



**MOLDOVAN ASSOCIATION
OF PRIVATE ICT COMPANIES**

ICT Sector



in Moldova

Policy White Book



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I. About the Moldovan ICT Association

The Moldovan Association of Private ICT Companies is a non-governmental association whose mission is to advance the competitiveness of the ICT sector and promote the ICT as a core enabler for national economic development. On the international stage the Moldovan Association of Private ICT Companies promotes the industry's potential as a reliable business partner for international IT and BP outsourcing clients.

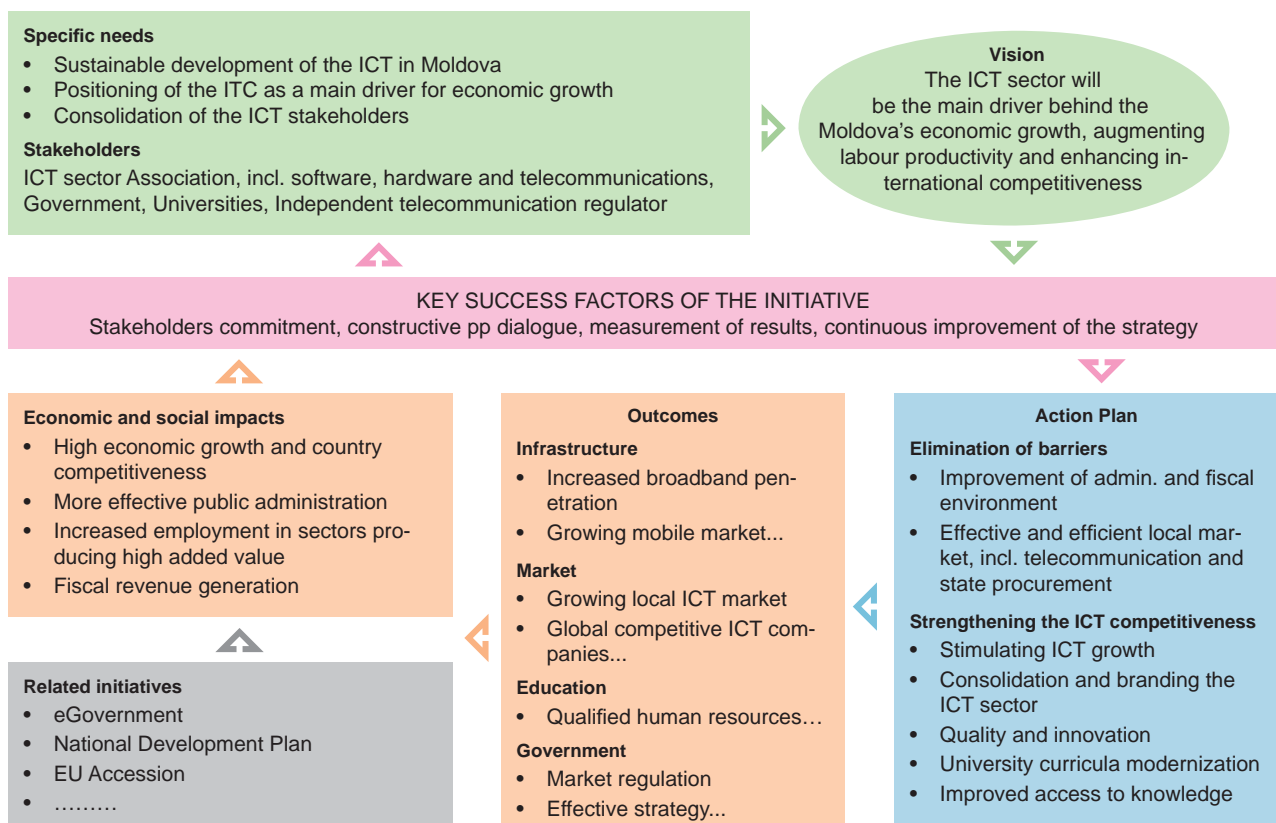
II. About the White Book

This White Book represents the consolidated opinion of the business community represented by the Moldovan Association of Private ICT Companies. Its purpose is to clearly define the national ICT sector as productive economic sector, to identify development opportunities for the next 3 years and to propose strategic recommendations for improving the business environment in the sector.

The process of developing the White Book started in January 2009 and included a series of consultations with private companies represented by the association, donors, and the Government. Thanks to the support provided by the USAID-funded CEED project, the Association has drawn on local and international ICT expertise which helped frame the conclusions within the context of international ICT development.

We believe that the White Book will increase public-private dialogue and help align governmental policies with the private sector priorities. In this context, we very much welcome the Ministry for Information Development's creation of a working group to improve the ICT sector Strategy where representatives from the Association have participated actively.

III. White Book Outline



IV. Recommendations and Priorities – Executive Summary

IV.1. Purpose and scope of the document

The main purpose of this White Book is to give a top-level overview of Moldova's ICT industry as a productive sector of the economy.

The sector's development requirements and outcomes are detailed in terms of economic and societal impacts.

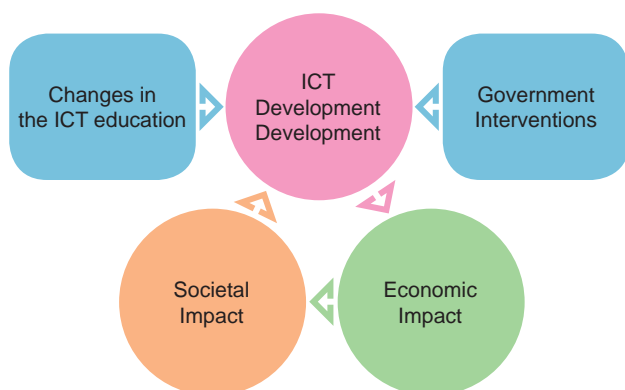
The benefits of Moldova's use of ICT as catalyst for a sustainable growth are detailed in an action matrix.

It is expected that the White Book will increase public-private dialogue and support alignment between private sector priorities and public sector policy goals as identified in the government documents, and that it will be further updated in the future.

IV.2. ICT Development Concept

This section aims to give the reader a big picture of the ICT development process and to show how it influences the economy and society. As shown in Chart 1, the societal and economic impacts of ICT development are basically derivatives from the ICT development outcomes (mobile telecommunications penetration, broadband penetration, computers penetration).

Chart 1 ICT development process



ICT development outcomes exert a positive influence on the labor productivity across the economy, raise efficiency of the public administration and make public services more citizens-centered. On a micro-level, increased labor productivity means augmented competitiveness, higher profits, better-paid employees and a widening tax-base. Increased efficiency of public administration results in increased efficiency, lower delivery costs, better management, and operational control. At the same time, public services will become more citizens-centered, meaning more advanced education technologies, better health protection system, improved administration of public transportation system; effective e-Services supplied, and finally yet importantly, increased citizens' participation in public affairs.

In turn, these positive effects reflect on higher living standards, better education outcomes and an improved social situation. One of the most significant affects derived from the economic outcomes is an increased number of available and decently paid jobs. More jobs in the economy will lower the migration rates. In the long-term it will improve the country's demographic profile and reduce social security claims on the public budget.



Improved social indicators will obviously have positive effects on the ICT sector by providing better-trained human resources and generating more demand for the ICT services.

It is clear however that the Government and education system have critical roles for this “virtuous circle” to set in motion. The main inputs expected from the Government are:

- Fair and equal treatment of all ICT market players,
- Effective regulation of the telecommunication market to enable competition,
- Transparent public tendering (procurement) procedures,
- Clear, simple, and predictable fiscal climate,
- ICT-responsive education policy,
- Effective protection of intellectual property rights.

In turn, the role of the educational system is as important as governmental interventions. For the ICT sector to develop its full potential, education institutions are expected to:

- Increase higher education enrollment rates to converge to the regional standards;
- Institutionalize aptitude tests for student enrollment in ICT-related fields;
- Adjust training and research curricula to ICT market needs.

IV.3. Moldova ICT Sector Development Vision

In our vision, in 5 years, the ICT sector will be the main driver behind the Moldova’s economic growth, augmenting labor productivity and enhancing international competitiveness, including by the wider use of ICT products and services across the economy and society.

The sector’s development will be driven by the enabling factors of rapidly increased mobile and widespread broadband penetration and the supporting factors of an effective regulatory framework and appropriately skilled and competitive human resources.

To achieve an effective and transparent dialogue with the Government a cohesive and focused ICT sector will ensure that changes introduced at the government level are matched by the desired response and from ICT companies.

