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Albania

Telecommunications Status Report in Albania

Since the 1999 with the adoption of new telecommunications policy by the Albanian Government, was paved the way to new reforms, which have significantly changed the telecommunications market structure and size.

This policy paper identifies participation of the private capital in telecommunications as the only alternative for a rapid and steady development. The engagement of private sector would be achieved through: 1) privatisation of the state owned companies, and 2) liberalisation of the market. Based on this policy paper, in 1999 the telecommunications reform was oriented in three directions:

- regulatory framework improvement,
- gradually market liberalisation, and
- privatisation of state owned companies; AMC mobile operator and Albtelecom fixed operator.

The law No. 8618 dated 14.6.2000 "For telecommunications in the Republic of Albania" as well as adoption of a couple Government legal acts, improved notably the regulatory framework, therefore improved the investment climate, which output was the interest expressed by private sector to invest and run telecommunications activities.

The long-term objective in telecommunications is the harmonised development of the telecommunications infrastructure of Albania and its gradual extension throughout the country, so as to ensure:

- access to basic telephone services at affordable prices;
- the full range of modern services is accessible by all the population of Albania;
- competition and choice for users;
- improved protection of consumers.

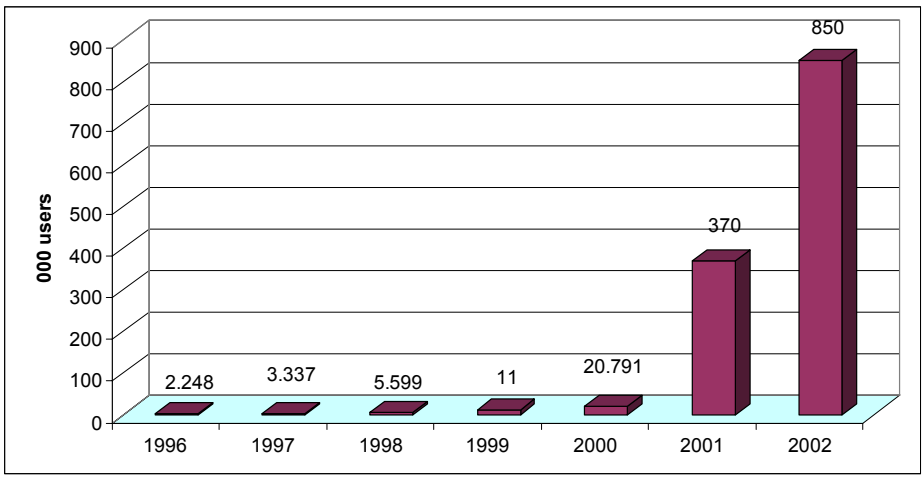
Concerning liberalization, was followed approach of phasing liberalisation, an approach successfully implemented in many Eastern Europeans countries. While the mobile market would be opened to competition, by licensing a second operator, immediately after the AMC privatisation, the provision of telephone calls in urban areas, of national fixed calls, and operation of international telephony gateways would be remain Albtelecom exclusivity.

As it is explained in this policy paper, the exclusivity period granted to Albtelecom, would allow it to have necessary time to adopt itself for operating in a competitive environment, as well as to re-balance its tariffs for providing telephony services. In the beginning of July this year the Albanian Government decided to end up the Albtelecom exclusivity in urban and national fixed telephone calls, and to hold over the Albtelecom exclusivity till the end of 2004.

If we give a look to the reform results during last 4 years, there is no doubt that the approach followed, that is engagement of the private sector, was the right way.

While in 1999 there were in the market only two telephone operators, both state owned, and a few Internet access provides, today are operating 80 companies; Albtelecom and 42 rural operators in fixed telephony, 2 operators, respectively AMC and Vodafone Albania, in mobile telephony, 20 value added service providers, and 20 Internet access providers.

Growth of mobile market

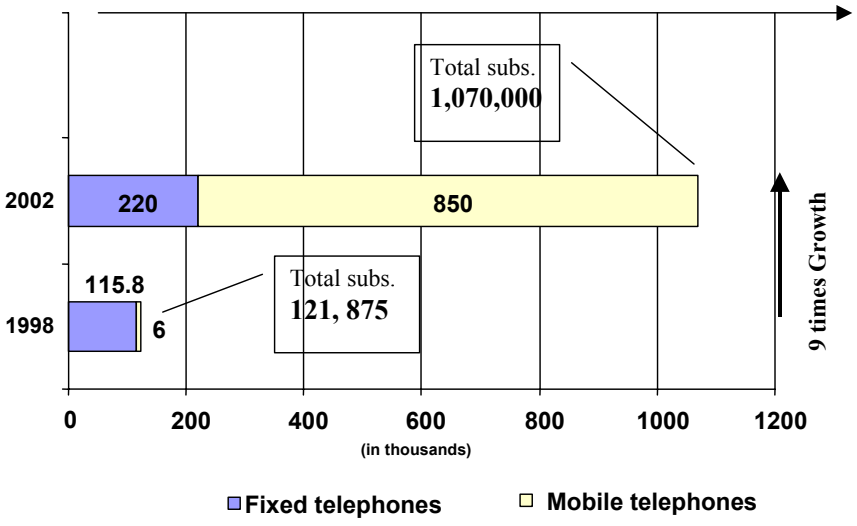


In the mobile market, where reform was fully implemented, the results are very impressive. While in 2000 this service was available in 20% of the whole territory, where lives 42% of the whole population, and was used by only 20 thousand people, today this service, provided by two companies AMC and Vodafone Albania based on GSM technology, is available in 65% of the country territory, to which corresponds 85% of total population. By the end of 2002, the number of mobile subscribers reached to 850 thousands, or a penetration of 28%.

In contrast with mobile, reform in fixed telephony, which was based on Albtelecom privatisation, is not achieved. As results of difficulties that are facing international telecommunications market, privatisation of Albtelecom was not executed. Comparing to 1998 the number of Albtelecom subscribers is doubled and has achieved to 210 thousands, which corresponds a penetration of 7%. However, the development rate is still low for fulfilling fixed telephony needs and for achieving European levels. Furthermore, only 1% of Albtelecom users live in rural areas.

Fixed telephony operators in rural areas (all private owned), even in the beginning of their activity, provide services to 10 thousands rural people.

Growth of telephony market



Internet market is still in the initial phase; there are only 15 thousand Internet users. It is developing, but the growth rate does not assure overcoming this situation in a middle term period. Of course, cultural and economic factors have their impact on this situation. Nevertheless, Albanian Internet development to the European levels needs huge financial resources, which cannot be provided without the foreign capital presence, as the mobile experience showed.

The above telecommunications market overview shows that a lot of work needs to do. Indicators show that only 1 in 5 households owns a fixed telephone line, and a big gap exists between urban and rural areas. The gap is bigger comparing to the European Union.

The evolution of ICT (Information and Communication Technology) last decade has spurred in the developed countries the creation of the so-called information society. The information society has shown the potential to render the economy more competitive, more efficient and productive, but also life more humane. ICT is in fact the essential tool to build the Information Society, and to reduce this gap between poorer and richer countries, called now digital divide.

Being aware on the importance ICT have, this year Albanian Government approved "Albanian ICT development strategy". This document sets 13 main goals:

1) Pro-Active, Well-Coordinated National ICT Policies;
2) Creation of ICT-Supportive Legislative Environment;
3) More Effective, Transparent, Responsive Government and Public Services;
4) Promoting Basic Computer Literacy;
5) Creating a Cadre of Advanced ICT Specialists;
6) Supporting ICT in Health and Social Services;
7) Supporting Development of Locally Relevant Content and Applications;
8) Creation of a competitive, liberalized telecommunications sector;
9) Development of inexpensive, fast and secure ICT infrastructure throughout Albania;
10) Development of the ICT Sector as a Production Sector;
11) Supporting Electronic Business;
12) Active participation in SEE regional Initiatives;
13) Active participation in EU Initiatives.

To this end, the Ministry of Transport and Telecommunications have drafted an action plan; its main directions consist on:

- To achieve by the end of 2005 about 450-500 thousands fixed working lines. Albtelecom have to be the biggest contributor.
- To further escalate competition in mobile market, by issuing 3rd GSM license to Albtelecom. During 2004, licensing procedures for 3rd mobile generations will be prepared.
- To extend telecommunication infrastructure in rural areas. Besides contribution of rural operators, Albtelecom has to install at least 30 lines in each commune centre. Moreover, by the end of 2005 lines, 5% of its fixed subscribers should belong to rural areas. Meanwhile, Albanian Posts has to offer to the public Internet services in its postal offices in rural areas.
- To improve regulatory framework, to fully comply it with EU directives, and to fully liberalize fixed telephony market. Focus will be on improving efficiency in managing scarce resources, such as frequencies and numbering, and their assignment through transparent and non-discriminatory procedures.

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Angola

Rapport national de l'Angola sur le développement des télécommunications

Présentation du secteur des télécommunications en Angola

1 Encadrement institutionnel

L'Institut Angolais des Communications – INACOM, crée par force du décret n° 12/99 du 25 juin, est une Institution Publique, dotée d'une personnalité juridique et possède une autonomie financière et patrimoniale.

2 Attributions et compétences

Ses attributions sont classées dans trois principaux niveaux

2.1 Assistance au gouvernement

Assiste le gouvernement dans la définition de politiques pour le développement des télécommunications dans le pays et prepare le cadre légal du secteur.

2.2 Réglementation du secteur

- Organise le secteur;
- Attribue et supervisionne les licences pour l'exploitation de services de télécommunications ouverts à la concurrence, établit les prix et adopte des mesures pour la défense de consommateur.

2.3 Dans le domaine technique

- Gère et controle le spectre de fréquences radioélectriques;
- Homologue les equipements et matériels de télécommunications;
- Etablit les plans fondamentaux, les normes et les particularités ou spécificités techniques pour le fonctionnement des systèmes de télécommunications;
- Etablit encore les règles de base pour les accords d'interconnexion.

3 Politiques du secteur des télécommunications en Angola

Le livre blanc approuvé par le conseil de Ministres en juin 2001 constitue le plan directeur dans lequel est défini les politiques pour le développement du secteur des telecommunications en Angola. De part la publication de ce livre, l'objectif poursuivi par le gouvernement angolais est de promouvoir le développement continu ou soutenu de télécommunications, mise à la portée du public, de façon à garantir un accès universel aux citoyens et à la société moyennant la définition de:

- Formes de promotion et de participation de plusieurs intervenants dans le secteur,
- Règles pour l'encadrement de l'intervention de l'Etat,
- Un cadre légal, propice aux investissements du secteur privé,

- Formes et mécanismes pour la création et le developpement de capacité humaine et tecnologie nationale,
- Rôle à assumer pour l'Angola dans le contexte des télécommunications aux niveau régional, continental et global.

Dans le cadre des stratégies globales tracées pour le secteur, l'INACOM est entrain de travailler dans:

- L'octroi des licences aux nouveau opérateurs;
- Le problématique ayant trait à l'interconnexion;
- L'administration des plans fondamentaux;
- Le controle de prix et de la qualité des services.

En ce qui concerne l'octroi des licences il faudra retenir qu'en Janvier 2003, l'INACOM a concédé quatre (4) licences de service fixe complémentaire pour une période d'exploitation de 15 ans. Dans ce contexte, il s'avère donc nécessaire l'adéquation et le développement du plan de numération.

Ce plan est au centre des attentions de l'INACOM, compte tenu de la nouvelle conjoncture du marché, caractérisée par l'entrée de quatre nouveaux opérateurs, qui au terme des réglements du concours devront commencer leurs activités huit (8) mois après la date de la concession de licence d'exploitation.

Dans le cadre de la coordination régionale, l'INACOM reconnait la nécessité de accroître et d'accélérer les actions de coordination et de l'intégration communautaire.

A cet effet, il vient de replanier le spectre radioélectrique, elaborer simultanément un diplôme légal sur cette matière, qui a déjà été approuvée par les instances superieures du pays.

Outres les diplômes déjà approuvés, le conseil des ministres devra encore se prononcer sur les diplômes suivants:

- Tarifaire radioélectrique,
- Réglement pour l'autorisation technique des stations de radiodiffusion,
- Réglement général d'interliaison,
- Réglement de prix des services publics des télécommunications,
- Plan de numération.

4 Le marché

Actuellement la structure du marché est de la forme suivante:

a) Service fixe

Operateurs	Services proposés
Angola Telecom	Téléphonie Données Circuits de louage Postes publics Telex
Mercury, SARL	Téléphonie Données (IP, ISDN) Internet Circuits de louage Téléservice
Mundo Startel, SARL	Téléphonie Internet Postes publics
Telesel, SARL	Téléphonie Données/Internet Circuits de louage
WEZACOM SARL	Téléphonie Données/Internet Télécentres Cabines publiques

Les quatre derniers sont les nouveaux opérateurs du marché angolais des télé-communications.

b) Service cellulaire

Opérateurs	Technologie	Début d'exploitation
Angola Telecom	AMPS/CDMA	1992
§ UNITEL	§ GSM	Abril/2001

ICTs pour le développement: accès public à l'Internet

Bien qu'il existe déjà l'accès direct à l'internet par satéllite, le problème de l'internet en Angola est primordial. Opérateur historique des réseaux de base, l'Angola Telecom n'est pas un ISP, dispose d'un backbone national et international qui sert de support aux services de l'internet.

Il a à cet effet, instalé à Luanda un point national d'accès avec facilité de peering, pour bien servir les ISP.

Il existe plusieurs prestataires de service internet en Angola, mais les principaux sont:

Ebonet, Netangola, SNET et Multitel. Les quatre prestataires, exploitent leur service à Luanda, capital du pays et dans d'autres zones importantes du pays, possèdent environ 11 000 utilisateurs. Des mesures adoptées pour assurer l'accès du public à l'internet sont: la création des télécentres, cafés internet, points d'accès dans les bureaux de poste, accès dans des établissements publics et les universités.

Les quatre nouveaux opérateurs licenciés en janvier dernier par l'INACOM vont aussi exploiter le service de l'internet dans tout le territoire national.

Les facteurs qui empêchent le développement des télécommunications en Angola sont les suivants:

- Peu d'investissement,
- Concentration des infrastructures de télécommunications dans des zones urbaines,
- Tarifs encore élevés.

D'efforts considérables ont été amorcés, afin de permettre à l'INACOM de devenir un régulateur indépendant en réglementation, contrôle des normes et d'emissions, assurant ainsi l'amélioration du système de planification, de gestion et de vérification du spectre radioélectrique.

Comment devenir un régulateur indépendant?

Avec l'aide de l'UIT peut-être?

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Armenia

Telecommunication Development Country Report for Armenia

1 Integrating Consumers into the Regulatory Process

In accordance with legislation effective in the Republic of Armenia, policy-making and regulatory area of the Armenian telecommunication is currently represented by the Ministry of Transport and Communication of the Republic of Armenia. The Ministry is authorized by the Armenian Government to elaborate and implement the policy of this area, as well as to license and regulate telecommunication activity of operators available in the market. Regulation of the nation-wide exclusive telecommunication operator of basic telephony, GSM and international access services (ArmenTel Company, a join venture with OTE Holding, Greece) constitutes an enormous part of regulatory efforts within scope of the Ministry's activities.

Interaction between the Ministry and consumers of telecom services serves as an important channel through which necessary inputs are received and transformed into an information and then vision for further regulatory initiations: monitoring, research and reporting, issuance of government directives, enactment of laws.

The interaction process with consumers usually includes the following components:

- Receipt and processing of consumer complaints and inquires by a structural unit of the Ministry, notably Communication Department,
- Focused monitoring and research/ surveying on the basis of received inputs, which may sometimes require calling of special commissions and holding of cooperative efforts with an operator and/or consumers,
- Requesting and receipt of additional necessary information from operator and/or consumers through the means of direct meetings, phone calls, traditional letter inquires, electronic mails.
- Follow-up information and feedback provision to consumers by the Ministry, featuring a regulatory effort (reporting, issuance of government directive, enactment of law) being initiated.

Interaction with consumers in the policy-making area of telecommunications is another platform upon which the Ministry has been elaborating principles of telecommunications development. In pursuit of consumer interests and on the Ministry's invitation, the Consumer Union (a non-for-profit organization) of the Republic of Armenia has recently delegated its representatives to actively participate in a working commission regular sessions, aimed at reforming and development of Conception for Armenian Telecommunication and Informatization Sectors Development. This commission has been created by the call of the Ministry and has invited responsible public organizations, private operators and civil society participants of the ICT field, such as Consumer Union, Union of Internet Users (Internet Society) to express their needs and conceptual visions for future development of ICT field in Armenia.

Opinions from consumer sector are contributive in terms shaping a customer-oriented, socially responsible telecommunication environment, calling for a transparent regulation, equitable approach to dispute resolution, multifactor QoS indicators, direct and regular participation of consumers in the regulator's decisions. These are the needs and requirements which have indeed been challenges for the regulator as well as private operator in the current monopolistic telecom environment of Armenia.

For a developing country, competition in the telecommunications services on one side, and universal service provision on the other, can be the necessary policy levers upon which a balanced business environment would be created: consumer-oriented for the population as well as equally favorable for all operators included. It should be noted that fast-paced technological developments presently experiencing in ICT field allow to lessen the social burden (for operators) of universal service provision to the most possible extent.

ITU BDT can assist its member countries with the task of integrating consumers into the regulatory process by working out a viable policy or mechanism of communication between state regulatory structures and consumers/their unions and associations. With respect to this, special working sessions may be convened with the participation of ITU member regulators and administrations, sectoral members, consumer representing agencies and institutions. The outcome of the work would be structured into a formal recommendation or a report to be considered by member states.

Another option where ITU's support can be instrumental is guidelining in formulation and definition of technical and business (multifactor) QoS indicators on basis of inputs and opinions from consumer perspective. These efforts may result in recommended guidelines for shaping standard indicators that would be acceptable by the industry, consumers and regulator of an ITU member country.

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Bangladesh

ICTs for development – Internet for all: Public Internet Access

1 Bangladesh: Country Profile

Geographical location	Between latitude 20°34' and 26°38' North and between longitude 88°01' and 92°41' East, South Asia
Boundary	North: India West: India South: Bay of Bengal East: India and Myanmar
Area	144,000 sq. km.
Administrative unit	Division: 6 District: 64 Upazilla: 496
Population	140 million
Literacy rate	44.3% (15 yrs. and above)
Climate	Sub-tropical Temperature: Winter 11°C to 19°C Summer 21°C to 34°C
Standard time	GMT + 6 hours
Language	Bangla
Currency	Taka
Land profile	Flat terrain crisscrossed by 4 big rivers and their tributaries
GDP (2002-2003)	Taka 3 004.85 million (USD 51.89 billion)
GDP growth rate	5.33%
Per capita income	23 025 Taka (USD 386)

2 Introduction

Knowledge is the heritage of all humanity. It is an unlimited resource that continuously grows and enriches as it is shared. Extending and protecting the information in the public domain is a major way of bridging the digital divide within and between the countries. The main vehicle of transferring and sharing the knowledge is Information and Communication Technology (ICT).

The Information and Communication Technology (ICT) is one of the driving forces for the socio-economic development of a country. With the advancement of Information and Communication Technology, one can live in the global village irrespective of distance or national and international boundaries. The term Information and Communication Technology (ICT) springs from the convergence of telecommunication, computing and broadcasting through the use of digital information.

3 ICT Capabilities and Digital Divide

Information and Communication Technology (ICT) can play a vital role in transforming the digital divide to digital opportunites. ICT not only narrows the gap between developed and developing countries but also works as a tool to bridge between haves and haves not. Though Internet may provide equal opportunities and democratic communication, yet access is limited to those who have Internet access either at home, at work or at an educational institution. Two significant factors to Internet access are income and education. Over and above, other factors such as age, gender, occupation and even geographical region also affect the degree and nature of Internet use in a given country.

Four priority areas, namely participation of government, infrastructure development, human resources development and enhancement of ICT literacy, draw particular attention for ICT take-off in the least developed countries. Above all, having recognized the crucial role of ICTs in the present as well as in future days to enhance ICT capabilities, political will is mandatory. Infrastructure development and human resource development constitute the fundamental building blocks for any development in the ICT sector.

The Least Developed Countries (LDCs) face the fast rate of technological change and sector expansion, which puts tremendous pressure on the upgrading of skills. They have acute shortage of ICT specialists and needs assistance from the international and regional organizations to use more ICT based tools. The manufacturers should come forward with appropriate technology for a low cost and high quality ICT terminal so that a maximum number of the people can have access to it with affordable cost.

4 ICT Scenario in Bangladesh

Bangladesh stands far behind compared to other regional and developed countries in terms of ICT infrastructure. A significant number of new projects has been taken by Bangladesh Telegraph and Telephone Board (BTTB), only public telecommunication sector of the country, under the initiative of Ministry of Posts and Telecommunication in order to increase the tele-density as well as to enhance the ICT activities in the country.

Telecom Scenario

Items	June 1990	June 1995	June 2000	June 2002	June 2003
Fixed Telephones	245 824	320 734	580 000	715 000	920 993
Cellular Mobile Telephones	0	3 000	235 000	710 000	1 350 000
International Circuits	200	954	2 302	2 767	3 600
Digitalization of Switching	1.25%	25.12%	68%	90%	94%
Tele-density	0.22	0.27	0.6	1	1.6

4.1 Fixed and Mobile Telephone

While considering the information infrastructure of Bangladesh, one should consider the parameters like access to telecommunication, fixed telephone penetration and mobile telephone penetration. The state-owned organization BTTB provides fixed telephone in urban as well as in rural areas whereas the other two private operators serve in some of the rural areas, for which they are able to cover 26 000 subscribers only (2.8%).

In Bangladesh, the fixed telephone density is only about 0.65%, which is very low compared to the developed countries. The telecom sector was liberalized for private investment in late 1980s. By this time only 4 (four) private operators are providing mobile telephone services. At present the numbers of mobile telephones outnumbered the fixed telephone lines and mobile tele-density is now about 0.95%.

4.2 Internet Services

Although not adequate, Internet and Data Communication facility in Bangladesh has

been greatly expanded. Long before Internet Services and Data Communication have been privatized. There are 114 Internet Service Providers (ISPs) all over the country connection through VSAT. The number of users is around 70 000.

First online Internet service has been introduced in Bangladesh in 1996. BTTB started the Internet service in early 1999. Two types of services are available now – Dial-Up and Leased Line Internet service. The present capacity of access port is 506 and backone capacity is 10 Mbps connected via two routes – one Teleglobe (Canada) and C&W (USA). Initially the Internet service has been made available only to 6 major cities, but due to huge demand BTTB has extended this service to all the 64 districts' headquarters. Now Internet service is also available at Upazilla levels/rural areas. Out of 496 Upazilla headquarters and Growth centers only 144 have been covered. However, project has been taken to make the remaining Upazilla headquarters under digital switching which will be completed by June 2005. The unique features of BTTB Internet service are roaming facility and CallerID authentication (in addition to username and password authentication).

Leased Internet connections (Broadband) are offered to the corporate users. The service is being given over DDN links. BTTB can provide this service to the areas where DDN nodes (23) are installed. About 10 universities, software exporters and large organizations have been using BTTB leased Internet service.

All the infrastructures of BTTB are playing an immense role in the activities of the ICT arena. Telephone connections, Microwave links, Optical fibres, Digital Data Network, Packet Switched Data Network, Internet Systems are supporting different organizations and people as a whole to move to an Information Society.

4.3 Digital Data Network (DDN)

BTTB has established a Digital Data Network in early 2000 with a total of 9 nodes covering 5 districts only. Under increasing demand, this network has been expanded to 13 districts with a total of 23 nodes till today. The DDN network is able to provide high-speed point-to-point leased data line from 64 kbps to 2 048 kbps using voice grade copper cables. Within a short time this service has become popular among the multinational organizations, banks, software compagnies and other organizations. Banks are using this service for their online banking service, operating Automated Teller Machines and credit card verifications, etc. The multinationals and other organizations are using high-speed link for data/file transfer and information sharing among their different offices. The performance of this network is very much better than services through VSAT and radio.

4.4 Packet Switched Data Network (PSDN)

Bangladesh Telegraph and Telephone Board (BTTB) has installed Packet Switched Data Network having nodes at the Dhaka multi-exchange area and 5 (five) other cities. The network provides three types of services to the data subscribers. These are X.25 leased, X.28 leased and X.28 dial-up subscriber. Internode connectivity has been provided over DDN (Digital Data Network) and international gateway connectivity has been obtained through Satellite Earth taking one 64 kbps circuit with VSNL (Videsh Sanchar Nigam Limited), New Delhi.

5 Factors affecting the promotion of ICT in Bangladesh

The digital gap is wider in Bangladesh compared to other developing countries. The lack of driving forces for the digital divide: technological, economical, educational, social and political and human resource are mainly responsible for this wider gap.

- *Techological factor*: one of the main reasons of digital divide in Bangladesh is the poor telecommunication infrastructure. Only about 6 persons out of 1 000 have access to fixed phones, which is the cheapest media to access Internet. And also about 10 persons

out of 1 000 have mobile telephones. Internet access through mobile telephone is very limited and expensive.

- *Economic factor*: the economic factor is one of the vital issues for computer use and Internet connectivity. Usually, wealthy and educated as well as young and urban people have the Internet access which implies that affordability plays an important role to inspire people to use Internet.
- *Educational factor*: illiteracy as well as the language barrier are also evolved from the educational factor. Due to literacy problem, Bangladesh is facing an acute crisis of skilled computer user. Language problem is also an important problem for the local user of the Internet.
- *Social and political factor*: male groups of the society can avail the web-access facility from commercial centers or outside the home but the local female community has limited access due to social and politial environment. Unfortunately, due to family obligations and services, they cannot spare sufficient time for using the Internet.
- *Human resource factor*: as we are approaching the digital era, the demand for human resource development is enormously increasing both for users and professionals. Without educated people, mere expansion of services will not be benefited. To provide ICT for all, it is necessary to increase the penetration of ICT-related products and services. To empower the people in ICT, general literacy, ICT awareness and training have no alternatives.

6 Government initiatives

To promote ICT in the country, all the districts and more than 144 Upazillas have been brought under digital telephone network. Government has taken a policy to digitalize all the 496 Upazillas and some important growth centers to expand its digital network by 2005. Moreover, the installation charge of telephone connection in the public sector particularly in the rural and sub-urban areas has been reduced to promote more access to the information and communication technology.

Installation of one million mobile phones covering the whole country through BTTB is under active consideration of the Government. For both public sector and private sector participation in mobile communications, mobile telephone penetration will certainly increase to a satisfactory level. With the introduction of BTTB's mobile telephone service along with private operators, rural telecommunication infrastructure will also be developed and the rural people will be able to get the facilities of ICT.

Governement is playing a very positive role to expand Internet services throughout the country. A project is on implementation to expand the Internet service in the rural areas to allow the rural people to get the access to ICT.

In an initiative to encourage the people to use more Internet, the Government has recently reduced the usage charge of BTTB's Internet services for both dial-up and leased line. BTTB is also encouraging private ISPs, universities and educational and research institutions, software exporters and corporate offices to lease Internet access at a very reasonable price. Moreover, Bangladesh has signed the consortium of SEA-ME-WE-4 to lay a submarine cable in order to have connectivity with the Information Super Highway. This cable will provide Bangladesh with sufficient bandwidth for ICT expansion and software export/data transmission at a much cheaper rate.

The price of ICT equipment has been falling sharply due to ICT-friendly taxation measures taken by the Government with a view to play positive impact for enhancing ICT capabilities of the country.

In Bangladesh, Telecom Regulatory Commission (BTRC) has been functioning since January 2002 and an updated Telecommunication Act has been enacted. It is expected that regulatory measures will help to create a conducive atmosphere for ICT investment and contribute to narrowing the Digital Divide.

7 Conclusion

To achieve the equitable universal access to Information and Communication Technology (ICT) for promoting social, economic and cultural development, to share knowledge and information to all citizens of this planet and to alleviate poverty, the United Nations have taken a resolution to hold a World Summit on the Information Society (WSIS). The first phase of the Summit will be held in Geneva from 10-12 December 2003 and the second phase in Tunis in 2005.

Though Bangladesh is making progess in expanding access to communication network, yet the rate is not fast enough to provide most citizens with access to ICT. The basic telecommunication access is not enough to promote ICT, unless it is affordable to the common people. Developed countries, international and regional organizations should come forward with a helping hand to the Least Developed Countries on different issues in order to promote ICT.

To promote Information and Communication Technology in order to get universal and affordable Internet access the following reommendations can be made:

- *Infrastructure*: priority should be given to develop the domestic telecommunication infrastructure with access to the main backbone of the International Information Super Highway in public sector as well as in private sector in order to extend socio-economic benefits of ICTs to all segments of society.
- *Human resource*: human resource development is key to enabling the people in the LDCs to benefit from the access to technology. Inclusion of ICT into the educational curriculum and proper training in hardware and software, appropriate to the needs of the times, is essential.
- *Attention to marginalized groups and areas*: promoting easy and affordable access to ICT, particularly to the rural and remote communities, by installing ICT-based equipment and extending the wired and wireless connectivity in order to provide ICT-enabled services like e-education, e-business, e-medicine, etc.
- *Awareness*: campaigning ICT awareness through mass media and developing web sites in local languages containing information which is more beneficial to the common people.

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Benin

Les défis de la planification des réseaux de télécommunications au Bénin

Introduction

La planification est déterminante dans la gestion des réseaux des Télécommunications. De la conception des programmes à leur réalisation, de nombreuses étapes intermédiaires méritent une attention particulière pour la bonne maîtrise de l'exploitation des équipements. Cependant de nombreux défis sont à relever pour que la planification puisse prendre sa place dans les programmes de développement des réseaux de télécommunications au Bénin. Les éléments à prendre en compte en ce qui concerne l'opérateur historique sont aussi bien endogènes qu'exogènes.

1 Contraintes liées à l'entreprise

1.1 Le système de gestion de l'information

Le système de gestion en place dans l'entreprise ne repose pas sur des indicateurs fiables. Des informations essentielles comme le chiffre d'affaires, le taux de recouvrement des factures à la clientèle, les indicateurs de performances des équipements, les taux de dérangements, les montants de factures, les sommes mises en recouvrement et les montants recouvrés ne paraissent pas toujours cohérents.

Ces indicateurs connaissent des distorsions de leur cueillette jusqu'à leur transcription et leur utilisation dans le système d'information de l'entreprise.

Cette situation perdure car à divers niveaux de responsabilité la préoccupation majeure ne se trouve pas dans un recueil d'indicateurs liés aux tâches définies à partir des objectifs. L'insuffisance des analyses des indicateurs ne permet pas de mettre en exergue les forces et les faiblesses et dans une certaine mesure d'améliorer ces dernières.

1.2 Les budgets annuels de l'entreprise

L'absence de la comptabilité analytique ne permet pas de rattacher les charges et les projets aux centres de responsabilité. Des efforts sont faits pour préparer un budget par Direction, mais il reste que certains éléments sont agrégés parfois par la Direction de l'Approvisionnement chargée des acquisitions. Le cas le plus indicatif provient des budgets de fonctionnement destinés à la maintenance. Les prévisions des montants ne reposent pas sur des quantitatifs de chaque service et la sommation globale constitue le besoin sur la période. Un autre exemple, c'est le matériel de bureau dont l'estimation n'est pas souvent maîtrisée par chaque service.

Quant aux budgets d'investissements qui semblent recueillir l'essentiel de l'attention, le financement n'est pas identifié et même sa recherche ne constitue pas souvent un souci pour la Direction qui l'a prévue. Elle attend en toute évidence de son collègue de la Direction Financière et Comptable la mise à disposition des fonds.

1.3 L'organisation du travail

Malgré la définition précise des postes dans l'organigramme, l'organisation effective du travail crée des confusions dans les attributions. Il y a même une tendance à voir plusieurs responsables s'attribuer les mêmes prérogatives. C'est ainsi qu'à défaut d'évaluation relative aux procédures et expériences mises en œuvre, certaines activités sont prises d'assaut pour une raison ou pour une autre tandis que d'autres paraissent abandonnées.

Le développement des ressources humaines constitue la pierre angulaire des insuffisances observées çà et là. Les programmes de formation à la tâche ont été détournés et interprétés comme des visas aux postes de responsabilités. C'est vrai qu'il y a eu une non concordance entre le souci de former un agent pour améliorer son rendement à sa position et l'obligation de promotion fortement recommandée par la convention collective outil de gestion des ressources humaines de l'entreprise.

La planification n'est donc pas encore perçue comme un creuset où chaque responsable doit venir puiser sa force pour mieux atteindre ses objectifs.

2 L'environnement national

2.1 Les procédures d'acquisition

Depuis janvier 2001, il a été institué une Commission Nationale des

Marchés Publics qui doit autoriser et signer les marchés publics dont le montant est:

- supérieur ou égal à dix millions (**10 000 000**) de Francs CFA pour les acquisitions de fournitures et services.
- supérieur ou égal à trente millions (**30 000 000**) de Francs CFA pour les travaux.

Le suivi rigoureux de cette procédure fait qu'une acquisition entamée en début d'année budgétaire ne peut intervenir avant le 3^{e} trimestre de l'année.

La Commission Nationale des Marchés Publics autorise l'appel d'offres, participe aux travaux d'évaluation, approuve le rapport d'évaluation et signe le marché.

2.2 Le régime fiscal

Le régime fiscal du Bénin n'exonère pas automatiquement les investissements en télécommunications. Ceci intervient dans le cadre des financements bilatéraux ou multilatéraux avec les pays ou les institutions internationales de financement. Il est alors spécifié que le prêteur ne prend pas en charge les coûts liés à la fiscalité en vigueur en à venir.

En dehors de ces cas, l'OPT dédouane normalement ses acquisitions au cordon douanier à hauteur de 40 à 50% du prix CIF des fournitures. Ces facteurs doivent être pris en compte dans les schémas d'investissement. Malheureusement ce n'est pas souvent le cas, ce qui constitue une pression à l'arrivée des fournitures au cordon douanier sur la trésorerie.

2.3 L'organisation territoriale

Il est difficile d'identifier un critère simple et convaincant sur la base duquel le découpage administratif est fait. Ce qui est commun à toutes les zones c'est un besoin très urgent d'accès aux équipements de télécommunications pour satisfaire une soif de communiquer.

Au niveau des villes et des villages, aucune politique d'occupation du territoire n'est mise en œuvre. A un moment donné, l'OPT s'est même vu obligé de participer à un programme de numérotation et de baptême des rues dans l'ensemble du pays aussi bien pour déployer son réseau de télécommunications que pour repérer les destinataires de courrier et la distribution des factures de téléphone entre autres.

Dans les campagnes, l'habitat est très dispersé imposant de fait l'utilisation de la technologie sans fil car le réseau filaire se révèle techniquement inadéquat et financièrement onéreux.

2.4 Le niveau de vie des populations

Le raccordement téléphonique pour un abonnement résidentiel se fait au coût de quatre vingt seize mille quatre cent quatre vingt douze (**96.492**) Francs CFA payable une fois et cent soixante quinze mille six cent quatre vingt douze (**175.692**) pour un abonnement commercial payable une fois. Des frais d'entretien sont payables chaque mois en plus de la consommation.

Le chiffre d'affaires moyen par abonné est de cinquante quatre mille (**54.000**) francs CFA l'an.

Souvent à la date limite de paiement des factures «les queues» constituées par les clients sont longues devant les guichets de recouvrement. Malgré des délais de paiement raisonnables, les clients arrivent difficilement honorer leur dû. Parfois même certains font recours appel à des prêts. Le besoin est donc évident mais la capacité financière pour payer le service rendu n'est pas toujours suffisante.

2.5 La position géographique

Le Bénin est un pays allongé de l'Océan Atlantique au fleuve Niger, sur 750 km et limité à l'Ouest par le Togo, au Nord par le Niger, au Nord – Ouest par le Burkina Faso et à l'Est par le Nigeria.

De la côte jusqu'à 400 Km vers le Nord et sur 50 Km jusqu'à la frontière avec le Niger, donc 450 en largeur le pays ne dépasse pas 125 km.

Sur le reste des 300 km, la distance extrême atteint 300 km, zone dans laquelle la densité de la population est la plus faible.

Par ailleurs comme partout ailleurs en Afrique les frontières sont très poreuses favorisant de fait une migration relativement facile des populations le long des frontières.

3 Conclusion

La rentabilité des investissements constitue un souci permanent de gestion qui risque d'être désespérément espérée dans les zones rurales où vit 70% de la population du pays.

Les contraintes sus mentionnées loin d'être un handicap doivent être tournées en avantages afin que la planification devienne une activité permanente quotidiennement prise en compte.

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Bhutan

ICT for Development vis-à-vis Gross National Happiness

1 Country background

The Kingdom of Bhutan lies in South Asia, in the Eastern Himalayas. It is landlocked, between the Tibetan Autonomous Region of China to the north and India to the east, south and west; with a total surface area of 46,500 square kilometers and a population of about 700,000. The country is almost entirely mountainous, with land rising from about 160 meters above sea level in the south to the high Himalayas in the north that rise to over 7,500 meters. Administratively, Bhutan is divided into 20 *Dzongkhags* (or districts), which are further sub-divided into 201 *Geogs*[1].

Bhutan has only recently ended its self imposed isolation and joined the international community. The process of planned modern development began with the First Five Year Plan (1961–1966). As it has gradually joined the international community, Bhutan has adopted a unique approach to development: Gross National Happiness (GNH). Articulated by the fourth and present King Jigme Singye Wangchuck in the 1970s to underline that development has more dimensions than just those associated with Gross Domestic Product (GDP), GNH has served to direct change within Bhutan for the last two decades. It recognizes that there are many dimensions to development and that economic goals alone are not sufficient. Development is understood as a process that seeks to contribute to both the material and spiritual well-being of the person. The four major areas identified as the main pillars of GNH are economic growth and development, preservation and promotion of cultural heritage, preservation and sustainable use of the environment, and good governance.

Into the second year of the Ninth Five Year Plan, 9FYP (2002–2007) now, the basic infrastructures in the country have been considerably improved. This in turn has allowed new economic activities such as the sale of hydroelectric power and construction to be developed. Indeed, the electricity sector provided almost 45% of the national revenue in 2000–2001 and is increasingly pivotal to the country's economic development. At the same time, the government has sought to improve the basic level of education and the efficacy of government. In late 1999, the government released a report aimed at facilitating good governance through enhancing efficiency, transparency and accountability that has subsequently been acted upon.

A vivid demonstration of Bhutan's willingness to embrace the international community can be found in its membership of international organizations such as the United Nations, World Bank, International Civil Aviation Organization, International Monetary Fund, G-77, Universal Postal Union, World Intellectual Property Organization, International Telecommunication Union (ITU), Asia-Pacific Telecommunity (APT), Asian Development Bank, South Asian Association for Regional Cooperation, etc. Through these organizations, Bhutan has begun to internationalize its decision-making processes. Bhutan has also applied to join the World Trade Organization (WTO), with a working party

[1] A Geog is the smallest administrative block comprising a number of villages. A village population in Bhutan normally ranges from 50 to 300.

having been established in 1999 to examine its application.[2] As of date, Bhutan has formal diplomatic ties with 22 countries.

2 Information and communications scenario

Telecommunications (telecoms) and information technology (IT) in Bhutan are also fairly recent affairs. The Royal Government of Bhutan (RGoB) initiated the first telecoms network to support road construction services, in 1963; the system then consisted of three separate analogue networks. Modern telecoms development process began in the late 1980s; IT was formally launched in June 1999 with the introduction of the Internet, and cable television services provision regularized in November 1999.

An accelerated development of the telecoms sector in Bhutan started with the formulation of the National Telecommunications Master Plan (the Master Plan) in 1989 by the then Department of Telecom (DoT). The Master Plan was funded through external grant aid from 1991 onwards, and implemented in four phases over a 7-year period. Bhutan now has a reliable digital telecoms network interconnecting all the 20 Dzongkhag headquarters and major commercial centers. The main transmission backbone network consists of 34 Mbps digital microwave routes connected to digital switching systems at some of the populous Dzongkhag centers and other urban areas while the lesser traffic spur routes consists of 8 Mbps microwave radios connected to Remote Line Units (RLUs). Digital Radio Multiple Access Subscriber System (DRMASS) was also deployed to extend services to some of the Dzongkhags and few other urban centers with smaller capacity requirements.

Present connectivity is limited to the Dzongkhag headquarters, satellite towns, places with close proximity to motor roads and very few rural areas. Rural services have been extended using Very High Frequency (VHF) and Very Small Aperture Terminals (VSAT) technologies. High Frequency (HF) wireless communications still play a vital role in serving isolated remote areas. National teledensity is about 3.25% but actual penetration in the rural areas is less than 0.01% per 100 inhabitants. About 79% of the Bhutanese population lives in rural areas. Only 76 of the 201 Geogs have telephone connections at present.

Internet services were introduced in June 1999 with the establishment of *DrukNet*, the country's first and only Internet Service Provider (ISP) so far. In its fourth year, DrukNet has about 1,750 dial-up and 26 leased line customers nationwide. There are 16 IT-based firms, 18 computer training institutes and about 15 Internet Cafés, 7 of which are based in the capital Thimphu. At the most 5,000 people must be accessing the Internet, which is less than 1 per 100 inhabitants. Literacy, in general, is low, at 54%. ICT literacy is very low. There are at present about 7,000 computers in the country, most of which are concentrated in the capital city and other urban centers.

The 77th Session of the National Assembly passed the Bhutan Telecommunications Act 1999, paving the way forward for sector reform. The Division of Information Technology (DIT) was created to promote IT development and Bhutan Telecom Authority (BTA) to regulate the telecom sector, in January 2000. The erstwhile DoT was transformed into a wholly government owned corporation, Bhutan Telecom (BT), in July 2000. Bhutan Telecom is the monopoly provider of all telecommunications services in the country till date.

BT has implemented a wireless Voice over Internet Protocol (VoIP) rural access pilot project in two geographically distinct areas, in 2002, with some valuable assistance from the ITU. The first phase of the project to introduce mobile cellular communications in the country is well underway and should commence operations by end of 2003. BT is also negotiating with the Danish Government for funds to

[2] Bhutan applied to join the WTO on the 17th September 1999, with a working party being established in October 1999. However, it was not until February 2003 that the Director-General of the WTO welcomed the commencement of 'serious work' on its accession process with the delivery of the Memorandum on the Foreign Trade Regime to the WTO.

implement the Rural Telecommunications Master Plan (the Rural Plan).

The Dzongkha[3] Development Commission has developed the software needed to include Bhutan's national language directly into the Windows Operating System. Towards the end of 2003, users around the world will be able to use Dzongkha automatically in all Windows-based programmes, without loading any plug-ins. This will make computers and information more accessible to users who are Dzongkha literate, and help schools teach Bhutan's national language effectively.

The erstwhile Ministry of Communications has been bifurcated into two ministries in June 2003 – Ministry of Works and Human Settlements, and Ministry of Information and Communications – taking into account the dual nature and distinct characteristics of the construction and ICT industries. The restructuring is also the result of the RGoB's initiative to promote good governance through enhancing accountability, transparency and efficiency. The Ministry of Information and Communications (MoIC) has already embarked on the formulation of a draft ICT Policy and a draft ICT Act under the auspices of the UNDP. The draft ICT Act will subsume the Bhutan Telecom Act 1999 and integrate the Media Act, also in the works, to ultimately draw up a single converged information and communications legislation for Bhutan.

3 Ninth Five Year Plan (9FYP), 2002-2007

Bhutan as a landlocked country, far from regional markets, with no major industries, and few export products, has everything going against it in a traditional economic model. It is farther away from opportunities, knowledge and information than many other countries. Thus, the need for promotion and development of ICT is very large, as are the vast intrinsic potential benefits.

Against all odds, Bhutan is characterized by a unique environment that greatly improves the chances for development of a knowledge-based society to succeed: widespread knowledge of English language; fairly good telecom network in much of the country; limited previous computerization, allowing the adoption of new (and open) standards; manageable amount of data and information; and the RGoB's commitment to adopting ICT as an essential and a strategic development tool. The Prime Minister submitted to the ongoing 81st Session of the National Assembly that the focus in the ICT sector was to enhance awareness, encourage the use of ICT and to introduce computer literacy of the population from the school level. Although the role of the private sector, for now, is limited to retailing customer premises equipment, running public call offices, operating Internet Cafés, facilitating IT training and since November 1999, providing cable television services, the Foreign Direct Investment (FDI) Policy approved in December 2002 should boost local and foreign investor confidence and provide access to capital, markets and new technologies. Various measures are being adopted to streamline and simplify licensing and administrative procedures. The entrepreneurship promotion centre would provide credit guarantee schemes to encourage self-employment through small and medium-sized enterprises (SMEs). Several incentives including tax holidays, tax exemptions and other concessions have been granted since 2002 to encourage private sector growth.

The objective of the ICT sector during the 9FYP is to provide 10 telephones for each of Bhutan's 201 Geogs, to expand and enhance communications facilities and services, promote e-governance, generate employment and foster private sector participation and development. These objectives are embedded into the five overall goals of the 9FYP, viz.:

- Improving quality of life and income level, especially of the poor;
- Ensuring good governance;
- Promoting private sector growth and employment generation;

[3] Dzongkha is the national language of Bhutan.

- Preserving and promoting cultural heritage and environment conservation; and
- Achieving rapid economic growth and transformation.

ICT, as an instrument (a tool and an enabler) and as an industry, is fundamental to achieving the 9FYP goals and objectives. Affordable and usable ICT can indeed transform the way societies work, entertain, study, govern and live – at the individual, organizational, sector, vocational and national levels. ICT cuts across all other sectors of the economy, and thus can be used as an important tool for accelerating sustainable socio-economic development. As an industry, ICT represents a growing economic sector covering hardware, software, telecommunication, data communication and consulting services. The implementation of the Rural Plan during the 9FYP is a national priority.

While reliable and affordable ICT infrastructure is the key to e-Bhutan, capacity building and development of appropriate applications and local content are equally, if not more, important.

The RGoB recognizes the role that ICTs can play in transitioning Bhutan towards an information and knowledge-based economy, and that, in the new emerging economic order, information and knowledge is the fundamental basis for wealth creation, for intellectual and spiritual growth, and for national prosperity. The Government believes that ICT offers the opportunity to leapfrog the key stages of industrialization and transform the agrarian Bhutanese economy into an information economy.

The progressive achievement of Gross National Happiness, through ICT for development, is illustrated by the value chain model depicted below.

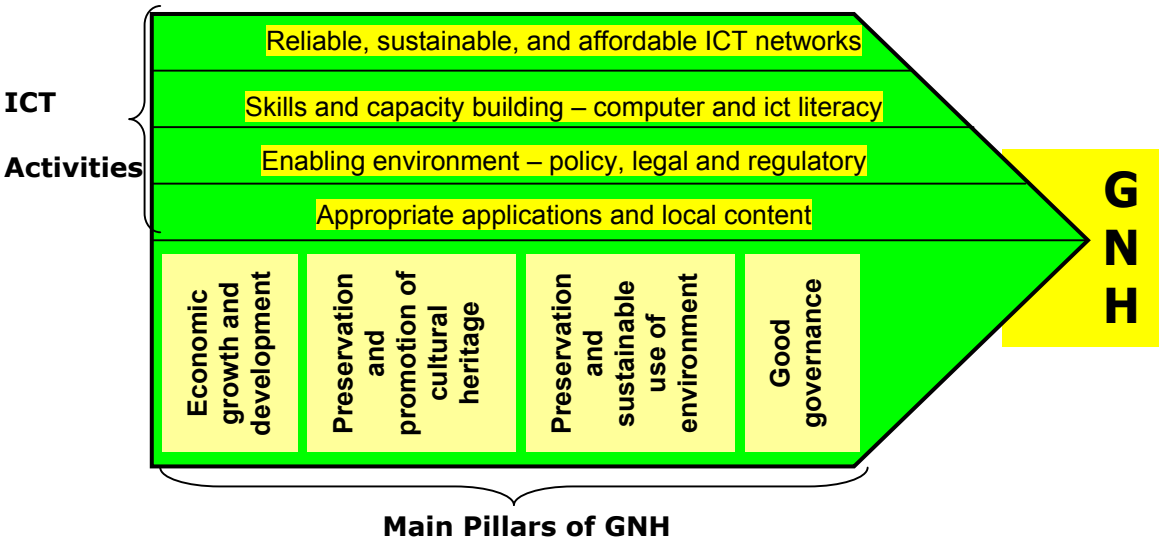

Figure 1 – ICT for Development and GNH

4 The Road Ahead

The right to communicate and the right to access information and knowledge are fundamental human rights (ITU, 2003). Information and communications are at the core of human progress, endeavour and well-being. ICT offers great potential for preserving our national identity and rich cultural heritage, in promoting accountability, transparency and efficiency through e-governance, and in enabling e-education (and life-long learning), e-health, e-business, e-employment, and e-environment.

Information and communications in Bhutan represents "a road less travelled"; "But I have promises to keep. And miles to go before I sleep". The Ministry of Information and Communications is fully committed to facilitating and enabling access to ICT for all Bhutanese, and promoting its use to achieving Gross National Happiness. The MoIC envisions "Information and Communications for All Dzongkhags (districts) and Geogs (blocks) by 2007", through:

- Building secure, reliable, sustainable and affordable ICT networks;
- Ensuring the adequate development of human capacity; and
- Facilitating development of appropriate, user-friendly, accessible and affordable applications and local content.

Strategies to meet these ICT vision include:

- Reinforcing political commitment and seeking highest national priority;
- Formulating a supportive and predictable policy, legal and regulatory framework;
- Providing universal, ubiquitous, and affordable info-communication services;
- Conducting vigorous public awareness campaigns;
- Facilitating equitable access to information, knowledge and ideas;
- Fostering partnership among all stakeholders;
- Coordinating ICT usage across all the other sectors of the economy;
- Building confidence, trust and security in using ICTs; and
- Enabling environment for local and foreign investments to support SMEs and other businesses.

Without the widespread and innovative use of ICT, the concept of GNH may not be fully realized and the UN Millennium Development Goals may prove impossible to attain.

The valuable assistance of international organizations like the ITU through the last two decades has gone a long way in transforming the Bhutanese communications landscape. The ITU assisted Bhutan build its first digital national telecommunications network during 1991–1998. ITU also provided the expertise necessary for implementing the rural access VoIP pilot project in 2002. It continues to facilitate human capacity building and mobilization of financial resources for implementation of ICT projects in the country. The ITU Regional Office in Bangkok has been and is no less instrumental: a computerization of schools project has been successfully implemented; a capacity building for new technologies and management initiative is in the works, and three ICT-related project documents have been acknowledged for fund mobilization and implementation coordination. The APT complements the ITU initiatives through focusing on coordination of ICT activities, developing human resources, and facilitating expertise requirements, for and in the Asia-Pacific region.

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Bosnia and Herzegovina

Integrating Consumers into the Regulatory Processes

1 Introduction to Communications Regulatory Agency of BiH

The Communications Regulatory Agency (CRA) is an independent State institution regulating telecommunications and broadcasting throughout Bosnia and Herzegovina. Established on 2 March 2001 by a Decision of the High Representative, it combines the competencies of the Independent Media Commission (IMC) and the Telecommunications Regulatory Agency (TRA), which were separately regulating their respective sectors. The obligations and responsibilities of the CRA are clearly laid out in the BiH Law on Communications, which became effective on October 2002.

The Telecommunications Sector Policy Document provides the roadmap for the country's future telecom policy and was adopted by the Council of Ministers in March 2002. The CRA implements this policy.

The Agency is responsible for regulating the three principle fields of convergent communications: telecommunications, broadcasting and the radio frequency spectrum. There are three respective operational divisions for each sector. Supporting these Divisions, there is a Communications Division, comprising of Public Affairs and Research Departments. Legal, Administration and Finance Departments complete the composition of the executive arm of the Sarajevo-based Agency. A regional presence is reinforced through two regional offices in Banja Luka and Mostar.

The Agency has a governing body – the CRA Council. This is comprised of 7 distinguished and expert international and national members. The Council guides the Agency on strategic issues of policy implementation. It consults with, and receives reports from the Agency and adopts codes of practice, rules for broadcasting and telecommunications and internal rules. The Council also acts as an appellate body for Decisions made by either the Agency or Enforcement Panel (EP).

The EP has 6 members and, like the Council, comprises both national and international members. It adjudicates violations of licensing conditions and other rules of the Agency and imposes appropriate remedies and sanctions.

2 Inclusion of consumers into a Public Rule Making Process

Following the practice of other European regulatory authorities, Communications Regulatory Agency (CRA) announces on August 16, 2002 the introduction of a Public Rule Making Process.

From time to time the CRA, either on its own volition or directed by policy makers, issues Rules, Guidelines, Licences and other formal notifications which have a direct impact on the operations of its licensees in both telecommunications and broadcasting sectors in BiH This is also in

accordance with Article 37 of the aforementioned Law on Communications: "Duties of the Agency", which stipulates that: Pursuant to the provisions of this Law the duties of the Agency shall be:

a) To promulgate rules on broadcasting and telecommunications, and ensure adherence thereto;

The CRA Public Rule Making Procedure envisages four stages:

– Firstly, a proposal is sent to the relevant parties such as: CRA Council, Representatives of Policy maker at State level, Broadcasters and/or Telecom Operators and others as appropriate, depending on the business sector. Twenty (20) working days is allowed for comments.

At this stage, a proposal is published on the CRA web-site, a press release is issued notifying the public of this fact, and all interested parties can also obtain it by contacting the CRA Public Affairs Dept.

– At the next stage, a draft is offered to the public for comments. Thirty (30) working days is allowed for comments, plus five (5) working days for internal review.

At this stage, the CRA usually also organises the Regional Advisory Panels (RAP), which are taking place in at least four different cities throughout the country, where it invites all interested parties and the public to offer their comments to offered proposals. Together with the invitations to the meetings, the CRA also sends copies of offered proposals. RAP meetings have proven to be an excellent source of direct communication with all parties. Comments received during these meetings are recorded, transcripted and in full presented to the CRA Council.

– Taking into consideration all comments, a Second draft is produced and sent to those that have previously commented. Fifteen (15) working days is allowed for comments, plus five (5) working days for internal review.

– Lastly, a final draft is produced which is offered to CRA Council for adoption.

CRA continues to consider input from the public, public organisations as well as the regulated industries a crucial part of the CRA rulemaking process.

3 Since 2000, CRA creating media landscape through public compliant processes

On April 04, 2003 CRA reminded citizens of BiH how to make complaint about radio and TV programmes (leaflet: "How to make a complaint" can be found on the CRA web-site www.cra.ba).

The CRA strongly believes that the general public can do much more to help shape and improve the quality of Radio and TV programmes, and do so by forging a dialogue between themselves and broadcast media. It is the right of every individual or organization to raise a voice regarding content and quality not only of political broadcasts, but also of educational, cultural, religious and entertainment programmes. When this procedure was introduced in 2000, most of the cases at the time were commenced by the regulator. However, today vast majority of cases have been initiated by the public.

All citizens wishing to lodge a complaint should first contact the relevant broadcaster, and then formalize the complaint by writing a letter. If they are unhappy with the response, they can complain directly to CRA. It is important to remember to write down the name of the television or radio station and the programme in question; the date and the time of the broadcast; the exact nature of the complaint, comment or enquiry; or in the case of an advertisement, the name of the product advertised.

Complaints must reach the CRA within 14 days of the broadcast. If the complaint arrives later, CRA and the respective station may not be able to respond fully. Upon receipt of the complaint, CRA will investigate the case and undertake appropriate action if concluded that there was a breach of Broadcasting Code of Practice.

In the first two years of operations, many cases of alleged breaches of the Rules and Regulations by the broadcasters have been opened either on *ex officio* bases or by complaints from related institutions. However, this has tremendously changed in the last two years of the CRA operations, where it is noted that the complaint driven procedure for opening cases is widely recognized and this avenue of addressing grievances used to a great extend by the citizens. The future will, hopefully, see even fewer situations that would require *ex officio* opening of cases of alleged breaches of the Rules (for detailed statistical data, please refer to the CRA Reports: "Case Analysis 1999-2001", and "Case Analysis 2002", which can be obtained at the CRA web-site).

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Burkina Faso

Rapport national du Burkina Faso sur le développement des télécommunications

A Integration du consommateur dans le processus de régulation

1 Cas du Burkina Faso

1.1 La réforme du secteur des télécommunications au Burkina Faso

Depuis 1991, le Burkina Faso s'est engagé dans un processus de libéralisation progressive de l'économie, qui se traduit par un désengagement de l'Etat d'un certain nombre de secteurs économiques pouvant être promus par le secteur privé. La réforme des télécommunications entamée depuis 1998, s'inscrit dans cette dynamique des réformes économiques. La participation du secteur privé dans les activités des entreprises publiques suppose une révision du cadre légal et réglementaire. Cette participation nécessite surtout le développement de la capacité de l'Autorité publique à réguler les opérateurs du secteur, afin que les objectifs sociaux essentiels qu'elle s'est fixés soient atteints.

Le processus de réforme du secteur de télécommunications a débuté par l'adoption de la loi N° 051/98/AN du 04 décembre 1998 portant réforme du secteur des télécommunications au Burkina Faso.

Les principales étapes de la reforme sont:

- l'adoption d'une vision nationale à travers un document de politique sectorielle, qui fige les objectifs poursuivis et les stratégies pour y parvenir;
- la mise en place d'un cadre légal et réglementaire;
- la mise en place d'un organe de Régulation;
- la libéralisation du secteur;
- enfin, la privatisation de l'opérateur historique.

a) La vision nationale

Elle a été adoptée par le Gouvernement en juillet 1999, à travers la déclaration de politique sectorielle. Ce document a fixé une dizaine d'objectifs et trois stratégies pour y parvenir à savoir:

- la mise en place de l'organe de régulation;
- la libéralisation de certains segments du marché;
- l'ouverture du capital de l'opérateur national.

b) La mise en place d'un cadre légal et réglementaire

L'adoption de la loi N° 051/98/AN du 04 décembre 1998 constitue le cadre légal,

dans lequel les télécommunications doivent évoluer.

La mise en place du cadre réglementaire est survenue dans la période d'août 1999 à mars 2000. Le cadre réglementaire adopté par le Gouvernement est composé des textes suivants:

- le décret portant modalités d'établissement et de contrôle des tarifs;
- le décret portant conditions générales d'interconnexion des réseaux et services;
- le décret portant modalités de mise en place d'un accès au service universel des télécommunications;
- le décret portant approbation du Plan national d'attribution des fréquences radioélectriques;
- le décret portant institutions de droits et redevances au profit de l'ARTEL;
- l'Arrêté conjoint du Ministre de la Communication et du Ministre des Finances fixant les tarifs d'usage des fréquences radioélectriques; etc.

c) La mise en place de l'organe de régulation

L'Autorité Nationale de Régulation créée par la loi N° 051/98/AN a vu ses statuts adoptés par le décret 99-419/PRES/PM/MC du 15 novembre 1999. Mais elle n'a pris corps qu'à partir de mars 2000, après la nomination de son Directeur Général et la mise en place de son Conseil d'Administration en juillet 2000. L'autorité a réellement commencé ses activités que pour compter du mois de septembre 2000, après son premier Conseil d'Administration.

d) La libéralisation du secteur

Parallèlement à l'élaboration du cadre réglementaire, le Gouvernement a procédé au recrutement d'un deuxième consultant pour l'élaboration d'un dossier d'appel d'offres pour l'attribution de deux autorisations d'établissement et d'exploitation de réseaux mobiles cellulaires de type GSM. A ce jour, 3 opérateurs exploitent le mobile et quant au réseau fixe, il sera ouvert à la concurrence en 2006**.**

e) La privatisation de l'opérateur historique

Ce processus qui est en cours, a traversé les étapes suivantes:

- le choix d'un auditeur international pour l'audit des comptes de l'ONATEL;
- le choix de la Banque d'affaires.

