Youth Forum

ICTs and the Future of Africa

**Organized by
the International Telecommunication Union (ITU)**

Hosted by the Republic of South Africa

**ITU TELECOM
AFRICA** 2001
Johannesburg
12-16 November

TELECOM
MEET THE FUTURE

Youth Forum

ICTs and the Future of Africa

SIEMENS

ALCATEL
ARCHITECTS OF AN INTERNET WORLD

WORLDSPACE®

Intelsat
inspiring connections

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

TELECOM
MEET THE FUTURE

Content
by Country

ii

Country	Author	Page

Content

by author

Author	**School**	*Page*

Mohamed Khelil Cherfi

Institut des Télécommunications d'ORAN

Algeria

Throughout history, mankind has striven to transcend the barriers of time and space, constantly developing, down the ages, new information and communication technologies that have culminated in the means of communication we know today. The rapid growth of telecommunications and the media has profoundly changed the modern world, a fact of which historians, economists, sociologists and philosophers are increasingly aware, but which has consequences we cannot as yet fully appreciate. We are moving ever closer to a global system encompassing the entire field of telecommunications, with its growing complexity and its broadening scope in terms of size (distribution of services) and sectors (diversification of services), and the convergence of computer technology and telecommunications. To achieve this, nations, businesses and individuals need to work together to construct a universal telecommunication network, perfecting the technology for creating new systems.

The outlook for, and planning of, future communication systems is one of the most important issues facing society, and will have a huge impact on our future. That future will be shaped not merely by what might happen or what is most likely to happen but, increasingly, by what we want to happen.

The trend towards a global telecommunication system is reinforced by the extraordinary technological revolution currently taking place, opening up fresh horizons and leading to the globalization of telecommunication networks providing a universal, reliable and high-quality service. This, in spite of all the problems - political, financial, technical and economic - which must be overcome in order to construct and implement such a system. The right to communicate, if we accept that such a right exists, must apply to everyone. If that is what we want to achieve, we must gear the development of the new information and communication technologies, now and in the years to come, towards developing services which offer new ways to enhance the well-being and quality of life of human beings.

Young people undoubtedly hold the key to the future, and have a direct say in the process of improving existing means of communication. We will see the emergence of fresh talent with new ideas which will form the basis for the technologies of the future and will provide solutions to the problems of communicating, which extend far beyond national borders. Young people, then, have a very real choice between different possible futures. They can and must opt for a future that safeguards the right to communicate and enhances mankind's overall welfare. If they do not, our children's children will hold us responsible.

Amel Wahiba Labiod

Institut des Télécommunications d'ORAN

Algeria

The emergence of the Internet and the convergence of voice and data; the emergence of mobile phones and the convergence of the fixed and mobile services; the huge growth in personal computers and in methods of access (satellite) – all these form part of the information and communication technologies (ICT).

The information technology revolution, and the unprecedented means at its disposal for processing, storing, refining and disseminating data, information and knowledge across frontiers by a variety of means, have wrought a radical transformation in the way in which government and the private sector operate worldwide.

The ICT sector comprises a whole range of industries and service activities: Internet service provision, telecom services and equipment, IT equipment and services, media, broadcasting, libraries and documentation centres, commercial information providers, network information services, etc.

Information and communication technologies have come to occupy an important role in education, at all levels of teaching. They are now a major priority, particularly for improving and developing teaching practice in higher education and research, to the benefit of international relations. The use of these technologies is not, however, confined to the educational sphere. Other applications include:

• space exploration

• medicine, especially surgery

• data transfer and transactions (commercial applications such as the stock exchange)

• distance learning and training

• meteorology

• radionavigation

• civil engineering

• marine engineering

• leisure and multimedia: TV, CD-ROM, electronic games

• technological, economic, environmental and competition research

• interactive services for use internally or in dealings with partners (customers, suppliers).

This has led to the introduction of the concepts of a national information infrastructure (NII) and global information infrastructure (GII), defined as the technologies, organisations and methods assisting the production and use of ICT.

The information and communication technologies can no longer be regarded as a luxury accessible to only a handful of countries. The worldwide move into an information age, recent technological advances and other structural and economic developments have produced a rapid fall in the cost of ICT.

More and more countries are discovering the immense possibilities of this technology. The African countries too have become involved in recent years and undergone their own ICT revolutions, albeit with differences between countries. Information and communications infrastructure is being put in place in Africa, encompassing the development of information exchange and processing and human resource development.

Information and communication technologies have now become an essential part of everyday life for people in general, and for the younger generation in particular, and of crucial importance to certain industries. It is the young, however, who are the key to sustaining the revolution, with future activities to include:

- developing new, very powerful and accurate programmes for advanced research, particularly in the field of leading-edge technologies and for processing new data in space research

- implementing new policies to improve and monitor the prospects for developing information and communication technologies

- studying market trends and the future needs of users, industry and the State

- promoting public relations and the development of economic activity via the exchange of ICT between parties

- heightening public awareness of these new technologies through all branches of the media

- ongoing calls for new investors and firms to broaden the scope of these technologies

- training of new managers specializing in ICT.

Ferdinand Bokossa Yaou

Polytechnique Universitaire

Benin

The huge progress made by science and technology over the last decade has paved the way for numerous and innovative information and communication technologies in the world. These new technologies, which have enhanced information and communication management, thereby accelerating europeanization and globalization in Europe and in America in particular, still remain a rare and precious means of training and communication in the poor countries of Africa, Asia and Latin America owing to the local tariffs.

The new modern challenge for this third millennium is therefore to build a common vision and understanding of a new information society and to establish a strategic action plan enabling that vision to be realized in a coherent and global manner, without omitting any country or race and with a view to making the information society a tool which provides the right to public information in digital format. We should effectuate a radical cultural change by digitizing libraries - tools for consultation that have been scattered until now - with a view to preserving the integrity of the documents.

Young people, the pioneers and hope of the future, must take on board these new information and communication technologies in order to meet the new challenge of the modernization of communication and information. This will involve six target areas, namely: teaching, cultural policy, modernization of public services, support for companies, industrial innovation and the emergence of effective regulation of networks. To that end, these new technologies must become a fundamental component of learning by means of computing tools for the reason that, as publicly stated by French Prime Minister, Lionel Jospin, "… those who are not connected to the Internet are the new social outcasts". Then we must seek to preserve, rehabilitate, rebuild and develop the cultural heritage of humanity, especially in Africa - the only guaranty of "africanization". To give an illustration, I can cite the multitude of contributions that photography has made to the reconstitution of the heritage of the city of Djenné in Senegal, and the royal palaces of Abomey in Benin. This example demonstrates the role played by photography in the information revolution thanks to information technology and telecommunications. Here we join Michel Menou in saying "… information is the third "frontier" of development after economic and social development".

So young people must seize this opportunity to take on board new information and communication technologies, while developing local information industries and products in order to finally cease being eternal consumers and to become suppliers too. They must use their own natural, cultural, craft and information resources in order to meet this key cultural, economic, technological and financial challenge in the new information society.

Laetitia Sessi Semado

Université Nationale du Benin

Benin

Globalization is the big issue of today. We also hear about a revolution in information and communication technologies. For information, in its multitude of forms of transmission ranging from text to sound and image, has now become a tool for global unification and an indispensable vehicle for action which must be managed and taken on board at all costs. Young people, as the custodians of the future, are the most concerned by this profusion of challenges - even more so in developing countries where the actual integration of these information and communication technologies has yet to be shown to take place.

New information and communication technologies (advanced software, Internet, mobile telephones, etc.) represent a major factor of change in today's world, whether in cultural, political or economic fields. This is so much the case that we now see information from three different perspectives, namely: as a boost to efficiency in that it brings professional training more in line with current needs and makes for more accurate decision-making, as a medium that is gradually becoming the point of transit for numerous influences and finally as a stake which everyone wants to control.

It is not easy to have a full grasp of one's own environment. This is why the foremost role of young people is to become conscious of the reality surrounding them. This entails keeping sight of the following: if in the western world new information and communication technologies, the hallmarks of the 'new revolution', have become the heart of all development strategies it is because their popularization phase has already been completed. It goes without saying that computers, the Internet, communication software, etc. all have a place in governmental institutions, companies, schools and even in homes. If developing countries want to benefit from the potential for economic growth which lies dormant in new information and communication technologies, the popularization and promotion of these must take place, or at least have been initiated. Therein lies the major role to be played by young people.

Tebogo Maseko

University of Botswana

Botswana

Information and communication technology (ICT) is both widely understood and misunderstood. It is actually the use of computer and communication technologies to receive, handle, store, retrieve, transmit, process, update and analyse data for the purpose of communication. Communication technologies include televisions, telephones, cell phones, e-mail and fax machines.

In today's world, ICTs provide the base and the structure for future developments in the economic and social aspects of every country. Without ICTs, development projects would be very slow-moving, and most African countries would find the going very tough. ICTs can be a great support to the economic development of a country - for example, in Botswana, with the opening up of businesses such as Mascom Wireless and Visa Cellular, among many others. They can also help to improve people's social standards, enabling individuals to sustain themselves by opening up small phone and fax shops to earn a living, and providing people with access to the various forms of communication technologies that can greatly change their lives.

Young people, as the future generation, should be empowered so that they can feel they have played a role in the development of their countries. They can, for example, form clubs that deal directly with communication so that they know exactly what is happening and are up to date with all the latest developments. Young people, educated as they are, have the responsibility of going out to the people and enlightening them about what is really going on. This can help in development, as people will no longer be as passive as they are at present.

Youth involvement is a very necessary aspect of ICTs, and the trend should change from the way it is at the moment.

Oarabile Pitso

University of Botswana UB

Botswana

At the dawn of the new millennium, the need for youth development opportunities in information and technology cannot be overemphasized. The availability of the Internet, television and the telephone has put young people at the forefront of those interested in the development of information technology.

The role of youth in the development of information and communication opportunities lies largely in the consumption of final ICT products. Development opportunities are most clearly seen among young people in the education system. They are the ones who use computers in universities and telephones in their everyday lives. Their education does not end upon graduating from university or joining the labour market, and if young people were to be given greater opportunities to learn and resourcefully use information technology their countries would greatly benefit.

National governments should set aside funds to aid the private sector in helping to develop young people in order to give them greater opportunities to compete in the work market. Empowering and developing young people will give them a far stronger footing in this era of globalization and privatization.

There is a need to realize the development opportunities that are available in the world of ICT. Young people use e-mail to conduct research and communicate with their families, friends and competitors, and hence enough energy should be concentrated on giving them greater knowledge of what ICT is and what it can do for them.

The computer and telephone industries have earned the western world a great deal of capital, and hence in order to empower our young people we need to provide them with knowledge about information technology and how they can use it to their advantage.

AFRICA 2001

TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Sétou Compaore

Université Polytechnique de Ouagadougou

Burkina Faso

Today, information and communication technologies have become an essential part of life. The Internet has reduced the distances between people and made the world into a "village". Against this background, what are the development prospects and role of youth?

There is an enormous need for information technology, particularly in the field of data communications and computer networks in order to disseminate knowledge more effectively. Access to sources of information is indispensable for education and research.

In order to make knowledge available to everyone, and in particular young people who are the spearhead of development, they have to be provided with the information they need to form them morally, culturally and intellectually. For example, the Internet facilitates communication between people and can help overcome cultural barriers. Thus, knowledge, particularly scientific and technical, becomes accessible to all. Young people can draw on this source to evolve and develop. Access to information helps to forge an outlook on the world which is more objective, understanding and tolerant. Whence the need to equip school, academic and scientific circles with access to information sources through the development of information and communication technologies. These technologies are the prime route to development of society in general and youth in particular.

Young people cannot remain indifferent to this miraculous opportunity offered by technical and scientific progress. They have to become more actively involved in the quest for knowledge and know-how. They must be willing to learn, dynamic, creative and above all discerning - in order to avoid drowning in the wealth of information flowing in from all directions. The right information will help young people flourish, liberate themselves and master their environment. At a time when we are submerged with information, only by adopting a discerning approach will youth be able to play its role fully, in other words gather constructive knowledge for the common good.

Thus, in our 21st century, information and communication technologies are a crucial tool for more democratic distribution of knowledge. They constitute the driving force behind social, cultural, economic and political development. Young people occupy a privileged position in this new landscape since, if information and communication technologies are a tool of the future, it must be remembered that the people of the future are, precisely, today's youth.

K. Claude Stéphane Karfo

Université Polytechnique de Bobo Dioulassa

Burkina Faso

Today's world is, by common admission, an information society. This situation stems from the development of communication technologies.

With this in mind, we shall state our point of view on approaches for development of these technologies, before putting forward our opinion on the role of youth.

Communication is probably the prime tool which has enabled humankind to progress to its present level in all fields. Its development can only bring benefits. Our consideration of this development will focus primarily on the IT sector, which is the one we know best.

A first approach would be to develop applications using our mother tongues. In our African countries, in order to use a computer, one has to know English or French, which are in fact foreign languages for us. Just think of a farmer who conducts all transactions in his own (of course, African) language, who is sidelined because he cannot understand information technology at a time when agriculture has become computerized.

A second approach would be to promote information technologies such as the Internet in secondary schools. This process has already begun, but lacks impetus.

None of these visions are worth anything without young people. It is up to youth - who will be the "world of tomorrow" - to generate ideas for improving communication techniques. Through their associations and various clubs, young people can reach out to larger numbers of people and sensitize them to the use of new information technologies.

Last but not least, we believe that, if real progress is to be made in information and communication technologies, public authorities have their part to play. This would no doubt enable inventors to come up with interesting products and the average citizen to take easy advantage of them. Youth, with its innovative ideas, will be a driving force in this policy.

Kelly Mategeko

University of Burundi

Burundi

Information and communication technologies have always evolved with time. Today, they could be grouped into two categories: traditional technologies (e.g. radio, television, telephone, fax, postal mail, seminars, colloquiums, books, newspapers, etc.), and modern technologies (such as the Internet, e-mail, mobile telephony, etc.). What can be done to contribute to these technologies and, in particular, what role should youth be playing?

The development of these technologies can be analysed from different angles. From the standpoint of the "equipment", quality training of technicians must be provided, primarily to design, manufacture and maintain the various tools. Among other things, the appearance and use of the available equipment and technology are important. They have to be adapted to meet the actual needs of the different categories of people using them: the illiterate, intellectuals, people with physiological impairments, persons living in rural or urban areas, and many others, depending on the criteria applied.

The role of youth is therefore crucial. The starting point must be to raise awareness of the importance of means of communication and information, whatever the area of activity. This would lead each young person to apply his or herself to the best of their ability in developing these technologies in some way. Moreover, it should be noted that young people are particularly receptive to new technologies. The popularization of these technologies must therefore take place through young people.

The role of youth in the development of information and communication technologies is thus indisputable. It would be interesting to exchange views on this issue with young people of different origins and who therefore necessarily face different realities. The issue could be studied more or less extensively, enabling a conclusion to be reached which, when applied, would be highly beneficial in any place, for any person and in any field of activity.

Alice Sindihebura

University du Burundi

Burundi

Information and communication technologies are evolving in a breathtaking and spectacular way.

Africa's youth have always harboured ambitions in respect of development and know-how in the world of communication and, indeed, represent a workforce and potential market in the communications world.

However, these young people cruelly lack training, both in the Internet and in radiocommunications and telecommunications.

Nevertheless, African youth in general, and that of Burundi in particular, have great expectations of the ITU Forum to be held in South Africa, which is a unique event. They welcome this initiative.

Among other things, young people hope to gain up-to-date training from this Forum which will be valid for development in the field of communication in their respective countries and in Africa as a whole.

Martial Gladys Kuitchoua

Ecole Nationale Supérieure des Postes et Télécommunications

Cameroon

Information and communication technologies can be defined as the set of methods and procedures used to transmit information and establish communications between two or more individuals via communication networks (Internet, digital broadcasting network, satellite, mobile telephony, etc.).

We will first examine the prospects for development of information and communication technologies (ICT) by highlighting their impact on the economy and other spheres in developing countries. We will then go on to study the role of young people in developing these technologies.

Recent years have seen an exponential growth in ICT worldwide, and in particular in the countries of the North. The chief effect of this trend has been to bridge the distances between nations and stimulate trade between them.

ICT has had a significant catalytic effect, playing an important role in the growth of national and international economies. The Web (Internet) has effectively become the new engine of the economy in the developed countries. Of the 50 most powerful companies in the world, the ten leading ones are engaged in ICT!

The development of ICT offers African countries a reliable solution to their problems. Accordingly, they stand to gain from incorporating ICT into their strategy to combat poverty; on a continent where telephone communication leaves much to be desired, electronic mail may have a very important contribution to make. According to the famous "leapfrog" theory, ICT should enable African countries to "skip" a stage in their economic development and catch up with the developed countries.

In this interconnected universe, young people must deepen their interest in ICT by means of conferences and debates, the mass media, forums such as the one being held by the ITU in South Africa on 15 November 2001, and ongoing training, enabling them to immerse themselves in the latest ICT trends. They must then stamp their imprint on this sector, for instance by developing Internet software or information services, designing systems for managing and maintaining websites, etc. To this end, governments must introduce ICT into the education system at the most basic level, while exempting ICT accessories from tax in order to allow as many people as possible to have access to them.

Information and communication technologies can now be regarded as the lever for overall development; the term "third Industrial Revolution" is no exaggeration. The international institutions (IMF, World Bank, etc.), in their aid programmes for developing countries, should therefore require that a proportion of the funds go towards developing ICT. There is a duty to ensure that the new world order which is emerging benefits everyone and excludes no one.

Sidonie Zeufack

Ecole Supérieure Polytechniques

Cameroon

The worldwide explosion in telecommunications witnessed over the past decade confirms the vital role of telecommunications as a tool for stimulating information. At the dawn of the third millennium, the Internet has become firmly established as a global means of communication of such promise that it is fuelling a growing demand in terms of bearer capacity and quality of service.

If we try to imagine how daily life might look in ten years' time, we run up against the difficulty of picturing new ways of doing the same old things, and thinking up new things which tomorrow's technology will make possible. The future shape of the Internet may be discerned from the current major trends. Thousands of stations now broadcast on the Internet and are listened to on personal computers (PCs), thanks to software that converts data streams into sound. Dedicated machines might well pave the way for other specialized equipment designed to reproduce digital content broadcast on the Internet in a variety of forms: video, formatted text, pictures or sound, or any combination of these. Great progress has already been made on the multicasting of digital content, but there is a long way to go before effective use is made of these applications. In order to meet people's desire to remain in touch at all times, we could envisage accessories being designed to be an integral part of garments, or at least to be portable and accessible. In the coming decade, it will become second nature for people anywhere in the world to receive information and thus improve their knowledge, and to be able to communicate with or locate someone in an instant, all these tasks being performed with maximum efficiency. Communication without constraints will play a major role in the development of the Internet and its applications; already we can see how contemporary society has benefited from wireless communications.

Continuity of service will depend upon the existence of adequate numbers of qualified personnel. Young people must keep pace with the changing technology. As the leaders of tomorrow, they must be in a position to step into their elders' shoes. Accordingly, they must have the training required to meet the different demands in this sphere and to ensure that the science advances. The most innovative ideas, moreover, come from the young, a fact reflected in the large number of small "start-up" companies whose prosperity is fuelling the continued expansion of the information technology sector (Microsoft, Apple, Yahoo, etc.).

The new information and communication technologies (NICT) are advancing all the time, under the impetus of the constantly increasing demand from consumers of the resulting products. This is the right place to encourage the dynamic young people with innovative ideas who have such an important role to play. Whether these developments produce a better society remains to be seen.

Silvestre Dos Santos Fortes

Institut Supérieur d'Ingénieur

Cape Verde

In a world where the byword is economic globalization, telecommunications as a cause and effect of globalization have encouraged transmissions worldwide.

As a result of new telecommunication systems, people engaging in various kinds of transactions do not even need to leave their homes in order to carry them out.

Access to education is becoming easier by the day, as schools, libraries and universities are brought into our communities and into our homes. Medical diagnoses can now be performed that at one time lay beyond the capabilities of medicine, housewives can do their shopping without leaving home, and even weddings can now be attended in real time by friends around the world without their having to travel to the wedding site.

Nevertheless, the differing levels of development attained around the world in regard to telecommunications, and particularly information systems, telephone services and the Internet, are becoming a chasm between the developed and developing countries.

The telecommunication sector accounts for worldwide revenues of approximately USD 650 billion, and yet it is a sector characterized by a diverse international context in which:

• The information society predominates.

• Although the number of telephones has grown in many countries, the gap between developed and poor countries has widened in terms of telephone density.

• Governments are searching for the best ways to live in harmony with the mushrooming of technology.

• The private sector is becoming increasingly involved in the development of telecommunications.

• Mobile telecommunication networks are growing apace in many countries, and profits on those networks are exceeding the profits on fixed service.

• The world market is becoming more and more demanding, and new products and services are continually being introduced.

All together, these factors give rise to fundamental changes in the telecommunication sector, and political, cultural and financial considerations complicate the situation further.

The imbalance that exists today between those countries that have introduced measures to encourage competition and those where monopolistic State or private regimes predominate means that delicate negotiations are necessary in order for telephone traffic to be able to move freely and without telecommunication services being impeded.

Problems urgently needing to be resolved at the world level include traffic flow, the interconnection of different systems in general terms, the allocation of the radio spectrum, the granting of operating lines and the accounting rate system.

Technological advances have been so swift that fear has begun to take hold not only amongst small operators but also amongst large ones, and it has been suggested that anyone who is not afraid now simply does not understand what is happening around the world. In brief, then, these are the principal areas to be discussed in my paper, which I should be honoured to share with you.

