

WHITE PAPER:  
INFORMATION AND COMMUNICATIONS TECHNOLOGY  
DEVELOPMENT OF MONGOLIA

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White Paper on ICT Development of Mongolia - 2010

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## Foreword

Information and Communications Technology is one of the most promising sectors in Mongolia. Given this importance, efforts have been undertaken to increase overall national Internet bandwidth, to reduce tariffs and costs, and to achieve objectives for computerization for all. The Government of Mongolia has recently issued a resolution to increase the number of television broadcasters to operate throughout the territory of Mongolia. Moreover, by establishing a main network of fiber optic, it became possible to provide our citizens with fixed and mobile services at similar costs and tariffs regardless geographic location. It was also decided to maintain the cost for rural Internet services at the same level as in urban areas of the country. As results, the Mongolian information and communication technology infrastructure will be closer to international standards. The economic indicators of the sector are also improving as well as the number of mobile and Internet users is increasing.

More works have to be done ahead. The Government of Mongolia is in the process of developing programs and projects to implement on the national scale such as “Mongolian national satellite for communications”, “Information technology training and industrial campus”, “Introduction of digital radio and television broadcasting services”, etc. A large-scale development project on extending high-speed fiber optic network to cover the entire country is to be implemented this year.

There is an ultimate necessity to create a favorable environment to support e-services, to ensure introduction of different outsourcing businesses, to provide more information, communication, postal and Internet services to rural part of Mongolia, and to engage public-private partnership.

We need to foster an information society based on development of ICT sector and lay down a basis for development of knowledge-based economy. It was initiated to establish Silicon Valley of Mongolia, and relevant directions and instructions were given to concur with the project to establish a campus of universities. Importance of everyone’s participation and creativity should be perceived in this regard. This will give impetus to develop not only this sector, but the whole country. Everything must start from innovation and improvement of business environment in order to speed up development. Our joint efforts and initiatives will be crucial in this endeavor.

May good deeds flourish!

A stylized, handwritten signature in black ink, consisting of several fluid, connected strokes.

Sukhbaatar Batbold  
Prime Minister of Mongolia

## Message

The Government of Mongolia has defined and prioritized the development of our ICT sector as the major accelerator and valuable factor of the socio economic development of the country. For we have set forth the primary objectives to reach world standards in the development of ICT, to promote it as one of the competitive advantages of Mongolia, and to create a highly productive ICT economic sector.

In order to achieve the above mentioned objectives, the Government of Mongolia has ratified the national program "E-Mongolia", and a number of projects are being successfully implemented within the framework of this program to achieve the universal computerization, to establish a national data and information center, to reduce service prices and tariffs, to improve infrastructure, to increase network capacity, to provide access to information and communications services in the rural and local areas, and to transmit numerous television channels into local areas. Furthermore, it plans to implement other significant programs and projects, namely "National Program to Establish Registration and Information Unified System", "National Program to Ensure Information Security", the project to build high-speed Internet network connecting all soums and provinces, E - Learning, Telemedicine, content development, and the project to placing mailing boxes in every household. As a result of these projects and programs, ICT will deeply penetrate into the lives of our people, and there is no doubt that the development of our country will significantly benefit from them.

The White paper on ICT development of Mongolia is published on a regular basis and presented to the general public as it is our strong belief that integrated statistical data of our "broad" sector is to be based on the multilateral cooperation of the government, private sector, customers and other stakeholders, and should be transparent.

We hope that you, our esteemed readers, will provide your feedback on the White Paper and continue close cooperation with us!

Sincerely yours,



Jiimen Sansar  
Chairman, ICTPA of Mongolia

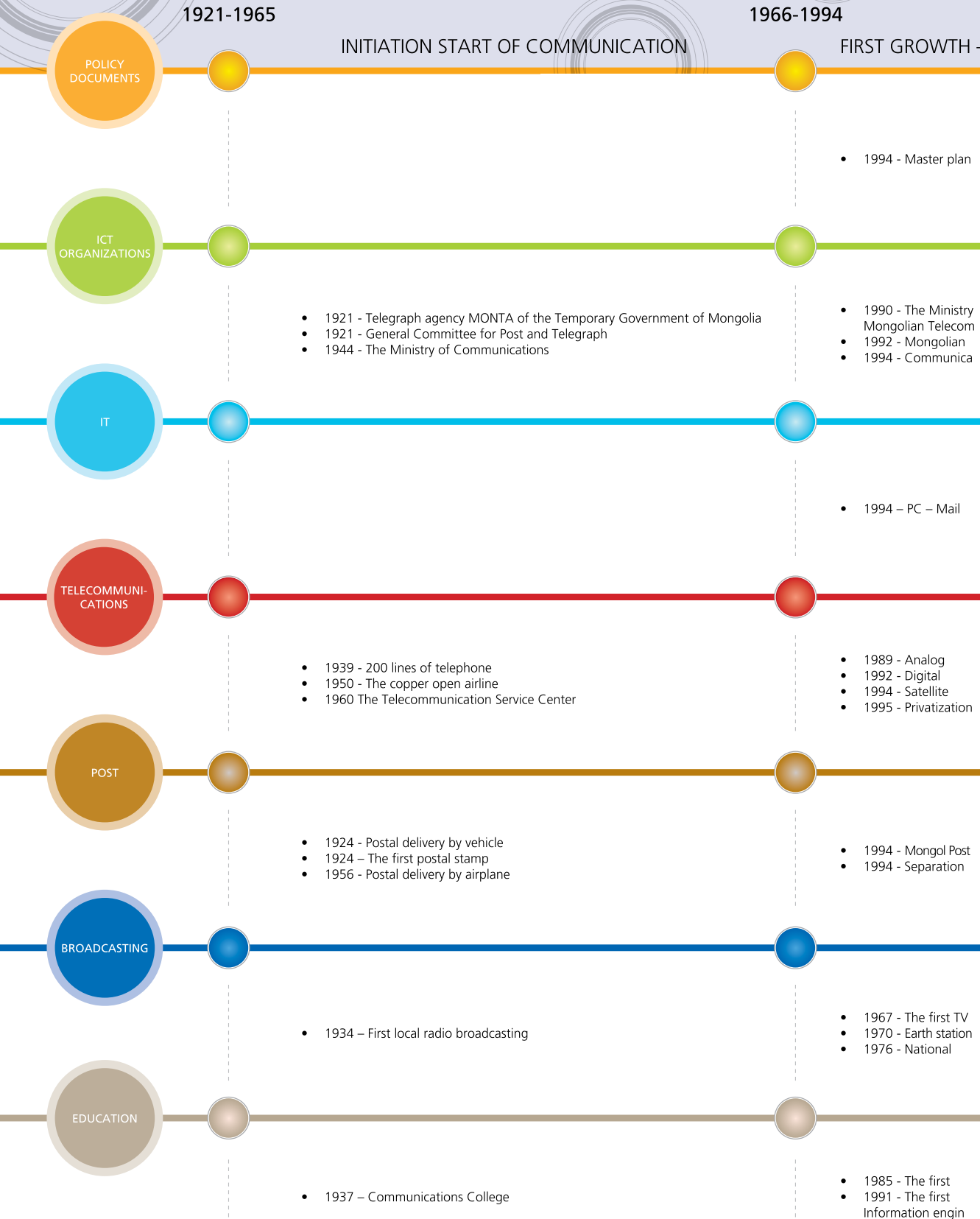


## 1. Acronyms

ADSL	Asymmetric Digital Subscriber Line
APIN	Asia Pacific Information Network
CATV	Cable Television
CDMA	Code Division Multiple Access
CRC	Communications Regulatory Commission of Mongolia
EDGE	Enhanced Data Rates for GSM Evolution
ERP	Enterprise Resource Planning
EVDO	Evolution-Data Optimized
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HDSL	High bit rate Digital Subscriber Line
ICNC	Information Communications Network Company
ICT	Information and Communications Technology
ICTPA	Information, Communications, Technology and Post Authority of Mongolia
IDI	ICT Development Index
IP	Internet Protocol
IPTV	Internet Protocol based Television
ITU	International Telecommunications Union
LAN	Local Area Networks
MDG	Millennium Development Goals
MECS	Ministry of Education, Culture and Science of Mongolia
MIDAS	Mongolian Information Development Association

MISPA	Mongolian Internet Services Providers Association
MITSA	Mongolian Information Technology Students Association
MNT	Mongolian Currency Tugrug
MOSA	Mongolian Software Industry Association
MT	Mongolia Telecom
MTWA	Mongolian Telecommunications Workers Association
MUST	Mongolian University of Science and Technology
NBIA	National Business Incubation Association
NDC	National Data Center
NGN	Next Generation Network
NGOs	Non-governmental organizations
NITP	National Information Technology Park
NSO	National Statistical Office
RTND	Radio and Television Network Department
SOHO	Small Office and Small Home
TLD	Top-Level Domain
UN	United Nations
USOF	Universal Service Obligation Fund
VDSL	Very-high-bit Rate Digital Subscriber Line
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WLL	Wireless Local Loop

## 2. Milestones of ICT De





# Development of Mongolia

1995-2010

## INSTALLING TELECOMMUNICATION

## SECOND GROWTH – DIGITALIZED TELECOMMUNICATION

to development Telecom sector by year 2010

- 1995 - Law on Communications
- 1999 - Law on Radio Wave
- 2000 - Concept to develop ICT in Mongolia by year 2010
- 2001 - Revised law on Communications
- 2002 - Mid - term strategy to development ICT
- 2002 - Master plan of Postal services
- 2003 - Law on Post
- 2005 - E - Government master plan
- 2005 - E - Mongolia National Program
- 2008 - National Program to Establish Registration and Information Unified System
- 2008 - Master plan to develop outsourcing

of Communications was reorganized into  
munication Ministry  
Telecommunication Company  
tions Department of Ministry of Infrastructure Development

- 1995 - Communications Regulatory Council
- 2001 - MIDAS
- 2002 - The Communications Regulatory Commission of Mongolia
- 2002 - National committee on ICT chaired by Prime Minister of Mongolia
- 2003 - National Information Technology Park
- 2004 - Information Communications Technology Authority (Now ICTPA)
- 2007 - MOSA
- 2006 - MISPA
- 2009 - National Data Center

network

- 1996 - The first ISP (Datacom)
- 1998 - "Human sustainable development for ICT" project
- 2001 - "Mongolian Development Gateway" project
- 2002 - Open Government portal

microwave network  
telephone switching  
Earth Naran Station  
of MTC

- 1995 - The first GSM mobile communications operator (Mobicom)
- 1998 - VSAT system
- 1999 - The first CDMA mobile communications operator (Skytel)
- 2002 - The first fiber optic network
- 2008 - Mobile communications services accessible in all soums
- 2009 - 3G mobile communications services

Company  
of portal services from telecommunications

- 1995 - Private postal operators (DHL Mongolia)
- 2007 - Introduction of Zip codes

broadcasting center in Ulaanbaatar city  
for receiving TV signals  
Broadcasting TV and Radio

- 1996 - The first cable TV (Sansar Cable)
- 2010 - Nationwide TV Broadcasting by Ku Band

computer curriculum for universities  
public ICT specialist educational institutions (School of  
eering, School of Computer Science and Management)

- 1996 - The first local private IT university (Tsahim)
- 1999 - Erdemnet for scientific and educational institution
- 2001 - IT training center at The Mongolian University of Science and Technology
- 2002 - The first foreign invested IT institution (Khuree)
- 2007 - The first international franchise institution (Aptech)

### 3. Executive Summary

The White Paper on ICT Development of Mongolia is a publication of the Information Communications Technology and Post Authority (ICTPA) of Mongolia. The first issue was issued in 2006 in cooperation with Intec Co., Ltd and MIDAS NGO and followed the second publication in 2008 in partnership with Intec Co., Ltd.

The current paper aims to provide comprehensive information on the development of ICT sector in Mongolia. The wide range of topics on policy, legal and regulatory environment and ICT sector specific areas, such as communications, Internet, software industry, postal services, radio and television broadcasting, ICT related resources, and sectoral organizations, is covered by this Paper.