D'ici fin 2003, un partenaire stratégique sera retenu.

1.2 Besoins et attentes du consommateur en TIC au Burkina Faso et les principaux problèmes

a) Les besoins et attentes que les télécommunications peuvent contribuer à satisfaire

Le Gouvernement a pris la résolution d'insérer le Burkina Faso dans la société mondiale de l'information, en élaborant un plan de développement de l'infrastructure et de la communication dont les objectifs stratégiques sont les suivants:

- le désenclavement global du pays;
- la bonne gouvernance;
- le développement durable des ressources humaines

Les actions prioritaires identifiées pour atteindre ces objectifs sont:

- le développement de l'infrastructure de base;
- la modernisation de l'administration;
- l'appui à l'éducation et la recherche;
- le développement des centres d'informations communautaires;
- la facilitation du commerce.

Pour les quatre derniers points, cela nécessitera la mise en place d'intranets sécurisés ouverts sur l'Internet.

b) Les principaux problèmes auxquels le Burkina Faso est confronté

- le financement du service universel;
- le financement du plan de formation de l'organe de régulation, de l'opérateur et du département des politiques et de la réglementation du Ministère chargé des télécommunications;

– le contrôle des performances des opérateurs et de leurs cahiers des charges;
– la formation du personnel chargé de la gestion et du contrôle des fréquences;
– l'équipement des services de la gestion et du contrôle du spectre.

1.3 Perspectives

- Dans le but de clarifier les missions assignées à l'ARTEL et au CSI en matière de gestion des fréquences des médias, il est proposé la révision de la loi 51/AN du 4 décembre 1998 sur la reforme du secteur des télécommunications.
- Pour plus d'autonomie, un projet de transformation du statut de l'ARTEL qui est un établissement public à caractère administratif en une société d'état est en cours.

2 Les outils pour la mise sur pied des instances de réglementation efficaces

La problématique de la restructuration du secteur des télécommunications est devenue une question stratégique à l'heure de la mondialisation de l'économie. Comme tous les autres secteurs de l'économie, le secteur des télécommunications est frappé de plein fouet par le vent du libéralisme qui souffle sur le monde entier.

La libéralisation est synonyme d'ouverture à la concurrence. Elle est une option de stratégie macro-économique et de développement. Elle correspond pour le télécommunications, à la suppression progressive de l'exclusivité de la fourniture des services de télécommunications par un seul opérateur. Elle induit donc l'idée de concurrence entre plusieurs opérateurs, qui sont tous du privé ou à participation minoritaire de l'Etat.

La participation du secteur privé dans les activités des entreprises publiques, suite au processus de privatisation, suppose une révision du cadre réglementaire. Cette participation nécessite le développement de la capacité de l'autorité publique à réguler les opérateurs dans le secteur, afin que les objectifs sociaux essentiels fixés soient atteints.

Avec le retrait progressif du monopôle d'Etat, la libéralisation entraîne des problèmes de régulation complexes et multiformes. Pour assurer une concurrence loyale entre les différents intervenants, les gouvernements se doivent de décider la séparation des fonctions d'exploitation de celle de régulation, en optant pour la mise en place d'un organe de régulation doté d'une personnalité juridique propre et d'une autonomie financière.

Pour assumer l'efficacité de cet organe, les outils indispensables sont:

– la mise en place d'un cadre réglementaire efficace et transparent;
– le financement de l'organe.

a) Le cadre légal et réglementaire

Afin d'assurer une gestion saine et efficace du secteur, l'organe de régulation devrait pouvoir s'appuyer sur un texte de loi, et l'ensemble des textes d'application qui créent l'environnement propice à une concurrence loyale. Les principaux éléments du cadre réglementaire sont dans le cas du Burkina Faso:

– le décret sur les tarifs,
– le décret sur l'interconnexion du réseaux et services,
– le décret sur le service universel,
– le décret sur le plan national d'attribution des fréquences,
– le décret adoptant les statuts de l'organe de régulation,
– le décret instituant les droits et redevances au profit de l'organe de régulation.

1) Le décret sur les tarifs

L'adoption d'un tel décret est indispensable en l'absence d'un scénario de concurrence pure et parfaite où les tarifs sont établis par la loi de l'offre et de la demande. En l'absence d'une concurrence, il est nécessaire d'adopter un régime tarifaire dans lequel les opérateurs proposent des tarifs qui sont soumis au contrôle de

l'organe de régulation. Ce régime est utile dans le cas où l'opérateur principal dispose d'un monopole ou d'une exclusivité sur certains réseaux ou services.

2) Le décret sur l'interconnexion

C'est l'une des questions les plus ardues auxquelles les régulateurs sont confrontés.

Un tel décret doit déterminer les conditions générales d'interconnexion des réseaux et services. En plus des modalités techniques, ce décret doit traiter de l'offre d'interconnexion, des conventions qui seront signées entre les opérateurs, des tarifs d'interconnexion, du traitement des litiges par le régulateur et les opérateurs, des sanctions administratives et des compensations.

3) Le décret sur le service universel

Avec le retrait progressif de l'Etat du secteur, l'on prend le risque d'assister à un abandon des zones rurales et isolés par les opérateurs, au profit des zones ur baines plus rentables. D'où la nécessité de l'adoption d'un texte qui établit un mécanisme de financement du service universel. L'organe de régulation doit jouer un rôle primordial au niveau de ce texte.

4) La gestion des fréquences

Cette ressource naturelle limitée doit être gérée dans un cadre bien établi et transparent pour tous les acteurs du secteur (l'Etat, le régulateur et les opérateurs).

b) Le décret instituant les droits et redevances au profit de l'organe de régulation

L'indépendance financière de l'organe de régulation est l'un des outils pouvant assurer son indépendance vis à vis des opérateurs. Cette indépendance financière est de nature à lui assurer un personnel de haut niveau pour assurer une gestion saine et transparente du secteur.

En conclusion, la gestion du secteur par le régulateur nécessite au préalable l'élaboration d'un cadre réglementaire efficace, souple, complet et transparent.

Le financement de l'organe de régulation doit être assumé par d'autres sources que les subsides de l'Etat, afin de lui garantir une indépendance réelle.

B Technologie de l'information et de la communication pour le développement:

Accès à Internet public

1 La situation de l'Internet au Burkina Faso

L'ONATEL (Office National des Télécommunications, opérateur historique) a mis en place en début 1997 un service d'accès à l'Internet dénommé Fasonet. Le point d'accès initialement à 64 Kbps, est passé à 256 Kbps puis à 1 Mb/s et est à 2 Mbps depuis février 2001. La liaison d'accès international est établie avec Téléglobe (opérateur canadien). La Configuration mise en place offre une solution évolutive pouvant s'adapter à la croissance du marché.

L'offre Internet de l'ONATEL se présente comme suit:

Des accès RTC sont disponibles à Ouagadougou et à Bobo Dioulasso. Le serveur de Bobo est relié à celui de Ouagadougou par une liaison spécialisée de 2 Mb/s. Les autres localités se connectent en passant par Ouagadougou ou Bobo Dioulasso.

Des connexions permanentes TCP/IP de LAN distants sont possibles pour des débits allant de 32 Kbps à 128 Kbps. Les réseaux distants installés au profit des fournisseurs de services et d'accès privés, de certains organismes et des structures de l'Etat, sont directement connectés au nœud national de l'ONATEL par des liaisons LS.

L'accès RTC à l'Internet est théoriquement possible à partir de n'importe quelle ligne téléphonique du Burkina à un coût de communication locale en composant un numéro spécial. La situation quantitative et évolutive de Fasonet se présente comme suit:

Année	1997	1998	1999	2000	Juin 2001
Abonnés	1 250	1 500	2 300	3 200	3 320
Sites WEB	3	–	–	30	50
ISP	1	2	3	5	6
LS	2	5	9	15	17

Le nombre de cybercentres, installés dans les principales villes du pays, est non fourni. La situation quantitative des abonnés des autres Fournisseurs de Services et d'Accès Internet est non fournie. Ce sont: CENATRIN, LIPTINFOR, DELGI, NETACCESS, ZCP, etc.

Néanmoins le nombre total de personnes ayant un compte d'accès à l'Internet peut être estimé à 7000.

1.1 Les tarifs

1.1.1 Abonnements RTC avec une boîte e-mail:

- formule à la durée:
  - création: 10 030 frs CFA
  - redevance mensuelle: 6 136 frs CFA
  - minute de connexion: 18 frs CFA
- formule forfait mensuel pour 10 heures de connexion:
  - création: 10 030 frs CFA
  - redevance: 10 030 frs CFA
  - minute de connexion supplémentaire: 12 frs CFA
- formule de connexion sans limite de temps:
  - création: 17 700 frs CFA
  - redevance: 17 700 frs CFA

Table 1 – Tarifs TTC des LS pour les Fournisseurs de Services Internet privés (avril 2001)

Débit liaison	LS locale		LS nationale (interurbaine)	
	Frais de raccordement	Redevances mensuelles	Frais de raccordement	Redevances mensuelles
32 Kb/s	200 000 FCFA	150 000 FCFA	300 000 FCFA	150 000 FCFA
48 Kb/s	200 000 FCFA	200 000 FCFA	300 000 FCFA	200 000 FCFA
56 Kb/s	200 000 FCFA	300 000 FCFA	300 000 FCFA	300 000 FCFA
64 Kb/s	200 000 FCFA	350 000 FCFA	300 000 FCFA	350 000 FCFA
112 Kb/s	200 000 FCFA	500 000 FCFA	300 000 FCFA	500 000 FCFA
128 Kb/s	200 000 FCFA	600 000 FCFA	300 000 FCFA	600 000 FCFA
256 Kb/s	600 000 FCFA	1 500 000 FCFA	700 000 FCFA	1 500 000 FCFA
512 Kb/s	600 000 FCFA	2 000 000 FCFA	700 000 FCFA	2 000 000 FCFA
1024 Kb/s	600 000 FCFA	2 500 000 FCFA	700 000 FCFA	2 500 000 FCFA
2048 Kb/s	600 000 FCFA	3 000 000 FCFA	700 000 FCFA	3 000 000 FCFA

1.2 Projets dans le secteur de l'Internet

Création d'une cité virtuelle des sciences et techniques avec comme promoteurs l'Université de Ouagadougou et le CONAGES. L'ONATEL envisage l'installation de cyber-centres publics dans ses bureaux et agences commerciales. Projet IIA (Initiative Internet pour l'Afrique) qui vise à renforcer la capacité des équipements et à décentraliser les points d'accès à Internet. Au Burkina ce projet a permis d'installer le centre d'accès régional de Bobo Dioulasso, un centre de formation sur les nouvelles technologies à Ouagadougou et l'extension de la liaison internationale. La suite du projet permettra d'installer 4 autres centres régionaux d'accès dans les provinces.

1.3 Sites WEB classés par catégories

Administration

www.primature.gov.bf
(Site officiel du Gouvernement)

www.finances.gov.bf
(Site du Ministère de l'économie et des finances)

www.mairie-ouaga.bf
(Site de la Mairie de Ouagadougou)

www.delgi.gov.bf
(Site de la Délégation générale à l'informatique)

www.legiburkina.bf
(Site sur la législation du BURKINA FASO)

www.ambf.bf
(Site de l'association des maires du Burkina)

Education et Recherche

www.univ-ouaga.bf
(Site de l'Université de Ouagadougou)

www.ird.bf
(Site de l'IRD ex ORSTOM)

Art et Culture

www.fespaco.bf
(Site du Festival Panafricain de Cinéma de Ouagadougou (FESPACO)

www.siao.bf
(Site du Salon International de l'Artisanat de Ouagadougou (SIAO))

Presse

www.tnb.bf
(Site de la Télévision Nationale du Burkina)

www.sidwaya.bf
(Site des Editions SIDWAYA)

www.zedcom.bf
(Site l'agence de communication Zénith Edition Communication)

www.aib.bf
(Site de l'agence d'information du Burkina)

www.fasonet.bf/hebdo
(Site de l'hebdomadaire du Burkina)

Entreprises et Associations

www.fasonet.bf/pr-prao
(Site du projet de la Société des Fibres et Textiles (SOFITEX)

www.onatel.bf
(Site de l'ONATEL)

www.fasonet.bf
(Site clientèle Internet de l'ONATEL)

www.cenatrin.bf
(Site de l'ISP CENATRIN)

www.cenatrin.bf/sogetel
(Site de la socité d'électricité SOGETEL)

www.sonatur.bf
(Site de la Société Nationale d'Aménagement des Terrains Urbains)

www.liptinfor.bf
(Site de l'ISP LIPTINFOR)

www.zcp.bf
(Site de l'ISP ZCP)

www.aceca.bf
(Site du Cabinet d'Expertise Comptable ACECA)

www.k-lala.bf
(Site de la société K-LALA)

www.fasonet.bf/apa
(Site de l'Association Pénitentiaire Africaine)

www.fasonet.bf/riod-ao
(Site du réseau des ONG)

Economie et Commerce

www.tradepoint.bf
(Site du Trade Point du BURKINA FASO)

www.ccia.bf
(Site de la Chambre de Commerce, de l'Industrie et de l'Artisanat du Burkina Faso (CCIA))

www.cenatrin.bf/ezdf
(Site de l'Etablissement d'Import-Export Zoungrana Denis et Frères)

www.cenatrin.bf/cofama
(Site de la Compagnie Maritime du Faso (COFAMA))

Organismes et Institutions

www.francophonie.gov.bf
(Site de la Francophonie)

www.ceni.bf
(Site de la Commission Electorale Nationale Indépendante du Burkina Faso (CENI))

Autres

www.crs.bf
(Site du CATHWELL)

www.france-burkina.bf
(Site de l'Ambassade de France au Burkina Faso)

www.cdp.bf
(Site du parti politique le Congrès pour la Démocratie et le Progrès)

www.adf-rda.com
(Site du parti politique ADF-RDA)

2 Problématique du développement de l'Internet en Afrique

Pour caractériser le développement de l'Internet en Afrique, on peut prendre comme indicateurs les rapports:

- nombre d'internautes / population totale
- coût mensuel de l'accès / PIB par habitant, ou coût mensuel de l'accès / revenu mensuel par habitant.

En considérant qu'il y a en Afrique environ trois internautes derrière chaque abonné (hypothèse de l'UIT), le Burkina Faso compterait:

- 20 000 internautes pour une population totale de 12 millions d'habitants, contre
- 137 millions d'internautes pour 303 millions d'habitants en Amérique du Nord (en 1999)
- 83 millions d'internautes pour 728 millions d'habitants en Europe (en 1999) et
- 2,5 millions (dont la moitié en Afrique du Sud) d'internautes pour 771 millions d'habitants en Afrique (1999).

Quant aux coûts d'accès, les chiffres suivants ont été relevés en 1999:

Zone	Charges mensuelles/abonné (USD)	Pourcentage du PIB/habitant (USD)
USA	29	1,2%
Afrique	60	–
Burkina Faso	40	16%

Les comparaisons ci-dessus montrent une insuffisance effective de la pénétration de l'Internet en Afrique, due en partie à des coûts d'accès élevés, comparativement au reste du monde.

Quelles solutions peut-on alors mettre en place pour réduire les coûts d'accès et permettre à une franche importante de la population africaine d'accéder à l'Internet qui est maintenant unanimement reconnu comme étant un outil de développement d'usage populaire?

2.1 Les facteurs de coûts

Les facteurs qui grèvent les coûts d'accès à l'Internet en Afrique ont été identifiés à plusieurs reprises et sont maintenant bien

connus. Ces facteurs sont la cause de coûts d'investissement relativement élevés par rapport aux moyens financiers dont disposent les ISP pour déployer leurs solutions d'accès. Ce sont:

- **L'insuffisance de l'infrastructure de base**

L'Internet a pris son envol au milieu des années 90, au moment où les pays développés avaient fini de déployer leurs réseaux de télécommunications depuis longtemps déjà et disposaient d'infrastructures nationales de base solides sur lesquelles ils ont pu construire l'Internet.

Ceci n'a pas été le cas en Afrique, et ne l'est toujours pas. Il y a encore d'énormes investissements à faire en Afrique pour soutenir le développement de l'infrastructure de base du réseau de télécommunications (liaisons interurbaines en fibre optique, réseaux d'accès, RNIS, ATM, SDH, ADSL …). Les fournisseurs de services et d'accès Internet africains ne disposent pas des facilités de leurs homologues européens ou américains et doivent supporter les coûts d'extension et de fiabilisation de l'infrastructure de base.

Par ailleurs, la faible densité téléphonique en Afrique concourt à faire du téléphone un outil encore difficilement accessible et cette situation contribue à augmenter les coûts des accès RTC proposés à l'utilisateur final.

- **L'apparente étroitesse du marché africain de l'Internet**

Les taux élevés d'analphabétisme et d'ignorance en informatique de la population restreint le marché de l'Internet et des Nouvelles Technologies de l'Information et de la Communication (NTIC) en Afrique. La clientèle potentielle se compte souvent en milliers seulement, dans les meilleurs des cas en quelques centaines de milliers (Afrique du Sud, Egypte). Cette clientèle restreinte doit à elle seule garantir et supporter le retour sur investissement des ISP qui n'ont d'autre choix que de se concentrer sur les capitales et les principales villes du pays, délaissant les zones rurales.

Mais cet argument perd de son poids dès lors que l'on considère l'Internet comme un instrument qui peut être utilisé pour l'éducation des populations analphabètes n'ayant pas accès aux structures classiques d'éducation.

- **Les coûts de branchement au réseau international**

Les ISP africains supportent entièrement les coûts d'établissement des liaisons internationales avec les pays développés et les répercutent sur les tarifs proposés aux abonnés.

Cette situation d'injustice qui vise à faire supporter aux seuls internautes des pays en voie de développement les coûts des liaisons internationales alors que toutes les parties connectées bénéficient de la liaison une fois qu'elle est établie, devrait trouver une solution dans le cadre de l'APEC.

- **Les coûts de l'équipement informatique**

Malgré une baisse sensible des taxes d'importation, les coûts d'acquisition des équipements informatiques nécessaires à la mise en œuvre d'une solution d'accès à l'Internet restent élevés.

2.2 Le financement de l'Internet pour le développement

Les facteurs de coûts ci-dessus évoqués montrent clairement que le problème de la réduction des coûts d'accès à l'Internet en Afrique pose celui du coût des investissements, et donc la problématique du financement du développement de l'Internet en Afrique.

2.2.1 Le scénario du statu quo

Il convient de remarquer que la question de savoir qui devrait payer la facture peut paraître surprenante de prime abord.

En effet pourquoi faudrait-il une approche particulière du financement de l'Internet en Afrique alors que de nombreux autres besoins élémentaires des populations africaines ne sont pas satisfaits? Des secteurs aussi vitaux que l'eau, l'énergie, l'agriculture, les transports, la santé, l'éducation et le téléphone lui-même, sont encore à un stade de développement peu

avancé, et d'énormes ressources financières sont encore nécessaires pour promouvoir ces besoins de base qui paraissent prioritaires à l'Internet.

Dans cette vision, l'Internet serait alors considéré dans le meilleur des cas comme un service ordinaire, et dans le pire des cas comme un service de luxe réservé à quelques privilégiés initiés à l'informatique; dans tous les cas l'Internet devra se développer suivant un schéma classique, en suivant sa courbe de vie naturelle toute tracée par la loi de l'offre et de la demande.

Sur cette base, le développement de l'Internet en Afrique dépendra fortement du niveau de développement des populations qui devront payer de leurs poches les coûts d'accès. Dans ce cas de figure, la promotion de l'Internet est d'abord assurée par les ISP, qui vont investir dans le développement du réseau et répercuter ces investissements sur les coûts d'accès à payer par les utilisateurs. C'est le scénario du statu quo.

La question de savoir qui devrait payer la facture ne se pose plus: c'est l'utilisateur final. La conséquence immédiate de cette approche est que l'Internet se développera au rythme du développement de l'Afrique, c'est-à-dire lentement.

2.2.2 L'Internet comme un outil de développement à la base

L'autre approche, qui semble recueillir aujourd'hui la meilleure opinion, est de considérer l'Internet comme un outil de développement à la base, un support au développement des autres secteurs vitaux tels que l'éducation, la santé, l'agriculture, etc. C'est dans ce cas de figure qu'il faut rechercher des solutions permettant à un large éventail de la population (particuliers, ONG, services publiques, entreprises privées, associations, communes, structures villageoises …) de bénéficier de coûts d'accès réduits à l'Internet.

a) Application des politiques et stratégies nationales des NTIC

La plupart des pays africains ont défini des politiques et des stratégies nationales de développement des NTIC qui contiennent déjà des solutions permettant de réduire les coûts d'accès à ces NTIC et de vulgariser leur utilisation. On peut noter:

- *La création de fonds nationaux pour le développement des NTIC*

  Ces fonds peuvent être alimentés de diverses manières:

  – taxes,
  – prélèvements,
  – aides.

  La gestion de ces fonds peut se faire à l'image des fonds prévus pour le service universel. Il s'agit là d'assimiler l'Internet et les NTIC à un service universel.

  La création de fonds de soutien au développement de l'Internet constitue l'une des meilleures solutions au problème de la réduction des coûts pour l'usager.

- *La subvention par l'Etat*

  Cette approche, qui a fait ses preuves dans certains pays développés, est aussi envisageable en Afrique. L'Etat, à l'aide des fonds créés pour le développement de l'Internet et d'autres ressources, accorde des subventions aux opérateurs et aux ISP pour mener des projets visant à étendre l'accès de l'Internet à une population généralisée.

- *La promotion des NTIC par l'Etat*

  L'Etat, pour sponsoriser le développement des NTIC et de l'Internet, accorde un certain nombre de facilités visant à réduire les coûts pour les utilisateurs et les ISP: suppression ou réduction des taxes douanières et taxes à valeur ajoutée sur le matériel et les services Internet, baisse de l'impôt, réalisation de programmes spéciaux d'accès gratuit à l'Internet pour le public ou des groupes cibles, etc.

b) Donner la préférence aux accès communautaires

A l'image de ce qui a été fait pour le téléphone, la mise en place de télécentres communautaires d'accès à l'Internet (cybercafés, cybercentres) contribuera sûrement à ramener le coût d'accès à l'Internet à la hauteur du portefeuille du client à revenu modeste.

c) Le financement par la publicité et l'accès prépayé

A l'image de ce qui se fait dans les pays développés, la publicité sur le Net peut-elle constituer une alternative pour le financement du développement de l'Internet en Afrique? Cette approche semble peu probable au regard de la faiblesse de l'activité économique sur le continent. Les ressources de la publicité sur le Net ne seront qu'une contribution légère.

Le système, si populaire, du mobile prépayé peut-il être appliqué à l'Internet? Certainement. Mais sa popularité ne sera pas forcément garantie car le principe du prépaiement ne fera baisser ni les coûts d'accès ni les coûts des équipements.

d) Le développement d'un contenu attrayant et payant

Si la publicité sur le Net semble apporter peu de ressources, le développement d'un contenu riche, attrayant et payant peut constituer une alternative. De nombreuses informations présentant un vif intérêt pour les africains eux-mêmes et pour le reste du monde (statistiques, indicateurs de développement, informations d'ordre général, tourisme) restent encore à porter sur web.

3 Conclusion

Si les obstacles liés aux coûts des accès à l'Internet en Afrique sont connus, il est en revanche plus difficile de mettre en place des solutions. L'interdépendance des problèmes en Afrique ne permet pas de trouver le coup de frein nécessaire pour s'éjecter du cercle vicieux de la pauvreté. L'Etat africain, au moment où il est appelé de plus en plus à se désengager de nombreux secteurs économiques dans un contexte de mondialisation et de libéralisation tout azimut, est curieusement rappelé ici pour soutenir le développement de l'Internet.

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Burundi

Les TIC pour le développement: Internet pour tous

Dans sa politique sectorielle des télécommunications pour la période 2002-2004, le Gouvernement du Burundi s'est fixé entre autres objectifs de «favoriser le développement de la transmission de données, de l'Internet et des services associés».

Dans l'optique d'informer le public national et international, le Gouvernement du Burundi a lancé en février 2003 son site Web sous la dénomination http://www.burundi.gov.bi

Le contenu du site officiel du Gouvernement du Burundi est présenté dans les sections ci-après:

1. **Institutions:**
- Présidence
- Gouvernement
- Parlement
- Commissions Nationales
- Cours

2. **Administrations:**
- Ministères
- Organismes publics
- Annuaires des services administratifs
- Guide de procédure

3. **Météo**
- Températures
- Précipitations

4. **Institutions financières**
- Banque Mondiale
- Autres

Le contenu du site, composé et enrichi sur base de données fournies par les entités et services concernés, sera géré par une équipe ad hoc.

Contrairement aux cyber-cafés dont l'affluence est composée essentiellement de jeunes gens, le site du Gouvernement du Burundi sera consulté par un public diversifié: fonctionnaires, employés d'entreprises publiques et privées, fonctionnaires d'organisations internationales, hommes d'affaires, ... en quête d'informarions sur le Burundi.

L'utilisation de l'Internet au Burundi est handicapé par plusieurs facteurs:

- le coût prohibitif d'un PC multimédia;
- les coûts élevés d'accès aux services des ISP;
- les coûts de télécommunications via le réseau de l'opérateur public.

Compte tenu du ptojet d'installation d'un nœud d'accès Internet et de l'Intranet par l'opérateur public ONATEL, la concurence pourra jouer en faveur de la réduction des tarifs par les deux opérateurs ISP (CNI, USAN);

Conclusion

La création du site officiel du Gouvernement du Burundi constitue un pas en avant dans la sensibilisation du public à l'utilisation de l'Internet dans la vie quotidienne.

La pauvreté reste un handicap majeur qui empêche la population de bénéficier des avantages de l'Internet.

Le développement étant un processus long et continu, il y a lieu d'espérer voir croître le degré de pénétration de l'Internet à travers le pays. Le site officiel du Gouvernement du Burundi deviendra ainsi une source d'informations pour un nombre croissant de la population burundaise.

Thèmes d'intérêt général

- le partenariat Nord-Sud et le développement des TIC dans les PMA
- les tarifs d'accès Internet: frein au téléenseignement
- nécessité de la réforme scolaire face au développement des TIC
- le transfert des technologies TIC: voie plausible à la réduction de la fracture numérique.

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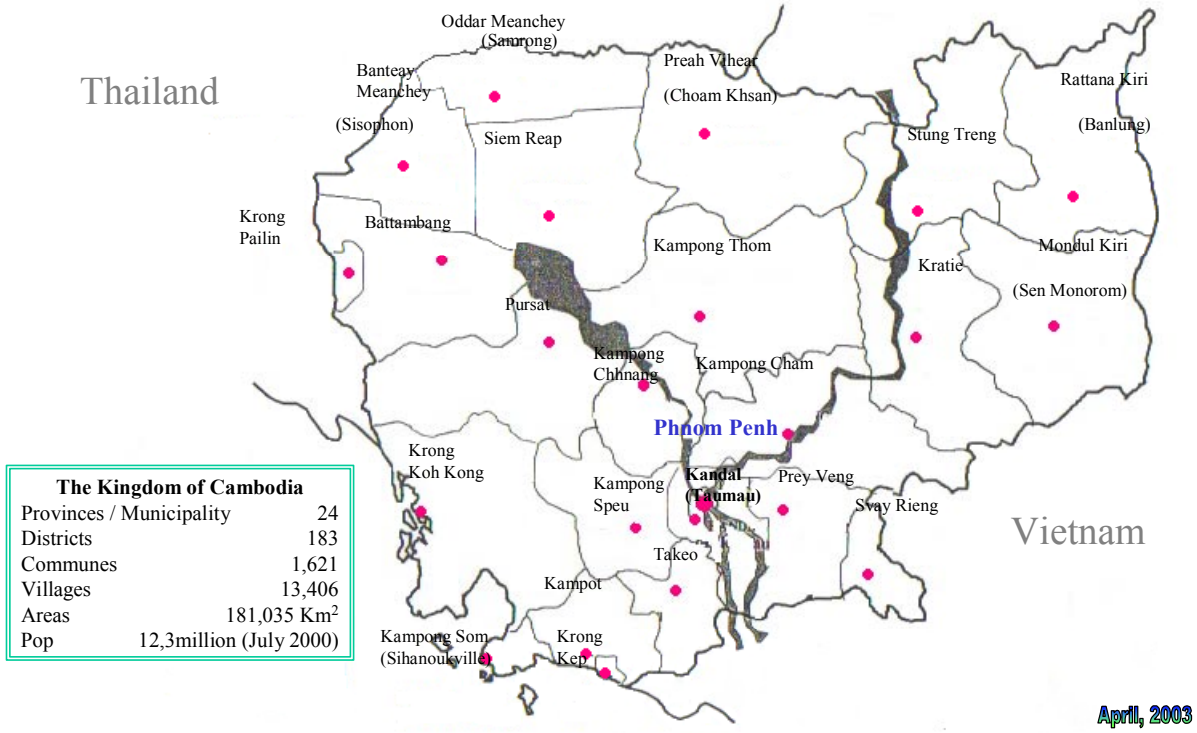
Cambodia

Telecommunication Development Country Report for Cambodia


P.T.C

The Kingdom of Cambodia	
Provinces / Municipality	24
Districts	183
Communes	1,621
Villages	13,406
Areas	181,035 km^2
Pop	12,3 million (July 2000)

Kingdom of Cambodia



The Kingdom of Cambodia	
Provinces / Municipality	24
Districts	183
Communes	1,621
Villages	13,406
Areas	181,035 Km^2
Pop	12,3million (July 2000)

A – Geographic Feature

Name of country:	**Kingdom of Cambodia**
Capital:	**Phnom Penh**
Provinces:	**24 provinces/municipality**
Territory:	**181,035 km²**
Location:	**In the southwestern corner of Indochina by Thailand to the west, Laos to the north, Vietnam to the east and Gulf of Thailand to the South**
Climate:	**Part of monsoon Asia and tropical zone, with pronounced wet and dry seasons:** **- dry season from November-April** **- rain falls mainly in May-October**

April, 2003

Population:	**More than 12 million**
Religion:	**Buddhism (90% of Population), others are Catholic, Protestant, Islamic.**
Language:	**Khmer is the national language, French was used as official language about 1970. Recently, English prevalent. Other languages, Vietnamese, Chinese and Thai are also spoken.**

JUNE, 2002

B – Ministry of Post and Telecommunication

1. MPTC Staff

There are total of 1960 staffs as of 2002 made up as follows:

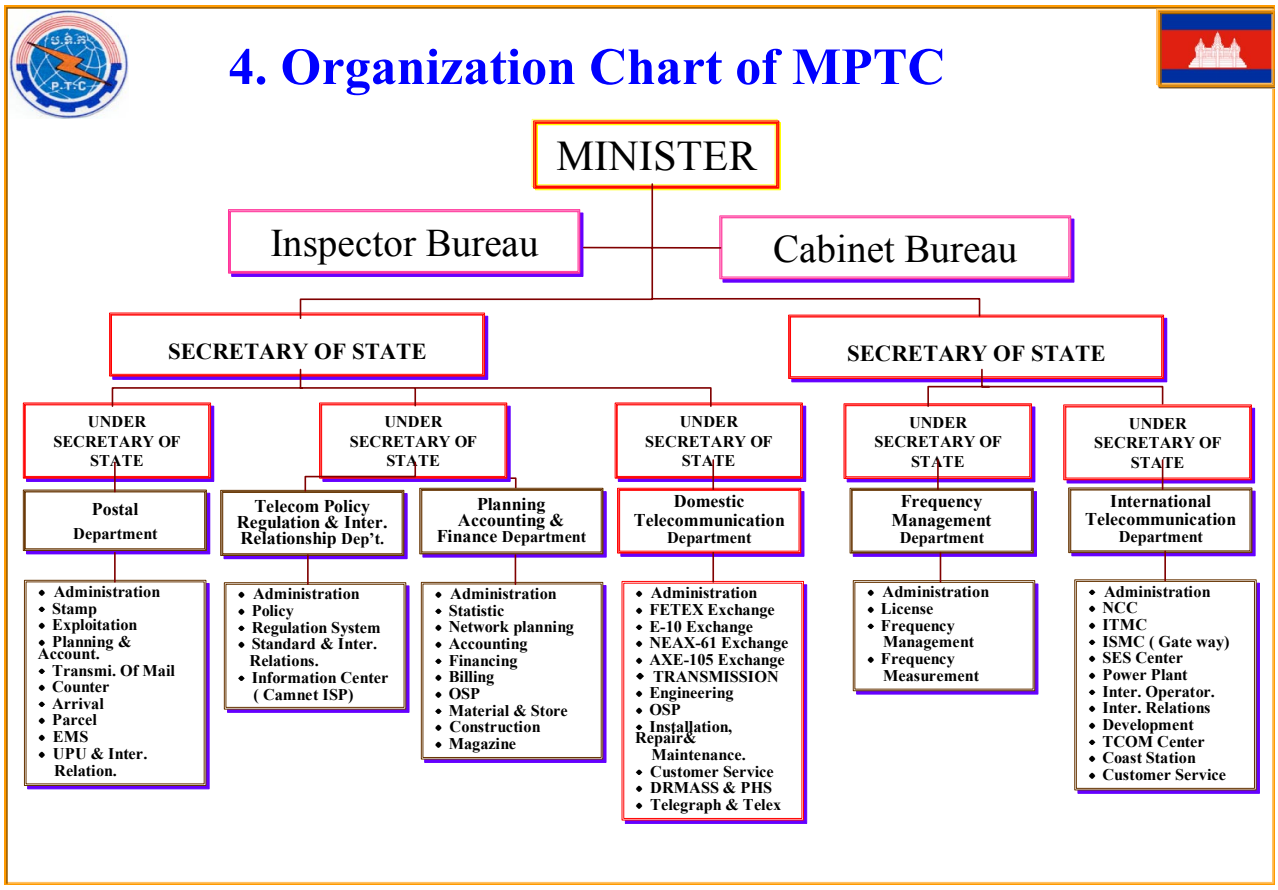
- **Number of employees classified by the Central 1309**
  - **Male 836**
  - **Female 473**

- **Number of employees classified by the Provinces 651**
  - **Male 496**
  - **Female 155**

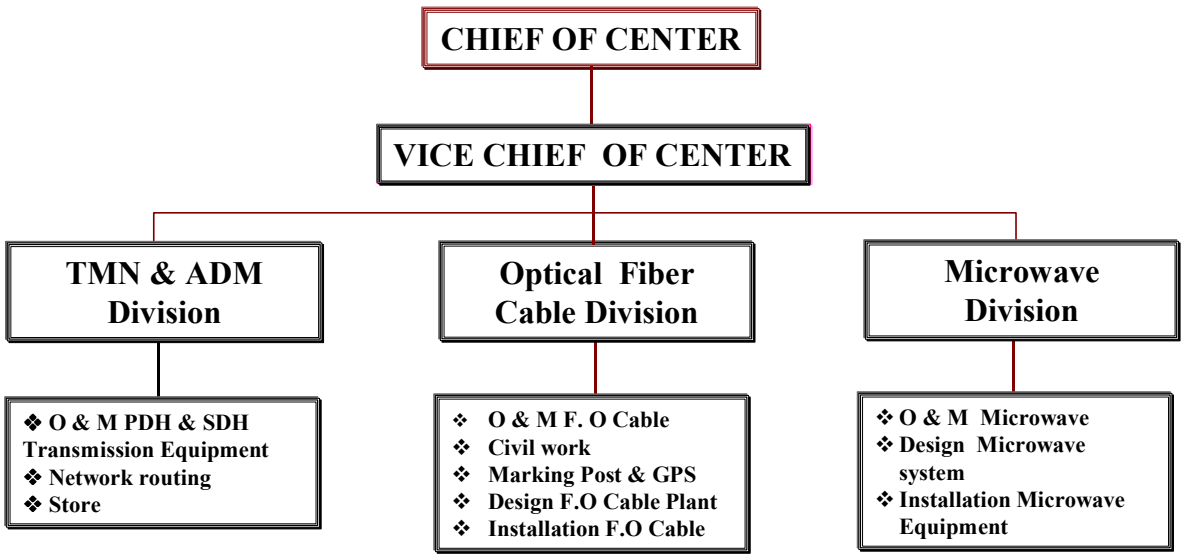
- **Working hour**

  Monday-Friday AM 07:00-11:00 / PM 14:00-17:00

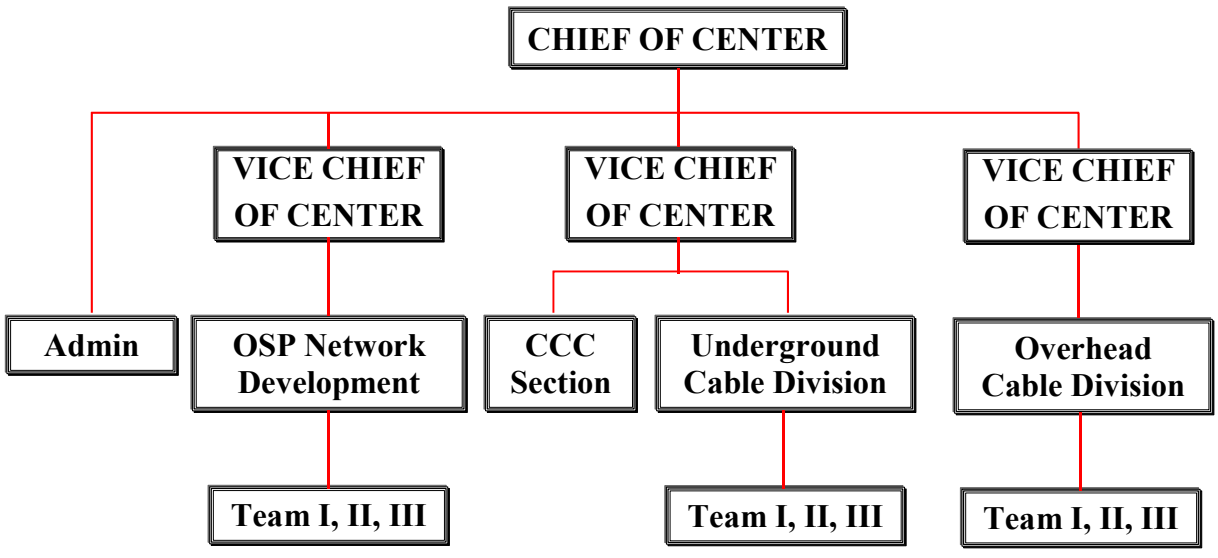
April, 2003



Organization Chart of Transmission Center



Organization Chart of OSP Center



CCC: Cross Connection Cabinet

5. Present Status

Cambodia regulates still telecommunication services through Government monopoly of the ownership of facilities. Regulation is highly centralised and coordinated through the Cabinet for approval of principle recommendation regarding telecommunication policy.

The Government has also increased the opportunities for private sector participation in construction and operation of telecommunication facilities in the form of Joint Venture or BCC.

A. Telephone Service

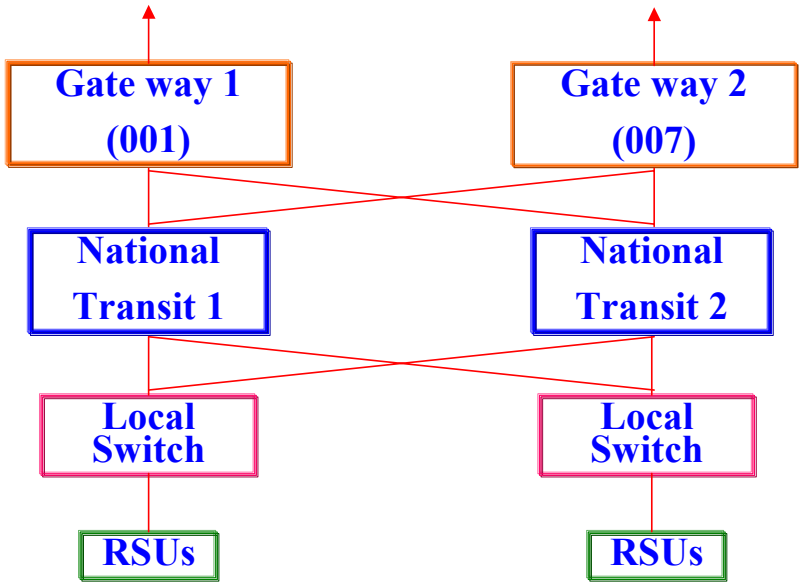
1. Telephone density

The telephone density in Cambodia including mobile telephone is 2.66 per 100 populations:

- 23.36 in Phnom Penh
- 0.27 for fixed line
- 2.39 for mobile telephone

All fixed network in the country is handled by own MPTC and the JV "Camintel". Mobile services provided by operators.

2. The nationwide network structure



3. Transmission hierarchy

Transmission network has three types:

- PDH, SDH Optical fiber cable transmission
- Satellite communication transmission
- Digital microwave transmission

Recently the SDH transmission network are widely used in Cambodia with CEPT standard type of Transmission hierarchy.

4. ISDN Services

Not applicable

5. Digital Subscriber Line (DSL) Services

Not yet introduce in Cambodia

6. Cellular Services

In Cambodia there are four operators, which provide the mobile telephone service. Coverage areas less then 50% of total land area. Along the main national road are mostly covered as service area and the people can receive telecommunication service.

1) CAMTEL (Cambodia Mobile Telephone Co. Ltd)

Established since 1992 which MPTC/CP group Thailand, using the system AMPS and the frequency band of 800 MHz and coverage in Phnom Penh Capital only.

2) CASACOM (Cambodia Samart Comm. Co. Ltd)

MPTC/Samart for provision for Cellular service with NMT system with the frequency band of 900 MHz and also GSM 1800 system.

3) CAMSHIN (Cambodia Shinawatra Comm.Co.Ltd)

MPTC/Shinawatra International Public Company Limited, Thailand. This Operator provided mobile service with GSM system and WLL using the frequency band of 450 MHz.

4) CAMGSM (Cambodia GSM or Mobitel)

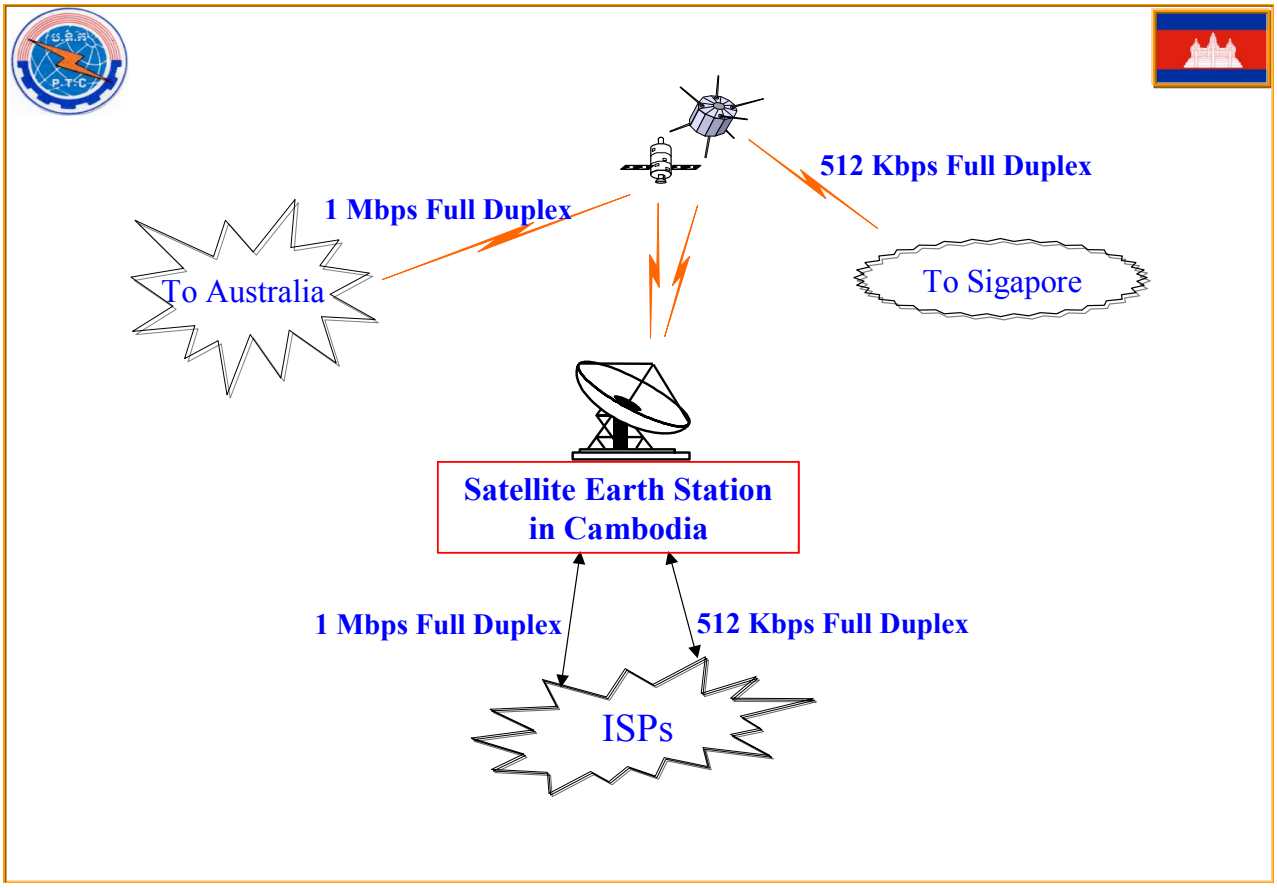
Since 1997, the Royal Government of Cambodia made the Agreement with Royal Millicom Co, Ltd, composed of local company Royal Groupe and a foreign company Milllicom from Sweden to established a mobile operator using GSM 900 technology. At present there are biggest subscribers.

7. Other telecom. services

a) ISP (Internet service Provider)

There are four ISPs in Cambodia: One owned by MPTC (called CAMNET) and the other by companies such as Bigpond, Camintel and Telesuft.

All ISPs possession leased lines for access to international network at 512 kbps and 1Mbps and provides to customers two types of service, E-mail and Internet full service through accesses by dialup leased circuits and wireless broadband. There are already about 10,000 subscribers and 50 Internet cafés opened in Phnom Penh and some major city.



b) IT Introduction Activity

The Cambodia Government is installed National Info-Communications Technology Development Authority (called NiDA) in 1999 under direct control of Prime Minster to promote the development and introduction of IT. At present the fist stage of E-Government infrastructure under implementing in Phnom Penh.

B. Future Program

1. Executive Project

MPTC has completed some of major telecom project in last few years with assistance from donors such as France, Japan and Germany:

- ❖ The Project for improvement of the telecommunication network in Phnom Penh (Phase -I, Phase II) with JICA Japan's Grant Aid;
- ❖ The DTTC (Digital Transmission Trunk line Cambodia) Project: the first long distance Fiber Optic Cable along NR.5 & NR.1 cross the Country from Thai border to Vietnamese border with length 620 km using SDH system (STM-1) has completed under Grant Aid from Germany;
- ❖ The Project for improvement of The telecommunication network in Siem Reap Angkor (Installation outside Plant and Switching facilities) under Government' budged;
- ❖ DTTSS Project (Digital Transmission Trunk line Sisophon -Siem Reap) : Construction of a STM-1 (1+1) Optical fiber Transmission Network connecting the Tourism City to the Capital through existing optical fiber transmission network.

2. On-going Project

There are some major projects on going on in the country:

a) Rehabilitation Projects in OSP is in progress in all parts of the Phnom Penh. This covers the replacement of all types of old cable damaged.

b) E-Government Project: This project under implementation with funding of Korea. The outside plant facilities and equipment is completed, commission and testing going on nowadays. The network will be provided computer network to connect all Ministry and communes in Phnom Penh capital to promote and safeguard foundation of administration.

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3. Planned Project

MPTC has setup some major strategic directions which can be summarized as follow:

1) Present STM-1 system of optical fiber cable from Thai border to Vietnamese border will be enhanced to higher level system

2) Construction optical fiber cable from Siem Reap to Phnom Penh put in ring configuration to ensure security and alternative system to increase network flexibility

3) Trunk Transmission system in Central Region which links from Kampong Cham through Phnom Penh to Sihanouk vill is built, and telecommunication network is expanded to major cities in the Region

4) Expansion of capacity of existing telephone centers with their outside plant

5) Construction of national backbone network using optical fiber cable or digital microwave system

6) Interconnection of networks with neighboring countries through optical fiber cable

7) Setting up of the ring system in optical fiber network in Phnom Penh to ensure higher services grade

C. Telecommunication problems, difficulties and possible solutions

MPTC is facing the problems as followed:

1) Congestion problems

As a chronic problem which can't be solved in near future soon. Occur at certain trunks in the network especially during the busy hours due to not enough number of circuits in the route. To increase the circuit we need approval form Ministry of Economy and Finance. Recently, a recursive problem occurs from usage of internet because internet has become very poplar. To access the internet we have to go to the telephone network which caused congestion to the network.

2) Standardization problem

Since we no have action center for standardization yet, the cooperation between all parties concerning with standard matters are very rare. All parties implement the way which is best for their own practice. This is prone to the areas of non-standard specification. This situation puts us on a very risky place to rational decide what technologies will be one that is widely accepted in future.

3) Human resources

Not having the required skilled employees for attending the maintenance and development work.

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Cape Verde

Rapport national: Cap Vert

Introduction

S'il s'agit la d'un enjeu commun à toutes les pays, dans la nécessite de renforcer la dynamique de développement des TICs, l'insertion dans la société de l'information et du savoir doit passer par la généralisation de l'usage des TICs et la banalisation de leurs outils dans le regard public, l'économie et la société, administration et collectivités locales, entreprise et commerce, éducation et formation, recherche, système scientifique et technologique, culture, santé et secteur sociaux, loisirs, etc.

Le Cap Vert, en tant que pays à forte insularité et discontinuité territoriale et désireux de l'intégration de la diaspora à son développement doit entreprendre des mesures pour adopter les TICs comme des priorités nationales.

C'est une nécessité incontournable pour bâtir les bases de la société de l'information et du savoir au Cap-Vert, et pour garantir les fondements de l'efficacité et de la compétitivité globale de notre pays dans cette nouvelle ère, qui permit de construire «*la route unique virtuel*» pour facilité les communications entre les îles.

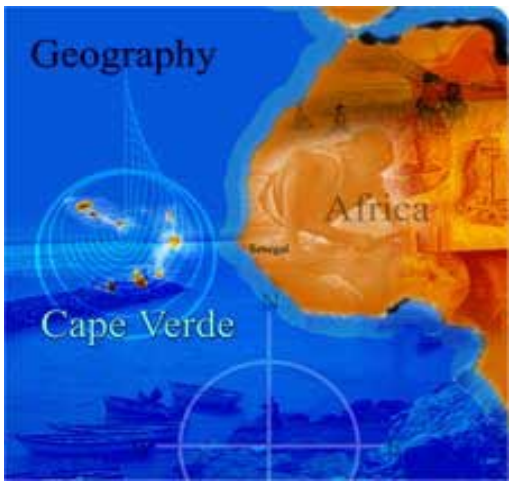
Dans cette perspective les Grandes Options du Plan du Gouvernement (2002-2005) soulignent l'importance du développement des technologies, notamment les technologies de l'information et la communication, comme une condition indispensable pour atteindre le développement économique durable. Ainsi, pour le Gouvernement, il est important et urgent de définir une politique active et dynamique de formation dans les domaines des TICs, incluant des mesures pour diminuer le coût d'accès, ceci étant une condition sine qua non pour convertir les TICs en facteur de développement vers une Société d'Information pour tous. La généralisation de l'informatique dans tout le tissu économique et social doit être un réel défi.

1 Profil du Pays

La République du Cap Vert est un archipel de 4.033 km^2 et avec une Zone Economique Exclusive (ZEE) qui s'étend à plus de 730 km^2.

Il est situé à peu près à 450 km à l'Ouest du Sénégal, entre 17º 12' et 14º 48' de latitude Nord et 22º 44' 25º 22' de longitude Ouest.

Il est composé de dix îles d'origine volcanique et avec une identité géophysique diversifiée allant de montagnes extrêmement accidentées à des vallées profondes et ramifiées.



Les îles sont distribuées dans deux groupes: celles Contre le vent (Barlavento) au Nord comprenant les îles de Santo Antão (754 km^2), S. Vicente (228 km^2), dont la capitale est la ville de Mindelo, S. Nicolau (342 km^2), Boavista (622 km^2), Sal (215 km^2) et Santa Luzia qui n'est pas habitée et celles Sur le vent (Sotavento) au sud, comprenant les îles de Maio (267 km^2), Santiago (992 km^2) où se trouve la ville de Praia, la capitale du Pays, Fogo (447 km^2) et Brava (65 km^2).

Selon un recensement national effectué en 2000, la population était alors de 43 4812 habitants. La population est jeune puisque 42% des Capverdiens ont moins de 14 ans et 6% seulement plus de 64, la moyenne d'âge étant à peine supérieur à 17 ans.

Et dispose d'une diaspora importante en Europe et aux Etats-Unis d'environ 700 mille Capverdiens

2 Secteur des télécommunications

Le Cap-Vert a fait des gains enviables sur le marché des télécommunications depuis l'indépendance à ce jour, en 1995 les postes et télécommunications ont été divisées en 2 entreprises, Correios de Cabo Verde SARL et Cabo Verde Telecom SARL.

La Direction Générale des Communications est l'organe chargé de la régulation du secteur de télécommunications.

Cabo Verde Telecom est l'opérateur historique, avec un monopole de 25 ans, parmi les premières privatisations d'Afrique, fournis des services comme téléphone fixe, le GSM et l'Internet.

Les services de valeurs ajoutes et les services de valeurs complémentaires (comme services Mobile et Internet) sont libéralisés. À cause de inexistence d'un cadre réglementaire plus efficace, de taille du marché très réduit et un faible pouvoir d'achat, ces services sont fournis uniquement par l'opérateur historique.

Actuellement le Gouvernement est en phase de préparation de mettre en place une effective concurrence dans ces services. Des diverses mesures sont prises, comme:

- création et la mise en place de l'organe de réglementation efficace;
- nouveau Plan National de Numérotage;
- portabilité des numéros;
- lois d'interconnexion;
- rééquilibrage des tarifs;
- et autres.

2.1 Réseau Fixe

Le réseau de téléphone du Cap Vert a une capacité de 71,9 mille lignes. Au mois de décembre de 2002 le nombre total de lignes connectées était de 70187, provocant une densité téléphonique de 15,1 par cent habitants.

Commutation

Le centre international se trouve dans la ville de Praia et est une centrale de type Siemens EWSD. Il existe deux centres de Commutation primaires localisés à Praia et à Mindelo, qui sont aussi des centrales de type Siemens EWSD avec 43 réseaux locaux formés par des secteurs de référence (Direct Line Units) et des centrales digitales de type SPX (Equitel – Brésil).

Transmission

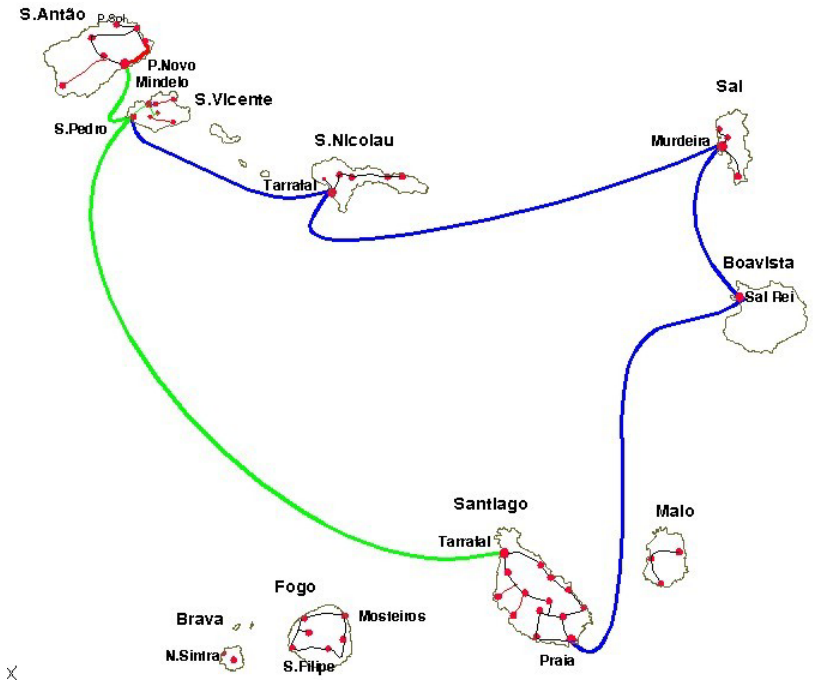
Les liaisons internationales sont assurées à travers le réseau Intelsat, par une station Standard B localisée à Praia et par le câble sous-marin international de fibre optique Atlantis 2, qui lie le Cap Vert à l'Afrique, l'Amérique Latine et l'Europe. Les liaisons nationales sont réalisées par le câble sous-marin inter-îles de fibre optique, par plusieurs faisceaux digitales et par des liaisons terrestres utilisant des câbles de fibre optique et cuivre. La sécurité de la transmission nationale est garantie par deux stations type F3 liées au réseau Intelsat et localisées à Praia et Mindelo.

2.2 Réseau Mobile Cellulaire

La Cap Vert Telecom opère en réseau cellulaire GSM numérique. Le service est garanti par deux «Base Station»: la première est localisé à Praia et servi par 27 «Base Transceiving Stations» (BTS) avec 45 cellules, couvrant les îles du Sal, Boavista, Maio, Santiago, Fogo et Brava et la deuxième localisé à Mindelo, servi par 16 BTS composé par 16 cellules couvrant les îles du Santo Antão, São Vicente et São Niculão. Dû à l'orographie du pays, il existe encore plusieurs zones sombres dans quelques îles. Le nombre d'abonnés de téléphones cellulaires portables est de 45101[1)].

1) Donnée juillet 2003

Le Réseau National en fibre optique



2.3 Réseau d'Internet

Aperçu général

L'Internet au Cap-Vert c'est développé d'une manière différente d'autres pays du monde. Dans la majorité des pays, l'Internet a commencé avec l'initiative de la communauté académique ou un projet d'appui au développement.

Au Cap-Vert, en 1996 la CVTelecom l'introduit pour la première fois avec un réseau expérimental d'une capacité de 64 kbps à travers du Telepac au Portugal.

Sa commercialisation a commencé une année après, environ de 500 utilisateurs.

L'Institut Supérieur de Génie et Sciences de la Mer est l'administrateur du domaine **.cv**.

A partir de 2000 la CVTelecom a augmente la largeur de bande jusqu'à 4 Mbps, avec une large extension aux autres îles;

Aujourd'hui la CVTelecom est le principal fournisseur du Service d'Internet, avec une liaison de largeur de bande 8 Mbps, il permet l'accès complet (full Internet access) à 4566 clients. Les services offerts englobent le «dial up PPP», accès de ligne, et «dial up». Il offre le service à travers un numéro, le seul qui permet l'accès au niveau national et avec tarif local.