Adilsa Fonseca Lima

Faculté de Sciences de l'Université Marien Ngouabi

Cape Verde

Cultural development and cultural exchanges are increasingly being furthered thanks to telecommunications and the new information technologies that are day by day having an ever-greater impact on socio-economic problems and are proving decisive in solving them.

Over the past 10 years, young people have witnessed the flourishing of a new era of technological advances that have facilitated the development of new telecommunication systems.

These systems, which have become information superhighways, make it possible to envisage the so-called Global Information Society, and to foresee a world without borders in which sovereignty and government are worldwide in scope whilst being concentrated in the hands of those that dominate the communications and information media.

From fibre optics to mobile cellular telecommunication systems, to personal mobile satellite telecommunication systems, to integrated voice, data and video systems, there has been an unprecedented stream of new communication systems emerging that have accelerated the pace of development worldwide.

The following are among the most noteworthy new systems:

•   Digital integrated service networks.

•   Multiple-circuit systems.

•   Fibre-optic systems.

•   Hertzian beam systems with local loop.

•   Broadband copper-wire systems.

•   Cellular mobile telephone systems.

•   Low-orbit satellite communication systems.

All areas of human development have benefited from the advent of these systems, as they offer capabilities that go far beyond those of traditional telecommunications, to distance education, telemedicine, interactive television, data transmission and above all the Internet.

Although the new communication and information technologies may meet with some resistance, they invariably penetrate the education system and have an impact on young people owing to the natural interaction that occurs between school and the society that surrounds it.

Without question, education must adapt to the needs of the societies it serves. The great challenge we face today is to adapt to the great social, cultural and economic changes brought about by these new technologies. Such adaptation is urgently needed, but it is not simply a case of adapting education to the new technologies. The great challenges are not technological, but rather social, cultural and economic. To put it another way, if technology is

the answer, what is the question? If the promise offered by the new communication and information technologies in regard to learning is to be realized, this will require a sound education system.

The new information technologies are opening up a parallel world to the real world.

Among the key characteristics in this process are the following: interactivity, characterized as a unique truth, and hypertext, being one of the essential paradigms of the World Wide Web which led to its acceptance and was followed by the trend towards digital multimedia; channel sharing and the distribution of computing and information that are consequences of the technology adopted through *de facto* standards and open systems, to which can be attributed the success of the Internet over competing proposed international network systems. The combination of these elements has resulted in new opportunities for cooperation between people who are geographically remote from one another; and some such undertakings have already been successful on a previously unimaginable scale.

This technology is having an impact that is both widespread and intense. It affects every aspect of life, and is bringing about profound changes. Skill in the use of computers is becoming a second form of literacy, bringing sweeping change to the realms of employment, economic activity and the perception of culture.

"And everyone makes changes, and imposes new twists that he dislikes, and still he is a child."
- Luis de Camões.

Vincent Sabone

Université de Bangui

Central African Rep.

Since the nineteenth century we have been witness to an ongoing renewal in technological sciences. This renewal affects almost all scientific areas, including information and communication technologies. Owing to their highly varied and perceptible usages, these technologies have an influence on development. However, an active portion of young people are always involved.

Do these technologies necessarily offer advantages? Why are young people in particular targeted?

These points are looked at in detail below.

Information technology, which is a body of processes for the dissemination of news and information, today employs different technologies such as newspapers, radio, television and, in particular, new information technology, via the Internet. This latter technology, which results from the interconnection of a computer with the telecommunication network, enables one to instantaneously receive an exhaustive variety information throughout the world. It is accessed by connecting oneself, either on advertising sites (job offers), or on sites providing radio information which is disseminated over specific international airwaves (RFI), or by accessing web pages containing teaching and learning materials.

Thus, information technologies benefit humanity, and young people in particular, who will open up to the world and be able to adapt themselves to state-of-the-art technology. These technologies therefore enhance young people's self-emancipation and development. In short, they make a significant contribution to increasing the numbers of qualified intellectuals.

As regards communication, i.e. the transmission of data, this involves the application of several transmission methods including the telephone, telex and, of course, the newcomer to communication technology: the Internet which, owing to its reliability for transmission, is being increasingly used for remote exchanges such as teleconferencing and computer-assisted learning.

We should also mention the interest generated by the new generation in telephony, i.e. the mobile telephone, whose implementation may be accompanied by the emergence of new telephone infrastructures, thereby meeting workforce needs. These new structures will subsequently make payments on the basis of turnover, thereby increasing the State's income.

However, for a third world country such as ours, these technologies are not always beneficial. The sad observation is that in most cases African countries have technological reforms imposed on them.

Of all the layers of society, youth constitutes the social group that is most affected by information and communication technology issues.

The "breeding ground" aspect represented by youth is a significant component in development policy, as young people are forced not to remain standing on the edge of current events, education and schooling, which form the fundamental basis for a good education, and for breaking with the lack of education of which they are often a victim.

Finally, information and communication technologies constitute, *inter alia*, a predominant factor for development. But we cannot have a genuine revolution unless a policy is adopted whereby young people have access to information, which would help to gear them towards the cutting edge of globalization.

AFRICA 2001

TELECOM

MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Nina Mirabelle Sandos-Yambide

Physique-Chimie

Central African Rep.

The world has always evolved by virtue of information and communication technologies.

Today, technological innovation in the field of information and communication constitutes a real driving force in the economy, for the primary vocation of information and communication is to link people over any distance. The challenge for the third millennium is to place this knowledge within the reach of youth, who are tomorrow's future.

Technological revolution and globalization are heralding in the network era, changing ways of producing information and communication. Information and communication technologies have many advantages: they progress in pace with innovations in microelectronics, information technology (hardware and software), telecommunication and opto-electronics (microprocessors, semi-conductors, optical fibres). These breakthroughs enable huge quantities of information to be processed and stored and rapidly disseminated via communication networks. The media are among the real cornerstones of these technologies, not forgetting the press, radio and television.

Innovation in information and communication is changing and expanding the possibilities for use by individuals of this technology. For example, the Internet, wireless telephony and other information and communication technologies are today enabling people to communicate and obtain information in a hitherto unimaginable way, thereby increasing their capacity to participate in decisions which affect them.

Although new technologies bring with them specific benefits for developing countries, they also entail considerable risks. Problems related to technology are often the result of inappropriate public policies. Most developing countries are therefore at a considerable disadvantage, as they lack the necessary means for action and institutions for effective risk management. One prospect for development involves the training of professional researchers and competent technicians. It would therefore be desirable to have suitably trained young professionals to adapt new technologies for local usages.

Young people, who are the talent of the nation, are directly concerned by these new communication technologies in order to ensure sustainable progress in this field.

The role of youth is therefore to become informed and obtain training with a view to furthering research on information and communication technologies to better develop their socio-economic and cultural environment.

Betoubana Djibangar

Université Roi Faysal

Chad

One night, herds of elephants invaded a village on Chad's southern border causing tremendous damage to life and property.

The next day, a Chadian living in France telephoned his brother in Lai, a town barely ten kilometres away from the village in question, to get more details of what had happened.

How surprised his brother was, since he had heard nothing of the invasion. Worse still, he could hardly believe his ears that his brother living in France knew about what had happened within 24 hours, while he was completely oblivious to the event despite living close by.

This apparently banal anecdote illustrates the importance, indeed vital importance, of information and communication technologies in today's world.

As we embark upon the third millennium, terms like the web, Internet, telephone, radio and television are household words in day-to-day life. More than that, millions of people use these technologies every hour, minute and second. Thus, mankind cannot do without information and communication technologies, even for a second.

In the face of this exponential growth in information and communication, young people cannot just stand by and watch. On the contrary, as the spearhead of nations, youth must assume their responsibilities in inheriting the future from their predecessors.

Guelnodji Milamem

Université de Ndaména

Chad

This theme prompts us to reflect on the different development possibilities opened up by the many information and communication technologies, and the role that youth must play in the process.

Information and communication technologies take many forms (written media, telephone, fax, Internet, information technology, …) and may be defined as the set of processes implemented to transmit information and promote exchanges between people.

Nowadays, the technologies are becoming increasingly refined, sophisticated and adapted to the needs of society. But what development opportunities does this wide range of technologies open up? From the social and political standpoint, these various information and communication processes constitute a powerful means of sensitizing and mobilizing people in a collective struggle, for example against illness or in favour of a given cause.

On the school, economic and professional front, these technologies enable us to exchange or pool experience, and offer a tool for distance learning; for instance, schoolchildren can use the Internet to carry out searches or access useful material for research.

Employees can easily follow any training they want in whatever field without having to travel abroad, which would be extremely costly for their employers; distance training is thus economically beneficial for companies.

In the face of all these benefits offered by information and communication technologies, young people must be proactive and dynamic in order not to miss this opportunity, which will open up the way to development. They must demand that the relevant authorities ensure they can take advantage of this new asset, in order not to lag behind technological development, and so that information and communication technology serves as a channel for transmitting technological know-how between today's and tomorrow's generation.

The more youth is trained in and accustomed to information and communication technologies, the greater care they will take of them and the better they will be able to use them to achieve sustainable development.

Henri Honoré

Ecole Nationale d'Administration et de Commerce

Comoros

Information and communication are fundamental elements for the development of a society or even of a State. Thus, one must constantly be ready to adapt them to social realities while multiplying the methods of information and communication in the interests of development. Moreover, young people must be the primary beneficiaries. In this way, they will become players in the process of development of their countries, thereby ensuring a better future.

Information and communication technologies, which first appeared alongside scientific and technical progress in the middle of the nineteenth century, immediately proved to be essential for life in society. From the telegram, the radio, the telephone, right up to the Internet, these technologies are still indispensable to us in daily life.

Of course, information and communication technologies deeply affect our habits, but sometimes their proliferation makes them inconvenient or incompatible with regard to social realities. In other words, the appearance of new information and communication technologies does not take account of the realities of social existence. For example, the arrival of the Internet in Comores does not take account of the reality of life in the country, given that the Internet requires a certain knowledge of computers and that a large portion of the population of Comores knows nothing about computers.

In order for the development of information and communication technologies to be for the best then, they must be adapted to the essential areas of life in a given society by being predominantly geared towards such fields as education, health, culture and so on. That would ensure that the emergence of new information and communication technologies would not go unnoticed and would stimulate the creation of further technologies.

In addition to social realities, these technologies must also take account of a fundamental sector of society, namely young people. These young people must be the primary beneficiaries of information and communication technologies. They will have good intellectual training to their advantage and will feel able to lead a country, keeping it in tune with the world as a whole.

To summarize, information and communication technologies represent a springboard for the development of society or of a country. They must therefore target the essential areas of social life (health, education, etc.), as well as targeting young people in order to ensure good development prospects, by coming to grips with the world system in order to adapt to the context of globalization.

Badriati Kambi Nourdine

Institut Supérieur de Formation et de Recyclage

Comoros

Humankind lives and grows in security by virtue of an ongoing exchange of social, cultural or economic projects, views, judgements and population changes, that bring meaning to each person's very existence. In order for those elements to be useful, effective and appropriate to the changing situation, they need a change of guard in the form of man himself, information and communication.

The machinery is so varied and complex that it is important to preserve the innocence of young people, who must only draw that which can contribute to any form of development for the benefit of humanity! On this level, those young people are in a position to demand that a field for reflection be opened to them that promises them the security of leading them towards a better future, to which end they must be objectively and appropriately educated. For it is in educational terms that information and communication are the most beneficial to this vulnerable category of the population. These young people must be gradually introduced to taking sound personal initiatives and well thought-out responsibilities.

For today, it is undeniable that entire countries place their hopes in young people owing to their constant intellectual potential - which still needs to be explored, their capacity for perception, creativity, and imagination which can carry countries towards their ideals and open the path to the globalization of different development projects. One can mention as examples the telephone, the Internet, fax, radio, television, CD-ROMs, DVD, and equipment on aircraft or ships.

Everyone is aware of the crucial role played by multimedia information and communication tools in the process of socio-economic development; it seems that our contemporaries would not have known how to make the most of advanced technology if young people in general had not been involved.

Christelle-Laura Ngooma-Telemine

Ecole Nationale Supérieure Polytechnique

Congo

Information and communication occupy a strategic place in today's society. In this world, which is evolving at a dizzying rate, the methods for developing the main information and communication media are multiplying at a staggering pace. More and more, new horizons are being studied in an attempt to meet the expectations of the new millennium. Today's young people, who constitute tomorrow's elite, cannot remain indifferent to progress and are an essential factor in its achievement.

The Internet now represents a powerful means of communication and information. Indeed, audiovisual specialists and computer manufacturers have decided to merge the Internet with television (a Microsoft and Intel project known as ATVEF) over the coming years. This marriage will, on the one hand, make it possible to insert additional content into television transmissions, while on the other hand the content of Web pages will be made available to us via the Internet, thereby increasing the information flow. And in connection with the Internet, it should be pointed out that new applications are at the experimental phase while others have already been implemented. As we enter this millennium, the Internet will be offering us the possibility of conversing in various forms, namely chat (direct conversation on the net), videoconferencing (live discussion via a video transmission), discussion forums (a space dedicated to dialogue on a Web page), newsgroups or discussion groups, and Internet telephony. It should be noted that all the aforementioned Internet applications are already available, serving to improve and facilitate the twenty-first century.

An integral part of the new world's development is mobile telephony, a revolution which marked the latter part of the last century. New means of communicating and informing ourselves freely are being discovered every day. Thus, one of the goals of researchers is that the videophone should become an integral part of cellular technology. In a few years from now, we will be able to see the face of our conversation partner on our mobile phone, as is already possible via the Web. Likewise, technicians have tended to focus on concentrating mobile telephony in major urban areas. However, the introduction of cellular technology in isolated areas by means of GSM networks would be a good thing.

It is essential that young people take an interest in the evolving communication and information technologies. Their mission is to bring their energies and ingenuity to bear in the experimentation, creation, innovation, realization and growth of those technologies, thereby ensuring the sustainability of the progress made in these spheres for future generations. Young people surely represent the best means of exploiting those technologies.

Where all these development prospects are concerned, information and communication are essential tools for ensuring that our future world is a bright one. Young people, to whom this world will belong, must play their part in the research and in the active struggle to bring those prospects to fruition.

Rossi Aimé Oddet

Ecole Nationale Supérieure Polytechnique

Congo
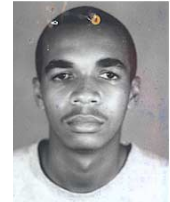
Communication consists in transmitting and exchanging information. It has become diversified, taking many forms as it adapts itself to the growth in both the nature and volume of channels. Access to information is being democratized, engendering new forms of communication, modifying the way in which knowledge is acquired and reshaping our society. The development prospects are numerous, and young people have a major role to play in that regard.

Radio and television will become genuinely "global" as their channels are increasingly carried via satellite, thereby helping to bring areas that are distant from the major urban centres out of their isolation. This process has already begun, but is far from complete.

The establishment of national and international communication networks requires that ever more efficient technologies be found. The telephone and the Internet are fierce competitors, each battling to conquer markets, particularly in Africa. The telephone is experiencing a revolution with the advent of the "mobile", which enables African countries to reduce their dependence on outdated systems which no longer satisfy demand. At the global level, however, the Internet, which by its nature is able to encompass all the other means of communication, is now taking a serious lead, evolving at the rate of 300% per year as against 6% for telephony. On the basis of these figures, we can see that by the year 2004 there will be as many PCs connected to the network as there are telephones. What we are witnessing here is a genuine "cybernetic revolution".

With the Internet representing a revolution, the class of individuals who should be taking a conscious interest therein is "young people". It is young people who form the basis of evolution and of the way in which things evolve, and the adult of the future (the young person of today) will need to replace conventional facilities such as the radio and television set by a computer system.

However, Africa is following this evolution timidly (not to say very timidly) on account of its many problems associated with poverty and technological underdevelopment, the latter being so serious that the continent is unable, in my view, to even comprehend the scope of the change that is required. It was not so long ago that Africa first experienced the benefits of wireless telephony, which it is currently attempting to implement in order to bring the free circulation of information to the most isolated corners of this great continent. Young people must therefore become aware of the need to communicate, initially through the fostering of mobile telephony and adoption of the Internet.

To sum up, the development prospects for information and communication technologies are associated with the Internet, the telephone and the migration to satellite of television and radio channels, in all of which areas young people should participate. In order to follow these developments, Africa will first of all have to wake up economically, and then inform young people of the scope of what is at stake and of the need to take the necessary steps to inform themselves through the organization of seminars and forums such as ITU TELECOM AFRICA 2001.

Edwige Assoko

Institut des Sciences et Techniques de la Communication

Côte d'Ivoire

Today we are hearing more and more about new information and communication technologies throughout the world. The advent of these technologies has an impact on adults and young people alike and seems to represent a boost to the economy, politics and culture. In view of the hopes raised by this new technological approach, one is led to wonder how new information and communication technologies can contribute to social "development".

The community plays a crucial part in any given society and would no longer exist if all forms of exchange were removed, as there would be nothing left to share. The survival of any society therefore depends on the community. The need to communicate has thus given rise to new information and communication technologies.

These enable us to communicate in order to exchange ideas, moral and spiritual values, to teach our children what we know and to educate them. Everyone can communicate with everyone else from any location. Communication is easy, facilitating the development of ties of friendship and partnerships between peoples. With the development of electronic messaging, videoconferencing and discussions over the Internet, the globalization concept is becoming a reality. Information travels from one side of the globe to the other at high speed. Everyone now has the opportunity to discover and to be discovered. A small company without substantial financial means can become known throughout the world simply by appearing on a website. Consumers no longer need television or radio advertising to become known, but can do so at low cost over the Internet. With CD-ROMs, we can store large quantities of information. By means of multimedia, one can integrate text, image, sound and video.

Given the considerable benefits of information and communication technologies in terms of technical potential, young people must become aware of and learn to use these new means of expression. They must also take their future in hand by endeavouring to develop and improve the technologies available to them.

Forums and seminars involving professionals in the field could be organized with a view to training young people and establishing the right conditions to transform them into true contributors to human society.

Nahkpyn César Niamien

Institut des Sciences et Techniques de la Communication

Côte d'Ivoire

The twentieth century will go down in history as having been the golden age of information and communication technologies, with the deployment of a worldwide telephone network, the invention of radio and television, the development of the computing industry and the launch of telecommunication satellites. Technological innovation, together with rapid social development, has brought about radical changes in this field, thereby giving rise to new information and communication technologies (NICTs). Within the framework of our work, the role of young people vis-à-vis this new language, or at least this new means of communicating, should be explored and examined.

NICTs are a body of technologies used to process, modify and exchange information and digitized data in particular. They owe their birth, *inter alia*, to the convergence of information technology, multimedia (text, image, moving image) and telecommunications (telephony, cable distribution and wireless communication technologies). The combination of information technology, audiovisual tools and telecommunications has had a considerable influence on the structuring of systems and the organization of communication (collection, processing, transmission and storage of information). Today, this symbiosis enables computers to be interconnected at local or remote level, thereby making exchanges possible. The Internet is the most prominent example of this in the field of information and communication technologies.

This new form of communication which, thanks to the digitization of information, enables different forms of data (text, soundtracks, video) to be combined in one piece of equipment, provides users with a wealth of possibilities. The information sought can be accessed in record time, thereby facilitating rapid decision-making and, most importantly, real-time management, which is highly beneficial to the world of work and research.

In view of the benefits provided by information and communication technologies, the role of young people is of crucial importance. Young people, who account for over half the population, must embrace information if they are to keep up in the debate on globalization; they must keep pace with the development of global society. For this, they must inform and educate themselves culturally, but they must also make the most of their potential. In other words they must not content themselves with being mere consumers, but must be active as producers. For this, they must be adept at using these new communication tools in order to have access to information. The decision of the Government of Côte d'Ivoire to introduce Internet learning in schools is therefore to be lauded.

Furthermore, African researchers must take on board these technologies and transmit contents of our own. Young people must set up websites pertaining to their own cultures in order to preserve them and to defend their views and realities which are so often crushed.

Narcisse Lokwa-Mbunzama

Université de Kinshasa

Dem. Rep. of the Congo

Everyone knows that at the start of the third millennium information and communication technologies are making an enormous contribution to the development of the world, partly by facilitating contacts between people and creating better relations, and partly by facilitating the process of development on a global scale. The question is what future does technical progress hold for us and what should youth's role consist of in this respect?

All the tools and techniques that enable us to transmit information and to communicate, such as television, fax, the telephone or Internet, have enabled human beings to gain access to information wherever they happen to be in the world. This has changed the world by allowing rapid growth and by improving our economic, financial and security environment.

Years ago, as we know, our world did not enjoy the benefit of a system that allows such quick and reliable communication.

Nowadays, the techniques we mentioned above allow information to circulate so fast across the world that they encourage the development of all human activities. Telecommunication, which in itself constitutes one of the key factors of a country's development, must be better understood and mastered by young people, who will one day have to take over in a sector that is so crucial for the development of every country, every continent and the whole world.

Young people should therefore seek every means of facilitating progress in the area of information and communication technology, by becoming more involved in efforts to improve this technology in the world, because it is constantly developing and is impinging more and more on our daily lives, with globalization creating a century, even a millennium of speed that has turned the world into a global village.

Youth must therefore try to adapt to the conditions and whims of this technological development.

Information and communication technologies are speeding up development by facilitating the circulation of information and by improving the way people communicate, so that young people should make sure they are ready to take over one day by undertaking training in this sector, which is so vital for full development.