IV.4. Opportunities

With a GDP share of 9.5% and with services exports growing 5.5 times in 2004-2008, the Moldovan ICT sector can be a major driver for increased competitiveness of the economy. ICT provides opportunities for building a competitive economy and increasing the effectiveness of the public sector. In the Strategy for ICT R&D and Innovation in Europe: Raising the Game¹ from 13 of March 2009 the EC stresses the importance of the ICT sector in economic development and provides a number of strong arguments in support of the ICT sector which are relevant for Moldova as well:

- ICT provides essential infrastructures and tools for knowledge creation, sharing and diffusion. ICT boosts the innovation capacity of all sectors and contributes to more than 40% of the overall productivity growth.
- ICT is also essential to address Europe's societal challenges. It brings unique responses e.g. to the growing needs for sustainable healthcare and ageing well, for better security and privacy, for a lower carbon economy and for intelligent transport.
- The importance of ICT is reflected in R&D budgets across Europe, where ICT typically represents more than 30% of the total.

¹ COM(2009) 116 final

In case of Moldova, two additional arguments can be added:

- The development of the ICT sector is a precondition for the overall modernisation of the society and for bridging its rural-urban development divide.
- The ICT sector is the key factor for the economy to move from being based on traditional sectors to a knowledge-based economy.

The EU strategy defines requirements for resources and stakeholders to be mobilised along three interlinked paths, which are relevant for Moldova as well:

- Raise both public and private investments in ICT R&D&I in Europe and increase their efficiency
- Prioritise ICT R&D&I in Europe into key areas and reduce the fragmentation of efforts
- Facilitate the emergence of new public and private markets for ICT-based innovative solutions

In case of Moldova, another precondition for the emergence of new ICT markets is to:

- Increase the mobile telephone penetration rate and the broadband penetration rate which are key drivers of new ICT markets and businesses.

The Moldova's ICT sector White Book proposes actions that are aligned with the paths defined by the Strategy for ICT R&D and Innovation in Europe. We are convinced that a more rapidly growing ICT sector will set in motion long-term and society-wide positive effects for Moldovan society. It will make a significant contribution to employment of young and qualified people, channel more tax revenues to the public budget, reduce transaction costs across economy, increase the ICT literacy in the society and enhance competitiveness of the Moldovan economy.

IV.5. Biggest Challenges

While the Moldovan ICT sector has significant growth potential, there are a number of key challenges hindering its development. On a strategic level, the key challenges could be summarised in the following categories:

Low affordability of internet connectivity

The low affordability of internet connectivity, which is from 5 to 10 times more costly than in CIS countries in per capita affordability terms, is a fundamental constraint affecting development of the IT society and IT economy. This issue must be addressed with temporary interventions and supports that can be removed when the tipping point of penetration reaches around 20% and market forces start to drive adoption and traffic.

Weak educational system

A weak educational system in the ICT area fundamentally undermines the ICT sector for which human resources are THE critical input. While the annual inflow of young ICT specialists is high in terms of quantity, the quality of the specialists suffers because of the outdated educational methods, poorly defined curriculum, weak business-university partnerships and shortage of skilled teaching staff.

Inconsistent sector messages

Mixed messages coming from the telecoms and existing ICT groupings are another significant hurdle to change. Both groups have a symbiotic relationship and failure to prioritise a common message to government drives procrastination in the regulatory and procurement areas. A common message with a shared view of actions and impact will result in reducing the barriers to change.



Below potential ICT market growth

Growth of the domestic markets in the communications and software development is below potential because of the dominant state monopoly in the telecommunications sector and because of the public tenders favouring state-owned software developing companies.

Unfavourable administrative environment

While software companies are subject to some fiscal exceptions, the generally unfavorable administration system and complex fiscal environment raise the costs of doing business in the ICT sector thus generating competitive disadvantages for Moldovan companies.

Ineffective private-public dialog

Ineffective dialog between the ICT Sector and Moldovan Government leads to unclear development priorities, low ICT sector visibility, and non-functional strategies. ICT in Moldova still is perceived as separate from other components of the “knowledge economy”, such as higher education and Research & Development activities.

IV.6. Prioritized Actions/Interventions

We can distinguish two main types of interventions needed to support rapid ICT growth in Moldova and achieving higher competitiveness of the overall economy.

1. Elimination of the barriers for ICT sector growth

On the one hand, ICT stakeholders in Moldova should find balanced solutions for the existing challenges in order to normalise the ICT environment in the country and to eliminate the barriers for ICT sector growth.

Improvement of the administrative and fiscal environment for the ICT sector

The Association will work with the Government in order to improve the administrative procedures related to the ICT sector. The immediate objectives of the actions will be to provide directions for VAT reimbursement in a shorter time, to establish a clear framework for ICT expenses treatment in the companies' accounting, and to simplify the administrative procedures related to the ICT sector. Because of these actions, the ICT companies will be able to plan and accelerate their investment strategies that will contribute to higher growth in the sector. We can expect that the proposed measures will decrease the share of the “grey” ICT market and will increase the overall taxes paid by ICT companies to the national treasury.

Effective and Efficient State Procurement

The Association will maintain constructive dialogue with the Government in order to improve state procurement procedures from purely cost base criteria to criteria that will guarantee effective and efficient quality solutions and will eliminate the privilege position and cross-subsidy of the state owned enterprises. Because of these actions, the private ICT sector in Moldova will be able to achieve sustainable growth and develop competencies that will provide long-term competitiveness advantages in the international market. At the same time, the public sector will acquire more solutions that are effective and will reduce its total cost of ownership of the ICT systems.

2. Strengthening the ICT fundamental competitiveness

On the other hand, the elimination of the current barriers will not automatically promote rapid growth in the ICT sector and higher national competitiveness. Further investments in strategic actions such as education and R&D are needed in order to actively stimulate sustainable ICT growth in the country. The key actions proposed on strategic level are:

Stimulating sustainable growth of the local ICT Market

The Association will establish and maintain constructive dialogue with the National Regulatory Agency for Electronic Communications and Information Technology in order to define and implement measures for stimulating market development of mobile services and broadband access. In addition, we will work with the all ICT stakeholders in the country to promote increased competitiveness of the Moldovan ICT industry through wider implementation of ICT products. As a result we expect rapid growth of the domestic market and improved national economic competitiveness. A growing domestic ICT market is a critical factor for the sustainable development of the ICT sector in the current global economic crisis.

Branding and positioning of the ICT sector

The Association will develop a branding plan and strategy that will present the ICT sector as a reliable partner both in the domestic and international markets. As a result, we expect the international image of the Moldovan ICT sector will be that it is as an excellent investment opportunity. On the domestic market, the sector will be positioned as one with excellent career opportunities for Moldovan specialists and as a provider of solutions that can increase the competitiveness of the Moldovan economy.

Competitiveness based on Quality and Innovation

The Association will analyse and propose measures for promotion of R&D and Innovations and Quality activities related to the ICT. As a result, we expect that Moldovan ICT companies will be able to achieve higher competitive advantage based on value added solutions.

Education and Human resources development

Modernization of university ICT curricula in cooperation with the private sector

The Association and Universities will create a working group on education that will coordinate improvements to the current curricula, develop new curricula in the Moldovan Universities, and update of the official registers of economic occupations. Private ICT companies will improve their coordination in activities that support ICT education. Universities and individual students will have direct access to the industry through short- and long-term internships. As a result, a higher share of ICT students will be employed in the Moldovan economy.

Engineer aptitudes testing

Aptitude testing will be implemented in relevant Universities as a condition of entry to all technical and engineering courses. The limited availability of places will be allocated to students who have the potential to be effective engineers and are likely to seek employment in the ICT sector after graduation.

Creation of strategic alliances with world recognised Universities and ICT excellence centres

The Association, Government, and Universities will define the needs of the sector, and then will plan to attract educational institutions, excellence centres, and global ICT players to extend their activities to Moldova in cooperation with leading Moldovan organizations. As a result, the Moldovan ICT sector will have direct access to modern technologies and relevant knowledge.



V. Moldova ICT Development in Regional Comparison

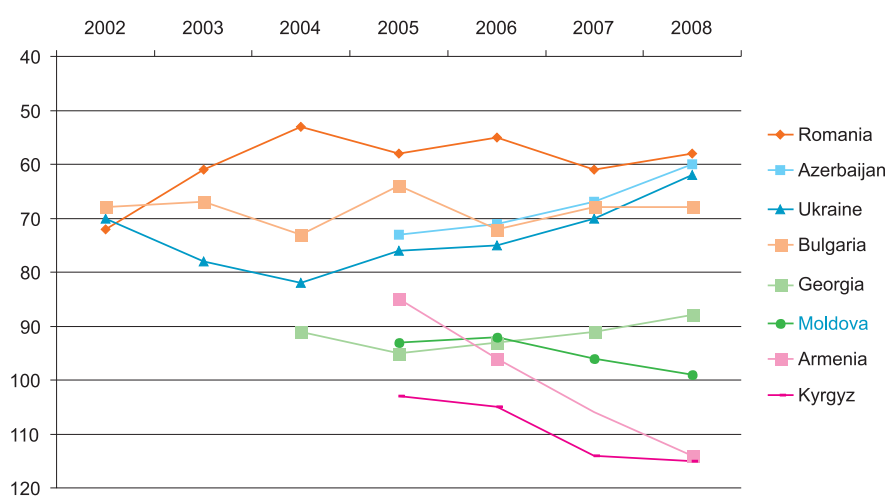
V.1. Falling Network Readiness Index

Moldova has achieved some progress in ICT development; however it still fares quite poorly in most international comparisons. Moldova's positions do not improve dramatically even in comparison with those countries which are close geographically, in their historical background, and in their level of economic development.