SITA - Société Internationale des Télécommunications Aéronautique opère aussi en tant que fournisseur de service, ses services étant destinés à des clients spécifiques.

Il existe aussi un autre réseau d'accès a l`Internet, le réseau du Gouvernement (RAFE-Réforme Administrative du Secteur Financier de l'Etat) – un projet financé par la Banque Mondiale sur la reforme du secteur public. Ce projet a déjà connecté tous les Ministères, quelques écoles secondaires et Municipalités qui permet à 2500 utilisateurs d'accéder à l'Internet.

A la fin de 2002, on estimait à 15000 les utilisateurs de l'Internet au Cap-Vert un taux de pénétration bas par rapport au pays développés

Internet Hosts	1
Usagers de l'Internet (estimation)	15000
Usagers de l'Internet par 100 habitants	3.3
Tarifs	
De 0 a 15 heures	17 USD/mois
De 15 a 20 heures	21 USD/mois
De 20 a 30 heures	27 USD/mois

2.4 Remarques

La CVTelecom a soutenu la croissance initiale du secteur des télécommunications dans lequel elle fait de gros investissements correspondant en moyenne à 45% de ces recettes au cours des 5 dernières années. Le pays atteint la plus forte densité téléphonique de tous les PMA en 1996. Il dispose également d'une infrastructure de télécommunication moderne, y compris des centres locaux entièrement numérisés des liaisons nationales et internationales à fibre optique et un réseau cellulaire mobile GSM numérique.

L'accès universel aux télécommunications est très étendu. En 2000, la CVTelcom a fournie au moins un téléphone dans chacune des 241 communautés dans la populations dépassait 200 habitants. En outre, la couverture du réseau cellulaire mobile s'étend à 90% de la population.

C'est-à-dire la disponibilité d'un téléphone au sein des ménages a progressé régulièrement avec un pourcentage de 15 en 1992 à 60 en 2002, ce qui place le Cap-Vert à la troisième place en Afrique (après la Réunion et Maurice).

Taux de pénétration, données Juillet 2003

	1995	1996	1997	1998	1999	2000	2001	2002	Jul/2003
Tel. Fixe	21513	25232	33241	39985	46865	55829	64132	70187	69971
GSM				1020	8068	19729	31507	42949	45101
Internet			474	1139	1654	2456*	2974*	3935*	4566*
Tel./100 habit (F+M)	5.9	6.8	8.8	10.8	12.8	17.4	21.9	24.4	24.5

*** Utilisateurs de** C.V.T

3 État des TICs au Cap Vert

Pendent les 4 derniers années, malgré l'absence d'une politique et du plan précis dans le domaine des TICs, le Cap-Vert n'est pas resté indifférent à ce qui se passe dans le monde, ses avancées dans ce domaine sont considérables.

3.1 Administration Publique

RAFE – Reforme Administrative du Secteur Financier de l'Etat, un projet financé par le Banque Mondiale dont l'objectif était d'informatiser le système financier, est aujourd'hui concrètement un réseau informatique du gouvernement qui a déjà connecté tous les Ministères, quelques écoles secondaires et Municipalités.

Si bien avant, pour l´Administration Publique capverdienne, la circulation du papier constitue le support matériel de toute information administrative, ce qui a conduit à des problèmes de gestion rationnelle, aujourd'hui grâce à ce projet le problème est réduit.

RAFE est vite devenue un des principaux moteurs de la révolution des TICs dans l´Administration Publique. Les services et la formation qu'elle assure auprès des pouvoirs publics, comme, construction des cites web, élaboration et développement des divers logicielles pour la gestion en différent domaine, etc., l'ont amenée à accroître son organisme.

RAFE espère rendre l'administration plus transparente et plus «conviviale» grâce à son projet de cybergouvernement dont l'objet est de donner l'accès à l'internet à tous.

3.2 Education

Un autre projet, aussi financé par le Banque Mondiale, est le PROMEF – Project de Consolidation et Modernisation de l'Education et Formation dont

l'objectif d'introduction et développement des TICs dans le système éducatif.

Sa réalisation plus important en matière des TICs est le développement d'un Système de Gestion d'information supporté par différent base de données sur le secteur éducationnelle comme: statistique basique de chacun des écoles, données pour évaluer et accompagner le travaille des élèves, budget, ressource humaine, données des étudiants boursiers au pays et à l'étranger, information d'évolution de chacun élève, etc.

Dans le domaine de E-Formation, il existe un projet en cours de formation des étudiants universitaires en ligne (Internet), financée par l'UIT et CISCO.

3.3 Santé

Cependant, le secteur de la santé a démarré très récemment avec l'introduction des TICs dans l'amélioration de la qualité de ces services médicales, pour l'utilisation des services, le gouvernement a opte premièrement l'informatisation de tous les infrastructures de ce secteur.

Concrètement au tele-santé il y à un projet en phase d'exécution qui permet lier deux hôpitaux centraux à l'autre en Lisbonne (Portugal), pour le changement des informations entre les médecins.

3.4 Media

En ce qui concerne les masses media comme, Radio, Télévision, et la Presse, il existe environ 12 radio, transmettent sur Web sites, la radio éducative assure la tele-education en générale, il y a 3 chaînes pour la Télévision une national et deux internationaux.

Actuellement existe 6 journaux, possèdent des web site, cela permit aux internautes national et la diaspora, qui est en masse importante de suivre l'actualité du pays.

Ces medias se présentent comme étant le meilleur moyen pour atteindre la population.

3.5 Secteur Bancaire et Commerce électronique

Grâce à la modernisation des infrastructures et à l'évolution des communications, principalement après l'introduction de la fibre optique et des centraux complètement numérisés, les banques ont eu la possibilité d'intégrer dans le système "on-line" des agences localisées dans le pays.

Parallèlement, avec l'évolution des TICs, le marché bancaire c'est penché sur la possibilité de mettre en œuvre l'usage des cartes de crédits et des transactions électroniques.

Pour relever ce défi, il a été créé la Société Interbancaire et des Systèmes de Paiement (SISP) avec la co-participation de la Banque Centrale, de l'entreprise des télécommunications et des banques commerciales.

Aujourd'hui le client peut procéder à des retraits d'argents, consulter les soldes, les extraits et les réquisitions de chèques, etc.

Le premier projet réalisé a été la création d'un réseau de cabines bancaires automatiques (distributeurs) où ce service fonctionne depuis décembre 1999.

Existe des postes de paiement automatiques distribués par diverses entreprises et services publics pour permettre le paiement d'achats, de dépenses effectuées, reçus, impôts, etc.

Avec la collaboration de l'UIT, récemment a était approuvée une ensemble des lois sur le Commerce-électronique, la signature électronique, les transitions électroniques, les contrats électroniques, etc.

3.6 Société et généralisation des TICs

Néanmoins le Cap Vert est doté aujourd'hui des infrastructures des télécommunications modernes, l'accès généralisé aux TICs reste comme un enjeu pour tous par conséquence de coûts élevés des ordinateurs et des tarifs d'accès

Pour rendre les TICs à la disposition de tous les Telecentres/Cyberespace et Telecentre Communautaire jouent un rôle vital dans la mobilisation des ressources et la fourniture au grand public d'un large accès au TICs, de plus aussi ils peuvent permettre l'accès a la formation au développement et renforcement des capacités.

Une enquête sur les points d´accès (télécentres/Cyberespace) à été menée à l´échelle national recensée dans les environs de 80 télécentres, à montrée des résultas importantes comme:

- une croissance très rapide des points d'accès au niveau du pays;
- une fréquentation massive de la jeunesse à (82%);
- un genre presque équilibre;
- un niveau de connaissance raisonnable;
- des cybers bien équipés;
- les tarifs mensuels à payer l'opérateur (ISP) sont très élevés et par conséquence les tarifs d'accès sont aussi élevés.

Entre temps il existe un centre communautaire, un projet pilot financé par l'UIT, Cabo Verde Telecom, OMCV (organisation des femmes capverdiennes) et Gouvernement du Cap-Vert, dans le but de stimuler surtout les femmes et les jeunes à l'accès aux TICs.

Ce centre est géré par les femmes, il est prévu dans la 2e étape, sera introduit la formation, le e-com, tele-education, telemedicine.Dans le cadre de la généralisation et l'insertion des TICs, le gouvernement a crée des «CAJ», des centres des jeunes, une initiative pour intègre la masse juvénile dans le développement social et culturel, formation, information, appui et orientation pour utilisation des TICs, qui sont mis a la disposition sans distinction pour tous. Ces centres sont équipé par des accès important aux TICs, implante dans tous les villages.

D'autre initiative importante aussi du gouvernement, d'avoir crée une **Commission Interministérielle** présidé par le Premier Ministre qui a comme but principal le développement de gouvernement électronique et de la société d'information, avec une coordination qui sert comme un centre opérationnelle, pour mettre en place ce plan du programme du gouvernement, jouent un rôle très important pour la généralisation des TICs.

Cette commission a des compétences suivantes:

a) proposer de forme organise les stratégies de développement intègre pour les novations de la société d'information et le gouvernement électronique;

b) promouvoir la nécessite d'articulation entres les initiatives pour les novations de la société d'information;

c) Approuver la stratégie et le programme du gouvernement électronique;

d) Approuver la responsabilité des différentes ministères et organisme public dans le cadre de programme de gouvernement électronique.

4 La stratégie nationale

Le Cap-Vert est parmi certains pays d'Afrique qui dispose d'un Plan National des Développement d'Infrastructures des **T**echnologies d'**I**nformation et de la **C**ommunication.

Mais le Pays envisage d'élaborer un Plan National Stratégique pour les TICs, avec une vaste participation du gouvernement, du secteur prive et de la société civile permettrait définir des buts réalistes pour le Cap-Vert, au moyen et le long terme, de designer les plans à mettre en œuvre pour atteindre les buts définis (tenant compte les besoins de formation de techniciens, les besoins d'investissements, le cadre réglementaire, etc.) et désigner des politiques pour favoriser la massification de l'utilisation des TICs dans ces différents secteurs.

Disposer d'un Plan d'action Stratégique pourrait aider à coordonner et rationaliser tous les efforts de façon à assurer les différentes initiatives dans le domaine

des TICs en cours et une utilisation efficiente de fonds disponibles et faciliter l'apport de fonds pour sa mise en œuvre.

La Stratégie National doit être fondée sur le développement des usages des TICs et se décline en des actions et mesures à travers particulièrement des grands axes et objectives.

4.1 Objectifs Généraux:

- Soutenir les mécanismes de transfert et diffusion des TICs;
- Promouvoir le développement et continuer encourager la culture technologique visant l'implantation des TICs au Cap Vert;
- Promouvoir la modernisation du Cap Vert visant le développement de la Société d'Information;
- Soutenir la création d'Infrastructures du pays dans les domaines des TICs;
- Soutenir les initiatives des institutions, secteurs et acteurs (publics/ privés) qui développent des projets d'innovation moyennant l'utilisation des TICs;
- Promouvoir le développement socio-économique et culturel du pays à travers l'utilisation des TICs dans la promotion de l'éducation, l'instruction et/ou formation, de la culture et de la lutte contre la pauvreté;
- Soutenir la croissance et le développement socio-économique du pays à travers l'utilisation des TICs;
- Promouvoir le développement démocratique en cours dans le pays, créant à travers la mise en œuvre des TICs, des mécanismes/espaces qui favorisent le dialogue, la concertation et la participation.

4.2 Objectifs Spécifiques

Le Plan d'action Stratégique doit considère comme objectifs spécifiques, les suivants:

- Soutenir le processus de dissémination et vulgarisation des TICs;
- Suivi de la stratégie globale de la modernisation du pays dans les chantiers fondamentaux comme cyber gouvernement, l'éducation, santé, commerce électronique, etc;
- Soutenir le processus de formation institutionnelle, éducationnelle et de l'instruction et scolaire;
- Apporter des contributions au développement du parc technologique national, régional et communautaire;
- Apporter des contributions au développement de programmes/ projets de formation éducationnelle et d'instruction et scolaire dans les domaines de la formation générale/professionnelle, l'alphabétisation d'adultes, à travers la formation débutante/continue et/ou à distance;
- Contribuer au développement de programmes de télétravail visant la création de possibilités d'emplois pour certains groupes-cible, nommément, les handicapés, les femmes enceintes et/ou en congés prolongés de l'après accouchement;
- Contribuer à l'éducation et l'intégration en visant des solutions des problèmes socio-communautaires;
- Soutenir l'effort national dans la lutte contre la pauvreté et le chômage, à travers l'exploitation de nouveaux services des TICs par les privés ou des groupes communautaires/ coopératives, régional et national;
- Contribuer pour le développement et la promotion de la langue et la culture capverdienne, à travers son utilisation dans les différents médias et supports de communication;
- Contribuer à l'intégration économique nationale, à travers de réseaux/systèmes de banques de données;
- Contribuer à l'intégration économique internationale et, particulièrement, régional, à travers de réseaux/systèmes de banques de données de production, échanges commerciaux, produits, commerce électronique, etc.;

- Contribuer au développement de la société d'information, à travers la création d'un système national d'information;
- Contribuer au développement de la société d'information, à travers l'intégration du Cap Vert dans les autres systèmes/réseaux existants au niveau régional et ibero-luso, brésiliens, castellannais nommément;
- Soutenir des programmes d'éducation et d'information pour l'environnement, l'éducation sanitaire et la santé communautaire;
- Soutenir des programmes de développement et la valorisation féminine, de la famille, de l'enfant, de la jeunesse et du troisième age;
- Contribuer à des programmes qui peuvent promouvoir le développement des droits humains et de la culture démocratique et participative;
- Promouvoir des mécanismes de liaison qui peuvent faciliter l'échange et l'approfondissement des rapports entre les capverdiens résidents et les communautés émigrées (Diaspora);
- Soutenir le développement du tourisme virtuel, à travers l'Internet et moyennant l'offre des **«sites»** à l'effet, visant la disponibilité et marketing des services touristiques, de la part des opérateurs nationaux.

5 Conclusion

En conclusion est constaté que:

1) Cap Vert est doté aujourd'hui des infrastructures des télécommunications modernes, mais l'accès généralisé aux TICs reste comme un enjeu pour tous par conséquence de coûts élevés des ordinateurs et des tarifs d'accès;
2) Les numéros d'accès aux TICs sont bas cela à cause du coût élevé d'acquisition et d'usage, l'absence de la concurrence, de la taille du marché petite et faible pouvoir d'achat;
3) Il y a dans les différents secteurs de la société des diverses initiatives dans les domaines des TICs, mais elles sont développées d'une manière volontaire de chaque secteur, sans une vision coordonnée;4) Pour cela il est nécessaire de disposer d'un Plan d'action Stratégique qui pourrait aider à coordonner et rationaliser tous les efforts de façon à assurer ces différentes initiatives dans le domaine des TICs en cours et une utilisation efficiente de fonds disponibles et faciliter l'apport de fonds pour sa mise en œuvre;
5) En fin les TICS devient une infrastructure vitale pour un pays insulaire comme le Cap-Vert pour construire des *routes virtuelles* pour faciliter la liaison entre les îles.

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Chad

Le développement de NTIC au Tchad

Figure 1 – République du Tchad

1 Presentation générale du Tchad

Situé en plein cœur de l'Afrique, le territoire de la République du Tchad occupe une superficie de 1 284 000 Km^2. Le Tchad est limité au Nord par la Libye, à l'Est par le Soudan, au Sud par la République Centrafricaine et à l'Ouest par le Cameroun, le Nigeria et le Niger.

2 Cadre géographique

Le territoire du Tchad est une cuvette encerclée par une demie couronne de montagnes et de plateau.

Le point le plus haut est le massif volcanique «Tibesti» dont le point culminant est le pic Emi-Koussi (3 415 m).

Le climat du Tchad est de type tropical caractérisé par deux saisons: une saison des pluies et une saison sèche.

3 Situation démographique

Selon les données du dernier recensement effectué en 1993, la population du Tchad est estimée à 6 279 931 habitants (voir le tableau de la page 6), soit une densité 4,89 habitants au km^2.

Le taux de croissance moyen de la population tourne autour de 2,5 % par an.

4 Tchad économie

L'économie du Tchad est fortement dépendante du secteur primaire. Le secteur secondaire est naissant et le réseau d'infrastructures peu développé.

Le PIB est constitué à hauteur de 38% par l'agriculture et l'élevage, de 15% par le secteur secondaire et de 47% par le secteur tertiaire.

D'une manière générale, l'économie du Tchad est très marquée par le secteur informel représentant environ 70 % de la valeur ajoutée totale.

Le Tchad dispose d'une potentialité de développement très importante :

Plus de 20 000 000 hectares des terres arables et 5 600 000 hectares des terres irrigables.

D'importantes ressources minières et pétrolières évaluées à plus de 900 000 000 de barils.

D'importantes ressources en sel, natron, uranium, étain, fer, tungstène, or, et diamant. Il existe également le calcaire, le kaolin, les marbres, les diatomites, etc.

De 2001 à 2002, le produit intérieur brut réel a connu une croissance de 12,3%.

Quant au PIB réel par habitant, celui-ci a connu une croissance de 9,5% pendant la même période.

En 2002, le PIB par habitant est de l'ordre de 158 400 F CFA (212 USD).

Avec ces indicateurs, le Tchad reste un des pays les moins avancés de la planète.

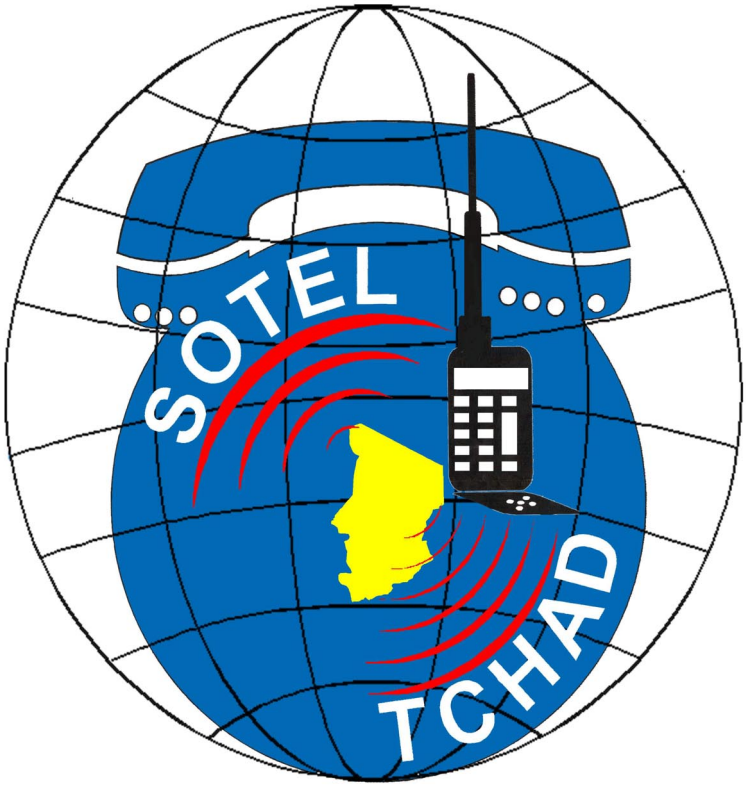

Figure 2 – Société des télécommunications du Tchad (SOTEL TCHAD)

5 Secteur des télécommunications

Doté d'un nouveau cadre réglementaire, le Tchad compte aujourd'hui trois (3) grands opérateurs des télécommunications:

- SOTEL TCHAD, opérateur historique;
- Libertis, opérateur cellulaire GSM;
- Celtel, opérateur cellulaire GSM.

Ces trois opérateurs totalisent environ 50 000 abonnés dont 13 000 pour le réseau RTCP.

La majorité du parc se trouve concentrée à N'Djaména (95%) où on dénombre seulement 600 000 habitants.

Le nouveau cadre réglementaire a permis également la création et la mise en place de l'Office Tchadien de Régulation des Télécommunications (OTRT), autorité administrative chargée de la régulation, de l'application et de la mise en œuvre de la Loi et Textes réglementaires du secteur des télécommunications.

6 Société des télécommunications du Tchad (SOTEL Tchad)

La Société des Télécommunications du Tchad (SOTEL TCHAD), détenue à 100 % par l'Etat, est issue des activités de la Société des Télécommunications Internationales du Tchad (TIT) et des activités des télécommunications de l'Office National des Postes et Télécommunications (ONPT). Elle est principalement chargée de l'exploitation de télécommunications de base et de tout ce qui s'y rattache.

7 Réseau de la SOTEL Tchad

De configuration étoilée, le réseau des télécommunications de la SOTEL TCHAD compte 11 835 lignes principales dont 80 % se trouvent à N'Djamena. Ce parc représente une pénétration de 0,15 lignes principales pour 100 habitants, bien en dessous de la moyenne des pays de l'Afrique Sub-Saharienne de l'année 2000 (3,5 lignes principales pour 100 habitants).

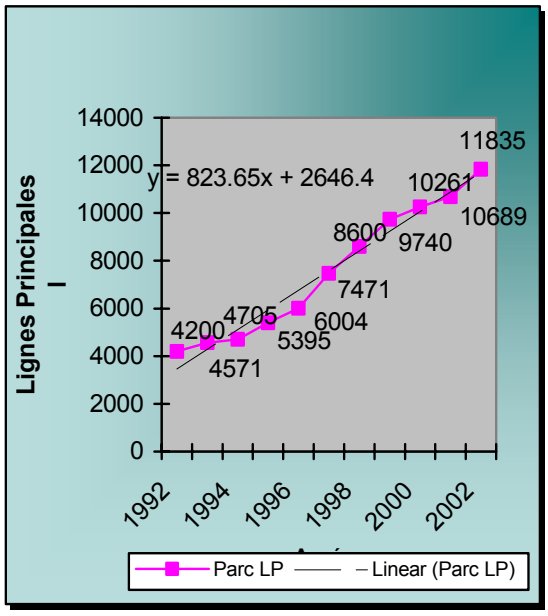

Figure 3 – Historique du Parc des lignes principales de la SOTEL Tchad

Tableau 1 – Situation des télécentres au 30 juin 2002

	Cabines privées	Cabines publiques (SOTEL TCHAD)
N'Djamena	133	46
Moundou	18	9
Sarh	16	11
Abéché	05	11
Autres villes	07	10
TOTAL	179	87

En fin d'année 2002, la pénétration des télécentres était de 0,033 pour 1 000 habitants.

NB: En 1998, la pénétration de l'Afrique Sub-saharienne était de 0,20 pour 1 000 habitants.

8 Le réseau Internet

Ouvert depuis le 19 Novembre 1997, le réseau Internet du Tchad dénommé TCHADNET est constitué d'un routeur CISCO 5300 situé à N'Djaména (Goudji) relié par satellite, au site de France Télécoms à Bagnole (Paris).

Les abonnés des villes provinciales accèdent au réseau TCHADNET sans discrimination, par le biais du Réseau Téléphonique Commuté Public (RTCP).

A l'introduction de l'Internet au Tchad, la SOTEL TCHAD ne dispose que d'une passerelle de 64 kbits/s de bande passante et de 43 abonnés au 31 décembre 1997.

A la date du 30 Juin 2002, le réseau Internet du Tchad «TCHADNET» compte 1 802 abonnés pour une bande passante de 512 kbits/s full duplex.

Tableau 2 – Historique de l'Internet au 30 juin 2002

	Abonnés	Trafique en minutes
1997	43	213 850
1998	317	1 576 518
1999	635	3 158 000
2000	999	5 075 507
2001	1 517	8 246 775
2002	1 800	8 656 375

En fin d'année 2002, la pénétration Internet était de 0,228 pour 1000 habitants.

9 Le réseau Internet du Tchad

Le réseau Internet du Tchad «TCHADNET» offre plusieurs services à travers le réseau téléphonique commuté. Ces services se présentent comme suit:

- Le courrier électronique (e-mail).
- La consultation des pages WEB.
- L'hébergement des pages WEB.
- L'émission et la réception des fax (Viafax).
- Le transfert des fichiers (FTP).
- Le forum de discussion et la téléconférence.
- La Viaphonie.

10 Développement de l'Internet et de NTIC au Tchad

L'accès à l'information est une condition préalable à toute prise de décision rationnelle dans l'établissement du développement humain durable.

Dans ce cadre, il a été mis en place le projet «Initiative Internet pour l'Afrique» dans le but d'implanter les services Internet et améliorer ceux qui existent déjà dans 12 pays africains dont le Tchad.

Au Tchad, ce projet a consisté à:

- renforcer le nœud Internet à la SOTEL TCHAD;
- créer et renforcer le nœud fédérateur national;
- renforcer le rôle du secteur privé en tant que Fournisseurs de Service Internet (SFI);
- renforcer les capacités nationales (formation des usagers et des techniciens, développement des contenus, etc).

11 Stratégie de développement de l'Internet et de NTIC au Tchad

Dans le but d'aider le Tchad à renforcer ses capacités humaines, techniques et matérielles, dans le domaine des Nouvelles Technologies de l'Information et de Communication (NTIC) et particulièrement Internet, un Protocole d'Entente a été signé en Avril 1998 entre le PNUD et le Gouvernement.

Par cet Acte, le Gouvernement a accepté les conditions à remplir pour bénéficier des services du Projet africain «IIA» dont l'UNOPS constitue l'agent d'exécution.

Les Bénéficiaires directs de ce projet sont:

- la Présidence de la République;
- la SOTEL TCHAD;
- le Centre National d'Appui à la Recherche (CNAR) et les chercheurs qui s'y rattachent;
- la Direction Nationale de l'Informatique;
- l'Université de N'Djaména;
- les autres régions;
- la Presse (ATP, RNT, TVT);
- les Fournisseurs des Services Internet.

Le projet permettra au Gouvernement de mettre en place une politique nationale de développement de l'Internet qui encourage la participation du secteur privé dans l'offre Internet aux consommateurs.

A cet effet, une cellule de coordination, supervisée par un Comité de Pilotage, est mise en place.

La cellule est chargée:

- du suivi de l'ensemble des activités;
- de la sensibilisation;
- de la formation;
- de la communication avec les différents intervenants.

Décision du Gouvernement, assure la participation de tous les partenaires dans la gestion du projet à travers les axes d'orientations suivants:

- création d'un environnement incitatif aux FSI;
- création d'un environnement incitatif aux utilisateurs et consommateurs des produits et services Internet;
- commercialisation de l'Internet;

- vulgarisation de l'Internet (encouragement et mise en place des cyber espaces);
- extension du réseau TCHADNET;
- création des télécentres communautaires;
- développement des contenus tchadiens WEB.

Stratégie de développement de l'Internet et de NTIC au Tchad

Activités identifiées	Objectifs	Observations
1. Renforcement de la capacité technique et de gestion de la SOTEL TCHAD	1.1 Extension du nœud national à 512 kbits/s	1.1 Exécuté
	1.2 Création des nœuds secondaires (Moundou, Sarh et Abéché) par LS à 64 kbits /s	1.2 Exécution partielle
2. Formation des Ingénieurs, Administrateurs, chefs de projets Internet et opérateurs	2.1 Formation des formateurs (10 Ingénieurs, et 5 Chefs de projet)	2.1 Exécution partielle
3. Création d'un environnement favorable au développement de l'Internet	3.1 Analyse des textes en vigueur en vue d'élaboration des textes visant à réduire les taxes et droits des douanes sur les équipements NTIC et à consolider la politique de libre concurrence et la facilité d'accès dans le domaine de NTIC.	3.1 Exécution partielle
4. Emergence du secteur privé pour fournir les services Internet au TCHAD	4.1 Définition d'une stratégie adapté au marché NTIC du Tchad (business plan)	4.1 Exécution en cours
	4.2 Elaboration de Cahier des Charges fixant les critères techniques et de gestion auxquels les FSI doivent répondre pour être prestataires des services Internet	4.2 Exécution en cours
	4.3 Elaboration d'une procédure rapide d'agréments et d'homologation des équipements et des infrastructures NTIC	4.3 Exécution en cours
	4.4 Elaboration d'une procédure raisonnable pour le raccordement LS des FSI	4.4 Exécution en cours
	4.5 Elargissement de l'éventail des SFI dans un futur proche en rapport avec le business plan	4.5 Exécution en cours

Stratégie de développement de l'Internet et de NTIC au Tchad

Activités identifiées	Objectifs	Observations
5. Formation des utilisateurs et des techniciens sur l'exploitation de l'Internet et des serveurs.	5.1 Production d'un plan de formation et identification des personnes à former	5.1 Exécuté
	5.2 500 utilisateurs à former sur l'exploitation de l'Internet	5.2 Exécution partielle
	5.3 30 techniciens à former sur l'exploitation et la maintenance des serveurs	5.3 Exécution partielle
	5.4 20 techniciens à former sur le logiciel Linux	5.4 Exécution partielle
6. Campagne de sensibilisation sectorielle.	6.1 Réalisation d'une campagne de sensibilisation (privé, public, universités)	6.1 Exécution partielle
	6.2 Journées nationales Portes Ouvertes pour l'information du public	6.2 Exécution partielle
	6.3 Organisation des ateliers d'information et démonstration de l'outil Internet	6.3 Exécution partielle
7. Développement des contenus Internet au Tchad	7.1 Création des sites WEB dans les secteurs prioritaires au développement	7.1 Exécuté
	7.2 Inventaire des informations pertinentes à publier sur Internet pour appuyer les actions de développement prioritaires	7.2 Exécution partielle
8. WEB nationaux sur le développement durable		

A terme:

- Augmentation de la largeur de bande de la passerelle, passant de 512 kbits/s à 2 048 kbits/s.
- Renforcement de la sécurisation du nœud national et des nœuds secondaires.
- Augmentation de la capacité de la liaison RTCP passant de 4 MIC à 12 MIC.
- Augmentation de la capacité de raccordement des SFI en liaisons spécialisées.
- Création de nouveaux nœuds secondaires.

A court terme:

- Réalisation du réseau national à Fibre Optique et introduction du système de commutation et de transmission par paquet.
- Implantation des systèmes de desserte à haut débit: le Digital Subcriber Line (DSL) et le Wireless Local Loop-IP (Boucle Locale Radio IP).
- Développement de la téléphonie IP et de la plupart des services associés au protocole IP (télé-éducation, télé-santé, e-commerce, visioconférence).
- Développement des Télécentres Communautaires Multiservices.

12 Conlusions

L'enclavement du pays, l'étendue du territoire, la faiblesse des infrastructures, constituent des contraintes réelles au développement et à l'accès à l'information.

L'accès à l'information est une nécessité dans l'établissement du développement humain durable.

Les entraves auxquelles le Tchad doit faire face en matière d'accès à des informations pertinentes, exactes et à jour pour orienter les décideurs et autres acteurs de développement sont multiples par lesquelles les infrastructures de télécommunications de base dont dépendent étroitement les Nouvelles Technologies de l'Information et de la Communication (NTIC).

Le développement des infrastructures des télécommunications constitue donc un défi majeur pour réduire la fracture numérique et permettre au Tchad d'entre dans de la Société de l'Information.

Afin de relever ce défi, l'apport des partenaires au développement (publics, privés) et des Institutions Internationales (PNUD, UIT,BM) est sollicitée, tant en assistance technique, que dans le domaine de mobilisation des ressources financières et du développement des ressources humaines.

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Djibouti

Activités pour le développement du secteur des technologies de l'information et de la communication (TICs)

Conscient de l'importance des technologies de l'information et de la communication (TICs) dans le processus de développement économique et social du pays, Le Ministère de la Communication, de la Culture chargé des Postes et des Télécommunications, a entrepris une large consultation nationale impliquant toutes les composantes de la société djiboutienne (secteur public et privé et société civile) afin de proposer un projet de réforme du secteur des technologies de l'information et de la communication (TICs) et créer une initiative djiboutienne de la société de l'information.

La consultation nationale a débuté le 11 mai 2002 et a pris fin au mois d'avril 2003 par la remise officielle du document de stratégie et du plan d'actions au Président de la République par les membres du comité national.

1 Contexte

La République de Djibouti se caractérise par l'existence d'un seul opérateur des télécommunications (opérateur historique) qui a le monopole sur tous les services de télécommunications (téléphone fixe, téléphonie mobile et Internet).

Il n'existe pas de régulateur indépendant du secteur des télécommunications. C'est le Ministère des Télécommunications qui joue ce rôle.

Ce contexte a conduit à la situation suivante:

Tableau 1 – données recueillies au mois de septembre 2002

	Djibouti	Afrique
Densité téléphonique pour le téléphone fixe	1,54	2,62
Densité téléphonique pour le téléphone mobile	0,47	2,95
Utilisateur Internet pour 10.000 habitants	51,32	84,89
Nombre de serveurs Internet pour 10.000 habitants	0,13	3,38
Nombre de PC pour 100 habitants	1,09	1,06

Trois directions de travail ont été retenues: La réglementation du secteur des TICs, la définition d'une nouvelle tarification pour Djibouti Telecom et enfin la conception d'une stratégie d'exploitation des TICs.

2 Réglementation du secteur des TICs

Cette phase a révélé la nécessité de la création d'une agence de régulation des TICs en charge des télécommunications, de l'informatique et de l'audiovisuelle.

En mars 2003, un projet de loi de base sur les TICs a été élaboré ainsi qu'un décret portant création de l'agence de régulation. Ce projet de loi est actuellement en discussion au sein du gouvernement.

3 Nouvelle tarification pour l'opérateur Djibouti Télécom

Les différents participants aux consultations ont recommandé à l'opérateur des télécommunications Djibouti Telecom et à son ministère de tutelle de proposer une nouvelle tarification afin de permettre le développement des TICs.

Depuis le 1er mars 2003, cette nouvelle tarification est en vigueur. Elle concerne aussi bien Internet (plus de 60% de réduction), le réseau cellulaire (plus de 40% de réduction), le téléphone fixe local (réduction de 40% en moyenne) et les communications internationales (entre 20 et 40% de réduction suivant les pays).

4 Développement de l'exploitation des TICs

Une stratégie nationale d'exploitation des TICs pour le développement de la République de Djibouti et son plan d'actions ont été élaborés. Elle constitue une vision d'avenir s'étalant sur les 10 prochaines années. Cette stratégie a été adoptée dans le courant du mois d'avril 2003. Elle est disponible sur le site Web du Ministère à l'adresse www.mccpt.dj.

Une agence d'exécution de la stratégie va être créée et mise en place très bientôt. Cette agence sera une association à but non lucratif (régie par la loi 1901), reconnue d'intérêt public par l'Etat et comptera dans ses rangs des représentants du secteur public, du secteur privé et de la société civile.

5 Les succès

1) Réduction des coûts des services et produits commercialisés par Djibouti Telecom, unique opérateur des télécommunications à Djibouti. La dernière révision tarifaire remontait à l'année 1985.
2) Elaboration de la stratégie nationale d'exploitation des TICs par une approche participative incluant toutes les composantes de la communauté nationale
3) Elaboration d'un cadre réglementaire (loi de base sur les TICs et création d'une agence de régulation)
4) Création prochaine d'une agence d'exécution des TICs. Association à but non lucratif reconnue d'utilité publique par le gouvernement, ayant ses membres issus de toutes les composantes de la société djiboutienne (public, privé et société civile), cette agence aura pour mission de conduire à la réalisation de la société djiboutienne de l'information et du savoir.
5) Lors de sa parution, la stratégie e-Djibouti a fait la «Une» du site web du PNUD (www.undp.org)
6) Présentation de la stratégie lors de la conférence arabe de développement des Telecom à Beyrouth au Liban (28 au 31 mai 2003).

6 Les problèmes rencontrés

1) Insuffisance des fonds disponibles lors de l'élaboration de la stratégie e-Djibouti. Ainsi certains travaux ont dû être annulés pour insuffisance de financement.
2) Difficulté de trouver des financements pour l'exécution de la stratégie.

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El Salvador

TIC's para el desarrollo Internet para todos: acceso público de Internet

1 Actividades para el desarrollo de las telecomunicaciones en El Salvador

Todavía en 1996 en El Salvador, los servicios de telecomunicaciones eran brindados y supervisados en forma de monopolio estatal, la Institución responsable de ello fue la Administración Nacional de Telecomunicaciones-ANTEL. Ese año fue el punto de partida para modificar el marco de regulación, el cual incluía la creación de la Superintendencia General de Electricidad y Telecomunicaciones-SIGET, la Ley de Telecomunicaciones, los correspondientes Reglamentos a cada una de ellas y para cubrir los aspectos sociales se creo el Fondo de Inversión Nacional en Electricidad y Telecomunicaciones (FINET), entidad encargada, de incrementar la infraestructura de telefonía para desarrollar servicios de telefonía en las áreas rurales. Todo el proceso quedo vigente desde 1998. Fundamentalmente la decisión del gobierno fue abrir el mercado de Telecomunicaciones, minimizar la regulación y permitir que actuaran las fuerzas del mercado. Los fines establecidos en la Ley de Telecomunicaciones incluyen: a) Fomento del acceso a las telecomunicaciones para todos los sectores de la población; b) Protección de los derechos de los usuarios y de los operadores proveedores de servicios de telecomunicaciones; c) Desarrollo de un mercado de telecomunicaciones competitivo en todos sus niveles; y, d) Uso racional y eficiente del espectro radioeléctrico.

2 Fomento del acceso a las telecomunicaciones para todos los sectores de la población

Para el logro de este objetivo, la Superintendencia, mediante su marco de regulación estableció condiciones y requerimientos mínimos para obtener los permisos, autorizaciones, Licencias y Concesiones para que los inversionistas nacionales y extranjeros pudieran de forma fácil, acceder a brindar servicios de telecomunicaciones. En el caso de los servicios públicos de telefonía la Concesión se otorga en promedio dentro de un mes de haber presentado la aplicación, con una vigencia de 30 años, sin costo, incluye cobertura a nivel nacional, quedando facultado el titular para brindar todo tipo de servicios, siendo la única restricción la que obliga a iniciar operaciones en el término de dos años, caso contrario se pierde la Concesión. En consecuencia, los inversionistas llegaron e iniciaron la instalación de infraestructura de telecomunicaciones, en su mayoría buscando los servicios de tráfico internacional, pero algunos crearon redes de acceso para servicios móviles y fijos.

3 Protección de los derechos de los usuarios y de los operadores proveedores de servicios de telecomunicaciones

Bajo el nuevo entorno, los usuarios y la población en general se encontrarían con más proveedores de servicios, quienes en la procura de captar más abonados crearían condiciones que posteriormente serían fuentes de reclamos, principalmente por cobros indebidos, contratos inexistentes y abusos de poder. La Superintendencia previendo esta situación estableció un procedimiento de reclamos que permite paso a paso iniciar el reclamo ante el proveedor del servicio, participación técnica del Regulador y finalmente la resolución final emitida por la Dirección competente en asuntos de protección al consumidor. Este procedimiento incluye las etapas de Audiencia, Pruebas e Informes técnicos hasta la Resolución final que se emite para cada proceso. SIGET también logra mediante un procedimiento de acceso a recursos esenciales evitar posiciones dominantes que entorpecen el ingreso de un nuevo actor al sector de telecomunicaciones.

4 Desarrollo de un mercado de telecomunicaciones competitivo en todos sus niveles

Si la obtención de los permisos se tornó sumamente fácil para los nuevos operadores, todo lo contrario se preveía para poder obtener la Interconexión e integrarse a la red de telecomunicaciones existente, por ello en la Ley de Telecomunicaciones quedó previsto que durante dos años a partir de la vigencia de la Ley, los operadores podrían negociar libremente las condiciones de los acuerdos en los aspectos Técnicos, Legales y Comerciales salvo en los Cargos de Interconexión, en los que la Ley definió específicamente cual sería el valor para los servicios de las llamadas locales, nacionales e internacionales. De esa forma se fomentaría la competencia entre redes que ofrecerían los mismos servicios sin ventaja para las partes, estableciendo la competencia en precios, calidad, cobertura y nuevos servicios. Se puede afirmar que con los nuevos operadores de servicios móviles y la reducción de las tarifas en los servicios del tráfico internacional, este objetivo se está cumpliendo exactamente como lo esperado.

5 Uso racional y eficiente del espectro radioeléctrico

Uno de los recursos naturales más valiosos con que cuentan los países es el espectro radioeléctrico, lamentablemente es limitado por lo que el uso y costo depende del desarrollo tecnológico de los servicios que se pueden explotar comercialmente. Tradicionalmente este recurso ha sido administrado en forma desordenada y con mucha discrecionalidad. En El Salvador, la Ley de Telecomunicaciones incluyó un proceso de ordenamiento y asignación por medio de subastas obligatorias para las frecuencias en operación en las que el derecho de explotación no pudo ser demostrado, brindando con ello, la oportunidad de normalizar el derecho de uso. La clasificación del espectro incluye las de uso oficial, libre y regulado, siendo estas últimas las que tienen la obligación de pagar una tasa anual por la Administración, Gestión y Vigilancia. En el nuevo procedimiento de asignación se elimina completamente la discrecionalidad, ya que éste inicia con la publicación de la solicitud de la porción de interés, la cual es publicada en medios escritos nacionales e internacionales con el propósito de llamar la atención en el sentido que haya interés o si alguien se ve afectado podría informar por medio de una oposición a lo solicitado. En el caso de no existir inconveniente y de no haber otro interesado se asigna a quien solicitó previo un pago del precio base, el que se calcula mediante un instructivo. La subasta por la porción del espectro aplica solamente en los casos de que haya muestra de más interesados, para ello se han desarrollado dos procedimientos 1) una sola presentación en sobre cerrado y 2) Rondas Simultaneas y Sucesivas.

6 Otros servicios

Conforme a lo esperado, la apertura del sector telecomunicaciones, provocó el aparecimiento de nuevos proveedores de servicios, incluyendo pero no limitándose a Internet, servicios de valor agregado en redes móviles y fijas, usuarios que utilizan los números 800's y 900's para brindar un abanico de servicios de diversión, información, entretenimiento, etc. De todos los servicios que se pueden mencionar, el que esta proliferando más es el acceso a Internet, en este servicio los operadores luchan por capturar usuarios, a tal grado que con el propósito de generar tráfico local procedente de otras redes de acceso ofrecen el uso del Internet en forma gratuita en la modalidad de acceso conmutado, obteniendo beneficios en las liquidaciones por la terminación de tráfico en sus servidores proveedores de Internet. Centros de Información y Centros de llamadas han logrado desarrollarse conforme los proveedores de servicios les brindan las facilidades técnicas para implantarse, de esa forma los restaurantes de comida rápida pueden ofrecer servicios de entrega en un tiempo máximo de treinta minutos, so pena de dar gratis el servicio si no se cumple con ese tiempo. En los sitios de acceso público, principalmente en la urbe se puede apreciar locutorios con servicio de Internet a bajo costo y con precios reducidos para los estudiantes o para los que utilizan el ordenador por tiempos prolongados.

Los equipos de acceso a Internet con vocación exclusiva de VoIP han surgido, pero el uso se ha visto restringido, principalmente porque para proveer públicamente el servicio de telefonía deben respetarse las disposiciones legales existentes, esto obliga a una interconexión, lo cual hace que se pierda el atractivo comercial que estas terminales con desarrollos tecnológicos recientes permiten.

7 TIC'S en El Salvador

Ya se ha descrito lo que esta ocurriendo en el sector telecomunicaciones en El Salvador, la innovación tecnológica esta llegando como producto de la iniciativa privada, evidentemente las instituciones de gobierno deben participar en los nuevos desafíos e integrarse con los nuevos procesos, utilizando herramientas informáticas en donde las tecnologías de la información y comunicación están desplazando rápidamente los procesos analógicos y de mucho control personal implantados en nuestras administraciones desde hace mucho tiempo. Los países desarrollados que ya cuentan con aplicaciones de TIC's partieron de un plan bien fundado, creando, desarrollando e implantando ordenadamente estas herramientas. En El Salvador, se ha iniciado con un proyecto que busca establecer un diagnóstico de nuestra realidad en cuanto a TIC's, para ello el gobierno esta recibiendo asistencia técnica del Japón. El estudio en ejecución se encuentra en la fase de investigación, el cual una vez realizado determinará cuales deben ser la políticas a seguir y establecerá nuestro punto de partida.

7.1 Internet en El Salvador

En El Salvador, en los últimos años se ha incrementado y modernizado la capacidad instalada con la que los proveedores de conectividad y servicios de Internet cuentan, motivados por la creciente demanda. Se estima que dicho crecimiento es de un 20% anual, por lo que, para mantenerse activos en el mercado, todas las empresas desarrollan planes de expansión programados en el tiempo, los cuales son celosamente guardados.

7.2 Cobertura

La cobertura del servicio provista, se halla concentrada principalmente en San Salvador, y probablemente en algunas otras localidades específicas del interior del país. Las únicas empresas que ofrecen cobertura en casi todo el territorio salvadoreño son las Sociedades CTE, S.A. de C.V., y Telefónica Multiservicios, S.A. de C.V.

7.3 Tipos de servicios ofrecidos

El servicio de Internet por medio del acceso conmutado, es ofrecido en forma gratuita por varios proveedores, quienes generan beneficios a partir del cobro de impulsos telefónicos y por medio de la

venta de publicidad. También se presenta la modalidad de cobro por acceso conmutado, normalmente sin límite de uso, en tarifas mensuales de USD 4 a USD 5.

Algunas de las tasas que emplean los proveedores locales de acceso conmutado son de 6 líneas telefónicas por módem y 25 a 45 usuarios por módem.

También hay enlaces «peer to peer» en forma bilateral entre algunos de los proveedores, para intercambiar el tráfico que fluye entre ambos, con anchos de banda que van desde los 64 hasta 1024 Kbps, dependiendo del tráfico observado.

Estos arreglos bilaterales, si bien solucionan el problema del intercambio de tráfico entre proveedores involucrados, sin utilizar el ancho de banda internacional contratado, resultan una alternativa ineficiente a largo plazo. De ser extendido este esquema, cada proveedor debería contar con un enlace dedicado a cada uno de los demás proveedores, lo que haría esta operación incosteable. De aquí que la mejor alternativa sea la instalación de un NAP, a lo que prácticamente la totalidad de proveedores se encuentra anuente.

Algunos de los servicios ofrecidos por las empresas consideradas Proveedores de Servicios de Internet (ISP's) en el país son:

- Accesos Conmutados,
- Accesos Dedicados,
- Alojamiento de sitios Web (Web Hosting),
- Web TV,
- Videoconferencia a través de IP,
- Diseño de páginas Web,
- Servicios de soporte a servidores de Internet,
- Diseño, instalación y configuración de redes LAN y WAN,
- Asesoría en adquisición de sistemas de comunicación de datos,
- Capacitación a empresas,
- Desarrollo de aplicaciones orientadas o basadas en tecnología Internet, tales como Intranet y sistemas bancarios,
- Telefonía computarizada,
- Servicios de acceso satelital.

Con las ofertas de Internet gratis, la inclusión de los impulsos en la tarifa de Internet y con las ofertas de servicios de parte de las empresas de cable, el Internet conmutado prácticamente desaparece. Se perfila que a futuro, los servicios de Internet serán ofrecidos por las empresas que cuentan con una red de acceso grande, y que el resto de empresas se quedarán trabajando en los enlaces dedicados.

A diferencia de la telefonía, la provisión de servicios relacionados con Internet, no requieren de una autorización por parte de la Superintendencia General de Electricidad y Telecomunicaciones (SIGET). Esto ha propiciado que aún empresas pequeñas, hayan visualizado éste como un negocio productivo, y se hallen decididos a perseverar y obtener una cuota importante de un mercado en continuo crecimiento, tanto en El Salvador como en el resto del mundo. Es así como actualmente se cuenta con 24 proveedores del servicio de Internet.

7.4 Equipos utilizados y costo del servicio

Algunos de los equipos utilizados por las empresas dedicadas a la provisión del servicio de Internet comprenden:

- Enrutadores Cisco 2500, 3600, 3640, 7206, para conexiones hacia proveedores y backbones,
- Equipos de enrutamiento Cisco1720, para clientes dedicados,
- Equipos de acceso Cisco AS5300, con capacidad de 4 E1's cada uno,
- Servidores Compaq para Mail Server, Web Server, Hosting, y Monitoreo,
- Equipos con plataformas Solaris, Linux y AIX.

En cuanto a enlaces y anchos de banda, tanto hacia el exterior como los ofrecidos a clientes locales:

- Varios accesos a Internet, normalmente con redundancia entre enlaces satelitales y enlaces de fibra óptica.
- Si bien los anchos de banda hacia el exterior son variables, de acuerdo al tamaño del proveedor, iniciando en 512 Kbps, a manera de ejemplo para una salida de 6 Mbps, el tráfico mensual promedio es de 4350 Kbps.

- Los anchos de banda ofrecidos a clientes dedicados son, en su mayoría, de 128 Kbps, pero también se proveen anchos de banda de 256 Kbps, 512 Kbps y más, siempre en múltiplos de 64 Kbps. Se utilizan como transporte enlaces de fibra óptica, cobre y microondas.
- Los precios de estos servicios oscilan entre USD 350 a USD 700 mensuales por un enlace de 128 Kbps, dependiendo del proveedor.
- El precio de instalación depende de la factibilidad técnica de cada cliente.

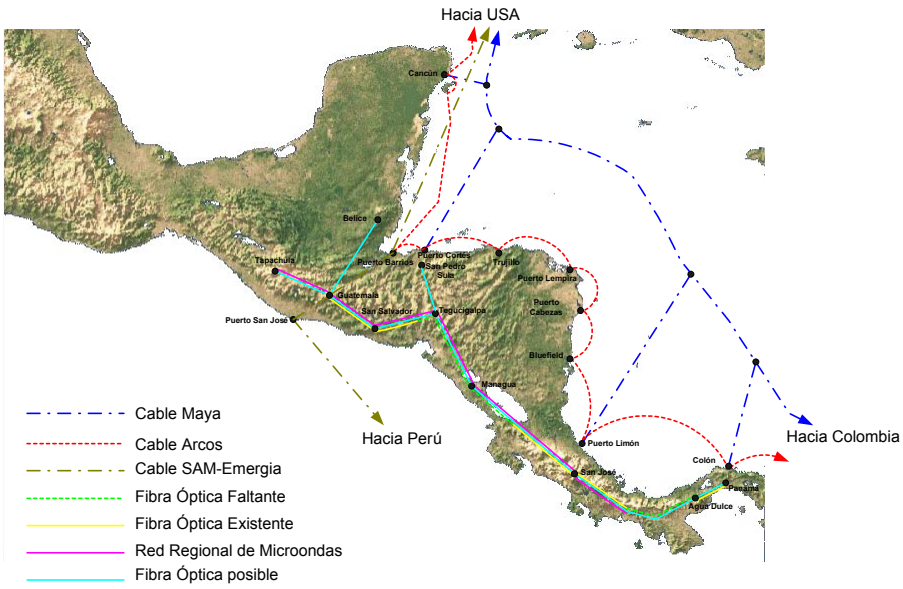
8 Tendencia del mercado de las telecomunicaciones

Durante los últimos cuatro años, las importaciones de equipos de telecomunicaciones, diferentes tipos de hardware y software se han incrementado rápidamente, debido principalmente, a los competidores en el mercado de la telefonía celular, lo que incluye la entrada a nuestro país de especialistas en la construcción y el desarrollo de centrales telefónicas, redes de fibra óptica, sistemas de microondas, torres y antenas para servicio celular, lo que también incluye laboratorios para reparar teléfonos celulares, todo esto con la intención de brindar toda clase de servicios utilizando las nuevas aplicaciones del mercado, que den una solución integral, rápida y confiable a sus demandas.

En el área de la informática, es obvio el incremento de equipos como: computadoras personales y residenciales, servidores, encaminadores, módems digitales, accesorios para Redes de Área Local (LAN). Los operadores locales proveen facilidades de financiamiento a sus usuarios para la adquisición de computadoras personales, con el objeto de extender sus servicios a los consumidores en el campo del acceso a Internet, como una medida de popularizar dicha herramienta para lograr su completa difusión.

9 Planes de desarrollo

Dentro del marco de apertura del sector telecomunicaciones, existen planes de desarrollo para la región centroamericana. Dichos planes contemplan entre otros proyectos el desarrollo de una red de fibra óptica en Centro América, que se contempla en un proyecto llamado «PPP» (PLAN PUEBLA PANAMÁ). Esta es una iniciativa de los Gobiernos de la región, y cuya responsabilidad está bajo el Gobierno de El Salvador, aunque deberá ser desarrollado con fondos de inversión privada. El proyecto interconectará a los siguientes países: México (Puebla), Guatemala, Belice, El Salvador, Honduras, Nicaragua, Costa Rica y Panamá. Sin embargo, es necesario y fundamental adecuar la regulación en cada uno de los países antes de establecer dicha red.