Gloria Mansoni

Université de Kinshasa

Dem. Rep. of the Congo

The whole world currently aspires to development. A number of means, including communication and information, are available to achieve this goal.

Nowadays, the only path to a nation's development lies through globalization. This is a general concept which may be broken down into a number of individual disciplines, including information and communication, which contribute to the fulfillment of peoples and nations in many different areas.

If we are to pursue this goal successfully, we must master the techniques that will enable us to inform, to be informed and to communicate with others in order to achieve our full potential.

But there is a problem. At a time when the developed countries have acquired a vast array of communication and information techniques, the under-equipped countries are not always managing to keep up with the pace of modern development, for a number of reasons.

In this situation, what should young people do and what role should they assume in the development of information and communication technology?

Young people living in developed countries are bound to see the problem in a different light. The youngsters in the under-equipped countries will be looking at the possibility of acquiring equipment that is already available, in an effort merely to improve the quality of communication and information technology.

If a fresh impetus is to be given to the world economy, to social fulfillment and to technical development and research, then this information and communication technology must be considered indispensable.

Young people the world over must therefore try to find ways to cooperate, so that they can exchange experience and discover the potential that resides in every individual, with the idea eventually of encouraging a better exchange between nations on the basis of the needs expressed at youth meetings.

Ayan Abdillahi Hersi

Institut Supérieur des Affaires de Djibouti

Djibouti

Informing people means conveying a message to them with the aim of teaching them something. Communicating means being familiar with the tools and language of communication (computer, telephone, facsimile, etc.). Rapid advances are being made nowadays in the field of information and communications technologies. Young people have a vital role to play in determining the outlook for development in general and telecommunications in particular.

Only yesterday we relied on household telephones and radio for distributing information and communicating. Today, people have the use of mobile telephones and the Internet, providing them with a huge range of facilities. We can make calls to anywhere in the world from the wheel of our car. We can negotiate prices or organize a meeting a long distance away by Internet. Firms even employ people to work from home using the Internet. Cash no longer needs to change hands: money can simply be entered in the accounts and transferred from one bank to another via a computerized system. That makes life easier for businesses, organizations and administrations, and not least for households. In the developed countries, it is possible to purchase goods by ordering them on the Internet and having them delivered.

The invention of the transistor has had an impact upon many sectors of the economy including telecommunications, banking and administration, and will continue to engender massive social change worldwide over the next ten years. The exponential growth of integrated circuits is unstoppable. But there are no grounds for claiming, on the basis of the current state of interconnection technologies, that the performance of integrated circuits will equal or even outstrip that of the human brain. That would be to deprive us of our own humanity. Scientists and researchers have devised a myriad of ways of making people's tasks even easier through computing and the Internet. It is quite conceivable that, in thirty years' time, all medical care will be delivered by computers.

So where do young people fit in? Huge numbers of young people today continue to study computing and telecommunications: in the current climate, they have no choice. The tertiary sector is the most important economic sector worldwide. A graduate with a degree in computer science, for example, can be sure of finding a job more quickly than a philosophy graduate.

The development of technology and telecommunications will foster regional integration, thus reducing the marginalization of certain regions or subregions. These developments will contribute to economic development in all sectors in my country, and in particular to the development of tourism. Djibouti has considerable tourism potential, but it is not enough to have remarkable sites and unique attractions.

Accommodation structures are also needed, as are access facilities capable of competing in the world tourist market. Young people in Djibouti have the skills and training to make a major contribution to developing this sector, but we need to open up towards the outside world. We must therefore be given a place in the information society, and be entrusted with responsible tasks.

I believe that telecommunication development could play a major role in developing tourism in Djibouti by facilitating contacts with other countries. We are witnessing the golden age of tertiary technology. As far as the industrialized countries are concerned, the third millennium will be the electronic age.

Abdo Ali Ahmed

Institut Supérieur des Affaires de Djibouti

Djibouti

For over a decade now, there has been a tremendous growth in information and communication technologies founded on the development of information and telecommunication technology in conjunction with human creativity. They comprise numerous applications, with the Internet being the most visible facet.

On the African continent, and in particular in the subregion of the Horn of Africa, technology can contribute to economic and social development, to inter-State exchanges and to regional integration, thereby reducing the marginalization of certain countries. This type of activity requires less financial investment than do traditional industrial activities, which depend on human capital. They are therefore more accessible to countries that have limited financial resources.

The necessary telecommunication infrastructures - a *sine qua non* of these technologies - are generally already in place.

At the local level, one can already see the emergence of small companies offering services in the field of Internet communications and a shift towards use of the Internet and away from traditional methods for companies' external communications. These new tools contribute to the opening up of economies and societies.

Young people, whose level of training is constantly on the increase, can be active and significant players in the development of these technologies. Their competencies, creativity and dynamism are assets which drive progress forward.

The thirst for modernity, the need for opening up and communicating with the outside world, the need to encourage and follow through development in order to gain a place in tomorrow's society can only contribute to the growth of all these technologies.

Marwa Fada

Future Generation Foundation

Egypt

It was ten years ago that communications began to develop rapidly in Egypt. We began to be linked to other countries through many methods like the Internet which provided a chance for faster and better commerce and trade, which has also helped develop broader horizons for young people who will be the ones to build the information infrastructure in our country.

The new advances in telecommunications have also provided young people with the opportunity to learn across borders and to get in touch with other cultures to improve international understanding and cooperation. The development of e-commerce has provided an opportunity for easy and direct trade between us and the rest of the world, as it offers an international marketplace where specific items can be exchanged.

International transactions are taking place daily through computers, with stocks and bonds being traded in markets thousands of miles away, thereby enabling badly-needed capital to reach companies that are getting off the ground.

As young people, we always have to try to upgrade our thinking and to make use of all the available technology and information to find new jobs in the international arena and see how we can utilize our learning talents.

We should aim at creating innovative opportunities both for ourselves and for our country.

International cooperation comes in after that to organize and widen the circle of business relationships and to spark new ideas on how to take advantage of the pool of expertise and talent in even the most remote places.

Hence the burden of responsibility lies both on young people and on governments to promote this field and bring people together in the interests of achieving the goal of creating one small efficient global village.

Ali Ahmed Mohamed Sedeek

Future Generation Foundation

Egypt

Since the late 1980s, new international concepts have come on board and imposed themselves upon the international community in the form of globalization. The universe has become a small global village, expanding the range of international relations among countries, facilitating the exchange of cultures and information and increasing the volume of trade. Foreign investment and international communication nets have appeared, enabling all countries to be linked by a common thread. Egypt has witnessed massive ICT development, with the major priorities and interests of the Government having transformed the country into a huge electronic and information resource. With the spread of technology leading the way in high schools and universities, our Government considers this to be a first step in modern Egyptian development towards internationalism. It involves making the provision of ICT services into an element of the Egyptian infrastructure, in the same way as water supply and land reclamation.

Following up on these policies involves the following:

• Exchanging internal information and communication for the purpose developing technology nets.

• Supporting Egypt's external relations with all five continents.

• Updating Egypt's existing international media, through which everyone has hitherto seen Egypt as an old and great civilization, to present Egypt as both a modern and civilized country.

• Increasing the volume of external trade and economic cooperation with other countries, especially in Africa (KOMSCA) and the EU.

• Increasing foreign investment through the transfer of information and provision of a broad technology base.

• Fostering industrial development with the establishment not only of modern factories, but also of huge industrial areas.

• Starting new forward-looking market opportunities for young people who are growing up with technology.

I was lucky enough to be one of millions of young Egyptians who knew what technology was. I learned it in secondary school and university, and through teaching programmes after graduation.

Such technological progress makes us as a major factor in the development process, where we act as a mediator for technology transfer. First we assimilate a new technology, then modify, develop and present it for the next generation.

Thus we are preparing ourselves to kindle the fire of technology and keep it burning to light the way for the next generation and create a better future.

Filomena Avomo Esono Asue

National University of Equatorial Guinea

Equatorial Guinea

Information and communication technologies have an impact on the cultural development of young people: thus, thanks to the broad array of communication media in use today, young people are increasingly able to stay current.

Among other things, the technology serves to maximize the potential of intellectual activity, by expanding opportunities for scientific study and investigation. Mobile telephones are a technology that has fostered the youth culture. Radio broadcasts of entertainment programmes have infused young people with a spirit of creativity: programmes have been heard by large audiences of young people, and it has not merely been a case of storing, transmitting or reproducing information, but rather of processing it.

A young person who stays current is one who, thanks to information, feels confident and capable within society.

It is often said that information technology is necessary in order for any social project to be successful. This is indeed the case in regard to mass communication - i.e. public information campaigns, public relations, commercial advertising.

The influence on young people resulting from the progress made in regard to information and communication technology can also be seen in the bringing together of various social groups. For example, parabolic antennas have made it possible for the population in general, and young people in particular, to witness directly events happening in many other countries around the globe. They can learn first-hand of different cultures, styles of dress, modes of expression, modern trends, and so forth.

All of this relates to the role of young people in society in regard to information and communications.

Antonio Nsue Ada

Universidad Nacional de Guinea Ecuatorial (UNGE)

Equatorial Guinea

Information and communication technologies have a very important role to play in the development of young people in today's world, as the effects of these technologies have an impact on determining the shape and scope of culture.

The development of information and communication technologies enhances the ability of young people to perform social tasks and increases their creativity in doing so, by giving them some facility in the handling of information, which serves to inform and to educate. Indeed, it is often said that information technology is necessary for any social project in order for it to have some chance of success. These technologies, along with computer sciences, are essential tools for orienting processes and giving direction to social values. Thanks to these technologies, millions of young people and other human beings are brought into the fullness of life; and consequently these technologies may be considered the chief characteristic of society in our age - that is, an advanced the society which is a rich in information and education.

Information and communication technologies help to maximize the potential of young people's intellectual activity, and open up possibilities in the areas of science, communications and research, facilitating their integration into society through the acquisition of an appropriate level of general cultural knowledge.

Forms of so-called artificial intelligence (computers, the Internet, cellular telephones, facsimile machines, etc.) are in fact an extension of human intelligence, and should be within the reach of all young people, so as to place everyone at the same level of socio-cultural reality in today's world.

We can say, in this case, that African youth are taking a great step forward along the path to development, thanks to the introduction of new communication technologies.

In short, these technologies will accelerate the processes of change and evolution, and the integration of young people into the society of today's world.

Merhawit Bereke Gebreyohannes

University of Asmara

Eritrea

Computer and communication technologies, the two components of information technology (IT), are transforming national and global societies and economies into information-driven societies and economies. This information revolution is as important as the Industrial Revolution.

The instrument of transformation is the global information infrastructure integrating people, communication networks, computers and information and services.

These networks will run factories, process financial transactions, organize work, instruct, help physicians and hospitals, monitor the environment, connect users with friends and family, entertain and perform many other tasks.

It is obvious that the key component of the information technology infrastructure is people, especially young people. The infrastructure's usefulness will depend on the ability of educators and students, government employees, medical personnel, businessmen and ordinary citizens to take advantage of the resources made available by the new system. The critical point is the capacity-building needed for full use of the global information infrastructure.

Training schemes and awareness campaigns are means of building the capacity of people, especially young people. The role of young people during this period of upheaval in Africa specifically will be to meet the challenges of globalization and the information economy. This comprises improving information and communication technology, strengthening the information infrastructure, democratizing access to information in society, arranging a special session on the use and development of information technology to increase society's awareness, etc.

Teweldeberhan Araya Misghina

University of Asmara

Eritrea

ICT is a basic development need for any nation and the world as a whole. Indeed, now that information is available, the only thing that remains is to handle it properly. In this, computers, even the smallest PCs, and the Internet play a major role.

ICT requires the use of modern communication systems and must be widely available. It plays an important role in updating the knowledge and heightening the awareness of citizens and with regard to sectors such as industry, business, trade, recreation, sports and education.

No country can develop without the awareness and active participation of its young people, who make up the majority of the population and constitute its labour force. Giving young people the opportunity to have access to ICT will promote their development, and that of their country. In general, we can say that young people provide the creative backbone for any development in a society.

ICT must be spread to developing countries like Eritrea and throughout Africa if they are to progress. For example, my country, Eritrea, has no direct telephone links to many countries of Africa, a stumbling block to the introduction of widespread ICT.

In any event, in today's world the development of ICT is a vital factor for the progress of a nation.

Brhanemedhin Aberra Tegegne

Addis Ababa University

Ethiopia

Information and communication technology can be defined as "the electronic means of capturing, processing, storing and communicating information". Hundreds of billions of dollars are spent every year on information and communication technologies (ICTs). But what do ICTs have to do with development? What, for example, do ICTs have to offer to the poor? They are believed to offer a great deal. The new technology greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance education systems, improve information and education policy, and widen the range of opportunities for business and the poor. The possibility exists to apply the new technology in supplying health, educational and agricultural information.

ICTs can make two major contributions to the development of a nation's economy. They can be used as an output and production technology. Some enterprises produce either tangible (computers, networks, components, keyboards, mice) or intangible (software, web pages) ICTs as an output. Others, such as designers and publishers, produce highly information-based outputs but use ICTs as a production technology. Both form part of a nation's "information economy". Such enterprises are becoming increasingly vital to low-income countries and represent a beneficial application of ICTs in terms of income, skill and export generation. ICTs can also be used to communicate information. Small businesses have a significant need both to receive and provide information. Given that ICTs usually lower communication costs substantially, their use has great potential for the small businesses of low-income countries.

Young people, as the most productive members of every society, can participate in using this new technology. Their sharp minds are well suited to making use of ICTs. Software and web-page development are some of the potentially rich fields in which young people can participate.

Selam Zenebe

Addis Ababa University

Ethiopia

During the past few decades, we have witnessed the birth and growth of an industry - information and communication technology. Never in the history of mankind has there been such sweeping change in an industry. The benefits have been felt by almost everyone in the world. Be it in business, the military, intelligence, education or just in the family, the uses are appreciated. Even though the industry has grown in scope and sophistication since its birth, there is a great deal of room for further progress.

The future of ICT can reasonably be imagined to include a wide range of applications. An outstanding candidate is the medical field. Microchips could be designed to detect and/or regulate human bodily functions. These chips could then be implanted in an appropriate place in the body. The implanted chip would sound the alert when a chemical threshold or other imbalance was reached. Depending on their design, the chips could detect cancer cells, regulate insulin levels and prevent or promote pregnancy. They could remove unwanted chemicals from the body, including cholesterol and toxic substances, or replace parts of the nervous system in cases of paralysis and similar conditions.

Mobile communication is another interesting field. Access to a variety of information anywhere in the world at any time is quickly becoming a prerequisite for success in business. To date, however, the capability and sophistication of mobile communication technology has not matched the seemingly insatiable appetite for extensibility and bandwidth. The kind of information people need to transmit has grown from simple audio or text messages to large databases and multimedia pictures with sound. This calls for a universal mobile communication device, possibly an altogether new technology, that can be taken anywhere on the globe.

Security and reliability are other issues the technology must work on. We often hear about security breaches in communication technology, with valuable information either lost or stolen. Glitches in software or communication devices have had disastrous results. Special attention must be given to the design, implementation, maintenance and control of secure and reliable systems. Reliable systems can then be applied in life-support, air-traffic control and similar critical applications, while secure systems can be applied in banking and the military.

No type of technology can totally ignore the environment. The technology's impact must be constantly assessed and damage to the environment prevented. With regard to ICT, alternative environmental-friendly or recyclable substances should replace existing hazardous ones, including lead. New technologies that use only environmentally-friendly substances should be explored. Potential health hazards (such as the link between mobile phones and cancer) must be properly investigated and remedies developed.

As members of society, young people bear responsibility for technological development. As future users of the technology, they are in particular expected to decide the course of development. Young people should always be up to date on technological progress and must voice their opinions. They also have a duty to come up with new ideas in an open-minded manner and to discuss the pros and cons with their colleagues in the broadest sense.

AFRICA 2001

TELECOM

MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Jerina Chendze Messie

Université Omar Bongo

Gabon

Information and communication occupy an important position in contemporary societies, in which obtaining information and mastering the means of communication are key. In the current context of globalization, information and communication technologies represent a powerful tool for development, particularly in the Third World, as they place the world within everybody's grasp.

Just a few short years ago, the members of a village cooperative, for instance, had no means of advertising their produce beyond the confines of their village. Now, thanks to the Internet, to mention just one means of communication, they can advertise and even sell their products far and wide.

Likewise farmers in even the most remote areas who have access to the Internet can benefit from logistical and technical support from people with experience in the sector.

In the research field, these technologies mean that researchers and students have easy access to the latest developments in all areas without having to incur travelling costs. They also allow our researchers to forge contacts with colleagues from a variety of backgrounds.

Conveying as they do information from the four corners of the globe, information and communication technologies allow people to escape from isolation and mobilize large numbers of people behind human rights and environmental issues.

In this development scenario, the role of young people is to promote these technologies in order to make them accessible to everyone. Young people, no doubt because of their innate curiosity, tend to be the most receptive to these technologies and to be the first to use them. It goes without saying that the farmer in his village would never gain access to the Internet or any other means of communication unless offered the opportunity. Young people have a responsibility to keep their elders informed of the various opportunities afforded by information and communication technologies.

Young people have a major role to play in shaping future development using these technologies. Despite all the possibilities offered by information and communication technologies, they are useless unless we have access to them. It is the task of young people, with their facility for assimilating and adapting to new technologies, to spread the word to as many people as possible.

Hubert Larcy Nguema Abiaga

Polytechnique de Masuku

Gabon

Since the nineteenth century, when the first long-distance means of communication were invented, there has been nothing short of a revolution in information and communication technologies. They offer a huge variety of services and products, thus contributing to human development. That is why young people, who represent the future, must be fully involved. We must therefore examine how these technologies can best fulfil their role in developing the world economy, and what young people should do in order to play an active part.

The era of the information and communication superhighway is now in full swing, and the world is becoming a global village. This revolution in communication technologies has engendered growth and economic development, giving the countries of the South in particular fresh prospects for development. Globalization, which has resulted from the revolution in information and communication technologies, offers potential for a transfer of technology and capital from the rich to the poor countries, enhancing the development prospects of the latter. Proof of this fact is provided by the fact that multinationals like Microsoft and IBM are investing in African countries, where the computer market is very dynamic and is expanding constantly. The mobile telephony market in Africa is among the most profitable in the world, again as a result of investment by multinationals. Accordingly, new information and communication technologies will have a major role to play in combating poverty, and offer hope of a narrowing of the development gap between North and South. But what role should young people play with regard to these technologies?

The young people who will take over the reins must play an active part in fulfilling the expectations raised, for instance by getting together to discuss the problems some of them face in gaining access to these technologies. They might, for example, discuss twinning arrangements between universities in the North, which are better equipped technologically, and those in the South, which often lack access to new technologies for exchanging information. Young people make up the majority of the population in Africa. They must therefore become better versed in these technologies and the benefits they offer, and organize discussion forums capable of persuading governments and business to boost investment in this field.

Information and communication technologies have a genuinely valuable role to play in development, as they facilitate the transfer of technology and capital and offer countries which are lagging behind in terms of growth and development the chance finally to embark on a path of genuine development. Young people must make a full contribution through their discussion forums.

Besenty Gomez

University of the Gambia

Gambia

Information and communication technology is the life blood of our universe. Nothing functions effectively and efficiently without it. It is as important as life and as essential as the air we breathe.

Before the advent of ICT, life and people's livelihoods were at a standstill, but now people eat, sleep, talk, play and smile because of ICT.

We use ICT to get in touch with someone in another place. Everything now is done with ease because of ICT and what used to be seen as difficult is now easy because of it. In short, ICT serves as a Messiah or Jesus to the entire universe as it redeems everybody from the dark side to the bright if not the brightest side of life.

ICT acts as a gateway to development opportunities for everybody, young people in particular. It connects people to people, people to business, people to States, people to planets, wherever they want to be connected. It makes the "impossible" possible. It provides the solution to all the problems faced by the wider community, young people in particular.

Young people have an enormous responsibility to promote ICT. They are the biggest age group everywhere in the world and must guard and maintain ICT, the life blood of every functional being. ICT is the powerhouse of life and as such needs energetic and zealous partners who can only be found among young people.

ICT therefore cannot be considered separate from young people. The two are complementary and inseparable. One cannot do without the other, which is why the role of young people in the promotion and development of ICT is vital.

ICT provides many development opportunities for all and sundry, too many to list here. It is life! It connects people everywhere, every time, anyhow, anywhere. It is, and will continue to be, the envy of the world. Its benefits to everybody, especially young people, are immense and everlasting.

ICT forever. Forward ever! Backward never!

AFRICA 2001

TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Sarah Martha Ekwa Mboge

University of the Gambia

Gambia

Information and communication technology (ICT) was originally basically intended for military use. Today, it has spread to society as a whole, making a substantial contribution to social and economic development. ICT will continue to grow and to bring in its wake development opportunities, the focus of which should be young people.

In many ways, ICT has enhanced the role of young people in society. It has given them more possibilities to participate in the development of their community. They are able to share ideas and communicate more rapidly so as to keep those ideas up to date.

ICT offers the opportunity for faster and cheaper means of communication with the world. Connectivity brings about knowledgeable societies. Access to information on what goes on in the world results in open-minded people, ready to question, analyse and draw conclusions that are of benefit to society. If this is to be ensured in the future, then projects for access to ICT should focus on young people.

ICT can be useful in improving educational practices. It is a valuable research tool for students at all levels of the educational system, as it contains masses of information on a wide range of subjects. Teachers and lecturers can use ICT in the classroom. This would encourage young people to explore the world, to express themselves and to exchange ideas with people all over the world. ICT programmes can be used to deliver courses to school drop-outs at convenient places (homes).