Moldova's rank in the Network Readiness Index has fallen almost constantly in 2005-2008² (see Box 1 for an explanation of the NRI). As in 2005, presently Moldova is positioned close to the bottom of the regional group, sharing similar positions with the poorest members of the CIS, i.e. Georgia, Armenia and Kyrgyz Republic. Other countries in the region, including neighbouring Ukraine and Romania, are growing in terms of NDI readiness³.

Despite remarkable growth in the ICT sector in Moldova, we can explain the decline in the NRI by the deterioration of competitive market conditions, relatively high prices for mobile communications, and low access to broadband Internet. The large urban-rural development divide also reflects a large urban-rural gap in Moldova's ICT development.

Chart 2 Moldova's Rank in the Network Readiness Index in regional comparison



Source: World Economic Forum, INSEAD, <http://www.insead.edu/v1/gitr/wef/main/analysis/historicaltrends.cfm>

² Network Readiness Index is computed annually by the INSEAD Business School and the World Economic Forum.

³ The Networked Readiness Index 2007–2008 rankings, INSEAD Business School, World Economic Forum <http://www.insead.edu/v1/gitr/wef/main/fullreport/index.html>

Box 1. What is the Network Readiness Index?

Network Readiness Index (NRI) is a research project conducted by the World Economic Forum in collaboration with INSEAD since 2002. The NRI is directed at measuring economies' capacity to fully use ICT for enhancing country's competitiveness and development level. It was build on a set of data collected by well recognized international organizations, such as the International Telecommunication Union (ITU), the World Bank, and the United Nations, as well as on survey data conducted annually by the World Economic Forum in each of the economies included in the Annual Report from the Executive Opinion Survey, conducted annually by the World Economic Forum in each of the economies included in the Report.

The Networked Readiness Framework is based upon the following pillars:

- Three important stakeholders to consider in the development and use of ICT: individuals, businesses, and governments;
- General macroeconomic and regulatory environment for ICT, where stakeholders play their particular roles;
- Degree of usage of ICT by these three stakeholders, which is linked to their degrees of readiness/ capability to use and benefit from ICT.

The framework used for NRI counting represents an effort to straighten out the essential complexity behind the role of ICT in a nation's development. The main features of this are:

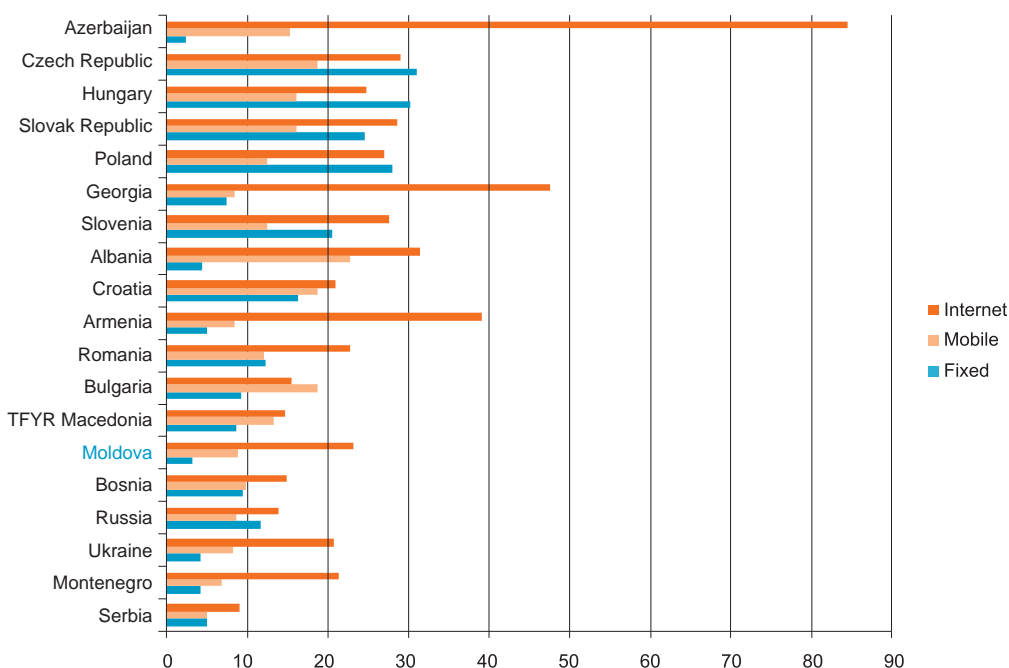
- a model for computing the relative development and use of ICT in countries,
- background that enrich understanding of a nation's strengths and weaknesses with respect to ICT.

Source: WEF, INSEAD, <http://www.insead.edu/v1/gitr/wef/main/about.cfm>

V.2. Relatively High Price of Communication Services

In absolute terms costs of communication services, including mobile, in Moldova are not high (Chart 3). As one report shows, effective mobile tariffs are on average \$0.07 per minute, with average revenue per user at about \$10-12/month⁴.

Chart 3 Countries ranking by absolute cost of telecommunication services basket*, USD



Note: * - countries are ranked based on simple average cost of internet, mobile and fixed telephony basket as defined by ITU.

Source: ITU "Measuring Information Society: the ICT Development Index", 2008

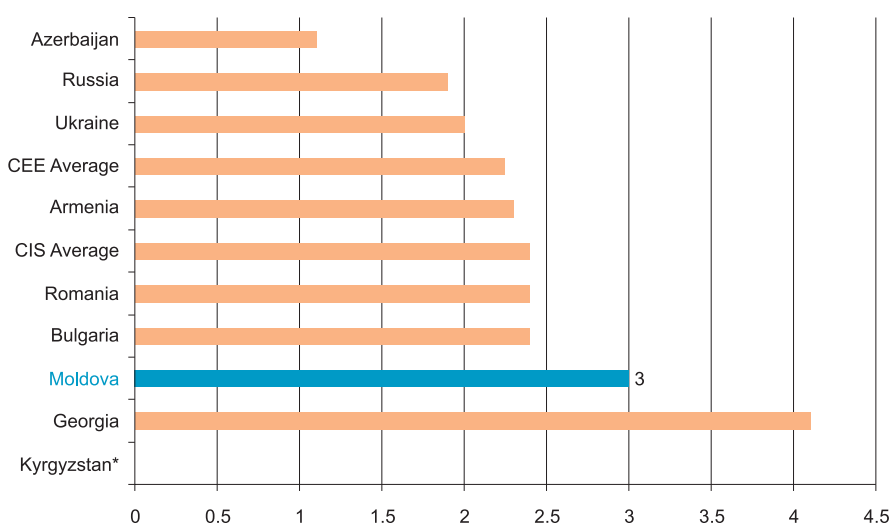
⁴World Bank, "Moldova Telecommunications sector diagnostic note", August 7, 2008, page 6.



However, because of the high level of poverty in Moldova, the absolute cost of services has to be expressed as ratio of the Gross National Income per capita in order to normalize the data and make more valid international comparisons. As shown in the Chart 4, Chart 5, and

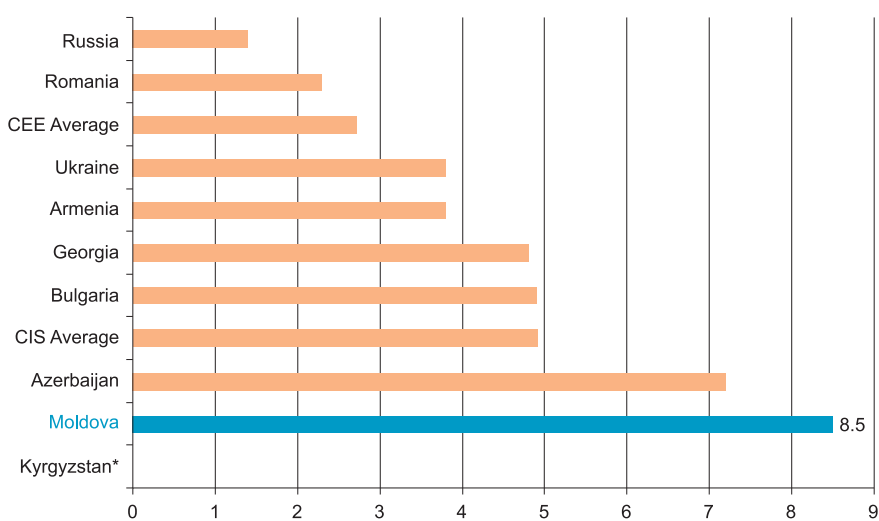
Chart 6 the relative cost of telecommunication services (in terms of GNI) are among the highest in the CIS countries and the CEE countries. In the case of mobile telecommunications, the services in Moldova are the most expensive as compared these countries. The cost of the mobile services basket is 2 times higher than the average cost of these services in CIS countries, which undoubtedly is one of the main factors inhibiting the mobile penetration rate growth in particular, and telecommunication services usage in general (according to the WEF methodology, the mobiles services basket includes a standard set of typical mobile services for different usage patterns). Another factor influencing the cost of the mobile telecommunication is relatively high, operator-to-operator asymmetric inter-connection rates. This results in stagnation and concentration of the mobile telecommunications market.