Indicadores de telecomunicaciones

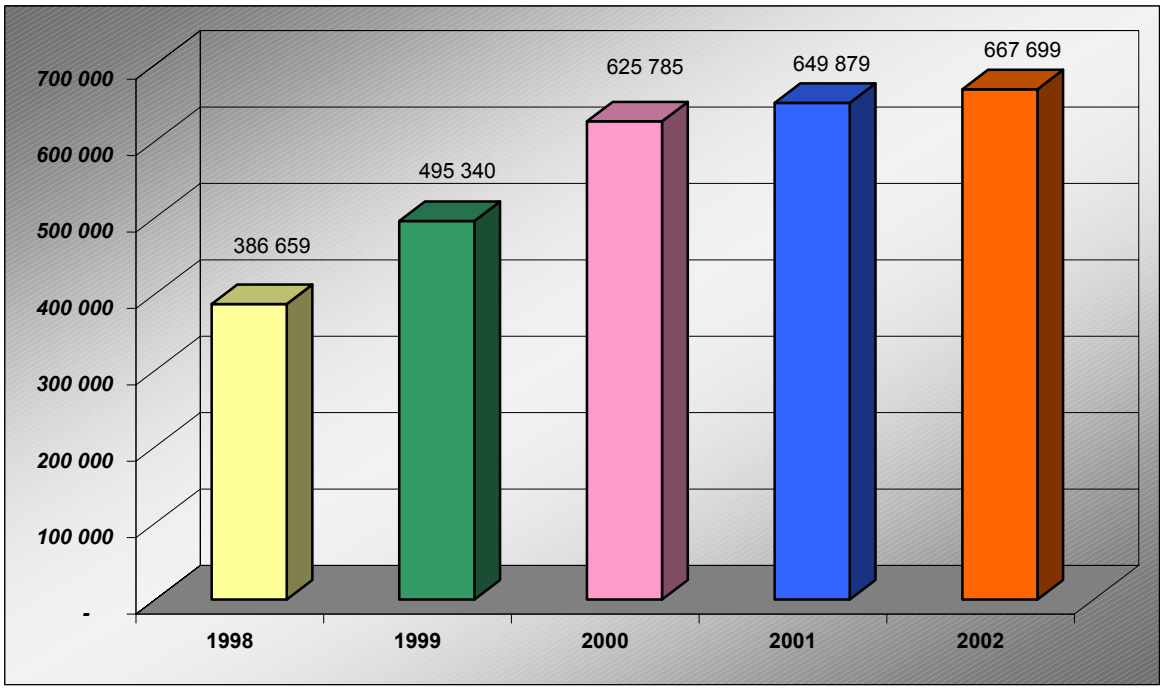


Figura 1 – Crecimiento en El Salvador de la cantidad de líneas fijas por año

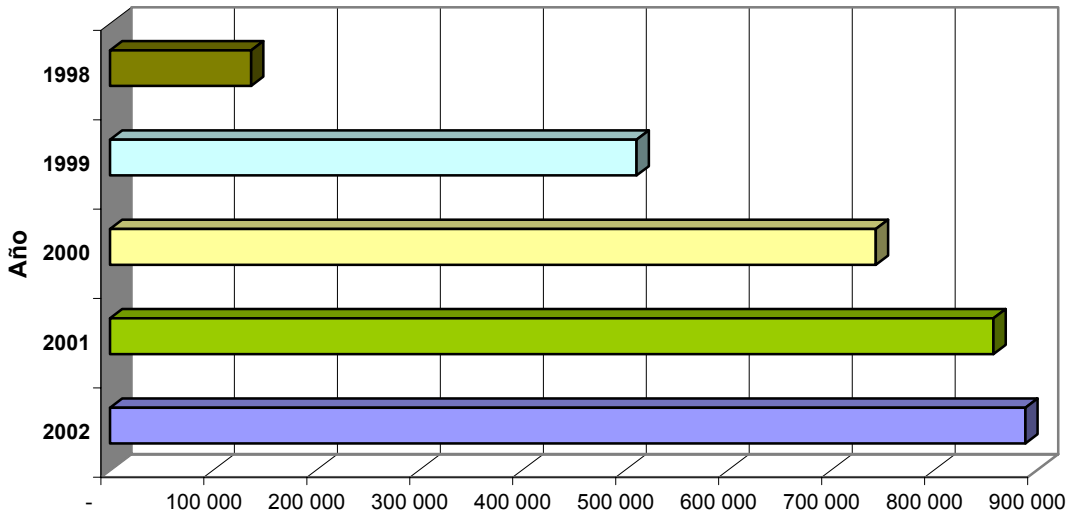


Figura 2 – Crecimiento histórico en líneas móviles en El Salvador

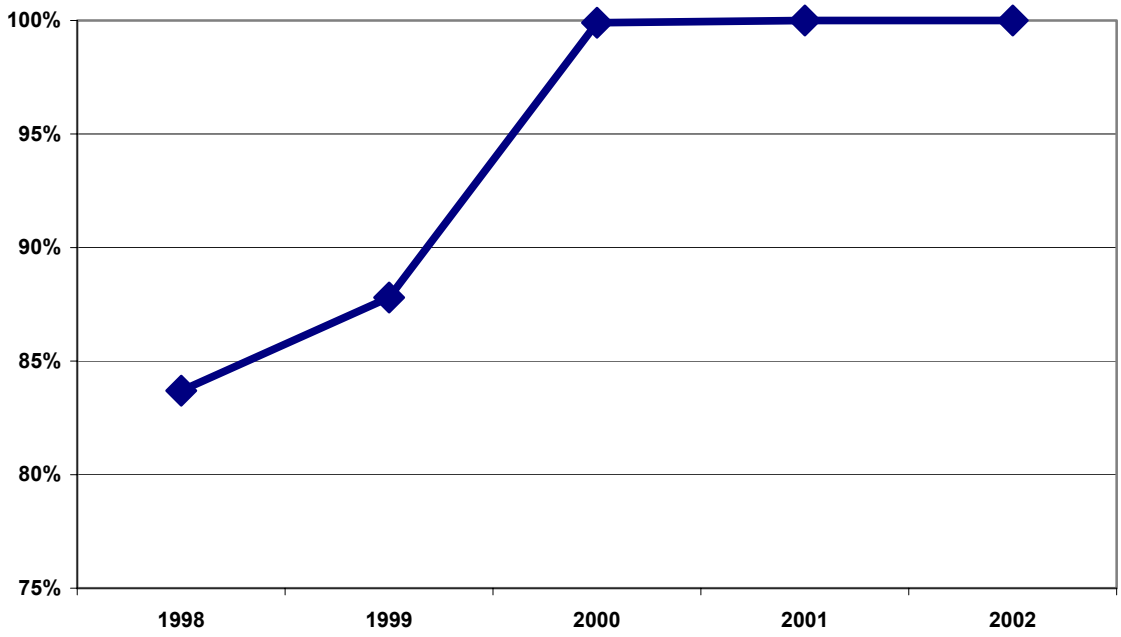


Figura 3 – Porcentajes de líneas principales conectadas a centrales digitales

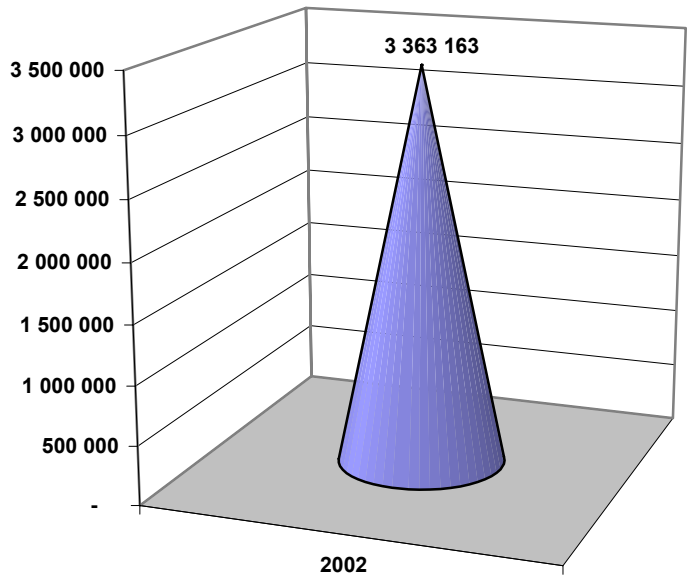


Figura 4 – Número total de conexiones en el año 2002

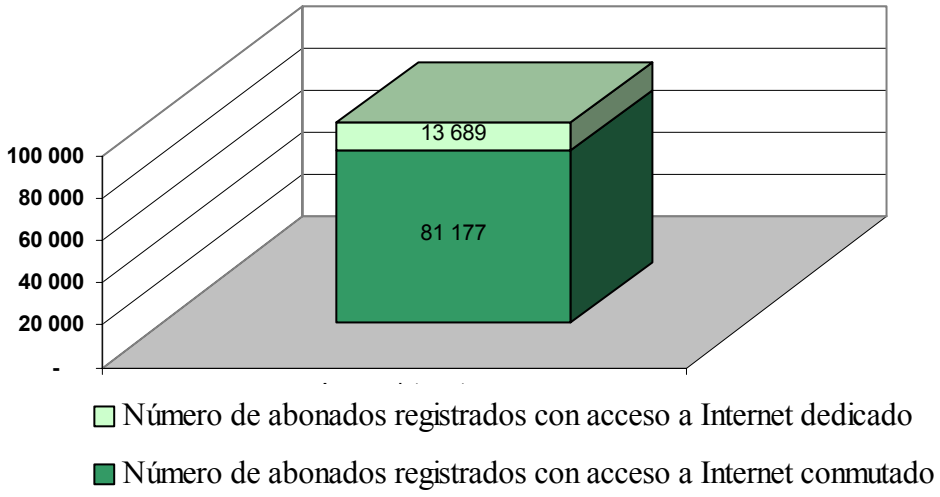


Figura 5 – Cantidad de conexiones a Internet para el año 2002

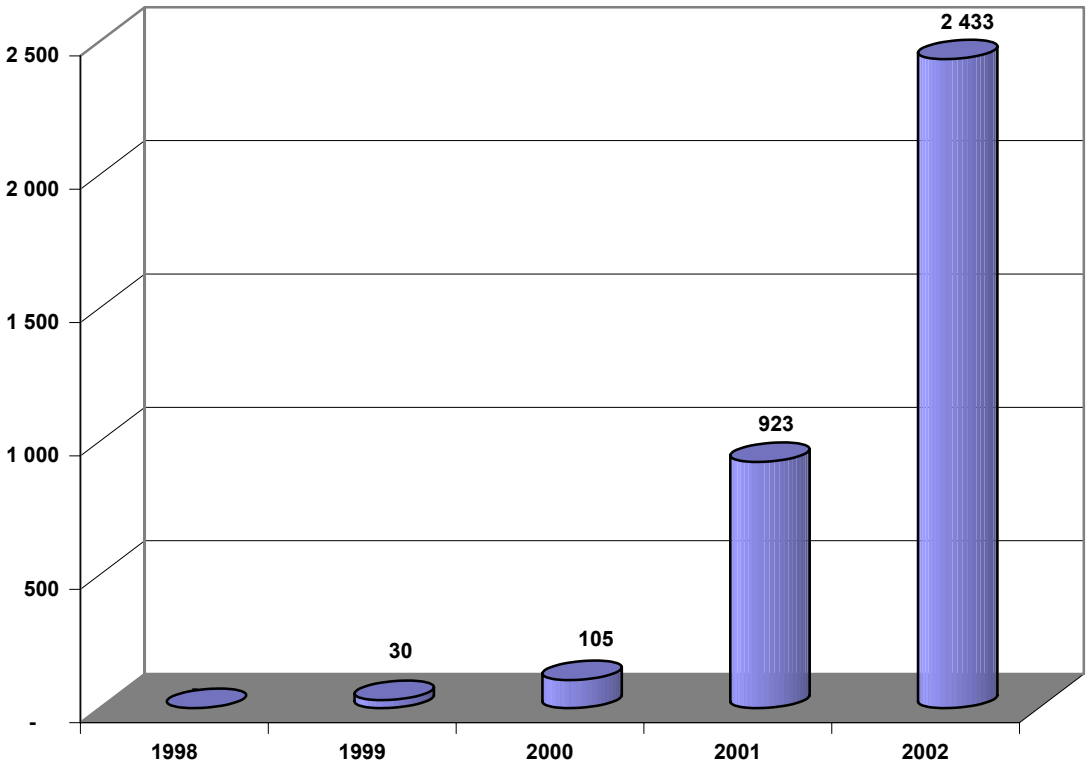


Figura 6 – Abonados a la RDSI por año

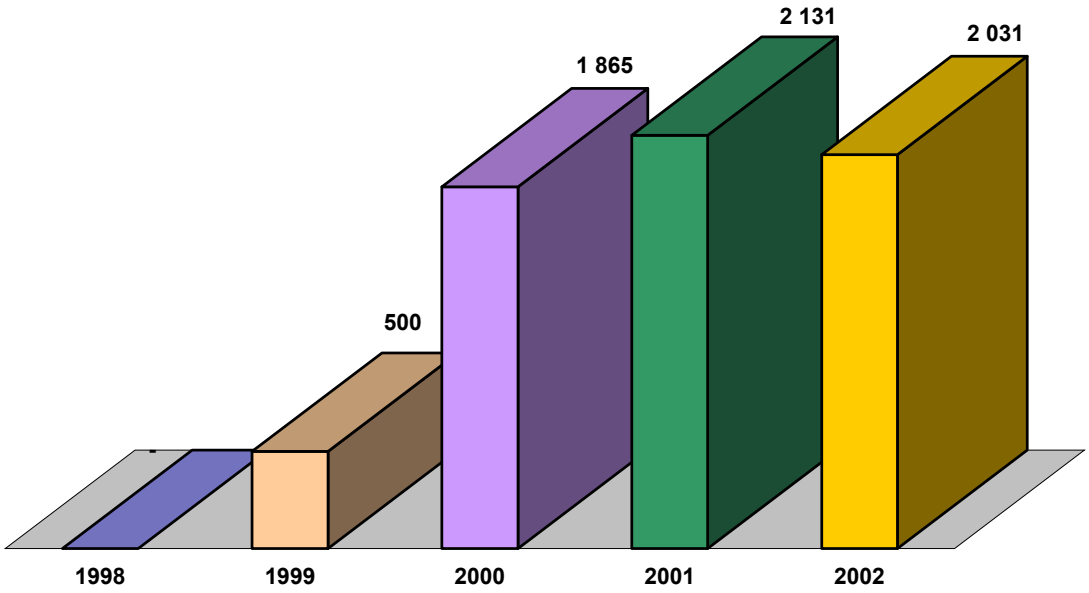


Figura 7 – Abonados a redes públicas de datos por año

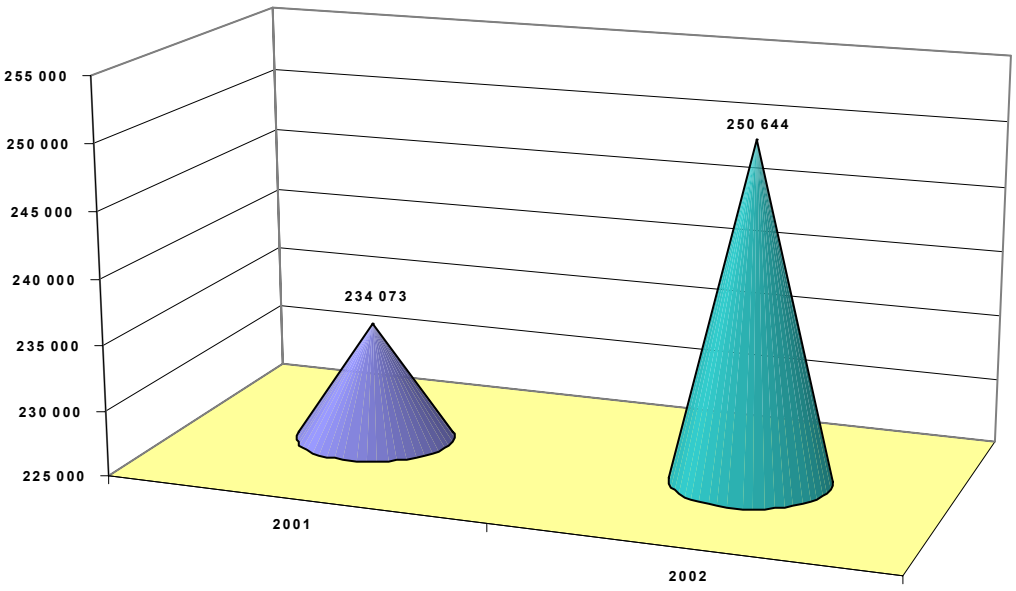


Figura 8 – Cantidad de averías del servicio telefónico, reportadas por los usuarios

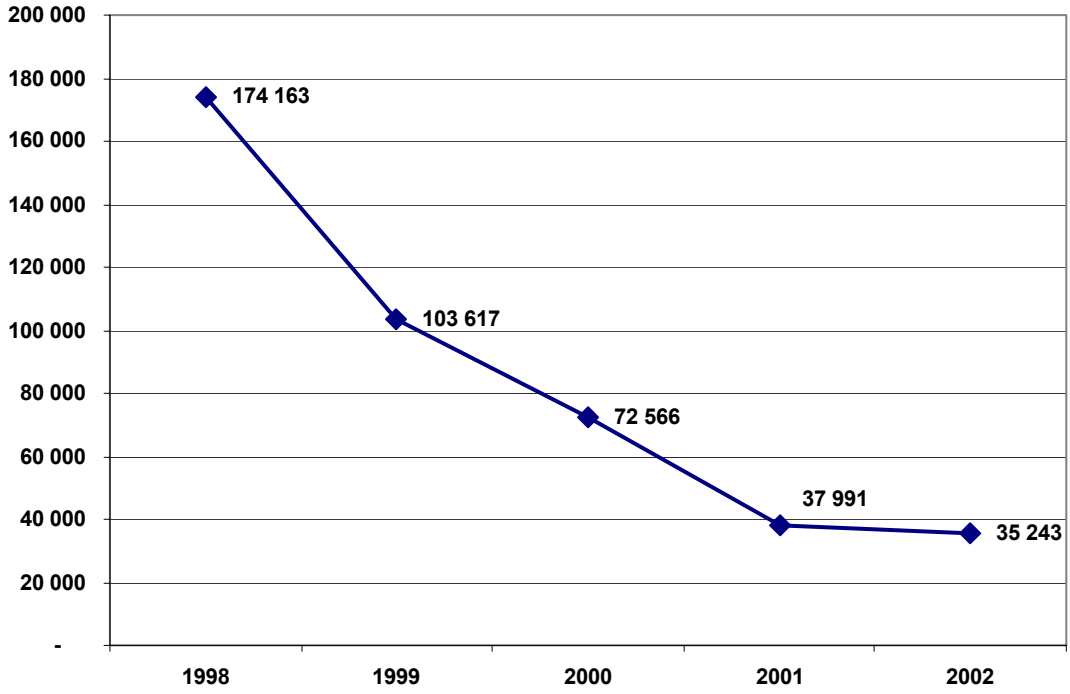


Figura 9 – Solicitudes no atendidas de líneas telefónicas residenciales por año

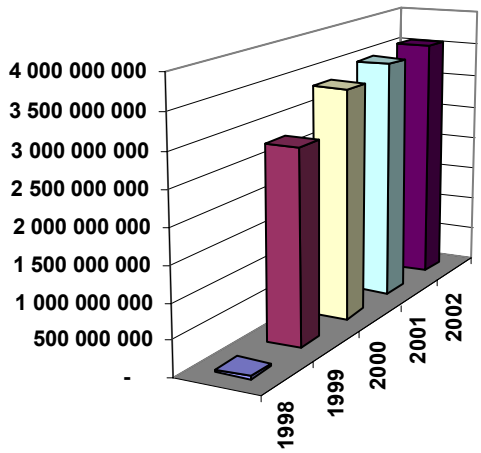


Figura 10 – Evolución del tráfico telefónico local en El Salvador

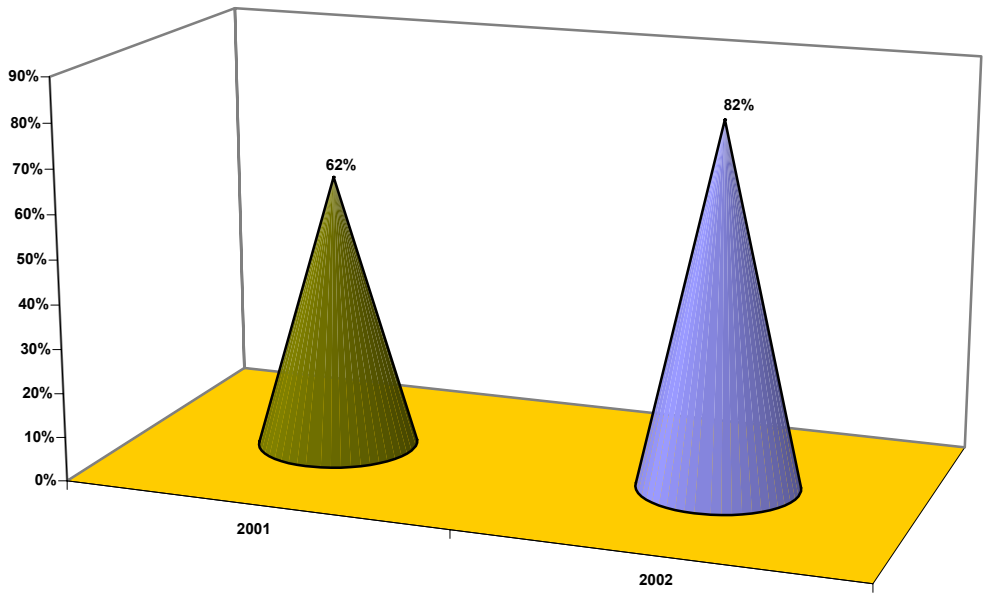


Figura 11 – Porcentaje de reclamos resueltos a favor del usuario

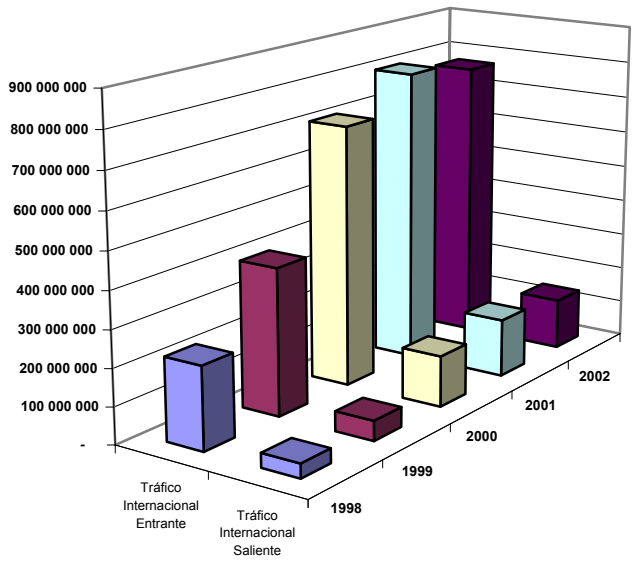


Figura 12 – Evolución del tráfico internacional en El Salvador

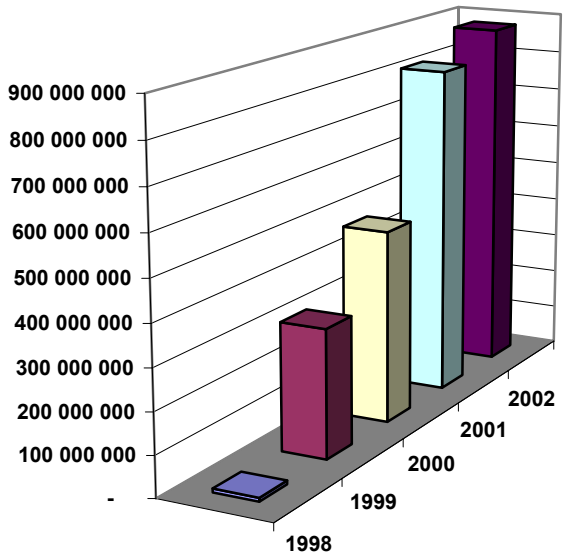


Figura 13 – Evolución del tráfico telefónico nacional en El Salvador

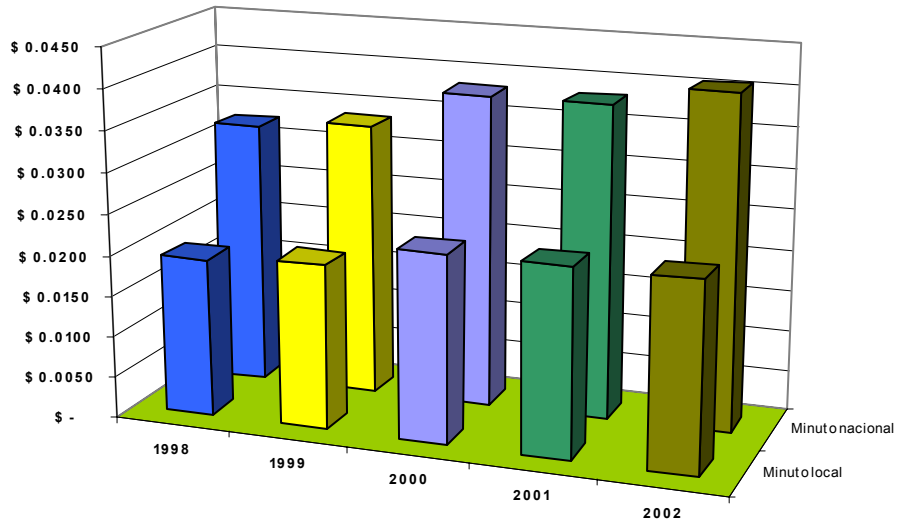


Figura 14 – Costo por minuto local y nacional en El Salvador

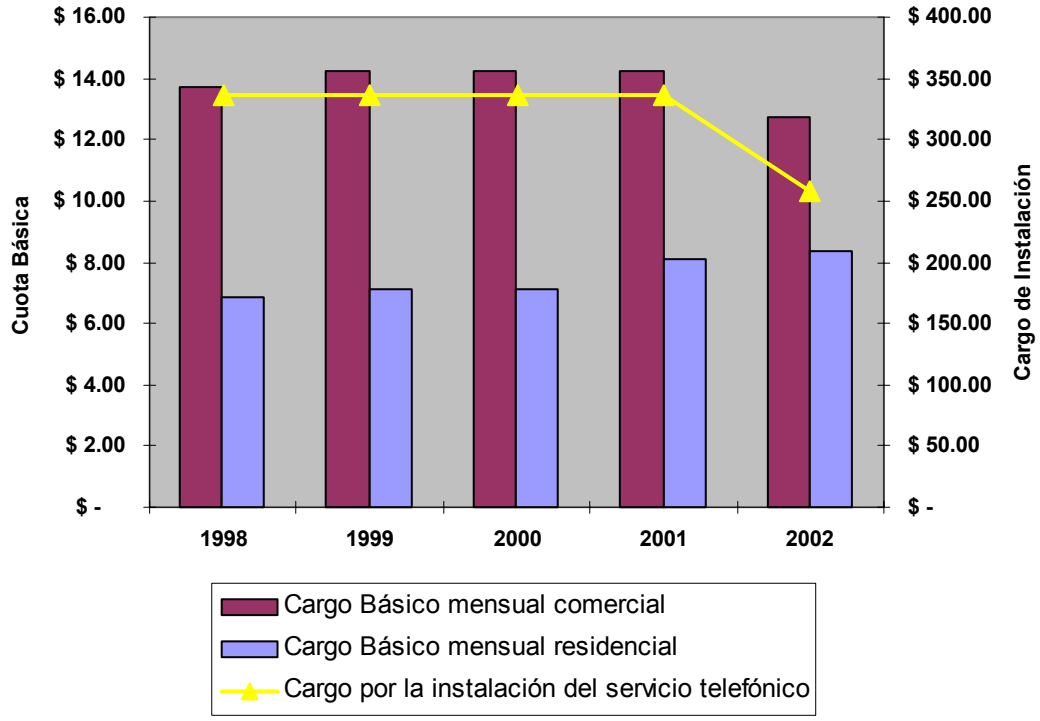


Figura 15 – Cargo de instalación, cuota básica residencial y comercial

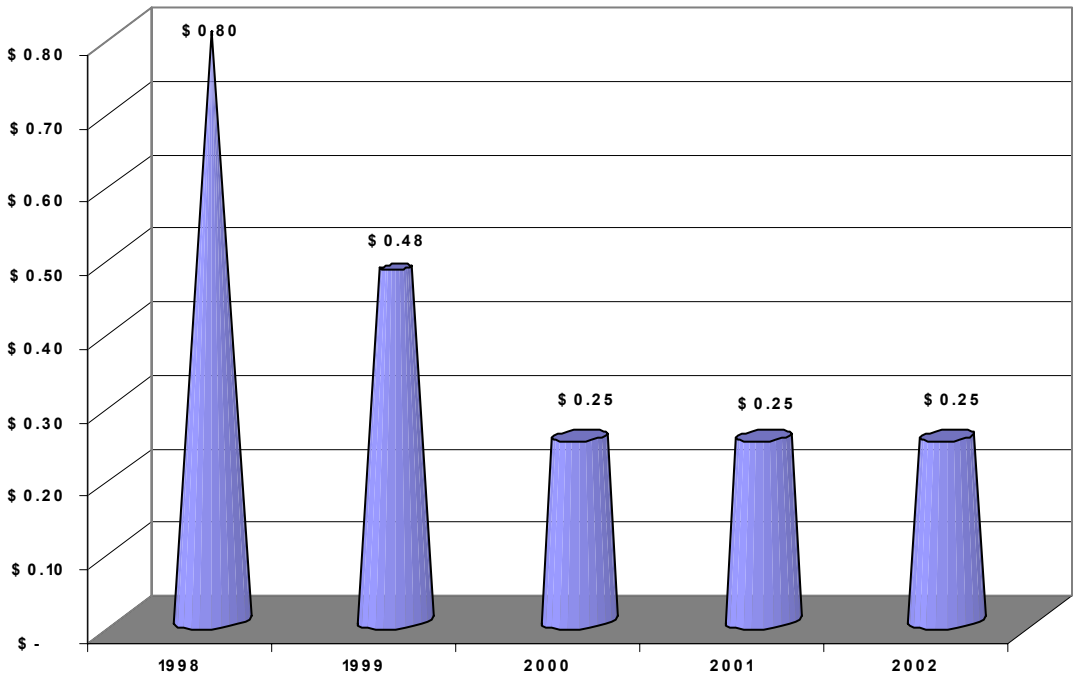


Figura 16 – Costo promedio por minuto en horario pleno hacia Estados Unidos desde El Salvador

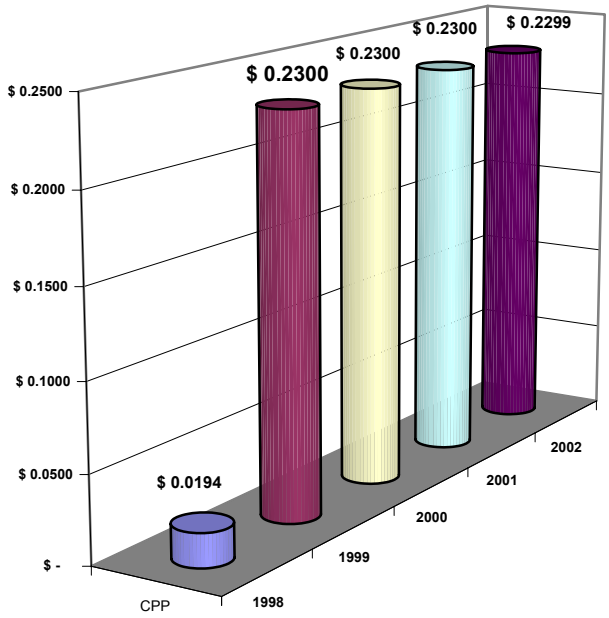


Figura 17 – Cargo por llamadas de fijo a móvil en El Salvador

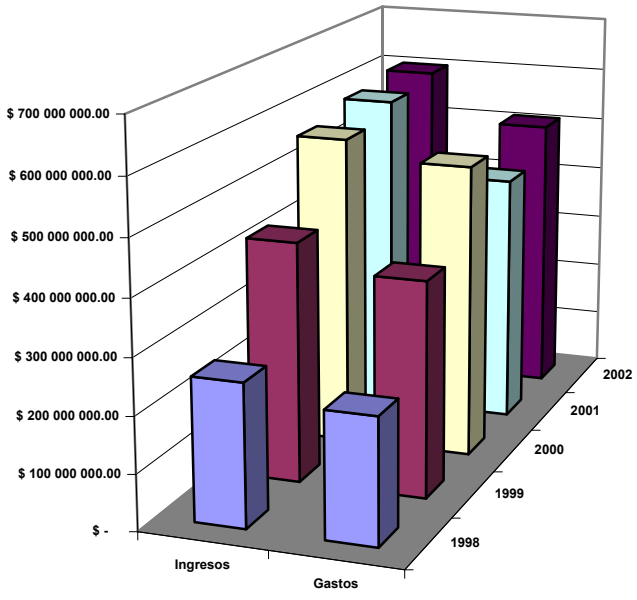


Figura 18 – Ingresos y gastos de las empresas de telecomunicaciones en El Salvador

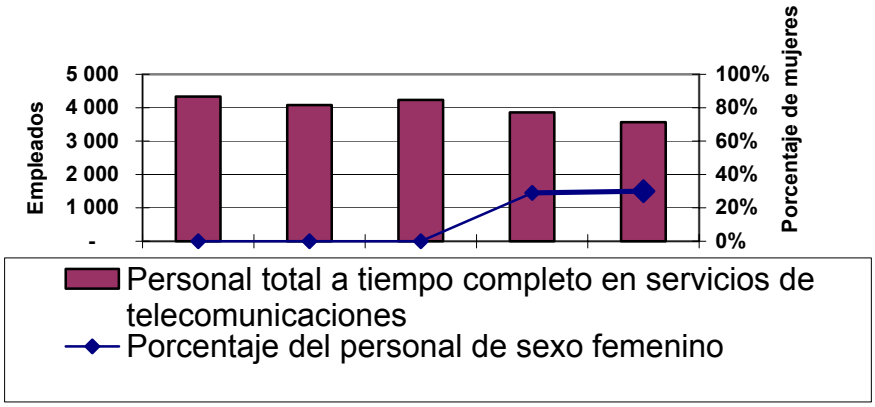


Figura 19 – Personal en las empresas del sector telecomunicaciones en El Salvador

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Eritrea

Telecommunication Development Country Report for Eritrea

1 Background

Eritrea lies 1000 km along the Red Sea coast. It is situated in the northeastern part of Africa between 12° and 18° north latitude and between 36° and 43° east longitude. Eritrea is bordered by the Red Sea in the east, Sudan to the West, Ethiopia to the South and Republic of Djibouti in the southeast. In addition several islands such as the Dahlak islands belong to Eritrea. The country has rugged geography with an altitude range of minus 100 meters (in Dallol depression south of Massawa) to 4000 meters.

The climatic conditions are determined mainly by altitude. The high plateau has a temperate climate throughout the year. The main climatic divisions are the "Dega" (or the temperate plateau) with a mean temperature of 18° C and the "Kola" (or the lowlands) with mean temperature of 35° C.

Changes in climatic patterns have rendered large parts of the country vulnerable to drought. Extensive projects are underway to improve the ecological balance and afforestation and soil conservation programmes.

Administratively, Eritrea is divided into six zones. They are:

- Zoba Maekel
- Zoba Anseba
- Zoba Gash-Barka
- Zoba Debub
- Zoba Debub-Keih-Bahri
- Zoba Semien-Keih-Bahri (see map of Eritrea next page)

Each zone has its own Local government and assembly which is responsible to the central government. The style of government in Eritrea is presidential where the president acts as the head of state and the chief of the armed forces.

Country Basic Data

Capital City	Asmara
Area	125,000 square kilometers
Population	3,800,000
Population growth	3% per annum
GDP	USD 190
Main Telephone Lines	36 500
Telephone Density	0.81%

2 Telecommunication sector in Eritrea

2.1 Regulatory framework

From 1991 up to 1996 the telecommunication sector was under the Eritrean Post and Telecom Authority. In 1996 the Post and Telecom were separated having the communication Sector divided into a regulatory body under the name of **Communication Department** and the telecom operator the **Telecommunication Service of Eritrea**. The Eritrean Postal Services, the Communication Department and the Telecommunication Service of Eritrea are responsible to the Ministry of Transport and Communications.

The Communication Department holds the responsibility of sector regulation. The Telecommunication Proclamation No. 102/98 is the primary law governing the sector and granted the government an exclusive power to establish and provide all telecommunication services and products including:

- Supervision and promotion of provision of communication services in Eritrea, and
- The authority to issue, renew, revoke or transfer permits, equipment approvals certificates, assignments of frequency and other regulatory documents in the communications sector on behalf of the Government of Eritrea.

The main objectives of the Communication Department are defined in the proclamation No. 102/98 as follows:

- Create a regulatory environment for the supply of communication network and services;

  Promote fair competition and efficient market practice in the communication sector;
- Facilitate the entry into market for communications services for persons wishing to supply such networks and services;
- Ensure that operators, suppliers and installers meet their commercial

obligations and such other obligations specified under the Proclamation in manner which promotes cooperation and fairness;

- Promote operators, suppliers and installers and the public from unfair conduct of other operators, suppliers and installers regarding the quality of service and payment of the tariffs;
- Ensure that operators, suppliers and installers achieve the highest possible level of accountability and responsiveness to customers and community needs;
- Ensure that standard telecommunications, broadcasting and postal services are supplied as efficiently and economically as possible and at such performance standards which reasonably meet the social, industrial and commercial needs of the community;
- Promote the development to other sector of the Eritrean economy through the commercial supply of modern communications services within the framework of the Proclamation;
- Establish technical standards and promote the development of Eritrea's communications capabilities, industries and skills;
- Ensure the Eritrean public have growing access to communications; and
- Optimize the use of communications networks and services in Eritrea with due consideration of the rights of the operators, suppliers and installers and the public interest etc.

2.2 Macro economic policy

With the liberation of Eritrea in 1991 the government of Eritrea launched a major rehabilitation and reconstruction programme of the country's economy and has begun the task of defining a development strategy. This development strategy is contained in its MACRO-POLICY manifesto which is a multifaceted development policy that addresses the infrastructure of the country. To complement this policy the government has issued Investment Proclamation No. 59/1994 inviting local and foreign investors to participate in the development objectives.

The investment policy is attractive, favourable and has the full government guarantee against nationalization or confiscation. Foreign currency remittance is allowed.

As a result of this foreign investors have shown interest and have started to invest in mining, fisheries, oil exploration and services, etc. In addition to the above hotels and other institutions are being sold to local and foreign investors.

The government is confident for the realization of its objectives as it possesses highly motivated and disciplined people who have a strong aspiration and commitment to bring it about.

The telecommunication sector being part of the infrastructure for development is slated for private participation and would-be partners have shown interest for investment in the sector.

2.3 Existing telecommunication network in Eritrea

2.3.1 Introduction

The Telecommunication Service of Eritrea (TSE) was set up under the Ministry of Transport and Communications with a view to run the telecommunication services on commercial basis and is the only provider of telecommunication services in the country.

The Telecommunication Service of Eritrea's public switched network (PSTN) consists of approximately 45,000 lines of which 36500 lines are in use. TSE waiting lists indicates that there are 40,000 waiting applicants currently waiting for service.

At the moment the Telecommunication Service of Eritrea is providing basic Telecommunication services and also providing carriers to communicate with the outside world. TSE also provides limited value added services such as Dial-up and leased line Internet services, international private leased circuits, etc.

2.3.2 Switching network

The network inherited from previous colonial administrations comprised a limited telephone service in the capital city Asmara and in the port towns of Assab and Massawa each having 10,000, 1800 and 1000 exchange lines respectively which were analogue of the 19th century make. Since independence there has been a substantial modernization Programme to replace the outdated analogue switches by digital ones, installation of new switches, the construction of a new satellite earth station for international traffic and the construction of new exchange buildings.

In early 1993, The Telecommunication Service of Eritrea saw the urgent need of expanding and modernizing its network by increasing the capacity of the exchanges in Asmara to connect the large number of applicants who were on a waiting list for telephone subscription. The same expansion and modernization became evident in the towns of Keren, Massawa, Mendefera and Dekemhare that have had very old analogue exchanges.

Therefore, TSE undertook a modernization and expansion programme of replacing its obsolete exchanges with modern digital exchanges in most of its major centers. Accordingly, the following centers were replaced by digital exchanges:

- Asmara II (Local/Transit combined) was installed and commissioned in 1994. Hosting the following Remote Suscriber Stages:
  - ASM III connected to the main switch via modern fiber optic trunks and is located in Asmara,
  - ASM IV linked via modern fiber optic trunks and is located in Asmara,
  - Dekemhare linked via PDH MW link located 40 kilometers away from Asmara to the south,
  - Mendefera linked via PDH MW link located 54 kilometers away from Asmara to the south.
- ASM V (Local/Transit combined) was installed in 1997 with a new version of digital exchange AXE-10 type connecting to:
  - Beleza PABX connected with microwave spur link located in the suburbs of Asmara,
  - Keren local exchange linked via STM1 SDH microwave and is located 91 kilometers away to the north,
  - ASM IV/1 (remote subscriber stage) connected via an optical fiber located in Asmara,
  - ASM VI (Remote Subscriber Stage) connected via an optical fiber located in Asmara,
  - Elaberid Hicom PABX connected to Keren exchange via microwave spur link,
  - Adikeih rural switch connected via PDH microwave link and is located 110 kilometers away to the south.
- Massawa (local AXE-10 Switch) installed and commissioned in 1998 connects:
  - Ghinda PABX with STM1 SDH microwave link,
  - Edaga (Remote Subscriber stage) via optical fiber,
  - Gurgusum (Remote Subscriber multiplexer) via an optical fiber link,
  - ASM V via SDH microwave link.
- An International Switching Center was installed in 1996 as a Gateway connected to:
  - ASM II local/Transit exchange via coaxial cable,
  - ASM V local/Transit Exchange via coaxial cable,
  - Assab (local □ nalogue switch) via domestic satellite link,
  - Akordat, Barentu and Tessenai rural switches via VSAT DAMA satellite link.

2.3.3 Transmission network

The transmission network was likewise expanded and modernized. TSE currently uses a variety of transmission systems to extend the telecommunications services to cities and towns throughout Eritrea.

2.3.3.1 Microwave systems

There are five microwave systems currently in use which are either newly installed or upgraded since independence of the country. These systems are summarized below:

- A Siemens SDH system was installed in 1997 to provide STM1 links:
  - Between Asmara and Massawa,
  - Massawa and Ghinda via Bonrspiro repeater Station; and
  - Asmara and Keren via the mount Ira repeater station.

Two low capacity PDH spur links between mount Ira and Elabered town and between Biet Ghioghis and Beleza were also installed under the same contract.

- An Alcatel/Teletra 34 Mb/s system between Asmara Central, Asmara M/W station, Abaselama repeater station, and Ethiopia was installed in 1996 to provide services to Ethiopia. But the Abaselama-Ethiopia link has been temporarily closed unilaterally by the present Ethiopian regime since June 1998.
- A Siemens SRAL 8 Mb/s link was installed beteen Abaselama repeater station and Adikeih in 2001.
- The Teletra M/W system between Asmara, Mendefera and Dekemhare was installed in 1986. This was rehabilitated in 1995. However, there are no spare parts available and is recommended to be replaced.

In addition there are also single channel HF, VHF and UHF links that connect the remote towns of Nakfa, Afabet, Adiquala, Dahlak, Segheneiti, Dongollo and Senafe to Asmara.

2.3.3.2 Fiber optic transmission systems

Fiber optic systems are used for all interexchange trunking in Asmara with four systems currently in use:

- An STM-4 provides primary trunking between Central and the Satellite Earth Station and the M/W sites,
- One 140 Mb/s PDH system provides trunking between central and the M/W sites. This link currently carries traffic only to Mendefera and Dekemhare due to the requirement for a 34 Mb/s interface at related PDH microwave system,
- The STM-1 system between Central, Gejeret and Sembel,
- The 140 Mb/s PDH system between Edaga Hamus, Central and Gejeret was installed in 1986 and has been put in service in 1994. This requires replacement.

Fiber optic systems are also used for inter-exchange trunking in Massawa with systems installed between Massawa Head Office, Edaga and Gurgusum.

2.3.4 The external plant

The external plant has been concurrently expanded using modern cable such as jelly filled plastic cables replacing the old paper insulated ones. Since independence close to 40,000 new telephone pairs consisting of underground (buried/ducted) and aerial network was installed.

As part of the access network TSE has implemented a Wireless Local Loop (WLL) technology that covers the villages around Asmara and the town of Debarwa which is 30 km away from Asmara. The first phase of the project was to connect 2 000 subscribers and this is planned to be upgraded and expanded up to 4 000 subscribers using latest wireless technologies.

2.3.5 Satellite communication facilities

TSE has installed two International ground satellite earth stations both of which are standard A located in the capital Asmara. One faces the Atlantic Ocean Region and the other to the Indian Ocean Region operating at 342° East and 60° degree East respectively. Besides, there are two standard F2 domestic earth Stations in Asmara and in Assab that connect the latter with all Eritrean towns. Other types of satellite communication are VSAT DAMA satellite antennas that connect the towns of Akordat, Tessenei and Barentu with the rest of the country and the world.

Table 1 – Subscriber lines, sales volume and revenues (1995-2002)

Item product	1995	1996	1997	1998	1999	2000	2001	2002
No. of lines	16,340	19,368	22,050	24,308	27,726	29,971	31,200	36,500
Urban Traffic (no of pulses- 000s)	50,102	70,344	96,194	78,556	84,998	96,161	128,372	144,862
Foreign outgoing traffic in 000s Min.	1,453	1,54	2,055	2,326	2,432	2,878	3,549	4,478
Foreign incoming traffic in 000s Min.	5,721	7,231	8,741	10,143	12,004	9,530	17,188	22,668
Urban Revenues (Nkf.-000s)	n/a	24,966	32,188	30,482	30,883	32,696	31,354	32,923
Interurban revenues (Nkf.-000s)	n/a	47,111	57,314	74,639	68,973	79,891	73,104	78,221
Net foreign billings (Nkf.-000s)	n/a	44,629	52,563	61,010	60,458	58,803	61,490	62,720

Table 2 – Historical operational performance indicators (1995-2002)

Item Description	Unit	1995	1996	1997	1998	1999	2000	2001	2002
Supply and demand									
Main lines connected	DEL	16 340	19 368	22 050	24 308	27 726	29 971	31 200	36 500
Mains lines per 100 people	%	0.5	0.55	0.63	0.69	0.78			0.81
Public payphones	No.	124	124	265	389	417			
Satisfied demand	%	30.5	55.7	57.7	56.9	58			
Average waiting time for a line	year	19	6.3	5.3	5.9	6			
Quality of Service									
Mean Installation Time of stations	days	n/a	n/a	1.24	4.07	3.17	1.6	1.47	1.64
Reported faults cleared in 24 hours	%	n/a	n/a	n/a	62.7	49.4	74.5	70.5	71.8
Mean fault clearance time									
Outside Plant	days	5.48	1.25	4.12	3.5	4.64	3.25	4.66	2.81
Customer Premises Equipment	days	n/a	n/a	3	2.1	6.5	1.32	1.17	1.08
Call completion Rate:	%								
Local		37	48	52	52	54	53	51	52
STD		n/a	24	21	48	49	56	48.5	55
International		22	47	49	53	49	43	31	41
Productivity									
Full Time Staff	No.	513	553	628	578	463	453	476	641
Number of main stains per employee	No.	32	35	35	42	60	66	66	57
Complaints									
Total number of complaints	No.	1 159	1 976	1 279	2 069	1 133	921	398	856
% of justified to total complaints	%	76.8	69	33	58	39	50.6	97.7	17.52

2.4 Operation and maintenance

2.4.1 Operations and revenues

The Telecommunication Service of Eritrea has expanded and rehabilitated the network which inherited from the colonial administrations. Since independence in 1991, TSE has been operating its network modestly well. The Telecommunications sales volume, revenue figures and subscriber line expansion and quality of service parameters starting from 1995 up to December 2002 are depicted in Table 1.

2.4.2 Operational performance of the national network

In the last decade the Telecommunication Service of Eritrea has made a substantial progress in operating, maintaining and expanding the national telecom network. In those years the capacity of the network has increased by 3-4 fold compared to the capacity of the inherited network.

By African standards the operational performance of the network as depicted in Table 2 shows the trend towards expansion, improved quality and increased subscriber satisfaction. This places Eritrea in a better position out of the 32 selected least developed countries.

3 Internet service

The Internet service in Eritrea was launched in November 1999. The government of the State of Eritrea and the government of the United States of America had cooperated to establish the National Internet Operating gateway under the Leland Initiative. It was agreed that the Internet is open for competition from the inception and the Telecommunication Service of Eritrea was entrusted to operate the National Internet gateway. Accordingly, 5 Internet Service providers were interested to go in for the business after meeting the Communication Department's requirements.

The objective of the Internet service is to assist in the creation of an enabling environment to facilitate electronic networking and access to global Information infrastructure technologies; ensure the availability of a reliable, competitive and cost effective services for accessing the Internet; and increase broadband utilization of the Internet to enhance sustainable development objectives.

During the commissioning of the project, the backbone bandwidth was 512 kbps downstream and 256 kbps upstream. After 6 months time this bandwidth was found to be too small to satisfy the users. Besides, since it was shared between the Leland Initiative countries, it was very slow. Therefore, it was expanded to 1 Mb/s Upstream and to 512 kbps downstream in a year's time. Still this also was not enough which required further expansion to 2/1 Mb/s. The speed of the Internet access at the current bandwidth is still very slow that indicates the bandwidth may need to expanded up to 10 Mb/s in order to provide fast Internet access for which the planning work is completed.

To date there are 5 Internet Service providers and about 50 Internet cafes. The number of Internet Users in the country is increasing fast. There are about 12,000 Internet users.

4 Competition in the Telecom Sector

TSE is currently the only provider of telecommunication services in Eritrea with the exception of 5 Internet Service providers which have started in November 2000. In addition one mobile network operator, has obtained a license from the Communication Department to operate a mobile network in Eritrea in a joint venture with the Government of Eritrea. The operator has conducted a pilot project and is preparing to install and operate the network.

Moreover, the Government of Eritrea is currently undergoing an exercise to transform TSE into a share company. An Internationally recognized organization (KPMG) has undertaken TSE's business viability, profitability and asset valuation assessment and has submitted its findings to the Government in 2001.

5 Network development

5.1 Objectives of the network programme

The prime objective of this programme is to enhance the socio-economic development objectives of the State of Eritrea by expanding and modernizing the network so that basic and advanced services are introduced throughout the country by:

- Increasing the telephone penetration from 0.81 to 5 per hundred population nation wide,
- Improving the quality of service,
- Introducing advanced services such as the Internet,
- Enhancing Eritrea's connectivity within the region and internationally,
- Improving and sustaining the profitability of TSE against the falling of tariffs and accounting rates worldwide.

The initiation of this expansion and modernization programme through the introduction of new technology is therefore, to address the above elaborated realities and problems.

5.2 Overview of planned projects

The Telecommunication Service of Eritrea has old and obsolete exchange and transmission equipment in its existing network. Some of the equipment are first generation analogue exchanges that are inherited from the colonial administration and were installed in the 1960's. Even the digital exchanges and the transmission equipment were manufactured in the 1980's. Since these exchanges and transmission systems are Y2K non-compliant they need to be replaced. In addition, these equipment are out production and hence it is difficult to maintain and operate the network as there are no spare parts available in the market.

With regard to the Outside Plant, the major part of the under ground cable network in Asmara is above 30 years old. It uses paper insulated cables and is difficult to repair because the accessories and materials for this technology are not available in the market.

Consequently, the reliability, availability of the network and the overall quality of service is very poor and is deteriorating rapidly. Besides, the capacity of the national network is fully utilized.

Therefore, TSE has drawn a network development programme which will be implemented in short and medium terms. The main objective of the programme is to replace the old switching equipment and expansion of total digital exchange capacity to meet the majority of forecast demand in major cities and towns. The programme also addresses the replacement of the older microwave systems and expansion of the overall TSE microwave network to provide a firm base for future network expansion and provision of telephone services to a number currently unserviced towns.

The network development programme envisages to encompass the following activities:

- Installation and Commissioning of a number of digital exchanges having 150,000 in the short term programme in Asmara, Massawa, Keren, Assab, Dekemhare, Mendefera Adikeih and Senafe and other unserviced towns and cities;
- The installation and commissioning of digital SDH microwave link between Asmara, Dekemhare and Mendefera and the extension of the microwave link between Adikeih and Senafe as well as between Asmara-Tessenei route;
- The introduction of mobile service covering Asmara, Massawa, Dekemhare, Mendefera, Keren towns and the highway from Asmara to Massawa. The initial capacity of the mobile network will be 30,000 lines;
- Expansion of the National Internet Gateway bandwidth;
- The introduction of sophisticated billing system within TSE;
- Planning, Design and implementation of access network for 260,000 primary network lines;
- Fiber optic ring network to connect the main switches in Asmara.

5.2.1 Switching systems

The switching systems in the development Programme in Asmara consist of 4 parent exchanges that will be connected in a mesh network using fiber optic and 13 Remote Subscriber Stages that will be parented to the nearest and convenient main switching unit. In Asmara alone the switching capacity will reach up to 110,000 exchange lines in the short term programme. Besides, the existing national gateway will also be replaced and expanded.

In the regional centers and other major towns 7 parent exchanges will be installed. In other small towns and villages 39 Remote Subscriber Stages appropriate to their population will be installed. Under the plan these remote units will be hosted to their respective regional centers. The overall capacity of the switching systems in the regional centers will be close to 50,000 lines.

5.3 Transmission systems

The planned transmission project in the Network Programme aims at connecting:

- the digital exchanges in different parts of the country via SDH microwave or latest technology as a long distance network,
- to meet the regional interest of COMESA and IGAD member countries TSE has plans to extend the connectivity of the Eritrean network via Sudan, Ethiopia and Djibouti to the rest of the continent,
- TSE is committed to terminate in Massawa any viable submarine cable that may pass via the Red Sea. It is to be recalled that Eritrea was one of the countries that signed the Letter of Intent to terminate the failed Africa ONE submarine cable project and has also signed the Shareholders' Agreement for the Comtel Project.

5.3.1 External plant

The external plant project consists of the planning, designing, supply of cables and accessories and installation of 260,000 primary network lines most of which is in Asmara. In addition, the supply of pair gain equipment and other wireless technology including the installation and commissioning are also envisaged.

6 Benefits and Beneficiaries

The output and benefits from implementing this programme are:

- Raise the telephone density of the country to 24% per hundred population in Asmara and 5 per hundred population all over the country. This will impact the socio-economic development of the nation as the telephone density has a direct correlation to GDP growth.
- By introducing and expanding Internet and other advanced services, the Eritrean society will be linked to the Global Information Infrastructure technologies which will improve business competitiveness of the Eritrean companies.
- The advanced services being introduced will enhance the educational and research institutions activities' (tele-medicine, distance learning e-commerce, etc) nationwide.
- The programme will improve the quality of service of the network and this will help TSE generate profit and the Government of Eritrea to earn income from corporate tax. The public will also benefit from having efficient and good quality of service.

7 Challenges

The main challenges TSE is facing in operating, maintaining and expanding its network among other things are:

- Difficulty in securing funds for projects,
- Lack of skilled personnel in the Eritrean market,
- Pressing demand from carriers to reduce accounting rates,
- Shortage of training relevant to telecom industry,
- Problems in getting spare parts. Suppliers specially Ericsson and Alcatel were not willing to provide spare parts though a contract for the supply of spares for the life of the purchased equipment has been signed.

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Ethiopia

Development through ICT

1. Development through ICT

As part of the Ethiopian Government's strategic move to embrace Information and Communication Technologies (ICT) for development, a large-scale expansion of the telecom infrastructure is underway.

As it stands today, there is a wide gap between what the market demands and what the incumbent operator, ETC, provides. For a nation of more than 65 million people, there are only 412,000 telephone lines, 55,000 mobile phone subscribers, 9,000 Internet customers and 130 data circuits.

To bring about a radical change of this scenario, there is a plan to increase capacity of these networks in many folds. Networks are designed to provide high bandwidth reach to urban and rural sites with full carriage of services. Interrelated with each other, three distinct broadband infrastructure projects have been conceived.

- Broadband VSAT reaching 1,100 stations nationwide.
- Broadband digital data network with optical core network.
- Broadband Internet.

Some of the applications ready to be supported by these networks are Distance Learning, Interactive Data, Internet content delivery, Video conferencing and voice. In providing the required connectivity, primary consideration has been given to educational system, health, agricultural research centers and government administration offices.

2. Distance Education Services

The broadband infrastructure is primarily meant to provide connectivity services to SchoolNet (a national network of Secondary and Vocational schools); EthERNet (a national network of higher learning and research institutions), WeredaNet (a national network of government administrations) and AgriNet (a national network of agricultural research institutions).

In the coming 3 to 6 months all secondary and vocational schools, institutes of higher learning and agricultural research institutes are planned to be connected to the above broadband infrastructure. Since Ethiopia is a vast country, reaching all places through terrestrial means is very difficult. Therefore VSAT is selected both as a transmission and last mile solution to reach remote sites. Moreover, the VSAT solution is favored for quick deployment of broadband services. Where the terrestrial digital data network exists alongside VSAT, it will be used as a return channel to uplink Internet content.

In a supply and installation contract recently concluded with Hughes Network Systems (HNS), 1,110 DIRECWAY VSAT terminals and hub station system were procured to work on Intelsat IS-901 satellite. To cater for all types of services such as distance learning, video conferencing, interactive data and Internet, the VSAT system is designed with a 45Mbps outroute DVB carrier and up to 384Kbps inroute DAMA carrier. A schematic diagram of the VSAT system together with the terrestrial system is shown below.

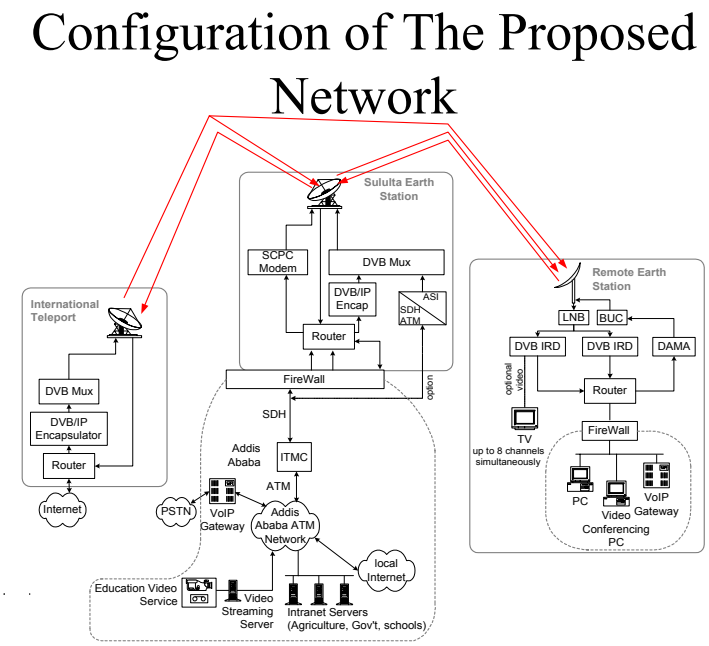

Figure 1 – Configuration of the proposed network

- The service will be provided to more than 500 secondary and technical vocational schools.
- The system will have eight video channels, which will carry classroom content to the schools.
- All the remote stations will have the ability to record material locally at school site so that program can be replayed at their convenience.
- Each video channel will have at least 2 audio channels.
- Some schools will have a classroom that will be organized as an interactive classroom (40 students will attend the interactive class). The remaining classrooms will be set on receive only mode. The interactivity will be one way video and two way audio. Two way audio will be provided through a suitable VoIP system provided at remote stations.
- The video content will be transmitted within the DVB carrier. The content will be encoded either as digital video (via a suitable DVB encoder) or as IP via a suitable video streaming server.

3. Government WAN Service

The Government network will have network structures that follow the administrative structure, that is, Federal Government is positioned on the top, Regional Government comes next then Wereda Administration follows.

- Each Wereda administration office will have a local area network called WRD-LAN.
- Several WRD-LAN will form a Regional wide area network called REG-WAN.
- Several REG-WAN will form Federal WAN called FED-WAN.
- There are 594 Weredas in 11 Regions.
- This network will offer data WAN services and IP based video conferencing services.

4. Agricultural Research Institutes Network Services

- 32 sites including the headquarters in Addis Abeba.
- Each site has existing LAN to be connected to the Headquarter.
- The Headquarter will serve as information hub for the remote sites.
- Information at any site will be accessed from any other site.

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5. Internet Services

All schools (more than 500 sites), all Weredas (594 sites), all agricultural research institutes (32 sites) and all higher education institutes (14 sites) will get an Internet service and will share a common Internet outbound link. The Internet will be delivered from a connection to the Internet backbone through DVB/IP carrier on terrestrial means.

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Guyana

Guyana Country Report

1 Basic Country Data

Physical Coordinates: Northern South America, bordering the North Atlantic Ocean, between Suriname, Brazil and Venezuela. Coordinates: 6^{O} 50' North 58^{O} 12' West.

Area: Total: 214,970 sq km, Land: 196,850 sq km, Water: 18,120 sq km. For purposes of comparison, Guyana is slightly smaller than the State of Idaho

Population: 772,000 (est. 2000)

Neighbouring Countries: Brazil to the South-Southwest [land boundary 1,119 km], Suriname to the East [land boundary 600 km], Venezuela to the West-Northwest [land boundary 743 km]. The Atlantic Ocean to the North [Coastline: 459 km]

Natural Resources: bauxite, gold, diamonds, hardwood timber, shrimp, fish

Ethnic groups: East Indian 51%, black 30%, mixed 14%, Amerindian 4%, white and Chinese 1%

Official Language: English. Amerindian dialects, Creole, Hindi are also spoken.

Government type: Republic within the Commonwealth

Capital: Georgetown

Currency: The Guyana dollar

Country Code (dialing in): 592

Mobile Technology: TDMA (one operator), CDMA (one operator), and GSM (expected turn-up, end third quarter 2003)

2 Economic Summary

Recent Economic Developments

Guyana is categorized as a lower-middle-income country. It has a population of about 770,000 and a per capita GDP of about US$900. About 90 percent of the population lives along a narrow coastal strip, part of which lies below sea level and must be protected by over 300 miles of sea defenses. The incidence of poverty, at 35 percent of the population is among the highest in the Western hemisphere.

Guyana is a very open economy [export to GDP ratio in excess of 80 percent). The country's exports are concentrated in sugar, gold, bauxite, lumber and rice, making it vulnerable to changes in international commodity prices. Like many other Caribbean countries, Guyana will face increased competition in export markets as preferential trading arrangements with the European Union for key commodities like sugar are eroded. Due to uncertain economic prospects and a difficult political situation, Guyana has over the years experienced massive emigration, which has depleted the country's pool of skilled labor and professionals.

Guyana's economy grew by over 7 percent per annum between 1991 and 1997. However, since 1998, economic performance has suffered. Economic growth averaged less than 0.5 percent over the period 1998-2001. This dismal performance is explained by a) terms of trade shocks, b) drought conditions caused by *El Niño*, c) industrial unrest,

and d) domestic political disturbances that followed the two general elections [1997 and 2001] as well as persistent political and ethnic tensions.

Policy Issues

Informed by a long-term National Development Strategy, Government has recently finalized a Poverty Reduction Strategy Paper (PRSP). The overarching goal of the PRSP is to sustain the trend of poverty reduction achieved between 1992 and 1999 by i) stimulating economic growth, ii) strengthening governance and public sector capacity and accountability, and iii) enhancing the delivery of basic services and improving social safety nets.

The key policy issues that have emerged are:

*Creating of an enabling environment for private sector development. [F*or example, harmonization of tax incentives across investor types, greater emphasis on rules-based rather than ad-hoc tax policies, and acceleration of privatization and strengthening of the regulatory framework].

Enhancing governance and strengthening public sector Institutions and processes. [For example, strengthening democratic institutions and processes, encouraging civic participation and increase public accountability and transparency, and building internal consensus on reform priorities]. Accelerating the modernizing of the judiciary, strengthening the Office of the Auditor General, improving the procurement system, modernizing land-titling, and streamlining the civil service are some of the critical steps that could be taken in the near future.

Improving macroeconomic management and policy. [For example, efforts aimed at improving fiscal performance, encourage domestic savings, encouraging foreign direct investment, broadening the tax base, simplify taxes, reducing tax-and-tariff exemptions, and improving tax and customs administration].

Ensuring sustainable development. [For example, via a) regulation of small scale mining, logging, wildlife harvesting, and freshwater fishing, b) effective sea defense management, and c) better regulation of private sector investment and economic activity in interior areas.