The ICT development of Mongolia has advanced tremendously for the last five years. The telecommunications network of over thirteen thousand kms of fiber optic cable covers all of Ulaanbaatar, the capital city of Mongolia, and connects all aimag<sup>1</sup> centers and some 151 soum<sup>2</sup> centers. The number of mobile phone subscribers has reached over 2.3 millions. Internet is widely used in all sectors of economic and social development of Mongolia.

According to the United Nations "E-Government Survey 2010", "...Mongolia (0.5243) gained 29 positions to be ranked 53rd globally, a dramatic rise due primarily by efforts to enhance its national portal and ministry websites to offer more e-services and more online content..." (UN, 2010).

The following table represents rankings of Mongolia among Eastern Asian countries.

Country	E-government development index value		World e-government development ranking	
	2010	2008	2010	2008
Republic of Korea	0.8785	0.8317	1	6
Japan	0.7152	0.7703	17	11
Mongolia	0.5243	0.4735	53	82
China	0.4700	0.5017	72	65
Sub-regional average	0.6470	0.6443		
World average	0.4406	0.4514		

Table-1. E-government development in Eastern Asia, 2010 (Source: UN, 2010)

Mongolia is in the top 20 countries in regards to online service development, in front of some developed countries. (ibid)

<sup>1</sup> Aimag is a largest administrative unit of Mongolia

<sup>2</sup> Soum is a sub-administrative unit of Mongolia

## 4. Overview Legal and Policy Framework of ICT sector

### 4.1. Policy Documents of ICT Sector

There is a number of sector specific key legal and policy documents, which govern ICT sector of Mongolia ratified by the Parliament of Mongolia as follows:

- 1) Law on Communications (approved in 1995, revised in 2001, and amended in 2003, 2005 and 2008)
- 2) Law on Radio Wave (approved in 1999 and amended in 2001)
- 3) Law on Post (approved in 2003 and amended in 2005, 2007)
- 4) Law on Licensing Business Activities (approved in 2001)
- 5) Law on Government's Special Fund (approved in 2006)

The "Concept to develop ICT in Mongolia by year 2010" was approved by the Parliament of Mongolia in February 2000, aimed to build a society based on knowledge and intellectual capacity, and to improve living standards of the people. In a view to implement the above mentioned ICT development concept, ICTPA has targeted to provide favorable conditions for legal and policy environment, ICT infrastructure, economic and business environment for ICT Government, and human resource issues.

The Information and Communications Technology Authority of Mongolia (now ICTPA) developed "E-Mongolia National Program", which was approved by the Government of Mongolia on October 14, 2005 by decree No. 216.

In July 2010, the ICTPA has monitored and evaluated "ICT Concept-2010" and E-Mongolia National Program pointing out at successful achievements of these policy documents in reaching total coverage of nationwide fiber optic network and mobile communications services, and increased access to internet. At the same time, it has been recommended to continue efforts in ensuring better access to online public services and expansion of available ICT human resources as further steps for promoting ICT policy within the framework of redefining objectives of E-Mongolia national program (Figure No.1)

ICTPA is now working on development of the ICT policy by year 2021 aiming to further development of the sector and establish programs well suited for local environment to address the existing challenges. It is also important to mention that it has been taken into consideration to link ICT sector development to UN Millennium Development Goals (MDG), and in particular, to the MDG based Comprehensive National Development Strategy pursued by the Government of Mongolia.



# ngolia onal gram



Hentii

Dornogobi

Omnogobi

## Master Plan on E-Government

Within the framework of implementing “E-Mongolia” national program, the Government of Mongolia has developed and is implementing “E-government Master plan”, which includes 22 key projects.

The initiative to establish a National data center, which was specified in this program, has been implemented. The center is operational since 2009, and it hosts registration, information databases at national level, provides regular and reliable support, connecting Government and organizations through high-speed broadband network, on top of which the standards of government information system, software and applications and databases are being developed, ensuring interoperability of technology as a basis for e-government initiatives.

The following projects are being successfully implemented:

1. E-customs, e-taxation, e-procurement, unified network for passport control, social insurance unified system, citizens’ renewed registration (“Smart ID card”) have been established step-by-step by respected ministries and agencies;
2. Reforming “Property Registration System” by the General Authority for State Registration and the Ministry of Road, Transportation, Construction and Urban Development;
3. “Government portal” and “Public Key Infrastructure” projects are being implemented at ICTPA;

In additional, to ensure favorable legal environment for ICT sector, the draft laws on information security and e-signatures are being reviewed by the Government of Mongolia.

## National Program to Establish Registration and Information Unified System

The Government of Mongolia has adopted decree No. 78 in 2008 on “National Program to Establish Registration and Information Unified System” with the purpose of making government services to citizens and organizations accessible, operative, and improving its quality. In order to implement this program, the objectives to “strengthen National Unified Registration and Information System” and “develop soft infrastructure based on matrix data base to improve efficiency of government services” have been integrated into the Action Plan of the Government of Mongolia from 2008-2012.

**The following activities are being implemented within this program:**

1. “The General Law on State Registration” was approved by the Parliament of Mongolia in 2009, and the General Authority for State Registration was established according to this law.

2. Conducting detailed research and assessment on the registration system of Mongolia, based on which the model of “National Program to Establish Registration and Information Unified System”, technical requirements and solutions will be developed.
3. Implementation of project “National System of Citizens' Registration” and connection to online network in 2007-2009 in all aimags, metropolitan and district departments and the General Authority for State Registration.
4. The required standards are being developed, and related laws, legal documents, decisions, rules and regulations are being revised.
5. In order to ensure successful implementation of the Action program of Government of Mongolia, the Government issued decree No. 44 on February 24, 2010, to enforce the use of Unicode standards in government organizations.

In order to create favorable legal environment for National Program to Establish Registration and Information Unified System, extensive works are being carried out to make amendments and changes, projects are being implemented, and measures are taken to ensure linkage and relationships between government organizations.

### **Master plan to develop information technology outsourcing services**

The Government approved “Master plan to develop information technology outsourcing services by year 2015” in 2007 and approved 2 billion tugrugs budget for implementation of activities.

### **National Program to Ensure Information Security**

On June 2nd, 2010, the Government of Mongolia has issued the resolution No. 141 to approve “National Program to Ensure Information Security” and Action Plan to implement this program. The main purpose of this program is to guarantee national security and basic rights and freedoms of citizens through gradual implementation of measures to ensure e-security of database and information, along with their supporting infrastructure, of governmental agencies, NGOs, citizens, business entities, and institutions. Within the framework of the national program, it will be aimed to create a favorable legal and regulatory environment and develop strategic plan of actions to ensure the establishment of information security system at national and local levels through introduction of new techniques and technologies, increasing necessary investment, creating markets for information security, and developing human resources capable of ensuring information security. It is also targeted to implement measures of introducing MNS/ISO 17799:2007 standard on “Code of practice for information security management”, and MNS/ISO 27001:2007 standard on “Information security management system and requirements” into operations of ministries and governmental agencies.

## 4.2. ICT Policy and Regulatory Organizations

The contemporary ICT history of the policy level organizations on ICT in Mongolia started in 1992, when the Government of Mongolia decided to separate policymaking and operating services. According to this policy, the Ministry of Communications of Mongolia was established in 1992. The following graph represents developmental stages of policy level organizations of Mongolia.

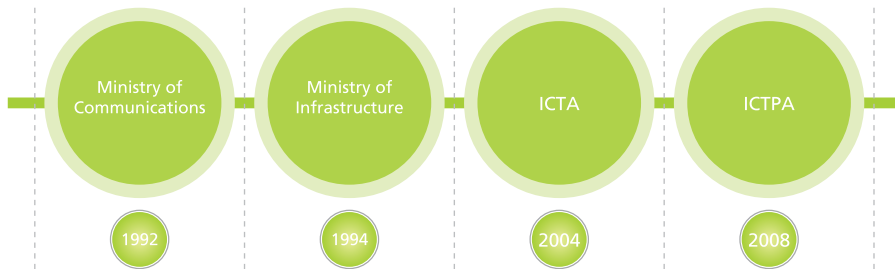


Figure 2. ICT policy organizations in development stages

There are two key ICT government organizations for policymaking and regulation in Mongolia:

- Information Communications Technology and Post Authority of Mongolia, and
- Communications Regulatory Commission.

### Information Communications Technology and Post Authority of Mongolia

(Website: <http://www.ictpa.gov.mn>)

Following implementation of the decree No. 64 of 2008 of the Government of Mongolia and decree No. 05 of January 19, 2009, issued by Prime Minister of Mongolia, the Information Communications Technology Authority of Mongolia has been transformed into Information Communications Technology and Post Authority.

ICTPA is mandated to provide primary areas of work related to the development of laws, regulations and development policies related to information technology, post, broadcasting, telecommunications and technology development matters within the framework of works of Prime Minister, development of unified registration system, organization of activities to implement policies, programs and plans, coordination, monitoring and evaluation.



ICTPA has been engaged in a variety of activities and initiatives to collaborate with international organizations and foreign countries to develop ICT. As an integral part of our international cooperation, ICTPA has recently commenced an initiative to have ICT Ambassadors from foreign nations to foster not only bilateral cooperation but also international cooperation between nations and organizations in ICT areas. As of September 2010, ICTPA has appointed ICT Ambassadors from Republic of Korea, Japan and Sweden.

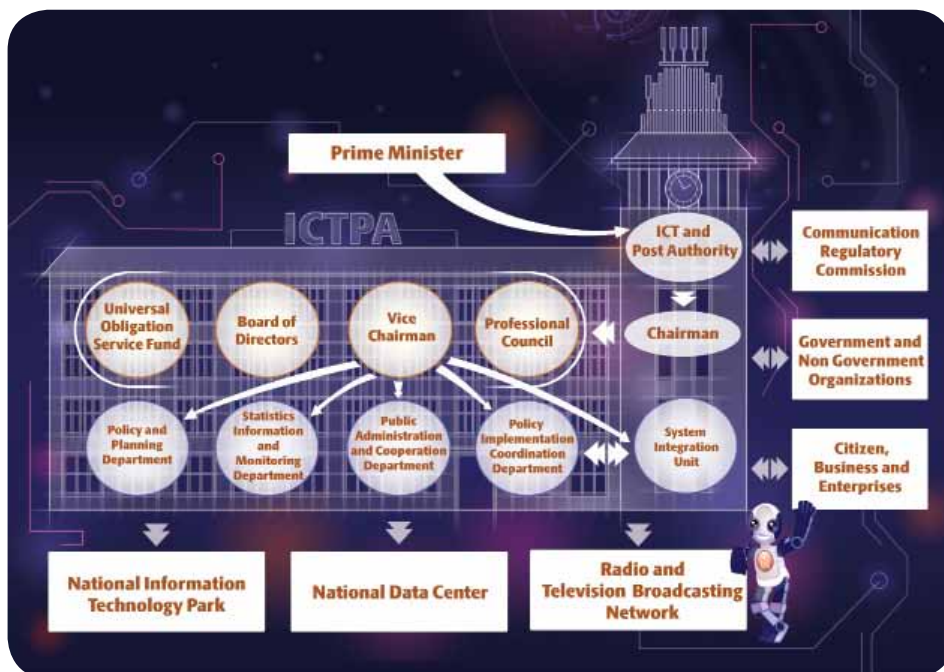


Figure 3. ICT policy and regulatory framework

### Universal Service Obligation Fund

The Government of Mongolia is committed to introduce Universal Service Obligation Fund (USOF) and amended the Law on State funds in 2006 for implementing USOF in Mongolia under authority of ICTPA. Following this, the obligations of contributing 2 per cent levy from revenues before taxes by all providers of ICT sector have been imposed and collected funds were used for providing ICT services to remote and rural areas of Mongolia. For the last 4 years, a total of 8.5 billion MNT<sup>3</sup> were collected and used to finance rural ICT development and rural internet access to mobile telephone services and building optic fiber network in rural areas.