Chart 4 Price of the fixed telephony, % of Gross National Income per capita



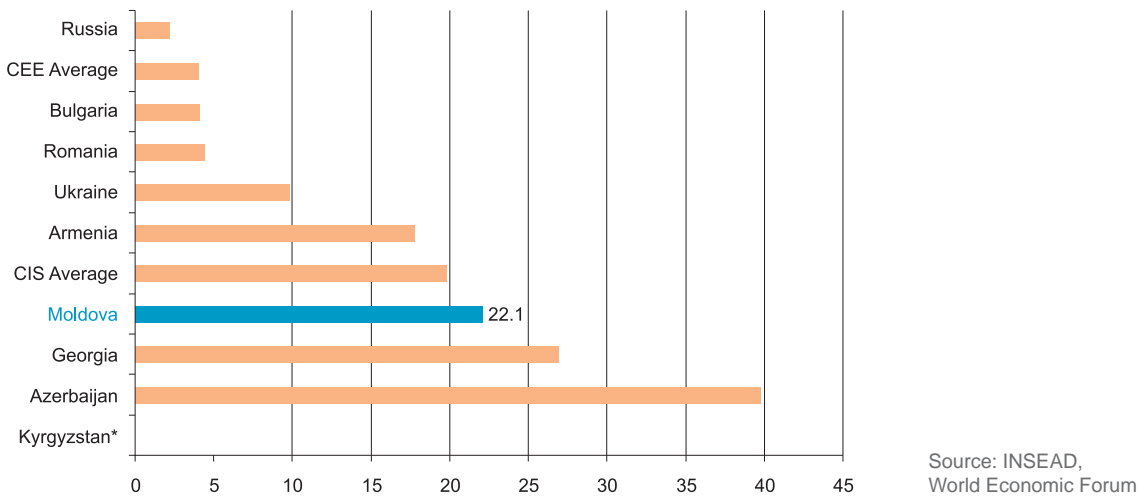
Source: INSEAD, World Economic Forum

Chart 5 Price of the mobile telephony, % of Gross National Income per capita



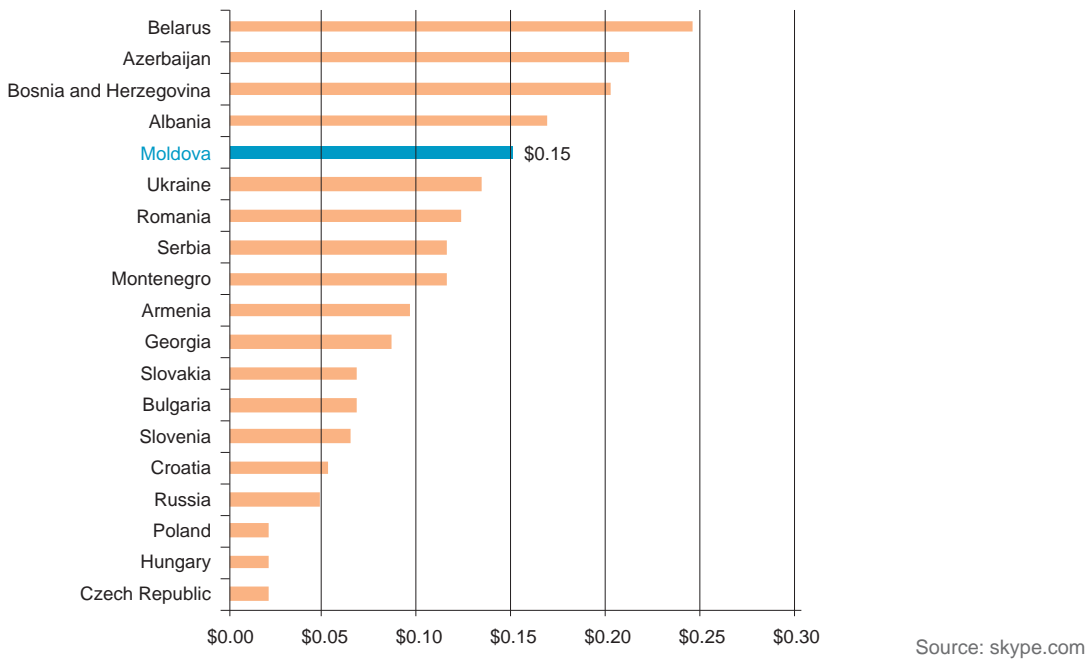
Source: INSEAD, World Economic Forum

Chart 6 Price of the broadband Internet access, % of Gross National Income per capita



As for the price of fixed telephony, it is rather low both in absolute and relative terms. But this low price is the direct result of an administrative cross-subsidising policy rather than being set by the market. This is supported by the fact that inbound calls to Moldova are the ones of most expensive (Chart 7) in Europe and comparable with the underdeveloped countries where ineffective regulations of the telecommunication market are the main obstacles to growth.

Chart 7 Sample of prices per one minute of the international VoIP call, USD



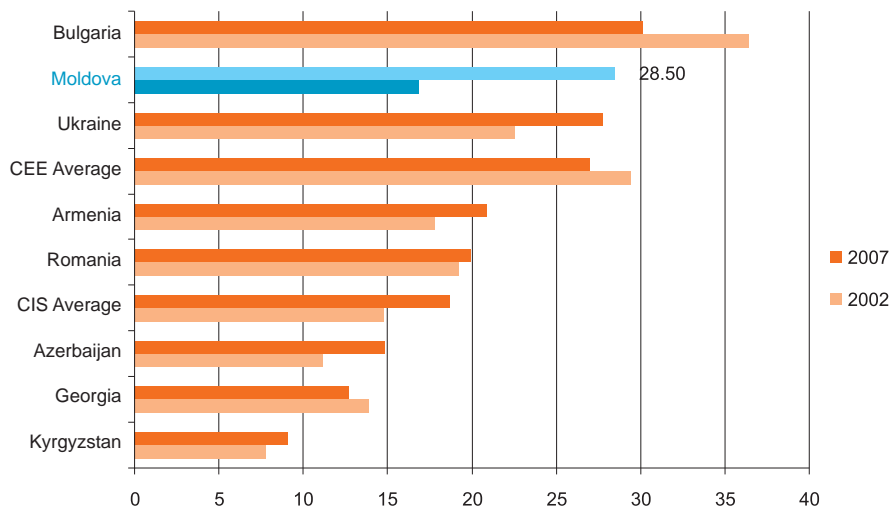
Broadband internet is again among the most expensive in the CIS and CEE region, 3 times more costly than in Romania and 2 times more than in Ukraine. The high cost of broadband connections are associated with a number of regulatory problems and infrastructure bottlenecks and result in a very low broadband penetration rate. There is no way to develop a truly knowledge-based economy unless the broadband penetration rate exceeds 20%.



V.3. High Fixed Line Penetration and Low Mobile Penetration

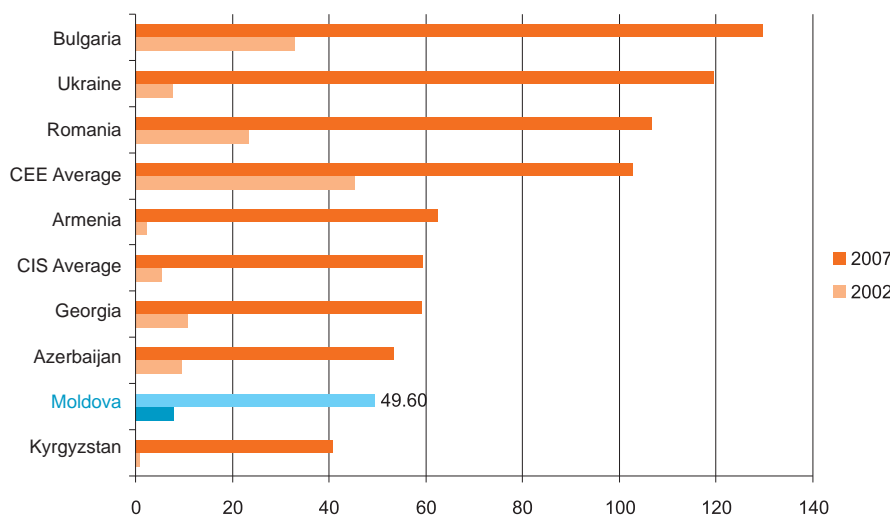
Inherited from Soviet times, a well-developed telecommunications infrastructure in Moldova has established a strong foundation for the modern development of fixed telephony. The fixed line penetration rate significantly exceeds the average figures for CIS and CEE. Somewhat contrary to the trend observed in Central Europe countries in the last years of substituting fixed lines with mobile lines, the availability of fixed telephony in Moldova has almost doubled over the past 5 years and could be a good base for growth in the number of broadband Internet connections. However, it is clear that as a market in itself the fixed line telephony in Moldova probably has reached its apex and in the future would be left behind by the mobile telephony.