Key Economic Data	**1999**	**2000**	**2001**	**2002**
Population	770.6	772.2		
Population Density (people per sq km)	3.58	3.59		
GNI (Current US$ million)	524.6	552.6		
GNI per capita (current US$)	760	750		
GDP (current US $)	593.6	596.9		
GDP Growth (annual %)	3.0	-0.8		
Inflation	8.6	5.9		
Period Average Exchange Rate (G$/ US$)	180.50	184.75	189.50	191.75

3 Regulatory Environment

Regulator	The Guyana Public Utilities Commission
Address	Public Buildings, Brickdam, Georgetown, Guyana
Telephone	(592) 227-3293
Fax	(592) 227-3435
E-mail	puc@solutions2000.net
Web Site	None
Main Contacts	Mr. Prem Persaud, Chairman, GPUC; Ms. Jennifer Ganpatsingh, Secretary (Ag.)
Year Created:	1990
Reports to	The Legislature
Budget Approved by:	The Legislature
Budget Financed by	Government subvention and by contributions from the two principal utilities, GT&T and the Guyana Power & Light Co.
Responsibilities	Tariff approval, specification of regulatory accounts, consumer protection, universal service, expansion plan approval, interconnection approval, research, investigations, and advising the Policy Maker.

Policy Maker

Regulator	The Ministry of Public Works & Communications
Address	Office of the Prime Minister, Wrights Lane, Kingston, Georgetown, Guyana
Telephone	(592) 226-6955
Fax	(592) 226-7573
E-mail	opm@networksgy.com
Main Contacts	The Hon. Prime Minister, Samuel Hinds.

Status of Services

Services	Monopoly	Liberalized	WTO Commitment
Local	x		In the area of value added services: a) All foreign suppliers are permitted to interconnect to the public telecommunications network, and b) online information and data base retrieval liberalized. In terms of Modes of Service Delivery, a) full market access and full national treatment to all cross-border foreign service providers all foreign consumers entering Guyana to consume the specific service, and b) full national treatment to all service providers granted commercial presence.
Domestic Long Distance	x		
International	x		
Mobile		x	
Leased Lines	x		
Data	x		
VSAT	x		
DSL	x		
Wireless Local Loop	x		
Paging		x	
Cable TV		x	
ISP		x	
Restrictions on Ownership	None		

Regulatory Overview

The state-owned Guyana-Telecommunications Corporation (GTC) was privatized in 1990 after the then Government considered privatization the best strategy for a) improving performance and service quality, b) enhancing the range of service provision, and c) injecting much needed new capital and expertise. The monopoly (exclusivity) model was opted for because Government felt that the company would be unattractive to investors if it were to face competition in the provision of basic network services. Government felt too that the market was too small [based on population and per capita income] to justify splitting the company along the lines of geography or service.

Recognizing the importance of effective telecommunication in a situation where the sector is monopolized, Government sought to institute a regulatory model that would promote consumer welfare and minimize the potential for abuse of market power. Regulation was also intended to a) the promote fair competition, b) provide the utility with incentives to improve efficiency, c) permit shareholders a reasonable rate of return, and d) ensure the adequacy of the utility's funding.

The arrangements for telecommunications regulation in Guyana is based primarily on a) the Telecommunications Act of 1990, b) the Public Utilities Act of 1990 (and its subsequent amendments), c) the Purchase Agreement between Government and the Investor (ATN), and d) the operating License granted to the GT&T.

The main provisions of the Purchase Agreement concern a) the scope of the License to be granted to GT&T, b) the primacy of the Purchase Agreement over the other documents, and c) conditions relating to pricing [including the guaranteed rate of return and how it is to be computed] and services provision [including an agreed expansion plan].

The PUC Act was introduced in 1990 and has since been amended on two occasions (in 1997 and in 1999). *The Telecommunications Act* of 1990 establishes among other things, the licensing regime, procedures for the approval and registration of apparatus, procedures relating to rights of ways and the acquisition of land, and regulations for the provision of cable programming. One of its central characteristics is that it caters for a Director of Telecommunications whose responsibility it is to, among other things, a) monitor license adherence and performance, b) promote

the interest of consumers in respect of prices and quality of service, c) oversee matters related to interconnection and determine reasonable terms in the event that agreement cannot be reached between parties. To date, this Office has never been filled.

GT&T's operating License sets out it exclusivities [including international voice and data transmission and sale of advertising in telephone directories] as well as its rights and responsibilities in a number of areas including, but not limited to, a) universal service, b) provision of public call boxes, c) public emergency call service, d) maritime service, e) interconnection, and f) international obligations. It also stipulates conditions that guard against transfer pricing, unfair cross subsidization, and predatory pricing and sets out the procedures for License revocation. The License insofar as it relates to exclusive services is for twenty years [and subject to renewal]. And, insofar as other services are concerned, for a period of ten years [with the option of renewal].

4 Telecom Statistics

		2002
General	Telecom Revenues (US$ '000) Total Telephone Subscribers Total Telephone Penetration (%)	NA 194,443 89.4
Fixed Network	Main Telephone Lines Main Lines Penetration (%) Main Lines Growth (annual %) % of Digital Lines	87,819 50.5 8 100
Mobile Network	Mobile Subscribers Mobile Penetration (%) Mobile Growth (annual %) % of Total Telephone Subscribers	106,624 61.3 45 54.8
Internet	Internet Subscribers Internet Users Internet Penetration Internet Growth Internet Hosts Personal Computers	NA NA NA NA NA NA
Traffic Minutes	International Outgoing ('000) International Incoming ('000)	21,834 100,229
Rates	Accounting Rate with USA (US$/min) Collection Charge to the USA (US$/min)	0.23 0.55

5 Telecom Market Overview

GT&T's operating License does not grant the company a monopoly over all telecommunications services in Guyana. All markets with the exception of local, local long distance, and international are open to competition. To date, in addition to GT&T, cellular mobile licenses have been issued to a) Caribbean Telecommunications Limited [license for CDMA network issued April 1996], b) Caribbean Wireless Telecom, LLC. [PCS license issued April 2000], and c) Cel*Star Guyana Inc. [license for GSM network issued February 2001].

To date, no significant competition has developed in cellular mobile telecommunication. Indeed, only one of the three operators have so far turned up service [a modest operation with roughly 200 subscribers and no network built out] that is restricted to one geographic region [Berbice] of the country. The absence of a clear regulatory framework and the inability to finance network roll-out are the principal factors inhibiting competition. GT&T has just concluded an interconnection agreement with Cel*Star.

There is active competition in the Internet Service Providers (ISP) market. However, based on the operating license it holds, GT&T is the sole operator with authority to purchase Internet bandwidth from the Internet Backbone Access providers in North America and Europe. Therefore, GT&T provides a wholesale Internet service and the ISPs resell the bandwidth to end-users.

There is competition too in the markets for customer premises equipment (CPE) and GT&T is encouraging the Regulator to encourage competition in the area of internal wiring. Government and GT&T have also collaborated to facilitate the licensing of non-interconnected VSAT operators to provide international connectivity to call centers.

The current legal framework and GT&T's operating License notwithstanding, over the last three years GT&T has experienced a significant level of competition to its international telephone service business. Technological advances permit Voice on Net and Voice over Internet Protocol (VOIP) services. Current estimates suggest that these illegal operations account for in excess of 100,000 minutes of outbound traffic per month. This international voice competition continues to proliferate, despite its illegality, because the regulatory bodies are "turning a blind eye." There are too operators that provide direct Internet access via VSAT links that bypass GT&T's network.

GT&T remains the only operator with an obligation for universal service. However, the recent precipitous decline in international settlement rates, the regulator's reluctance to initiate meaningful domestic rate rebalancing, regulatory failure to have other operators and/or Government make a contribution to this laudable goal, and increasing network and settlement bypass all conspire to limit the universalization of access.

6 Key Player Profile

Company Name: Guyana Telephone & Telegraph Co. Ltd.

Company Details	Address	Telephone House, 79 Brickdam [PO Box 10628], Georgetown, Guyana
	Telephone:	(592) 225-1315
	Fax:	(592) 225-0190
	Web Site:	www.gtt.co.gy

	Company Profile:	Established 1991 as a network operator and service provider and authorized to be sole provider of local, local long-distance, and international telephony.
	Key Businesses:	Local, local long-distance, and international telephony; Telephone Directory (White & Yellow pages); PBX; mobile; data; public phones; Interconnection; maritime; wholesale of Internet bandwidth,
	Employee Headcount	650
Contacts	GM/CEO:	Ms. Sonita Jagan
	DGM Operations:	Mr. Gerry DeFreitas
	Director Business Dev.	Mr. Eustace Abrams
	Director Sales & Marketing:	Mr. Michael George
	Legal/Regulatory Consultant:	Mr. Godfrey Statia
Key Shareholders	Atlantic Tele-Network (ATN)	A holding company registered in the USA that has the following subsidiaries and affiliates: GT&T, Wireless World LLC, Atlantic Tele-Centre, Bermuda Digital Communications, ATN Haiti
	Shares Held:	80 %
	Government of Guyana	–
	Shares Held:	20 %

7 The National Telecommunications Network

GT&T provides the national telecommunications network. Within a period of roughly 10 years, the company has brought Guyana a modern, digital telecommunications network employing fibre optic cables, digital microwave radios, and digital satellite systems for purposes of transport. The access network includes fibre rings employing SDH technology, which serves the entire country.

The switching network employs SS-7 signaling configured with 3 DMS-100s and 2 DMS-200 switches. These switches support numerous International Line Control Modules (IRLCM) and International Outside Plant Modules (IOPM) to provide a total switching capacity of over 90,000 lines. Total working lines currently stands at 87,810 and the network capacity is being increased continuously.

The transport network connecting the switching nodes consist of single-mode fibre optic systems configured in four main rings to provide route limited diversity in the event of major equipment failure or fibre cable damage.

The access network consists of mixed gauge [mainly 24-gauge for distribution and 26- gauge for feeder distribution] copper cables. Nortel's Fixed Wireless Access (FWA) technology and a Fixed Cellular network are also used to serve a number of areas. Intelsat DAMA Mesh Connection is deployed to serve remote regions of the country. Fibre cables employing SONET technology serve the main commercial centers in Georgetown.

GT&T operates a TDMA cellular network in cellular band B in the 800 MHz range. The network comprises a DMS-MTX Switch and 20 cell sites. The network provides coverage that is almost seamless along the coast and is estimated to provide portable quality coverage to approximately 15 percent of the country.

The company's Data Network (in service since 1999) is based on Nortel's Passport Switches and has a present capacity of 160 ports. This network comprises of fifteen nodes, configured to provide Frame Relay services. Data rates between 64K and 2Mb are provided via a copper loop. Fibre interconnection allows for data rates of up to 10Mb.

GT&T's Internet Gateway was installed in December 1996 and the first ISP was connected in January 1997. At its inception, this gateway was connected to the Internet backbone via a 256K Satellite link since there was no fibre connection to Guyana at that time. The network was designed to provide 64/128 K links to ISPs and corporate clients via a lease line.

The network has grown to meet the bandwidth demands of ISPs and other dedicated users and currently has a 20Mb capacity to the Internet Backbone. This capacity comprises links via the Americas II cable and a redundant path via Satellite.

Consequent upon a steady decline in the demand for telex and telegram services and notification by international correspondents of their inability to support these services at the "far end," GT&T ceased to offer telex and telegram services in 2002. The Company continues to discharge its obligation to maintain Maritime services.

International switching is provided by a DMS-300 digital switch that employs CCS-7 signaling connections (both to the international environment and to the two DMS-200s in Georgetown and New Amsterdam). Appropriate software is used with DCMEs to control traffic quality on major international satellite and fibre cable routes. The switch is equipped with the full range of network maintenance and management capabilities.

The international transport network consists of the capacity GT&T's owns in the Americas 1 Cable, the Columbus II Cable, the Antilles Cable, the Americas II cable, and the Eastern Caribbean Fibre System (ECFS) and two Standard "B" Earth Stations. The ECFS provides an alternative transport medium for service between Trinidad and Tobago and Barbados. The Americas II Cable provides direct routes and lease services to countries in North America and Trinidad and Tobago.

Both Earth Stations employ digital technology and modern standard-B antennas. These Earth Stations provide leased circuits and carry PSTN traffic to the principal international destinations in North America, Europe, and the Caribbean. The Earth Stations carry private network traffic using IBS Carriers and PSTN traffic using QPSK/IDR Carriers. By end-2003 both Earth Stations will be equipped with TCM/IDR carrier. The international transport network provides for direct routes to 8 countries that account for over 90 percent of our traffic. The remaining traffic is transit switched.

The Georgetown Earth Station (in combination with VSAT facilities in four interior communities) forms part of the domestic network in that it provides service to interior locations using the Intelsat (DAMA) satellite facilities.

GT&T operates a TDMA cellular network in cellular band B in the 800 MHz range. The network comprises a DMS-MTX Switch and 20 cell sites and it has a current capacity of 115,000 customers. The network provides coverage that is almost seamless along the coast and is estimated to provide portable quality coverage to approximately 15 percent of the country. The network now serves some 107,000 customers.

Success Stories and Pressing Problems

The extent of network modernization that the company has achieved and the continuous roll-out of the national network in the face of uneconomic domestic rates, the FCC's Benchmark Order [which reduced settlement rate on the principal route from US$0.85/minute to US$0.23/minute], and increasing network and settlement bypass that escapes regulatory sanction, are among the company's greatest successes. Another success story for the company, and indeed the country, is the positioning of mobile cellular service as a mass-based service, consequent upon

the company's introduction of lower rates, calling party pays billing, and pre-paid service.

Among the major challenges to the continued modernization of telecommunications in Guyana and the continued universalization of access are a) regulatory reluctance to initiate meaningful rate rebalancing and other regulatory uncertainty, and b) the erosion of international telephony revenues occasioned by bypass via alternative procedures [Voice on Net, VOIP, "leaky" PBXs].

8 Prognosis for Guyana's Telecommunications Sector

The Government pf Guyana has indicated its subscription to the new telecommunications paradigm that focuses on the trade in telecommunications services. Consequently, the opening up of markets for basic telecommunications [including local, long-distance and international voice and data transmission services] is deemed critical.

The Government endorses the Free Trade Area of the Americas (FTAA) and has made modest commitments under the WTO.

Government has commenced a review of its policies and approaches to the sector with a view to developing a new national telecommunications strategy. It is anticipates that at the end of this process, there would result a) the introduction of a clear National Telecommunications Policy that underpins the introduction of market-based reforms, b) a renegotiated GT&T license that shortens the exclusivity period, c) a move to cost-based/cost oriented pricing of telecommunications services, d) an orderly (phased) transition to competitive service provision in all markets, e) Introduction of price-cap regulation, and f) strengthening, reorganizing, and re-orienting regulatory institutions.

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India

Indian telecommunications: On the threshold of a new revolution

1. India is today one of the most liberalized telecom markets in the world. With a growth of more than 100 per cent in the mobile service sector during the last financial year, it is probably the fastest growing high potential telecom market in the world. While government policies surely have played a big role in this, the role of incumbents and the private service providers also cannot be discounted. Even though not really free of problems, the opening up of the sector to competition has largely meant better and cheaper telecom services for the people of India.

1.1 Last decade was very significant for the Indian telecom sector from the point of view of liberalization. It went through fundamental structural and institutional reforms. It was in 1994 that the government realized the need for opening up of the market for competition. Consequently, National telecom Policy NTP (1994) was formulated. NTP 1994 paved way for introducing competition in fixed line and mobile telecom services. By 1996, private telecom operators were providing services in most of the states in India. In 1999, need was felt to review NTP 1994. The result was a new telecom policy NTP (1999). The current regulatory environment allows the entry of private companies in all areas of telecom services including international & national long distance communications and equipment manufacturing.

1.2 The Telecom Sector operates under the overall policy directive formulated by the Ministry of Communications & IT. Telecom Regulatory Authority of India (TRAI) is responsible for ensuring level playing field for all the operators. TRAI's responsibilities also include regulating tariffs and interconnection between different operators. It also gives its recommendations to the department of telecommunications on various policy related issues.

1.3 India's telecom sector can be classified into the following categories:

- Govt. owned/controlled large undertakings called Public Sector Undertakings (PSUs).
- Integrated private service providers that are regional or national level players, including joint venture companies with foreign telecom enterprises.
- Smaller players offering one or more value added services.
- Equipment manufacturers, including foreign companies operating in India through subsidiaries and joint ventures.

1.4 There are over 80 operational entities in this sector, which includes 4 International Long Distance Operators, 4 National Long Distance Operators, 41 Basic Service Licensees, 25 Cellular Licensees besides numerous equipment manufacturers, Internet Service Providers, etc.

1.5 In its march towards further liberalization of telecom sector, the Telecom Regulatory Authority of India (TRAI) is now proposing a new licensee regime – unified license i.e. a single operating license which may cover fixed, mobile, domestic long distance and international long distance and create uniform rules for all the players. Now, the

Indian telecom sector is becoming a happening place with lots of activities in various segments taking place. In the Indian perspective, the rolling out of mobile services and Business Process Outsourcing (BPO) business can very well be considered as success stories.

2. Incumbent's success story in a highly competitive market

2.1 The success of Bharat Sanchar Nigam Limited (BSNL), the government-owned incumbent fixed line and national long distance service provider, as a GSM wireless service provider is a unique case not just in India but in the whole world. No where in the world, an incumbent has succeeded in a market that is already crowded with private competitors. In past nine months (BSNL started its mobile service in October 2002), BSNL has not only added more than three million subscribers to become India's second largest cellular operator but has also created an entirely new market for itself. Its success stories have reached those places where it is not an operator. For instance, in places like Delhi and Mumbai, the prospective subscribers and the subscribers of existing services, who have grudges against their existing operators, want BSNL's services. A report recently mentioned how at a BSNL run PCO at Mumbai Airport, the attendant was busy answering inquiries about BSNL's Cell One mobile service even though Mumbai does not fall in BSNL's mobile service network.

2.2 Of BSNL's 3.1 million subscribers (till June 30th) 90 per cent are first time mobile users. An analysis by India's premier telecom magazine Voice & Data shows that during the February- March 2003 more than 95 per cent of customers that BSNL added to its kitty were new users. The magazine reported that during the February-March period, there were only nine instances where there was a decline in the subscriber base of an operator where BSNL had its service, excluding Chennai and Calcutta. The total decline was to the tune of just 37823 subscribers, while BSNL added a total of 985197 subscribers during the period. If we presume that the private operators' loss was BSNL's gain, then only around 4 per cent of BSNL's new subscribers in the two months came from the other operators.

2.3 What is also unique about BSNL's success is the fact that while almost all Indian operators have majority of their cellular subscribers preferring pre paid connections, BSNL's majority of the subscribers are of the post-paid variety. According to one estimate, 55 per cent of its subscribers have post-paid connection while market leader, a Private Cellular Company, had just 24 per cent post-paid subscribers at the end the financial year 2002- 2003.

2.4 It would be pertinent here to discuss the reasons behind BSNL's success with its mobile services. What made so many people prefer a state operator that is considered to be relatively less market savvy and customer friendly? One reason was that in most places BSNL's competitors did not take it seriously.

2.5 However, attributing BSNL's success only to complacency of its rivals would mean undermining the other ingredients behind its success. In my view the tariff plans designed by BSNL that lowered the entry costs for new subscribers has been one of the major factors behind its success. The waiver of deposits for its existing landline customers has also provided an incentive for customers to avail of mobile services, as it dramatically lowers entry costs. BSNL tariffs have not just been low, it is also simple to understand. There was no hidden cost in its tariff plans. In price sensitive market like India offering services at a cost that customers perceive to be cheap and affordable is very important. BSNL appears to have realized this very well. Also, unlike the private operators, BSNL offered simple tariff packages. Contrast that with private operators, some of who offer some 80 tariff plans, each more complex then the other. Given all this, BSNL tariff appeared attractive to the lower middle and middle-income group subscribers, the group that is supposed to represent India's huge potential subscriber base.

2.6 BSNL's thrust on network design and coverage also paid off. Spread across

the length and breadth of the country, BSNL cellular service was taken to some 1100 towns and cities in just six months. It designed its network in such a way that it covered areas where there was lot of people movement but were beyond city or town limits like highways. Rolling out network in places where there was either no service or the private operator was not active enough also helped in notching up numbers.

2.7 While it would still take some time to know what kind of impact BSNL's success in the mobile services will have on its overall business, especially in terms of bottom line. However, BSNL's efforts in the mobile business should be praised for two important reasons – one, it has successfully created a new class of mobile users by going to new places and second, it has shown the world that a right approach can help even incumbents win tough business battles.

3. Telecom Fuels Growth in Business Process Outsourcing

3.1 It is now a fact that India is the back-office hub of the world. The Business Process Outsourcing (BPO) industry, which is also called IT-enabled Services, is estimated to grow by around 65 per cent year on year. Indian BPO firms are now equipped with world class infrastructure for providing high quality service at competitive price. Companies from Europe and US are increasingly opting to outsource their critical business process related work.

3.2 NASSCOM, the apex association of Indian IT companies, estimates that for 2002-03 the ITES services were Rs.11300 crores (2.5Bn $) – which was an increase of 59% over the 2001-02 exports of Rs 7100 crores (1.51 Bn $). NASSCOM projects that BPO exports would touch 21 to 24 Bn $ by 2008. The employment generated by the sector is estimated to be 171000 in 2002- 03. It is expected to increase to 1.1 mn by 2008.

3.3 The Indian Advantages

3.3.1 India currently offers the strongest value proposition to outsourcing companies globally as compared to any other outsourcing destination country. Some of the key unique Indian outsourcing advantages are:

3.3.2 Abundant Skilled Manpower

India's English speaking manpower rates high in areas such as qualifications, capabilities, quality of work and work ethics. India produces in excess of 2 m graduates per year. This places India ahead of competitors such as Singapore, Hong Kong, China, Philippines, Mexico, Ireland, Australia and Holland, among others.

3.3.3 Infrastructure

The fast track growth in the Indian telecom and physical infrastructure area is fast bringing it on par with other countries.

3.3.3.1 Telecoms

The successful liberalization of both mobile and fixed lines as well as International services and Long Distance has been the key success factor in the growth achieved in IT and ITES services. Today there are 4 operators in ILD services and multiple operators in mobile and fixed lines. Prices have been steadily declining.

3.3.3.2 Civil Infrastructure

Software technology parks have come up in most metros and capital cities – giving significant benefits to users – and enabled high quality office spaces to come up which have centralized power and telecom facilities.

3.3.4 Quality

Indian companies have unique capabilities and systems for setting, measuring and monitoring quality targets. NASSCOM (National Association for Software Services Companies) in India is working with international certification agencies to set standards such as COPC and eSCM (from Carnegie Mellon University). This will no doubt replicate the success that India has had in software where India has more than 50% of CMM Level 5 centres. This builds up confidence in Indian delivery of services.

3.3.5 Productivity

In certain categories, Indian centers have achieved higher productivity levels, for example, the number of transactions completed per hour for back office processing, as compared to their Western counterparts. McKinsey NASSCOM estimates that for certain UK/US banks the no of transactions per hour is higher by 20% on a like to like basis. Similarly the no of correct transaction is 98% in India vs. 95% in UK/US.

3.3.6 Efficiency

India is capable of offering a 24x7 service and reduction in turnaround times by leveraging time zone differences. India's unique geographic positioning makes this possible.

3.3.7 Government Incentives

The Indian Government has provided incentives such as income tax holiday until 2010 for the export of IT Enabled Services. The Government of India has announced a special policy for call center services. Many state governments in India are offering incentives and infrastructure for setting up IT enabled services. For example there is no duty payable for import of capital equipment for ITES services under the STPI scheme.

3.3.8 Dept of Telecom initiatives

The scheme for Call centres has been simplified tremendously by the DOT – cases in instance are:

- Simplification of reporting for call centres registered.
- Allow ITES companies to access Internet on same LAN in India – leading to savings.
- Allow ITES companies and IT companies of the same group to share telecom bandwidth.
- Enable hot stand by facilities to come up to serve the needs for Disaster Recovery.
- Enable centres belonging to different group to connect for disaster recovery situations.

Many new initiatives are under way for further simplifying procedures and enable Indian companies to remain competitive in the international arena.

3.3.9 Labour laws

Govt has allowed ITES companies to employ women in the night working – with many states passing legislation to enable this without hindrance. This has led to significant employment opportunities.

3.3.10 BPO service providers depend heavily on telecom resources to deliver their services. In fact, telecom is the lifeblood of any BPO operation. The growth in telecom infrastructure, therefore, has been the most significant reason behind the emergence of India as a favorite BPO destination of the world during the past five years. BPO companies can today rely on widely available, cheaper and more reliable telecom services.

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Indonesia

Indonesia's country report on the Internet development

1 Policy and regulatory framework

1.2 The Internet

The Internet has been stated as a program of priority because of its important role in the globalization of economy and information. The biggest challenge is to provide a telecommunications infrastructure for accessing the internet in the form of community access centre. The government offers the use of the internet to many communities such as universities, schools, businesses and employees. It also endorses the growth of content-based businesses that will empower the emergence of the information society. The growth of the internet in Indonesia has significantly increased. The government has provided licenses for 139 Internet Service Providers (ISP). Currently, there are 109 ISPs already in operation supported by approximately 800,000 subscribers. In order to increase the Internet users, Universal Service Obligation (USO) and the Internet Kiosks will be encouraged to promote the proliferation of the internet networks to many cities and villages.

Approximately 2,550 private individuals or organizations have established kiosks to provide internet services for the public. Although the registered number of Internet subscribers is 800,000, it is estimated that there are more than three million Internet users.

1.3 The Internet Applications

The Indonesian Government has established a national team for telecommunications and informatics to encourage the use of information Technology (IT) for government offices and proliferation of Internet access for the Indonesian society. Followings are the application of the Internet in Indonesia:

- Public services such as E-Government, national ID system, and computerized system Home Affairs.
- Social empowerment such as tele-education, cyber universities, and tele-medicine.
- Electronic-commerce (e-commerce) and electronic Data Interchange (EDI).
- Wide Information Systems such as Geographical Information System, and
- National Security and Defense such as Information system for trained people and public security.

1.4 E-Commerce

IT applications are frequently used within business practice in Indonesia, many companies apply on-line shopping, Internet banking and on-line business to daily operations. Business on the Internet is

also advancing, encouraged by the presence of free Internet access. The government does not restrict on-line business information services and always support any organization or business that make efforts to promote and boost the use of Internet and E-commerce.

2 Digital divide

2.1 General Policies

The Telecommunications Law No. 36/ 1999 was implemented in September 2000 to improve the business environment.

2.2 Government Initiatives

- Centre of IT development: By Presidential Instruction No. 1/2001, the government has initiated a Multimedia City or Cyber City by providing a grant of 1,500 acres of land including IT infrastructure, located in Kemayoran, an area in old Jakarta Airport. A cyber city, which will be developed by private institutions will provide facilities for many business points with broadband access and services. This business includes: development of IT software, computers and accessories suppliers, "Indonesian Silicon Valley", and IT school and training centre.
- Other initiatives in developing IT centers are Bandung High Tech Valley (BHTV) in Bandung and Parahyangan Multimedia Centre near Bandung. Currently, a centre for IT software development has been developed by a private enterprise and called Balicamp, in Bali.
- The use of Bahasa Indonesia for content.
- By including the Presidential Instruction No. 2/2001, the government encourages programmed software in Indonesia as well as more Indonesian-based language contents. Indonesian contents are especially applied for information sources for Indonesians who live in villages.

2.3 Private initiatives

- Technology diffusion to individuals and households: The IT kiosk called Warintek is a mode of Internet Kiosks developed by the Indonesian Institute of Science and Research (LIPI) and endorsed by the Ministry of Research and Technology. It is aimed to build 9,000 kiosks in villages across Indonesia.
- The Association of Internet Providers endorsed by the Ministry of Education has launched a program called Sekolah 2000 (School 2000), which aims to invite 2,000 schools from all over Indonesia each year to be connected to Internet services with lower cost connections.
- Millenium Internet Roadshow (MIR): This program is aimed to distribute knowledge of IT and Internet by using easy and cheap media Compact Disc (CDs). The CDs containing IT materials are distributed to societies through events such as seminars and exhibitions. Its contents are also displayed on-line for use any time.

3 Conclusion

- Top level political leaders should have awareness of the importance of IT (Internet) use.
- The government of Indonesia is concerned with the use of IT in particular the Internet as a tool to bridge the digital divide.
- Program of the use of IT (Internet) in every field can only be executed by involving all related stake-holders: government – private sectors – society.
- For least developed and developing countries, the use of Internet can only be executed when the illiteracy issue is already tackled.

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Kazakhstan

Telecommunication Development Country Report for Kazakhstan

Internet for everyone

1 Introduction

A great deal of discussion is currently being focused on the influence that new information technologies have on the life of human beings and society.

The way of life of many people and the opportunities that are open to them have significantly changed with the emergence of broad access to information services, and, while in our country the number of such people is still being measured in small percentages, in the developed countries we are looking at double-figure percentages – a fact that simply cannot be ignored.

Research on the Internet community and its communication environment in Kazakhstan is being carried out on a long-term and regular basis. The uniqueness of this study lies in the fact that, for the first time in Kazakhstan, a survey has been carried out both outside the Net and within the Net itself (by means of online interactive interviews).

In this way, the results obtained give a more objective picture of the Internet user community and its environment in Kazakhstan.

2 The Internet community in Kazakhstan and its environment

From the research carried out to date it emerges that the Internet community in Kazakhstan is made up chiefly of specialists and business users, followed by students. One is far less likely, on the other hand, to come across workers, pensioners, housewives and unemployed people on Kazakhstan's Internet scene.

2.1 The Internet user community in Kazakhstan

The core of the Internet community in Kazakhstan: 1.6% ± 0.4% of the adult population in the country's major cities, i.e. **60.7** ± 15.2 thousand people. The core community consists of those who regularly connect to the Internet, spending at least three hours a week on it, or visiting daily.

The active Internet community in Kazakhstan: 3.7% ± 0.6% of the adult population in the country's major cities, i.e. **140.3** ± 22.7 thousand people. The active community consists of those who regularly, and at least once a week, visit the Internet.

The regular Internet community in Kazakhstan: 5.3% ± 0.8% of the adult population in the country's major cities, i.e. **200.9** ± 30.3 thousand people. The regular community describes those users who regularly visit the Internet, be it only a few times a month. The SpyLog company, a leading provider of statistics on the Russian-language Internet, put the number of unique visitors from Kazakhstan in January 2001 at **145** thousand.

The maximum Internet community in Kazakhstan: 10.4% ± 1.2% of the adult population in the country's major cities, i.e. **394.3** ± 45.5 thousand people. The

maximum community refers to anyone who has visited the Internet, including those who have visited it on only one occasion.

The information that circulates on the Internet is accessible not only to those who themselves visit the Internet (i.e. who belong to the core, active, regular or maximum community). Through personal contacts and family, the information that is gleaned from the Internet, for example on goods that are on sale in electronic shops, becomes accessible also to those who themselves do not visit the Internet but who have friends and relatives who regularly do so. Thus, in order to gain a more comprehensive picture of the extent of which the Internet has an influence on the people of Kazakhstan, the study also looked at the communicative environment (both immediate and extended) of the country's Internet community. What we are talking about here is the number of people who, while having no personal experience of the Internet, are able to obtain information about events on the Internet from friends and family members who have found that information on the Internet.

The immediate environment of the Internet community in Kazakhstan represents 18% ± 1.4% of the adult population in the country's major cities, i.e. **682.5** ± 53.1 thousand people. The immediate environment refers to those people who themselves do not use the Internet, but whose friends include at least three regular Internet users.

The extended environment of the Internet community in Kazakhstan represents 42% ± 1.4% of the adult population in the country's major cities, i.e. **1 592.4** ± 53.1 thousand people. The extended environment refers to those people who themselves do not use the Internet, but whose friends include at least one regular Internet user. The extended environment (1 592 thousand) is over four times the size of the maximum community of Internet users in Kazakhstan (360 thousand).

It is the communicative environment of Kazakhstan's Internet user community which has seen the most significant rise in the last half-year, from 847.5 thousand to 745.0 thousand individuals.

Internet users in Kazakhstan include people from both high-income and low-income groups, but the proportion of users constituted by people with a high income per family member (above 7 000 Tenge) goes up with increasing regularity and duration of Internet use.

The maximum Internet community in Kazakhstan is dominated by salaried employees and specialists, who make up 30%. The next largest group is students, at 26.8%. Managers and businessmen make up 22%, which gives their social group the third-largest representation. Pensioners and invalids make up 1.6%.

For the past half year a significant increase was observed in the proportion of students; since this survey was conducted during the time when students were preparing for the summer term, it may be concluded that those students actively used the Internet to find information in preparing their examinations and dissertations.

3 Internet utilization by region

The largest proportion of users throughout the Internet community comes from Almaty. The new capital, Astana, is not yet as well represented as Almaty, but it is interesting to note that it is particularly well represented within the regular Internet community, with managers and specialists employed by national government bodies and in the offices of national companies making up a significant portion.

Analysis of the geographic distribution of the zone of influence of the Internet among the adult population in the country's major cities leads to the conclusion that the Internet community is not evenly distributed among the regions of Kazakhstan. The zone of influence of the Internet is particularly weak in northern and central Kazakhstan. It is particularly dense in the population of the cities of Almaty (26.3%), Astana (16.9%) and the major urban centres of western and eastern Kazakhstan.

4 Growth of the regular community

Even cursory statistics about the development of the Internet in Kazakhstan provide a clear picture of the runaway character of the growth process of this new sector of telecommunications.

The number of regular Internet users (monthly use) increased from 10 000 in 1996 to 117 000 at the end of 2002. Even more spectacularly, the number of hosts (meaning the so-called real hosts) in the KZ domain increased from seven registered in January 1995 to 8 385 in March 2003, an increase of three orders of magnitude. The number of Internet service providers has reached hundreds, including several companies possessing licences for the provision of IP telephony services.

Online shops began to appear in 2000, conducting retail commerce in the "business to consumer" category; their number is increasing with every month.

Six years of development of the Internet in Kazakhstan have allowed ordinary citizens, the business community, non-government organizations and the government to learn a great deal about the Internet, state-of-the-art telecommunication technologies and their promise for contemporary society. Domestic and foreign companies annually invest tens of millions of dollars in Kazakh information and telecommunication companies.

Over the past six months the sustained growth trend of recent years in the regular Internet community experienced a renewed surge in Kazakhstan. From October to April the number of servers increased by more than 70%, reaching 209 000 individuals.

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Kenya

Internet for all: Public Internet Access

Introduction

Information and Communications Technologies (ICTs) is an enabler to both socio-economic development in any country and Kenya as a country is not an exception. The following are key issues to the development of ICTs:

1 Regulatory Policy

The Communications Commission of Kenya (CCK), which is the telecommunication regulatory body in Kenya, has the mandate of creating an enabling regulatory environment. The introduction of a new telecommunication market structure in December 2001,has created new areas of investment in the communications sector in the country, introduced competition and increase private sector involvement, which is expected to impact on the growth of the ICT sector.

As part of its role the Commission is expected to provide support to private and public sector initiatives aimed at spurring growth in the communications sector and transferring technological advantages and opportunities to Kenyans. It is in fulfilling this role that the Commission has been involved in the implementation of regulatory policies such as the granting of special consideration for VSAT networks used for social services including tele-education and libraries, telemedicine, public services such as intra-government, civil aviation, meteorology and disaster management. Consequently the Commission is involved in projects aimed at promoting the deployment of Information and Communication Technologies in schools and institutions of higher learning in Kenya.

2 Infrastructure

Access, i.e. availability and affordability of telecommunications infrastructure and services underlies the growth of ICT services. The strategy should be to build focused network infrastructure capacity for key sectors including education and health. This infrastructure should include telephone lines, leased data lines and the Internet backbone based on cost effective leading edge technologies.

The Commission guided by the Telecommunications and Postal Sector Policy Statement of 2001, through obligations given to network providers aims at improving the availability of efficient reliable telecommunication services by increasing the number of lines per 100 people from the current 0.16 lines in rural areas to 1 line and from the present 4 lines per 100 people to 20 lines in urban areas by the year 2015. This objective will be achieved through the installation of approximately 3 million new lines and liberalization of the telecommunication sector.

The Commission in addition looks forward to encouraging the use of wireless access technologies in future as this require minimal implementation and maintenance cost and can provide services where other telecommunication infrastructure on cable is unavailable. These technologies include VSAT, Wireless Local Loop (WLL) and Spread Spectrum Technologies (SST).

3 Hardware

Access to fixed telephone whose penetration now stands at 1.1 is still very low while computers are still found in office rather than homes. However the government has zero-rated import duty charged on computers in an effort to promote ICTs (Information and Communication Technologies) development in the country.

4 Human Resource

ICTs involve the rapid deployment of computer based learning facilities that would advance teaching methodologies and improve access to infinite database of learning materials.

There are proposals to improve and expand education and training to develop a critical mass of knowledgeable workers, technology users and motivated entrepreneurs. Training strategies to be focused on educating and retaining of a core of professionals with the technical capabilities to provide and maintain ICT infrastructure and related ICT services, and to adapt new technologies for local requirements.

Currently Kenyan universities and other higher institutions of learning offer Computer-Science, engineering, commerce and business administration degree and certificate courses. However most of these programs have not been tailored to meet the requirements needed in the implementation, maintenance and running of ICT services.

Vendors of computer and Internet related hardware, now offer training in Microsoft, Cisco, CompTia, Compaq and other vendor specific international certification courses. One of the Universities, Jomo Kenyatta University of Agriculture and Technology host the Cisco's Networking Academy Program providing a 280-hour technical training course over the Internet. This course trains workers in developing countries in designing, building, and maintaining computer networks, enabling students to obtain jobs in the local IT industry.

5 Economy and Politics

In fulfilling the Government's commitment to expand educational opportunities and achieve free universal primary education in Kenya, there are proposals to use Information and Communication Technologies as the intervention measure to deal with the challenges currently facing the educational sector in Kenya.

It is hoped that the growth of the Internet industry will be achieved owing to the current stability, openness and consistency in economic, legal and political institutions to foster a low-risk business and investment climate spearheaded by the new government.

6 ICTs For Development: Public Internet Access

In any society Communication is the tool to the development of the economy in facilitating all aspects of business transactions.

Internet Services started in Kenya during the 90's and its development has not been rapid enough due to lack of adequate infrastructure that could facilitate the growth. There is only one Internet Backbone operator in Kenya with Internet Points of Presences (IPOPs) only in major towns. The Backbone operator despite having IPOPs in major towns is not allowed to offer Internet services to the public to avoid unfair competition to licensed Internet Service Providers (ISPs) who are prohibited from putting up any infrastructure except that provided by the incumbent operator.

By June 2003 there were over 70 licensed ISPs in the country out of which about half are in active operation. Still the operational ones have concentrated their services within the major towns specifically in the Capital City and are not interested in moving to the rural areas due to economic availability concerns compounded with lack of adequate infrastructure.

Telephone penetration on the other hand still remain very low in the country with approximately 80% of telephone lines being in the urban areas out of which a

greater percentage still are business telephone lines. This implies that rural and more specifically, residential telephone access is quit limited.

The result of all these is that Internet Services still remain a tool for the urban population and particularly in the capital city while home access and particularly the rural remains an illusion. The mode of Internet access for many people is through offices and in Internet Cafes, which have played a major role in providing access to a majority of the Kenyan population. The cost of access in the Internet Cafes ranges from $0.01 in the capital city to $0.07 per minute in other major towns.

Residential access is still very limited and where one has the access, the cost is very prohibitive to the user, making it a difficult means of research but rather quick email access means.

The future of rural Internet access lies in the opening up of certain policies that currently can be considered as impediments to the growth of Internet. These include;

Lack of competition in the fixed market segment has contributed to lack of adequate infrastructure that would facilitate Internet access.

Lack of competition in the provision of Internet Backbone is a major impediment to growth. The only Backbone provider is better placed to provide access in a wider community and affordable prices but due to foreseeable unfair competition, this cannot be allowed at the moment.

However, the incumbent has been allowed to provide Internet services through a separate subsidiary Company as a way out but is yet to start services for reasons not known at the moment.

Restrictive policies on technology that could provide cost effective infrastructure development for easy access Internet access, like VSAT have been some of the impediments to Internet growth.

There is however plans to open up most of the telecommunication sectors in the country that will lead to the development of this sector.

7 ICTs for Education: Addressing Shortage through E-Learning

True monopolistic times in the telecommunication sector used to be and no longer are or at least dying out slowly with the liberalization of the sector in many countries. Telecommunication companies have been operating as independent entities

In Kenya the incumbent Telkom Kenya has a training school, Kenya College of Communications Technology (KCCT) that for many years has been used for training telecommunication staff not only for Kenya but also for East Africa. The college is a subsidiary of Telkom Kenya with adequate training facilities and resource personnel drawn fro the experienced staff of Telkom Kenya.

However, things have changed and the college now moves towards being independent and running its own programs as a separate entity to ensure that it becomes self sustaining while offering competitive training not only for Telkom Kenya but also for the private sector. The challenge for the institution is the ability to remain self reliant while offering competitive courses that will attract loyalty from both public and private sectors and retain its skilled resource personnel.

Another telecommunication training institution in Kenya is African Advance Level Telecommunication Institute (AFRALTI), which is a ITUs Center of excellence offering wide ranging telecommunication programs most of which are, organized by ITU and the CTO. It has been serving not only Kenya but also the English speaking countries south of Sahara.

The two institutions however still rely on local resource personnel. Except for online courses offered through other organizations through these institutions as the accredited institutions, ICT has not been fully employed in these institutions as a training tool.

There are however other initiatives to the use of ICT for training not necessarily in telecommunication field. One such organization is the Kenya Education Network (KENET).

8 Kenya Education Network (KENET)

KENET is a project supported by US government 'Leland initiative', which is a global information project to extend full Internet connectivity to 20 or more African countries, Kenya included, in order to promote sustainable development. The initiative objectives include assistance in creating and enabling policy environment suitable for the development and extensive use of the Internet in order to share information on development matters, business, the environment, health, democracy and education among others. The Kenyan government embraced these objectives but placed more emphasis on the education.

The project is an integration of proposal in the education sector including the Information technology in Primary Schools developed by the Ministry of Education and the Kenya College of Communications Technology and the Internet for schools project (ELIMUNET) developed by CCK to provide Internet connectivity to 710 schools, 5 primary and 5 secondary schools, in each of the 71 districts of the Republic of Kenya.

In support of the project the Commission has helped create an enabling policy environment and facilitated low cost, high-speed access to the Internet to educational institutions by providing logistical support in the granting of licenses and waiving of frequency fees.

In June 2002, CCK granted KENET a licence to construct and operate a private telecommunication network to interconnect all universities and tertiary educational institutions. The Commission is currently providing support to the project through allocation of needed frequencies on ex-gratia basis in addition to providing financial support to the Secretariat for an initial period of two years. The Commission has so far granted a six-month waiver on frequency fees to KENET for purposes of testing of a VSAT system.

9 Memorandum of understanding for collaboration

Additionally the Commission has signed a Memorandum of Understanding for collaboration with the University of Nairobi and the Jomo Kenyatta University of Agriculture and Technology, for purposes of research and development, and continuing education in the areas of telecommunications, type approval, radio frequency management, information technology and other related areas. This collaboration is expected to be an avenue to promote information exchange for the promotion of education in the ICT sector.

10 African Virtual University

The African Virtual University is a satellite-based teaching network working with 22 partner institutions in 16 countries. AVU offers non-credit, remedial and specialized certification programs with content provided from major universities in Africa, North America and Europe as well as private corporations and organizations.

To facilitate its operations the Commission in April 2002, granted AVU a licence to construct and operate a VSAT system for data transmission between their Nairobi offices and Washington D.C.

11 Conclusion

It is now accepted fact that the telecom infrastructure is one of the key factors that affect economic, social and cultural development in both developing and industrialized countries.

In rural Kenya, people are spread sparsely over the landscape in the districts that can cover thousands of square kilometers. This makes conventional cabling very expensive especially when low usage of lines in these economically under developed areas is taken into account.

However, with the opening up of the market and deployment of advance technologies such as wireless applications and the recently developed broadband wireless applications which hopefully shall be cost- effective and easy to use solutions for providing communications services, these will facilitate and improve on the accessibility to these areas.

Such low-cost technologies are capable of providing voice and data connectivity in rural areas at a low and operational cost. Thus they are attractive for sparsely populated rural areas where existing (wireless technologies like GSM and CDMA) based technologies may not be commercially viable.

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Mauritius

Mauritius Country Paper

1 Introduction

The Government of Mauritius has showed its commitment to make ICTs the fifth pillar of the economy after the agriculture, textile, tourism and the offshore sectors in the address [1]. The strong political will of Government is evident by the fact that as from February 2001, the Prime Minister is personally chairing a Ministerial Committee on ICT, which initially met every month but now meets at longer intervals, to review and monitor the work of three Task Forces as follows:

1) Task force on Cybercity and Business Parks chaired by the Deputy Prime Minister and Minister of Finance.
2) Task Force on E-Government by Minister of IT and Telecommunications.
3) Task Force on E-Education and E-Training by the Minister of Education and Scientific Research.

Since then, several laws have been enacted and regulations made; a new regulatory body (ICT Authority of Mauritius) has been set up; the telecommunications sector was liberalised on 1 January 2003 (one year earlier than originally scheduled); and the University of Technology (the second university in the country) has specifically been mandated to address the shortage of ICT skills of the country.

As the Internet is recognised to have the potential of transforming Mauritius into an E-island, our policy makers are fully aware that Internet is not a luxury but an essential tool for economic development, hence the urgency to promote public Internet Access. The remaining sections of this report are structured as follows: the current ICT state of the country is presented in section 2, section 3 describes some projects undertaken to make ICT the engine for development and accessible by all, and presents a number of additional means by which accessibility can be improved, section 4 describes the strengths and weaknesses of the country as far as ICT development is concerned. Section 5 concludes the paper.

2 The present situation of the ICT sector in Mauritius

This section presents the ICT sector as it is today. The situation is expressed in statistical terms, and equally in terms of policies, regulations and legislations that have been put in place, and those proposed for in the future. Also the ongoing projects that will contribute in making ICT the fifth pillar of the economy are described.

2.1 Facts and Figures

Several surveys have been carried out in Mauritius (which has total area of approximately 2000 sq km and a population of about 1.2 million) so as to quantify the ICT penetration. The SADC E-readiness report [2] published in 2002 quotes the PC penetration for Mauritius to be as high as 12.5% or 120 PCs per 1000 people. Although on the African benchmark this is a remarkable performance, yet the Government believes that there is still a long way to go. There are currently 9 licensed Internet Service Providers (ISPs), however only two are operational. There were 15 cyber cafes [2] in 2002. The

number of Internet users has been rising exponentially over the past years reaching some 16% of the population in 2002. A survey [3] carried out by the National Computer Board (NCB) last year, demonstrates that Internet is accessed from several locations, and that home is the main access point [3] as illustrated in Figure 1.

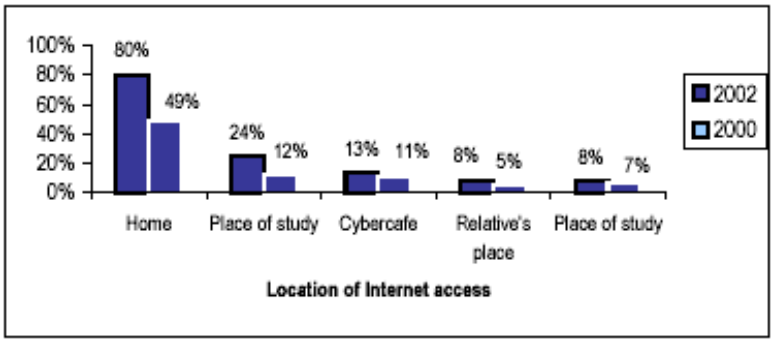

Figure 1 – Location of Internet access[1]

Another interesting result of this survey concerns a comparison of Internet usage in urban and rural areas in different locations as shown in Figure 2. In general, the survey revealed that the majority of Internet users access Internet from home both for urban and rural areas. Also Internet cafes are more popular in rural compared to urban areas. As far as tariffs are concerned, dial-up subscribers pay 15 USD monthly whereas cyber cafes charge an average of US$2.5 per hour for access to the Internet according to the SADC e-readiness report 2002 [4].

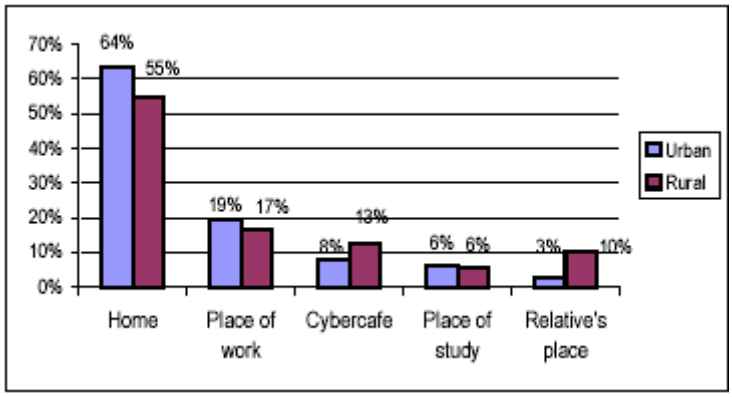

Figure 2 – Internet access of users by region at different locations[1]

1 Source [3].

2.2 Policies, Regulations and Legislations

The Government, is committed to develop the IT and communications industry to increase national wealth, create new opportunities and jobs. It has identified IT in education as central to supporting the development of an efficient workforce for sustained economic growth, and for transformation of Mauritius into an information-based society.

In 1997, Mauritius was among the 69 countries who were signatories of the WTO treaty to allow full liberalisation of the Telecommunication sector, as from 1st January 2005. This commitment was clearly indicated in the Telecommunication Act of 1998. In 2001, in an effort to reduce the cost of doing business and to promote the application of ICT in Mauritius [5], Government brought forward the liberalisation of the telecommunications sector by one full year to 1th January 2004, with the enactment of the ICT Act 2001, which repealed the previous Telecommunication Act of 1998. In October 2002, Government further amended the ICT Act of 2001 to bring forward the liberalisation by yet one more year to 1st January 2003. One of the first results of this decision has been a consequent decrease in telecommunication services tariffs. It is expected that this liberalisation will enhance opportunities for operators to market new value added services [5], and offer a wider choice in terms of technology solutions for businesses [5].

Since 2001 the following laws, policies and/or regulations related to the ICTs have been passed in Mauritius in order to create the right institutional, legal and regulatory frameworks and facilitate the execution of Government's policy:

- **February 2001:** Policy framework for Internet Service Providers (ISPs) in the Republic of Mauritius issued by the Ministry of IT and Telecommunications.
- **March 2001:** Telecommunication Licensing Regulations made under sections 8(5) and 26(2) of the now repealed Telecommunications Act 1998.
- **August 2001:** Electronic Transactions Act 2000, parts I to V, VII to IX, XI, XIII, and section 41 proclaimed.
- **December 2001:** Information and Communication Technologies Act 2001
- **November 2002:** The Postal Services Act 2002
- **May 2003:** The Computer Misuse and Cybercrime Bill – (enacted in Parliament on 15 July 2003 and yet to be proclaimed)
- **July 2003:** Licensing and fees regulation, and Amendment of Schedule regulation made under section 48 of the Information and Communication Technologies Act 2001

2.3 The Cybercity project

The main ICT project for development is unquestionably the Cybercity project which is located in close vicinity of the University of Mauritius and along the main highway linking the major cities of Mauritius. This project which started from a mere concept in 2001 will see the inauguration of its first Cyber Tower in December 2003. The Cybercity will be part of an IT free zone which will also be made up of other digital parks. The Cybercity is being constructed on some 75 hectares of land and will comprise of a cyber tower, a business tower, a knowledge complex, a multi-media complex, a Government administrative complex, common facilities and residential units. The activities in which the Cybercity will be involved comprise among others of software development, Multi-media development such as animated movies, hardware design and development, ICT services such as software and hardware support and ICT enabled services like call and data centres.

2.4 A computer in every home initiative

There is currently established in Mauritius a number of schemes driven by the Government to promote the culture of "one Personal Computer for every home". A soft loan scheme from the Development Bank of Mauritius with an interest rate of 7% per annum, extended

over a repayment term of 7 years is provided to Mauritian for the purchase of a Personal Computer. This scheme was introduced in August 1991 and as at end June 2003, 45155 homes have benefited from the scheme. Government is encouraging private organisations to facilitate access for their employees. Air Mauritius Company Ltd. (our national airline) has even decided to allow its employees to access to the Internet from their home after office hours, using the office infrastructure subject to certain conditions.

3 ICT for all

The statistics presented in the previous section show that only 16% of the Mauritian population are Internet users; hence it becomes important to encourage the creation of public Internet Access points. As highlighted in [3], Mauritius has a successful E-learning policy. There are currently four official online training programmes available at primary, secondary and tertiary level. It is expected that the use of ICT in education will create a skilled workforce for the economic development of the country. Several projects have been undertaken to bring the Internet to all regions of the country and more importantly to people found at different levels of the society.

3.1 The Cyber Caravan

One of the main initiatives in bringing about accessibility of IT to the people is the IT Coach or Cyber Caravan project, which was launched in November 2000. The aim is to bring computer facilities to the doorstep of Mauritians. The main objectives of the Cyber Caravan are [6]:

- To raise the level of knowledge about ICT and the level of competence in using personal computers and common computer applications.
- To promote and encourage ICT literacy.
- To ensure all computer users understand the advantages of using a personal computer.
- To increase the employability of all people, to enable them to be part of the global Information Society.

The Cyber Caravan project is the realisation of the National Computer Board (NCB), which has two IT Coaches each equipped with 9 and 10 PC's respectively, and they can accommodate between 9 to 18 persons per training session [6]. A third caravan is in the process of acquisition. The training sessions are free of change and are targeted towards people with little or no skills in ICT [6].

According to the NCB, over 21700 people in 285 centres, primary and secondary schools had already benefited from the ICT courses delivered by the IT Coach as at April 2003. The centres include, Social Welfare Centres, Village Halls & Municipal Councils, Youth Centres and Women Centres.

3.2 The National Computer Proficiency Programme

The National Computer Proficiency Programme (NCPP) is a nationwide training programme which has been set up by Government in collaboration with the private sector aiming at providing IT training to all classes of the population, up to the level of computer proficiency [7]. The ultimate objective is to spread the IT culture at all levels of the Mauritian society from teachers to students, the unemployed, the working population and the community at large [7].

This programme forms part of the national E-government project which requires that all civil servants become IT literate. At the end of April this year some 6600 people have been trained within the NCPP.

3.3 Other initiatives in improving access to ICT

An ICT training programme for public officers started in September 2002 and by end of June 2003, 2000 officers have completed their training. There is currently the school IT project which is in the pipeline. The evaluation exercise for the provision of hardware and software as well as for Project Management Services has been completed in May 2003. The approval for the construction of 34 IT laboratories has already been obtained [8]. There are additional IT courses offered by the Industrial, Vocational & Training Board of Mauritius (IVTB); as at May 2003, 164 participants had followed basic courses in Call Centre Operation while 970 participants had followed basic courses in IT E-business [8].

3.4 Future means to improve accessibility

In addition to the ongoing initiatives and projects mentioned above there are some proposed projects and initiatives that may improve ICT accessibility and availability over the island:

a) provide free Internet access in public Access point such as post offices, educational institutions and other similar points to the public;

b) provide unlimited Internet access to educational and research institutions;

c) ensure reasonable and affordable tariffs for Internet access through flat rate dial-up access; and domestic access through xDSL;

d) promote competition in the field of ICT and Internet access provision;

e) define accessibility to ICTs as one of the prime functions of the Universal Service Fund;

f) examine alternatives to fully cost-based tariff rebalancing, especially in African countries, since the reality is that in most parts of Africa accessibility issues may be amplified when all ICT services are provided at cost.

4 Strengths and Weaknesses

The main strengths of Mauritius are:

- Its excellent inland infrastructure, the total backbone bandwidth capacity is 34 Mbps, consisting of a copper, microwave and optical fibre network. As far as electricity is concerned, 94% of all households are connected and the total electricity generation capacity is 1,584,500 MW [1].
- Its education system which is to a very large extent free of any charges. It is estimated that 43% of all adults left school after completing their primary school education and that 41.3% of all adults have secondary school education and 1.7% has tertiary education [1].
- The strong commitment of government to make ICT the fifth pillar of the economy.
- A converged regulatory framework for IT, Telecommunications, and postal services under a common umbrella.
- Competition has been introduced in the sector.

The country also has some weaknesses, such as:

- The small size of the local market.
- The shortage of qualified and experienced people in the ICT sector
- Telecommunication costs are still quite high
- Limited public access to Internet outside the home and the office
- There is strong dependence on the incumbent's infrastructure
- Access to its outer islands (the closest which is about 500 Km away is only accessible through satellite).

The country is open to foreign expertise in areas where it is currently lacking and where it has not yet built enough local capacity; these include areas of security, data protection, and cyber crime which

are altogether novel avenues locally, but essential for our success in the various ICT-based projects.

5 Conclusion

This paper has demonstrated the commitment of Mauritius to make ICT its engine for development, it was seen also that much has been done to promote public Internet access and to make ICT available for all. ICT is expected to become the fifth pillar of the Mauritian economy. It is recognised though that the communication costs are still very high and that there is a shortage of qualified persons in the ICT sector. However, much effort is being made by the regulator (the ICT Authority) to see to it that the tariffs go down so as to benefit development. The multi prong approach adopted by Government is expected to bring greater accessibility at affordable cost.

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Moldova

Telecommunication Development Country Report for Moldova

Integrating Consumers into the Regulatory Process

Institutional framework reform (institutional separation of administration, regulation and operation functions in the area of telecommunications) has started in 1993 in the Republic of Moldova, when separation of operation functions from the administration and regulation ones took place, and in 2000 separation of administration functions from the regulation ones took place. Nowadays, the Ministry of Transports and Telecommunications (MTC) manages or administrates the area of telecommunications in our republic, which is the specialty central public authority that carries out the Government politics in the area of telecommunications and determines the development strategy of this sphere.

Regulation in the area of telecommunications, as well as implementation of development strategy in this area are carried out by the National Agency for Regulation in Telecommunications and Informatics, which is independent from the Government, operators and central public administration bodies.

At the moment consumer participation into the process of regulation or elaboration of different policies is insignificant. As an explanation to this are impacts from planned (centralized) economics, where consumer role was limited.

In order to change consumer mentality, a transition period is necessary. Another reason is information access, which due to infrastructure at a low level and relatively poor usage of the new information and communication technologies does not allow exploration of all the opportunities, that can offer this market segment.

Telephone density at 100 inhabitants has reached the level of 20% for fix lines (level of digitalization: 50%) and 11% for mobile phones.

Actually step by step things are changing and a successful example is elaboration of the New National Numbering Plan (NNP), creation of working groups, where were included representatives of the basic telecommunications operators which have participated in roundtable debates, transparency and posting information on Internet site www.anrti.doc, active participation of customers and consulting with public opinion making questionnaire, as a result operators expenses to the new NNP passing have been minimized.

At the present moment an increased interest of consumer participation in the process of elaboration of different regulations and policies is noticed.

As a conclusion, I could also mention the fact that consumer participation into the process of regulation of the telecommunications in Moldova can be and have to become the factor, which will stimulate economic, social and cultural development.

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Mongolia

Telecommunication Development Country Report for Mongolia

Mongolia is located in the central part of Asia and borders with Russia along 3,485 km to the north and with China along 4.676.9 km to the south. The average altitude is 1,580 m above the sea level with the capital city Ulaanbaatar at 1,350 m and the highest point at 4,653 m. Mongolia is a country which has mountain ranges, mountains and hills, steppes and valleys as well as the Gobi and other deserts. It is the seventeenth largest country in the world. The climate of Mongolia is continental and there are four seasons.