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## Communications Regulatory Commission

(Website: <http://www.crc.gov.mn>)

The Communications Regulatory Commission of Mongolia (CRC) was established by the Communications Act of 2001, and is charged with regulating and supervising a wide range of subjects including competition issues, the provision of networks and services for fixed line and wireless telecommunications, television and radio broadcasting, and satellite transmission, spectrum management, postal services and the internet to ensure that the public interest is well served. The CRC's jurisdiction covers each region of Mongolia (CRC, 2009). The main objectives of CRC are the following:

- To facilitate access to safe, reliable and affordable ICT and Telecommunications networks and services by pursuing, where appropriate, a commercially viable and competitive environment;
- To support innovation and expansion in ICT and Telecommunication, postal markets, by the efficient and impartial oversight of network and service providers and the enforcement of their obligations;
- To protect the interests of users of networks and services in the sector in which we regulate;
- To Increase tele-density and access to ICT and Telecommunications in the country at affordable prices;
- To establish an interconnection regime that allows fair, transparent, prompt and equitable interconnection;
- To re-balance tariffs so that the objectives of affordability and operator viability are met in a consistent manner;
- To protect the interest of consumers and to address general consumer concerns relating to availability, pricing and quality of service and other matters;
- To monitor the quality of service provided by the various operators, including numbering and radio frequency resources;
- To work on development of sector standards (ibid)

The ICTPA has three state-funded implementing organizations, such as National Information Technology Park, National Data Center and Radio and Television Broadcasting Network Department.

## National Information Technology Park

(Website: <http://www.itpark.mn>)

The National Information Technology Park (NITP) was established by the decree No.107 of the Government of Mongolia, and officially started operations in August, 2002.

The main objectives of the National Information Technology Park (NITP) are to support the development of information technology in Mongolia, and to serve as the incubator for turning new and unique ideas of venture businesses into competitive products and services.

NITP provides incubation services for start-up companies, renting premises for exhibitions, lectures, and provides high-speed Internet connection for companies and organizations located at the premises of NITP. Since its establishment, NITP has provided incubation services for about 30 software development companies, groups and teams. (NITP, 2010)

NITP is a member organization of the Asia Pacific Information Network (APIN) and the USA-based National Business Incubation Association (NBIA), USA.



Painting by D.Ariunaa (3rd grade, Mongeni complex school , Ulaanbaatar city)

## National Data Center

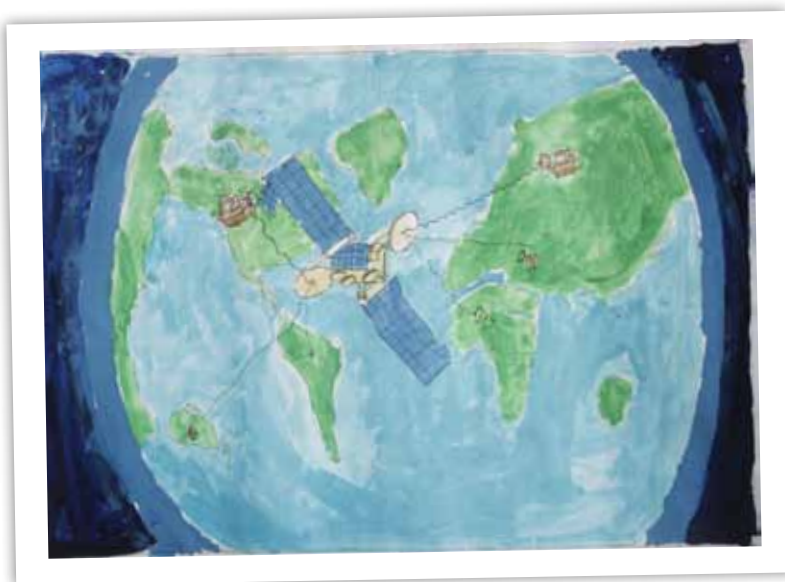
(Website: <http://www.ndc.gov.mn>)

The Government of Mongolia issued the decree No. 183 on June 24, 2009, establishing the National Data Center, which is fully operational since August, 2009. The main purpose of the National Data Center is to provide operative, secure and accessible services for data and information of government organizations of Mongolia.

## Radio and Television Broadcasting Network Department

(Website: <http://www.rtbn.gov.mn>)

The Radio and Television Broadcasting Network Department (RTBND) is a state funded enterprise with the mission to re-transmit radio and television programs throughout the territory of Mongolia at high quality and ensure reliable and continuous operations, introduce new technologies, and provide citizens with information. RTBND maintains radio and television transmission networks in Ulaanbaatar city and throughout the territory of Mongolia, and ensures broadcasting of national radio programs overseas in four foreign languages (Chinese, English, Japanese and Russian)



Painting by M.Erdenebat (8th grade, School #71 , Ulaanbaatar city)

## 5. Current Situation of ICT Sector of Mongolia

The ICT sector of Mongolia is comprised of telecommunications, information technology, radio and television broadcasting, and postal services.

The national fiber optic network of Mongolia is now extended to reach all 21 aimag centers and over 151 soums. ICTPA is currently implementing the project to extend fiber optic network in the next 2 years, which will connect more 148 soums.

Four mobile operators currently provide mobile services to over 2 million subscribers throughout the territory of Mongolia and are currently expanding their services to provide Internet connections to schools at aimag and soum centers as well as extending further mobile content.

The Universal Service Obligation Fund (USOF) has enabled extension of backbone fiber optic network to rural and remote areas of Mongolia, thus allowing access to information and communications technologies and its services by rural population.

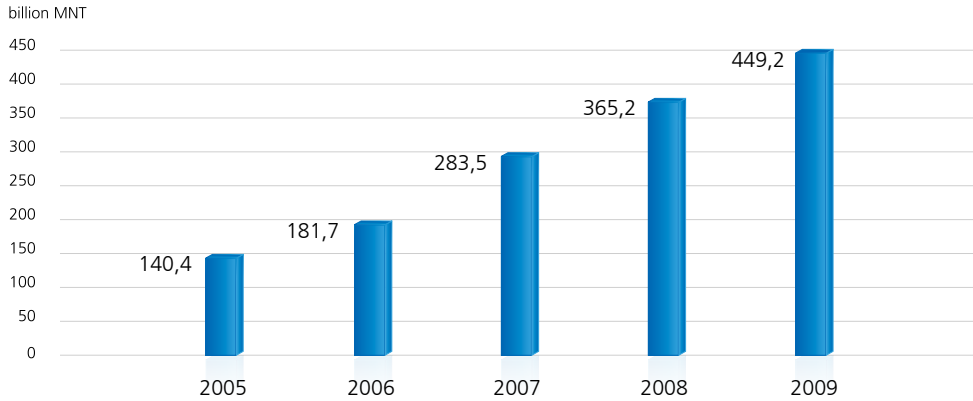
In order to successfully implement “Computers for all” component of “E-Mongolia Master Plan” in 2005-2007, the waiver policy from customs taxes for imported computers and spare parts for computers was introduced, which created favorable environment, resulting in more than doubling the number of computers purchased during this period compared to previous years.

The number of software and development companies has reached over 100, which currently develop software and applications for government organizations and private sector.

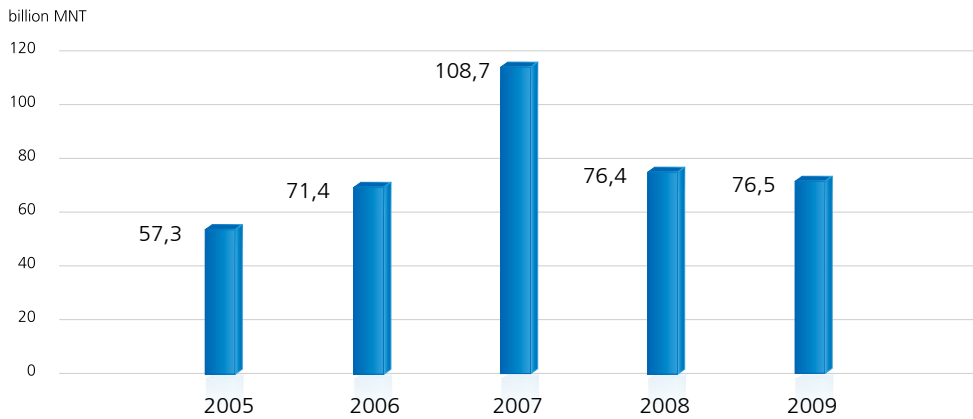
The number of websites has been increasing steadily for the last few years, with each organization getting domain names at .mn top-level domain (TLD) and outsourcing development of websites to local software development companies.

The number of students to apply and register at universities specializing in training on ICT areas has been steadily growing in the last few years, becoming a preferred choice of major for students to study. This includes not only system administration, hardware and software engineering courses, but also management of information systems, information systems engineering, and designing and multimedia applications development.

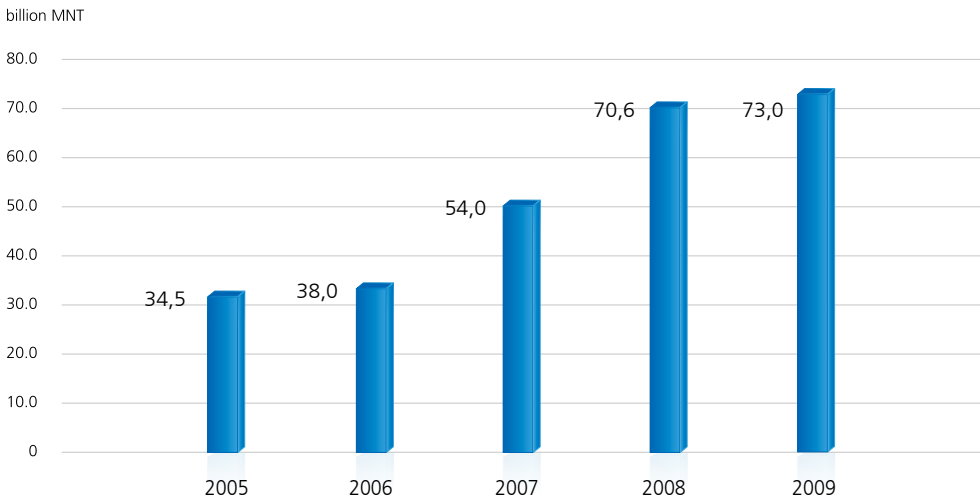
The following graphs show the total revenue of ICT sector for the period of 2005-2009, and tax contribution of ICT sector to the state budget and sector investments.



Graph 1. Total revenue of ICT sector (2005 – 2009)

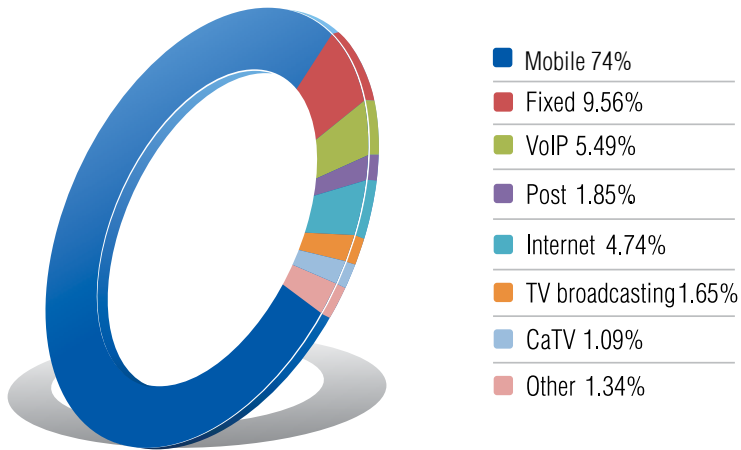


Graph 2. Tax contributions to State budget (2005 – 2009)



Graph 3. Sector investment

The following graph represents composition of ICT sector revenues in 2009. It can be seen that about 74% of total revenues of ICT sector are generated by mobile services and the remaining 26% are contributed by fixed telecommunications network, VoIP, Internet, Cable TV, broadcasting and other.



Graph 4. Composition of ICT sector revenues in 2009



## 5.1. Telecommunications Industry

Our country has become fully digitalized as far as switching and transmission equipment is concerned. The following graph represents the overall coverage of fiber optic and VSAT network of Mongolia. It can be seen that the backbone fiber optic network has reached all aimag centers and some soum centers. The Information Communication Network Company (<http://www.icnc.mn>) is the owner of the national backbone and access network of Mongolia including international, long distance, rural and local transmission networks and local loops. In addition, private operators such as Mobicom (<http://www.mobicom.mn>), Gemnet (<http://www.gemnet.mn>), Skytel (<http://www.skytel.mn>) and Mongolian Railway (<http://www.railcom.mn>) have installed fiber optic networks in some locations.