Chart 8 Fixed telephone lines per 100 inhabitants



Source: INSEAD, World Economic Forum

Chart 9 Mobile telephone subscribers per 100 inhabitants



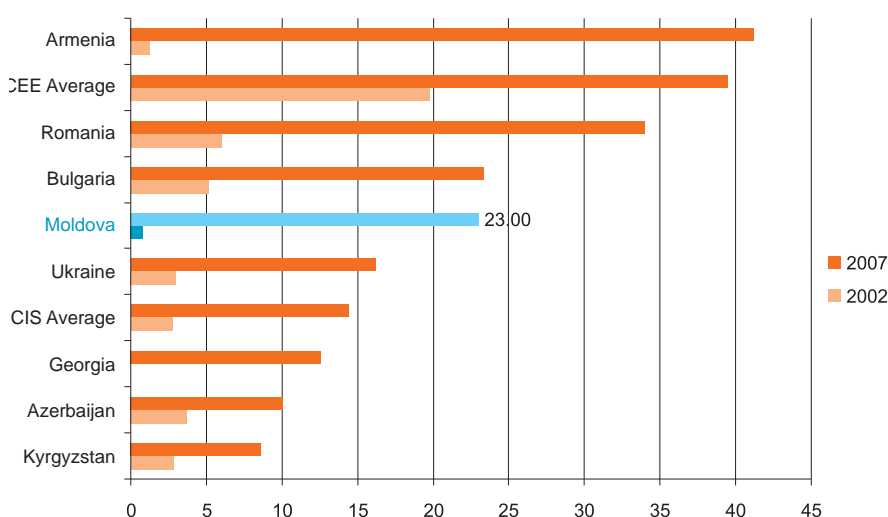
Source: INSEAD, World Economic Forum

The penetration rate for mobile telephony is much lower in regional comparison. Not only is level of mobile penetration in Moldova (49.6% as of end 2007) lower than the average for the CIS (59.6%) and CEE (102.7%), it is also two times lower than in its immediate neighbours, Romania and Ukraine. This suggests that the mobile telephony market has large potential for growth before it converges with the regional standard. Increased and fair competition and better-focused regulation would definitely help reducing costs and increasing availability of the services. So far, private investments made in this sector were among the most profitable and have been crucial for the development of the sector.

V.4. Relatively Low Computer and Internet Access

In comparison with CIS countries, Moldova enjoys a higher rate of computer penetration. This is a very positive sign that the broadband penetration rate can dramatically increase if critical constraints are removed. At the same time, Moldova yet has to converge to CEE standards in terms of hardware endowment. The public administration and education sectors are probably the sectors with potentially the highest demand for computers.

Chart 10 Proportion of households with computer, per 100 households

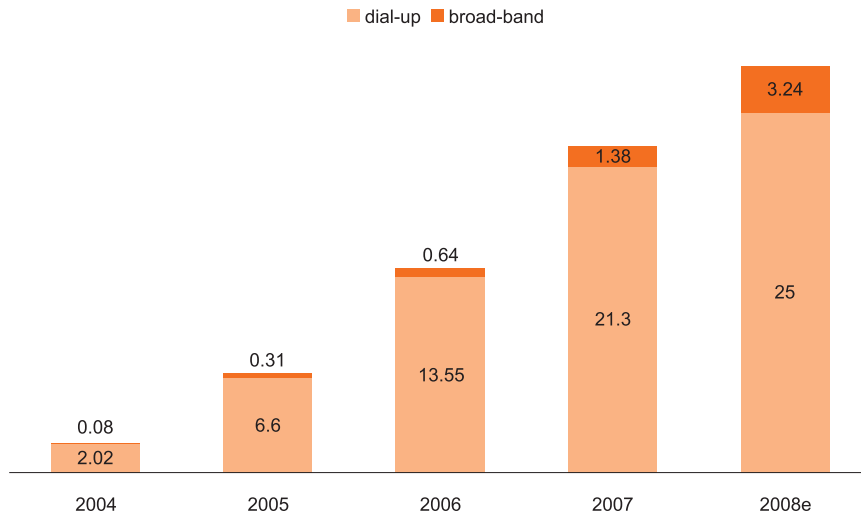


Source: INSEAD, World Economic Forum

Access to the Internet has about 28% of the population. The proportion of users who has the broadband access is very low, below 4% (Chart 11). Though such a low penetration rate of broadband access can be compared with the CIS countries, it is almost 5 times less than in CEE countries (Chart 12). Low broadband penetration is a critical constraint on the way of development of the ICT sector. (As in case of the traditional economy which cannot develop with underdeveloped physical infrastructure, such as roads and electricity).

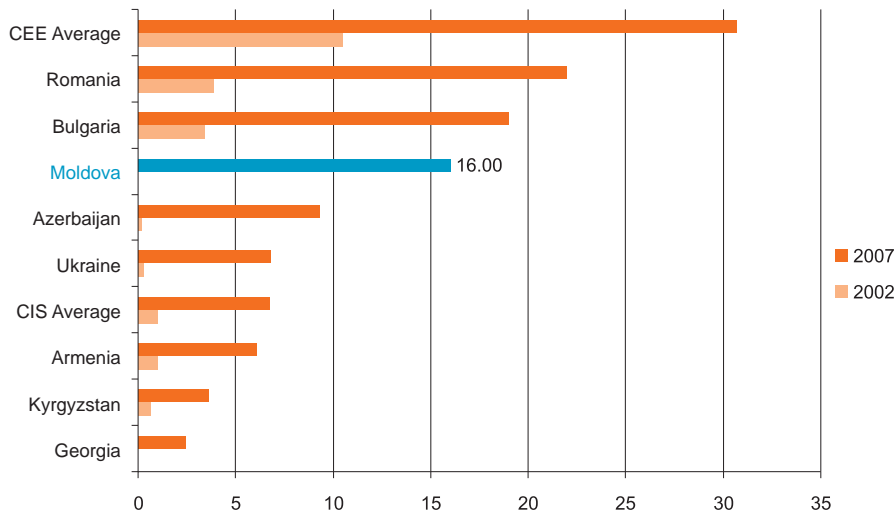


Chart 11 Internet penetration rate, users/100 inhabitants



Source: MDI, NARITE and ATIC estimates for dial-up penetration rate for 2008.

Chart 12 Proportion of households with Internet, per 100 households



Source: INSEAD, World Economic Forum

VI. ICT Sector in Economic Context

VI.1. An Incomplete Official ICT Definition

ICT sector definitions used by the Moldovan government do not convey the real composition of the ICT sector, which is much more complex and richer than generally believed. The Draft of the Governmental Strategy on Development of Information Technologies and Communications (SDITC) refers only in general terms to “software developing companies” (NACE codes 72000) and “electronic communications” (NACE codes 64200) and does not include computers and other hardware production and equipment wholesales. The formal argument for omitting the manufacture and sales sector in the SDITC was that the value-added created in these subsectors is very low because companies are mainly importing rather than producing hardware. Such an argument is flawed for several reasons.

- Besides computers import/assembly the ICT manufacture sub-sector includes many other branches which are present in Moldova, such as manufacture of electronic components, manufacture of transmitting equipment, manufacture of radio and TV receivers and others which are part of ICT industry because of rapidly evolving technological and software contents. (According to EU standards, even the manufacture of the insulated wire and cable is part of the modern ICT definition).
- Even those trade companies that are only importing and selling hardware are part of the Moldovan economy; they create supply, employ people, and pay taxes.
- A well-developed computer market provides the necessary infrastructure to the overall ICT sector growth.

VI.2. What is ICT sector in Moldova?

There is no standard ICT definition accepted by all countries, but most of the developed countries tend to adopt definitions close to those used by the EU countries and which are based on the European nomenclature NACE rev.1. In most of the EU countries, the ICT sectors include 19 broad industries (at 4-digit NACE disaggregation level, see services.

Box 2). These industries can be grouped in four subsectors: equipment manufacture, wholesale of equipment, telecommunications and software developing.

Presently the Moldovan NACE edition 2005 is compatible with the EU NACE and this allows for constructing statistical figures reflecting the European definition of the ICT sector. Based on the European comprehensive definition of the ICT, it has to be mentioned that in 2007 only one manufacture industry was not present in the Moldova ICT sector (manufacture of office machinery), while in all other manufacture and services branches at least one company was reported active.