Country Profile	
Capital	Ulaanbaatar
Area	1,566,500 sq km
Population	2,608,100
Urban Population	57.2%
Population Growth	1.01%
GDP	USD 949 million
GDP per Capita	USD 452
GDP Growth	1.2%
Currency	Tugrug
Main Telephone Lines	131,300
Telephone Density	
Overall	5.4%
Rural	0.9%
Waiting List for Telephone Lines	19.318
Paging Subscribers	N/A
Cellular Subscribers	260,100
Internet Subscribers	10,000
International Outgoing Traffic	N/A

Network Digitisation	
Switching	95%
Transmission	85%

Government Department Responsible for Information and Communication Technology (ICT)			
Ministry	Address	Tel No.	Fax No.
Policy and Coordination Department of Information and Communications Technology (ICT) Ministry of Infrastructure MONGOLIA	Ministry of Infrastructure Government Building-2 United Nations Str-5/2, Ulaanbaatar 210646 MONGOLIA	+976 11 329 236	+976 11 310 612 +976 11 329 236
Minister: H E Mr. Byamba JIGJID Director General: Mr Jalavsuren BAT-ERDENE			

Regulatory Body			
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Operator	Mongolian Railway Communication (Railcom)
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Cellular Operators	
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Operator	Skytel Company Co Ltd
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1 Telecommunications Sector Objectives

The information and communication technology is a competitive industry in the development course of Mongolian economy and shall have the important role in the reconstruction and renovation as well as investments into other industries in economy. The modern and new services and advanced technologies shall set the new possibilities for making more quality based and effective the Government's administration, public and social services.

The objective of the general strategy for developing telecoms in Mongolia (for 2010) is to introduce more productive investment, along with the latest high-tech and technology. This will improve telecoms service supply by 2010, with an intended telephone density in urban areas of 15 phones per 100 inhabitants in Ulaanbaatar, and 10-12 in aimags (provincial centres). International and domestic calls from all somon (village) centres will be accomplished automatically. Another aim is to ensure that no less than 50% of the population with the technical facilities will be connected to the Internet.

1.1 Telecommunications Policy

The Mongolian Government highlighted in its Action Plan the importance of communication and information technology to the development of the country, a focus that cuts across education, infrastructure and economic sectors and gives great significance to the information and technology accessibility in the rural areas of Mongolia.

In December 2000, the Ministry of Infrastructure adopted the Mongolian Telecommunications Sector Policy Statement (2010). The policy of the Government of Mongolia is targeted to implement the liberalisation of the communication sector as well as the principle of non-discrimination in the telecommunication sector by creating an efficient regulatory system.

In November 2002, the Government of Mongolia adopted the "Mid-term strategy for development of the ICT in Mongolia" and it has defined as follows the medium-term development strategy in this sector in order to establish a state policy and regulatory system and create a favorable environment for human and social, economic and business, political and legal developments. Main objectives:

- Policy and legal framework;
- Infrastructure development;
- Human capacity building;
- Business and private sector, support and partnership; etc.

Accordance with the Resolution No. 232 of the Government of Mongolia, as of 1 January 2003 the Ministry of Infrastructure of Mongolia were restructured and the established the new department named as the Policy and Coordination Department for Information and Communications Technology (ICT). The department is responsible for information and telecommunications, and postal sector development policy and strategy making & its coordination, and implementation activities in Mongolia.

2 The Telecommunications Network

The overall Mongolian telecommunication backbone network consists of 2,500 km of analogue, and approximately 900 km of digital microwave, 2200 km long optical cable link, plus 21 Very Small Aperture Terminal (VSAT) systems linked to Ulaanbaatar and all provincial centres. 332 telephone exchanges have a total switching capacity of 135,000 telephone lines, with 131,000 lines currently in service. More than 95% of the total switching capacity and 85% of the transmission network are digital.

By the end of year 2002 teledensity has become 5.4 per 100 inhabitants in the country, 11.5-12 in the capital city, 4-5 in provincial centres (aimags) and 0.9 in villages (somons).

Provinces are connected to villages via about 30,000 km of open-wire systems with 3-12 channels capacity, radio links and small capacity digital microwave network.

There is an Intelsat earth station which uplinks domestic television programme broadcasting to remote television receivers within the whole territory of Mongolia, and receives a variety of regional satellite TV channels for programming in Ulaanbaatar, and provincial centers.

3 Basic Telephone Services

Basic voice telephony is offered by Mongolia Telecom and another four smaller operators.

3.1 MongoliaTelecom

The Mongolia Telecom is the incumbent network operator. The network, however, is owned on behalf of the State by the Post and Telecommunications Agency (PTA). Mongolia Telecom has concluded a lease agreement with PTA for the exclusive use of the national network. Until 1990 the telecommunications infrastructure was operated by the Ministry of Communications. In 1990 the Ministry was restructured and a Mongolian Telecommunication Authorities (MTA) established. In 1992 the Mongolian Telecommunication Company (MTC) was created as a 100% state owned Joint Stock company. The first phase of privatisation started in 1995. The majority of shares are owned by the State, with 40% belonging to a foreign investor, Korea Telecom, and 5.56% publicly traded.

4 Mobile Communications

The Government of Mongolia has announced international open tender for third mobile operator in Mongolia (GSM-900/1900 systems) and it is expected to start service in the end of 2003 year.

4.1 Mobicom

MobiCom Corporation was the first operator for mobile cellular services. It was established and approved to provide cellular mobile services in Mongolia in 1995. Mobicom is a private company. The shareholders are the Japanese companies KDD and Sumitomo, and the Mongolian firm NewCom. Commercial operations started in March 1996. Mobicom operates a GSM 900 network. Mobicom provides local, long distance and international telephone services as will as fax and internet services to and from hand-held, portable, mobile and fixed terminals. The Mobicom network covers capital city and 25 province centers through Mongolia. Mobicom is also a reseller of Inmarsat services. Now more than 80% of the subscribers are based in Ulaanbaatar. The number of mobile phone subscribers exceeds the number of fixed lines subscribers as at the end of 2002. Mobicom has also introduced WLL system in remote and remote areas in Ulaanbaatar and province centers. In 2002 there were 9,000 subscribers to the WLL services. Mobicom has introduced IP services via satellite.

4.2 Skytel

Skytel received a licence for the operation of a cellular telephony network and a licence for radio frequency utilisation in March 1999. Skytel became the second mobile operator after Mobicom. The shareholders of Skytel are Korean companies – SK Telecom Co Ltd, Taihan Electric

Wire Co, and (from Mongolia) MCS, Altai Traiding and UnivCom Co Ltd. The Skytel network covers Ulaanbaatar and 16 big cities/province centers and introduced public card phones in spring 2000 and a CDMA system in 2001.

5 Internet Network and Services

There are seven Internet Service Providers in Mongolia. The largest ones are MagicNet (former Datacom), which was the first datacommunication provider, and Micom, which is owned by Mongolia Telecom, and Bodicom. The other four providers operate in a very specific market: CSCM is an academic institution that connects universities and schools, Onet works only in Erdenet. Internet cafes, which are mushrooming in Ulaanbaatar, use the services of the internet service providers and offer Internet access to the public. MagicNet is introducing voice over IP or voice over internet services.

The Internet Exchange Point was established in 2000. All ISPs have been connected to the Exchange Point since June 2001.

In September 2002, the IT training center (equipped by video conferencing, SUN computer servers, laboratories, distance learning hall, etc.) were established in Mogolia under the Science and Technology University of Mongolia, which is connecting 5 province centers by satellite.

The total speed of outgoing line is reaching approximately 16 Mbit/s, whereas of incoming – 9.5 Mbit/s and there are over 10,000 Internet registered subscribers and more than 50000 users presently.

6 Strategy and the Priority Objectives for Information and Communication Technology Sector Development in Mongolia

The Government of Mongolia recognizes that Information & Communication Technologies (ICTs) have an important role to play in its development. They offer a platform for building and applying knowledge; facilitate participation in trade for isolated communities and SMEs as well as corporations; are critically important for national competitiveness; and allow for improved delivery of public services. As a result these technologies offer the opportunity for accelerated economic growth (see Attachment: General information and network introduction of Mongolia).

The Government also approved the Communications Law of 2001 and has established the Communications Regulatory Commission to regulate the telecom sector. Further, the Goverment of Mongolia approved the Medium Term Strategy for the Development of the ICT sector and an Action Plan for its implementation in January 2003.

The Policy & Coordination Department for ICT has also been established within the Ministry of Infrastructure in January 2003.

The Government of Mongolia implemented policy and regulatory framework for building the appropriate regulatory and management structure, and renovation of the backbone telecommunications network.

The Government of Mongolia's Mid -term ICT strategy identifies harnessing the potential of ICTs as a key driver of development and is supported by four pillars which include:

- Establishing the appropriate policy, legal and regulatory framework;
- Developing the key telecommunications and information infrastructure necessary for providing access to reliable and affordable connectivity;
- Establishing an economic and business framework for the utilization of ICTs in governance and other applications; and
- Developing human resources to effectively utilize ICTs.

In order to develop the information infrastructure in Mongolia, the Government places priority on:

- Developing government capacity to lead and implement a national ICT program;

- Establishing a policy and regulatory framework that encourages the competitive provision of affordable and reliable telecommunications infrastructure and services;
- Establishing an appropriate legal and regualtory framework for the development of e-services;
- Further privatizing Mongolia Telecom;
- Digitizing the transmission network between aimags and soums, to enable internet connectivity;
- Establishing appropriate insitutional and regulatory frameworks for public–private partnerships in the provision of rural access to ICTs; and
- To increasingly utlize ICTs, especially the Internet in the social services sector, with a focus on education and health.

As part of the objective to develop human resources, the Government intends to i) mainstream IT into the education curriculum; ii) organize schemes to provide basic knowledge of IT to the population, to support primary, intermediary and advanced IT courses and centres using economic policies, tax policies and other policies, and to enable broad enrollment/ involvement of the population in such training; and iii) develop distance learning based on ICT, to create a system of acquiring formal education through open training programs, to support training centres that conduct training in the use of electronic text books.

As part of the objective to support the development of business and the private sector, the Government intends to create a favourable policy and regulatory environment for ICT related privae sector led development.

Mongolia has made considerable progress in developing its information and communications infrastructure in recent years, particularly in the availability of modern basic service and cellular services. The number of main lines grew from 3.5 per 100 inhabitants in 1996 to 5.4 in 2002. The number of cellular subscribers grew from 1800 in 1996 to 235,000 in 2002 with the licensing of two operators. The Internet service market is fully liberalized and there are approximately 50000 internet users of the Internet. A number of licensed VSAT service providers also provide various value added services such as managed network services, which allow businesses to utilize ICTs. Approximately 90% of the current fixed network infrastructure is digitized. Further, Mongolia Railways also owns fibre optic infrastructure. This provides the opportunity to provide affordable bandwidth while increasing returns on state owned assets and investments.

Mongolia will ensure that the policy and regulatory environment allows for fair and compeututve provision of infrastructure and services. The challenge Mongolia faces is to increase rural access to ICT infrastructure and services.

As the broadcast media has an important role to play in the development of Mongolia by providing information to its citizens, the equipment of radio and TV studios will be improved and transmission systems and stations for TV broadcasting will be upgraded. Within this framework, Mongolia will start broadcasting of the 4 domestic digital TV (including the National TV) and 4 FM radio channels whole Mongolia in the end of 2003.

The Government of Mongolia's short to medium term priorities for the ICT sector as follows:

- Develop and implement a Universal Service Fund to provide access in rural and peri-urban areas of Mongolia;
- Implement policies (economic/fiscal/ tax) and design incentives to encourage adoption and use of ICTs in businesses, the social sectors, civil society;
- Strengthen CRC's capacity to adeqately regulate the telecommunications sector and create a pro-competitive environment for the private sector led development of Mongolia's information and communications infrastructure;
- Improve regulatory framework for the introduction and widespread use of new services/IP enabled services, transit data transfer, call-back, and its interconnection & tariff issues;
- Cyberlaws, and others;

- Create the enabling environment in order to improve availablity of IT services including E-learning, Tele-medicine, and national information databases;
- Increase usage of ICT for the economic growth – industry, financial sector, Agriculture – such as introduce ICT applications in socia-economic sector;
- Increase the potential and results of basic and complementary research studies in the ICT sector;
- Broaden and deepen regulatory reform;
- Implement e-commerce and e-services /applications for all sectors;
- Develop and implement the Concept on DTH (Digital-To-Home) Distance-learning and education, distance-medicine and national registry, etc.

Implementation of short and medium term strategy on ICT and infrastructure development will create one of the prerequesite for establishment of knowledge based society, introduction of new types of services and appplications, ensuring sustainable and rural development, improvement of access to education and public/social services, and ensuring balanced level of regional development.

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Myanmar

Telecommunication Development Country Report for Myanmar

It is found that, in the later part of the 21st century, advances in science and Technology were very rapid and great changes occurred. Communication and electronics in particular have changed and developed a lot in every decade since the Second World War. During the last two decades of the 21st century, computer technology advanced very fast. The use of computer technology has become greater and more widespread in every social infrastructure, education, health, economic, commercial and military sectors. As computer technology, the Internet and the communication infrastructure have developed on a large scale in the world, the term "Communication Age" has been invented.

In other words, electronics has been used in various fields and the term "e-everything" has been used as a form of expression. Such things as e-TV, e-education, e-learning, e-mail, e-banking, e-commerce, e-trading, e-government and e-tour have been emerged. In accordance with these advances in technology, economic and social infrastructures related to social environment need to be changed.

The government is implementing short and long term plans to achieve development of human resources in terms of not only quantity but also quality. These plans cover development of school education systems and distance education systems and creation of constant learning opportunities and life-long learning opportunities.

To build the nation into a new, modern one which has advanced technology and economic development, human resources development is the vital importance. This working programme is a national duty. It is a long term task which every ministry, organization, entrepreneur and citizen have to undertake to the best of their abilities.

The Ministry of Information has to be carrying out the tasks concerning not only news and information but also entertainment and education. In the radio and television programmes, educational programmes are being broadcast periodically and continuously. As information technology has advanced greatly in the radio and television sector, the use of IT is being extended. The Ministry is also aware of the education and e-learning systems being widely used in the word on the basis of IT.

The setting up of a distance education system necessitates a system for teacher-student communication.The teaching and learning system used on the basis of technology available in different periods are as follows:

- Posts and Telecommunication Services (Postal Offices) undertook the tasks of sending lessons to students and their answer papers, discussion and questions to teachers (after 1800 and in the early 1900s);

- Radio and television stations broadcast school lessons (as of 1970);

- Teaching school lessons with the use of video tapes and CD ROMs and through satellite broadcast (after 1980);

– Teaching school lessons with the Web – based system through the Internet (the worldwide network of computer links) (after 1995).

In the nation, efforts are being made to be able to effectively use IT and extension of communication network infrastructure which are the basis for the development of the Internet and the Internet. In that situation, Satellite Data Broadcasting System is to be implemented to broadcast and teach school lessons to every part of the nation in every season and to introduce a new, modern teaching – learning sector.

Therefore, Myanmar Radio and Television under the Ministry of Information set up Satellite Data Broadcasting system together with the satellite television broadcasting system and built a communication network based on IP (Internet Protocol). As of 1 January 2001, the e-education system has been launched. By use of that system the following services can be provided.

1 The present condition of Satellite Data Broadcasting System

– The direct broadcast of school lessons from the teaching studio or with the use of education video tapes through Streaming Video System.

– The storing and broadcasting of digital learning resources such as Streaming Video Files and Web-based resources, e-based resources and e-books in the Archive system and Servers; and the individual downloading of data (in this regard, it is necessary to make arrangements to link individuals and the Network).

– The transfer of Unicast Files requested by individuals and that of Multicast Files sent to learning centres, schools and students (File Transfer).

– The asking and answering of questions between students from learning centres and the teacher from the teaching studio by telephone while school lessons are on air (16 Subscriber Trunk Dialing, STD phone lines have been installed.)

2 The possible extension use of Satellite Data Broadcasting System

– Video Conference between student and teacher can be held with the use of VSAT Return and Wireless communication systems.

– Interactive Responses including e-mail and Voice over IP can be linked by use of telephone or VSAT network.

– Education programme channels can be extended by use of Multi channel streaming video system if they are needed.

3 Establishment of an IT-based teaching and learning system

Data Broadcasting system, which has been launched for distance education, has been used at present mainly for the broadcasting of school lessons direct from the teaching studio and TP streaming education video programmes. The Ministry of Education is giving priority at present to extension of learning centres, production of educational video lessons and the broadcasting of special teaching programmes including special courses.

The establishment of e-learning resource centres, the e-teaching system and the Interactive communication network which provides access anytime is required to use the distance education system effectively and successfully. The already-established Data Broadcasting System can be linked for extensive use.

However, the extension of the e-learning system depends on the individual use of computer, availability of e-learning resources and establishment of a communication network.

4 Services available

At present, Data Broadcasting education TV programmes are being broadcast through the satellite. The broadcasting of IP Video Streaming programmes, the recording of educational lessons at learning centres, archiving by video tapes and transfer of data files including materials

for lessons and questions as well as the giving of lectures direct from the teaching studio can be carried out.

In other words, the broadcasting of more educational programmes on the basis of academic years and subjects for the distance education, the drawing of necessary plans designed to make teaching effective and distribution of Text Files relating to be carried out.

5 Working programme for establishment of e-learning system

The following tasks are to be carried out to use an e-learning system effectively and successfully in distance education.

- To extend production of educational video tapes of high quality in terms of subjects and academic years so that all the lessons can be broadcast.
- To extend broadcast hour of the educational lesson programmes through the IP Video Streaming System.
- To extend the interactive communication system so that the broadcasting of school lessons from the studio takes the form of Virtual Class Room.
- To broadcast lessons extensively with the Web – based Authorising System.
- To distribute Text Files including lessons and questions via Data Broadcasting Network to make teaching effective and to make arrangements for asking and answering questions by use of e-mail.
- To implement extensive installation of the Video Conference system and the High Speed Wireless system to make education discussions more effective.
- To carry out the work extensively by linking the communication network already set up in the nation, multimedia broadcasting systems including Digital Broadcasting System, the Internet and the Intranet.
- To provide individual students with opportunities of using computers, canter to the needs of computer skills and give training.
- To extend the activities of research, studies and trial projects and international cooperation to form an e-education of the international standard.
- To allocate a budget every year for conducting trial projects and research.

6 Conclusion

The establishment of Data Broadcasting System is meant to contribute to the effective and successful implementation of the national education promotion plans of the government by use of Information Technology. It paves the way for the application of electronics in the education sector. It is found that the expenditure is by far less than those of projects implemented in the world. For instance, it is learnt that Distance Education Via Satellite Project being implement in a South-East Asian nation cost about USD 10 million and its operation expenditure is about USD 3 million. Moreover, it is also learnt that about USD 50 million was allocated to the establishment of studios and resource centre for six educational TV channels aimed at basic education of Grades 7 to 12 which was started in 1996.

In extending the modern teaching and learning system in the nation, the IP-based e-learning system is to be used extensively. It is necessary to extend a communication infrastructure network, to extensively produce Web-based e-learning resources, to set up Digital Asset Management system, to promote teaching systems, to generate opportunities to enable individual to use computers, to provide training on computer application and to cultivate a self-learning habit and to create opportunities for it. These are the issues that we are encountering in modernization of teaching and learning system.

The introduction of the modern teaching and learning system by the use of Data Broadcasting Technology means the building of a constant learning society which is practising a life-long education system for the improvement of the national education standard and development of human resources in accord with the aspiration of the government. The development of human resources in the nation is a fundamental requirement of the e-knowledge age for the development and modernization of the nation.

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Nepal

Telecommunication Development Country Report for Nepal

Abstract

Internet café are mushrooming in Kathmandu – the capital city of Nepal. The challenges and opportunities both are very high for ICT in Nepal. About 83% of populations live in the rural areas; and the 83% of the area is mountainous/hills, which are rugged and remote. Email is required to overcome the deficiencies of infrastructure in hills. As one million Nepalese work abroad, for whom email is a necessity to contact their families in Nepal and vice versa. The Government has a plan to focus the rural areas of Nepal for public internet access. Many agencies are in planning states to implement Rural ICTs. After the operation of few years will indicate its effectiveness and successes. Still there is a great opportunity to make Community Tele center as a success story like Community forestry in Nepal. Experiences from other developing countries would be valuable for Nepal.

1 Introduction

The Himalayan Kingdom of Nepal is a landlocked and mountainous country with 147,181 sq. km of area with 17% of flat land and 83% of rugged terrain. The population is of about 23 millions. The average life expectancy is 60 years. 58% of the population are literate where the percentage of male literacy is 70 and female is 30.

Administratively the country is divided into five development regions and seventy five districts. Lowest administrative units are Municipalities and Village Development Committee. Currently, there are 58 Municipalities and 3914 Village Development Committees (VDCs) in Nepal.

Nepal is predominantly an agriculture country. Its contribution to gross domestic product is the largest followed by tourism, finance & real estate, construction, industry, transport & communication, etc. The per capita income is around USD 235 and a very large proportion of the population are below poverty line. The major source of government revenue are custom duty, value added tax, income tax.

As the country estimated population growth is 2.3 per annum, the gain achieved by developmental activities has been concealed by growing population. Little over half (57%) of the population of working age reported economically active in 1991 and among them 81% were engaged in agricultural activities. Contributions of non-agricultural activities are gradually increasing in the GDP. Per capita GDP is estimated in the order of USD 240 for 2000/01.

The policy of economic liberalization has been highly instrumental in improving Nepal's trade performance. Nepal major export commodities are paste, Pulses, oil Cake, Catechu, Jute good Sacking, Twins, Carpets (Hand knitted woollen), Ready-made garments, handicrafts, ginger, ICT products and services. Industrial development is slow as such the government has formulated various policy and Acts for its further development.

About 90% of the population live in rural areas. Due to difficult terrain, in many places it takes about one week of trekking to reach a motorable road and two weeks to reach a letter to the capital. The importance of telecommunications in remote areas is obvious.

2 Telecommunication Infrastructure of Nepal

When we talk about Internet, Telecom infrastructure becomes key factor for success of its implementation. In spite of the poor economy, the available telecom infrastructure in Nepal is on par with that in many developed countries. Nepal entered the era of telecommunications over four decades ago. In 1955 with the establishment of a 300-line manual crossbar (CB) exchange, the general public had access to telephones. Department of Telecommunications and Nepal Telecommunication Corporation (NTC) were established in 1959 and 1975 respectively.

NTC, the only provider of telecom facilities (basic as well as international links), provides about 400,000 subscriber lines including mobile phone services through 130 digital PSTN switches and GSM 900 Mobile switches throughout the country. 33% of the Villages are connected with telephony network.

The liberalization of V-SATs in 1999 enabled the private sector to provide data services. Other data services such as Radio Paging, trunk mobile, and wireless in local loop have opened up in recent years.

In spite of the tele-density is 1.4 (telephone per 100 populations). However, this density is heavily concentrated in the cities, mainly in Kathmandu valley. The actual coverage in rural area is very low.

Till date only one operator Nepal Telecommunications Corporation is providing PSTN and GSM mobile services. Some facts and figures on Present status of basic Telecommunication services in Nepal are as follows:

Telephone Exchanges in Operation

a)	Locations	170
b)	Districts	67
c)	Number of Exchanges	172

Telephone Lines

a)	PSTN	440 000
c)	GSM Mobile	45 000
d)	Internet Subscriber	35 000
e)	Internet Users (approx)	120 000

Villages coverage by Telephone Service 1761/3914
Rural Telecommunications Services

a)	Multi Access Radio Telephony (MARTS) Terminals MARTS Subscribers 3000	504
b)	VHS Telephone Subscriber	1 100

3 Towards the Liberalisation of Telecom Sector in Nepal

As a breakthrough towards the liberalisation of the sector, a new Telecommunications Act, 2053 (1997) was enacted and a regulatory body, Nepal Telecommunications Authority (NTA) was constituted. His Majesty's Government of Nepal (HMG/N) pronounced its Telecommunications Policy in 1999. The policy has recognised the telecommunications service as an essential pre-requisite for socio-economic development of the country. The Telecommunications Policy is committed to develop and expand the telecommunications services in a fair competitive atmosphere with the involvement of the private sector. These legislations were amended later. Due to rapid development in telecom sector the related Policy, Act, Regulation are some what outdated within only a few years. The concept has changed. Hence, process has already started to amend the related legislation in some months time.

4 Presently available services in the country

The NTA, the regulatory body has issued following number of licenses to provide the different telecommunications services as mentioned below:

–	Basic Telephone Services	2
–	Mobile Telephone Service	1
–	Internet including e-mail	20
–	Radio Paging	8
–	Fax mail Service	6
–	Video Conferencing	1
–	VSAT Service Provider	10

- GMPCS Service 2
- VSAT Service User 48

HMG/N has a plan to establish minimum two telephone lines in each Village Development committees (VDC) by 2005 for the fulfilment of Universal Service Obligation (USO). Presently, HMG is implementing a "Special Rural Telecommunications Program" (SRTP) partly through NTC and partly through private operator. A private operator will be selected through international competitive bidding process by NTA. This operator will establish minimum two telephone lines in each VDCs of Eastern Development region of the kingdom.

5 ICT's for Development – Internet for all: Public Internet Access

Present Status of ICT and Internet in NEPAL

In this 21st century, a bright future of any individual or a society or a nation is dependant on the use of computers and the Internet. Information & Communication Technology (ICT) is changing the way people share information, doing business, delivering services, government functioning. ICT is reconstructing the basis of national economic power. ICT can reduce knowledge gaps between developed and developing countries.

With proper implementation of ICT, our societies could be enhanced with: well equipped education centres regardless of geographic conditions, improved health care system in remote areas, direct access to global market from remote parts of the country, faster exchange of information between organisations within the country. All these things are possible only if Internet access becomes easily available and affordable in each part of the country.

Nepal's fascination with the Internet started with the e-mail services provided by Royal Nepal Academy for Science and Technology (RONAST). But commercial e-mail was introduced in the early 90s through a private initiative. Connectivity was based on dialling in through India. Mercantile Communications, a local company, began to provide commercial e-mail services in June 1994. Full Internet services were offered a year later on 15 July 1995. Currently there are 20 ISPs operating in Nepal, and the total bandwidth available is around 20 Mbps.

At present, unofficial estimates put the number of E-mail/Internet registered subscribers in the neighbourhood of 35,000, where as the total number of users of these services is estimated to be 120,000, because of the tendency to share the expensive connection with relatives and close friends. Estimates also put the number of computers in the country at about 140,000. The number of computer users is estimated at 500,000, a whopping 70% of them in the capital alone.

These days people in the urban areas in Nepal have easy access to Internet as the Telecom infrastructures in the urban areas are developed. Internet cafes are mushrooming in the capital and in bigger cities. Mostly young people are spending considerably long time in internet cafés. Most of the Internet Service Providers (ISPs) are concentrated in urban areas.

ICT is still a rare opportunity to the people living in the rural part of the country. Most of the villages in Nepal lack normal telephone lines. In a country with 58% of literacy; less than 5% population are computer literate. There is a great challenge to expand the service and the transfers of technical know how of the IT application to those who are just literate in order to make them computer literate.

NTC has kept its policy in line with the objective of HMG to provide basic telephone service as well as ICT to all the VDC's through the expansion of its network in the rural areas irrespective of its economical value and the low prospect of return. NTC is keen to start Multipurpose Community Tele-Centres (MCT) in rural areas of Nepal.

6 Programs and Institutions Related to Rural ICT Public Centers

Public Access Centers

HMG/N has an ambitious plan to set up 1500 IT access centers by the end of the 10th Plan period (2008). There are many

stakeholders who are initiating work in rural ICT Public centers. The Ministry of Information & Communication (MOIC) and the Ministry of Science & Technology (MOST) are collaborating through the National IT Coordination Committee and other working level committees to develop a strategy to implement the plan. The other agencies are Rural-Urban Public Partnership Program, Ministry of Local Development (MLD). The UNDP is providing MOST with limited support to pilot fifteen rural Tele-centers in order to design test and specify a replicable methodology for eliciting and delivering the information needs of rural communities.

UNDP is undertaking a study "Assessing the Feasibility of ICT as a Development Instrument for Rural-Urban Linkages in Nepal". With the assistance of ESP, the MLD is preparing an IT Master Plan for Local Governance, which is nearly in final form. The interest of the MLD in ICT is to promote ICT in District Development Committee (DDC) and municipalities and to host the web pages of these institutions. The Department of Postal Services is very much eager to launch e-posts in the remote districts.

MOIC and MOST both have the responsibility towards ICT development in Nepal. NTC, with its vast telecommunications network can become a key player in ICT development. NTC is playing a key role by supporting the growth of business in the IT field.

Probable Users of Internet in Rural Areas

For using Internet and getting benefit out of this requires certain level of literacy. Being able to connect ideas and to assess information critically are important. The minimum would be secondary school completion for using Internet successfully. One of the categories of the people to get advantages is a Development Worker who provides services to the rural population. If a Development Worker is better informed or informed and organized, it will benefit the rural people. Remittance from aboard is a good source of income for Nepal. One million Nepalese mostly from the rural areas are working in India, Far East, Middle East, and other regions of the world. For the Nepalese living/working aboard, Internet has become a cheap means of communication with his/her family in Nepal and vice versa.

Namche is a famous place which is the starting place for Mount Everest Expedition. The ICT/Internet is running well in such a remote place. In Kathmandu medical network Healthnet provides online access for doctors to international databases and Nepalese Health information. This facility is available in Tribhuwan University Hospital Campus. For new users a weeklong training is provided to doctors. Delivery of services such as health, distance education, and other government services to the rural population is a possibility. At present such programs are not initiated/designed.

7 The Bottleneck in Rural ICT Development

The most important concern for the various agencies involved in Rural ICT Public centers in Nepal is the cost of telephone calls for Internet access. Demand from all sectors is to treat all Internet access calls as a local call. The IT Policy-2057 stipulates that for ICT activities, the Internet access will be made available through local call. Concerned Ministries are working together to provide such provision.

How Appropriate is Internet for Rural Nepal

Establishing access to Internet is important if it results in creating informed citizenry and better quality of life for all. But access can be used to increase inequalities just as it can serve as a catalyst for spreading the benefits.

Access to information and knowledge is increasingly recognized as a basic human right. The poor and the marginalized often consider themselves excluded from the decision-making and activities through ethnicity, caste; gender; disability or physical isolation. These groups need to be empowered to take part in the debate and to contribute their knowledge to decisions that affect their lives.

Reaching out to these isolated communities and taking information to them – rather than expecting them to come and get it –

is a major challenge in development. There is a perceived need within Nepal for better access to information relevant to development and governance. Access to Internet does not make any sense if it can provide information relevant to people living in remote part of the country. There are quite a few URLs where local contents are available. Therefore local content development should be prime concern during development of ICT in rural areas of Nepal.

In most parts of the country there is no electricity. Solar power backed ICT equipments are getting popular in Nepal, but it is not easily affordable to general public. Internet access cost is much higher than in developed countries.

The following four questions are relevant in context of Public Internet Access to rural population in Nepal.

How can we make fruitful use of Internet for the rural areas of a developing country like Nepal; where there are other pressing needs such as clean drinking water, primary health services, schools, etc.? What are the areas we have to focus on while providing information services in rural parts of the developing countries?

Voice Over IP has become a debatable issue in Nepal. Convergence of various ICT services (Voice, Data, Images, Video) is possible using single IP based service. Therefore IP based services including Voice Over IP should be taken as technology or Service and whether it should be regulated by government?

Some of Contents on Internet (pornography, violence, etc.) are socially not acceptable in countries like Nepal. In such cases what are the guidelines to follow by Services providers and regulators to control access to such information?

What are the experiences of other developing countries in using "Internet Scribes" to provide services to illiterate person or one who can not use Internet himself/ or herself?

Experience of Other Countries

Some countries have developed successfully internet café culture. Examples are: "Cabinas Publicas" in Peru and "Wartels" in Indonesia. Bhutan has recently started e-mails from post offices. Broad band connection in homes have resulted drop in the internet café use. African countries have jointly developed a program which has indicated success.

8 Conclusion

There is a potential of almost limitless possibilities from the use of Internet in Nepal. However, it needs certain level of literacy to use Internet. In the urban areas especially in Kathmandu the Public Cyber Cafes are mushrooming. In only a couple of years time other towns will follow the trend of the capital city. Several agencies are planning and about to start the services in the rural areas for ICT including internet. At present it is not known what will be the result of these initiatives in rural areas. Only the operation for some time and lifting of subsidy will tell the results for evaluation. As about one million Nepalese work in other countries for a living, Internet will be a good source of communication to their families in rural areas. It will be worthwhile to learn from the lessons from the success stories of other similar developing countries.

HMG has made a positive attitude for Internet use for all. There are still many minor problems that need to be sorted out for the benefit of the net users.

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Nicaragua

Retos del acceso público a internet en Nicaragua

Nicaragua enfrenta el reto de aprovechar las infinitas oportunidades que brinda el Internet como herramienta de desarrollo y visualiza el acceso público como uno de los mecanismos más efectivos para alcanzar el objetivo de universalizar los beneficios asociados con la disponibilidad de esta herramienta para toda su población. El aprovechamiento de esta herramienta y la efectividad de las políticas de acceso público tendientes a mitigar la brecha digital, no dependen únicamente de las alternativas tecnológicas o de la difusión de modelos aislados que han resultado exitosos, sino fundamentalmente, de la capacidad del país para articular múltiples esfuerzos mediante una política nacional de acceso a Internet:

- Que optimice los limitados recursos públicos disponibles para el acceso universal, provenientes de la cooperación internacional o de recaudaciones internas, al evitar duplicidad y al definir estrategias de cobertura que respondan a las características de los distintos segmentos de población agrupados de acuerdo a su disponibilidad de pago.
- Que responda a las necesidades de las comunidades y visualice el acceso público no como un fin en si mismo, sino como un medio que se inserte dentro de una estrategia integral para el desarrollo de dichas comunidades.
- Que aproveche el potencial de las iniciativas privadas de acceso público a Internet, al evitar que el Estado se convierta en competidor debido a la implementación de proyectos dirigidos a segmentos que podrían ser atendidos por el sector privado y al facilitar un marco regulatorio adecuado para el financiamiento, despliegue, desarrollo y sostenibilidad de dichas iniciativas.
- Que fomente el uso de Internet a través de la generación de contenidos y aplicaciones locales, así como del aprovechamiento y sistematización local del amplio material global existente.
- Que responda a una visión de futuro para lograr el acceso gratuito en todas las escuelas y centros del sistema nacional de educación, su articulación con los objetivos educativos de largo plazo y la sensibilización del sector privado con relación a los significativos retornos futuros que pueden ser obtenidos mediante este tipo de inversión.
- Que considere todas las alternativas tecnológicas y los modelos de acceso público disponibles que mejor respondan a las necesidades de demanda de servicios. Las soluciones de banda estrecha tales como los sistemas de radio paquetes de bajo costo, continúan siendo alternativas válidas cuando el acceso público a Internet responde primariamente a la necesidad de comunicación.

En menos de un año Nicaragua ha experimentado un crecimiento de las cabinas públicas de acceso a Internet con fines comerciales, de aproximadamente un 300%. El éxito de este crecimiento es atribuido al simple hecho de no interferir con sus operaciones y a la existencia de un marco jurídico que las respalda. No obstante, continuamos enfrentando el enorme reto de encausarnos con una visión común para aprovechar el potencial del Internet como herramienta de desarrollo,

para dinamizar el papel del sector privado, para dar atención a la demanda existente en las zonas que no son atendidas por este sector, para mejorar la gestión del sector público y para poder implementar soluciones creativas de acceso público a Internet en un país donde más del 50% de su población enfrenta problemas de analfabetismo funcional y cerca del 65% de su población se encuentra en condiciones de pobreza, sin disponer de recursos económicos para ser invertidos en comunicaciones. La optimización de los limitados recursos disponibles mediante el desarrollo coherente de una política nacional de acceso público y de aprovechamiento del Internet, marcará la diferencia entre la ampliación o reducción de nuestra brecha digital.

Referencias

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TELECOM ITU Helping the world communicate

Pakistan

Telecommunication Development Country Report for Pakistan

PTA PAKISTAN TELECOMMUNICATION AUTHORITY

COUNTRY PAPER

PAKISTAN TELECOMMUNICATION AUTHORITY

Introduction

1. Among the ten most populous countries of the world, with a population base of 149 million, Pakistan is a developing economy located in South East Asia. It has India on the East, Afghanistan & Iran on the West, China on its North and Arabian sea in the South. Pakistan is primarily an agricultural country that contributes to 25% of the economy with raw cotton and rice as major exports. Pakistan's GDP per capita is USD 492.

PAKISTAN TELECOMMUNICATION AUTHORITY

Introduction

2. The Government of Pakistan has identified IT & Telecom as one of the major sectors of growth on which to revitalize its economy. Major reforms have been introduced and sector opened to competition to facilitate private investment and create a pro-business environment.

PAKISTAN TELECOMMUNICATION AUTHORITY

Telecommunication Sector of Pakistan

Pakistan has made steady progress in expanding telecommunication networks and services in recent years. Key features of the present telecommunication infrastructure in Pakistan are:

1. PTCL, the incumbent, enjoyed monopoly over fixed line telecommunications services until December 2002. It was established as public limited company in 1996 and has 88% shares owned by the Government of Pakistan. It has shown impressive growth in the past 5 years and manages a well-developed domestic telecommunication infrastructure of 4.85 million access lines (June 2003), nationwide fiber-optic backbone and international communication through sub-marine cable (SMW3) and satellite links.

PAKISTAN TELECOMMUNICATION AUTHORITY

Pakistan Telecommunication Company PTCL

2. PTCL has installed more than 1.5 million new telephone lines since June 1997. As a result, teledensity (defined as the number of operational telephone lines as a percentage of population), at about 2.56%, has increased by 6% per year.
3. The telecommunication network is 100% digital.

PAKISTAN TELECOMMUNICATION AUTHORITY

National Telecommunication Corporation NTC

National Telecommunication Corporation was formed in 1996 in order to meet telecommunication requirements of Government and Defense Forces. It has nationwide presence with a network of 72,000 customer access lines and nationwide fiber-optic backbone infrastructure.

PAKISTAN TELECOMMUNICATION AUTHORITY

Special Communication Organization (SCO)

The Government created SCO in 1976 and gave it the task of installing and maintaining telecommunication facilities in the entire Azad Jammu and Kashmir and Northern Areas. SCO operates a network of 60,000 lines in its territory.

PAKISTAN TELECOMMUNICATION AUTHORITY

Cellular Mobile Telephony

Cell-phone usage is rapidly growing and the subscriber base has crossed 2.3 Million mark from a mere 0.35 Million. Calling Party Pays ("CPP") regime has significantly contributed to the growth of mobile industry. Currently, four operators (2 GSM, 1 D-AMPS, 1AMPS) provide services all over the country based on nationwide licenses.

PAKISTAN TELECOMMUNICATION AUTHORITY

Internet Services

More than 70 active Internet service providers provide Internet access, which is accessible in more than 1700 cities and towns. Low Internet rates have contributed to higher Internet usage in the country. Internet services are accessible at a cost of single unit local call charges without discrimination of distance, in most parts of the country. Substantial reduction in bandwidth prices contributed towards growth of IT sector. Low-priced data communication services are available to companies in the information and communications technology sector in order to encourage these companies to establish and grow in Pakistan.

PAKISTAN TELECOMMUNICATION AUTHORITY

Role of Other Private Sector Operators

Private sector operators have played a very important role in developing the value added services market in Pakistan. Major investments are in cellular mobile and value added services that include Card Payphones, Premium rate services, call centers, Internet service providers and data network operators. Some private sector service providers have deployed fiber-optic infrastructure in main cities to provide CaTV and Internet services. In addition, PTCL has entered into O&M contracts with private sector partners to offer services such as Wireless Local Loop (WLL), pay-phones, DSL based Internet access, pre-paid calling cards, International voice termination using VoIP technology. Companies in the Information Technology business can set up satellite based direct international connectivity for call centers / IT services under franchise agreement with PTCL.

PAKISTAN TELECOMMUNICATION AUTHORITY

Regulatory Perspective

1. Efforts to develop a fully competitive market in telecom sector were initiated in the early 90's. The Pakistan Telecommunication (Re-organization) Act, was promulgated in 1996. Pakistan Telecommunication Authority ("PTA") – the telecom regulator, was established to regulate the telecom industry.
2. Frequency Allocation Board ("FAB") is entrusted with the responsibility of allocating and assigning frequency spectrum to Government, telecom system / service providers, broadcasting operators and private users of wireless systems.

PAKISTAN TELECOMMUNICATION AUTHORITY

TELEPHONE ACCESSIBILITY

1. Pakistan Telecommunication network is expanding each year, thus providing telephone access to rural and urban communities. Total lines installed by May 2003 are 4.446 million, out of which 3.747 million are in service as against 3.655 million last year. This resulted in an increase in the tele-density from 2.27 to 2.56 during this year. The tele-density is still lower than many other developing countries. Table 1 shows the tele-density for the last six years.

PAKISTAN TELECOMMUNICATION AUTHORITY

TELEPHONE ACCESSIBILITY

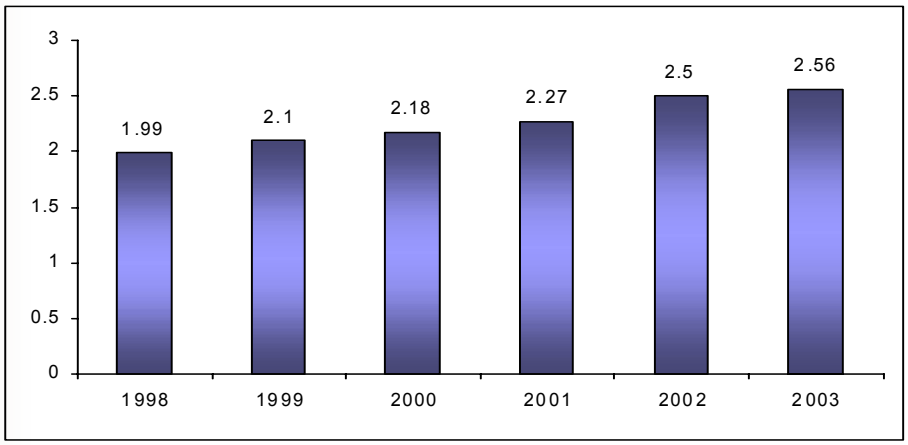
Growth Trend of Teledensity in Pakistan (fig-1)

Years	ALIS	Population	Teledensity
1998	2.660	133.61	1.99
1999	2.874	136.69	2.10
2000	3.053	139.76	2.18
2001	3.252	142.86	2.27
2002	3.655	145.96	2.50
2003	3.816	149.03	2.56

PAKISTAN TELECOMMUNICATION AUTHORITY

TELEPHONE ACCESSIBILITY

Growth Trend of Teledensity in Pakistan



PAKISTAN TELECOMMUNICATION AUTHORITY

Cellular Mobile in Pakistan

Cellular industry of Pakistan comprises of four companies namely Instaphone, Paktel, Mobilink and U-fone. The industry has shown tremendous growth in the year 2001-2002 as the subscriber base increased from 0.7 million to 1.2 million (70% increase). However, this growth rate is lower than the previous years growth rate.

Mobilink and U-phone are using digital technology (GSM) for its cellular service. Lately Instaphone introduced D-amps, (Digital Analogue Mobile Phone System). Table 2 gives a bird's eye view of the situation of cellular market in Pakistan from 1999 to 2003.

PAKISTAN TELECOMMUNICATION AUTHORITY

Cellular Mobile in Pakistan

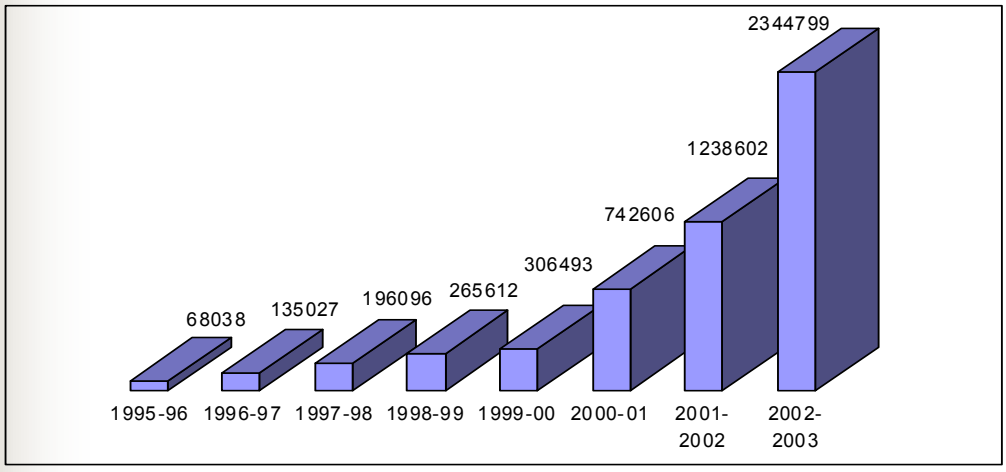
Cellular Subscribers in Pakistan (fig-2)

Year	Instaphone	Mobilink	Paktel	PTML (U-fone)	Total	Growth rate %
1995-96	20,950	16,385	30,703	-	68,038	-
1996-97	43,029	52,600	39,398	-	135,027	98.4
1997-98	53,184	82,912	6,000	-	196,096	45.2
1998-99	108,058	87,556	70,000	-	265,612	35.4
1999-2000	112,000	114,272	80,221	-	306,493	15.4
2000-2001	220,000	309,272	96,623	116,711	742,606	142.0
2001-2002	319,926	570,888	206,109	141,679	1,238,602	66.79
2002-2003	441,226	1,080,903	272,511	550,159	234,799	89.3

PAKISTAN TELECOMMUNICATION AUTHORITY

Cellular Mobile in Pakistan

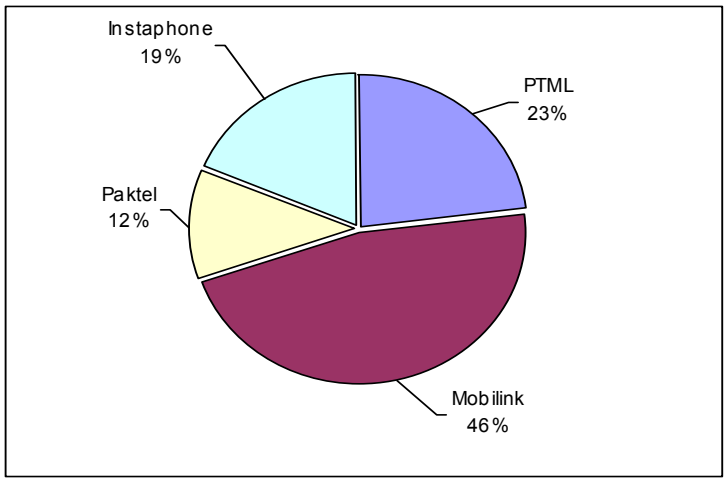
Cellular Subscribers in Pakistan



PAKISTAN TELECOMMUNICATION AUTHORITY

Cellular Mobile in Pakistan

Figure shows the market share of cellular operators with respect to the number of subscribers.



PAKISTAN TELECOMMUNICATION AUTHORITY

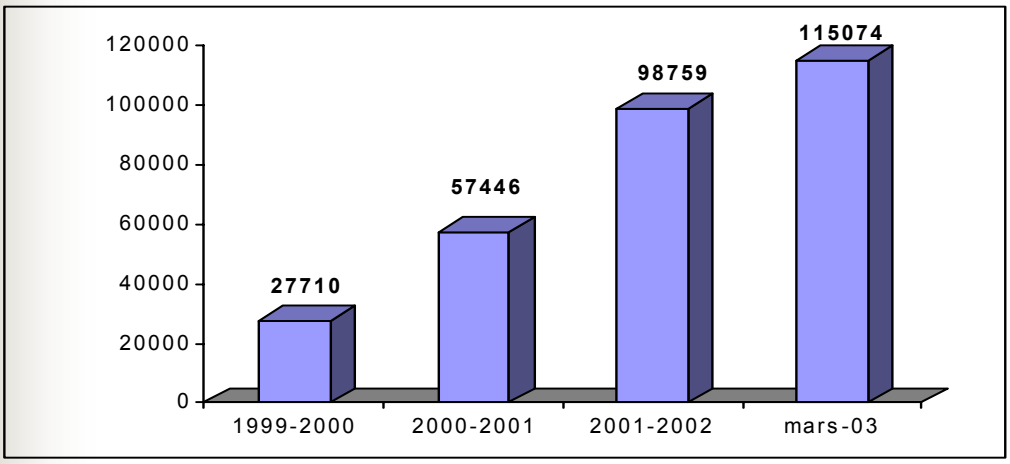
Card Payphone Industry

As part of the broader consumer oriented policy, Pakistan Telecommunication Authority has been encouraging deployment of payphones in the country with special subsidies for the rural areas. Local manufacturing of terminal equipment has been encouraged. Annual revenues have exceeded 8 billion rupees. Indoor and outdoor units are installed in urban and rural areas exceeding 116,000 phones.

PAKISTAN TELECOMMUNICATION AUTHORITY

Card Payphone Industry

Total Number of PCO's in Pakistan (1999–2003)



PAKISTAN TELECOMMUNICATION AUTHORITY

Type Approvals

Under the provisions of the Pakistan Telecommunication (Re-organization) Act 1996, the Authority certifies the terminal equipment which is to be connected to the public networks. In order to facilitate users and operators the process have been made easy and fast. As part of the liberal policy PTA accepts certification of world renowned certification labs.

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Papua New Guinea

ICTs for Development – Internet for all
Public Internet Access

1 Summary

The world is increasingly becoming IP-centric through the increased use of the Internet. At the same time the development of certain IP protocols such as the Session Initiation Protocol will further benefit developing countries such as Papua New Guinea.

The Papua New Guinea Government and the Papua New Guinea Telecommunications Regulatory Authority through their policies and regulatory arrangements provide some support for the use of the Internet as an important medium for national development.

This Report identifies that in Papua New Guinea two of the main constraints to public Internet access for both urban and rural areas is the high cost, and inadequate network infrastructure. It further identifies that more government support is required in terms of relevant vision, strategies, and policies, and their timely execution.

2 Introduction

The Internet Protocol (IP) is enabling the convergence of telecommunications and computing, which in turn should lead to lower cost of the telecommunications services, such as the public Internet access. This should very much benefit a developing country such as Papua New Guinea (PNG), http://www.postcourier.com.pg/.

In this Report some of the major current problems and several possible solutions in relation to public Internet access in PNG are discussed briefly.

3 Public Internet Access in Papua New Guinea

The Papua New Guinea telecommunications network is operated by a single monopoly Carrier, Telikom PNG Ltd, http://www.telikompng.com.pg, which is 100% owned by the Papua New Guinea Government.

The Papua New Guinea telecommunications authority, PANGTEL, http://www.pangtel.gov.pg/pangtel, is the national telecommunications regulator.

Four Internet Service Providers (ISPs), provide the public Internet access in PNG. The four ISPs are connected to the outside world via a single gateway router. This single router, owned by Pacific Mobile, which is a subsidiary Mobile telephone company of Telikom PNG, is connected to Australia via two links, one to Optus and other to Telstra. The total bandwidth to Australia is currently six Mega Bits Per Second (6 MBPS).

4 Constraints to Internet Access in Papua New Guinea

The following are two main constraints to Internet Access in Papua New Guinea:

- High Cost,
- Infrastructure Limitations.

4.1 High cost

Telikom PNG Ltd incurs high operational costs due to many factors including

equipment vandalism, difficult tropical mountainous terrain, and land compensation demands. Therefore it is financially constrained. Being government owned, it also suffers from various governmental disturbances. Existing internal network management process inefficiencies also contribute to slow response to market demands. Until most or all of the problems are eliminated, the high cost of Internet access will continue to exist.

The local telephone call (dial up access) itself costs around K3.00 per hour (USD 80 per hour). However final costs including the ISP costs to the end user is close to K10.00 (USD 2.70) per hour. The local Internet Cafes also charge an average of around K10.00 per hour. The four ISPs pass on these costs to the end users. However, these cost are not easily affordable by the ordinary citizens.

4.2 Infrastructure Limitations

Currently Telikom PNG lacks the necessary financial resources to quickly upgrade and modernize the infrastructure. Therefore, there is very limited Internet access from the rural areas, due to almost nil infrastructure. This does not include the remote resource development Centers, such as mining and oil field sites.

In the urban areas the Internet access is limited by bandwidth bottlenecks within various network segments through out the national network. This also affects the very few Internet users in the rural areas.

Despite the high cost of accessing the Internet, the demand is very much on the increase. Not long ago, the bandwidth was increased to 6 MBPS, but already, it gets 100% utilized during the normal working hours. Majority of the people who are accessing the Internet are the working class, and students.

Due to many reasons, including those mentioned above, the response to market demand by Telikom PNG is also very slow. Sometimes there can be over a million KINA worth of unfulfilled outstanding orders in a year.

5 Deregulation, Government Policies, and Regulatory Approaches

The Government already has Plans to deregulate the industry. But segments of the industry feel that, in the interest of its citizens, and the development of the country, the government will need to deregulate certain segments of the industry as soon as possible. This should be done in a responsible manner whereby for Internet access, more than one Internet gateways are allowed to operate from certain areas in PNG. These gateways should operate competitively and help to keep the Internet access cost low.

The Government is currently in the Process of partially privatizing Telikom PNG, which should result in a modern and efficient management system for the Company. Such a Management System will be expected to respond quickly and cost effectively to the telecommunications service needs of the people of Papua New Guinea, based on modern telecommunications business decision sequences, without any negative impact on the Papua New Guinea environment and culture.

Government policies already exist, that cover areas such as, rural telecommunications, community service, and universal service obligations. However, they will need to be executed based upon relevant and more focused, visions and strategies. Further more, they will need to be financially supported, and be executed in a timely manner.

PANGTEL also believes in a consultative approach to the communication industry in PNG and have formed various volunteer committees to capture industry viewpoint on matters relating to the telecommunications industry in Papua New Guinea.

6 Network Infrastructure Development

The emerging cheaper IP based technologies presents an opportunity for Telikom PNG to reposition itself as a

"green field" Carrier by redeveloping it's mostly out dated network infrastructure with newer IP based network equipment.

Unfortunately, being a Government owned monopoly entity, Telikom PNG is faced with financial constraints. Therefore, its move towards modernization of the national telecommunications network will be slow and gradual, until the Government completes the partial privatization process.

Recently, Telikom PNG embarked on a national strategy in consultation with the national government, to acquire VSAT equipment for deployment in rural areas. This is under the government's rural telecommunications policy. Using a technology such as VSAT, Internet access can be provided to the rural areas. Telikom PNG Ltd will provide the service, but the government will help subsidizes the costs of supporting the service.

Currently Telikom PNG is very slowly working towards finalizing an acquisition process to acquire a modern data communications network infrastructure. This will be a broadband network and will be able to transport voice, data, and video services. The Core will consist of ATM/MPLS switches, while the access will consist of DLC, DSLAM, and broadband wireless, access devices. The network will be developed in three phases within a three-year period. It is anticipated to cover the nineteen provinces. Due to the financial constraints, the phase one network, which is part of three-year three-phase plan, will consist of a scaled down three-site network.

This infrastructure development will also require the upgrade of the current 6 MBPS Internet gateway bandwidth, and will support both the rural and urban areas.

Plan is also in place, despite it's implementation being delayed, to introduce VOIP trunking on the international links as well as the national links.

7 Services Development

It is anticipated that a rural VSAT connected to the new network should enable cost effective Internet access into rural areas. The broadband wireless access devices based on meshed technology will be used to connect both rural and urban customers. These systems may be useful for further expansion from the remote VSAT sites. They may also be used to enable access into those rural areas that are adjacent and closer to the urban areas.

The use of session initiation protocol (SIP) over this new network will further present an opportunity to Telikom PNG to offer IP telephony services at a much more affordable prices to both rural and urban customers.

It is also planned to evaluate the use VOIP over 802.11 for both rural and urban areas.

7.1 Rural Internet access

Rural community based Internet access can be quite easily provided using such technology like VSAT. Most likely place to locate these rural Internet access systems would be in schools, community centers, satellite towns, and local government centers.

The location of these systems will also very much enable the government's rural telecommunications policy initiative. Not only, would there be Internet access, but, there will be other services such as telephone and fax services. Overall a community center or a school, for example, will provide services such as; email, chat, web surfing, e-learning, e-store, pots, fax, etc.

8 Rural Internet Applications

A recently established remote satellite town, Panakei, which is located in the Siwai area, on the island of Bougainville, Papua New Guinea, already has demand for telecommunications services. The Community is hoping for the Provincial Government, National Government, and Telikom PNG to assist them. The planned Internet applications include online cultural artifact shop, online tourism promotion, and online vocational training. When such a service become available it will help in bringing social and economic development to the rural grass roots people. It will also simultaneously minimize the urban – rural digital gap and the migration of youth into the town and cities.

The University of Papua New Guinea planned to offer online degree courses to regional University Centers, some of which are located in the remote areas of Papua New Guinea, starting this year. Unfortunately this was delayed due to lack of necessary infrastructure. When implemented, cost effective university level education will be readily available to the remotely located citizens.

9 Conclusion

This Report has briefly highlighted that despite some Government support, the development of the Papua New Guinea telecommunications network, lacks adequate financial resources and efficient management. This will continue to slow down the adoption of the Internet technology. Therefore any support, from the ITU or the Region, to cost effectively develop the Network, would be most welcome.

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Paraguay

ICTs for Development: Internet for all: Public Internet Access

1 Introduction

The public access to telecommunications services is a special interest for the national authorities. This policy is according with the philosophical line of the legal normative in Paraguay.

Particularly, regarding Internet, we can divide the public access in two parts. One, referred to the urban environment; the other one, referred to the rural environment.

In Paraguay, the diffusion of Internet in the urban environment, is extensive. It is given principally in the populated cities, Asunción, Encarnación and Ciudad del Este, however, in the rural areas the diffusion of Internet is limited. This is because of the market forces difference among the mentioned areas. In the cities you frequently see the Internet access availability at home, via phone or via leased connection, however, this is not the case in the rural areas.

2 Initiatives from the public and private sectors

The investments in projects of public Internet access from the private sector have been focused in the urban environment. In the populated cities, have been installed the named "cybercafés" those are places where people lease computers with access to Internet, to accessible prices, also those "cybercafés" are installed in shopping centers in which the access is free and they are used to promote the services of the suppliers (ISPs).

Besides, also exist shops named "cabinas telefónicas", that offer phone services, fax services and Internet access.

From the public sector, the Comisión Nacional de Telecomunicaciones (CONATEL), government institution of the telecommunications regulation in Paraguay, is in charge of promoting the availability from the public access to Internet. In particular, from the State, projects have been elaborated for the sector of the education.

3 New horizon in the use of Internet

On the other hand, from a general point of view of the use of Internet, besides the traditional interest of the users in the Web, electronic mail, chat, etc. It is being carried out efforts for the implementation of the distance learning in diverse universities. Although to the date don't still exist centers that dictate courses at distance, the international offer of courses is extended, and a lot of students in Paraguay have adopted this education method.