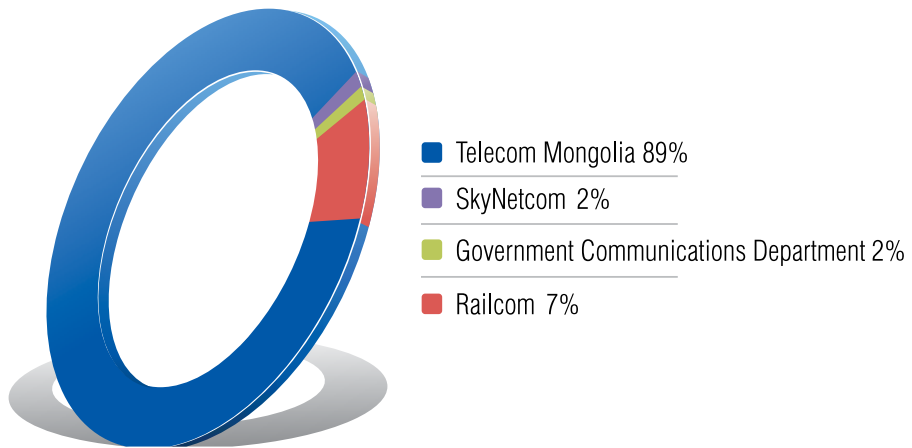
There are over 188,875 fixed telephone users in Mongolia constituting a ratio of 6.9 per 100 people.

There are over 44,539 users who are subscribed to WLL services, and a ratio of WLL subscribers per 100 people has reached 1.52 in 2009, an increase by 0.22 compared to 2008. WLL services are provided by Skytel, Mobicom, and Mongolia Telecom (<http://www.telecommongolia.mn>).



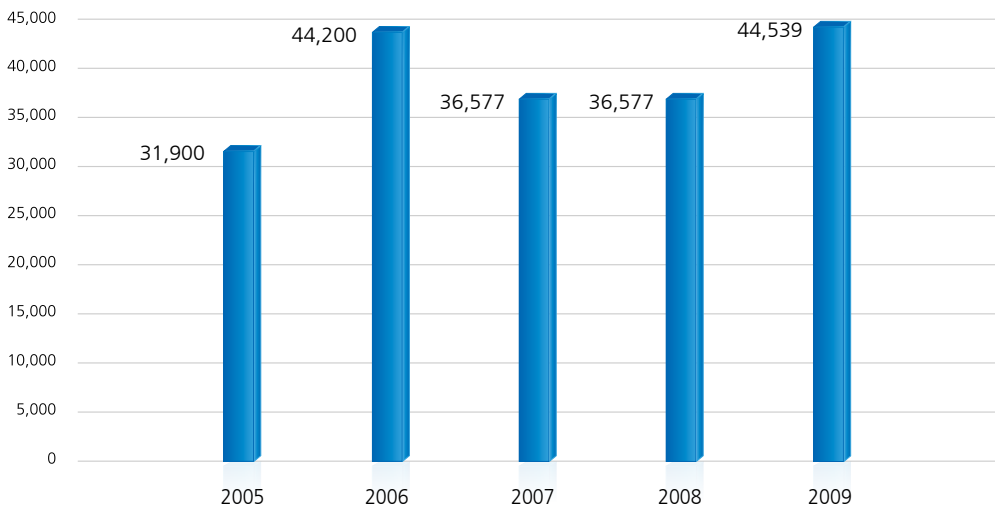
Figure 4. National transmission network

Out of total of 188,875 fixed telephone users, the majority (89% or 128,675 users) are users of Mongolia Telecom, and the rest are users subscribed to the Government Communications Department, RailCom and SkyNetCom (<http://www.skynetcom.mn>).



Graph 5. Number of fixed telephones

Out of all 44,539 users, who are subscribed to WLL services, the majority of subscribers use services offered by Mongolia Telecom, representing 88% of subscribers (39,443 subscribers), and the remaining subscribers use services offered by Mobicom and Skytel. The following graph represents an increase of the number of WLL services in Mongolia.



Graph 6. Number of WLL users



# 3.5G

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**VIDEO CALL**



**MOBILE INTERNET**



**MOBILE TV**



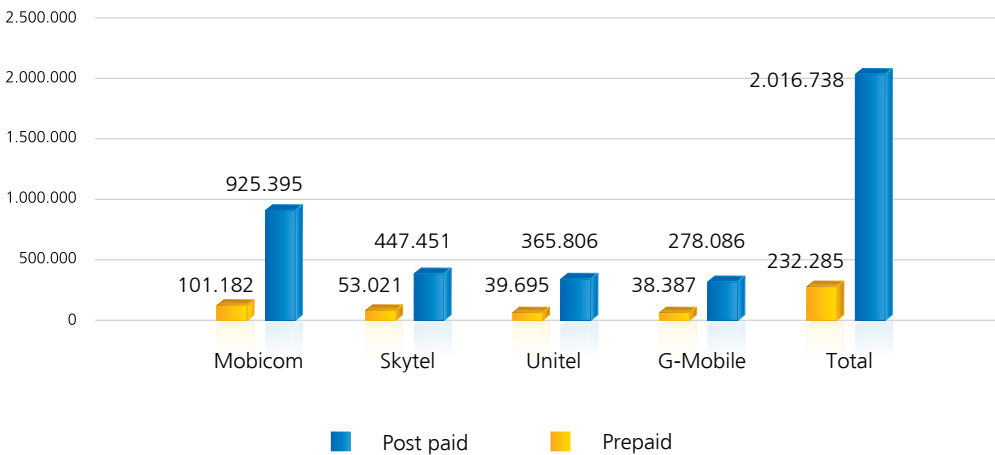
For further information please call 2222, [www.mobicom.mn](http://www.mobicom.mn)

 **MobiCom**

What drives you *drives us...*

## 5.2. Mobile Communications Services

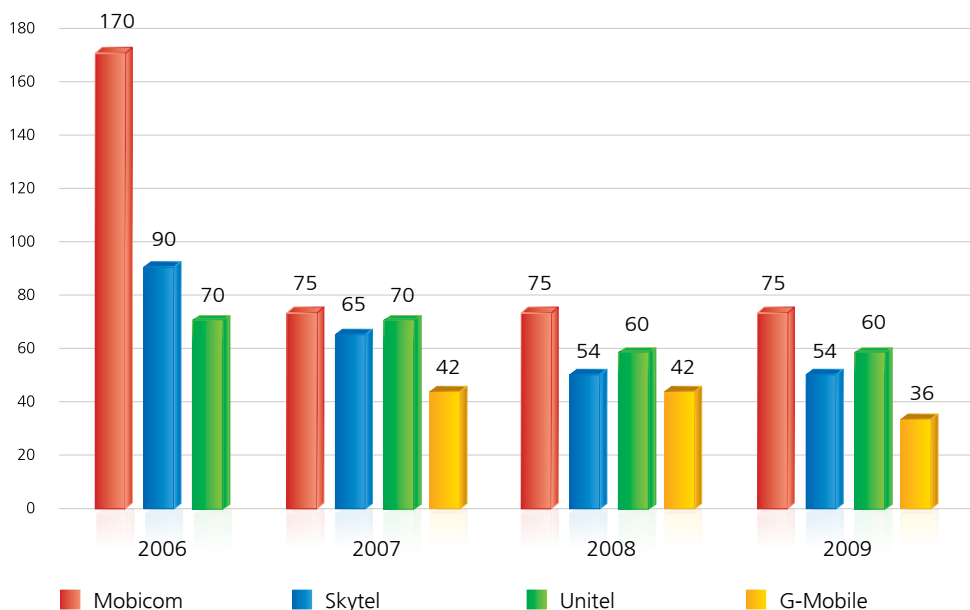
There are four mobile phone operators in Mongolia, which provide services to over 2 million subscribers of Mongolia, with penetration of more than 80% of the total population of Mongolia by 2009. Two mobile service providers use GSM system and the other two operators use CDMA system. The following graph represents the number of subscribers by each mobile service operator including pre-paid and post-paid services.



Graph 7. Number of subscribers by each mobile service operator

As it can be seen from the following graph, the charges for mobile communications have been reduced more than twice since 2006. As of the end of 2009, 1 minute charge for a call with a mobile operator is average 56MNT. This shows that Mongolia is in the 91st place among 161 countries (ITU, 2010), having charges lower than the Asian average. (ITU, 2010)





Graph 8. Mobile communications charges per 1 min

### 3G services

Since 2009, MobiCom, Skytel and Unitel (<http://www.unitel.mn>) have launched 3G - high-speed mobile broadband services in Mongolia, offering new services to their customers, such as Video call, Mobile broadband with high speed connection through mobile phones or special modems, and watching TV programs. All subscribers of these mobile service providers can have access to these services with the condition that their mobile phones support these services.



Painting by Kh.Khulan (4th grade, Mongeni complex school , Ulaanbaatar city)

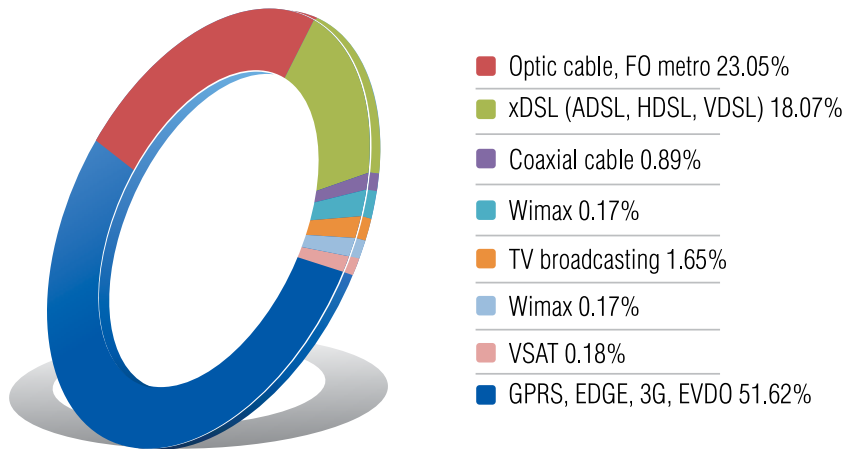
### 5.3. Internet Services

The first Internet Service Provider (ISP) started providing Internet services in Mongolia in 1996 with 64kbps through VSAT technology.

Nowadays, there are 56 companies, which were granted with licences for Internet access and service provision by CRC. (CRC, 2009)

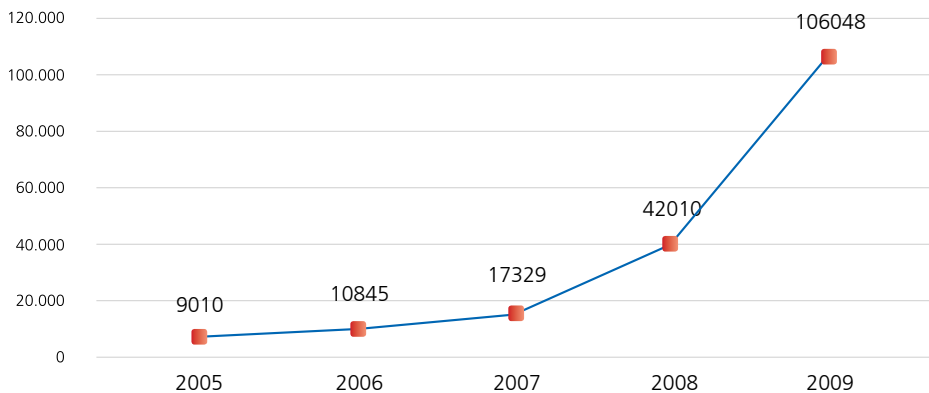
The overall bandwidth of Mongolia is downloading 7.8Gbps and uploading 7.8Gbps. The Internet connections are made through fiber optic cable network going along the railway lines to the north to the Russian Federation, and to the south to the People’s Republic of China.