Moldovan ICT sector is rapidly growing: 1228 companies were active in 2007, as compared with 934 companies in 2005⁵. Most of the ICT companies are micro-, small or medium-sized enterprises, employing on average 10-20 people. Only the telecommunications sub-sector is dominated by large and very large enterprises employing hundreds and even thousands people.

According to 2007 data, in Moldova there are about 89 companies specialized in the manufacture subsector as compared with 75 in 2005⁶. This sector is dominated by 26 companies specialised in the manufacture of television and radio receivers, sound or video recording or reproducing apparatus and 33 companies in the manufacture of instruments and appliances for measuring, checking and control (Table 1). While the technological progress of these industries is not very advanced, their ICT use and content is growing.

As many as 154 companies are specialized in equipment wholesale, while in 2005 their number was 124. The wholesale sector is composed of mainly of companies specialized in the sale of radio and electronic

⁵ ATIC calculations based on statistical information from the NBS.

⁶ Ibid.



appliances (36 companies), and sales of computer, other computer accessories and software (103 companies), but there also 7 companies specialized in wholesale trade with other office machines and equipment and 8 companies in wholesale trade with other electronic components. Some of the companies in this subsector operated as groups (clusters) with clear division of operational responsibilities (production, import, assembly, and sales)⁷.

In 2007, about 466 companies, as compared with 358 companies in 2005, represented the telecommunications sub-sector. There are 4 companies providing mobile telecommunications services, and many more companies providing fixed telephony and internet services, but with the state-owned Moldtelecom clearly dominating the sector.

Software sub-sector is the most rapidly growing, in terms of number of companies: 519 in 2007 as compared with 376 in 2005. This sector has emerged almost from zero and benefited from the rapidly growing number of young professionals. However, since the market is growing and competition becoming fiercer, the sector has to get to a qualitatively new stage of development based on larger numbers of highly trained IT specialists. National software companies have expertise in such areas as e-government, Business Process Integration, ERP-solutions for financial sector, and Web programming. This is the sector where the number and volume of unreported economic activities is the highest per entire economy. As interviews with software and hardware companies have shown, the unobserved market may account for 1/3 of the official one. Most of the free-lancers are selling their services internationally, while payments are often received in form of work remittances, making it difficult to evaluate the total amount of exported ICT services.

Box 2 [Composition of the ICT sector in the EU countries](#)

In EU countries the **ICT sector** is seen as part of the broader **Information sector** (which includes also the **content sector**). The ICT sector is composed of all industries that produce goods and services for the information society and includes many manufacturing and services industries. A "typical" definition of the ICT sector based on the NACE rev.1 would include the following industries:

Manufacturing:

3000 – Office, accounting and computing machinery; 3130 – Insulated wire and cable; 3210 – Electronic valves and tubes and other electronic components; 3220 – Television and radio transmitters and apparatus for line telephony and line telegraphy; 3230 – Television and radio receivers, sound or video recording or reproducing, apparatus and associated goods; 3320 – Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process equipment; 3330 – Industrial process equipment.

Services:

5143 - Wholesale of electrical house-hold appliances and radio and television goods, 5164 Wholesale of office machinery and equipment, 5165 Wholesale of other machinery for use in industry, trade and navigation; 6420 – Telecommunications; 7123 – Renting of office machinery and equipment (including computers); 72 – Computer and related activities.

These industries can be more specifically subdivided into equipment manufacture industry, equipment wholesale trade (and in some countries retail trade as well), ICT consultancy services, and telecommunication. Most of the problems in defining the ICT arise when it comes to the manufacture and wholesale subsectors. It has to be mentioned that in most European countries ICT manufacture and wholesale sub-sector includes not only "classical" ICT products (computers, laptops, printers etc.) but also the household appliances and industrial electronic equipment (such as TV and radio sets, players, different industrial controllers, measuring equipment etc.). The latter are becoming more and more digitalised i.e. by their technological content are rapidly converging to "classical" ICT product. Main part of the value-added they incorporate is by no means ICT product. However, some of the OECD countries include in the wholesales only the core ICT products.

Source: OECD

⁷ATIC calculations based on statistical information from the NBS.

Table 1 Moldova's ICT sector definition based on European NACE rev.1 approach

4-digit code in Moldovan NACE	Description	No. of companies*	
		2005	2007
Equipment manufacture			
3001	Manufacture of office machinery	0	0
3002	Manufacture of the computers and other information processing electronic equipment	9	9
3130	Manufacture of insulated wire and cable	3	5
3210	Manufacture of electronic components	1	1
3220	Manufacture of transmitting equipment	6	10
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	23	26
3320	Manufacture of instruments and appliances for measuring, checking and control	30	33
3330	Manufacture of industrial process control equipment	3	5
	<i>Total equipment manufacture</i>	75	89
Equipment wholesale			
51432	Wholesale of radio and television goods	38	36
5184	Wholesale of computer, equipment and software	77	103
5185	Wholesale of other office machinery and equipment	5	7
5186	Wholesale of other electronic equipment and components	4	8
	<i>Total equipment wholesale</i>	124	154
Telecommunications			
6420	Telecommunications	358	466
	<i>Total telecommunications</i>	358	466
Software and other computer-related services			
7133	Renting of office equipment and computers	1	1
7210	Computing systems consultancy	33	58
7220	Software development and consultancy in the area of computers and related areas	116	197
7230	Data processing	33	43
7240	Database related activities	37	43
7250	Maintenance and repair of office equipment and computers	70	88
7260	Other computer related activities	86	89
	<i>Total software and other computer-related services</i>	376	519
Total ICT sector		934	1228

Note: * - companies which have indicated the corresponding code as their main area of activity

Source: ATIC calculations based on Moldova NACE edition 2005 and statistical information from the NBS.

VI.3. A High Share of the ICT Sector in Total GDP

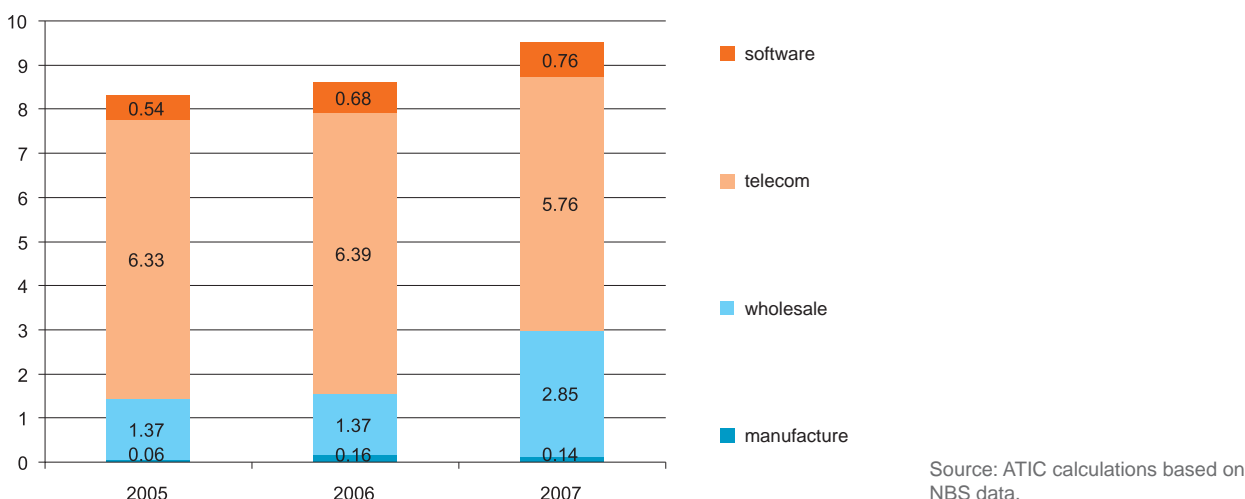
According to Association estimates based on the statistical information received from the National Bureau of Statistics, ICT sector's share in total GDP has grown from 8.3% in 2005 to 9.5% in 2007 (see Chart 13). While comparisons with earlier periods are difficult due to changes in the NACE in 2005, based on the national statistical accounts we estimate that in 2002-2004 the share of the ICT sector was around 6.5%-7.5% of the GDP. i.e. in long term, the ICT sector has grown faster than the economy as a whole and may have exerted a positive impact on labor productivity in some sectors such as banking and public administration.

It is interesting to note that by international standards the share of ICT in GDP in Moldova is relatively high. According to some sources, the EU average for ICT's share in GDP is 4.5%⁸. Coupled with increasing exports of ICT products and services, the relatively high share of ICT in Moldovan GDP is a feature

⁸ COM(2009) 116 final

common for the countries with a rapidly growing ICT sector. Even more, it could be interpreted as a sign that the ICT sector is more competitive than other sectors of the Moldovan Economy. When combined with a high network readiness, a relatively large ICT sector may positively influence labor productivity in the entire economy.