Grassroots participation can be enhanced by ICT, which can be a means of making people living in communities far from the centre of political activity, especially young people - the leaders of tomorrow - aware of what is going on and of enabling them to contribute to political life. In other words, it empowers local communities.

ICT improves financial markets and enhances private sector development, trade and global competition; it encourages tourism. One business opportunity consists in completing a bank's financial transactions. A country could take advantage of different time zones to offer information services to a bank, doing the bank's financial transactions at the end of the banking day, and thereby clearing all previous transactions for the bank, especially the credit card billings. Young people with knowledge of accounting practices could be usefully employed in such jobs. Opportunities such as these increase foreign deposits, create job opportunities and improve living standards. This is an easy way to turn around a country's economy.

In short, our world is dynamic and therefore bound to change. For a nation to keep up with the change, young minds have to make good use of the social, political and economic development opportunities ICT presents. Yes, ICT offers young people the skills and opportunity to develop and succeed in the years to come.

Vera Owusuah Mireku

University of Cape Coast

Ghana

With the advent of computers has come a vast array of rapidly developing networks and new ways of communicating. Information and communication are the essence of information systems. In the context of an organization, information and communication are dealt with together because information is of little value unless it is accurately and reliably communicated. The organization establishes the technical framework for data collection, then examines communication and how it is affected by technology.

Recent developments in the field of information and communication technology (ICT) are indeed revolutionary in nature. Information and knowledge are gaining in quantity and becoming more accessible. In many fields, future decision-makers will be presented with unprecedented new tools for development.

Purpose and scope

The purpose of this essay is to discuss issues such as policy-oriented perspectives, constructing and accessing the ICT infrastructure, building capabilities for producing or using ICTs and services. The essay also considers the participation of young people in ICT development and the drawbacks of ICTs. It consists of ten paragraphs. The first two paragraphs highlight the report by the United Nations Commission on Science and Technology for Development (UNCSTD) on science and technology policy for ICTs. The third and fourth paragraphs examine young people and ICTs used for development and ICT-related advantages for young people. The following paragraphs summarize potential uses and benefits of ICTs for sustainable development. The disadvantages of ICTs are enumerated in paragraph nine. Finally, the points raised in the essay are summarized in the last paragraph.

The United Nations Secretary-General, Mr Kofi Annan, emphasized the enormous potential of ICTs for development in his remarks to the first meeting of the UN Working Group on Informatics; is that potential being realized today? This question is central to understanding the social and economic impact of ICTs, and to answer it the United Nations Commission on Science and Technology for Development established a working group to assess the role of ICTs.

The working group observed that to develop a better understanding of the social and economic impact of ICTs on all sectors of the economy, ICTs should benefit all people rather than the privileged few.

Young people can help harness the potential of ICTs to achieve socio-economic benefits, primarily at the local and community levels where they concentrate their efforts. The contributions of young people who combine technical ICT skills with developmental awareness and sensitivity towards other cultures can be instrumental. Specific roles for young people include:

−   helping to strengthen the capacity of civil organizations and official institutions to use and manage ICTs;

AFRICA 2001
TELECOM
MEET THE FUTURE
ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

- supporting NGO and CBO endeavours to establish/manage communication networks;
- liasing with NGOs to develop applications for educational purposes;
- directing training for a range of ICT applications (e.g. word processing, spreadsheets, d-base, web page creation);
- supporting the establishment of community telecentres and carrying out focused outreach functions;
- establishing online volunteering programmes;
- partnering institutions that promote projects where ICTs are used to further ICT development. This can be facilitated by seeking sponsorship from NGOs involved in development projects.

ICT-related advantages for young people are enormous. For example:

- a few years of professional experience can enable a young person to make an important contribution to a project;
- young people who master ICTs are easier to recruit as volunteers;
- the Internet enhances the volunteer's role in development:
  - knowledge is easy to disseminate and often openly (freely) shared;
  - the internet is an efficient recruitment mechanism;
- because young people are involved, ICT-skilled people work in a professionally challenging and rewarding environment.

ICTs contribute to economic growth and competitiveness and also introduce new challenges for developing economies. When considering the role of ICTs, it is important to avoid the pitfall in reasoning called technological determinism. Increased ICT use is often thought of as economic growth but it may also be a result of economic growth. In terms of pure economic growth, ICTs are used in the construction of larger human and physical systems that are capable of generating economic value. ICTs also reflect economic growth, however, because in societies with higher levels of income individuals employ ICTs to save time, an increasingly costly input.

Given the economic significance of the use of ICTs, it is important to assess the desirability of producing them domestically. Recent history has demonstrated that the production of ICTs can provide a major source of export income and in some cases hasten the domestic deployment of these technologies.

The use of ICTs for educational purposes has been described as a paradigm shift in education owning to the focus on learning rather than on teaching. Learners can devise personal learning action plans (Bargellin, 1997: 30) to tailor knowledge and training to their own pace and style.

In terms of the environment, ICT applications can facilitate access to environmental information. ICT applications can be used to collate environmental data in a form suitable for particular groups of users.

In spite of the benefits discussed above, ICTs have drawbacks. Firstly, if information technology is introduced in the business planning process, it will affect the range and nature of alternative courses of action identified for consideration. Secondly, when an information system is a major component of a strategic courses of action, managers are compelled to judge the attractiveness of the course of action rather than focus on the technology itself or on narrow definitions of cost and benefit. Thirdly, ICTs have grown in variety and complexity. They can be costly to install and can give people easy access to confidential information.

In conclusion, all countries, and their young people in particular, will have the opportunity in the coming years to make the best use of the potential offered by ICTs to support their main development goals. National governments and other stakeholders should therefore ensure that ICT use is encouraged at all levels of formal education and promote creative approaches to ICT development through employment measures.

BIBLIOGRAPHY

1   M. Abramovitz (1986): "Catching up, forging ahead and falling behind", Cambridge University Press, Cambridge.

2   L. Adam (1996): "Electronic communications technology and development of Internet in Africa".

3   M. Castells (1996) - "Relationships of advanced information technology, economic organization and the social structure of cities". Paper prepared for the MIT Colloquium on advanced information technology. Cambridge MA, March.

4   Information management, CIMA textbook.

5   R. Mansell and U. When (Eds) (1998): Knowledge societies: information technology for sustainable development, Oxford University Press Inc., New York.

Kafui Amenu Prebbie

University College of Education

Ghana

The means used to send messages and convey information in the early nineteenth century were limited and unreliable when compared to modern information and communication technology (ICT). Today, ICT processes and communicates data using computerized systems. More basically, information technology is perhaps **the** cultural development issue at the dawn of the new millennium. Not only is it the key to unlocking economic growth, it has a virtual impact on the most pressing global issues such as health, education, the advancement of women and inter-cultural understanding.

ICT furnishes opportunities to promote quality educational, scientific and cultural information on multicultural websites and in cyber communities. It has a future in web page design, telemedicine, e-commerce, informatics, the digitization of books, journals, reference documents, etc.

Young people play a crucial role in the ICT revolution, since they are the next generation of industry professionals. Thanks to their motivation and encouragement, clubs are formed and forums and conferences attended; they direct all their energy to innovations in the field.

The formation of youth clubs will make it possible to bridge the digital divide, as such clubs will channel the energy of ICT-literate young people towards unearthing potentials for economic development.

Young people in the profession can also work for the establishment and management of facilities to reduce costs. For example, the Nepalese Government liberalized access to the Internet via a satellite using VSATs.

One of the biggest problems in Ghana today is unemployment among the young, the result of our inability to incorporate the study of ICT in schools, low socio-economic status and ignorance.

Ghana's Free Zone Act and Trade and Investment Gateway Project can only be successful if they employ ICT, since business is now information-based. The opportunity exists for ICT-literate young people to contribute to national development in terms of data collection and analysis.

Database growth is so terrific that the demand for efficient systems is as high as for processing systems; the present ICT revolution is the answer. Demand is rising for computer programmers, system analysts and database designers for customized software, since effective ICT systems must support business aims.

In industry, manual systems of production have proved to be inefficient in the era of automated production. Computerized systems are of significant help in forecasting national economic growth and formulating policy.

Young journalists and meteorologists need to be trained in the relevant technologies to support our democracy and agro-based economy respectively.

The ITU Africa 2001 Conference will serve to expose Africa's young people to the major ICT issues and the applications of benefit to our national development efforts. The experience that I stand to gain from the conference workshops and seminars can be passed on to colleagues to raise ICT awareness.

Mamadou Moussa Diallo

Université Gamal Abdel Nasser de Conakry

Guinea

Today, information technology applications for communication are indispensable for telecommunication development.

First, the number of people who can use computer tools throughout the world, in particular in the less developed countries must be increased; in other words, information technology must be accessible to all sectors of the population and what I shall refer to as rural information technology developed. This must be achieved by exerting pressure to lower the cost of computer equipment, both hardware and software. In addition, computing should be considered a fundamental subject from the first year of school, or even in kindergarten.

Once we have finished spreading information technology, we must apply it to communication by endeavouring to extend the Internet, i.e. to make the Internet accessible to everyone. This will mean developing rural telecommunications, since telecommunications in towns is already fairly well developed. This implies opening Internet training centres in all main towns worldwide, in two phases:

- phase 1 - training of young instructors;
- phase 2 - training of users.

This cannot be achieved without the large-scale participation of young people. Rural information technology, rural telecommunications, Internet training - all of these require the investment of a great deal of energy.

Some of the main ways of facilitating the development of information techniques and technology are:

- to train young people in computing and make them available to the population in the field;
- to expand telecommunication networks while at the same time increasing the pass-band;
- to train young people in the use of the Internet and place them at the disposal of the population in the field;
- to create organizations of young students, bringing together information technology researchers;
- to establish research centres at all universities.

No sector of life can develop without the involvement of young people, who must nevertheless consult older, more experienced people.

Ana Inès Horta Aly

Ecole Normal Supérior "Tchico Té"

Guinea-Bissau

In today's world, as in the past, living in society means communicating with each other.

Communication is the password to success in contemporary society. Knowledge and the state of information technology have today become markers for a country's development. Training in this field is vital in order to promote our human resources and equip young people in particular with qualifications. The computer is now the main producer and product in contemporary technology.

Of all the machines humankind has invented, it stands out because of its capacity to ensure further scientific and technological progress.

The Internet is currently undergoing exponential growth among ordinary people and in the media. It consists of a worldwide chain of interlinked computers, and may hold the solution to our electronic mail problems.

In addition to the mail function, the Internet gives access to a vast array of online databases. It represents the sum of all the developments in electronics today and has replaced all the organs of information and telecommunications (radio, newspapers, television, telephone).

The Internet can be used to send messages anywhere in the world, make telephone calls, watch television, read newspapers, listen to music, conduct research and so on, more quickly and at less cost than by other means.

In today's world of globalized information, competition is on a world scale; accordingly, governments must redouble their efforts to ensure that everyone is computer literate.

We want to stand on an equal footing with our partners and participate in the revolution of new technologies. The young people of Guinea Bissau must therefore "speak the language" of computers in order to harness the potential of this field of knowledge.

Francisco Dimir Nhaga

Instituto de Ciencias Técnologica (SITEC)

Guinea-Bissau

Communication is essential to a country's development.

From the etymological standpoint, the word "communicate" means "to make common". Communication consists of conveying information from one person to another or from one person to a group, and once it goes beyond the simple exchanging of messages between individuals and becomes the transmission of information through a central source, it becomes mass dissemination.

Communication is one of the essential underpinnings of development because thanks to communication we are able to know about events taking place in our political, economic and social lives.

Electricity (magnetism) is the physical basis for communication because at high frequencies electrical current is transformed into the electromagnetic waves used in television, radios, computers (the Internet), radar, and so on.

Telecommunications emerged simultaneously as a social, economic and political need. The inventive capabilities of the mind, placed in the service of science and technology, brought about a change in our way of living.

Here are some concrete examples:

- The Internet gives access to the future in business dealings, either gradually, step by step, or as a giant leap. It opens the door to a world in which men and machines work in perfect harmony, and it places information at Man's disposal in an increasingly more natural way so that it can be easily decoded using the computer, which is both the main producer and the main product of contemporary technological society. A computer contains the necessary physical and logical resources necessary to enable it to perform the tasks required of it: it communicates, prints and stores ideas perfectly, all at the touch of a key.

- The telephone enables us to speak with someone thousands of kilometres away, in mere fractions of a second.

- Television supplies us with real images of the day's events from around the world.

- Radio criticizes institutions or depresses the level of public intelligence, and explains to the masses the point of view inherent in actions involving honour, dignity and duty.

In conclusion, every society gives encouragement and hope to its young people, and fosters their development. And through communication, a society promotes their development still further and strengthens them by training them so that they will enter the society of tomorrow richer in humanity, in competence and in moral values.

We must do more to encourage technological development, and strengthen worldwide cooperation in the field of communications.

Joseph Kipngetich

University of Nairobi

Kenya

Information and communication technology (ICT) involves the application of computer resources and the use of the telecommunication infrastructure for the storage, retrieval and sending of information. It plays a vital role in supporting and sustaining the national economic growth of every country today and the global economy at large, thereby reducing levels of poverty. The need to have more versatile and sophisticated means of information exchange has focused attention on fast, cheap, efficient, secure and reliable services like mobile telephony, the Internet and broadband, and on fast switching methods like ATMs in local area networks.

The Internet has facilitated electronic commerce and provides advertising opportunities for the business community. Modern ICTs like ATM switching have improved the efficiency of large networks over smaller ones, as in banking institutions. Mobile telephony has improved the flexibility of the telephone services every business needs and facilitated social contacts.

Remote learning via the Internet and the use of local area networks in learning institutions has seen computer technology boost education. Services provided by the Internet, especially e-mail, have fostered the exchange of information. Broadband services have enabled consumers to access a wide range of services, such as video, image and data.

Young people have the stamina, motivation and diligence to master the skills required by the latest technology. ICT is a tool through which they acquire skills for application in industry or in setting up micro-enterprises. Since they have no pre-conceived ideas, young people are more flexible and can easily adapt to technological inventions and innovations. They have access to modern technology through their institutions of learning. This makes them more conversant with modern tasks like web design and approaches to the problems facing the economy and other development sectors like public health.

Education offered on the IT platform has made young people immediate ICT consumers, especially when they use the Internet to learn. Young people are vibrant and interact with others, exchanging ideas and publicizing ICTs.

Young people are involved in the research work of learning institutions, where students' projects are part of ongoing research. All young people must therefore be ready to contribute to meaningful ICT development and must have a vision and a mission for the industry.

Judith Muigai

Jomo Kenyatta University of Agriculture and Technology

Kenya

A few years ago, a telegraphic money transfer took up to one day. Today, the same transaction takes less than one hour thanks to faster and more efficient communication facilities. Information and communication technology (ICT) is one of the fastest growing industries. Sadly, the impact of all this has been felt much less in Africa than in the developed world due to the lack of resources and technical know-how. Young people have a role to play in changing this as they have what it takes to make a change.

Young people can play a pivotal role in developing crucial sectors of the economy. In Kenya, for instance, agriculture, tourism and trade are major foreign exchange earners. Young people can get involved in things like web design to help foster awareness of what the country has to offer on the Internet.

Most Kenyan peasants are subsistence farmers unable to access information on technological progress. Such information on new farming methods, for example, or on trade fairs such as the one recently held in Hannover, Germany - may be obtained by young people from the Internet as they have greater access to it. This would serve to bridge the gap between young people and their elders.

Diseases such as AIDS are another obstacle to the development of African countries. By extensively using ICTs such as the Internet to disseminate information on hygiene, disease prevention, nutrition and family life, young people could play a major role in educating the rest of the population and would thereby help improve the quality of life.

With each passing year, more and more graduates join the job market. To ease the problem of unemployment, young people should be more innovative, especially in the fields of information and technology. They could get involved in network design, consultancy, e-commerce, software development and programming, none of which require a large capital outlay.

The Internet offers an excellent opportunity for young people to improve ethnic/cultural relations by exchanging ideas and practices. This could play an especially important role in African communities torn apart by ethnic strife fanned by tribal mistrust. Young people tend to be tolerant of their differences, and by exploiting the opportunity offered by telecommunications could provide the impetus for peaceful coexistence.

The emerging liberalization of the telecommunication sector offers several opportunities which, if properly exploited, could help improve the quality of life of the peoples of this continent.

Mathe Maema

National University of Lesotho

Lesotho

Communication and the sharing of information have for centuries been regarded as paramount in the lives of human beings. Their importance is attributed to the deep-seated need humans have to communicate with each other.

Technological progress has been spurred by this deeply-rooted need or desire for humans to communicate to ensure effective and efficient communication. The impact of technology in this regard has resulted in drastic changes in our usual perception of communication. It is still not, however, universal. For example, many African countries have unique communication needs which are not addressed by existing technology. Even if African countries were "filthy rich", the existing technology is not suited to Africa's magnificent landscapes, in particular that of Lesotho.

The biggest challenge facing young people is therefore to ensure that the technology responds well to all needs. Moreover, all people, governments, communities, policy makers, etc. must keep pace with ICT developments and innovations. The challenge is huge, but with sufficient effort the goal can easily be achieved. The key to this achievement lies in the well known cliché that knowledge is power. Knowledge can be obtained by looking at situations from the viewpoint of others and understanding their needs. With knowledge and a bit of enthusiasm, obstacles can be overcome and technology will work for us all.

In short, we young people can assume whatever role we need to in terms of ICT, provided that we understand that technology can make communication easy and that communication is pivotal to the development process because it fosters human growth.

Nts'Asa Tholoana

National University of Lesotho

Lesotho

Information and communication technology (ICT) is the processing and communication of information using electronic devices. The device most often used is the computer, which is able to handle and process large amounts of information.

Modern ICTs offer a wealth of opportunities for various forms of education, e.g. distance collaboration, tele-education, etc. ICT holds great promise for Africa, with its exceptional cultural heritage and entrepreneurial potential to contribute content. ICT can further governance goals in many ways, from making long-distance education, telemedicine and environmental management a possibility to strengthening participatory approaches and creating new jobs.

There is an urgent need to develop ICTs in tertiary institutions so that they have the tools they need to carry out the academic work and research required to meet the demands of the 21st century. The Internet is already doing a fine job of providing tools for academic work. Internet facilities such as electronic journals and text books are highly valuable in Africa, where paper copies are in short supply. ICT development can be especially successful when young people are interested in web development where e-commerce seems to be a fast emerging technology. ICTs can only be sustainable if both the academic and the private sectors are involved in their development.

ICT will be the major driving force of the global economy and academic developments in this millennium. Young people need to be educated in preparation for this challenge (especially in developing countries). ICT should be introduced at primary, secondary and tertiary institutions. National policy must be aimed at introducing ICT at all levels of education.

Fulkra Cassell

Cuttington University College

Liberia

Information and communication technology (ICT) is the processing and communication of information using electronic devices. The device most often used is the computer, which is able to handle and process large amounts of information.

Modern ICTs offer a wealth of opportunities for various forms of education, e.g. distance collaboration, tele-education, etc. ICT holds great promise for Africa, with its exceptional cultural heritage and entrepreneurial potential to contribute content. ICT can further governance goals in many ways, from making long-distance education, telemedicine and environmental management a possibility to strengthening participatory approaches and creating new jobs.

There is an urgent need to develop ICTs in tertiary institutions so that they have the tools they need to carry out the academic work and research required to meet the demands of the 21st century. The Internet is already doing a fine job of providing tools for academic work. Internet facilities such as electronic journals and text books are highly valuable in Africa, where paper copies are in short supply. ICT development can be especially successful when young people are interested in web development where e-commerce seems to be a fast emerging technology. ICTs can only be sustainable if both the academic and the private sectors are involved in their development.

ICT will be the major driving force of the global economy and academic developments in this millennium. Young people need to be educated in preparation for this challenge (especially in developing countries). ICT should be introduced at primary, secondary and tertiary institutions. National policy must be aimed at introducing ICT at all levels of education.

Cecelia Walker

University of Liberia

Liberia

Communication and the sharing of information have for centuries been regarded as paramount in the lives of human beings. Their importance is attributed to the deep-seated need humans have to communicate with each other.

Technological progress has been spurred by this deeply-rooted need or desire for humans to communicate to ensure effective and efficient communication. The impact of technology in this regard has resulted in drastic changes in our usual perception of communication. It is still not, however, universal. For example, many African countries have unique communication needs which are not addressed by existing technology. Even if African countries were "filthy rich", the existing technology is not suited to Africa's magnificent landscapes, in particular that of Lesotho.

The biggest challenge facing young people is therefore to ensure that the technology responds well to all needs. Moreover, all people, governments, communities, policy makers, etc. must keep pace with ICT developments and innovations. The challenge is huge, but with sufficient effort the goal can easily be achieved. The key to this achievement lies in the well known cliché that knowledge is power. Knowledge can be obtained by looking at situations from the viewpoint of others and understanding their needs. With knowledge and a bit of enthusiasm, obstacles can be overcome and technology will work for us all.

In short, we young people can assume whatever role we need to in terms of ICT, provided that we understand that technology can make communication easy and that communication is pivotal to the development process because it fosters human growth.

Alhadi Zahmuwl

Al-Fateh University

Libya

Nowadays, in the 21st century, we cannot talk about civilization and humanity without mentioning communication and the exchange of information. From the beginning, men have needed to communicate with each other to avoid the evils of nature and animals. Until now, people have communicated and exchanged information to cooperate on their society's improvement. With the fast pace of technological change, especially in the 20th century, we find that we need to know more and more about our lives, our problems. Present and future … something called information, which is the key resource of the future.