At present, internet services in Mongolia are distributed via xDSL, Fiber optic, GPRS, WiMax and WiFi technologies. The following graph represents different types of technologies used for access to Internet, and as it can be seen, the majority of users access Internet through GPRS, 3G, EVDO and EDGE technologies.



Graph 9. Different types of access to internet

In 2009, the number of Internet subscribers was over 106,048 constituting an increase of over 61% compared to 2008, which is shown in the following graph.



Graph 10. Internet subscribers

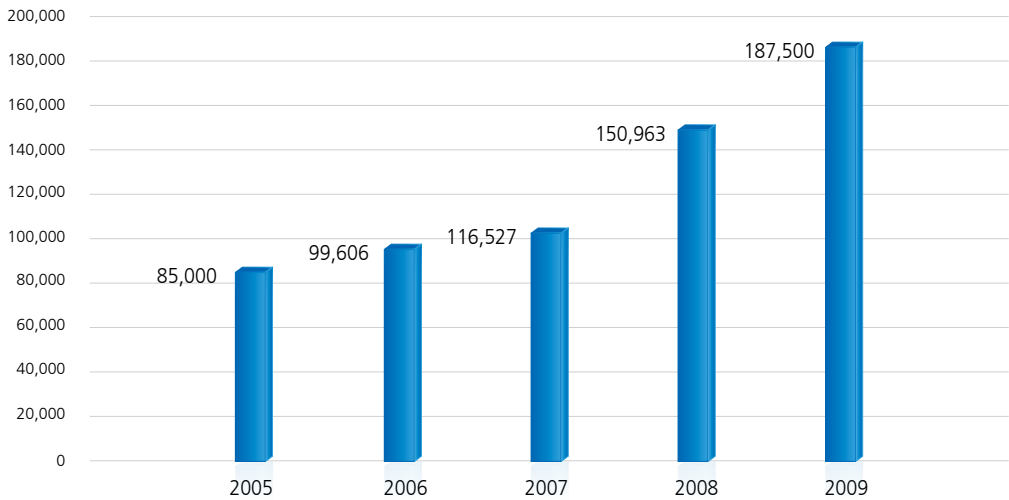
The cost of connection to Internet services fell down tremendously in the last year. The Internet connection for corporate organizations is starting from 180,000 MNT for 1Mbps for dedicated leased line on monthly basis. The number of users connecting to Internet through dial-up is reduced to almost none as preference is given to affordable ADSL and wireless EVDO/3G modem connections. The Internet connections for small office and small home (SOHO) solution nowadays is 27,900MNT for monthly fee of 1 Mbps.

### Voice over Internet Protocol (VoIP)

There are a number of companies, which offer pre-paid international calling cards services through Internet protocol. The costs of calling cards starts from 2,000MNT allowing over 1 hour of phone call.

### Hardware supply

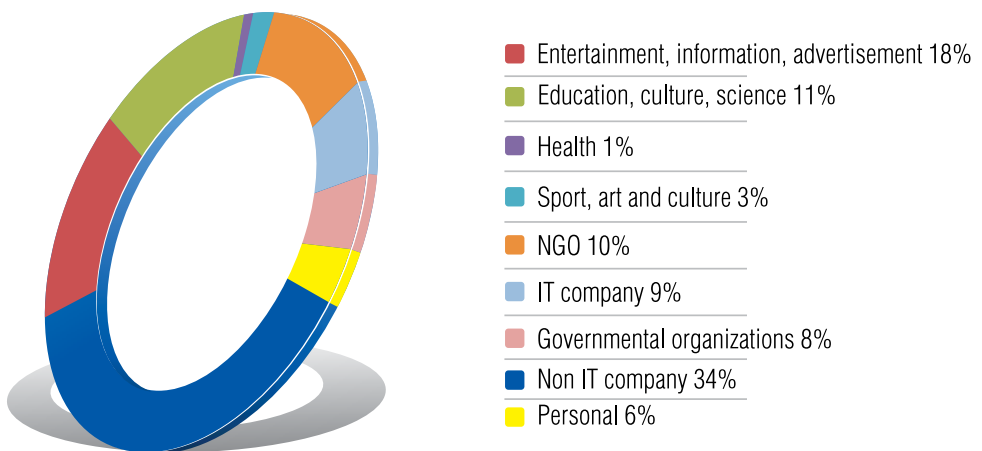
There are over 30 companies in Mongolia, which supply computers and equipment to the market. There were a total of 187,500 computers in 2009, constituting an increase of 20% compared to 2008, according to the 2009 Annual Statistical Yearbook of the National Statistical Office (NSO, 2010).



Graph 11. Number of computers (2005-2009)

## Websites

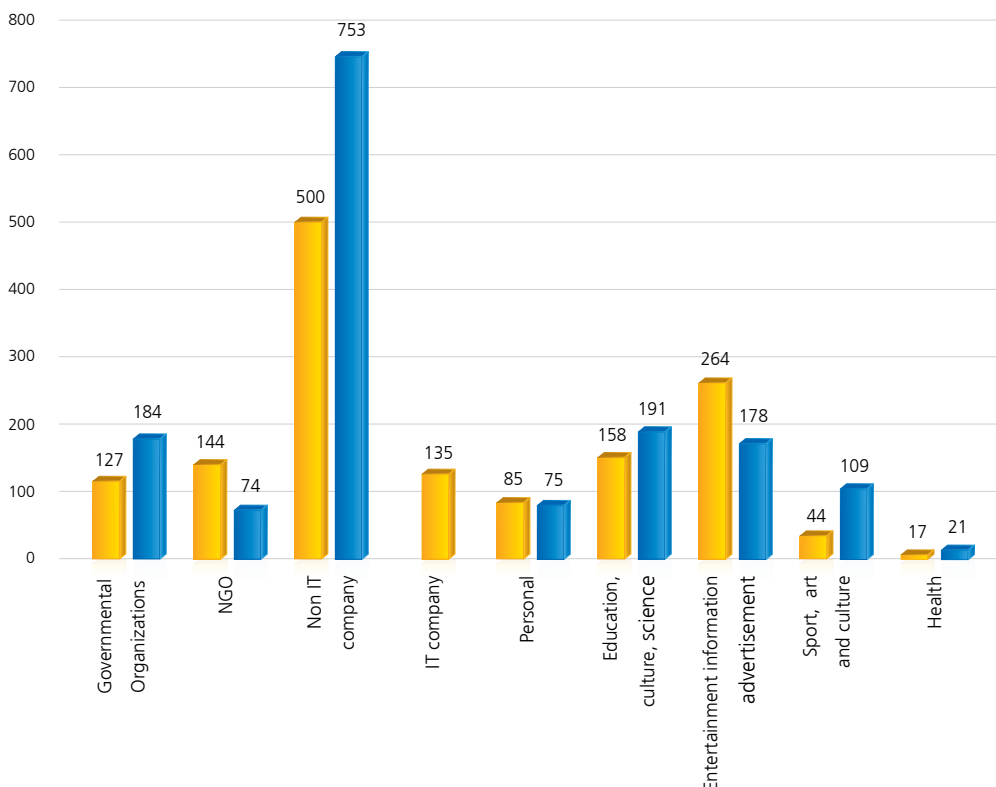
There are over 2,800 websites with Mongolia-related contents, which are hosted at .mn, .com, .org, .net, .edu, .info, .biz and other top level domains. About 63% of those websites are hosted at .mn domain. About 56% of those websites are functional, and the rest of them are either under construction, or not working. (Intec, 2009). The following graph shows the distribution of websites by different types and it can be seen that 34% of websites are websites of non-IT organizations.



Graph 12. Distribution of websites with Mongolia-related contents by different types



The below graph represents a comparison of websites in 2006 and 2009. It can be seen that number of websites of government organizations, non-IT companies, educational, cultural, scientific, sports, and arts organizations has increased in 2009 compared to 2006. However, the number of non-governmental organizations (NGOs), entertainment and advertisement-oriented websites has decreased.

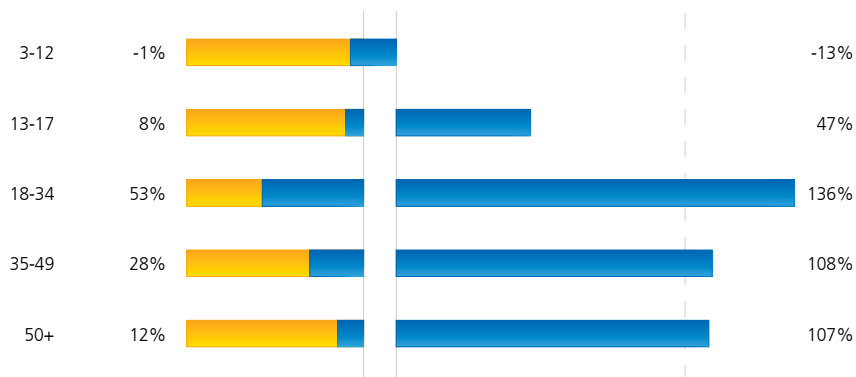


Graph 13. Comparison of websites in 2006 and 2009

### Internet based social networking

With the development of social networking websites, more and more Mongolians have started using social networking portals. According to social networking portals, the most popular ones among Mongolians are Facebook, Hi5, Biznetwork, Twitter and Flickr. (Vincos, 2010)





Graph 15. Number of Mongolian users at hi5 by age group

Since its launch in 2009, the Mongolian social networking website called Biznetwork has been highly appreciated and used by Mongolians. Biznetwork is developed in Mongolian language, thus making it more accessible and user-friendly for Mongolians. It has now over 34,600 users, who are using it not only for networking and communicating with different people by their hobbies and interests, but also for promoting their businesses and activities. Individual users create their own profiles, inviting people in their own circle of friends, colleagues and interest groups. Business organizations sign-up as business members, which allows them to promote their businesses, advertise their products and services as well as to share information on their works and announce employment opportunities. Around 50 new jobs and vacancies are announced daily, and top 10 Mongolian companies advertise through Biznetwork. (Singleton, 2010)

The email marketing is becoming one of the popular means of providing information on products and services to citizens. The email marketing companies have databases of email addresses of Mongolian users, which are mostly subscribed at yahoo.com, and use this network for marketing of products and services.

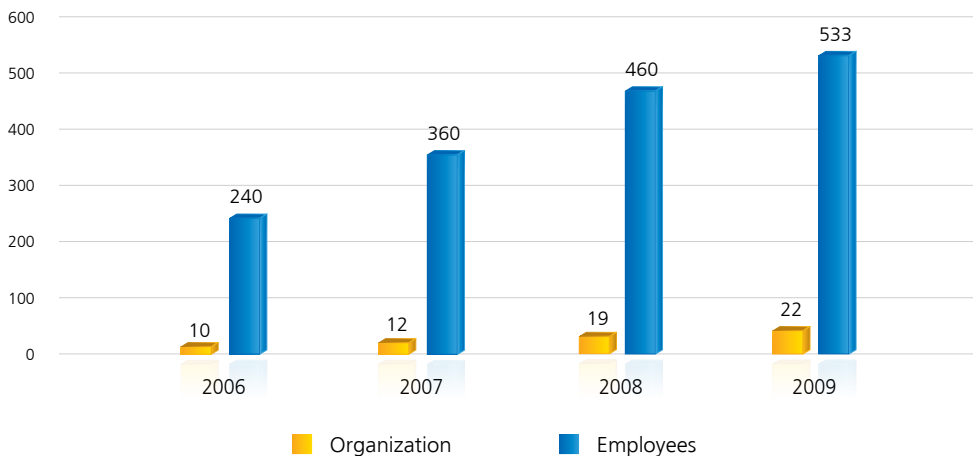
Painting by B.Gantsetseg  
(3rd grade, School #71,  
Ulaanbaatar city)