Chart 13 Share of the ICT sub-sectors in Moldova’s GDP and total contribution of ICT in GDP



The telecommunications sub-sector is the largest within the ICT sector (Chart 13), contributing about 5.8% to the country’s GDP; however, its share in total value-added created by ICT has been rapidly declining from 76.6% in 2005 to 60.6% in 2007. In long term, its share is expected to grow again as monopoly structures are removed and competition gets more intense.

The manufacture sub-sector has a marginal role in the total output of the ICT sector but the general trend is positive (from 0.75% of GDP up to 1.44% in 2007). The profitability of enterprises in this sub-sector is quite low. Many state-owned companies survive only due to soft budget constraints. However, the sector has big potential that can be realised if it becomes more integrated with software companies and universities.

The equipment wholesale sub-sector has a growing share in the total ICT value-added: 30% in 2007 as compared with 16.5% in 2005.

As for the software sub-sector, its share of ICT value-added has rapidly increased in the last years, from 6.6% in 2005 to 8.0% in 2007 (and the estimate for 2008 is 8.5%).

However, these estimates are probably too conservative because of large unobserved activities in the software and hardware wholesale sub-sectors. There are no official estimates regarding the share of these unobserved activities, but according to some Association members, in the software sub-sector, the unobserved sales may represent about 30% of the official market.

VI.4. Growing Exports and Imports of ICT

The ICT sector is very open to the global economy and is influenced by the import and export regimes. It is interesting to note that statistical data show small but rapid growth in exports of the computers and other IT equipment (from USD 0.6 million in 2003 to USD 2.7 million in 2007, as shown in Table 2). It is not clear where this hardware comes from, but this trend adds to the argument that the manufacture subsector should not be neglected as part of the Moldova ICT sector. Obviously, imports of hardware are much bigger, accounting for USD 45 million in 2007.

Table 2 Value of exports and imports of some ICT products and services, million USD

Item	2003	2004	2005	2006	2007	2008
Exports						
Computers and other IT equipment	0.6	1.2	1.6	2.1	2.7	n.a.
Computer and information services	1.2	2.6	3.6	8.0	14.3	26.3
Communication services*	24.4	45.3	59.4	71.2	85.7	114.6
Import						
Computers and other IT equipment	16.2	24.6	25.1	28.0	45.0	n.a.
Computer and information services	2.7	6.1	4.4	5.9	15.7	15.9
Communication services*	19.0	18.8	27.3	29.0	37.6	47.4
Trade balance						
Computers and other IT equipment	-15.6	-23.4	-23.5	-25.9	-42.3	n.a.
Computer and information services	-1.5	-3.5	-0.8	2.1	-1.4	10.4
Communication services*	5.4	26.5	32.1	42.2	48.1	67.2

Note: * - includes postal services as well
 Source: Comtrade and National Bank of Moldova;

As opposed to trade in hardware, Moldova has a more favorable trade balance in services. Sales abroad of computer-related and information services have grown more than ten times in only 6 years, from USD 1.2 million in 2003 up to USD 14.3 million in 2007 and USD 26.3 million in 2008. It has to be considered that a large part of exports is not reflected in the balance of payments due to the many unobserved economic activities in the software sub-sector. At the same time, imports of computer and information services have expanded from USD 2.7 million to USD 15.9 million in 2008.

As shown in the table, the trade balance in communications services was continuously positive for Moldova from 2003-2008 (however, it has to be considered that “communications services” include also postal services, which probably account for 10-15% of the total).

VI.5. Growing Fiscal Impact of ICT Sector

As suggested by the NBS data, the ICT sector is an important contributor to the public budget in Moldova and its share has only grown in the last decade.

In 2005-2007 between 7.6% and 9.7% of all VAT paid to the state budget came from the ICT sector. In 2007, the total VAT amount paid by the sector equalled 737.7 million MDL, with 23 million MDL coming from manufacture sub-sector, 167.8 million MDL from wholesales, 413.3 from telecommunications, and 133.5 million MDL from the software sub-sector correspondingly (Chart 14).

Telecommunication and software services are not subject to any customs duties, but the manufacture sector alone has channelled to the budget more than 35 million MDL in 2007 (estimates by the Association based on NBS national accounts). This represents 4.2% of the total amount paid to the state budget in customs duties by Moldovan importers.

ICT companies are also important contributors to the social and medical insurance funds, with more than 240 million MDL paid in 2007 (about 4.3% of total revenues of the social and medical insurance funds). This represents a 50% growth as compared with 2005. About 7.7% of the total ICT sector social and medical insurance payments come from the hardware sub-sector, 66% from the telecommunication subsector, and 26% from the software sub-sector.



Chart 14 VAT paid by ICT sector, million MDL and %

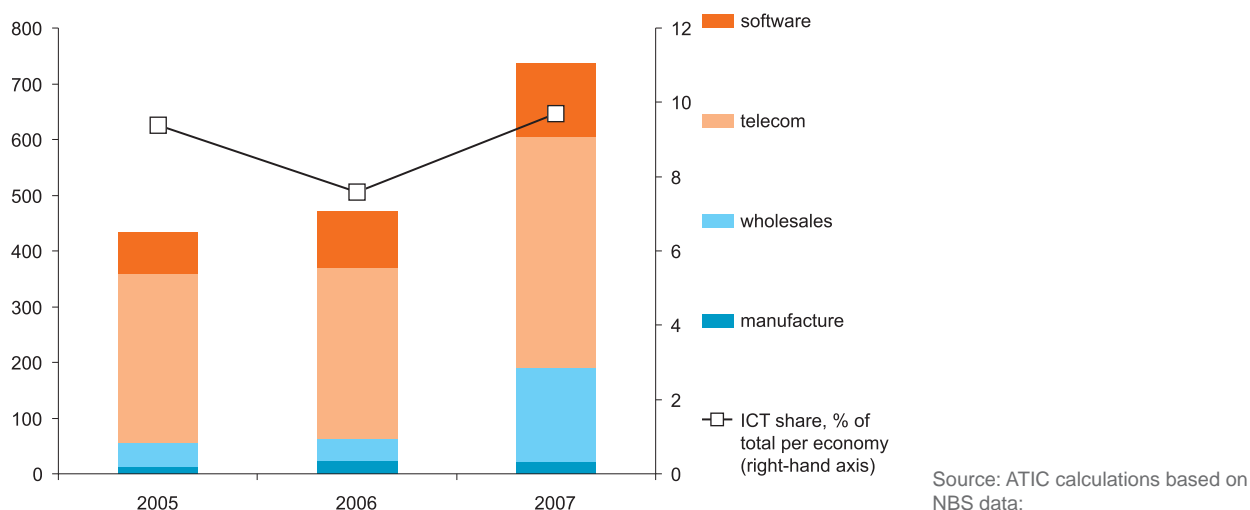


Table 3 Share of ICT sub-sectors, % of total ICT sector payments to social and medical insurance

	2005	2006	2007
Manufacture	6,2	6,9	7,7
Wholesale	1,1	1,0	1,3
Telecom	75,4	68,8	65,6
Software	17,4	23,2	25,4
Total ICT, million MLD	162,7	196,0	242,5

Source: ATIC calculations based on NBS data;

VI.6. An ICT Sector Creating Jobs

According to statistical data provided by the NBS the Moldovan ICT sector employs about 20.5 thousand people, which represent 2.7% of the total labor force reported to the statistical office by Moldovan companies. It has to be mentioned that this figure includes only ICT specialists working in the companies with ICT as main sector as activity, but a big number of ICT specialists are working in the ICT departments of companies in other sectors (banking and finance, education, energy sector, public administration). Some other reports suggest that the total number of active ICT specialists may rise to 40 thousand people.

As indicated in Chart 15 the telecommunications sub-sector employs more than half of the total workers in the ICT sector. However, Moldtelecom employees dominate this figure. Companies engaged in database related activities employ 18% of the ICT labor force, while other software companies employ about 14%. About 15% of all ICT specialists are employed in the manufacture sector, with the wholesales companies only 3.8%.