During the last twenty years, the techniques for handling information - information technology (IT) - have developed considerably. IT is an emerging interdisciplinary field that is driven and shaped by the rapid development of computing, communication and Internet-related technologies and their tremendous impact on our daily lives. In contrast to the more traditional information systems, IT deals with the development, utilization, interrelation and confluence of computers, networking, telecommunication and business. As we enter the information age of the 21st century, society will become increasingly dependent on information technology and demand for IT professionals will remain high throughout the decades to come.

Great scientists like Einstein and Edison were young when they tried to do something great and helpful for humanity. When we talk about civilization, we clearly point to young people.

Young people are the main factor in the development of information technology. They represent the majority of people using ICT in the developing countries. In doing so, they attract companies and personal investment to the ICT field to meet market needs and requirements. Young people are students today and ICT professionals tomorrow. Future development and research, the education of the entire community about ICT and encouraging all people to benefit from it depends entirely on them.

Young people, deserve most of our attention in terms of ICT. Our aims should include making it easier for them to use ICT, teaching at least most of them the essential lower limit of knowledge about ICT and creating a qualified and well-educated pool of ICT-literate young people through educational institutions and universities, specialized conferences, etc.

Beginning with family sons, we can teach young people the importance of ICT. Through the future concepts of "online" jobs, e-training, communication instead of travelling, we can promote our ideas and give young people a chance to build their future.

In Africa, for example, although there are other challenges (e.g. AIDS, poverty), they should not keep us from participating in ICT development because ICT can be an effective and important tool to fight those problems and create a developed community that can effectively resist any obstacle in the future.

Nowadays, everyone, including every young person, should have a basic knowledge of ICT to keep him or herself as a human living in the 21st century.

Tina Andrianasolo Rajaonarison

Ecole Supérieure Polytechnique d'Antananarivo

Madagascar

We are living in an age of highly advanced technology, which is improving at a very considerable rate. Telecommunications are one branch that is highly conducive to development.

But what is the nature of these information technologies? Where are communication technologies to be found? How can one explain the role of youth in development prospects?

Although each human being is the focal point of a network of relationships, he must nevertheless continue to develop his sense of communication. Of the many information technologies that exist, we shall mention just a few. Coding is one of the most important. This is the act of assigning or allocating symbols to the information to be transmitted in order to ensure that the messages remain confidential. Thus, only those who have the appropriate decoder will be able to access the information. Digitization is also a key factor in the field of information technology. Researchers use an analogue-digital converter after having sampled and quantified the analogue signal which represents the information. This results in high image resolution, as in the case of digital cameras, and high fidelity of transmission.

Information technologies are extremely powerful and progressive, but do they not represent wasted expenditure if not accompanied by communication technologies?

One of the outstanding communication technologies is cellular mobile telephony. This type of communication represents the end of so-called "conventional" communication. One can now communicate anywhere, there being no longer any restriction in terms of the place in which the conversation occurs, or indeed of the number of connected parties, given the availability of videoconferencing.

Satellites also represent an essential support for communication, constituting as they do a link point for tele-informatic networks. Their advantage lies in their relatively low cost and lack of geographical constraints - both factors which make for rapid development. Their drawback lies in the difficulty of effecting repairs in the event of breakdown, since they are located several hundred kilometres above our heads. The Internet is the most recent - and most popular - means of communication of our time, providing rapid and reliable contact at a reasonable cost. The most useful elements are e-mail, which represents an assured means of dispatching confidential messages, and web pages, which constitute a low-cost information source. The drawback of the Internet lies in computer piracy or hacking, the aim of certain individuals being solely to destroy for their own benefit the fruits of research done by others.

And the role of young people?

It is during one's youth that one achieves total fulfillment and that the intellectual quotient is the most highly developed. It is for this reason that young people represent a vehicle for innovation: they need only to learn the principles in order to pursue their own research without

more ado. It is young people who realize and improve communication technologies. What is more, it is during one's youth that communication develops and reaches its apogee, whence the development of awareness.

Communication and development could therefore never be separated from one another, and it could be said that development is another form of healthy communication. Thus, communication is the reflection of development by means of information processing techniques. Young people are also a source of communication and the development prospects are none other than information and communication technologies.

Rinalalaina Irà Ramandasoa

Ecole Supérieure Polytechnique d'Antananarivo

Madagascar

Graham Bell invented the telephone in 1876 and now, in the age of the third millennium, a wide range of telecommunication products is on offer.

This rapid development of information processing methods and communication technologies has placed the African continent in a state of emergency - the emergency being to adapt to these numerous opportunities.

For this reason, the infrastructures in place are constantly being called into question, in respect both of the physical tools for transmission (wideband channels, digital radio-relay systems, optical fibres, etc.) and of human resources.

There can therefore be no doubt as to the fundamental, even crucial, need to train our young students who will go on to become tomorrow's leaders and operators.

An application which would be of interest for the African continent, for instance, would be the development of mobile service or wireless applications including the mobile Internet and its associated applications (electronic commerce, multimedia data exchange, etc.), use of the radio local loop, etc., which would not only ensure coverage of the more remote areas on an immediate level, but would also sidestep regulatory problems (universal WAP, frequency spectrum allocations, etc.).

It remains to be seen whether the African countries will have the opportunity to adopt these new technologies, which are extremely expensive (installation, maintenance and operation) and require a young, dynamic and qualified workforce.

AFRICA 2001   TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Davie Mtsuko

University of Malawi

Malawi

Malawi, one of the 160 members of the International Telecommunication Union (ITU), has recently experienced an influx of cellular phones, computers, satellite dishes, televisions, GPS navigation systems, etc. This marks the dawn of an information and communication technology era.

ICT in this context implies all methods of sending, receiving, storing and retrieving data of all kinds (e.g. words, numbers, pictures, voice, etc.) by optic and electronic means (i.e. optoelectronics). This essay focuses on the development opportunities and the role of young people in the telecommunications realm.

ICT provides young people with a broad spectrum of development opportunities and good career prospects. Its introduction in ITU countries as part of the educational curricula has increased the intake of many universities and technical colleges. Many young people are now employed in the telecommunication industry. The young people of today have the opportunity to start profitable business ventures, such as selling "top up" phone cards and mobile phones or running telephone booths. This has helped to combat the problem of unemployment among young.

ICT has furthered the social development of young people by enabling NGOs and other charitable organizations to disseminate ideas on their rights. It has also led to the establishment of a strong bond and positive interaction between young people from various nations. For instance, a youth group in the Saskatchewan plains in Canada can be easily interlinked to youth groups from Nouakchott and Ouagadougou in Mauritania and Burkina Faso respectively because they have the technology.

What is the role of the youth in this era? Whilst many people welcome technological development, some ungrateful individuals vandalize the equipment involved. It is therefore of supreme importance that young people protect telecommunication systems from vandalism. In many third world countries, where poverty is widespread, thieves steal the equipment and sell it on the black market. Young people must refrain from this practice. They should report such vandalism to the telecommunication authorities or to the police.

Young people should also take the initiative to learn about the technology so that they can be employed by MTL, Celtel, TNM and the Malawi Communications Regulatory Authority (MACRA) and provide efficient and effective services. There has recently been a positive response among the young towards education in this field. Many young people, irrespective of their gender, have enrolled in the Malawi Polytechnic and the Multicountry College for training in information/telecommunications/electronic engineering.

Young people also have to protect telecommunication systems from the harmful interference commonly caused by bugging. Instead, they should invent supplementary and complementary technologies. However, this is easier said than done. They would have to work extremely hard.

Thomas Edison, the inventor of the light bulb, said "Genius is 1% inspiration and 99% perspiration".

Last but no less importantly, young people must advocate cooperation between communication technology providers and their customers. They should also advocate cooperation between providers. A developing nation such as Malawi does not need the current misunderstandings between Celtel Malawi and Telekom Networks, which work to the disadvantage of their respective customers. Young people, it is your role to "bridge" this "communication gap".

Mary Nkasala

University of Malaki, The Polytechnic

Malawi

Introduction

This paper discusses the development of the information technology (IT) industry and the impact that IT will have on the social development of the people of Malawi.

Since the 20th century, the world has seen many new discoveries and much development in the areas of science and engineering. One of the developments that has had a notable impact in a wide range of fields is computer technology and telecommunication.

Computer technology has led to the establishment of what is known today as information technology (IT), which is basically concerned with the procurement, recording, organization, retrieval, display and dissemination of information.

Information technology and the world today

Today IT is applied in a wide range of fields, including finance, health care, hotel/lodging, transportation, university/schools, corporate/commercial industries, to mention but a few.

By deploying IT, people are able to obtain, record, organize, retrieve, display and disseminate information much faster than ever before in the history of mankind.

One of the most outstanding benefits of IT is the Internet. The Internet is basically an interconnection of computers and related peripherals located at different places around the globe.

With the Internet, people are able to communicate through e-mail, advertise, buy and sell all sorts of things, access all kinds of publications - engineering, scientific, literature, news, etc. The list goes on and on.

As far as Malawi is concerned, few people have access to the Internet. There are about five Internet service providers (ISPs) in Malawi, and less than 1% (rough estimate) of the population of about 10 000 416 (1999 estimate) has access to the Internet. Most of the people with Internet access work in places that have the facilities.

Malawi has recently witnessed a growth in the number of organizations with their own websites where people can get information on the organization's business.

However, one of the most important areas that has seen no growth in the number of Internet users is learning institutions. The reason is basically limited funds for the purchase of PCs and telephone line and ISP subscriptions. The effect is that people in these institutions are denied access to a wide range of up-to-date information that they require for their professional and academic studies and research.

IT and the world of tomorrow

The world is now heading towards what is known as the "convergence" of voice, data and video. The public switched telephone network (PSTN) has always been the backbone of IT. That is, data between computers is transferred over the PSTN, which is predominantly a voice network.

Experts are now predicting that data traffic will soon exceed telephone traffic, if it hasn't already. Since data traffic is growing much faster than telephone traffic, there has been considerable interest in transporting voice over data networks (as opposed to the more traditional data over voice network).

Support for voice communication using the Internet protocol (IP), which is usually just called voice over IP (VoIP), has become especially attractive given the low cost, flat-rate pricing of the public Internet. In fact, toll quality telephony over IP has now become one of the key steps leading to the convergence of the voice, data and video communication industries. The feasibility of carrying voice and call signalling messages over the Internet has been demonstrated, but work is just beginning on the delivery of high-quality commercial products, establishing public services and convincing users to accept the technology.

Information technology and the Malawi of tomorrow

As discussed in the preceding sections, voice, data and video technologies will, in the future, be based on Internet protocol (IP) networks. It may take time for this technology to become the order of the day, but there can be no doubt it is coming.

So now the question is, should Malawi, a least developed country, ignore this world trend and pretend not to notice these developments in information technology, specifically the Internet?

One of the things that Malawi has to do now is to draw up a policy that would help to increase access to the Internet at the grassroots level, meaning that computer use should be introduced at a basic level, for example in secondary schools. This will help students, who are basically the people who will lead this country during the transition from data over voice networks to voice over data networks like VoIP.

The government initiative to remove customer tariffs on computers and related accessories goes a long way towards achieving this goal, but it should also introduce computer lessons at secondary schools and provide computer equipment to them.

This will ensure that Malawi as a country will never be taken unaware by the challenges that future technology, like voice over IP, may bring to a country with few people who are conversant with the Internet and computer technology.

Conclusion

It is a well-known fact that no country can exist as an island. Therefore it is important that countries like Malawi should start thinking about deploying new technologies like the Internet to keep themselves up to date in the information age.

Fatoumata Diarra

Faculté de Medecine, Pharmacie et Odonto-Stomatologie

Mali

Nowadays, the basis of knowledge and communications is information, transformed into information technology - the science that is considered to be the medium for human knowledge and communications in technical, economic and social fields. Moreover, communication is essential. We young Africans can only welcome the prospects for development of information and communication technologies. Our role should be to support or even - why not - to contribute something extra to these new technologies. By becoming more interested and closely following their application and development, one day this Africa of ours could become one of the world's most powerful nations.

Close study of the past reveals a considerable discrepancy in the development of information and communication technologies then and now. This development is beneficial at all levels. With these new technologies, information is available to all; communications are now almost free of charge and are extremely fast at any distance, thereby contributing to countries' development - particularly where Africa is concerned.

Let us take the case of the Internet: electronic mail is by far the cheapest option for companies. If an e-mail is sent to India in one minute (during which time several pages of text can be sent!) in Mali (with a connected computer) this would cost 51 francs before tax at most, whereas the same communication would cost 2 640 francs by telephone and 3 700 francs by fax.

The advantages are plain to see for organizations that communicate a lot with their partners! Increasing numbers of companies are setting up their own websites to advertise throughout the world. The battle of globalization will be waged over computer networks. Thanks to the Internet, researchers in Mali who cannot usually obtain up-to-date scientific information, suddenly have all the riches of the world's biggest libraries at their disposal.

Finally, videoconferencing can support distance learning, telemedicine, etc. applications.

The above examples clearly demonstrate that new technologies can help in a country's development.

In that context, young people must give lots of support to the development of new information and communication technologies, and above all must contribute to this by physical and moral actions.

Gaoussou Ly

Faculté des Sciences Juridiques et Economiques

Mali

Nowadays, the remarkable development of information and communication technologies in various fields has made it necessary, as well as highly important, to promote growth and a better understanding of new information and communication technologies (NICTs), or information and communication technologies (ICTs). Young Malians, driven by the determination to succeed, and who will be the leaders of the future, will need information and communication technologies for the development of their beloved continent. They therefore need to have easy access to information and communication technologies in general, and to the Internet in particular. The development of these information and communication technologies is no easy matter as Mali, which is a developing country, does not have adequate resources and infrastructures to promote access to information and communication technologies in general, and to the Internet in particular. For the development of these in Mali, the following is required:

−   Information and communication technologies should be publicized, in other words, young people should be informed about the Internet, NICTs, ICTs, etc.

−   All schools, establishments and universities should be computerized with a view to popularizing the Internet.

−   Partnerships should be encouraged between Malian and foreign universities, as should those between secondary schools. Such partnerships may entail computerization projects, as was the case with the Ségou secondary school, partnered with the Guez de Balzac secondary school in Angoulème.

−   Taxes on computer equipment (monitors, central units, modems, etc.) should be reduced.

−   A budget should be adopted in the framework of the development and popularization of the Internet.

−   Centres or complexes should be established where young people can connect as simply as possible, with a reduced connection charge (CFA 500 instead of CFA 1 000) in private Internet cafés.

−   Finally, forums and conferences should be held on information and communication technologies.

And in respect of young people:

−   They must be motivated and determined; use of the Internet should become part of their everyday lives.

-     Given that our university libraries are not very well stocked, we must take full advantage of the Internet.

-     Young people's efforts should be geared towards projects on specific topics, such as that undertaken by a young student at the *Faculté de Médecine, de Pharmacie, et d'Odonto-stomatologie* (FMPOS), who wrote a thesis on telemedicine.

Mint Yahdhih Zeinebou

Faculté des Sciences et Techniques

Mauritania

At this time of intense globalization, what are the prospects for the development of information and communication technologies in Africa? While a cartographic approach shows disproportionate growth in this area, teledensity has made clear progress. The number of cellular telephone users has increased and almost all countries are connected to the Internet.

While technologies are now making it possible for anyone to telephone anywhere, the means still have to be provided. For rural inhabitants, even a handset remains inaccessible. In view of these obstacles, African governments must make significant investments as well as long-awaited reforms in this area.

Adama N'Diaye

Faculté des Sciences et Techniques

Mauritania

Owing to the spread and increasing demands of globalization, a number of practices need to be reviewed in order to enhance understanding between nations. Indeed, a number of countries still chose to remain isolated internationally, thereby limiting the mobility of young researchers and the circulation of information among them. One might add to this opinions and judgements which continue to exist in respect of ethnic, racial or religious diversity.

In order to address these scourges, young people must mobilize through regional associations in the first instance, which will then go on to become a worldwide association of young people. Their aspirations can only be fulfilled through perseverance, endurance and by continuing the fight, as the young people of today are the decision-makers of tomorrow.

Before concluding, it should be added that in order to fulfil the above-mentioned objectives, certain important tools for the circulation of information, which are the means to attain all understanding, need to be fully mastered, namely new information and communication technologies (NICT) and the Internet.

Gyanee Dewnarain

University of Mauritius

Mauritius

Information and communication technology (ICT) englobes all the means and media for transmitting, receiving and processing information. There are innumerable development opportunities in this sector, and young people in particular are called upon to take advantage of them and create their niche in the silicon society.

The world of mobile communications is on the brink of significant change. The coming deployment of third generation (3G) networks represents a sea-change of unparalleled significance. 3G technology would offer advanced, broadband and high bit-rate services.

The growing complexity of word and image offerings on websites is only adding to the squeeze on bandwidth. Streaming audio and video technologies have come a long way in attempting to overcome this challenge and, combined with new caching systems, may provide at least some of the relief required. If the streaming and caching technologies are fully taken advantage of, then the multimedia capabilities of the World Wide Web look set to advance to the level of today's television services.

We all know that Internet usage is growing at a phenomenal rate. Traditional telephone networks are quickly being swamped by data traffic. One solution would be the use of network intelligence. The intelligent network is the bridge that enables fixed-mobile convergence and voice-data convergence.

As far as videoconferencing is concerned, there are two major challenges awaiting the communications engineer - firstly, the "network" issue and secondly, the "standards" issue. Two-way gateways (used currently) are only a stopgap measure. Universal transcoding might be an interesting solution for good quality videoconferencing.

The submarine cable sector is becoming the main vehicle for the explosion in telecommunications. This breakthrough has been achieved by two developments - optical amplifiers and dense wavelength division multiplexing. In fact, the rate of deployment of new undersea networks in the Pacific and Atlantic Oceans is already very high. They remain to be deployed in the Indian Ocean.

Concerning the role of young people, we find that in the coming years the ICT industry will be required to meet such huge demands that a large number of engineers will be needed. It is up to the young people to train themselves to become the application developers and content providers that the industry needs.

The young people of today will be the leaders and decision-makers of tomorrow. They will be expected to be aware of the ICT developments that are likely to occur and consequently prepare themselves to work in a fast-moving and dynamic environment.

We are currently living in a global village. Therefore the young people should keep abreast of the latest innovations occurring in the ICT field by attending conferences, reading journals and

magazines. Teamwork and sharing of ideas via the Net should be encouraged. Youngsters should communicate with researchers abroad and should try to implement interesting features at their local workplace.

Young people are very creative, a faculty that could be used by software developers to create new websites and new games. Young people could also contribute by teaching young children and people living in rural areas the basics of ICT.

Young people should also be the ones to heighten awareness of the use of "environmentally clean" technology in order to preserve the environment. It is also up to them to respect copyright laws and other such agreements and to demonstrate good ethics and discipline.

Young people can make a world of difference by participating actively in the field of ICT. ICT is the technology of tomorrow and youngsters are the people of tomorrow.

Mahomed Ally Zabee-Ullah Rujbally

University of Mauritius

Mauritius

The importance of ICT is growing rapidly from day to day. It has been proved that ICT can help to improve the world. In the first place, it can help to reduce poverty by creating a more skilled workforce. Through distance learning, use of educational software and IT-related professional training programmes, ICTs can help provide access to culturally appropriate educational and job training, thus producing a more highly-skilled workforce.

Moreover, it increases the penetration of aid and subsidies. ICT can help to improve the targeting of aid to the poorest and most deserving citizens, while at the same time making the aid more timely, cheaper and more user-friendly to administer. It can also enhance basic services by improving the quality of healthcare.

ICTs can improve healthcare workers' access to knowledge bases about health and diseases, and also improve the prevention of chronic disease in rural communities. Moreover, telecommunication networks and specialized educational software can be used to supplement traditional education, especially in remote and rural communities.

Computerized decision support tools can be used to create national and local plans for basic services such as water, sanitation and electricity. Furthermore, they can help to improve agricultural productivity and commerce. ICT can help to collect, store, process and present complicated data quickly, accurately and more efficiently than is otherwise possible.

In addition, it can help to improve public administration by facilitating informed decision-making, managing the burden of foreign debt, revitalizing local economies and public safety, improving public administration and efficiency, facilitating regional, national and subnational coordination and communication, improving the quality of public services and facilitating better post-conflict reconstruction and administration. Furthermore, ICTs can promote citizen empowerment by enabling citizens to communicate with each other and with the government electronically.

Hence, if youth become computer literate and understand the real value of ICT, they can help to eradicate poverty, promote democracy, reduce illiteracy and make information accessible.

To each and everybody, the world will thus become a better place to live.

Badir El Mir

Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes

Morocco

At the dawn of this new millennium, new information and communication technologies (NICT) have become the living core of a revolution that is taking over the whole world at a breathtaking pace, bringing the third world to a critical juncture. For, soon it will not only have prepared itself for the new economy, but it will also have to play an active part in it. For this, a number of elements must be established. These relate to several highly distinct areas which can be briefly summarized as follows:

− Establishing other functions around technological monitoring: legal (laws, jurisprudence, regulations), commercial (strategy of competitors, consumer trends) and economic and financial (mergers, market prices, solvency of partners, etc.) surveillance.

− Making particular efforts to promote familiarization with computer tools, which have become the preferred communication tool.

− Increasing the number of experts working in the field of NICT, in this case engineers in the field.

− Establishing a minimally interventionist policy on NICT in combination with a highly attractive tax regime for the sector.

− Joining the forces of third world countries.