## 5.4. Software Industry

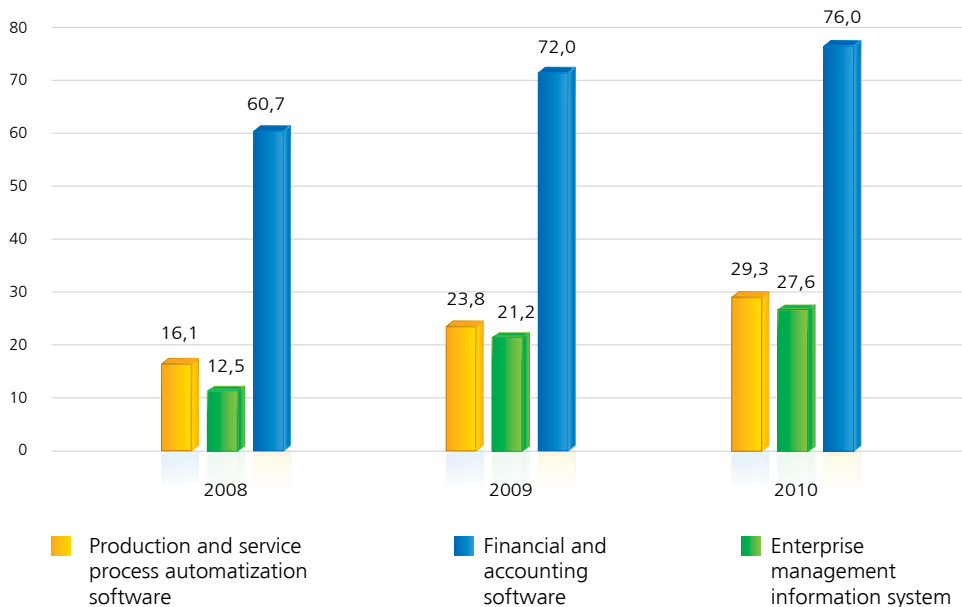
The Mongolian software industry currently has over 100 software development companies, which specialize in the development of different software and applications, ranging from applications to be used at stand-alone computers to enterprise resource planning software to be used at network environments. There is a number of software companies, which specialize in the development of websites and portal sites, and more software companies have started to shift towards the development of web-based applications. The following graph represents information on software development companies as per number of organizations working on software outsourcing, number of staff and their income. (NITP, 2009)

One of the latest tendencies in software industry is outsourcing of software and application development works from countries such as Japan, USA, UK, and others. According to a recent study conducted by the NITP's research team, there are 22 companies in Mongolia which employ over 533 employees and are engaged in outsourcing for international markets.



Graph 16. Mongolian outsourcing companies and number of employees

As it can be seen from the below graph, more and more organizations are using financial and accounting software and use of automatization software and enterprise management information systems are increasingly at organizations.



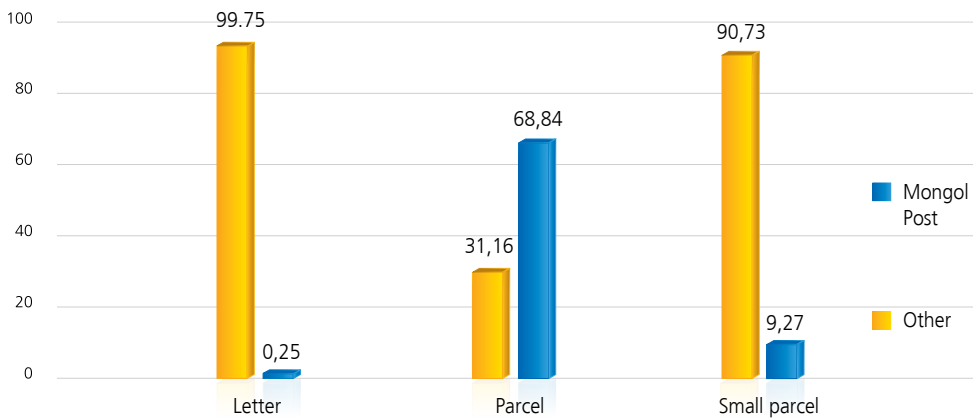
Graph 17. Software used in business



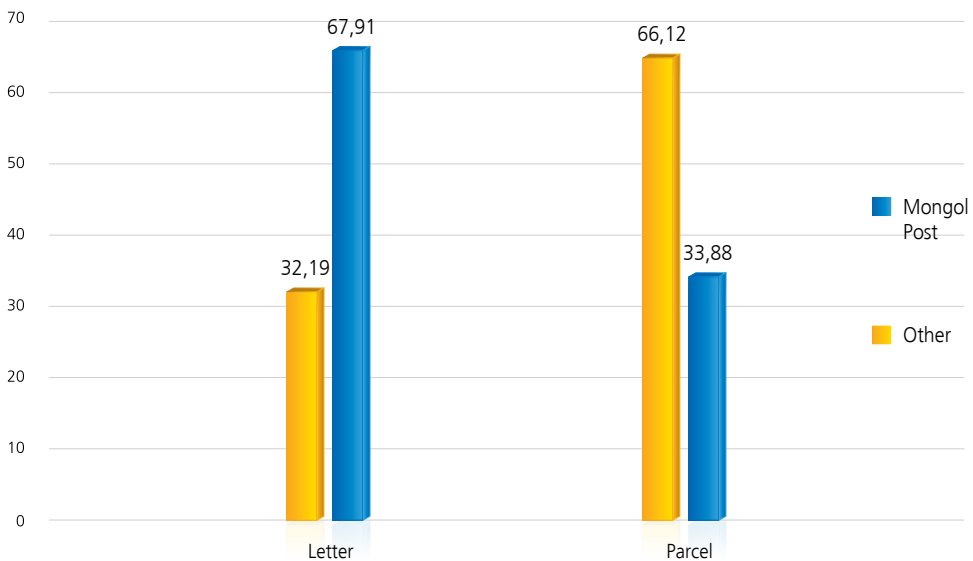
Painting by S. Anujin (7th grade, Ui Tsai school, Ulaanbaatar city)

## 5.5. Postal Services

In the Mongolian postal service market, 51 licensed postal operators are currently running postal service business. There is one state owned company (designated operator) Mongol Post (<http://www.mongolpost.mn>), and others are private companies. Some competitive services in the postal market such as outgoing international postal services (parcel, post letter, small parcel) and outgoing international express services are shown in the following graphs.



Graph 18. Types of international postal services



Graph 19. Types of International postal express services

## ICT-related journals

There are three major ICT-related journals published in Mongolia: "My computer/Digital World", "Computer Times", "Bileg" and "Kholboochin"

They differ from each other on the content and target audience. "My Computer/Digital World" and "Computer Times" are targeted for broader public audience, whereas Computer Times is more of entertainment type. "Kholboochin" and "Bileg" are targeted for ICT professionals and contains serious articles and publications related to ICT research and development. All of them are included in the list of journals for subscriptions. For more information on these journals, visit [www.kt.mn](http://www.kt.mn) and [www.mycomputer.mn](http://www.mycomputer.mn) websites.



## 5.6. Broadcasting Industry

TV broadcasting in Mongolia started in 1967, when the first national television program was aired in Mongolia. The following graph shows the evolution of the television broadcasters in Mongolia.

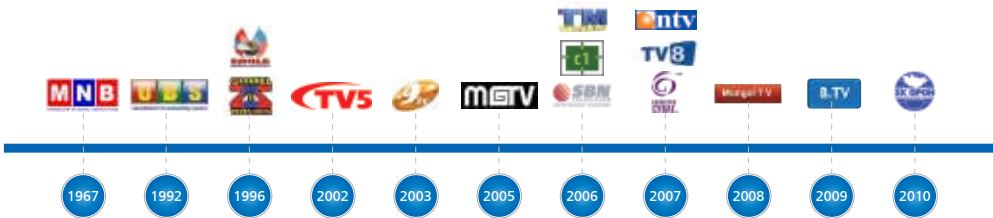
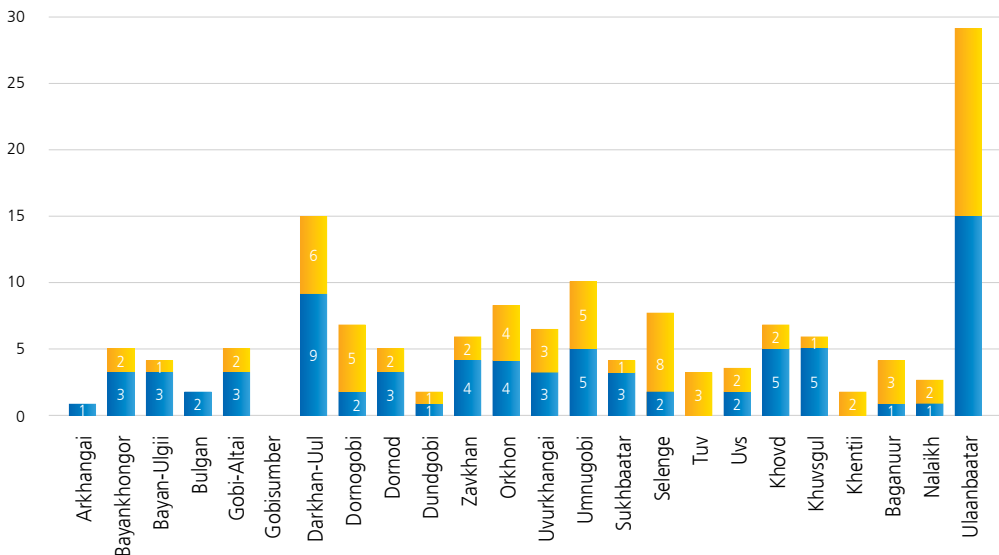


Figure 6. The evolution of the television broadcasters in Mongolia

Nationwide public TV broadcasting started transmission in 1992 by C-Band. Since May 2010, Mongolia has shifted to Ku-band, which allows broadcasting public and commercial TV channels nationwide.

There are 115 companies and organizations, which have television broadcasting licenses, of which 21 companies have licenses in Ulaanbaatar city and 94 – in aimags. The following graph represents distribution of TV and Cable TV in aimags of Mongolia.

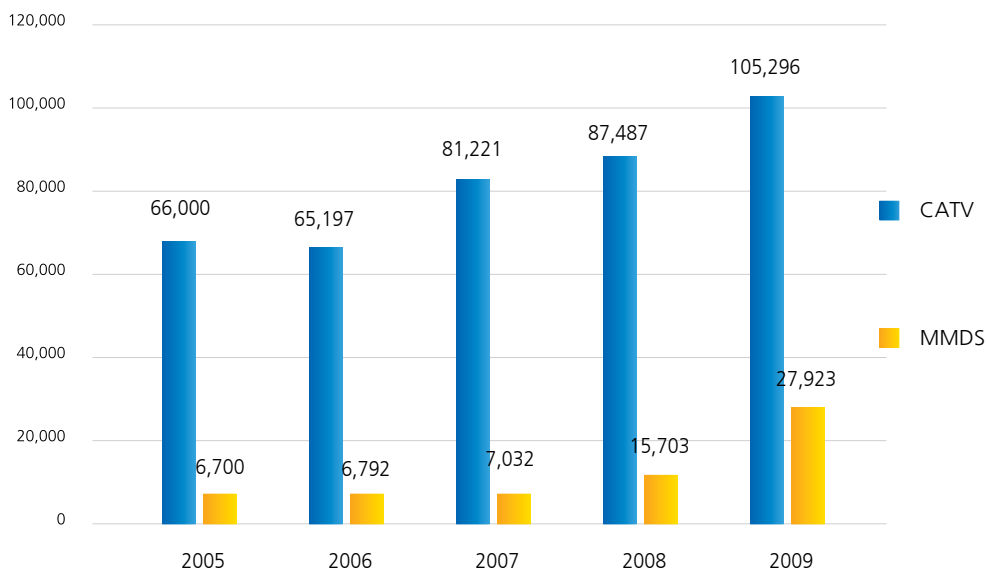


Graph 20. Distribution of TV and Cable TV in aimags of Mongolia

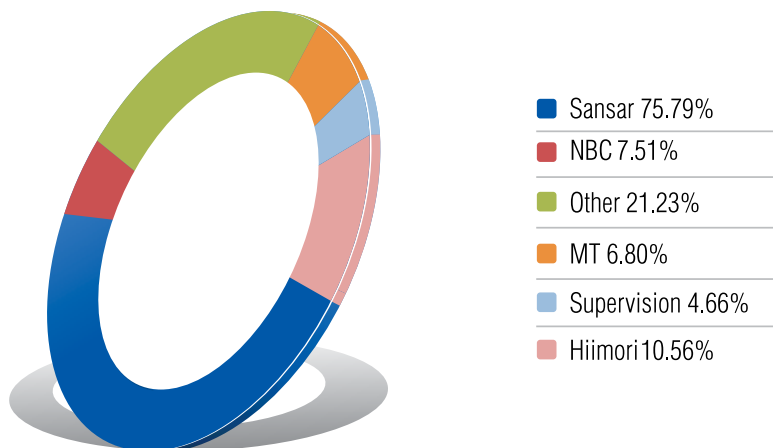


## Cable Television

There were 79 cable television (CATV) operators in Mongolia in 2009. In recent years, as a result of the enabling rural citizens to watch National TV programmes and CATV, the total number of rural subscribers has rapidly increased, especially in 2009. The following graph shows the number of CATV subscribers and market shares in CATV services in 2009, from which it can be seen that the number of the CATV subscribers has increased by 23% between 2008 and 2009.