4 Practical example of application of the development of the public Internet access in Paraguay

A practical example of development of the public Internet access is the one implemented by the Comisión Nacional de Telecomunicaciones (CONATEL).

The CONATEL, is subsidizing installation and operation of the Internet access for schools of primary and secondary levels (high school) in the whole national territory, with main attention in the rural areas.

At the moment, the project takes little more than one year and it arrives at some 278 schools. The financing is carried out by using a fund coming from the operators of telecommunications services who contribute proportionally to its revenues in concordance with the Law 642/95 of Telecommunications. This fund is called Fund of the Universal Services. This way, the provision of the Internet access to the rural areas is taken as an universal service.

In order to implement the development of the public Internet access, the CONATEL has elaborated a project of attendance to the schools, determining in a first phase, 278 schools which have been endowed of computers, printers and other equipments besides the Internet access and maintenance of the equipments for five years. To take the project to the practice, the CONATEL has called to bid to national companies that are willing to provide the goods and services referred. The winning company was, according to the terms of the bid, the one that the minor prices request to carry out this provision.

The schools are endowed this way, of the goods and necessary services. The equipment and services let the students to access to the available information in Internet, for the elaboration of the investigation works through the Web and the distance learning.

The project has as objective the diffusion of Internet in sectors of the education that would not have access in another way. However, the grant on the part of the State won't be able to be indefinite. For that reason, it is planning, the way in that service will be financed lapsed the five years of recruiting of the company. An alternative is the contribution of the parents of the students for the maintenance of the service; other, the contribution of the private sector in order to continue the service once the CONATEL no longer subsidizes them.

5 Conclusion

In the urban environment, the public Internet access is sufficiently diffused by means of named "cybercafés" and by means of named "cabinas públicas", however, in the rural environment where it is not justified the private investment due to the null or negative revenue, it is necessary the participation of the State. This way, National Constitution from 1992, defines to Paraguay as a Social State of Right. In this sense, the State, through the Comisión Nacional de Telecomunicaciones has taken to the Internet service, as an universal service and therefore it is subsidized it.

There are two questions that they should be kept in mind for the near future; one: other areas of the telecommunications should be attended with the Fund of Universal Services; an example is the public telephony and since the resources are scarce, probably the grant to the schools for the Internet access is not sustainable; two: the implemented project just affects to one of the rural population's segment (children and teachers of the school environment), It haven't an universal projection.

For the referred reasons, it would be desirable that the State, in direct way and by means of the use of special funds dedicated to the project, maintain and foment the public Internet access in the rural areas.

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Peru

TICS para el desarrollo: Internet para todos: Acceso publico a Internet

1 Introduccion

El servicio de Internet aparece en el Perú en 1991 a través de la Red Científica Peruana (RCP), en su etapa inicial estuvo restringido al ámbito académico. En 1994 la Red Científica Peruana (RCP) funda la primera cabina pública Internet, a partir de ese momento las cabinas públicas de acceso a Internet en nuestro país han experimentado un gran crecimiento, por lo que han sido consideradas como modelo a nivel internacional.

Y es que el Perú se ha convertido en el pionero de las cabinas públicas a escala mundial, implementando un sistema de conectividad compartido, un modelo de desarollo impulsado por pequeños empresarios.

Funcionan en el país más de 2500 Cabinas que permiten el acceso comunitario a Internet a casi el 75% de usuarios con precios alrededor de los 0.60 centavos de dólar por hora, lo que ha hecho posible que en la que el acceso de los peruanos a Internet sea mucho más alta que en varios países de la región y el mundo.

En el ranking elaborado por la Universidad de Harvard (2001) que mide el acceso público a Internet, el Perú destaca nítidamente, por delante de la mayoría de los países de la región, e incluso del mundo, ocupando el puesto 13 a nivel mundial[1].

[1] OSIPTEL: Documento de Trabajo: La situación de Internet en el Perú (a Diciembre de 2001).

2 Las oportunidades que ofrece internet

El Estado Peruano asume los retos de la globalización, aplicando las tecnologías de la información y comunicación para insertar al país en el nuevo orden de la sociedad de la información. Por lo tanto, ha emprendido una serie de iniciativas tendientes a promover que las entidades del Estado utilicen Tecnologías de la Información y Comunicación para lograr transparencia, participación y una eficiente gestión gubernamental y optimizar el uso de la infraestructura de Telecomunicaciones utilizando las redes existentes.

Para ello ha desarrollado una Estrategia Nacional de *Gobierno Electrónico* que torna la gestión pública más eficiente.

El *sistema de información regional* permitirá a cada municipio publicar su historia, cultura, atractivos turísticos, proyectos, etc., el *portal de compras del Estado* hará posible canalizar las compras públicas hacia las regiones de forma totalmente transparente, y el *sistema de memorial institucional* basado en la Intranet, que permitirá que la información del Estado se preserve, difunda y sea accesible.

De esa manera se facilita la descentralización del país, otorgando una mayor transparencia y un mayor fortalecimiento de la democracia.

La cabina pública se convertirá en una oficina virtual de atención ciudadana atendiendo en cualquier parte de la

nación, e impulsará el desarrollo del comercio electrónico en el Perú al permitir que ciudadanos y empresas paguen sus tasas con medios tan variados como la tarjeta de crédito, tarjetas de débito, tarjetas prepago

El Proyecto Piloto de *Bibliotecas Rurales* desarrollado en conjunto con la Biblioteca Nacional del Perú, está contribuyendo a elevar el nivel de vida en la zona alto andina del Departamento de Huancavelica, beneficiando a 10 distritos rurales en extrema pobreza, mediante el acceso a Internet y telefonía, promoviendo la producción y difusión de programas con contenidos propios y acceso a un Portal Web.

El programa Huascarán es un programa estratégico especializado en el uso educativo de las tecnologías de la información y comunicación, contribuye a ampliar la cobertura y a mejorar la calidad de los procesos de enseñanza y aprendizaje en todos sus niveles y modalidades, permitiendo su descentralización y democratización. Llegando a más personas en cualquier lugar del territorio nacional, usando todos los medios tecnológicos como son la radio y televisión educativas, la informática educativa, el Internet y otros medios digitales.

El programa Huascarán ha iniciado la atención a nivel nacional de los centros educativos estatales, rurales, urbanos y urbanos marginales donde docentes y alumnos tienen acceso directo al uso de equipos de informática. Los docentes son capacitados en la Integración, el aprovechamiento pedagógico, la apropiación, así como la producción de material educativo con las tecnologías de información y comunicación. Además, la implementación de la plataforma satelital y tecnológica y un centro de datos que constituirá la red de transmisión más grande del país, la creación del portal Huascarán con recursos educativos variados para niños, jóvenes docentes y comunidad en general. El programa se extenderá a 2353 centros educativos estatales, beneficiando a aproximadamente 1’808,000 alumnos y 78,900 docentes.

3 Barreras que impiden el acceso de grandes sectores de la población a Internet

A la fecha se han obtenido mejoras importantes en el sector telecomunicaciones en el Perú, con relación a la expansión y modernización de los servicios, incremento de la densidad telefónica, desarrollo de servicios básicos de telecomunicaciones en zonas rurales, calidad de los servicios, opciones de elección para los usuarios en el ámbito nacional e internacional. Sin embargo, la densidad telefónica y conectividad a Internet son aún muy bajos, debido principalmente a la existencia de barreras de carácter económico, social y tecnológico que impiden el acceso de grandes sectores de la población a las redes de información.

Entre las *barreras de carácter económico* podemos señalar: (a) Los altos costos que deben pagar los usuarios por el acceso a Internet, especialmente cuando el costo está en función al tráfico cursado, y a tarifas del servicio telefónico; (b) Los altos costos que se pagan por los enlaces internacionales y (c) Los altos costos de recursos informáticos (hardware y software) necesarios para el acceso a Internet.

Entre las *barreras de carácter social* se puede observar la falta de capacitación de la población en cuanto al uso y beneficios que ofrece el Internet necesario para un mejor aprovechamiento del mismo, así como la falta de una cultura de autoaprendizaje a distancia.

Entre las *barreras de carácter tecnológico* se observa que para gran parte de la población aún no están disponibles tecnologías alternativas para el acceso a Internet, que permitan una mayor capacidad de transmisión y velocidad de respuesta, a costos accesibles para los usuarios, tal es el caso de las tecnologías de línea digital de abonado.

La existencia de tales barreras dificulta la masificación del acceso a Internet, originando que gran parte de la población aún no tengan posibilidades reales de participar de las ventajas de la era de la información.

4 Medidas de política regulatoria

El Estado Peruano conviene en convertir la llamada *Brecha Digital* en *Oportunidad Digital*, basándose en la formulación de propuestas para un Plan de Acción para el acceso democrático a la Sociedad de la Información y Conocimiento, planteadas por la comisión Multisectorial: «e- Perú».

El Estado es consciente de la importancia de la Sociedad de la Información para el futuro del Perú, especialmente en la educación de la población, el aumento de la competitividad económica de las empresas, la cohesión social del país y su posición en el contexto internacional en un entorno caracterizado por la globalización económica, la apertura de mercados y la continua innovación tecnológica.

En tal sentido, en le Perú se han dado una serie de dispositivos legales con el objeto de promover el uso masivo de Internet, su expansión,| acceso, y aplicaciones.

5 Normas generales

- En agosto de 1998, mediante Decreto Supremo, se aprueban los «Lineamientos de Política de Apertura al Mercado de Telecomunicaciones en el Perú», que señala como una de las principales metas del sector, el incrementar sustancialmente el acceso a Internet en el Perú.
- En junio de 2001, mediante Decreto Supremo, se aprueban los «Lineamientos de Políticas Generales para promover la masificación del acceso a Internet en el Perú». Dicho Decreto crea también una Comisión Multisectorial encargada de la formulación de un Plan de Acción Nacional para Masificar el Uso de Internet.

Las acciones destinadas a lograr la masificación del acceso a Internet en el Perú, deben considerar, entre otros, los lineamientos de política siguientes:

1) Promover la masificación del acceso y uso de Internet y las tecnologías de la información, optimizando y desarrollando la infraestructura de telecomunicaciones existente a nivel nacional.

2) Promover el uso de redes alternativas para el acceso a Internet, y una competencia efectiva en el mercado de telecomunicaciones que beneficie principalmente a los usuarios, con menores tarifas y mejor calidad de servicios.

3) Propender en coordinación con los operadores de servicios de telecomunicaciones, al establecimiento de esquemas tarifarios destinados a reducir los costos de acceso a Internet en el más breve plazo.

4) Promover la expansión del acceso a Internet a nivel nacional, a usuarios domiciliarios, o a través de cabinas públicas de acceso a Internet y Fortalecer los planes gubernamentales que permitan el acceso a Internet en zonas rurales y de preferente interés social.

5) Las entidades gubernamentales según el ámbito de su competencia, deberán identificar y desarrollar proyectos pilotos regionales y nacionales basados en tecnologías de la información, tales como teleducación, telemedicina, teletrabajo, entre otros.

6) Las entidades de la administración pública deberán incluir en sus planes sectoriales, así como en el desarrollo de sus actividades, metas relacionadas con el uso de Internet y el uso de herramientas informáticas, a fin de agilizar la prestación de servicios gubernamentales y propender a la prestación de servicios en línea (gobierno electrónico) a través de páginas web y servicios de consulta interactivo.

7) Las entidades de la administración pública deberán crear una red integrada del Estado, sobre una plataforma tecnológica segura, que permita optimizar los recursos asignados.

8) Las entidades gubernamentales involucradas y las organizaciones privadas interesadas deberán realizar coordinaciones para desarrollar planes destinados a aprovechar el potencial que ofrece el comercio electrónico y las tecnologías de la información para

crear nuevas oportunidades comerciales para nuestro país, en especial para las medianas, pequeñas y microempresas.

9) El Ministerio de Educación en coordinación con los organismos correspondientes deberá entre otros, presentar planes para la dotación del servicio de acceso a Internet y de herramientas informáticas en los centros educativos, bibliotecas públicas y universidades; establecer como parte de la currícula educativa, cursos de informática de carácter obligatorio para los estudiantes; promover una cultura de auto aprendizaje y capacitación a distancia; difundir a través de Internet, programas educativos, recursos didácticos y material de consulta desarrollados en base a la currícula educativa, a fin de promover su utilización masiva de los educandos.
10) Promover la reducción de costos en todos los componentes que permitan la conexión a Internet por parte de las entidades competentes, en particular de los que constituyen herramientas indispensables para la masificación del acceso a Internet.
11) Promover la generación de contenidos de interés, de carácter institucional, educativo y cultural, entre otros, que estén disponibles en Internet en por lo menos dos idiomas.

La Comisión Multisectorial a la que se hace referencia en el párrafo anterior, en virtud del encargo recibido, presento el documento denominado «e-PERÚ: Propuestas para un Plan de Acción para el Acceso Democrático a la Sociedad Global de la Información y el Conocimiento».

El plan consiste en un conjunto estructurado de líneas de acción que contribuyan a impulsar eficazmente desde el Estado el desarrollo integral de la Sociedad de la Información en el Perú y su acercamiento al sector privado y a la ciudadanía en general.

Dicho documento contiene (i) Diagnóstico preliminar de la situación vigente a esa fecha, (ii) Bases para la formulación de un plan de acción, y (iii) Propone líneas de acción para:

a) Infraestructura
b) Gobierno en Línea
c) Comercio electrónico
d) Educación y Capacitación
e) Organización y Gestión

- En junio de 2003, se crea la Comisión Multisectorial para el Desarrollo de la Sociedad de la Información – CODESI con el mandato de elaborar un Plan para el desarrollo de la Sociedad de la Información (SI) en el Perú, el que deberá contener el diagnóstico de la situación actual en el contexto de la Sociedad de la Información, las acciones necesarias a ejecutar y los proyectos de normas y dispositivos para el desarrollo, implementación, y promoción de la Sociedad de la Información en el Perú.

  Asimismo, esta comisión tiene como función, la promoción y ejecución de programas que promuevan el uso seguro de Internet, de las telecomunicaciones y de las tecnologías dela información por parte del Estado.

6 Normas específicas

Además de las ya señalados, se han ido dando en nuestro país, normas más específicas relacionadas a la Sociedad de la Información. A continuación se detallan algunas de ellas:

- Ley de Firmas y Certificados Digitales y su Reglamento.
- Ley que incorpora al Código Penal los delitos informáticos.
- Resolución Suprema que crea una Comisión Multisectorial encargada de definir las «Políticas y Lineamientos para la administración del nombre de dominio ccTLD correspondiente al Perú».
- Decreto Supremo que crea el proyecto Huascarán como órgano desconcentrado del Ministerio de Educación y dependiente del Vice Ministerio de Gestión Pedagógica, con el encargo de desarrollar, ejecutar, evaluar y supervisar con fines educativos una red nacional moderna con acceso a todas las fuentes de información.

– Resolución Suprema que constituye la Comisión Nacional de Telesanidad encargada de elaborar y proponer las acciones necesarias para el desarrollo de la Telesanidad en el Perú.

7 Apoyo a las comunidades rurales

I. En el ámbito de la sociedad civil se viene trabajando en el desarrollo de proyectos específicos con la finalidad de promover el crecimiento sostenible de los pueblos del Perú a través del uso de las tecnologías de la información y las comunicaciones.

Plan PUYHUAN, que tiene entre sus objetivos, generar el modelo integral de desarrollo rural sostenible aprovechando las Tecnologías de la Información y Comunicación, e implementarlo en la Comunidad Molinos, antiguamente Puyhuan, ubicada en el distrito de Molinos, a 7 Kms. de la ciudad de Jauja, Provincia de Jauja, Departamento de Junín así como fomentar la relación empresa privada, Estado y Sociedad Civil para replicar el modelo PUYHUAN otras comunidades, provincias y regiones del país. Planificado de arriba hacia abajo se busca el desarrollo de abajo hacia arriba

El proyecto contempla la creación de un centro de investigación de tecnología informática para el modelo de desarrollo rural y la investigación de tecnología aplicada, estudio de practicas de mercado, desarrollo de productos y servicios, difusión e intercambio, telecentros, entre otros, con una infraestructura que estará compuesta de dos centros de computo con servidor central cada uno, diez estaciones de trabajo con sus terminales de computo, licencias de Software y facilidades de comunicación satelital para acceso a Internet.

II. Proyectos financiados con el Fondo de Inversión de Telecomunicaciones (FITEL) que administra el Organismo Supervisor de Telecomunicaciones (OSIPTEL)

– Información Agraria Vía Internet

El objetivo general del proyecto consiste en lograr que los agricultores de la Junta de Usuarios del valle del Río Chancay-Huaral (Provincia de Huaral, Departamento de Lima) manejen de manera óptima, colectiva y organizada información agraria puesta a su disposición vía Internet en la gestión de sus unidades productivas.

El proyecto busca beneficiar de manera directa a 6,000 agricultores – a mayoría de pequeña propiedad y actualmente con una economía de subsistencia – del valle de Chancay-Huaral, mediante la utilización de modernas tecnologías de información y comunicación en la gestión de sus unidades productivas y de sus organizaciones.

Así el proyecto busca atacar dos problemas: la desventajosa participación en el mercado de los pequeños agricultores debido a la deficiente provisión de información a la que tienen acceso; y, las dificultades de gestión de las organizaciones de riego, debido a la deficiente comunicación entre las diversas organizaciones y las entidades relacionadas con la gestión del agua.

– Sistema de Información para el Desarrollo Rural

El objetivo del presente proyecto es diseñar e instalar un sistema de provisión de información para pequeños productores y autoridades locales mediante la implementación de centros de información rurales (Infocentros), en seis localidades de la Provincia de Cajamarca, que integre al mismo tiempo servicios de información no convencionales, servicios bibliotecarios tradicionales, rescate del conocimiento campesino y nuevas tecnologías de la información, con el fin de tener un acceso rápido a la información que les permita elevar su capacidad productiva y el nivel de gestión. Se instalará una línea de datos (acceso a Internet) en cada uno de éstos. La línea de datos, permitirá que el sistema de información sea puesto en la web para una comunicación interactiva con el Centro de Información Coordinador ubicado en el Ciudad de Cajamarca y la difusión de sus contenidos. Asimismo, se instalará un teléfono público en dichos centros, contribuyendo a la autosostenibilidad de los mismos.

ITDG ha llevado a cabo el proyecto financiado por el Banco Mundial, a través de Infodev, denominado INFODES, mediante el cual se implementó un

sistema de información dirigido a pequeños productores rurales y gobiernos locales, construyéndose una red de centros de información, que brindan a su comunidad servicios básicos como biblioteca, preguntas y respuestas (preguntón), video club, asistencia técnica, etc.

– Sistemas de Comunicaciones para Establecimientos Rurales de Salud

El proyecto consiste en la implementación de un sistema de comunicación y acceso a información para el personal público sanitario en 40 Establecimientos de Salud rurales de la provincia de Alto Amazonas, departamento de Loreto con la finalidad de contribuir a la mejora del sistema público de asistencia sanitaria en las zonas rurales del Perú.

Los Puestos de Salud (nodo terminal) se interconectarán mediante enlaces de radio VHF (usados tanto para voz como para datos) con los Centros de Salud (nodo local), que servirán como pasarela a Internet utilizando los sistemas de telefonía financiados por el OSIPTEL. Cabe señalar que la participación de OSIPTEL consistirá en instalar siete líneas telefónicas con acceso a Internet en dichos nodos locales. Dependiendo del tipo de información, los establecimientos podrán acceder por Internet al Centro Coordinador Nacional (nodo nacional) o a la red MINSA (Hospital de Apoyo Yurimaguas o a cualquier otra dirección electrónica), pasando previamente por el servidor de la Universidad Católica del Perú (actúa como ISP), que se encargará de enrutar las comunicaciones efectuadas entre los Establecimientos de Salud con el MINSA y con la Universidad Cayetano Heredia o con la dirección correspondiente.

III. Proyecto de Apoyo a la Comunicación Comunal (PACC) desarrollado por el Ministerio de Transportes y Comunicaciones

A la fecha, se ha instalado en cada uno de los Establecimientos de Salud de las 7 localidades involucradas en el Proyecto Piloto, un teléfono fijo y un acceso a Internet, los cuales están siendo usado básicamente por el personal de salud.

Desde 1994, a pedido de los centros poblados rurales se implementó el proyecto de Apoyo a la Comunicación Comunal con la finalidad de llevar los servicios de Televisión a más de 1000 localidades rurales y comunidades nativas.

Este proyecto busca romper el aislamiento de localidades alejadas, llegar a zonas deprimidas y apoyar la difusión de programas educativos y culturales, beneficiando a más de un millón de pobladores.

La infraestructura existente de las estaciones de TVRO permite avanzar hacia el proyecto Internet Rural, complementando las estaciones VSAT del proyecto FITEL-OSIPTEL.

Fórmula que permite llevar estos servicios a lugares donde no es rentable para la inversión privada, logrando beneficios tanto para el Gobierno Central, Regional y Municipal, y que el ciudadano peruano de comunidades rurales y nativas pueda acceder a la información, a contenidos y sea participe de la gestión del Estado.

8 Nuevas iniciativas del estado

El Sistema de Información Agraria del Ministerio de Agricultura, tiene como objetivo mejorar la calidad y cobertura de la información que requieren los productores rurales, priorizando la información básica y de mayor impacto en la gestión de sistemas productivos y de comercialización;

La Red Nacional de Servicios Integrados, cuyos objetivos son contribuir a la equidad en el acceso y distribución de la información, integrar las zonas rurales y apartadas del país. Utilizando la infraestructura existente perteneciente a las distintas instancias de gobierno (aproximadamente 1,200 antenas instaladas a lo largo y ancho del territorio nacional) minimizar el costo de implementación de un sistema de telecomunicaciones en el Perú con servicios de radiodifusión masiva y acceso a las tecnologías de la información.

El Sistema Integrado de Administración Financiera para el Sector Publico, mediante el cual se busca integrar a todos los organismos del Estado y a los gobiernos locales e instituciones de dependencia del Estado con un sistema de información única para el cargo y abono de activos.

Sistema Electrónico de Adquisiciones y Contrataciones del Estado (SEACE) Programa piloto a cargo de la Presidencia del Consejo de Ministro, dentro de la Estrategia Nacional de Gobierno Electrónico

El objetivo general del proyecto es desarrollar un sistema integral, compuesto por políticas, procedimientos, normas y software basado en el uso de Internet, que permitirá a las Entidades Públicas Contratantes dar a conocer por medios electrónicos sus demandas y que los proveedores puedan presentar sus ofertas por el mismo sistema. Adicionalmente, el SEACE permitirá que cualquier ciudadano pueda conocer las contrataciones que el Estado realiza.

El proyecto se enmarca dentro de las políticas de Gobierno de modernizar y mejorar la gestión pública, descentralizar el Estado y la transparencia y acceso a la información pública. Una Comisión Multisectorial ha sido la encargada de emitir el informe sobre los requerimientos técnicos y funcionales del SEACE.

La Primera fase del proceso contempla el desarrollo de del Módulo de Registros de Procesos (MRP) y un Módulo de Compras y Contrataciones de menor Cuantía (MCM). Se ha establecido un programa de implementación piloto para ambos módulos en 10 Entidades de Gobierno Nacional.

9 Comentarios finales

Avanzamos hacia una sociedad basada en las tecnologías de la información y comunicación, en la que sus ciudadanos tengan igualdad de oportunidades a la educación el conocimiento y una mejor calidad de vida, conciente y orgullosa de su historia, cultura y capacidades para ofrecerla al mundo, en la que gobernantes y gobernados mantengan relaciones permanentes, armoniosas y de mutuo entendimiento; en suma una sociedad plenamente participativa, justa, solidaria y democrática.

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Philippines

ICT for sustainable development

1 The Philippines: A Profile

The Philippines stands at the crossroads of the developed western world and the Orient. It lies at the heart of Southeast Asia, stretching more than 1,840 kilometers. Composed of 7,107 islands with a population of approximately 80 million, the Philippines is readily accessible to the different capitals of the world. Its three main islands are Luzon, Visayas, and Mindanao.

More than half (56 per cent) of the Philippine population resides in Luzon. The remainder is almost equally distributed between Mindanao (23.7 per cent) and Visayas islands (20.3 per cent). The Philippines is divided into sixteen (14) regions with the National Capital Region (NCR) as the smallest region with a land area of 636 sq.km. and is the most densely populated region with 13,617 persons occupying a sq.km. of land. This man-land ratio is 61 times the national figure of 255 persons per sq.km.

In 2002, the Philippines Gross Domestic Product (GDP) rose at 4.6 per cent or 1.03B from 3.2 per cent of 9.5M in 2001. The Gross National Product (GNP) was pegged at 5.2 per cent or P1.1B in the same calendar year compared to 3.4 per cent or P1.01B in FY2000. This was the strongest recorded economic performance of the country since the 1997 Asian financial crisis, exceeding the high end of official forecasts.

Growth of all production sectors surpassed expectations. This is accredited to policies that have created a stable macroeconomic environment in 2002, as well as structural and productivity enhancing reforms.

In services, the Philippines continue to reap the benefits of deregulation in the telecommunication sector, which robustly grew at 8.9 per cent. Trade continues to benefit from strong consumer demand, as bigger local retailers opened up new malls in regions outside Metro Manila.

Services sector is expected to grow from 5.2 to 6.2 per cent, again led by telecommunications, trade and private services. Policies to liberate air transportation and measures to boost housing are expected to further keep services healthy.

2 The Growth of Telecommunications in the Philippines

Two decades ago the Philippines telecommunications industry was a virtual monopoly. With the lack of competition and limited capital, the industry hardly grew. In 1993, with the introduction of the interconnection policy and the universal telephone service policy, the development of the domestic telecommunications industry was finally underway. The privatization and liberalization of the Philippines telecommunication industry was sealed with the passage in 1995 of Republic Act 7925 or what is known as the Philippines Telecommunications Policy Act.

The passage of the law aimed at accelerating the development of the telecommunications infrastructure through increased private sector participation and liberalizing the sector. This paved the way to a more vibrant and thriving telecommunications industry.

In 1997 alone, investments in telecommunication reached ₱307B and telephone density increased from less than one in 1993 to almost 10 per cent population in 1998. Monopoly was torn apart with the entry of more big players who established strategic partnerships with foreign allies, creating and expanding the needed telecommunication infrastructure to address the growing demands of the public. Telecommunications build up remains to this day a priority of the Philippine government, as it remains as the Philippines principal top income earner.

For this reason, Her Excellency, President Gloria Macapagal Arroyo declared that Information and Communication Technology (ICT) should be the leading sector for economic growth and key to finding the country's proper niche in the global information economy in the 21st Century and as a powerful weapon to eradicate hunger and poverty.

3 Key Government Players in ICT

The *Department of Transportation and Communications (DOTC)* was created pursuant to Executive Order 125-A and is the primary policy, planning, programming, coordinating agency of government pertaining to transportation and communications. It is committed to the maintenance and expansion of viable, efficient, and dependable transportation and communications systems as effective instruments for national recovery and economic development.

The *National Telecommunications Commission (NTC)* was created pursuant to Executive Order 546 and is the sole government agency having jurisdiction over the supervision, regulation, and control over all telecommunications and broadcast services throughout the country. Although independent, as far as regulatory and quasi-judicial functions are concerned, the NTC remains under the administrative supervision of the Department of Transportation and Communications as an attached agency. However, with respect to NTC's quasi-judicial functions, its decisions are final unless appealed to the Court of Appeals or the Supreme Court of the Philippines.

The *Information Technology and Electronic Commerce Council (ITECC)* was organized in 2000 pursuant to Executive Order No. 264 and chaired by no less than Her Excellency, the President of the Philippines. The Council seeks to streamline all ICT related government agencies to provide effective and focused leadership in the implementation of the nation's ICT policy agenda. The vision of ITECC is for an "enabled society where empowered citizens have access to technologies that will provide quality education, efficient government service, greater source of livelihood, and a better life."

3.1 Philippine Telecommunications Policy

The Philippine telecommunications policy as contained in RA 7925 states: Telecommunications is essential to the nation's economic development, integrity and security and shall be developed and administered to safeguard, enrich and strengthen the economic, cultural, social and political fabric of the country.

3.2 The Philippine Telecommunications and Broadcast Services Today

Philippine telecommunications today is highly liberalized, privatized, and competitive. The sector is stimulated by investments, which accelerates its sustained growth. Likewise, it has played a significant role in boosting our economy with its revenue generation. The use of the mobile telephone service has become a way of life and has eliminated the waiting lists, reminiscent of the fixed lines days. Mobile penetration in the Philippines is high, however affordability is still a big barrier to universal access. The state of affairs of Philippines telecommunications as presented in tables can be seen as **Attachment A**.

ATTACHMENT A

Table 1 Telecommunications/Broadcast Industry Structure

TELECOM SERVICE	1999	2000	2001	2002
Local Exchange Carrier Service	76	77	74	73
Inter-Exchange Carrier Service	12	12	14	14
International Gateway Facility	11	11	11	11
Radio Mobile				
• Cellular Mobile Telephone System	5	5	7	7
• Public Trunk Repeater Service	10	10	11	11
Radio Paging Service	15	15	11	11
Coastal	12	12	12	13
Broadband	10	18	19	19
Broadcast Stations (AM,FM,TVD,DTU)	1032	1089	1143	1274
CATV Stations	1055	1162	1219	1373

Table 2 Regional Distribution of Telephone Lines

REGION	POPULATION	INSTALLED CAPACITY	SUBSCRIBED LINES	TELEDENSITY	
				TELELINES	SUBSCRIBED
CAR	1,461,529	94,144	35,503	6.44	2.43
NCR	10,758,840	2,847,516	1,698,365	26.47	15.79
I	4,276,974	182,076	108,760	4.26	2.54
II	2,922,220	39,602	30,667	1.36	1.05
III	7,982,573	406,583	236,490	5.09	2.96
IV	11,904,461	1,118,707	513,907	9.40	4.32
V	4,919,499	135,422	66,701	2.75	1.36
VI	6,548,108	443,763	112,023	6.78	1.71
VII	5,750,685	457,709	173,355	7.96	3.01
VIII	3,899,553	165,035	43,352	4.23	1.11
IX	3,300,211	166,000	29,740	5.03	0.90
X	2,984,121	199,566	51,529	6.69	1.73
XI	5,523,366	431,541	133,497	7.81	2.42
XII	2,784,797	84,744	32,876	3.04	1.18
XIII	2,171,985	100,648	36,153	4.63	1.66
ARMM	2,287,349	41,179	8,015	1.80	0.35
TOTAL	**79,476,271**	**6,914,235**	**3,310,933**	**8.70**	**4.17**

Table 3 Telephone Density Index

YEAR	INSTALLED LINES	SUBSCRIBED LINES
1998	9.08	3.44
1999	9.12	3.87
2000	9.05	4.01
2001	8.88	4.26
2002	8.70	4.17

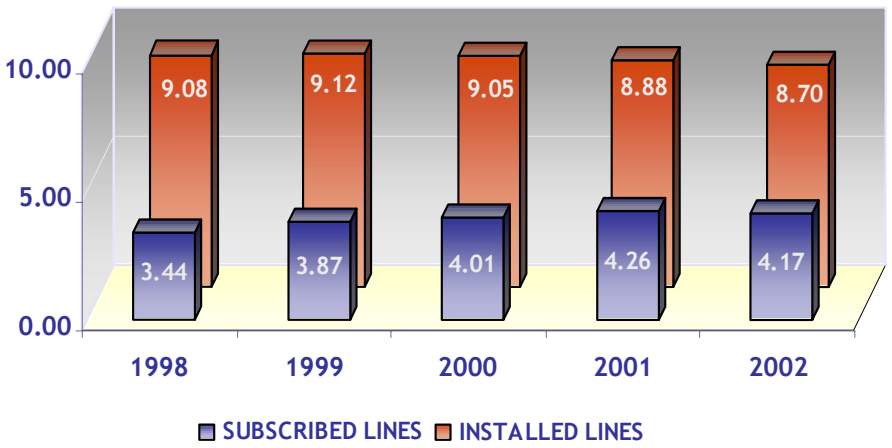


Table 4 Cellular Mobile Subscriber Distribution

OPERATOR	2000	2001	2002
BAYANTEL	Not yet operational.		
DIGITEL	Commercially launched in 2003		
EXTELCOM	194 452	194 452	29 896
GLOBE	2 563 000	5 405 415	6 572 185
ISLACOM	181 614	181 614	181 614
PILTEL	656 814	1 483 838	1 773 620
SMART	2 858 479	4 893 844	6 825 686
TOTAL	**6 454 359**	**12 159 163**	**15 383 001**
CMTS DENSITY	8.46	15.61	19.36
POPULATION	76 320 141	77 898 196	79 476 271

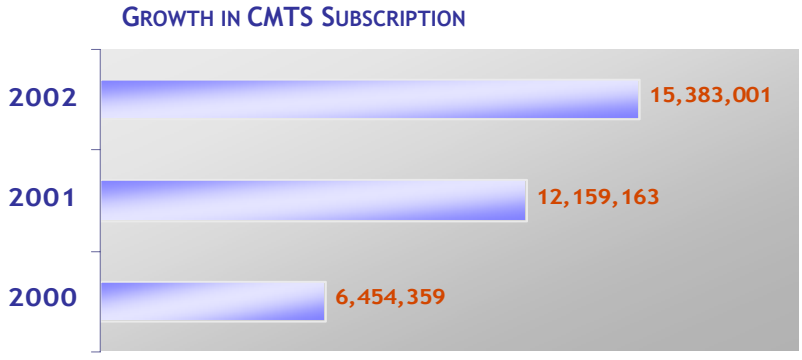


Table 5 Internet Service

YEAR	No. of NTC-Registered ISPs	Estimated No. of Subscribers
1996	24	100 000
1997	17	200 000
1998	23	300 000
1999	31	350 000
2000	34	400 000
2001	64	500 000
2002	53	800,000+

3.3 Strategic Roadmap for ICT

The Information Technology and Electronic Commerce Council (ITECC) has developed a strategic roadmap in the following directions:

E- Government implementation

- Make it easier to do business in the country (investor-friendly);
- Improve efficiency, accessibility, accountability and transparency in delivering basic services;
- Spur the domestic ICT Market with the government as the largest customer;
- Provide proper environment to enable and increase IT usage.

Human Resource Development

- Increase the use of IT in delivering Basic Education;
- Improve the quality of IT knowledge/skills throughout the supply chain;
- Accelerate the development of relevant IT knowledge/skills;
- Leverage overseas Filipino ICT professionals.

Business Development

- Build the RP brand and image;
- Focus on niches in the Foreign Market where the country has a sustainable competitive advantage;
- Use a more targeted approach in selling and closing outsourcing opportunities.

Legal and Regulatory Framework

- Rationalize the institutional framework by creating a Department of ICT;
- Strengthen the legal and policy framework to address critical issues arising from new technologies;
- Provide a support framework to ensure enforcement of laws, promote;
- e-commerce and facilitate ICT investments.

Information Infrastructure

- Consolidate existing government ICT resources to be shared by all government offices;

- Undertake the development of a Universal Service Program;
- Update network performance service standards to conform with acceptable Global standards;
- Develop a National IT Security Program.

4 Recent Regulatory incentives

1) Addressing the 3.8 million unsubsribed landlines and as a government response to consumer needs and of the poor, the government has allowed some pricing flexibility on their local telephone service to allow the introduction of local measured service and prepaid service
2) **MC 08-07-2002** – Small, medium and micro enterprises are allowed to invest in telecommunications through the installation of public calling stations and/or telecenters particularly in the rural areas to help promote universal access using the facilities of enfranchised and certified operators;
3) **MC 09-2002** – Guidelines for Competitive Wholesale Charging for Interconnection Services.
4) **MC 07-06-2002** – Sets the service performance standards for Cellular mobile telephone service.

   MC-05-5-2002 – Provide for high speed networks and connectivity to IT hubs, namely: Pasig Ortigas Business District, Makati Global City Business District; Alabang – Paranaque Business District; Subic Clark Specific Economic Zones; Cebu Asia Town IT Park and University Belt.

5 Internet for development

There is no official figure for the number of ISPs operating today. The NTC has registered for 2002, 53 ISPs with an estimated number of more than 800,000 subscribers. Internet access provision is considered a value-added service (VAS) in the Philippines. ISPs need only to register with the NTC to be able to provide service. There is a one time processing fee and an annual fee for five years, payable at the time of registration for the full five years. A VAS registration could be for any service and not necessarily Internet access.

A value added service (VAS) is one that is provided over existing telecommunications infrastructure. The definition as provided for by law (RA 7925) is technically applied and no value added service provider is allowed to supply their own infrastructure but must lease it from authorized carriers. Registration is valid for a period of five (5) years. Public telecommunications operators can also be Value Added Service (VAS) providers provided that they seek prior approval of the Commission to ensure that VAS offerings are not cross subsidized from the proceeds of their utility operations; other providers of VAS are not discriminated against in rates nor denied equitable access to their facilities; and that separate books of accounts are maintained for the VAS.

There is no Internet content control in the Philippines. An Internet content provider can establish a web site without any formal application. Nonetheless content is a concern, particularly pornography and games that border on gambling.

Over half of the country's Internet users are in Manila. It is estimated there are more than 20 million potential Internet users in the country but only less than two millions are actually using it. The number of PCs is also low. Recent statistics show that out of 379 government units only six remain to have no website.

6 E-Learning: A Project to Provide Personal Computers for Public High School

A government program under the Department of Trade and Industry (DTI) to bridge the digital divide between the public and private schools all over the country got a boost with the recent approval by the Japanese government under the Non-Project Grant Aid (NPGA2), of a P584 million grant for the second phase of the PCs for Public High Schools Project.

Citing RA 8792 or the E-Commerce Act of 2000, which mandates the e-commerce readiness of all government agencies, the acquisition of the PCs to be allotted for local government was done to upgrade IT capabilities for local governance and in the delivery of services. It is expected that local government units (LGUs) can utilize the computer technology in automating their key administrative systems such as business registration and licensing, real property, tax administration, treasury operations and management information. Only 170 of the close to 1,500 LGUs have access to computer technologies under existing government computerization for LGUs.

The project is part of the Japanese government's concrete steps to narrow the International Digital Divide between developed and developing countries. Through the project, the Philippines would be able to develop its human resource capital in the field of IT, and modernize and automate key local governance systems.

While the first phase of the project expanded IT access in secondary schools from 28% to 54%, about 2,345 public high schools remain without access to computer technologies. Under the second phase, another 10,000 computers will be distributed to 900 public high schools and 250 municipalities. In addition to the 200,000 students, another 18,9000 teachers will be trained on IT base education while 1,250 municipal employees will be trained on automation of LGU administrative systems.

Each of the recipient schools in this Phase 2 activity will receive 10 personal computers equipped with essential computer peripherals. Each municipality will have 4 personal computers, a printer, and a server. The government hopes to build on the gains of this project to concretize the country's vision of further developing the country's IT human resources and making IT as the country's engine of growth in the new economy.

7 Text2Teach Project: Texting for Education

Bridgeit is a global program which pilots the *text2teach project* in 40 Philippine schools (37 public and 3 private schools), representing both urban and rural areas, this coming school year. Under the set up, Ayala Foundation Inc, will oversee the text2teach project locally for Bridgeit's core group members – **Nokia Corporation, the International Youth Foundation, Pearson and the United Nations Development Program.**

A fast and easy to use service, **Bridgeit** combines existing mobile products and satellite technologies to deliver digital, multimedia materials to teachers and students who otherwise would not have access to them. Teachers will be able to use mobile phones supplied by Nokia to access a library of science videos provided by Pearson, the world's leading learning company. Once selected, videos are downloaded via satellite to a Nokia digital video recorder connected to a television right in the classroom. Local Philippines organizations have donated their time and services to make this project.

Bridgeit was developed locally under the leadership of the **Ayala Foundation** and with the commitment and involvement of the Philippines Ministry of Education, SEAMEO Innotech, Nokia, Globe Telecom, PMSI-Dream Broadcasting, and Chikka Asia. The Philippines has been chosen as the pilot site, primarily due to the country's comfort level for digital technology, particularly the cell phone, and its English proficiency.

The project has a developmental goal – to bringing kids to a broader range of information that's more up to date, more user friendly, and more exciting will not only keep them engaged, it will help keep them in school.

(See Attachment B for additional features of the Project)

8 Community e-Centers (CEC): A Philippine Model

Citizens residing in small communities do not have basic services and need to travel long distances just to avail of e-centers (e.g. telephone services, internet access, e-learning). Existing telcos are not interested in developing access to smaller

communities (barangays, barrios, towns, municipalities) and tend to concentrate on the more lucrative business. This project will augment the existing government efforts on solving the "last mile problem" with private sector and local community participation to improve bandwidth affordability in remote areas through several deployment models. These e-centers can possibly establish a new channel for delivery of e-government services at a lower cost.
(See Attachment C for the Project Profile)

9 Regulation and Consumer Rights

Under the Public Telecommunications Policy Act of 1995 (RA 7925), the National Telecommunications Commission (NTC) as the principal administrator of the law is mandated to *"promote the consumer's welfare by facilitating access to telecommunications services whose infrastructure and network must be geared towards the needs of the individuals and business users".* The same law further mandates that consumers must be protected *"against misuse of a telecommunications entity's monopoly or quasi-monopolistic powers, but not limited to, the investigation of complaints and exacting compliance with standards from such entity."*

Likewise, under the Philippines Consumer Act (RA 7394), it is "the policy of the State to protect the interests of the consumers, promote the general welfare and establish standards of conduct for business in industry."

Consumers/users of telecommunications services have the following rights recognized under the Telecom Policy and Consumers Laws:

- **Right to non-discriminatory utility service** – Consumers have the right to non-discriminatory, reliable service, which meets the minimum service standards set by the Commission.
- **Right to instant telephone access/ connection/service** – Consumers have the right to given the first single line for telephone connection within two months of application for service.
- **Right to timely installation, restoration, and repair service** – Consumers have the right to timely installation of new services, and restoration and repair of existing services.
- **Right to accurate, clearly worded and organized bills** – Consumers have the right to be accurately billed for services they received. Vendors of telecommunication services shall provide clearly worded and organized bills.
- **Right to Prompt Investigation and Action on complaints** – The service providers shall endeavor to allow complaints to be received over the telephone and shall keep a record of all written or phone in complaints.
- **Right to Quality Service** – Consumers have the right to quality services. Local telephone companies must provide and list in their directory a 24-hour repair service number. Consumers have the right to access vendors' annual quality of service reports.
- **Right of Public Participation** – Consumers have the right to participate in public policy proceedings through public notice.

  Right to Reasonable Accommodations – Consumers with disabilities have a right to reasonable accommodations needed to understand consumer rights. Consumers with disabilities must have information to access disability related equipment, services, or information needed for utilization of telecommunication devices and services.

***The One Stop Public Assistance Center (OSPAC*).** Recognizing the need to provide consumers/clientele with accurate and relevant information as well as assistance regarding issues/concerns they may have on telecommunications, the NTC has established at its Central and Regional Offices a One Stop Public Assistance Center (OSPAC) to address specific needs or complaints, to include petty thievery of cellular phones.

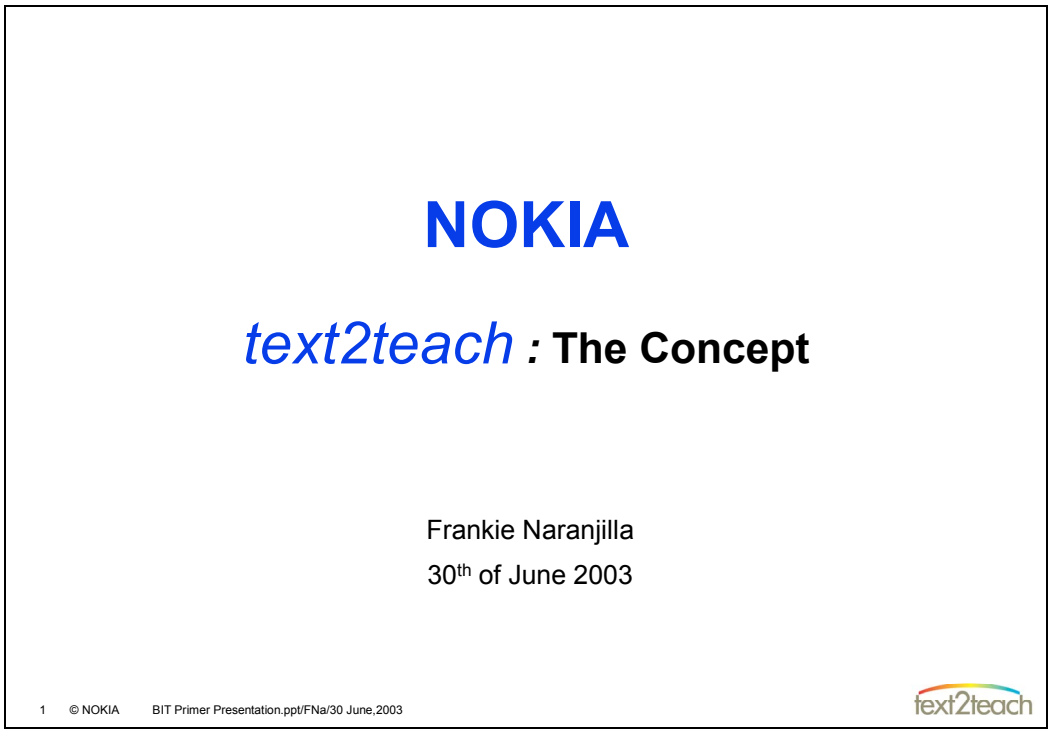
10 Conclusion

Although the Philippines telecom industry is considered as one of the fastest growing in Asia, a number of technical and commercial issues must still be resolved within the sector. In an era of privatization, liberalization, competition and globalization, the issue of regulatory intervention over the operations, especially on the commercial aspects in the midst of the many service providers come to fore. Nonetheless, NTC continues to take a proactive approach and undertakes continuing information dissemination campaigns as well as hold regular public hearings and dialogues on issues and concerns that require the participation of all stakeholders.

Whether government intervenes or not remains debatable, especially where no specific law exists. One strong point of regulation has the advantage of widening the choice of service providers, and making more efficient use of the spectrum and stimulating more competition. On the other hand, the argument that the environment is sufficiently competitive, that regulatory intervention is unnecessary, is also valid given the mandate to the regulator "to foster a healthy competitive environment telecommunications where carriers are free to make business decisions and to interact with one another in providing telecommunications services with the end in view of encouraging their financial viability while maintaining affordable rates."

The fact that the Philippine government is the most committed advocate of ICT in the Philippines portends to a future where the Filipino can be competitive in a world propelled by information and communication technologies. The potential of ICT as a reliable and powerful agent of progression and advancement for all peoples of the world, indeed, presents a compelling *raison d'être* to build an information society that will attain for all peoples prosperity, harmony and peace – ideals that have remained elusive to humankind.

ATTACHMENT B



Agenda and Objectives

Agenda:

1. Corporate Citizenship.
2. Philippine Education in the global map.
3. Bridge IT – “Text 2 Teach” Providing a solution to the challenge.

Objectives:

1. To be open with our valued business partners.
2. To share, exchange notes and seek high level advise.
3. To arrive at a solution in improving the condition of Philippine education – Nation Building.

text2teach

Unleashing Human Potential
Through Innovative Use of Digital Technology

text2teach

The Challenge

- Provide full access to learning in developing countries
- Build locally relevant programs meeting the community needs
- Build replicable and scalable programs
- Build on existing programs and share best practices
- Find unique and focused ways of implementation with strong local ownership

text2teach

Our Strategic Intent & Vision

'We enable young people to create their own place in the world'

We want to go beyond enabling young people to merely use technology – we want to enable young people to use technology for a purpose

Content, Connection & Curriculum

We will make an active and sustainable contribution to bridging the Digital Divide all over the world, by complementing the *local curriculum* with high quality educational *content* delivered through a high-speed digital *connection* and integrated *teacher training*

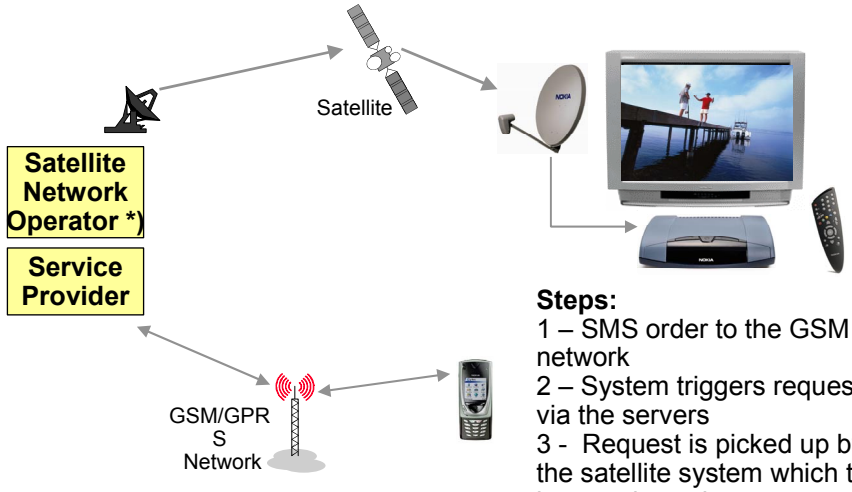
text2teach

The Solution

- Specific, yet universally replicable solution to help young people in developing countries to get full access to educational content and information
- Combines digital satellite broadcasting and media terminal technologies with the Internet and mobile connectivity (GSM/GPRS) in a future-proof solution
- Content will focus on natural sciences and will be provided and developed by both international and local content partners in co-operation with local educational authorities
- Teacher training as part of the program

text2teach

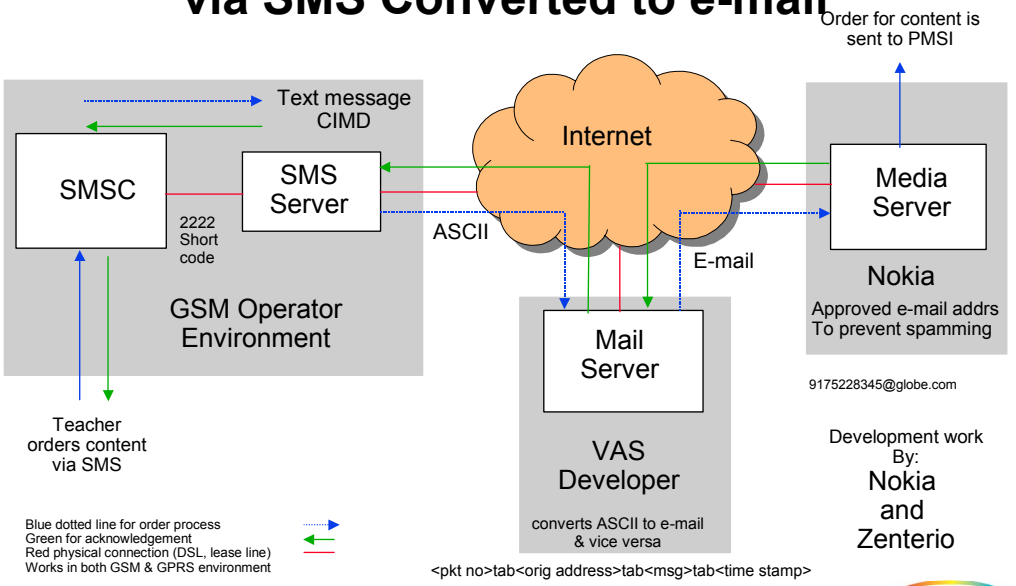
General Technical Architecture



Steps:
1 – SMS order to the GSM network
2 – System triggers request via the servers
3 - Request is picked up by the satellite system which then beams down the content
4 – Content is downloaded to the set top box
5 – Playback to view

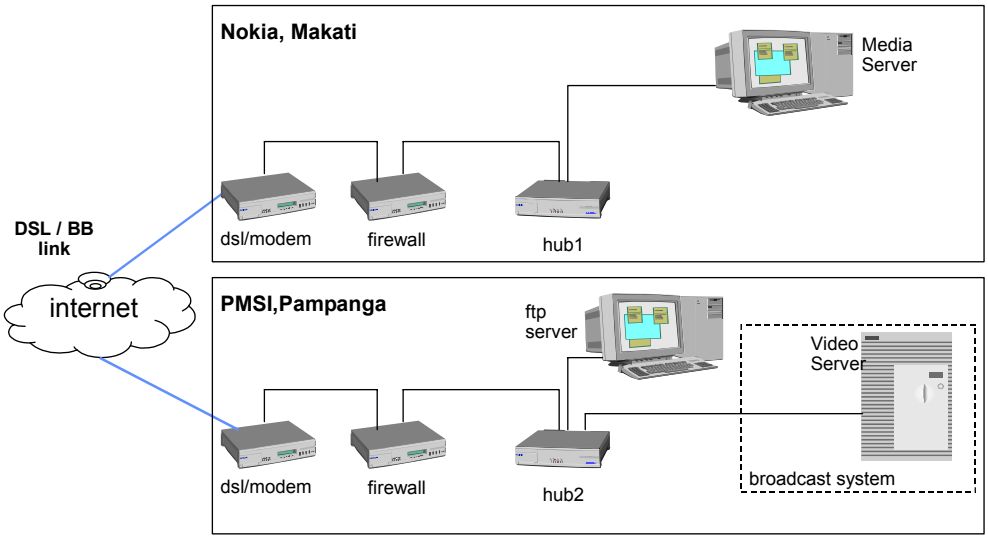
text2teach

Content Ordering via SMS Converted to e-mail



text2teach

Clark - Makati Network Connections



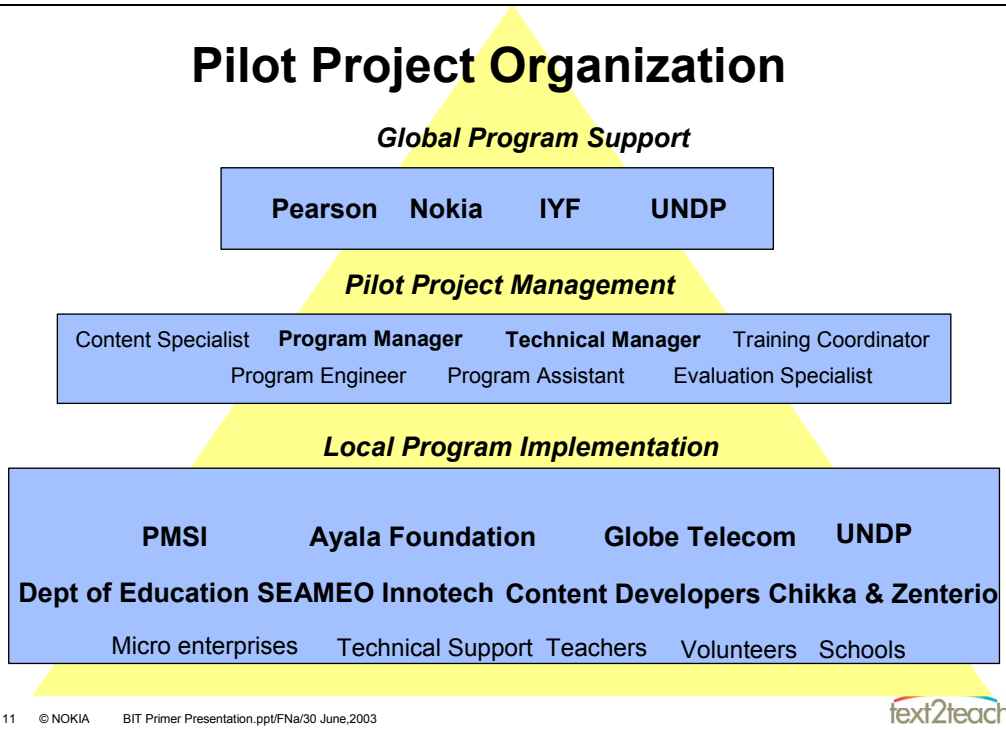
text2teach

Pilot Project

- Assess validity of overall concept (technology, content, operational mode, sustainability)
- Provide learning for all partners through continuous monitoring and assessment
- Establish basis for possible replication
- Pilot project country - The Philippines:
  - 40 schools in the Philippines
  - Urban and rural areas
  - Combination of public and private (not elite!) schools
  - English language content viable

text2teach

Pilot Project Organization



text2teach

What Bridge IT Brings to the Corporate

- **Fulfills Corporate Citizenship functions to the community**
  - Corporate and Community role
  - Nation building
- **Builds positive image to the market thereby strengthens corporate branding**
  - Excellent publicity
- **New technology learning**
  - Can also open new business opportunity of similar applications
  - Increases competitive positioning in the market
  - Adoption of best practices
  - Keeps us ahead – Its a convergence project that combines terminal, GSM-GPRS, DSL and satellite solutions
- **International exposure**
  - Possible business exposure outside of the country

text2teach

In Summary

Social & Human

Increases student academic performance and motivation

Improves teacher motivation and skill building

Positively impacts the communities where the program is implemented

Business

Drives digital convergence and the mobile Internet

Encourages content development by local and international content providers

Opens new markets for technology focused educational tools

Process & Organizational

Establishes a replicable and scalable pilot project which can be expanded within the country and around the world

The Department of Education will view Bridge-IT as having significant supplemental educational value and will play a central role in scaling the Program to a larger percent of the Philippines

Reputation

Increases the reputational capital of the organizations involved

text2teach

ATTACHMENT C

ATTACHMENT C-2

Updates: Development Activities

- CECP OVERSIGHT COMMITTEE CREATED and OPERATIONAL
- INITIATIVES
  - BATANGAS PILOT PROJECT
  - TELOF'S COMMUNITY E-CENTER IN BUKIDNON
  - E-PLDT PROPOSAL TO DEPLOY 6 TELECENTERS
- PLANNING AND STRATEGIES WORKSHOP (17 June 2003)
- DRAFT EXECUTIVE ORDER TO INSTITUTIONALIZE THE PROGRAM

CECP ESSENTIALS

- Branding
- Efficient and effective partnership of public and private sectors
- Content an essential component of CECP and its sustainability. Content and applications must be adopted or developed to suit particular needs and conditions of local communities
- Cross-sectoral, multi-disciplinary efforts of community development in the introduction of CEC services

ACTION ITEMS

- Data gathering possibly at barangay (smallest political unit) levels
- Draft EO (Team Comprised of Members of Policy, Regulatory and Strategic Sector)
- Site Visits
- Draft Primer
- Identify and develop potential role models
  - TELOF
  - Public Schools with PC Deployment
  - SMEs
  - Barangay.net
  - E-PLDT
  - Philpost E-post shop

POSSIBLE INITIAL FUNDING

- Open Window from banks
- ODA
- Government Incentives
- Adopt a barangay program
- Private sector funding
- BOT
- Telcos to adopt areas
- Budget insertions

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Sierra Leone

Telecommunication Development Country Report for Sierra Leone

A 2-Megabit VSAT system was installed as additional bandwith to the Internet gateway to cater for the ever-growing demand for this service.

1 Switches

The following switch and Remote Sensing Units (RSU) have been recently installed:

- Bo 2 000-line switch,
- Lungi 1 500-line RSU,
- Kenema 1 500-line RSU.

They provide very modern switching facilities in some of our major provincial towns and most importantly customers are now benefiting from reliable dial up internet facilities.