− Establishing fields of research and investment. For this, there must be a huge emphasis on targeting collaboration between universities and companies, which would enable research costs to be cut down to a minimum and the innovative and productive force of young people to be taken advantage of.

Owing to their enthusiasm for all new technologies, young people are the best placed to inspire the dynamism of change.

For one thing, statistically speaking, young people account for 30 per cent of the world's population, and for an even greater percentage in the third world.

In addition to their intellectual contribution, through their capacity for mobilization, their flexibility and their innovative spirit, young people bring to bear an original and creative approach to the subject and this should be taken into account.

This is why they are undeniably a significant player in this technological revolution.

It is therefore essential that young people participate in paving the way for these changes. They must participate in the progress of new technologies and in the promotion of the economic and social sectors of their countries.

Nargisse Skalante

Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes

Morocco

At the dawn of this third millennium, information and communication are the key to the success of any project. It is not enough to have the information at one's disposal, but one must know how to communicate it, i.e. how to transmit the message and ensure that it has been properly received at the other end. A number of technologies have been developed in answer to this need - technologies that are constantly changing and are a constant source of surprise to us.

The range of information and communication technologies is, then, growing exponentially. We witness the birth of new and ever more sophisticated technologies daily. Where will this growth take us? Have information and communication technologies reached their culmination? The answer is certainly no. There remains much to be done, especially in developing countries where computing tools are far from widespread and where infrastructures are still weak. Apart from this rather disappointing reality, information and communication technologies have a bright future ahead. As long as there are people who think, dare and act, technology will continue on its upward path in the interests of information and communication. The necessary conditions need to be created for the development of the sector however, i.e. quality training, a rich infrastructure and a regulatory and financial framework that are conducive to innovation.

Thus, for a country to make its mark in the field of information and communication technologies it must adopt a complete strategy. Given that such a transformation cannot happen overnight, the main players involved will be the company managers of the future. Young people are therefore the driving force for the development of information and communication technologies and they have a number of strong points to bring to bear. First, their creativity and enthusiasm for new technologies transform their work in the sector into a pleasurable pursuit. Second, they have more likelihood of mobilizing themselves for their research. Moreover, they are not put off by challenges: young people are always ready to meet challenges as long as they are encouraged and provided with an ideal framework.

In conclusion, the information and communication technology sector is a productive sector and will be for a long time to come. It creates jobs and wealth, and enables integration in the new economy. New technologies still have bright times ahead, but their growth is heavily dependent on young people. They are the ones who will accelerate the process of development of the sector. The young people of today are the managers of tomorrow. Let us prepare them to fulfil that mission in the best possible way!

AFRICA 2001

TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Mauro Mac-Arthur

Universidade Eduardo Mondlane

Mozambique

In order for Man to develop fully within society, it is essential that he receive proper training and be provided with the necessary means to permit an ongoing exchange of views, optimize his use of time, make the most of the activities he carries out and assure his spiritual stability.

Information has made a crucial contribution to human development, as it has ensured that people are aware of the events that take place around them.

Information broadens people's outlook so that they are in a better position to assess procedures in performing various activities, and as an adjunct to them.

From the beginning, Man has sought ways to make better use of time by obtaining information about the various processes and procedures vital to his existence.

To meet these needs, communication technology has emerged and has developed swiftly, with the aim of providing individuals with the greatest possible opportunity to rationalize their activities.

It is thanks to the growth in communication technology that it is possible today to gain occupational experience, engage in independent study, increase values over long distances and obtain growth indices for various economic systems around the world.

All of this is made possible by satellite communications systems (the Internet, mobile telephones, etc.).

The technology of satellite communications plays a major role in the dissemination of scientific information, and hence in the development of the world economy.

By way of example, the Internet offers websites that provide information on current scientific programmes and discoveries, as well as websites devoted to leisure pursuits (sports, gymnastics, films, music) that to a greater or lesser degree contribute to the stability of the individual.

All the information resources made available thanks to modern communication technology represent a challenge to young people in so far as development opportunities are concerned, for the availability of faster, more efficient communication media obliges young people to investigate the rates of return offered by the various productive sectors within society.

Young people are faced with the task of taking the fullest possible advantage of the scientific and educational opportunities available, and directing their attention to examining a specific scientific field in order to cope with the ever-increasing demands of the job market: in other words, young people must make use of these as essential tools whereby the desires of society can be satisfied to a greater degree.

The role of young people is to put information to productive use - i.e., to transform information into a tangible product or a service by applying their physical and mental skills.

Neyma Tamimo

Instituto Superior Politecnico é Universitàrio

Mozambique

We live in an era in which everything revolves around telecommunications. Telecommunications play a pivotal role in every country because they make it possible for communication and dialogue to take place between people regardless of the physical distance separating them. A practical example of telecommunications in Africa is to be found in computer networks, the so-called LAN, MAN and WAN. The future of telecommunications in Africa depends primarily on the efficient planning of telecommunication networks with the aid of digital cartography. In order for young people to make a greater contribution towards the development of telecommunications, they will have to possess a strong educational background in technology and communications, which means that the necessary infrastructure must be established in order to provide that training (more universities, institutes and technical schools). In addition, research areas will have to be established and school laboratories will have to be upgraded. Study grants will have to be made available, involving less bureaucratic selection criteria. Moreover, groups associated with telecommunications will have to undertake fundamental efforts such as persuading investors to invest more resources in young people. In particular, Telecomunicações de Moçambique [Mozambique Telecommunications Corporation] (TDM) should work with ITU to ensure that events of this kind continue to be held, particularly given that relatively few young people are in attendance. Strategies should be elaborated so that these gatherings are not simply meetings but also provide practical opportunities for young people. Groups associated with telecommunications at both the domestic and international levels should provide increased sponsorship for projects that will, among other things, promote greater participation by young people. They could set up associations under whose auspices young people interested in the information field might meet to exchange ideas and experiences under the guidance of coordinators, as a contribution towards the continued development of telecommunications in the future. The future development of telecommunications depends on young people. Accordingly, it is essential that there be an opportunity to exchange ideas through seminars, forums, meetings and conferences so that new ideas and experiences can be obtained that are not reflected in telecommunications today. The direction in which a society develops can be either positive or negative. Ultimately, the character of its young people in regard to issues of morals, education, research, training, and reproduction will determine that direction.

In conclusion, young people's engagement in competitive society depends on the goodwill of those who possess capital and hold financial power, and on the knowledge that exists within organizations.

It is important to give backing to young people because on their shoulders rests the future of any nation. They are, beyond any shadow of a doubt, the blood that courses through a country's veins.

AFRICA 2001

TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

Maria Kaula

Polytechnic of Namibia

Namibia

Telecommunication is an essential means of communicating around the world; it allows us to convey information over a distance using telephones, faxes, the Internet, mobile communication, etc.

In Namibia, we have a good communication network. People are starting to realize the need for global communication and are providing the corresponding services to the community, e.g. the Internet companies that are being established every day. Those services are very effective because they are provided throughout the day and are available at places like the library, Internet cafes, etc.

Major developments are needed in our rural areas because 65% of Namibia is rural - a figure which indicates that the greater part of the country does not get information fast enough, or at all. We need to introduce the whole range of communication technologies to such areas and teach the local populations how they work, so that they too can benefit from their use.

And in countries with landscapes like that of the Democratic Republic of the Congo - i.e. a rainforest and tall trees - it is difficult to have telephone networks, so more advanced networks are needed like the newly introduced ultra-phones that do not work with wires but via satellite, another approach being to connect to the network using radiowaves.

The problem we have is that the Internet is slow, and we need more advanced facilities to speed it up, in addition to which we need to find other ways of using the Internet via satellite so that we are not dependent on telephone lines. What is more, we need to make the information available not only to certain people, i.e. those with money who can afford to pay for it, but rather to everyone who needs it.

We, the young people, need to introduce these types of technology to the older generation, rural dwellers and the disadvantaged, who may be afraid of it in order to ensure that everyone understands and is benefiting from it. We should encourage young people to take courses relating to communication, e.g. information technology, as we lack professionals from Africa. In the future I hope that we will have enough professionals in this area of communication, so that we may one day have our own software and hardware companies or companies relating to communication facilities.

Gottlieb Petrus

Polytechnic of Namibia

Namibia

Information and communication technology is a global challenge, especially in the developing world. In many developing countries, people are left with inadequate information about important issues. Communication technology is playing a significant role in the development of countries. It also contributes to improving people's living conditions. For example, people are obtaining more information about their environments from multimedia.

The changes that are now occurring are more obvious in the developing countries than in their counterparts in the developed world. Communication technology has a link with intercultural communication, which influences the ways in which societies decode information from multimedia sources. People are receiving more information from news organizations such as the broadcast media and the press, as well as from the Internet.

The Internet, as one of society's most important news sources, enables communities to be more informed. The development of the World Wide Web demonstrates the tremendous growth of multimedia. The emergence of mobile telecommunications is changing the traditional ways of receiving and sending messages.

It would be a mistake to talk about development without mentioning the role of the youth. The future belongs to today's young people, but without development the future will be difficult to deal with. To make this development a reality, opportunities need to be made available by those in power. The empowerment of young people can lead to their dynamic contribution to information technology and development. The point I would like to emphasize here is that young people should be given the freedom to participate in development activities, because participation is the noblest way for them to exercise their knowledge of the global village.

Thus, participation in this context means taking part in decision-making in order to build society. Furthermore, decision-making implies assuming the responsibility for any risk that is inherent in the outcome of those decisions. Young people should be more active in bringing about development in their respective countries.

The empowerment of young people must enable them to form organizations which are more independent and free from influence or interest, whether political, ideological or otherwise. Empowerment here means that governments should invest money in training young people within the ICT industry. It is in this context that young people, particularly in Africa, will take up the responsibility of exercising their knowledge in the field of information and communication technology.

The young people of today have great opportunities for education, which is the key to developing and improving communication between societies. Development in Africa is low because the older generations did not live as freely as the generation of today.

Most of the elderly in Africa have lived in fear of victimization and isolation; in other words, they have lived in a primitive world, with no access to information enabling them to determine their future. The point I would like to make here is that the level of ICT used to be very low, and there were no clear distinctions between propaganda and information.

Development brings about new ways of thinking, feeling and action, as individuals develop a sense of the quality of life. Let us work hard to connect Africa from North to South and from West to East. Let us make Africa a continent that belongs to the family of well-informed nations.

Zarma Grema Ary

Institut de la Formation aux Techniques de l'Information& Communication

Niger

Communication is today the most appropriate arm in the struggle to develop underdeveloped countries, particularly those of Africa. This being the case, in order to resolve a certain number of ills which are undermining Africa, it is information, education and communication that constitute the only means of pursuing a participative approach in the interests of sustainable development. This involves a number of techniques and strategies that are appropriate to African conditions, above all through the mobilization and active participation of young people in development structures.

Nowadays, many African countries are using information and communication technologies to help them in identifying ways and means of benefiting from development prospects, which are supported and fostered by young people, who are therefore always called upon in the context of the many development activities instituted by meetings and forums organized by national and international bodies.

Information and communication technologies are designed to create an ideal framework for the exchange of communication-related ideas according to well-determined objectives. It is for this reason that the new information and communication technologies constitute appropriate tools for effectively conveying messages and information. It is by using these tools that communicators are able to specify their target group according to the type of information they wish to transmit, those target groups being made up mainly of young people who are exposed to many problems in the area of social integration, and particularly problems in the areas of education, health, employment and conflict.

These new information and communication technologies and the various approach strategies used by the experts constitute the basis of a communication programme for development prospects which are needed by the less affluent countries. In the case of Africa, the problems are of a material nature, i.e. technologies that can be adapted to the African context, and also have to do with the less effective participation of young people in the various development structures.

These young people are tomorrow's elite, and it is they who are the most exposed to social ills. They are therefore aware of the problems that surround them and would thus represent the target population for any type of communication that is in line with the desired objectives and according to the degree of behavioural change. Young people, having understood the dangers that are inherent in the problems that await them, constitute the bridge to development prospects for all areas of society. They will thus use the new information and communication technologies for exchanging ideas with one another (between Africans and with people the world over) and will seek to determine strategies that can be tailored to each communication programme with a view to specifying the development prospects of the underdeveloped countries. These young people must use NICTs to implement training, awareness-building, leadership, organizational and promotional activities.

Information and communication technologies are tools that are used by communicators in order to inform, and make it possible to determine the development prospects according to the objectives pursued. They would be of great benefit to African counties in terms of their self-fulfilment, and all the more so if young people were to be fully engaged in their application.

Absatou Mamane Talba

Université Abdou Moumaini Dioffo

Niger

In today's world, global development, and in particular African development, relies on information and communication technologies (ICTs) - three letters which embody the secret and indeed the very key to the revolution that will result in tomorrow's society. This is why today's young people must all contribute to that revolution. The convergence and globalization of information and communication technologies will from the outset give rise to very interesting projects for tomorrow's society, in the areas of telephony, telemedicine, tele-agriculture, tele-education, etc. The Internet, which now constitutes a key source of information, stimulates young peoples' curiosity and encourages them to learn many things. Among its major objectives, the Millennium Africa Programme also advocates increased investment in the field of information and communication technologies, failing which it will not be possible to bridge the digital divide.

To that end, all countries, and particularly those of Africa, must accelerate the implementation of communication and modern computer technologies in the fields of education, health, commerce, etc.

It should also be noted that in the field of infocommunication, human resources development is one of the most important tasks facing African governments. Africa must have its own experts in areas pertaining to its needs, so that the continent can have a chance of playing an active part in the global information society. African youth must therefore mobilize itself as of now in order to fight against marginalization, and must become fully aware of its future and the role it has to play in an ever-changing world, above all in the fields of communication and technology.

Aluka Osakwe

University Ile-Ife

Nigeria

We are living in an information society where information has become an important component of the production mix. Competition is enhanced more than ever before among individuals and business entities in today's fast-paced environment due to the speed with which data is converted into information in support of new business ideas and the discovery of new channels of distribution. Technology is the vehicle by which breathtaking innovations are introduced. Microsoft is able to maintain its leadership position in the software industry because it has stayed ahead of its competitors insofar as the provision of innovative software solutions and services is concerned, while new economic outfits such as www.amazon.com have pioneered the practice of online sales of books.

Information and communication technology (ICT) is the use of technological tools to provide innovative services. The convergence of computers and telecommunication has only helped to expand the frontiers of creative and innovative service delivery. For example, B2C and B2B eCommerce is taking over from traditional methods because of relatively low start-up requirements, cost efficiency and ease of operation. The imperative of fostering technologically-driven business strategies in African countries is understandable in view of the benefits mentioned above vis-à-vis the availability of seed funds, dilapidated infrastructures and obsolete technology.

As mentioned earlier, the adoption of modern ICTs would enable African economies to take advantage of opportunities offered by advancement in science and technology to improve the competitiveness of their local resources in the global marketplace. The danger of doing otherwise is continued loss of potential and lower revenues due to more expensive business methods and human resources that lack the skills required to compete in the global IT marketplace. These benefits are achievable where there is a properly articulated and focused action plan aimed at developing skilled IT manpower for both the local and international markets. The Nigerian Government's recent launch of a national IT policy is a healthy step in the right direction, and such stops should be encouraged across the African continent with a view to re-enacting the feat achieved by India in developing an IT-based economy. ICT would also bring development to other sectors of our economies, such as education, through the establishment of virtual universities and the development of multimedia education tools. In Nigeria, for example, there are investment opportunities in the education sector owing to the lack of teaching facilities, in spite of growing numbers of applicants.

In conclusion, young people could play an essential role in partnering with statutory agencies for the achievement of sustainable development. The vital component in realizing the above objective is the availability of technology leadership. Young people are also expected to provide leadership through cultural re-orientation for the introduction of a durable information technology culture. With the African continent representing a large proportion of the world's population, today's young people have a major role to play in providing the human capital resources necessary to support the increasing demand for IT-focused leadership.

Oluwagbenga Sesan

University Ile-Ife

Nigeria

1 Introduction

Information and communication have always had a strong relevance to mankind. The Sumerian writing system was a means of communication around 3000 BC; the 1830s saw the first viable design for a digital computer and the world's first computer program by Lady Augusta Byron; while Alexander Graham Bell's 1877 contribution, the emergence of information science in the 1940s, the eventual development of ENIAC in 1946 and Claude E. Shannon's information theory of 1948 all took the world by storm. Little did history know that yesterday's innovative wonders would become exhibits in today's museum.

The global feats of today's information and communication technology (ICT) are traceable to conscious efforts, the influence of technology and the need for a faster, more reliable and convenient means of information handling, transfer and networking. The Internet, optical fibre, satellite communication, mobile telephony, eCommerce, bluetooth, wireless application protocol and other emerging technologies make ICT a present reality with future prospects and vast development opportunities.

2 Development opportunities

ICT has provided diverse opportunities for development in all nations of the world, and the developing nations actually have an opportunity, by virtue of this technological tool, to leapfrog the looming digital divide that promises greater devastating effects on any economy than the industrial divide. Global relevance and accessibility is an opportunity that countries like India and Malaysia have grabbed. Shortly after her independence in 1957, Malaysia sent people to Nigeria to learn how to grow palm trees, but with its Vision 2020, which includes the development of a USD 40 million Multimedia Super Corridor (a technological city that will replace its vast oil plantation), Malaysia's Prime Minister projects a quadrupling of the country's USD 9 000 per capita income by 2020. India has invested heavily in technical education, introduced ICT-inclined courses and produced 250 000 scientists and engineers a year, and today has its own Information Technology Park and attracts the attention of the whole world.

Economic development opportunities abound for any ICT participant. Forrester Research says that B2B and B2C eCommerce transactions will generate USD 108 billion and USD 1.3 trillion, respectively, by 2002. Other opportunities include technological innovation, healthy global competitiveness and career opportunities.

3 Conclusion – The role of youth

The role of young people in any developmental process cannot be compromised because the continual relevance of any phenomenon is dependent on the availability of equipped manpower that can continue the trend. The role of young people in ICT development opportunities include:

• information-gathering to keep pace with global trends and to enable self-preparation for national and global development;

• breaking free from the usual cycle of mediocrity and adopting a paradigm shift that encourages innovation, creativity and pioneering efforts;

• interest in national relevance and development;

• information sharing and synergism, an example of this being a Yahoo! Group (blackpioneers@yahoogroups.com; www.blackpioneers.htmlplanet.com) which seeks to integrate individual inputs for global development.

We, the young people, must adopt a mindset that establishes us as responsible contributors to ICT development worldwide.

Sources

EMEAGWALI, P., Can Nigeria Vault into the Information Age?, as prepared for delivery at the World Igbo Congress, August 1997, New York City.

SESAN, O., 3eCommerce, Nigeria and the Next Generation, ITAN Expo 2000, December 2000, Abuja, Nigeria.

SESAN, O., eCommerce: Boundless Career Opportunities", Electronic Week 2001, February 2001, Obafemi Awolowo University, Ile-Ife, Nigeria, and
http://www.myron.sjsu.edu/ceasers/techn.htm

Yves Kimenyi Gatsinzi

Kigali Institute of Science Technologie and Managment

Rwanda

Information and communication technologies (ICTs) have given rise to new innovation in many parts of life in our society, such as education, social activities, business and research processes.

Nowadays, we spend a lot of time using television, radio or Internet in order to be informed very quickly and efficiently. It is this interest that motivates our society to develop and build upon new ICT systems based on the thinking of the new generation.

Traditionally, the way people were communicating was based on natural resources that limited the speed and efficiency with which the information could be sent. During that period, young people were the most concerned on account of their physical ability to transmit the information.

So, in order to be more competitive, many organizations have developed new ICT systems and are investing more in order to offer their potential customers resources that they would otherwise find elsewhere.

Our African continent is not keeping up with this development, and new perspectives need to be taken into account by taking appropriate decisions on areas such as teaching and learning, in terms of their process and organization and their significance for mankind.

Young people must grasp ICTs as a key for promoting their activities, for example by creating Web pages to express themselves, through data design and access in order to organize work, and through online publications against violence and the Aids epidemic.

Even those aspects of ICT development face the problem of poor national telecommunication structures in many African countries, lack of staff, threat to knowledge, linguistic problems, lack of powerful equipment providing fast connection to the Internet, and a low or even below - minimum level of education among many young people in Africa. There is no doubt that the bringing together of ICTs and young people represents a unique opportunity for teaching, learning and research, and that the Internet, if used intelligently by young people, will act as a powerful supplement to their learning methods, as well as to the methods used in teaching them.

This is why it is important that young people the world over must be given equal access to ICT and information highways. It is a priority for organizations such as UNESCO to promote ICT for young people in the south as in the north, in the east as in the west, enabling all regions to deliver their own contributions to global knowledge, the development of research activities and publication facilities.

This can be done by increasing access to information and by ensuring the perfect administration of libraries and e-libraries.

One example is the role of ICT by universities for remote teaching, learning and research. An example of this is the Kigali Institute of Science, Technology and Management (KIST), which, through the African Virtual University (AVU), provides many people with the opportunity to learn languages or basic computer software applications and to participate in seminars on videoconferencing. A further achievement of KIST in the field of ICT has been the establishment of a wireless network for Internet connectivity. Under this project, in which I have participated, we have developed a cheap networking system based on wireless technology and Linux networking facilities. Nowadays, ICT technologies and facilities are used to access information through the World Wide Web, as well as in the organization and management of tuition, monitoring student progress, evaluating applications, etc., in the context of distance tutoring and virtual classes.

