication lines so that high-resolution radiology images are sent from any village to any given destination? Does this address the local needs and realities? What would it mean to create e-business opportunities? Is it to implement highly sophisticated EDI platforms or to rely on basic communication tools that are increasingly available, like mobile telephony or PDAs, in order to create commercial networks?

These are the kind of questions that engineers can consider in order to create viable digital opportunities and provide the right solutions to Africa's challenges.

Valorising research and innovation

During the last centuries, the agricultural and industrial revolutions were led by R&D. It is now the case for the information and knowledge age.

Knowledge of how ICTs are designed, adapted to the local environment and maintained is a prerequisite to reinforce ICT production capacity. It is therefore important that R&D be supported and encouraged for sustaining

and improving the benefits of the information society. This can be done by spreading an R&D culture. A recent ECA document entitled “Making science and technology work for the poor and for sustainable development¹¹” recommends programmes to implement popularisation of science. It suggests several mechanisms that could be adapted for the ICT R&D sector. These include:

- Encourage creativity and innovation in everyday scientific and technological activities, and provide incentives for participation;
- Provide opportunities for the general public (especially the youth), to appreciate science and technology and participate in its development;
- Demonstrate the linkages between basic and applied science and technology, and showcase their role in development;
- Give visibility to successful projects and results of research that impact on society’s progress and development; and
- Honour and recognize scientists and technologists who make significant contributions in their fields.

Over the years, R&D capacities of a number of African countries have been fading away, hampered in their development by limited human and financial resources and marginal access to up-to-date information and knowledge. Even when funding was available - mainly from the donor-community, research activities have predominantly targeted stand-alone projects and have, in most cases, not given rise to long- term capacity-building in research and in the management of research centres.

More critically, R&D programmes have never been adequately embedded into national economic and social development plans. An important component of the NICI plans is to create awareness of the importance of R&D to build a successful information society and to improve R&D capabilities in universities, technology and research centres and, to some extent, private firms that could become innovators and incubators in the field of ICT. Research centres need to have a demonstrable capacity to capture synergies between research and policymaking and between research, business and investment.

African Governments should set up enabling and friendly policies in consultation with major stakeholders. They should create the conditions that make the private sector convincingly invest in local R&D activities. Modalities of such conducive environments could be through formulation of fiscal policies and public procurement rules that give preference to ICT goods and services integrating local innovations. Finally, joint projects that bring together the private sector and academic researchers need to be more systematically supported.

¹¹ Making science and technology work for the poor and for sustainable development in Africa. Paper to be discussed during the third meeting of the African committee for sustainable development, Addis Ababa, 7-9 October 2003.

Conclusion

There is no doubt that engineers should be considered among the pillars that will help to create and support the African information society. This paper has tried, very briefly, to capture their potential share of the process. However, in order for them to be fully involved, continuous attention should be paid to creating a critical mass of African engineers, by encouraging more people, in particular women, to get plugged in engineering careers.

The time has come for Africa to mobilise all the forces and energies that can contribute to building a sustainable Information society, that will create wealth and improve the welfare for all. Efforts must now converge to make the African Information Age a reality, which will eventually benefit *every man, woman, child, village, government office and business...*