2 Network

Extensive rehabilitation work is been undertaken to our cable network. Old cables are being replaced to handle higher date throughput and a substantial expansion work is in progress.

3 Billing

To enhance our revenue collection and credit control we have installed a prepaid platofrm to ensure that all mobile and international calls are connected through this platform either as prepaid calls or with prearranged credit limits.

4 The present state of Sierratel Network

The present telecommunications infra-structure include the following:

a) Six local exchanges in the Freetown multi exchange area.

b) Three automatic exchanges in the main provincial area.

c) Two gateway exchanges. A standard, an earth station and two VSAT links.

d) Trunk microwave network connecting Freetown with the provincial towns.

e) Local distribution neworks in all areas where automatic exchanges are installed.

5 Development plans to improve data throughput and enhance Internet access

a) Introduction of ISDN service.

b) Installation of SS7 (No. 7 signaling).

c) Suitable wireless systems to take telephone and Internet services to the inaccessible areas.

d) VSAT solution for linking rural and remote areas.

e) Replacing copper screened exchange junction cables with opitical fiber.

f) Wirelesss local loop.

6 Conclusion

The benefits of the Internet to our socioeconomic development are fully appreciated and the need to take this service to the every area of the country is now very paramount. The problem in achieving this, is to get the right technology at affordable cost especially as we are faced with a monumental challenge of rebuilding and expanding the telephone network. The availability of cheap computers and effort to make the Internet more extensively used in schools are also essential to complement our effort.

Our plans to attain a teledensity of one by the year 2005 has been adversely affected as a result of the significant drop in foreign exchange earnings since the accounting rate system all but collapsed and the concept of tariff rebalancing has not proved an effectual remedy. These situations combined with the granting of VSAT licenses to private operators to carry international traffic have had a negative impact on our projects.

We are in the process of forming a strategic alliance with a reputable compagny to set-up our mobile phone company. It is hoped this will build-up our customer base and enhance our revenue base to realize our future plans.

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Somalia

Telecommunication Development Country Report for Somalia

Is the Internet a myth in Somalia? Since 1999, the country of the horn of Africa belongs to the society of information. If the sites on Somalia pullulate, often in local language, one very often questions the reality of the Net for the inhabitants of a country politically recovering the trauma of civil conflict.

On 7 388 200 inhabitants, Somalia counts 39 000 subscribers with Internet but nearly 134 000 people use it. The connection costs USD 0.80 cents per hour on average. Astonishing figures, with the sight of the infrastructures, settings with evil by several years of war in a country used to call itself the rising country of Africa. It is a surprise for all which Somalia finds an economic dynamics and which the sector of Telecommunications develops as much, even more in comparison of neighboring countries who are stable politically.

1 Somalia Internet, the way towards the rebuilding

Internet connection is accessible since 1999 but, as the majority of the countries are in the process of development, the computer ownership remains a product of luxury and one often connects in internet coffees or work. This is however not the only obstacle with the development of the Internet in the country. The weak mastery of English, principal language used on the Web, or of French, is another. Moreover, Somalia is a Moslem country, a religious environment which always does not support the development of unmonitored contents. Nevertheless, the optimism is to be retained for the future of the Internet in Somalia: for Somalia, telecommunications represent an opportunity for the rebuilding of the country.

Connectivity is a key challenge for developing and least developed countries in particular. Until recently, the only question was how to provide quality phone services at affordable costs throughout the entire country. In the coming years, we will have to address in addition, the question of how to offer fully relevant Internet services to support development of local activities.

Main barriers to Internet penetration are identified as: lack of efficient telecom infrastructure, income, inadequate content, language, application, know-how and public awareness.

Real Internet diffusion on a large in developing world will only possible, if all above mentioned obstacles are resolved and make it available the disadvantage people in the least developed countries. In addition, as soon as relevant Internet services and applications are offered to address specific local needs and other concerns of potential end-users through an innovative way of using Internet, then we should be expecting the Internet penetration to improve.

Somalia as being one of Least Developed countries and countries recovering from prolonged civil conflict faces challenges similar to those that are in Rwanda, Bosnia and Afghanistan.

They need to strengthen and diversify their economies, educate and engage their young people, develop the infrastructures that support economic growth, and lure back the educated professionals and business-people who have fled to other countries.

ICT will be instrumental in meeting these challenges, but recent history shows that Somalia and the other culture minded countries are often suspicious of, and resistant to, technological change. If ICT is to fulfill the role of building and strengthening the economies of these countries, it must be adapted to the needs and cultures of its users.

ICT strategies are often developed and publicized mainly to attract external investment to construct new infrastructures or to market hardware and software without giving sufficient attention to local concerns and requirements. These strategies give too little consideration to the plight of marginalized people and fail to build upon existing strengths in the local environment. The political and economic priorities of key decision makers often dictate the outcomes of these ICT strategies.

2 Conclusion

It is clear evidence that an urgent need exists to develop ICT strategies and actions that bring marginalized social and economic groups within reach of modern communications technologies. Such strategies must take into account that the user may be someone living in a small village, a factory worker controlling a robotic system on an assembly line, or a government official.

Countries recovering from civil conflict face the same problems as other developing or Least Developed countries around the world: low levels of education and literacy, poor technology infrastructures, and a wide gap between the disposable income of the relatively few "haves" and the more numerous "have-nots". Use of the Internet requires a fairly complex set of skills and technology. At the very least, one must have electricity, a communications line, a terminal capable of interacting across the communications lines, and (in most cases) a reasonable fluency in English (80% of the material on the World Wide Web is written in English; however, a movement to replace some English-language Web pages with Indigenous-language ones is gaining momentum. All of these factors contribute to the digital divide.

Sri Lanka

Telecommunication Development Country Report for Sri Lanka

1 Consumer Participation

In Sri Lanka more techniques are now adopted ever before to bring about a large population of active consumers or correctly termed End-Users of basic tele-communication services to participate along with:

- Government policy makers,
- Regulator/Administrator,
- Service provider/Operator;

to voice consumers:

- complaints, and
- interests;

thereby, to bring:

- solutions, and
- integrate them to reform process,

to have better serve, end-users needs for tomorrow.

It is the same successful story, when end-users were asked to voice other services such as radio & television, internet and e-commerce, spectrum as natural resource, billing-specially the tariff on international calls, cellular incoming free, tariff of computers connected to ADSL.

2 Consumer population

Speaking of telecommunication, averagely there are 1,700,000 units available with consumers for telephone access. Comfortably this figure can be doubled to obtain an average consumers. Other services such as paging, trunk radio, internet, etc will bring another 100,000 to voice on regulatory matters differently. Young and new consumers who will be demanding for phones in near future are always seen mostly at public booths, countrywide post offices, wayside communication centers, will bring multiple of important consumers further. Well defined teledensity shows currently there are minimum of four people as consumer for every hundred people in population. All services provide a maximum of ten people as consumers for every hundred people in the country. They are now seriously accounted by regulator. Various steps are taken to integrate these consumers in to the regulatory processes to better serve and address end-users needs.

3 Consumer information

These consumers voices are propagated via:

- mainly from three fix line operators & four cellular operators,
- at public hearing attendance visiting or through on-line,
- publishing questions and suggestions on daily/periodic newspapers,
- writing such issues directly to regulator,
- through elected representatives.

4 Ultimate Consumer Service

Every end-users' final goal is to have the best price, quality of service, less interruption, comfortable access for additional options and new technology. For any short

of above services, routes has been provided to "beat the drum" till regulator take appropriate action. They report through various paths as mentioned before and fair policy and regulator decision is taken to integrate and absorb the findings in the reform process.

5 Benefits currently given to consumer

- the government of Sri Lanka intends to revise the current legislation governing the spectrum and telecommunication to reflect international best practice in regulation, the national telecommunication policy and the ICT development road map.
- Sri Lankas' commitment to universal access have taken a decision to expeditiously provide six hundred sub-post offices in off cities with telephone service.
- Regulator offering a subsidy scheme for payphones operation for each incremental payphone installation and service to rural and remote consumer in order to provide greater access.
- providing of telephones for consumers with special needs (for visually/ hearing/physically impaired persons)
- registration of communication outlets (BUREAUX) allowing them to be responsible and answerable for call services provided for consumers.
- action to replace the Telecommunication Regulatory Commission (TRC) act with Telecommunication Information Communication Technology Act (TICTA) to protect the interest of all and wider consumers and promote efficiency in the relevant industries.
- consumer awarness program by publishing the quality of service indicators for fixed access operators periodically highlighting, call completion ratio, faults cleared within 24 hours, faults cleared within 72 hours, faults per 100 exchange lines.
- opening "sunnivenda piyasa" in remote areas to be in-line with "internet café culture".

6 Integrating consumers into the regulatory process general comments/ conclusions inclusive of Strength of regional presence

APT and other Broadcast Unions plays a vital role, brings Sri Lankas' commitment to universal access in various ways. Rules, Laws, Technical support, Training, meetings and many more services bring Sri Lanka to have equal opportunity to stand with rest of the world. When reforms are Introduced to suit with consumer needs, World/Regional body and industry manufactures' thoughts are well consumed & best practiced whenever and wherever possible.

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Sudan

Telecommunication Development Country Report for Sudan

1 Country Overview

Sudan, the largest country in Africa, is a multi-cultural, multi-ethnic and multi-lingual society, an Afro-Arab country occupying a remarkable position in the center of the African continent with a north – east coastline with the Red Sea. It shares common borders with nine African countries.

Current estimates put the population of Sudan in excess of 30 millions with an annual growth rate estimated at 2.6%. 65% of the population is rural, mostly farmers. About 6% of the population resides in the capital, Greater Khartoum.

Sudan enjoys an extremely diversified ecological system that provides extensive stretches of fertile, cultivable lands and plains estimated at 200 million acres, huge livestock wealth estimated at 130 million heads of cattle, sheep, goats and camels, some 250 million acres of forest, bushes and natural pastureland, considerable water-supply reserves in forms of rainwater, rivers, streams, surface and underground water reservoir and broad climatic zone that stretches from lush vegetation of the equatorial Southern Sudan to the arid deserts of the north.

In addition to its agricultural and animal resources, Sudan abounds with potential mineral wealth such as oil, natural gas, gold, copper, manganese, mica, zinc, cobalt, granite, marble, nickel and tin.

GDP growth has averaged around 6% since the mid-1990s,the highest in the region. GDP per capita is estimated at USD 8,500 million.

2 Telecommunication Sector Profile

a) Pre-Privatization Era

Sudan has known telecommunication services early 1897. Since that time, the entity in charge of telecommunications had undergone a number of organizational restructuring changes. The intent of these changes was to allow the entity in charge to operate in a commercial, business-manner, but it remained, for all practical purposes, a government department with little or no operational and financial autonomy and with little real control over its own destiny. Despite many development plans and efforts, the state of telecommunication in the country remained extremely poor up to the year 1993. By that time, Sudan had one of the lowest penetration rates even by regional standards. Its penetration rate was 0.23% compared an average of 0.6% in the region.

b) Privatization Era

The Government of the Republic of the Sudan, being aware of the constraints and conflicting forces facing the public sector entities, and being convinced that these entities, in particular the telecommunication entity, be permitted to behave more like commercial businesses under the conditions of competitive market disciplines, adopted a Three-Year Economic Salvation Programme (1990-1993).

The said Salvation Programme emphasized the role of the telecommunications in the socio-economic development process and called for the removal of the monopolistic environment in the sector and for the involvement of the private sector-whether local or foreign-in the telecommunication sector as well as in other sectors of the economy in an endeavour to overcome the persistent shortfalls in investment and performance.

As an outcome of this programme, the structure of the telecommunication sector in the country at present stands as follows:

a) The Ministry in charge of policies and legislations,

b) The regulator (NTC) in charge of regulatory functions,

c) Licensed operators and service providers in charge of operation of licensed networks and provision of the services.

The tables below show the main telecommunication indicators in Sudan as at 31/12/2002.

a) Capacities, customers and penetration rates

	1994	1997	1998	1999	2000	2001	2002
Fixed (Exchange capacity)	74,000	154,000	198,000	280,000	415,000	790,000	1,224,600
Mobile (Subscribers)	***	2,600	7,810	18,200	45,000	100,000	256,000
Internet (Subscribers)	***	300	1,027	2,283	6,014	12,000	30,000
Penetration Rates							
Fixed	0.24	0.48	0.62	0.85	1.24	2.47	3.82
Mobile	***	0.0078	0.024	0.055	0.132	0.285	0.800
Internet	***	0.001	0.004	0.004	0.017	0.034	0.094

b) Fixed Telephone Traffic Growth (Millions minutes)

		1994	1998	1999	2000	2001	2002
International	1/C	19.2	89.7	101.9	155.7	195.8	236.2
	0/G	11.1	20.2	24.9	31.8	36.5	44.3
National		11.0	143.2	180.4	207.0	388.0	531.0
Local		N,A	510.0	850.0	1 080.0	1 544.0	2 022.6

c) Licensed Operators on Board

One fixed services operator, one cellular mobile operator, twelve ISPs (six in operation and six not in operation yet), fifteen prepaid cards (fixed service) operators (eight in operation and seven not in operation yet) and three value – added services operators (voice mail, fax over e-mail, payphones).

A second cellular mobile license is due to be awarded shortly.

Currently, the telecommunication sector in Sudan is widely held to be among the most modern in Africa, if not in the Middle East. It is, in fact, a remarkable transformation considering the state of the sector just over ten years ago.

3 ICTs for Development

It goes without saying that the new information and communication technologies (ICTs) offer immense opportunities for all societies and individuals for alternative, universal and often cheaper ways of accessing and disseminating information.

The numerous new technologies and new applications offered which, if harnessed, can assist developing countries to accelerate their development programmes in a variety of sectors such as education, health, agriculture, rural development, environment and emergency management, governance, culture, mass media, libraries and archives, and scientific research.

The key challenge for developing countries in the Information Age remains to be the need to build the infrastructure necessary to capture the full benefits of the opportunities and applications of the ICTs, in particular those of the Internet.

Moreover, to foster the development of ICT in developing countries, it is necessary to create a pro-competitive environment that attracts private investments and results in lower costs.

Policies such as broadband access, cost-based capacity and fair local charges allow ICT service providers, ISPs in particular, to provide services and customers to access them at low prices with improved speed and quality.

Sudan, in its relentless efforts for the progress towards an information society in the country, has managed to liberalize and reform the telecommunication sector, adopt market–oriented policies and finally formulate a national strategic plan for the build-up and promotion of an Information Society nationwide with a mission to integrate country with the Global Information Society and the Global Economy.

The outcome of these policies adopted and measures taken so far can be summarized as follows:

a) Liberalization and privatization of the ICT sector in the country since the beginning of 1990's.

b) Establishment of an independent regulatory body, the National Telecommunication Corporation (1996).

c) Issuance of a telecommunication act, Sudan Telecommunication Act 2001; an act that aims to promote and regulate the telecommunication sector so as to conform to development and globalization, to provide an appropriate stable and open commercial environment favourable to the promotion of the services and the encouragement of investments in the field, to ensure and diffuse free and constructive competition and lay down plans, policies and regulations for the provision of the ICTs services and their establishment on the national level with consideration to balanced development and the service of the social and national objectives.

d) Formulation of a national strategic plan for the build-up and promotion of an information society nationwide, (2001) galvanized by the political will at its highest level; the President of the Republic.

e) An ICT-Fund which has recently been designed and concluded (May 2003);a fund that will be implemented and coordinated by the National Telecommunication Corporation, the Regulatory Authority, under the auspices of the Ministry of Information and Communications. This fund is planned to focus ICTs on education (primary and high) and rural development at length. Moreover, the National Telecommunication Corporation is contemplating the promotion of the implementation of Multipurpose Community Telecentres as one of the most appropriate platforms for providing urban, rural and remote areas, and businesses with ICTs services and applications. Such telecentres can provide not only the physical access, but also the necessary user support and training to help the addressed populations to effectively exploit and also develop useful ICTs applications.

The foregoing policies and measures are part of the efforts that aim to realize the basic drivers for promoting the establishment of the necessary infrastructure upon which ICT applications thrive; namely, competition, investment and technological neutrality.

4 Public Internet Access: Internet for All

Currently the ICT sector in Sudan is buzzing with achievements, activities and great expectations that keep all players quite busy.

The activities of the regulatory authority, the National Telecommunication Corporation (NTC), have witnessed the licensing of many service providers and operators as narrated previously which led to the emergence of various ICT services.

The incumbent operator, Sudan Telecom. Co. (SUDATEL) has managed, since its inception in 1993, to establish a fully–digital telecommunication infrastructure comprising:

1) Domestic telephone system based on fibre-optic cable backbone network extending for more than 6 500 km.
2) Domestic satellite systems with 50 (VSAT and SUDOSAT) earth station.
3) International links provided by satellite earth stations-Intelsat (Atlantic Ocean) and Arabsat.

The domestic fibre-optic backbone network is connected to Ethiopia via a microwave link and Saudi Arabia via a submarine fibre-optic cable across the Red Sea. Afibre-optic land cable to Egypt is to be installed on both sides of the borders.

The regional connectivity is part of a declared policy and objective of SUDATEL to be a regional carrier-a regional bridge between Africa, the Arab Region and the world.

In addition, a GSM network, managed by Sudan Mobile Telephone Co. (MOBITEL), is fully operational in many of the major cities and various neghbouring rural areas and in interface with the international (roaming) GSM network.

SUDATEL and MOBITEL systems offer bseband and broadband access that is considered to be adequate for Internet and its applications. But due to the concession granted to SUDATEL protecting it against competition in the field of international telecommunications up to the end of October 2005, all licensed ISPs are obliged to lease the capacity necessary to develop their Internet networks from the said company. This seems to constitute a partial constraint to the development of Internet networks in the country which will ease when the ISPs have the right to own the capacity they require by the end of the said concession period.

Nevertheless, many measures have been implemented to establish the widest possible Internet access. These measures include but not limited to the licensing of hundreds of Internet cafe's and centers throughout the country and the introduction of "Free Internet" which led immediately to the tripling of the users who only pay the telephone charges.

5 Conclusion

The liberalization and privatization of the telecommunication sector, the policies, the regulations and plans adopted by the Government of the Sudan has created a capital –attracting, pro-competitive policy environment that has fostered the build–up of a modern, fully–digital infrastructure in the country and furnished a climate suited to enhance ICTs development nationwide.

The remarkable transformation and achievements witnessed in the Sudanese Telecommunication sector coupled with the growing and diversifying use of the ICT services including those of the Internet and its applications have been a success story that made Sudan to be widely held among the most developed in Africa, if not in the Middle East.

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Swaziland

ICTs for Development – Internet for all: Public Internet Access

1 Background

ICT has demonstrated enormous power to change economic structures and contribute to economic prosperity and better quality of life. However, disparities exist that separate those with easy access to network resources (especially internet) and those with no access. This is particularly the case in Swaziland, where the concept of a digital divide is a reality; it exists across the entire social fibre, not just between urban and rural but also within institutions and families. Thus it is critical for us to bridge the digital divide if we are to enable everyone to reap the benefits of ICT.

Three main challenges have been identified and these are:

1.1 The need to enhance ICT literacy

In order for everyone to have the basic skills required to fully participate in the information society, care must be taken to ensure that there is an education component to enhance ICT literacy.

1.2 Infrastructure

Steps should be taken towards developing the necessary information and communication infrastructure. This task requires private sector participation, which can be harnessed through the creation of transparent legal frameworks.

1.3 Essential Application

Swaziland has identified that, in order for ICT to be of benefit to our communities, it is essential that various applications should be developed – such as e-health, e-education, e-commerce, e-learning, etc. These applications should be available for both urban and rural residents.

2 Swaziland's position

2.1 Country Information

Swaziland is a land-locked country in Southern Africa, about 17 000 square kilometers. The population is about one million.

2.2 Available resources

The Telecommunications network is fully digital. The Telecommunication infrastructure covers mainly the urban areas with about 42 000 fixed lines and 80 000 mobile lines. For the fixed lines, the telecommunications density is 4.2 lines per 100 people.

In Rural areas, most communities already have commercial power. These include schools and "Tinkhundla"[1] centers. If telecommunication access points can be

[1] Centers within communities established for purposes of carrying out basic civil services.

made available at these areas then a wide range of community members can have access. Such an arrangement would make it convenient for government to make cross-subsidies.

2.3 Financier

A Financier/Sponsor is required in order to roll out ICTs to the wider Swazi community.

2.4 Education

There is need to improve the computer literacy in the country. The print and electronic media has been identified as a critical stakeholder in promoting awareness on e-business.

2.5 Inventory

In order for Swaziland to benefit from structures (be it funding or other support) it is necessary that regulation is introduced in Swaziland.

2.6 ICT Priority

A large section of the population has problems meeting basic requirements such as access to clean water, electricity and basic telephony. Consequently, this section of the population sees ICT only as a dream.

3 Initiatives

The initiatives currently being undertaken include:

3.1 Telecommunications Industry

Developing a clear policy on ICT rollout.

- Introducing a Regulator to level the playing field and facilitate the liberalization process.
- Identifying and developing ICT community access points.
- Making ICT gadgets more affordable accompanied by low tariffs. To achieve this, it would be necessary for government to waive some taxes on ICT related equipment.

3.2 Information & Broadcasting

- Developing a policy that merges information and its transport (communications).
- Improving level of information sharing/communication among stakeholders.
- Addressing issues of skills/capacity building (HRD).

3.3 ISP Industry

There are five major ISPs with the Telecom's company being one of them. The major objective of the Telecom's Internet project was to spread Internet access through out the country at an affordable price. Prior this project, Internet access was for the rich people in the urban areas.

To spread Internet access, the postal division has Internet cafés in some of their post offices and they plan to roll out the project even in the rural areas.

The ISP sector relies heavily on other stakeholders for service delivery, such as SPTC[2] (for infrastructure) and the computer industry. Key areas to attend to are:

- Address issues of monopoly and control, which have a direct influence on enterprise, fair competition and pricing.
- Removing or reducing the barrier of entry.

4 Conclusion

It is concluded that in order for ICT to bear long-term benefits to the people of Swaziland, efforts must be directed towards the following:

4.1 ICT policy

Finalizing the ICT Policy and setting up of an independent regulatory function. The policy must define all necessary parameters associated with ICT.

2 Swaziland Posts and Telecommunications Corporation.

4.2 Benchmarking

Through the Ministry of Tourism, Environment and Communications, consultations must continue to be made to establish what SADC or other countries in the region are doing, for comparison purposes.

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Tanzania

Information and Communication Technology Development in Tanzania

Abstract

The use of information and Communications Technologies (ICTs) has grown relatively rapidly in most countries in Africa. Five to ten years ago, only a handful of countries have local Internet access; now it is available in every capital city. In the same period, more mobile cell phones were deployed on the continent than the number of fixed lines laid in the last century. Hundreds of new local and community radio stations have been licensed, and satellite TV is now also widely available.

However, the digital divide is still at its most extreme in Africa, where the use of ICTs is still at a very early stage of development compared to other regions of the world. Of the approximately 816 million people in Africa in 2001, it is estimated that:

- 1 in 4 have a radio (205 m) 25%
- 1 in 13 have a TV (62 m) 8%
- 1 in 35 have a mobile phone (24 m) 3%
- 1 in 40 have a fixed line (20 m) 2.5%
- 1 in 130 have a PC (5.9 m) 0.7%
- 1 in 160 use the Internet (5 m) 0.6%
- 1 in 400 have pay–TV (2 m) 0.24%

Set out in Table 1 are key statistics indicators benchmarked at Tanzania's Independence, at the start of the major reform process, in 1993 and 2002. The progression has been remarkable since 1993.

Indicators	1961	1993	2002
Population (in millions)	12.3	26.7	33.6
Fixed line exchange capacity	11,300	125,703	234,640
Mobile operators		1	4
Mobile subscribers		1,500	800,000
Teledensity (lines per 100 people)	0.10	0.32	2.5
Data communications operators			16
Internet service providers		1	23
Internet subscribers (Dialup accounts and Wireless)		10	14,000
Internet capacity (total bandwidth Kbits)		64	44,000
Television licences		1	24
Radio broadcast licences	1	2	18

1 What and why Information and Communications Technologies (ICT) Development in Tanzania

Information and Communications Technologies (ICTs) driven by the convergence of computers, telecommunication and traditional media, are crucial for the knowledge based economy of the future. Rapid advances made in this technology and diminishing costs open up the new window of opportunity for Tanzania and Africa as a whole continent to accelerate their economic growth and development. Currently level of ICT and IT in the country is significantly influencing the formulation of policies and strategies which shall guide investment in IT development in Tanzania.

2 Objectives of ICT Development in Tanzania

Tanzania like many other developing countries have embarked on ICT development as a means of enhancing socio-economic performance so as to achieve objectives set forth in the National Development Vision 2025. ICT is a vital tool for poverty reduction, fight against killer diseases such AIDS/HIV, and ignorance. It empowers people to be able to communicate and share knowledge through exchange of information and experience on how best to improve their living standards. ICT development in Tanzania is geared towards achieving the following objectives:

- giving impetus to the democratization process and good governance,
- facilitating the integration of Tanzania, Africa and the world with the new information society, using its cultural diversity as a leverage,
- using in a range of applications, environmental, agricultural and infrastructure planning,
- existing complementarities can be better utilized to provide training that would allow for the production of a critical man of professionals in the use of ICTs,
- using ICT in identifying and exploiting opportunities for trade, investment and finance through e-government, e-agriculture, e-commence, e-education, e-health, etc.,
- addressing issues on manpower skills management, knowledge sharing and information exchange in government, private sector and public in general.

3 Current Status of ICT in Tanzania

Tanzania is yet to fully realize benefits of ICT due to a many factors mainly; the lack of ICT Policy, poor or weak infrastructure, and lack of adequately skilled personnel. Other problems include lack of funds for buying modern working equipment, human resource development and for investing in local training and research and development institution.

3.1 ICT Initiatives in Tanzania

ICT initiatives, in the past two or so years, were being executed by various groups of public and private entities. The fragmented initiatives were not effective in delivering services and in the coordination of ICT activities in Tanzania. The lack of proper coordination of ICT initiatives associated with poor infrastructure and limited human resource in this industry resulted into the need for government intervention.

In April 2001 the Ministry of Communications and Transport (MCT) was appointed as the National ICT Coordinator and a Focal Point for all matters related to ICT in the country. The intention was to have proper coordination of ICT related activities, for effective planning process, resource mobilization, allocation and utilization, monitoring implementation of ICT activities and evaluation.

3.2 Actions Taken by MCT

MCT supported by SIDA has been taking actions on ICT development process

including the formulation of a friendly, flexible and implement able National ICT Policy. Currently the policy document was ready as from March 2003 and implementation strategies being finalized and it is expected ready by end of this year. Other tasks in pipeline include:

- coordinate of the establishment of an effective ICT national institution that will provide guidance for planning, management and implementation of ICT projects for sustainable services to people and the economy in general,
- preparation of a National ICT implementation Master Plan.

As the Focal Point, MCT needs to ensure that ICT development is based on a Public-Private partnership perspective. The private sector participation in the establishment, development and investment in ICT is of crucial importance. The government including local government authority has to conduct a full awareness and sensitization campaign program at all levels on the role and importance of ICT to citizen and the national economy.

For ICT to be able to deliver sustainable services to the people and all sectors of the economy there is a great need for making heavy investment in ICT infrastructure, human resource and other enabling sectors of Telecommunications, Postal, Education and Energy. Joint projects may be designed with the objective of attaining connectivity at optimal costs so as making end services affordable. In solving the problem of limited human resource, Tanzania has to invest adequately in training institutions ranging from lower schools to higher learning ones in order to build up and expand their capacities to train ICT professionals.

The draft National ICT Policy document outlines Ten Focus areas that can be implemented in order to fully realize ICT benefits. These areas include the Leadership that is aware, willing and committed to ICT development. Legal and Regulatory framework issues for enabling provision of quality standard services, human resource development to meet the growing demands of knowledge economy and information society – ICT for education in rural areas, to disadvantaged groups and underserved areas, infrastructure development, and the Universal access and local content development issues, etc.

These Focus Areas are intended to achieve objectives below:

- Establish an infrastructure network that will enable ICT to provide services to other sectors,
- Create a backbone from which make other sectors share facilities thus lowering costs and associated tariffs,
- Promote connectivity program that links the government, schools, hospitals and health centers, training and research institutions, travel and tourism places to build up high level manpower,
- Lower the costs and improve reliability of services,
- Build up local capacity for the management of ICT,
- Recruit own ICT experts at lower costs and for a sustainable development,
- Create employment for Tanzanian people as a way for fighting against poverty,
- Develop and produce a pool of ICT proficient youth and students, from which ICT professionals can be drawn,
- Develop local content software, based especially on African cultural legacy,
- Promote innovation and creativity of our people using local resources to meet local markets,
- Facilitate the implementation of the ongoing Public Sector Reform Programme.

3.3 Current Tanzania Plan of Work

- Coordinate computerization process in the public institutions particularly in all the Ministries which will lead to harmonization process,
- Networking (LAN and WAN systems) in all Ministries and related department,

- Website design and development in all Ministries,
- Internet and intranet connections in all Ministries,
- Design and development of a National ICT Database system,
- Coordinate the establishment of ICT sections or units to work as contact points in all Ministries and related institutions,
- Developing intranet for the Ministry to form a base of pilot project which will be shared between ministries and other interested institutions which may lead to paperless communications. Train two graduate students to form an entry point in making government intelligent user of ICT,
- Intensive **awareness** and **sensitization** all over the country and content development.

4 Recommendation

- How can ERB be effective in implementation of the ICT policy.
- Design and develop full intranet and internet in MCT and later on services extended to other Ministries in phases.
- Conducting awareness and sensitization campaigns in the public sector on the use of ICT services.
- Coordination of ICT development process – creation of a public –private sector partnership spirit through involvement of all the key stakeholders.
- Facilitating local and overseas assistance and research related to ICT development.

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Togo

Rapport national du Togo sur le développement des télécommunications

Présentation du secteur des télécommunications et de Togo Telecom

1 Introduction

Trois changements importants ont marqué ces dernières années le secteur des télécommunications sur le plan de la réforme:

- L'ouverture du capital des opérateurs historiques au secteur privé,
- L'ouverture du secteur à la concurrence,
- La création d'organes de réglementation indépendants.

Togo Telecom n'a pas échappé à la règle.

2 L'environnement national du secteur des télécommunications

2.1 L'état des réformes: le cadre réglementaire

a) Réforme institutionnelle du secteur

Elle a été marquée par l'adoption d'une déclaration de politique sectorielle en 1996 qui scinde le secteur des postes de celui des télécommunications et par la promulgation de la loi sur les télécommunications le 11 février 1998 donnant naissance à l'Autorité de Réglementation des secteurs des Postes et télécommunications.

b) Libéralisation du secteur

Des segments de marché ont été ouverts à la concurrence notamment les services internationaux, la transmission de données, la téléphonie mobile, les services Internet. Le monopole étant toujours conservé pour le moment dans les faits sur les services téléphoniques fixes local et longue distance.

c) Octroi des licences

Tous les services en dehors, de la transmission de données et de la fourniture de services Internet sont soumis à licence.

d) Concessions

L'opérateur historique Togo Telecom n'est pas encore privatisé mais une convention de concession avec l'Etat est en cours d'élaboration. Par ailleurs, un projet de concession pour la téléphonie rurale englobant des zones urbaines est en cours de finalisation entre l'Etat et un opérateur privé.

2.2 Le marché

a) Etat de la demande

- Les demandes en instances pour le téléphone sont estimés à environ 30 000 à fin 2002. Environ 200 localités rurales sont desservies par le téléphone fixe, sur plus d'un millier recensé. Même si les réseaux cellulaires ont permis d'accroître le taux de couverture du territoire national, la densité téléphonique reste faible (environ 4% en fin 2002).

- L'Internet n'est présent qu'à Lomé et dans quelques grandes villes de l'intérieur. Seul environ 1,07 pour 100 utilisateurs.
- Le RNIS (Réseau Numérique avec Intégration de Services) est disponible à Lomé et Kara.

b) Les produits et services existants

- le téléphone fixe avec:
  - le RNIS,
  - la SDA (Sélection Directe à l'Arrivée),
  - les services conforts: la hot line, la facturation détaillée, le transfert d'appel, …
- le télex et télégramme,
- la téléphonie mobile cellulaire,
- la transmission de données par paquets,
- l'Internet,
- la VoIP (Téléphonie des réseaux de type IP).

2.2 La concurrence

Elle est introduite sur les segments et marchés suivants:

- Le trafic local et interurbain avec la concession des zones rurales,
- Le trafic international (Togo Telecom, Café Informatique, Telecel),
- La téléphonie mobile cellulaire (Togocel et Telecel),
- L'Internet (l'accès: TGT et Café Informatique/les services: les ISP),
- La VoIP (les ISP).

2.4 Situation de l'Internet au Togo

a) Généralités

Sur une superficie de 56 600 km², le Togo a une population de 4 675 000 habitants. Le marché des télécommunications a été ouvert à la concurrence depuis 1998.

Le pays compte deux (2) fournisseurs d'accès Internet: l'opérateur historique et un exploitant de VSAT. Mais il faut signaler que trois (3) opérateurs ont également obtenu la licence d'exploiter les services de VSAT; ces derniers sont de potentiels fournisseurs d'accès.

L'opérateur historique est relié au backbone mondial par un nœud de 6 Mbt/s en montée et 10 Mbts/s en descente, mis en service en 1997. Il s'est positionné comme un fournisseur d'accès exclusivement. Il fournit des liaisons spécialisées dont le débit peut aller jusqu'à 256 kbts/s aux fournisseurs de service (ISP). Aujourd'hui, il dispose d'une dizaine de liaison intranet et d'une vingtaine d'ISP qui exploitent leur activité par l'intermédiaire de cybercafés. Le nombre de cybercafés est d'environ 300 sur toute l'étendue du territoire dont plus de 90% se retrouvent à Lomé la capitale. Ils exercent leur activité à travers une liaison wireless ou à travers le RTCP. Beaucoup d'ISP ont délaissé l'accès par liaison spécialisée au profit de l'accès par ligne RNIS moins onéreux. C'est ainsi que le parc RNIS en un an a été multiplié par deux.

Stratégie de base de l'opérateur historique: ayant décidé de se positionner en fournisseur d'accès, Togo Telecom avait initié dès le départ une sensibilisation des opérateurs privés afin de susciter chez eux l'intérêt pour la fourniture et l'utilisation du service internet. Etaient ciblés par cette sensibilisation, les opérateurs privés potentiels fournisseurs du service Internet, les écoles, les ONG, les institutions. Togo Telecom s'est proposé à leur apporter son assistance: logement de serveurs, abonnement ou création de comptes d'accès distant gratuit pendant près de six mois, organisation des sessions de formation pour les fournisseurs et pour les utilisateurs de l'Internet, assistance technique. Cette stratégie a été à la base du développement rapide de l'utilisation du service Internet dans le pays.

b) Tarification

L'opérateur historique, bien que n'étant pas le seul fournisseur d'accès, essaie de proposer des tarifs plus ou moins acceptables pour les fournisseurs de service. Les tarifs pratiques sont exposés dans le tableau suivant.

Liaisons spécialisées			
Frais de mise en service (uniforme)		472 000 Franc CFA	
Tarifs d'abonnement mensuel (sont fonction du débit et de l'offre auxquels le client est abonné)			
	64 kbit/s	128 kbit/s	256 kbit/s
ISP	590 000	1 003 000	1 534 000
Sociétés & Entreprises	413 000	649 000	
Cybercafé & ONG	354 000	590 000	
Institutions d'enseignement	295 000	531 000	

Lignes RNIS	
Frais de mise en service	109 000 Franc CFA
Redevance mensuelle	consommation + forfait de 13 000 Franc CFA

N.B: Il s'agit de prix TTC exprimés en Francs CFA.

Le second fournisseur d'accès, Café Informatique, est relié au backbone mondial par un VSAT à 1 Mbts/s. Il dessert environ une quinzaine de cybercafés et quelques sociétés par des liaisons wireless. Son nœud national est desservi par une cinquantaine de lignes analogiques.

c) Réglementation

Une loi a été adoptée en 1998 soumettant toute transmission de données à autorisation. Mais la fourniture du service VoIP fait l'objet d'une réglementation particulière.

d) Accès du public à Internet

En ce qui concerne l'accès du public à ce nouveau service, aucune politique n'a été initiée par le gouvernement pour faciliter cet accès. A ce jour, ce sont les Organisations non gouvernementales (ONG) financées par des bailleurs de fonds étrangers, certaines organisations religieuses et les cybercafés (même si pour ces derniers le service est payant). Ce nouveau produit est beaucoup consommé par les jeunes, les élèves, et les étudiants. C'est ainsi que surtout les mercredis soir et les samedis (période de repos des jeunes), nous constatons un afflux de ces jeunes dans les cybercafés. Les professionnels des sociétés privées, étatiques et autres ont aussi un engouement certain pour l'Internet. Près de deux cent localités rurales desservies par le téléphone sont de potentiels utilisateurs d'Internet. Togo Telecom est en phase de recherche de points de relais dans ces localités pour le lancement de l'Internet (écoles, ONG, ...). Mais beaucoup, aussi bien dans les zones urbaines que rurales, se font assister pour avoir accès ponctuellement à l'Internet.

2.5 Activités sous-régionale et internationale dans le domaine des télécommunications

Togo Telecom participe aux travaux de certains organismes sous-régionaux et internationaux tels:

- La Conférence des Télécommunications Ouest-Africaine (CTOA),
- L'Union Internationale des Télécommunications (UIT), …

Togo Telecom est actionnaire dans:

- L'Organisation Régionale Africaine des Communications par Satellite (RASCOM),
- Intelsat,
- Le Centre Régional de Maintenance des Télécommunications de Lomé (CMTL).

3 L'état du réseau de Togo Telecom

3.1 Le réseau téléphonique

A ce jour, Togo Telecom dispose d'un réseau téléphonique commuté (RTC), entièrement numérique qui couvre 19 villes et 181 localités rurales.

Au 30 juin 2003, le nombre d'abonnés au téléphone fixe est de 55 968 dont 43 280 à Lomé.

– *Commutation*

Togo Telecom comporte deux (2) centres de Transit international (CTI), deux (2) centres de Transit national (CTN) et deux commutateurs locaux. Ces centraux gèrent au total dix neuf (19) Unités de Raccordement d'Abonnés Distants (URAD).

– *Transmission*

La transmission est assurée par des liaisons en faisceaux hertziens et fibres optiques. Sur le plan international deux (2) stations terriennes de standard A à Lomé et Kara assurent l'acheminement du trafic international. Ces deux infrastructures assurent largement les besoins du pays dans la mesure où elles sont actuellement utilisées à 30% à peine de leur capacité.

– *Réseaux locaux*

Les réseaux locaux sont constitués par les infrastructures aériennes et souterraines de câbles permettant de raccorder les abonnés. La capacité globale de raccordement est d'environ 140 000 paires, à l'issue d'importantes extensions en cours de finition à Lomé.

– *Téléphonie rurale*

Les localités rurales sont essentiellement desservies par des équipements radio de type IRT 2000. Certaines localités sont desservies par câbles à partir d'une URAD AXE 10. Au total 181 localités sont desservies en téléphonie rurale.

– *Téléphonie rurale*

Togo Telecom exploite ce segment de marché par le biais de sa filiale Togo Cellulaire.

3.2 Réseau de transmission de données

Pour la transmission des données, Togo Telecom dispose de trois (3) types de réseau: le réseau X25 (TOGOPAC), le réseau télex et le réseau Internet.

– *Réseau télex*

Le réseau initial d'une capacité de 1 500 lignes est aujourd'hui remplacé par un concentrateur chez British Telecom. De 301 abonnés en 1995, il ne compte plus que 51 abonnés en juin 2003.

Ce réseau est en déclin compte tenu des évolutions technologiques mais il reste un des moyens de transmission de données le plus sécurisant pour la plupart des institutions bancaires.

– *Réseau TOGOPAC*

Mis en place en 1988, ce réseau utilise le protocole X25. Il est axé autour de deux (2) centraux situés à Lomé et à Kara. Sa capacité actuelle est de 88 ports. Sur ce réseau, il est offert des liaisons spécialisées point à point essentiellement aux entreprises. On y compte aujourd'hui 50 abonnés.

Avec l'avènement de l'Internet, la connexion X25 est également en régression au profit de la connexion via des réseaux types Internet.

– *Réseau Internet*

Togo Telecom dispose d'un nœud Internet avec deux liaisons: une liaison à débit asymétrique de 10 Mbits/s à la descente et 6 Mbits/s à la montée et une liaison à débit symétrique de 2 Mbits/s pour le secours.

A ce jour, Togo Telecom offre des liaisons spécialisées point à point par câble pour la transmission des données. Ce produit est essentiellement destiné aux entreprises et aux fournisseurs de services (ISP: Internet Services Providers). Les ISP offrent également aux particuliers des accès par ligne téléphonique. Ce type d'accès présente des contraintes aux utilisateurs à cause de la qualité et de la lenteur de la connexion. On compte à fin juin 2003, 46 liaisons spécialisées point à point sur le réseau dont 16 ISP.

Le second accès proposé aux utilisateurs est l'accès par ligne numérique RNIS (Réseau Numérique avec Intégration de Services) beaucoup utilisé.

4 Les projets en cours

4.1 L'artère en fibre optique Anèho – Lomé – Kara – Cinkassé

Le projet de fibre optique en cours va créer un axe de transmission synchrone entre Aného, Lomé, Kara et Cinkassé.

Ce projet se situe dans le cadre du renforcement et de la modernisation des liaisons de transmission de Togo Telecom.

Cette liaison va desservir les centres d'Aného, Baguida, Lomé Port, Lomé centre, Hedzranawoé, Caccavelli, Agoé, Tsévié, Notsé, Gléï, Atakpamé, Anié, Blitta, Sotouboua, Sokodé, Kara, Niamtougou, Kanté, Mango, Dapaong, et Cinkassé ainsi que quelques bretelles.

La capacité de l'artère sera de 2,5 Gbit/s soit l'équivalent de 30 000 communications téléphoniques simultanées.

4.2 Le projet d'extension en commutation, phase 2

Dans le cadre du développement de son réseau, Togo Telecom a eu à signer avec Ericsson, un contrat d'extension des centraux téléphoniques à réaliser en 2 phases. La première phase a permis l'installation et la mise en service de 42 000 lignes.

Pour la seconde phase une capacité globale de 14 900 lignes est prévue; seize localités rurales seront transformées en URAD et des extensions seront réalisées dans les grandes villes.

4.3 Installation des équipements d'énergie électrique et solaire

Pour l'alimentation des équipements de télécommunications, l'installation des équipements d'alimentation en énergie électrique et solaire est prévue.

4.4 Le projet de réseaux locaux

D'importants travaux en réseaux locaux sont prévus dans les villes de l'intérieur au terme des extensions en commutation.

4.5 Migrations informatiques

La réalisation de ce projet permettra de moderniser l'outil informatique de la société. Les applications suivantes seront développées: comptabilité générale et budgétaire, gestion du personnel et paie, gestion commerciale des télécommunications.

5 Bref aperçu du plan quinquennal

Le plan quinquennal 2004-2008 a pour objectif d'élaborer des projets de développement à la lumière des informations détenues sur la situation actuelle de la société.

Ce plan s'est basé sur la projection de la demande enregistrée en fin 2002 sur les années à venir, l'hypothèse étant de satisfaire cette demande. Ce plan se propose donc de déployer sur cinq ans 100 000 lignes supplémentaires sans perdre de vue l'évolution des nouveaux services.

Une analyse est faite de la situation financière de la société permettant ainsi d'émettre les hypothèses de financement.

6 Annexes

6.1 Evolution du service Internet au Togo

	1997	1998	1999	2000	2001	2002	Juin 2003
Abonnés Internet	247	2 500	4 000	7 000	10 000	12 000	12 500
ISP facturés	10	15	20	26	37	24	17
Nombre d'Intranet	3	5	7	10	15	25	32
Réseaux connectés	13	20	27	36	52	49	49
Utilisateurs estimés d'Internet	10 000	15 000	30 000	100 000	150 000	200 000	250 000
Nombre de RNIS facturés		18	61	61	108	136	238
Serveurs Internet[1]	37	110	120	159	220	230	250[2]

[1] Source: Internet Software Consortium.
[2] La majorité des ISP sont sur lignes RNIS depuis un an.

6.2 Indicateurs de base (au 30 juin 2003)

Capacité installée en équipements téléphoniques	Installée	En service	Taux d'occupation (en %)
National	86 412	55 968	65
Lomé	68 012	43 280	64
Capacité installée en équipements d'abonnés RNIS	1 712	315	18
Parc de publiphones de Togo Telecom	207		
Nombre de cabines privées	12 103		
Centres urbains desservis	19		
Centres ruraux desservis	178		
Effectif du personnel	883		
Investissement annuel (2002)	18 400 millions de francs CFA		
Total des recettes de services téléphoniques (2002)	29 359 millions de francs CFA		

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Vanuatu

ICTs for Education – Addressing the shortage through e-learning

Introduction

The use of information and communication technologies (ICTs) for education is rapidly expanding in many countries worldwide. In Vanuatu it is now seen as a necessity and an opportunity for pupils as well as teachers to use this tool to enhance their conventional classroom blackboard/whiteboard and textbook learning.

Telecom Vanuatu thus, having realised the use of ICTs for learning, designed and launched a product specially geared for schools: **L@goon School**.

1 Objectives of the project

- To promote access to the Internet to schools throughout the country, including the outer islands.

- To expose and encourage school children on the use of advanced information and communication technology to advance their learning/ academic developments.

- To develop a positive image of Telecom Vanuatu Limited (TVL) as a company, in caring and willing to help members of the community and the country as a whole.

2 Goal/Forecasted Results

From its planning stages in 1999, it has been projected that by the end of the year 2001 there would be thirty (30) schools accessing this Internet service. This meant that there would at least be 2.5 schools per month provided with the service.

Lagoon School was launched in 1999 as a specific Internet offer for schools with a very competitive rate (VT 135 an hour), during school hours only, from 07:30-113:30 and 13:30-16:30. With the growing interest in the new service and as more and more people were becoming aware of the product, TVL decided to make Lagoon School totally free of charge to schools in March 2001 to facilitate more schools to access the Internet. Free Lagoon School was rolled out after heavy advertising campaigns through the media (press releases, Television Blong Vanuatu reports & news). In April 2001, an agreement was signed formally between Telecom Vanuatu Limited and the Ministry of Education to officiate the Free Internet Access for schools. At the same time donation of some computers, modems and other peripherals were made by TVL for schools on Efate and the remote islands till the end of the school year and to enhance the impact of TVL assisting children in their academic developments.

TVL realises that in the years to come, Internet will be omnipresent in all the fields of activities in which the actual generation of pupils will be working, thus has decided to facilitate the access to the Internet to these young people, by providing a special service for schools: L@goon School.

Figure 1 – A student at Ecole Française surfs the weg

4 Key factors to success

Internet access has become a priority for schools as Vanuatu is an isolated country. It is a very powerful tool, which can be utilised by both students and teachers schools to search for documentation and information through the Web. With Lagoon school, TVL is seen as playing a very vital role in preparing the youth for the future. It is also seen as an important social obligation on the part of TVL to a developing country such as Vanuatu by making Internet access free to schools and providing some of the necessary equipment.

Response from community schools requesting access to the Lagoon School Internet service has been very positive. More and more educational institutions are realising the importance of accessing the Internet for advance learning for their pupils and teachers.

5 New ideas, new changes

New stage: The Commercial Department has expanded its activity to enhance the increase of Internet usage (traffic), through competitions such as "Best Lagoon Web Site" which was launched in June 2001.

The "Best Lagoon Web Site" was a competition involving schools aimed at generating interest in the Internet as an important tool for learning as well as creativity. School pupils had to design and create their schools' web sites. Prizes were then presented to the best-designed Websites based on various criteria.

Telecom Vanuatu Limited has recently been contacted by Hawaii regarding a project call **"Pacific Islands Network" (P.I.N.)** aimed at interconnecting schools and universities around the Pacific region to facilitate the exchange of data between these institutions among the islands nations. TVL is therefore working closely with Hawaii in the process for implement-ing that network and getting Vanuatu connected. The project includes provision of computers and on-site training.

6 Project application methodology

1) Identifying the need to establishing Free Internet Access in the schools for academic developments.

2) Signing of Agreement between TVL and the Ministry of Education.

3) Awareness programmes through heavy advertising campaigns carried out through the various medium of communication.

4) TVL Management makes the decision on the eligibility of the applicants.

5) Tests on the technical feasibility and capability to install the Lagoon School Service.

6) Provide training to the schools (especially in the rural areas). These trainings are coordinated by the Ministry of Education and Non-Government Organisations.
7) Follow up activities after 6 months of establishment to monitor progress on skills and knowledge.

An application form must completed and signed. TVL decides whether the school is eligible or not before providing the login name and the password to the applicant.

7 Duration of the project before realisation

This depends very much on the location of the project. If it is the Urban area it takes less time however, if it is in the rural areas, it takes more time. Average time taken is approximately a month. TVL Technical Services has standard Service Provision guidelines for new services – up to 30 days and up 60 days for urban and rural respectively. The actual product, however, took at least 2 months for the actual preparation before launching.

8 Results obtained in comparison with the forecast:

Since free Lagoon school was introduced, 57 schools have subscribed to the service. This number includes some schools in the remotest parts of Vanuatu such as the Banks Islands and Malekula. So far just over 50 % of the targeted annual forecast is in the process. This indicates huge interest amongst the schools for the community.

9 Initiator and contributors of the product

The initiator of the Lagoon School product was TVL's Managing Director, Mr Richard Hall. The original internal contributor was only TVL, through its dedicated Commercial Department staff, technicians assisting in setting up equipment, wand also through its donation of some computers and other equipment. External contributors are the Ministry of Education, the Director of the Education and the NGO's to donating some computers, modems, solar power equipment and generators for schools in the rural and remote areas mainly.

10 Difficulties

To introduce and promote a new technology in the rural areas is difficult and costly since in most cases the basic ingredients do not exist, such as a telephone line or power source. The majority if not all, of the remote schools in the archipelago still do not have access to a telephone line, or a computer, no power (generators/solar power). Many rural schoolteachers are not computer literate and they do have the technical ability to be ready for this service. The targeted schools have to be provided with computers and other related equipment and resources for the project to become a reality.

11 Possible application in other countries

It is possible to apply this project in any other countries in the hope of building the children to prepare for the future. It is a matter of identifying the external contributors who will be willing to be partners in the project.

12 Solution proposed

For the project's progress into the future, TVL would like to see itself as providing the access or the service and, not necessarily providing the necessary equipment and the resource person for implementation of the service in schools. However, TVL is the promoter to the solutions. TVL obtains assistance from the Government (Ministry of Education and the Director of Education) and the NGO's. It stimulates the companies to play their role with in the areas to install computers and providing the training.

13 General Comments and Conclusions

In just over a decade, TVL has modernised the country's Telecommunications network and introduced the Internet to its citizens. It has also gone one step further by introducing Lagoon School, which is a free Internet service for schools. It now remains a collective obligation for every one else to work towards improving education standards and increasing the ability of young children by donating equipment and introducing them to this important Information and Communication Technology tool.

14 Strength of regional presence – ITU's support and regional organizations' activities

The on-going participation of regional and International organisations, such as the ITU, in providing training to Pacific Island countries has and will always be welcomed, especially in this fast changing information society. Many other regional organisations no doubt, have contributed in one way or another to the progress of ICTs both in the workplace and schools. However, there is still a large imbalance of ICT resources between the rural and urban areas of the island nations and Vanuatu is no exception.

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Zambia

Telecommunication Development Country Report for Zambia

Zambia has a population of about ten million people out of which about 400,000 people are in formal employment. It is worth noting that Zambia has a teledensity of 0.9. There are currently five Internet Service Providers (ISPs) namely Zamtel Online, Zamnet, Uunet, Microlink and Coppernet. Altogether they have a total of about 20,000 Internet customers.

Almost all ISPs Offer the following Services:

- Dial-Up Internet Services,
- Leased lines Access,
- E-Mail Services Only,
- Virtual Private Networks (VPN),
- Domain Name Services,
- Web Designing,
- Web Hosting,
- Advertising,
- Internet Training and Demonstration.

Most customers hold Dial-up accounts. The last three years has seen a steady customer growth in this sector largely due the following reasons:

- High quality of internet services,
- Good customer support,
- Low local charges. This especially true for Zamtel Online.

Demand for high-speed Internet connections especially from corporate customers has equally been high. Hence the increased demand for dedicated leased lines.

Public Internet Franchises otherwise called Internet Cafes are springing up quite rapidly especially in the urban areas. These Internet cafes are making it easy for travelers to find access to internet in airports, hotels malls and restaurants. Checking and sending emails is fast becoming as easy as making a call at a public pay phone.

Internet is a research tool being a major source of information for students and researchers and a media for messaging communication. However, there is a disparity in access among the rural and urban areas.

Zamtel Online has tried to go round this problem by creating virtual Points of Presence (POPs) in rural areas. In such cases the cost of accessing internet is charged at local call rates. This has drastically reduced the cost of surfing in rural areas. The virtual POP strategy has been used to stimulate or promote the "Internet Café culture". The Non Governmental Organizations (NGOs) and private schools have taken full advantage of this facility. Further, several organizations have lobbied government to reduce or scrap duty on equipment such as computers that will enable internet to be accessible to the mass market.

The strategy in the urban areas has been to open up more POPs whilst introducing new products such as the wireless internet and the Digital Subscriber Lines (DSL).

The following are some of the major problems facing the ISPs in Zambia:

- Limited IP bandwidth,
- The high cost of procuring IP bandwidth from international vendors,
- Congestion,

- Low customer base considering the high population. This is largely due to the majority of the population not being able to afford the prerequisites of internet connection let alone affording additional spending on internet bills.
- E-commerce platform not yet ready. Secure payment system not yet established.

It is projected that the internet customer base could begin to increase exponentially as the bandwidth and congestion problems are sorted out. The issue of procuring IP bandwidth from cheaper but reliable vendors is high on the agenda. The impending deployment of fibre in both the access network and the backbone could further stimulate customer growth. Another planned project is the upgrade of DOMSAT to TDMA technology.

In conclusion, ISPs should start research and development (R&D) and offer value added services, like development of portal in various areas. For example, a portal for engineering students, having related educational information and links. Similarly, portals for medical students, business community, welfare organizations and social services can be developed. This could increase the number of people accessing the Internet. ISPs could also deliberately make available computers with full Internet access to the disadvantaged groups at affordable rates. In this way Internet for all could be achieved.

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Zimbabwe

Integrating consumers into the regulatory process

1 Introduction

The Posts and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ) was established by an Act of Parliament, Posts and Telecommunications Act Chapter 12:05 of 2000.

The Act was the first step in the deregulation or liberalisation of postal and telecommunications services in Zimbabwe. Before the Act the Posts and Telecommunications Corporation (PTC) was the sole player with dual responsibility of offering and regulating the sectors; i.e. both player and referee.

The Posts and Telecommunications Act [12:05] of 2000 resulted in the split of the Posts and Telecommunications Corporation (PTC) into:

- Posts and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ) – responsible for licensing and regulating the postal and telecommunications sectors.
- TelOne (Private) Limited – deemed licensed and responsible for fixed telephone, data and internet services.
- NetOne (Private) Limited – deemed licensed and responsible for mobile services.
- Zimbabwe Posts (ZIMPOST) (Private) Limited – deemed licensed and responsible for postal, philately and courier services.

The three companies above are wholly owned by the Government of Zimbabwe, and operate under the Companies Act. The government has plans to have a phased disposal of its stake in the companies.

POTRAZ is an independent Regulatory Authority that finances its activities from revenues generated from various fees and fines. The POTRAZ Board is non-executive and is appointed by the Minister of Transport and Communications who is the custodian of the Act. The day to day activities of the Authority are run by the Director General who is an ex-officio member of the Board.

2 Consumer protection

The functions of the Authority as espoused in Government Telecommunications Sector Policy and the Act include:

- to promote the interests of consumers, purchasers and other users, in respect of the quality and variety of postal and telecommunications services provided and telecommunications apparatus supplied;
- to promote the development of postal and telecommunications systems and services in accordance with practicable recognised international standards and consumer demands;

- to maintain and promote effective competition between persons engaged in the provision of postal and telecommunications services and any activities connected therewith;
- to monitor tariffs charged by postal and telecommunications licensees with a view to eliminating unfair business practices among such licensees.

Various stakeholders, including consumers and consumer groups, were participants, through workshops and direct contributions, to the process of preparing the Posts and Telecommunications Act.

It is apparent in both Sector Policy and the Act that the Government of Zimbabwe fully embraces consumer protection. It is therefore the role of POTRAZ to ensure that consumers are integrated into the regulatory process.

3 Telephone users association (TUA)

Telephone Users Association (TUA) was formed in 1994 as a pressure group to push for the redress in the poor services offered by the PTC. The TUA is an affiliate of the Consumer Council of Zimbabwe (CCZ).

The Telephone Users Association actively lobbied the government and participated in the formulation of the Act that now regulates the telecommunications sector. The TUA activities cover the whole communications sector in ensuring that the interests of consumers are well articulated. Unfortunately the operations of the association are on a voluntary basis which has undermined its activities.

POTRAZ has engaged TUA on several occasions in assessing and reviewing how best to deal with telecommunications consumer issues such as:

- communication with consumers;
- support for TUA;
- support for ZIMTEL;
- possible review of the Act.

TUA and operators are also active participants to the POTRAZ organised World Telecommunications Day.

POTRAZ plans to conduct a national market survey, by the last quarter of 2003, to gauge the consumers' perception of the services offered by POTRAZ and the licensed public operators.

4 ZIMTEL

Zimbabwe Telecommunications (ZIMTEL) is an annual event that is supposed to showcase the Zimbabwe consumers, operators and suppliers the developments and the various products and services available on the telecommunications market nationally and internationally. This is one of the activities organised by the Telephone Users Association.

The event is scheduled for the month of September of each year. It is in two parts of Exhibitions and Panel discussions. The Exhibition is the platform for various operators and suppliers to display their products and services. The Panel discussions discuss topical issues pertaining to telecommunications in Zimbabwe.

POTRAZ has engaged itself to actively participate in the annual and successful hosting of ZIMTEL as a forum where various stakeholders can interact on communications issues.

5 Challenges

The Zimbabwe telecommunications market is characterised by demand far surpassing supply. There is a shortage of both fixed and mobile network services lines.

It is the outcry of consumers that the telecommunication services are not easily available; where the service is available it is characterised by congestion, drop out or generally poor quality of service and regular "unjustified" increase in tariffs.

POTRAZ is engaging the licensed public operators through the Telecommunications Operators Association of Zimbabwe (TOAZ) on how the current challenges can be addressed. A general understanding was reached to tie operators' tariff increase to commensurate benefits to consumers in terms:

- quality of service;
- availability and increase of capacity.

6 Conclusion

Zimbabwe is going through an economic turbulence. However, the resilience of Zimbabwe makes the challenges surmountable. Managing hyper inflation situation and availability of foreign currency will be the key in meeting the needs and protection of the consumers.

Integrating consumers in the regulatory process will involve participation of various consumer associations and the education of the consumers on their rights.

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