Graph 21. Cable and MMDS Television subscribers



Graph 22. Market distribution among different cable television providers

## Radio broadcasting

The two programs of the National Public Radio Broadcaster (NPRB) are transmitted throughout the territory of Mongolia, covering all aimags and soum centers. As it can be seen from the below figure, there are six major coverage areas: in the east in Choibalsan, in the south in Dalanzadgad, in the center in Honhor, in the mid-west in Murun and Altai, and in the west in Ulgii.

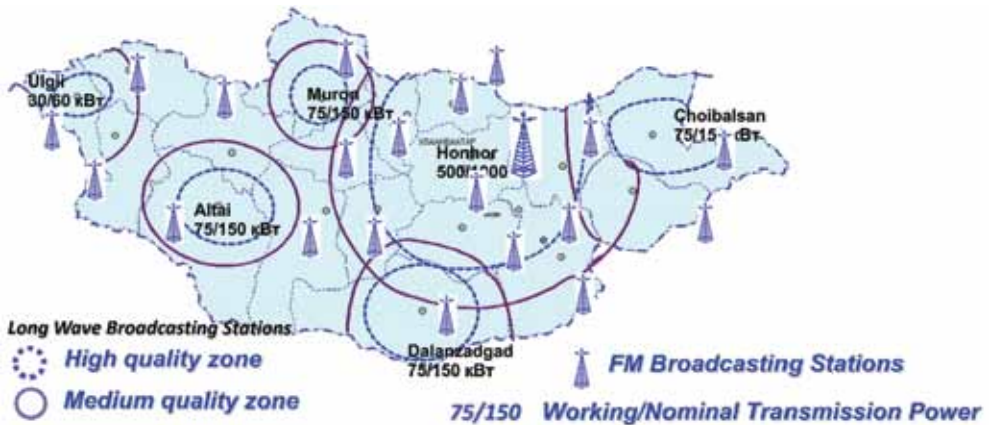
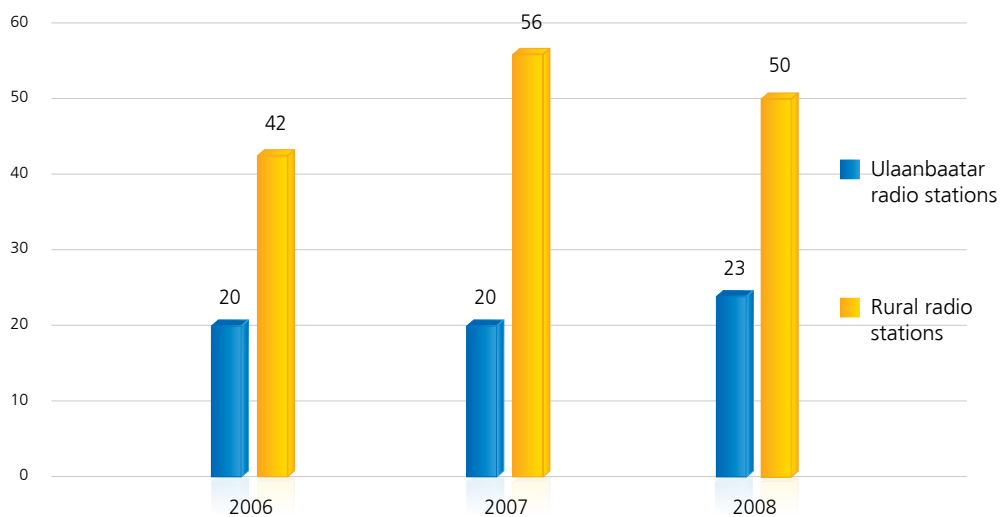


Figure 7. Major coverage areas of NPRB

The mobile subscribers also have benefit of listening to radio stations on their phones, especially if their phonesets are enabled radio or Internet radio services.

## Community radio network

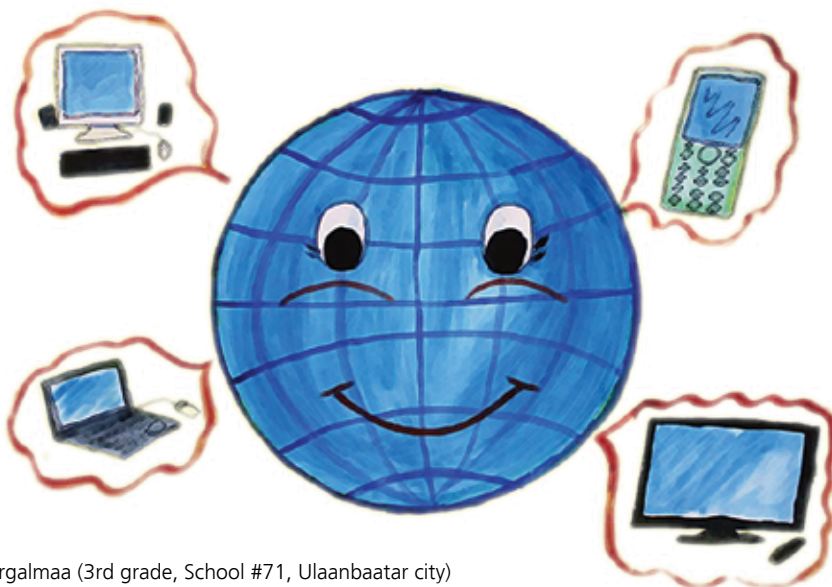
There are 124 companies, organizations and individuals, which have received licenses from CRC for operation and functioning of FM radio stations in Ulaanbaatar city, in aimag and some soum centers.



Graph 23. Radio stations

### Internet Protocol and Mobile TV

By end of 2009, the CRC issued two licenses for Internet Protocol (IP) based television and two licenses for mobile television services in Ulaanbaatar city initially, and extended later to other cities. The companies have modernized networks to introduce IPTV and mobile TV services, and, as a result, mobile subscribers of these two companies can benefit from watching television on their phones, Internet, or other multimedia devices.



Painting by G.Jargalmaa (3rd grade, School #71, Ulaanbaatar city)

## 5.7. ICT Human Resources

### Policy

The revised laws on education, tertiary education, primary and secondary education were adopted in 2002. In 2006, the Ministry of Education, Culture and Science of Mongolia (MECS) developed “Master plan to Develop Education in Mongolia for 2006-2015”, approved by the Parliament of Mongolia.

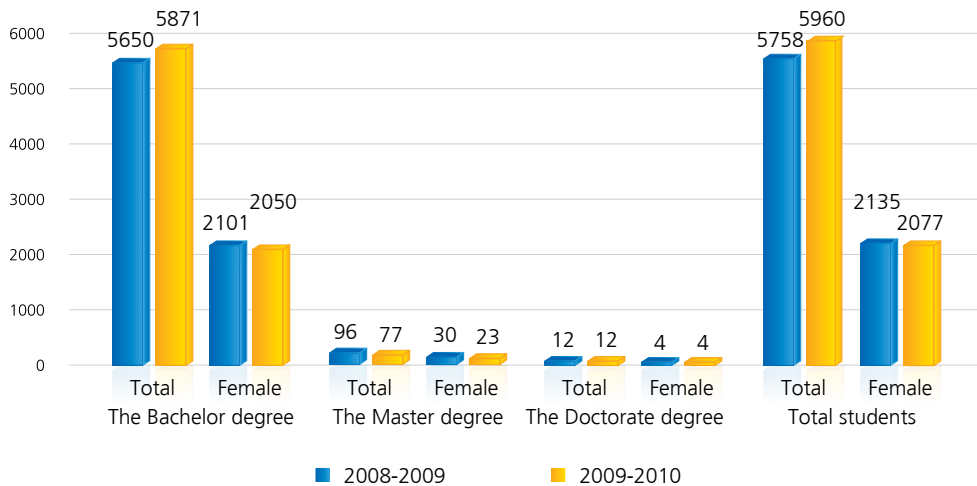
Since 2006 MECS has been implementing “General directions to introduce information technologies in the primary and secondary education sectors by year 2015”.

On June 5, 2007, the Minister for Education, Culture and Science issued the decree No.183 approving some measures to be implemented in the near future, describing the measures such as using Erdemnet (Knowledge Network) for Internet connection for science, education and cultural institutions, connecting public tertiary institutions to Internet and recommending private educational institutions on increasing their Internet connection bandwidth, improving skills and knowledge of ICT of teachers and students studying in those institutions, improving use and application of ICT and Internet by teachers, and paying more attention to increasing number of computers and equipment, software and quality of utilization (MECS, 2006). For more information, visit <http://www.mecs.gov.mn> website of Ministry of Education, Culture and Science of Mongolia.

### Tertiary educational institutions

There are 24 ICT educational institutions in Mongolia, which train ICT professionals, of which 7 are public institutions, and the remaining are private institutions. There are over 6,000 students studying in those institutions, specializing in software engineering, network administration, information systems and management, hardware engineering, telecommunications engineering, postal services, electronics engineering, optic communications, television and radio technology, satellite and wireless communications, information technology, and others.

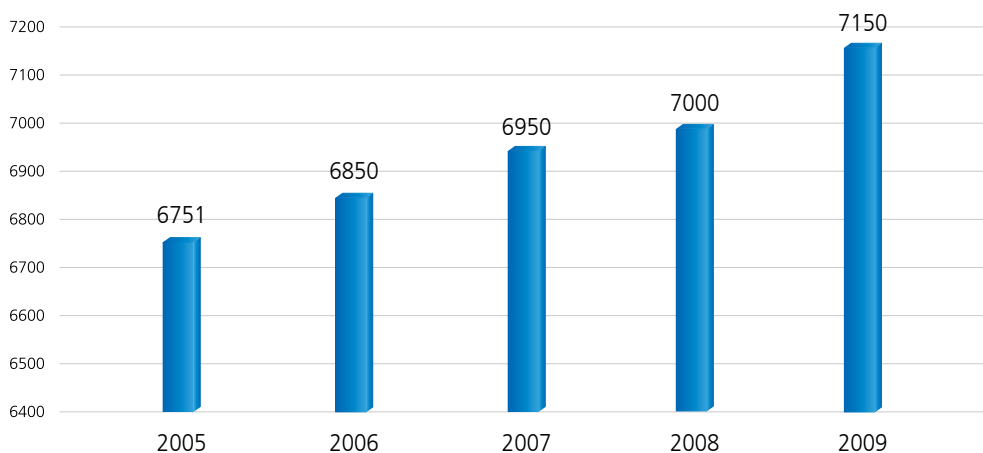
The following graph represents the comparative table of students studying at Bachelor, Master and Doctorate levels at all higher educational institutions of Mongolia, separated by proportion of female and male students.



Graph 24. Number of students studying at ICT areas by degrees and gender

### Number of ICT specialists

There are over 7,150 people working in telecommunications, mobile communications services, Internet services, software, hardware and consulting services companies of Mongolia. In addition, there are over 1,500 people, who are working in television and radio broadcasting.