Following an evaluation of the development and importance of information, there must also be a focus on youth participation. Ultimately, youth comprises a large number of people in secondary schools, universities and educational institutions, all of whom must be prepared for flexible learning and for a role in research activities, locating and accessing large amounts of information online in their field, and increasing their research capacity by sharing equipment and using remote computer resources.

Denise Umuhoza

Kigali Institute of Science Technologie and Managment

Rwanda

Information and communication technologies (ICTs) are used throughout the world for communication without the need to move from one place to another. These technologies are used by many people in various sectors, such as education and trade, and in different social activities. Operating such communication systems well plays an important role in development at the level of the country and of the world. Young people, whether students or otherwise, could also play an important role in development.

ICTs are highly necessary. For example, distance learning enables students to access virtual information from anywhere in the world, without having to travel to another country, which is very expensive, particularly for we Africans who have limited financial means. Students carry out research and consult libraries that are connected to the Internet. They receive and send electronic messages, read journals and keep up to date on information via the Internet. Through local computer networks, people share information or data at the same time on their individual machines, which facilitates the dissemination of information and communication between people working on computers connected to the same network.

ICTs include fixed or mobile telephones, radios and television sets, etc. Traders also use information technologies to deal quickly and efficiently. People from other social sectors also use these technologies to send and receive messages. In this context, young people must play a role in development, for example in the field of ICTs, since it is known that without communication there cannot be development.

Young students must develop their knowledge of ICTs, have knowledge of database application programmes that might be used in the running of companies and banks, and learn how to install Internet networks and teach Internet applications, as well as create websites for people to advertise commercial items and provide information. Young schoolchildren must be taught with a view to developing a flexible attitude towards using computers, so that they will have access to information and will be able to express their views where development is concerned.

There must be associations and training centres where young people who no longer attend school can go to learn about new information technologies and their uses.

Used properly, ICTs are tools that help us to deepen our knowledge, facilitate learning and teaching and enable quick and effective publishing.

Emery d'ALVA

Université Pascal Paoli

Sao Tome and Principe

We are currently witnessing a real revolution. How else could one define this new way of organizing work and ourselves, of communicating, of learning and of running our everyday lives - this age of the information society, as it is called? Moreover, the signs are that this is only the beginning; there are huge prospects for development and, of course, young people have a key role to play. First then, let us assess the situation and then see how young people can contribute.

This new age was born out of the advent of new information and communication technologies, which are in turn a product of the marriage between information technology, telecommunications and media, so that sound, image and writing can be digitized and exchanged in a matter of minutes on a worldwide scale via the Internet in particular. There are countless applications involved, including telemedicine, distance learning, electronic commerce, documentary research, remote banking, online information, telecommunication (wireless, teleconferencing and videoconferencing) and the exchange of cultural products that are now accessible to millions of people.

Each year, millions of new cybernauts join the network and high-speed connections are gradually being adopted, even though mobile telephony has met with unrivalled success and its new generation (UMTS) holds the promise of remarkable technological progress (including mobile visioconferencing).

These new technologies therefore mark huge technical progress, but have different economic and social repercussions depending on whether one lives south or north of the equator, for there is a real digital divide between the two hemispheres. Millions of people from developing countries do not know what a telephone is and computers remain an item of great luxury for most human beings. There is a risk that digital exclusions will increase and that the Internet will be limited to a few dominant languages and cultures.

Young people are often the main forerunners, definers and users of the Internet. This is why they can contribute to its healthy use for purposes such as: the promotion of solidarity; denunciation of injustice, crime and extremism; development of ethical, multicultural and multilingual contents; debates and exchanges of information on issues that concern them (education, employment, leisure, travel, love and friendship, etc.).

They might also be interested in professions related to the new economy (publication and conception of websites, computer services, multimedia journalism, etc.) or they might even set up companies in the sector (software engineering services companies, Web agencies, online services, etc.).

In western countries, new information and communication technologies have generated thousands of jobs and huge gains in productivity, have created wealth and provoked a similar kind of entrepreneurial drive to that which powered the conquest of the American Far West two centuries ago. Should these remain the preserve of the north?

What about the south? Each young person must understand that the future is in his or her hands. They just have to take up the challenge.

AFRICA 2001   TELECOM
MEET THE FUTURE

ITU TELECOM
AFRICA2001
Johannesburg
12-16 November

Ibrahima Fall

Université Gaston Berger

Senegal

« Techniques de l'Information et de la Communication : perspectives de développement et rôle de la jeunesse»

Les deux dernières décennies du XX ème siècle ont été marquées par l'émergence du secteur de l'information et de la communication comme moteur du développement humain. Les nouvelles technologies ne doivent pas être considérées comme un luxe après le développement en général du pays, mais comme l'une des conditions qui déterminent les capacités des pays en développement à engager la modernisation de leur économie et de leur société. Leur développement ne doit cesser donc de croître et d'appeler une implication soutenue des jeunes.

Le téléphone, la radio, la télévision et l'ordinateur, pour ne citer que ces moyens de communication marquant le XX ème siècle, ont chacun évolué dans un rythme phénoménal ; leur convergence dans Internet laisse entrevoir toujours de nombreuses perspectives allant dans le sens de leur vulgarisation et de permettre le plus possible de profits pour la société.

La première des préoccupations est la mise en place d'infrastructures humaines et matérielles nécessaires à l'implantation et au développement des NTIC (par le recrutement et le maintien aux universités d'hommes dans les domaines informatiques). Il faut réorienter les systèmes éducatifs vers un enseignement des disciplines qu'il faut : création de nouvelles filières, renforcement des enseignements informatiques dans les filières proches (mathématiques, électroniques, ...) etc. Cela favorisera l'exploitation de toutes les possibilités offertes par le secteur : les télé services comme le télétravail (télé-médecine télé-enseignement....), le commerce électronique etc. sont à promouvoir dans nos pays. Il faut aussi de concrets résultats pour la baisse des coûts et l'accessibilité des NTIC à tous. Egalement, des efforts pour une «parfaite sécurité des systèmes doivent être menés. (et cette liste des perspectives n'est pas exhaustive).

La jeunesse dans tout cela doit jouer un rôle primordial ; elle doit davantage s'y intéresser pour éviter une marginalisation de nos pays. Les jeunes doivent s'orienter vers la recherche et opter pour une maîtrise sans failles de ces technologies et sous toutes leurs formes afin de s'affirmer comme les mutants du prochain siècle.

Cela est bien sûr possible car maintenant le savoir n'est plus détenu par un tiers, elle est accessible de tous. Et de cette manière cette jeunesse, jouera le rôle d'avant garde et poussera les décideurs à bien appuyer le secteur, elle va aussi pallier au manque criard de ressources humaines et va venir à bout des problèmes d'ordre techniques actuels dans le réseau téléphonique...). C'est aussi du rôle de la jeunesse de promouvoir l'exploitation due du secteur (aujourd'hui sous exploité) à travers des PME et d'aller dans le sens d'une vulgarisation de ces nouveaux outils.

Les perspectives sont nombreuses, mais comme 'il n'y a pas de vert favorable pour celui qui, ne sait pas là où il va», la jeunesse en particulier doit vite s'y mettre pour réussir toutes les possibilités d'un développement, identifier les atouts de bord pour faire de sorte que cette ère dite des nouvelles technologies de l'information et de la communication soit réellement vécue chez nous.

Mame Penda Laye Gueye

Ecole Supérieure Polytechnique

Senegal

Les techniques de l'information et de la communication connaissant aujourd'hui un développement spectaculaire et ne cesse d'évoluer de manière exponentielle.

Compte tenu de l'enjeu que constitue l'information et la communication, une nécessité s'impose pour tous pays, celle d'avoir une bonne maîtrise des nouvelles technologies de l'information et de la communication, d'éduquer sa population, surtout les jeunes à celles-ci.

Une question se pose, celle de savoir les perspectives de développement que nous offrent ces nouvelles technologies et le rôle que les jeunes ont à jouer dans tout ceci.

Si nous nous arrêtons un peu pour faire un constat, nous verrons que les pays les plus riches dans ce monde sont ceux qui ont une main mise sur le commerce mondial.

Avec l'essor des réseaux informatiques, dont le plus important est l'Internet, les méthodes de commerce ont changé, l'Internet nous offre un marché beaucoup plus large. Donc, un pays qui permet à sa population d'accéder à cet outil peut voir ses recettes de commerce augmenter les paysans pourront se créer des marchés partout dans le monde, les industriels, ainsi que d'autres tranches de la population.

Hormis le secteur du commerce, la productibilité émanant de l'activité professionnelle peut aussi augmenter considérablement avec l'utilisation des nouvelles technologies de l'information et de la communication : traitement de l'information ira beaucoup plus vite, certains retards pourront être évités.

Tous ces facteurs peuvent contribuer au développement d'un pays.

Quand on parle de développement, il faut qu'il soit durable. D'où la nécessité d'impliquer la jeunesse.

En effet, la jeunesse doit être bien imprégnée de ces nouvelles technologies pour assurer la relève et surtout faire preuve de beaucoup de créativité. Mais tout ceci nécessite une bonne formation des jeunes dans ce domaine.

Les nouvelles technologies de l'information et de la communication nous offrent de réelles perspectives de développement et les jeunes ont un rôle déterminant à jouer dans ce domaine.

Myra Veronique Dine

Polytechnic Technical Studies

Seychelles

The Seychelles, located four degrees south of the Equator, comprise three main islands - Mahé, Praslin and La Digue - and other smaller islands, all of the islands being more or less equipped with technological facilities. The population is about 80 000, of which 45 per cent is made up of young people.

Hence, the Seychelles are not isolated from the world of technology. Indeed, we are becoming more dependent on it, for the last ten decades have seen the rapid and widespread development of information and communication technologies (ICTs) in our country. Thanks to the Cable and Wireless Communication Company, faxes can be sent anywhere within seconds and fixed telephones bring families, friends and businesses closer. The famous mobile phone has proved its efficiency so well that a great proportion of people, including young people, own one and benefit, through the advantages of roaming, from the ability to contact friends and associates from anywhere.

The establishment of the Airtel company is helping the country to keep pace with the age of communication and has brought about competition, generating more opportunities and enabling many electronics graduates to find employment.

Kokonet and Atlas provide Internet connectivity, with assistance from Cable and Wireless in the form of telephone lines. Internet facilities linking our country to the rest of the world are accessible to virtually every primary, secondary and post-secondary educational establishment, as well as to businesses and domestic users.

Exposing young people to Internet facilities is bringing them closer to the outside world through e-mail and videoconferencing, not to mention the great wealth of information of all kinds they can obtain from the Web. Used correctly, these facilities enhance their knowledge and further upgrade their studies. Various companies also offer computer training skills.

Television, educational and computer programmes keep young people at home. FM and AM radio provides music entertainment and, more importantly, news with youth participation. In future, cable TV will also be available, providing viewers with a selection of channels.

In short, the young people of the Seychelles can play a pioneering role by further developing their skills and expertise in the use of these tools, which can be instrumental in bringing about greater economic change in the country.

They should use the available facilities to their best so that the Government sees the need to introduce more of these opportunities. Easier access to more jobs and career opportunities for young people should exist to encourage them to pursue further studies. The Internet should gradually be improved to make it faster, and telephone lines should become cheaper and eventually affordable to young people. At the same time, however good the advantages of ICTs are, young people wish to see further research being done on its effects on human health and the environment, e.g. mobile phones, high-frequency satellites, etc.

I should like to conclude by observing that a positive attitude towards technology and the proper use thereof can serve to develop the kind of good qualities in young people that society needs, for young people are the cornerstone of a brighter future where ICTs are concerned.

Dona Morel

Ministry of Information Technology & Communication

Seychelles

In this information age where telecommunication technologies are advancing rapidly, young people have important roles to play in helping in the creation of a better tomorrow for us and for future generations. These new developments in telecommunications are allowing the convergence of the information technology (IT) and telecommunication sectors. The convergence of these two sectors with its vast range of applications is set to accelerate the development of mankind as a whole.

The many applications of IT, with the help of advanced broadband telecommunication facilities, include multimedia applications, e-mail, chat, videoconferencing, Internet browsing, voice over Internet protocol (VoIP), information searching, distance learning, news, entertainment, television-to-Internet adaptation and many more. IT also provides new ways of improving the many services in society, including business, government, healthcare and education services.

These exciting applications will most certainly attract the young people of any society. They are the means that young people can use to develop themselves as individuals, whether at the professional or non-professional level.

It is often said that young people are the pillar of society. In other words, it is the youth of today who will be tomorrow's leaders. Without proper training for today's young people, tomorrow's society will not be bright.

With this in mind, the many exciting applications of IT offer great opportunities for young people to keep busy and develop themselves, rather than engaging in wrongdoing and other worthless activities.

The role of young people is to use these facilities for their personal benefit and for the benefit of society in general. There are so many benefits. A young student should make use of the Internet for research and for access to study documents. IT also makes distance learning possible, and young people can broaden their horizons by taking remote courses. The Internet is a medium of communication which young people can use to make friends, corresponding with others around the globe through e-mail and Internet chat.

In conclusion, IT and telecommunications are providing young people with new high-tech facilities for their exploration. It is up to them to use these facilities for their own benefit and for the benefit of mankind.

Raho Hashi

University of Somalia

Somalia

I was 12 years old in 1991 when civil war broke out in my home country, Somalia. It was early in the morning and I was attending school. My younger brother, who is nine years old, and I heard big noises coming from the north of Mogadishu and pouring into the presidential palace.

The school principal made an announcement telling us that something had gone wrong, and that we had to prepare for the worst. I was thinking of my younger brother, as I had to look after him. After a while, a bomb was dropped right next to the school. We had to run for our lives. I put all my efforts into finding my younger brother; fortunately I found him hiding in his class. I grabbed him and ran towards home.

My mother had two other children. She fled from home to my school in order to find us. Unfortunately, we had gone back home to look for her; we therefore missed each other and we panicked, fearful for our lives. We did not know where we had to go.

My father had gone on mission to the Northern Region to work for the Ministry of Posts and Telecommunications. My brother and I decided to run in the same direction as everyone else. Fortunately, we found one of our neighbours who helped us to go with them. We stayed until the next morning. The next day the war got worse and spread all over Mogadishu. It was then that we decided to leave the city to go to another town about 500 km from the Kenyan border. Then, we came upon a very good gentleman who was operating a two-way military radiocommunication unit. We asked him to help us make a radio call to Mogadishu to find out about my mother and two younger brothers and sisters. Without any charge he agreed to try; then, after repeated calls, we found one of our neighbours who informed us that my mother and her two siblings were in the same town where I was sheltering from the war. In that moment I was re-born. We had not had any food for 24 hours; now we had tree bananas and water.

On the third day, I went to the town to find my mother, searching from one neighbourhood to another. We finally found her, exhausted, in a home that was very different from the one we had left three days previously.

As a result of the radio call we made in an attempt to find my mother and her two siblings, I have decided to become a telecom expert. Without that two-way radio we would not have been able to find my family. Thanks, Mr Alexander Graham Bell, father of modern telecommunications.

Mohamud Isse

University of Somalia

Somalia

Somalia has been in a state of civil war for more than one decade. I was ten years old in 1991 when the civil war started. I was living in the north-east of Somalia, at the tip of the Horn of Africa facing the Yemen. I have not attended school for seven years and that gap is a lost opportunity.

Today I am attending Bossaso University after three years of hard private schooling in Bossaso. I had to achieve very good grades in order to get into the university. Today I am learning computer science, as I am trying not only to participate in reducing the digital gap, but also to close the generation gap that exists in my home country.

As regards the generation gap in Somalia, I am sure that it can be closed through the education and the learning of new technologies. However, closing both gaps is not an easy task.

Countries have different needs and priorities, while some countries are more advanced than others. Moreover, those that have experienced into civil strife, such as Somalia, have a major task ahead on account of the yawning generation and digital gaps that need to be closed.

Information technology could be the tool that will enable us to narrow the gap. However, progress in that regard is being hindered by a lack of security and foreign investment.

Brenda Chauke

University of South Africa (UNISA)

South Africa

It is a fact that South Africa is in short supply of people with the ICT skills required to propel the country into the global world.

This essay focuses on the shortcomings and importance of ICTs in South Africa, with emphasis on young and underprivileged people.

ICTs enable people around the world to communicate via, for example, the Internet, telephones and satellites. These are the tools that can build the capacity of the organizations and communities they serve. ICTs facilitate the sharing of information and link communities. They enable human beings to live and interact in a "small" global village.

When one thinks of a township youth, the first thing that comes to mind is a person who has not been exposed to different technologies, particularly ICTs. Our education system denies us the opportunity to acquire ICT skills and knowledge. This was evidenced in the episode of the TV series *Yizo Yizo* aired on Tuesday, 24 May 2001, where one of the township students could not use/operate a computer while visiting a Model C school. Imagine the embarrassment of the poor student!

Another sector of our community affected by the lack of ICT access and knowledge is the rural population. Education in their case is apparently a privilege, since most of the parents are unemployed and some work in suburban areas. Their priority is to provide food for their children, since they find it expensive to finance their children's studies.

From what has been indicated above, it is evident that South Africa has much to do with regard to the introduction of ICTs. In one of his speeches, the former president said, "the reality is that there is a technological gap (digital divide) between developed and developing nations that is actually widening". He went on to say that only the best resourced countries could keep up with new developments and that South Africa had much to learn from other developing countries.

The introduction of ICTs to young people and the underprivileged may not be an easy task given the current state of affairs. The following are suggestions:

- Government and business-funded communication centres should be established in underprivileged areas.
- Training and development can be used in the education system so as to encourage usage of ICTs.
- ICT educational programmes should be made available in township and rural schools.

Many institutions and people remain sceptical about the benefits of ICTs for them. They are unaware of or unconvinced about the potential ICTs have to enhance and contribute to sustainable development processes. An integral part of training is therefore to introduce the trainers to new technologies and to raise awareness of how ICTs could enhance their lives.

For South Africa to be an information society, all South Africans should make a conscious effort.

Rushil Ranchod

University of Cape Town

South Africa

Former United States President Bill Clinton, in an address at the Civil Society Initiative Conference held recently in Johannesburg, stated that it is the responsibility of young South Africans to become more involved in projects for promoting a better society. It is in this spirit that we need to combine the commitment of African youth with the power and potential of information and communication technology (ICT). Nelson Mandela so aptly described the impact of ICT development on the Third World when he said that:

"Nevertheless, one gulf will not easily be bridged – that is the division between the information rich and the information poor. Justice and equity demand that we find ways of overcoming it. If more than half of the world is denied access to means of communication, the people of the developing countries will not be fully part of the modern world. For in the 21st century, the capacity to communicate will almost certainly be a key human right"

It is this reconciliatory process that we, as African youth, must engage in, if we are to free ourselves from the information "black hole" and embrace the possibilities that an information rich and accessible society holds. The gap that exists between the developed and developing worlds with regard to technology is enormous, and narrowing it would lead to and contribute towards sustainable economic and social growth. The developing world has the skills and knowledge it needs to partake in information and technological development and to enter the Global Information Society. It is my view that this passage into the information and technology rich culture should be at the forefront of the African renaissance so keenly espoused by President Thabo Mbeki.

With the huge demand for information and communication technologies and services in the developing world, the major problem is the unsatisfactory level of investment in information infrastructure. Information infrastructure is the result of building strong information networks, and is necessary in order to access the global information systems. Similarly, the potential of information technologies has important ramifications for development, if only in an indirect sense. Meeting basic needs, developing human resources, expanding the economy and creating a culture of effective public service delivery are all challenges which can be met far more effectively with the aid of information technology.

Amongst the many advantages that information technology brings, I would lay emphasis on three key development scenarios, which the youth of today need to engage in for a more productive tomorrow. These are:

Firstly, the new global economy could stimulate new industries and create *new employment opportunities*. This would attract investment and create employment within national economies.

Secondly, *training and education* is an important dimension to the emergence of the information society, and this in turn empowers people in a way that is essential. This leads to their active and full participation in the global information society.

Thirdly, it allows for *universal access*, which reduces information inequality. This also applies to the incorporation of marginalized groups, such as women, young people and the disabled, into the global information society.

Thus we see that there are important development opportunities that the young people of today need to embrace. My vision is of those young people taking a proactive role in addressing information inequalities, and empowering themselves by addressing the information needs of modern society.

Amna Elhaj

Sudan University of Science and Technology

Sudan

It is evident that information and communication technologies (ICTs) are taking the lead in the world of today. Globalization is a reality in the new millennium, and with globalization in sight, ICTs are the key to any future development. Anyone not literate in basic computer skills and the Internet will have remained on the sidelines and been out of touch since 2000.

The new century heralded the advent of tremendous new communication facilities, such as information superhighways, air space utilization by a number of satellite channels and advanced technological equipment. Africa, which continues to be a recipient of all that comes through space or communication technologies, should not remain on the sidelines.

Could African countries compete to repulse what is known as cultural invasion from the West? To be able to compete, you need to produce comprehensive information products, but is that feasible? Is it possible?

Considering the reality, African countries are faced with real challenges in the new century in the field of communication technologies.

Africa's problems in this field are obvious:

a)   Non-standardization of equipment;

b)   Weather conditions that lead to the deterioration of technological equipment;

c)   The pace of change in communication technologies;

d)   The high cost of such technologies, which are unaffordable in most African countries;

e)   The need for training.

The obvious solution is to invest in young people, or the next generation.

Africa can get off to a good start by having its young people meet, discuss and find appropriate solutions. ICTs are a sensitive issue on which the continent's future, and, for that matter, the fate of socio-economic development, depend.

As masters of the future, the young people of Africa need to determine what should be done. They have to work out a simple strategy or plan together.

One Sudanese proverb says: "Half of your brain is with your brother". Another says: "If you succeed in identifying your problems, you are half-way to solving them".

THIS IS IT.

Samer Ibrahim

Sudan University of Science and Technology

Sudan

We all know that the capacities of a society's young people are without any doubt the capacities of the future. In order for us to benefit from this latent force in society, young people must be given the attention they need in order to be able to take part in the computer revolution the world now requires. This goal is receiving growing support from governments and competent bodies in the private sector, which is essential if it is to be achieved.

Economic and social development has objectives and requirements. One of its more distinctive objectives is to improve people's standard of living. It also has a number of requirements, one of the most important of which is the exploitation of capacities to mobilize human and natural resources. In every nation, young people are considered an important human resource capable of developing sources of production by taking part in various sorts of development operations. The number of young Africans is increasing tremendously as a proportion of the total population: more than 65% according to the latest United Nations statistics.

The many problems facing young people in the developing countries generally include unemployment and lack of job opportunities. The rapid solution to this problem would be to provide income-generating projects.

In order to exploit young people's capacities in Sudan and other African countries, this vital group must be provided with training, their capacities must be developed and support given in the form of subsidies for technical equipment (such as computers) to enable training objectives to be met.

In Sudan, we need to broaden the scope of training, particularly in the fields of information and communication, in order to develop modern technology and set up education programmes for many groups of people. This Sudanese model requires that scientific knowledge be disseminated in all the states where there are still no modern technical education centres. Study should take place in local languages so that the human base can be extended, thus promoting innovative thought.

There are no information and communication training programmes for young people in Sudan, yet this is what we need in the present circumstances, when the country is experiencing new developments in the industrial and petroleum sectors. Those sectors need young people qualified to use the most modern ICT equipment in order to stimulate development.

In some African countries provision is being made to develop technical vocational training centres. Sudan is a large African country and has a high proportion of young people, many of whom have little opportunity to enter universities and higher education institutes; these capacities must be developed in order to create groups obtaining assistance from the private sector in long-term technical training projects that build the talent of young people - both men and women - so that they can play their part in stimulating development projects.

Young people in Sudan, as in other African countries, are hoping to obtain technical, material and logistic assistance from United Nations agencies specializing in information and communication, such as UNICEF, UNESCO and the United Nations Industrial Development

Organization, and from the voluntary and non-governmental organizations which are providing continuing basic support to many developing countries, especially in Africa (assistance in putting in place systems and information infrastructure) and providing for young people in general, regarded as an influential human factor in development.

We propose to establish exchange programmes between young people's organizations, university student associations and science and communication institutes in African countries in order to exchange knowledge and experiences and organize scientific travel programmes. The aim is to learn about young people's role in development in different African countries and to foster participation in disseminating scientific and technological awareness in order to bring about development accompanied by the requirements of the information age.

Sabeld Dlamini

University of Swaziland

Swaziland

The era we are living in is termed the information age, and therefore popular understanding of what is happening is an urgent need. Information is being applied to the human side; it is used to make us believe and accept that current developments are benign if not beneficial. Technology has basically improved the way we communicate.

Information and communication technology (ICT) presents a particular challenge to young people, mainly because we have been forewarned of its potential to amplify the powers of information and behavioural control, of surveillance and of indoctrination. Clearly ICT is here and young people must respond to it. The response must be not only to use the hardware, but also to endeavour to draw out the human implications of ICT and from this to identify the philosophies which will best serve to liberate humanity from its own illusion.

To understand the whole concept, young people need to learn the hardware and software behind it and how it works. They need to distinguish between what is known and being said and believed from what is really happening. They need to apply ICT to change for the better; they need to create a future that will include change to a degree we control and which will not frighten us. They need to know that ICT has been responsible for replacing human action with that of machines.

ICT has improved, especially at the dawn of the new millennium. Young people need to take advantage of this, but also to be aware of the negative impact that comes with it. They need to develop themselves in terms of creating job opportunities, alleviating poverty, fighting prostitution and the spread of Human Immunodeficiency Virus (HIV), increasing learning opportunities and productivity in the work place, in administrations and politics, and grooming lost cultures.

But there is a need to assess what they browse; not all that is in there is good. Young people should be the first to be acquainted with what the era comes with in terms of expectations, applications and results. In education, young people have to demand to be included in planning, so that they can contribute what they need based on what they see. They need to adapt to the challenges brought by the advances in ICT. The curriculum should reflect this. They need to use this to be involved in research work and national economic development organization. They need to use change to boost capacity building.

Young people need to learn from a global perspective; they need to learn from the technology on their own and solve problems, to learn about current and future ICT, and to exhibit high quality skills at the end of the day.

Young people need not miss the point. They must make the time-honoured effort to keep life relevant, and learn how to use databanks for everyone's benefit. By doing so they will create a good future which we will be able to control and master, one that accommodates what we want of the future and the best the past has to offer.

Farzillah Peera

University of Dar-es-Salaam

Tanzania

Information and communication technology (ICT) encompasses all technologies used to handle information and facilitate different forms of communication between electronic systems.

ICT plays an increasingly important role in developing countries in terms of trade, the eradication of poverty, enhanced production and increased job opportunities. ICT provides new ways of capturing, storing, processing, transporting and displaying information and has had a profound impact on societies, socially, economically and from the development point of view.

Socially, ICT has given people the opportunity to connect in a global village, in that there is equal access to fast and accurate communication. Examples are telephones (either mobile or fixed), electronic bulletin boards, facsimile technology and e-mail.

Economically, ICT has greatly influenced the resurgence of trade between countries and increased world productivity. It has opened a wide range of markets.

There are many opportunities for a developing nation using ICT. One example is the decision-making process, for which timely and accurate information can be obtained via the Internet. Most researchers and policy-makers use ICT to solve problems such as food insecurity.

ICT is also used to empower rural communities, allowing the voices of the poor to be heard and living conditions improved. People living in rural communities can find motivation in the exchange of messages and thereby find themselves in a position to make decisions for their own betterment and development.

Through ICT development, job opportunities increase, easing the problem of migration between urban and rural areas. Individuals can become small-scale entrepreneurs using the centres established in rural areas. Several developing countries are supported by FAO, ITU, UNESCO, and others.

With ICT development opportunities, young people, in particular young women, can solve their problems, especially traditional ones. For example, it is believed that a woman's place is in the kitchen and taking care of household chores, limiting our opportunities to work in offices or other managerial positions. ICT development enables us to work at home comfortably.

As we young people are energetic and flexible, we can rise to the challenge of the "digital divide" (the gap between the developing and the developed countries) and look for options and ways to bridge it.

Young people's knowledge and experience can be shared with others in seminars and conferences. One example is the youth forum ITU is planning to organize, which brings together young people to enable them to enhance and share their experience and to provide them with ICT knowledge.

Such institutions should continue to help the developing countries by providing technical knowledge and financial resources as to reduce the gap between the developing and the developed countries.

Anael Samuel

University of Dar-Es-Salaam

Tanzania

Information and communication technologies (ICTs) make information easy to handle and facilitate different forms of communication between human beings, between human beings and electronic systems, and between electronic systems.

They are used to capture, store, process and display information. The common feature is digitization.

One of the problems facing the world is the big gap between developing and developed countries, known as the "digital divide". ICTs spur trade, employment and production in the world. They present opportunities to combat poverty by increasing income, opening markets and providing the poor with the means of making their voices heard.

Areas in which ICTs could catalyse development include decision-making processes that need comprehensive, timely and up-to-date information. For example, the food security problem facing developing countries must be dealt with by informed people like researchers and policy-makers.

ICTs can also empower rural communities by enabling them to contribute to the development process. Rural communities can improve their living conditions and find motivation thanks to the ability of ICTs to penetrate under-serviced areas and to enhance education and hence facilitate development through distance learning.

Socially, ICTs can create employment opportunities in rural and urban areas by engaging telecentre workers. Such centres help bridge the gap between urban and rural communities and reduce rural migration to urban areas.

ICTs targeting marginalized groups could benefit all stakeholders, including civil society and in particular young people and women.

The process of connecting most people will make the above advantages and related information technology and development opportunities possible.

ICTs give young people greater exposure to development opportunities by providing fast and cheap means of communication, enabling them to acquire knowledge that will further their social, political and economic development.

The role of young people is first to acquire knowledge about ICTs so that we can use them to improve our communities. Secondly, we should accept the challenge of the digital divide and look for means of bridging it. Young people should also do research and educate society about ICTs. Young men and women are supposed to protect ICTs from malicious use.

As young people, we have the obligation to think. What kind of society do we want to see in the future? How can we influence the design and deployment of new technology in ways that most further our own goals? In this regard, institutional innovations and technological breakthroughs create opportunities for human development.

Applying ICTs to development opportunities requires knowledge and technical and financial support. ITU is therefore to be commended for organizing the Youth Forum, where young students will gain exposure to ICTs and have the chance to exchange their experiences.

Farouk Ben Salah

Ecole Superieure des Télécommunications

Tunisia

For more than ten years now, the new information and communication technologies would appear to have been enjoying unstoppable development in the industrialized countries. The forthcoming decades will see not only billions of individuals connected to the global network, but also countless items having their own Internet address (dishwashers, refrigerators, etc.). The notions of virtuality and the abstract will form part of the foundations of the new twenty-first century culture. We are already witnessing a socio-cultural transformation in the daily life of human beings as a result of the phenomenal propagation of the Internet. The advent of high-speed networks will from the outset have an essential bearing on human communication around the globe. The mobile telephone, for its part, has now become a *sine qua non* in the business world, and is no longer merely a means of verbal communication, but is also becoming the support for digitized data exchanges. For this reason alone, the major manufacturers of telephone and computer equipment are waging a relentless war.

NICTs therefore represent a major economic challenge for the majority of countries. Even if the exercise is a complex one, it is essential for those countries, and above all their young people, to understand and master them. Indeed, the speed of development is bound to lead to an integration of NICTs into the consumption pattern of young people, as is already the case, for example, with television.

And since, on the one hand, all human and social activity is oriented by these means of organizing, processing and disseminating information, and, on the other hand, education is the vehicle *par excellence* for adaptation and social change, it is essential that NICTs be incorporated into the school and university life of young people. Those young people should, therefore, take care to ensure that the communication thus conveyed is not "dematerialized", but rather that it represents an opportunity for a beneficial exchange of knowledge, and that the culture develops in a spirit of universality and solidarity. The attitude of young people toward ICTs can no longer be merely "optimistic" or "pessimistic", but must be constructive, responsible and pragmatic. It is also up to young people to ensure that the development of ICTs serves to strengthen not inequality and exclusion, but rather social cohesion, so that all human beings can ultimately become, let us hope, eco-citizens. Finally, NICTs are in a constant flux of development, which makes it incumbent upon us to improve them while at the same time mastering the power and instantaneousness which is their hallmark.

Hela Masmoudi

Ecole Supérieure des Communications de Tunis

Tunisia

Over the past decade, new information and communication technologies have ceaselessly prospered, improved and indeed become popularized. Today, the telephone is no longer a luxury, and mobile phones, not to mention the Internet and associated services, are within reach of all. Things are bound to progress even more rapidly in the coming years, and this extraordinary boom will unavoidably continue to transform the lifestyle of modern societies.

NICTs are currently the road that countries are taking.

Naturally, young people are at the very heart of this evolution, and it will be for them to pursue the development of new communication technologies. They have the ability to understand, master, and hence improve them. Their very education - above all at the academic level - encourages them to adapt to this technological environment that is rich and inexhaustible, stimulating and dynamic, with a mind that is open to the outside world; no more the isolated or closed world, for this is the age of globalization in which borders are abolished. The young people of today have a revolutionary spirit in line with the requirements of the environment, in which innovation, creation, the spirit of adventure and the effects of this revolution encourage them to explore the world of ICTs, put together start-ups and form project incubators with a great deal of courage and initiative, but also a good measure of caution, given the terribly competitive nature of the environment.

It is young people who are at the centre of this revolution, and tomorrow it will be their duty to expand the range of ICTs.

It will be their task to ensure that information technologies represent an opportunity for meeting, discussion and enrichment on the technical, economic, social and cultural levels.

It will also be up to them to do away with the inequalities that currently exist between rich countries and poor countries, and to ensure that everyone has the same opportunities for becoming part of the vast universe of NICTs.

Finally, the best achievement of all would, to my mind, be for young people to succeed in making information and communication technologies an opportunity for social cohesion, and perhaps even world peace.

Pamela Birungi

Makerere University

Uganda

The advent of computers has led to the growth of a new dimension in technology. With applications ranging from research, science, medicine, education and business, computer technology has developed faster than ever before in the history of technology. In the communication industry, with specific emphasis on telecommunications, information transfer, chiefly data communication, continues to register increased traffic volumes on most transmission media. This has opened up opportunities for individuals with a keen interest in information technology, especially the young people who have grown up with the technology.

The use of computers and associated equipment for teaching and learning is the fundamental purpose of ICT. It involves using computers to deliver knowledge in basic hardware and software skills.

Information for development

Information enhances development, lack of which leads to backwardness among people. The sharing of information using computer-based technologies presents numerous opportunities for development. Fundamentally, computer networking has contributed greatly to the development of ICT. Individual PC users connected to localized networks can access other networks via established links. The internetworking of computers, popularly known as the Internet, has revolutionized the information age. The Internet provides opportunities and challenges to almost every individual. These opportunities, once embraced by young people, help them learn, compare notes, do research, conduct business and rise to challenges that could lead to new discoveries.

The protagonists

ICT provides a learning tool for young people. The introduction of computer use at early stages of learning has an impact on how students at university and other higher institutions learn. African Virtual Universities offer similar courses on the World Wide Web. Students are spending more time on the computer than in lecture rooms. This helps students in less developed nations to access first class material.

A number of services such as distance learning, telemedicine and e-commerce have been developed thanks to information technology. Young people should endeavour to embrace these services, to learn about them and how they can use them to enhance their professional development and career prospects.

Research is another major factor in the development of any country. Using the fast developing ICT as a source of information, young people should carry out research in various fields so as to solve the problems affecting them.

With the growth of an industry that is wholly based on ICT, young people are presented with the possibility of tapping into the earnings. Communication centres, Internet cafes and Internet service providers all provide employment opportunities, enabling young people to earn a living and develop themselves. Once the effect has trickled, down to the population as a whole, the welfare of all people could be improved.

Moses Mangwebe

Makerere University, Faculty of Technology

Uganda

Information and communication technology (ICT) is the driving force behind changes in the economic, political and social landscape, resulting in a new wave of development opportunities in developed and developing countries alike. "Digital revolution", "information age" and "global village" are some of the buzzwords that have emerged to describe this phenomenon, which can undeniably be attributed to the spread of the Internet and the growing global tendency to deregulate and liberalize the telecom sector.

Development opportunities come not only in the form of the direct economic benefits of the booming telecom sector; they also stimulate the rest of the economy. Africa is adapting to this change, as evidenced by the penetration of computing, telephony and broadband applications. The question, though, is whether or not Africa will take advantage of this and move from the wrong side of the digital divide in a sustainable fashion. A viable strategic approach for Africa is to invest in its young people and build capacity for a new breed of human resource, capable of embracing the information age and breaking away from the old business paradigms and models.

ICT has triggered a wide range of development opportunities, some of which are yet to be imagined. Specifically, it has had an impact on the following aspects of development: business, education, health care, industry and a host of political and social aspects.

In business, for example, e-commerce has created virtual market places, eliminating the physical interaction between buyers and sellers. On-line banking is also a reality.

The e-learning trend in the education sector has left its mark on higher learning and corporate training.

Knowledge networking has fostered teleworking opportunities across geographical boundaries. Knowledge networks are networks of people working on collaborative tasks in virtual enterprises.

With telemedicine, medical personnel can now not only diagnose and give prescriptions but also monitor their patients' bodily functions at a distance. This trend has opened opportunities for tapping the expert knowledge of medical workers irrespective of their geographical location.

On the political front, ICT has made teledemocracy a possibility. Africans both at home and in the diaspora can debate issues of national interest. Although electronic voting is not yet a reality, the interest and debate it has generated indicate that it is a goal that may be realized in the future.

Socially, the information age has done away with the "off" switch in human relationships to such an extent that every relationship is turning into a continual presence in the individual's life.

ITU TELECOM
AFRICA 2001
Johannesburg
12-16 November

AFRICA 2001

TELECOM
MEET THE FUTURE

Clearly, ICT has penetrated literally all aspects of life. Moreover, the information age has generated opportunities requiring outstanding technological skills. Regardless of the professional aspirations, gender, culture or ethnic group, young people will need the capacity for strategic planning, critical thinking, creative problem solving and teamwork. The challenge for African governments is to initiate strategic programmes aimed at technological literacy for all. Reaching for tomorrow's success requires taking responsibility today.

"Adapt or perish", runs the mantra for the information age. Surely Africa cannot hold back, just miss out on the opportunities and risk perishing. Young people will act as agents in this process, embracing new paradigms and transforming the corporate culture. As a group, young people will be technology stewards, innovators, knowledge handlers and astute decision-makers. The implication is that the young people will need to acquire technological skills and adapt the culture of learning throughout their entire lifespan at a pace dictated by the global trends in ICT.

Swithurn Mwenifumbo

University of Zambia

Zambia

The role and importance of information and communication technology (ICT) to any nation this century cannot be overemphasized. This essay looks at the ICT development opportunities in specific sectors such as the Internet, telecommunication infrastructure, and organization information networks, with Africa and in particular Zambia in mind. Finally, the role of young people in seizing those opportunities is discussed.

One sector that depends on ICT and offers immense opportunities is the Internet. Unfortunately, especially in Zambia, access to the Internet, though growing, is still the preserve of the privileged few. However, educational and health institutions need the Internet to facilitate networking and the exchange of ideas. Businesses also need it if they are to compete effectively on the increasingly globalized world market. Therefore, providing Internet services is one development opportunity waiting to be seized.

In Zambia, as in most African countries, the core telecommunication network is in government hands. The reliability of connectivity is poor in most parts of the country and further strained by the problem of vandalism. The network needs to be improved and the present drive to have the analogue local exchanges replaced with digital ones will improve last mile linkage. Development of a national optical fibre network is another ICT development opportunity that needs to be pursued as demand for more bandwidth and reliability of connectivity increase. Zambia has no such network at present.

The cellular networks that have been established offer great opportunities for development. The two major mobile cellular phone service providers have grown to a subscriber base of over 50 000 each in about five years, yet they cover only three of Zambia's nine provinces. Opportunities therefore exist for wider coverage and more services.

Most companies, educational and health institutions have not yet or are just developing their information networks. The banks are leading the pack, offering ATM services and credit cards; these have become so popular that queues at ATMs are a common sight. This points to yet another opportunity for development.

Every form of development is about people and is fostered by leaders. As potential and upcoming leaders, young people need to be fully aware of the importance of ICT and the wealth of benefits it provides. Then, as they become government and industry leaders, they will implement ICT in economic development. Furthermore, development opportunities entail change and change is rarely popular. However, young people with their boundless energy and sense of adventure, may help many organizations implement these changes.

In addition, young minds, especially in colleges and universities and under experienced mentorship, can provide practical solutions of benefit to society. This is by no means new, as certain big business ventures like Netscape and Microsoft were conceived in young people's minds.

In conclusion, ICT offers many and diverse opportunities. However, at the centre of them all are the human resources, especially young people, required to ensure these opportunities are implemented in the long term.

Doreen Tembo

University of Zambia

Zambia

Individuals can receive the necessary daily dose of information in this "modern age" via various channels: radio, television, newspapers, magazines, periodicals, telephone, fax and more recently, especially in the developing world, the Internet. While it is evident that these communication media are present in some form in most of the Third World, everyone has access to them and hence to vital information.

Among the groups constituting the ICT "have-nots" are the young people of the developing world. This is truly an unfortunate situation, as young people are tomorrow's leaders in politics, business finance and science. The Third World is riddled with problems of under-industrialization, poverty, illiteracy, poor infrastructure and low living standards, and the improvement of ICT often takes a backseat to other priorities that are perceived to have a greater impact on development. This is especially alarming as ICT plays a vital role in the social, economic and political development of any nation, and it must be borne in mind that sustained development in the Third World will depend upon its young people.

Written information must be made more widely available to communities, including young people; this can be done via the Internet, which provides an infinite array of information that can benefit users both now and in the future. Development is proportionate to the development of ICT systems; in order to enhance development, therefore, the available communication media must be fully utilized and improvements made in terms of accessibility to technologically advanced media.

Every nation must make information, especially concerning policy objectives, available to the public. A faster exchange of information would smooth market operations and promote financial business operations. In Zambia, for example, less maize would go to waste each year if buyers and sellers were more readily and easily identified. Heightened awareness of subjects like Acquired Immuno-Deficiency Syndrome (AIDS) requires a well-developed information and communication system.

Today's world can be called a "global village"; the actions of one nation or region inadvertently affect the economy and development of the rest of the world. This was evident in the South-East Asian financial crisis of the late 1990s. In such a world, it is economically disadvantageous to remain isolated. Present development strategy is to promote regional growth to achieve development; it is therefore vital for all nations to observe and study the financial, economic, political and cultural landscapes of both their regional neighbours and the rest of the world through a developed communication system.

Young people will become leaders in the Third World in various fields. To achieve success locally and internationally in these fields, they must be educated in the use of ICT, which must be made available to them, especially at institutions of learning. Knowledge of ICT helps young people find jobs and be successful in their field of work. ICT also enables young people to familiarize themselves with national and international development issues, issues on which some of them will in the future have to formulate and implement policy.