Graph 25. Number of people working in ICT sector (2005-2009)

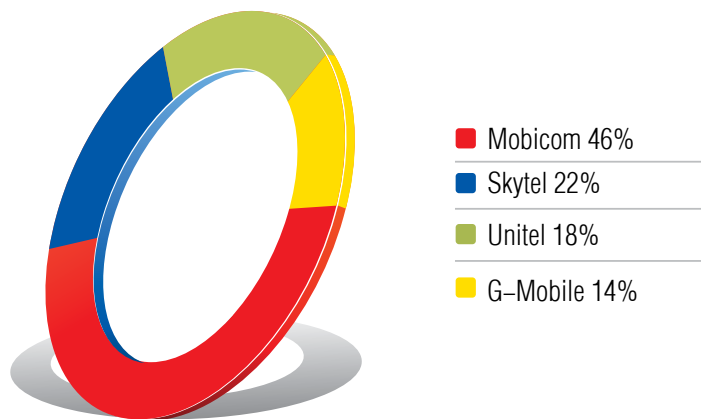
## 5.8. ICT related Organizations

### Telecommunications operators

Mongolia Telecom (MT) is one of the leading telecommunications companies of Mongolia, which provides fixed telephone services to households and organizations. It is a joint-stock company, 54.33% of which belongs to Government of Mongolia, 40% belongs to Korea Telecom, and remaining 5.66% belongs to individuals. From 2006, the MT started offering Next Generation Network (NGN) CDMA 2001X and installed NGN stations at each district of Ulaanbaatar. In addition, MT is offering F-Zone wireless telecommunications services, which are used in 21 aimags centers and 34 soum centers. Among service providers, the Information Communications Network Company (ICNC) plays a leading role. ICNC is a state-owned company, which owns 100% backbone network of Mongolia, including national and international transmissions. The ICNC has its main office and branches in 3 cities, and 340 soums. The main services offered by ICNC are renting voice and data channels, cable and networks within Ulaanbaatar city, fiber optic network and other transmission equipment nationwide.

### Mobile phone operators

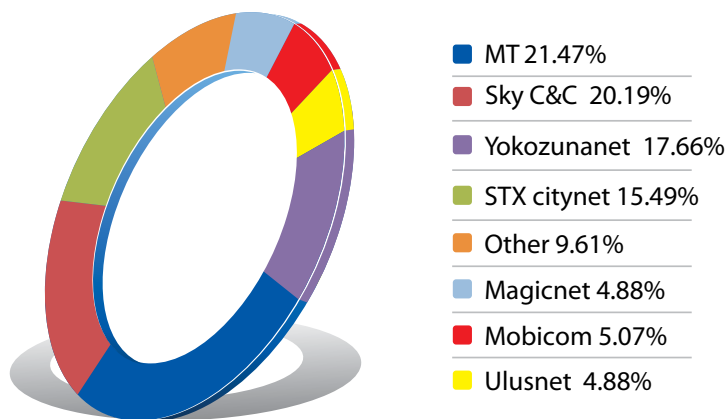
There are four mobile service providers in Mongolia: Mobicom and Unitel provide services of GSM system, and Skytel and G-Mobile ([www.g-mobile.mn](http://www.g-mobile.mn)) provide CDMA system services.



Graph 26. Market share in mobile telephone service

## Internet Service Providers

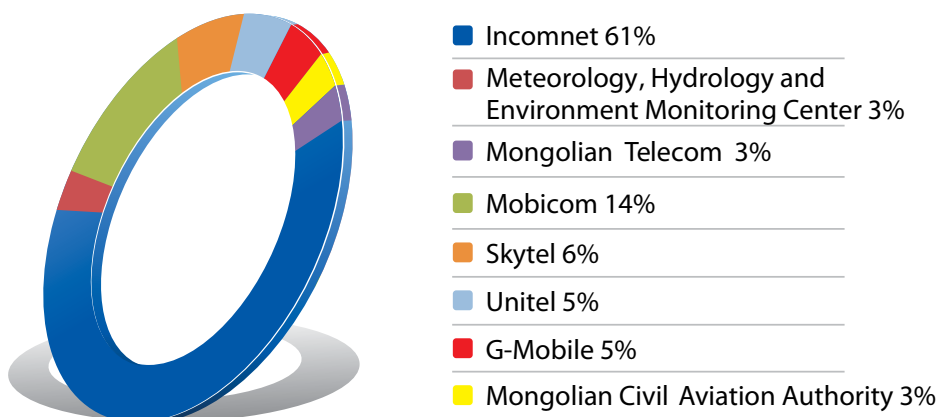
There are 56 Internet service providers, which received licenses from Communications Regulatory Commission (CRC) in 2009. The following table represents distribution of market share among ISPs.



Graph 27. Distribution of market share among ISPs

## VSAT

There are 8 operators and companies that provide VSAT services. Mongolian Telecom has 19 VSAT stations, Incomnet (<http://www.incomnet.mn>) has over 400, Orbitnet (<http://www.electronics.mcs.mn>) has over 29, Mobicom has 94, Skytel has 4, Unitel has 31 and G-mobile has 29 VSAT stations throughout Mongolia.



Graph 28. Number of VSAT stations by companies

### ICT consulting companies

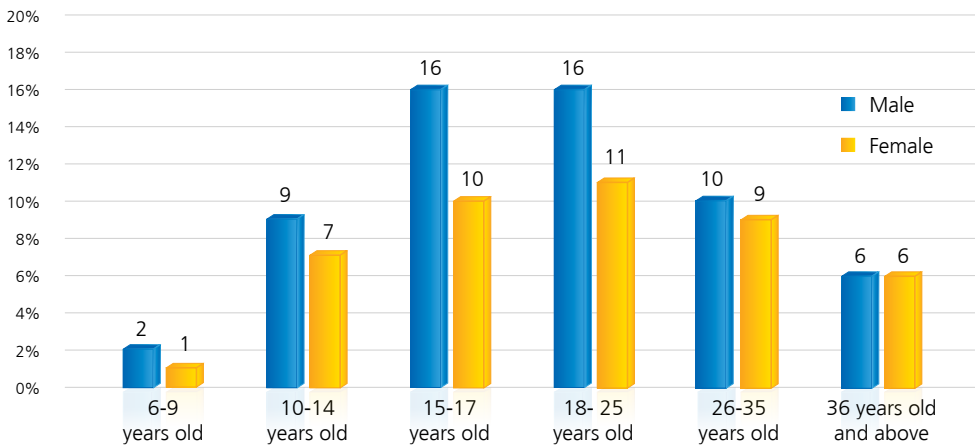
There are about 10 companies, which specialize on providing ICT consulting services. The concept of consulting services is considerably new in Mongolia, therefore, the majority of companies specializing on ICT consulting service provision tends to offer their services to international and donor organizations, rather than to companies and institutions in Mongolia.

### Internet cafe

There are over 120 internet cafes and game houses in Ulaanbaatar city, which are connected to high speed Internet. The services offered at Internet cafes are access to Internet, use of computers and basic services, such as photocopying, scanning documents and taking photos.

According to the recent survey conducted by Intec (<http://www.itconsulting.mn>), IT consulting company of Mongolia, among the Internet cafes and game houses in the rural parts of Mongolia covering 16 aimags of Mongolia, the estimation is that there are about 3-5 Internet cafes or game houses in each aimag center, leading to conclusion that there are 80-100 Internet cafes outside of Ulaanbaatar city, and over 200 Internet cafes and game houses nationwide.

The majority of them are connected to Internet through ADSL of 256kpbs or 512kpbs connection speed. They are equipped with computers of Pentium IV model, other equipments such as video cameras, digital cameras, printers, photocopy machines, scanners, etc. (Intec, 2009). The following graph represents users of Internet cafes and game houses, from which it can be seen that the majority of users are male high school students, and those who are aged between 18-25 years old.



Graph 29. The users of Internet cafe and game houses by age groups





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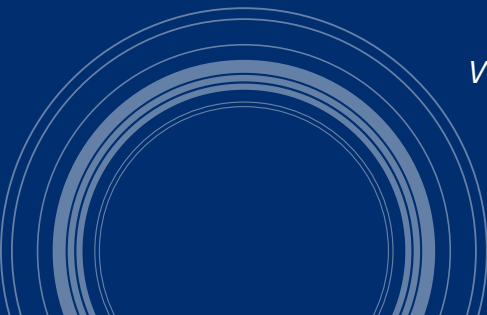
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## Directory Service Providers

There are 144 directory service providers, which have licenses for premium numbers, out of which 106 are in Ulaanbaatar city, and the remaining 38 - in aimags of Mongolia.

In addition to the premium numbers, there are 13 toll-free and local rate numbers to be used for emergency purposes such as ambulance calls, fire alerts, law enforcement agencies, and others.

## Content Development

Extensive efforts are being made to improve content development both for Internet and for mobile phones. Initiatives such as “Mongolian Content Forum”, contests among students and developers on development of software and applications for mobile services, and Further enhancement content for mobile phone, TV, IPTV and Mobile TV are being organized to support and encourage development of Mongolia content.

## Non-Governmental Organizations

There is a number of non-governmental organizations (NGOs), which are active in ICT sector in Mongolia: Mongolian Telecommunications Workers Association (MTWA), Mongolian Information Development Association (MIDAS), Mongolian Software Industry Association (MOSA), Mongolian Internet Service Providers Association (MISPA), MITSA, “Leading Researchers” and others.

NGOs are mainly established with the focus on either addressing sector specific matter (internet service provision, software industry) or on generic areas to promote the development of ICT in Mongolia, such as MIDAS and “Leading Researchers”.

MTWA (<http://www.com-assn.mn>) was established in 1991 with the purpose of establishing an independent organization with members working in all types of private, government and semi-governmental postal and telecommunications organizations of Mongolia to protect and represent the rights of its members.

MIDAS (<http://www.ict.mn/midas>) was established in 2001 with the mission to promote development of ICT sector in Mongolia.

MOSA (<http://www.mosa.mn>) aims at promoting the software development industry to match world standards and requirements and protecting rights of members. It has about 30 corporate members and over 40 individual members.

MISPA (<http://www.mispa.mn>) was established in 2005 as an association to represent and protect the rights of ISPs, coordinate and cooperate with national and international

organizations on pricing and conditions for bandwidth for Mongolia. Since its establishment, MISPA has worked successfully to reduce costs of Internet connections for Mongolia and within Mongolia. MISPA operates Mongolian Internet Exchange (MIX) to transfer Internet data that originates and terminates within Mongolia locally.

MITSA (<http://www.mitsa.mn>) was established in March 2010 with the purpose of improving professional skills of students studying in ICT specialties.

The Leading Researchers NGO (<http://www.leadingresearchers.mn>) was established in 2009 with the purpose of conducting professional research and studies related to ICT development of Mongolia.



Painting by B.Ninjabdar (3rd grade, Mongeni complex school , Ulaanbaatar city)

## 6. Challenges of ICT development of Mongolia

Nowadays ICT have penetrated into almost all sectors of the economy and society of Mongolia. The penetration is expressed widely in the use of computers for processing data, development of reports, materials and other documents, providing online information services to citizens, communicating through websites, emails and others, introduction of 3G in mobile services, content development, etc. In addition, the number of softwares and applications used by organizations is increasing together with the complexity of those applications. The Enterprise Resource Planning (ERP) solutions are in greater demand by organizations.

Along with remarkable achievements, Mongolia is yet to tackle a series of challenges of ICT development at national and local level:

1. To advocate the necessity of continuous efforts in creating favorable legal environment by introducing ICT laws in demand;
2. To expand telecommunications network and service provision to have full coverage nationwide;
3. To intensify a national broadband policy to improve quality and affordable services for citizens, households and organizations;
4. To enable provision of online public services to citizens, such as e-government, e-health, e-education, e-government, e-commerce, etc;
5. To promote switching over towards digital technology for radio and television broadcasting;
6. To modernize the postal service by introducing IT based services;
7. To continue promotion of ICT educational programs to improve knowledge and skills of ICT professionals, civil servants and general public to meet demands of a knowledge-based society.

ICTPA is fully committed to continue comprehensive efforts of the Government of Mongolia to build a knowledge-based society, and welcomes all partners to unite with the aim to promote development of ICT sector in our country as one of the essential requisites to foster the implementation of the MDG based Comprehensive National Development Strategy of Mongolia.

## 7. Appendix

### 7.1. Tables

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