Chart 15 Distribution of the employed by types of ICT activities and total number of employees

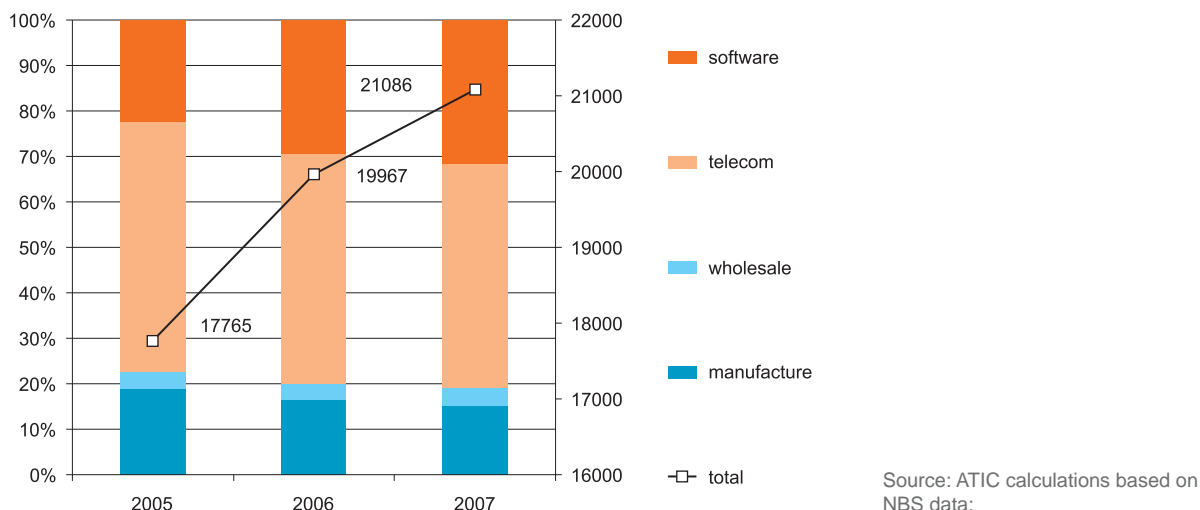


Table 4 Labor productivity in the ICT sector, % of average per economy

	2005	2006	2007
Manufacture	29	75	64
Wholesale	3278	3016	5345
Telecom	1015	951	827
Software	216	176	172
Total ICT	734	650	676

Source: ATIC calculations based on data from NBS

Table 5 Monthly wages in the ICT sector, % of average per economy

	2005	2006	2007
Manufacture	66	73	91
Wholesale	57	50	59
Telecom	287	246	240
Software	169	155	158
Total ICT	210	184	185

Source: ATIC calculations based on data from NBS

It is important to mention that in 2005 the ICT sector employed 16.5 thousand people i.e. we had a 24% growth in employment in three years. This growth was unevenly distributed across the three sub-sectors. In the manufacturing sub-sector, employment has decreased by 5%, which was true for all companies across this sub-sector. In the wholesale sub-sector the number of jobs increased 22%, while in the telecommunications sub-sector there was only a 6.6% increase in the number of jobs. Software sub-sector registered the most rapid growth in employment; the number of reported jobs grew 68%, from 3960 in 2005 to 6650 in 2007.

In comparison with other economic sectors in Moldova, the ICT is the most efficient in using the labor force (Table 4). Based on statistical data for 2007, one ICT worker generated 263 thousand MDL of added value, as compared with 35.6 thousand MDL in the general economy, i.e. ICT workers are 7.5 times more productive than an average worker. At the same time, this ratio apparently has been decreasing (9.2 times in 2005 and 8.3 times in 2006). At the branch-level, the most productive ICT workers are those employed

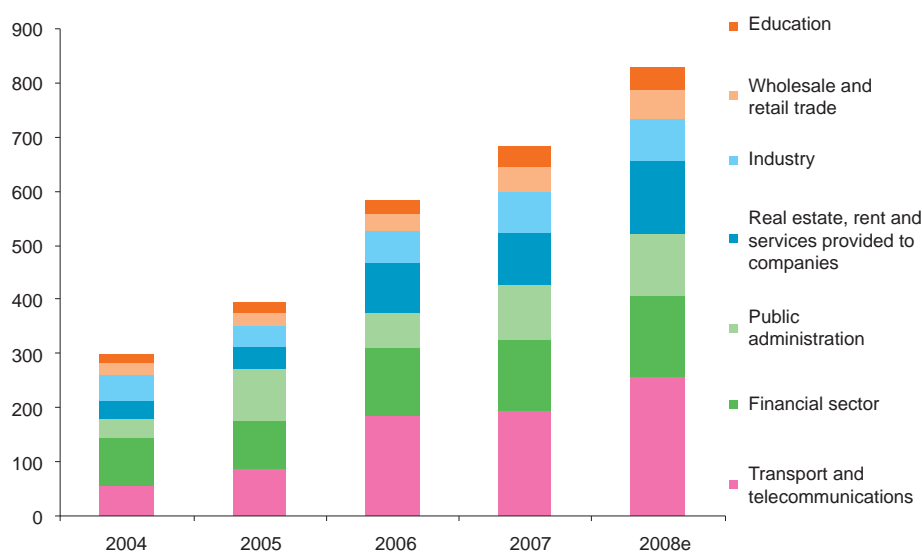
by hardware wholesale companies (863 thousand MDL value added in 2007). The telecommunications sub-sector fares high as well, with 294 thousand MDL value added/worker. Software companies are least labor-productive in the ICT sector – 61.2 thousand MDL value-added/worker – which probably reflects the problems related to the education and training of the labor force.

VI.7. Expanding Domestic Demand for Software and Hardware

It is difficult to get a clear-cut and comprehensive picture on the domestic ICT products market because the statistical data necessary for market analysis are quite scarce. According to NBS information, the expenditures of Moldovan legal entities for information technologies and related equipment have grown from 306.1 million MDL in 2004 (24.8 million USD) up to 715.7 million MDL in 2007 (59.0 million USD), as shown in Chart 16. Based on our preliminary estimates, in 2008 the figure rose to 866.7 million MDL (83.4 million USD).

Total IT expenditures of legal entities cover four broad areas of expenditures: IT equipment (about 50% of the total per economy), software purchasing (about 22%), design and development of the information systems (5%) and other expenditures (23%). The transport and telecommunication sector is the main consumer of software (for which it spent 6 million USD in 2007) and is also the only sector spending more for software than for hardware. The financial sector is the main consumer of IT equipment with 5.7 million USD spent in 2007. The public administration and public services sectors are the main customers for design and development of the information systems (2.7 million USD).

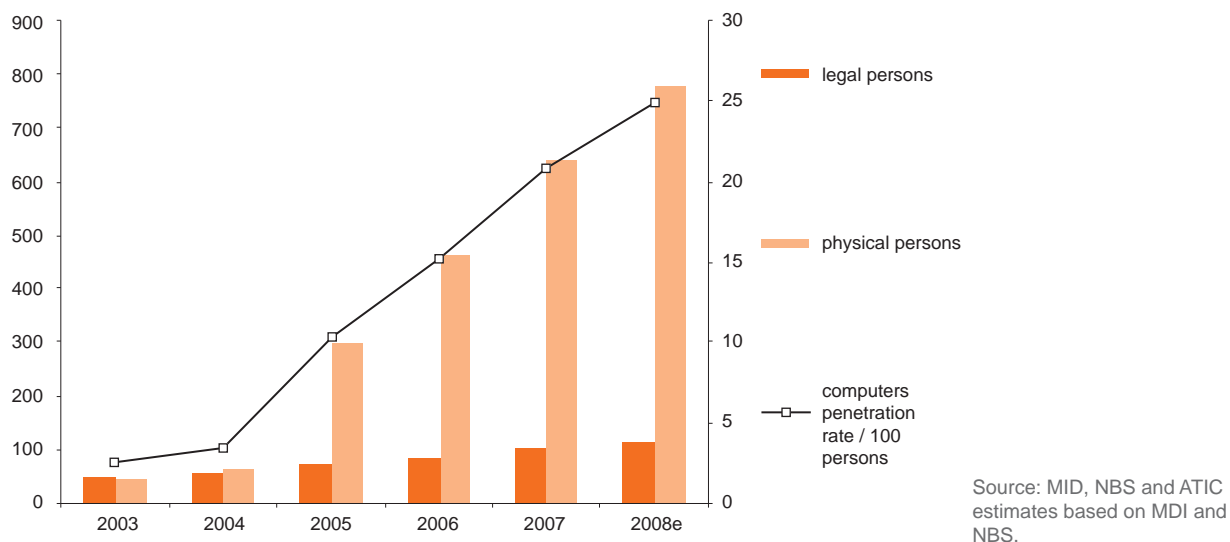
Chart 16 IT related expenditures* of the legal entities in Moldova, million MDL, by main economic sectors.



Source: NBS and ATIC estimates for 2008.

It is much more difficult to evaluate the IT related expenditures at the household level, but it is clear that households spend mainly for hardware and are using mostly pirated software programs. Estimates show tremendous growth of households with computers from 2003-2008, with total number of household computers being 6-7 times higher than in the economic sector (Chart 17). The current ratio of 25 computers to 100 households seems to be higher than in the CIS (estimates 14 computers per 100 households in 2007) and lower than in CEE countries (estimates 40)⁹. In terms of numbers of computers, Moldova is catching up with CEE countries.

Chart 17 Computers penetration rate per 100 inhabitants and estimates of the number of computers used by legal persons and physical persons, thousands



9 ITU, "Measuring Information Society: the ICT Development Index", 2008.



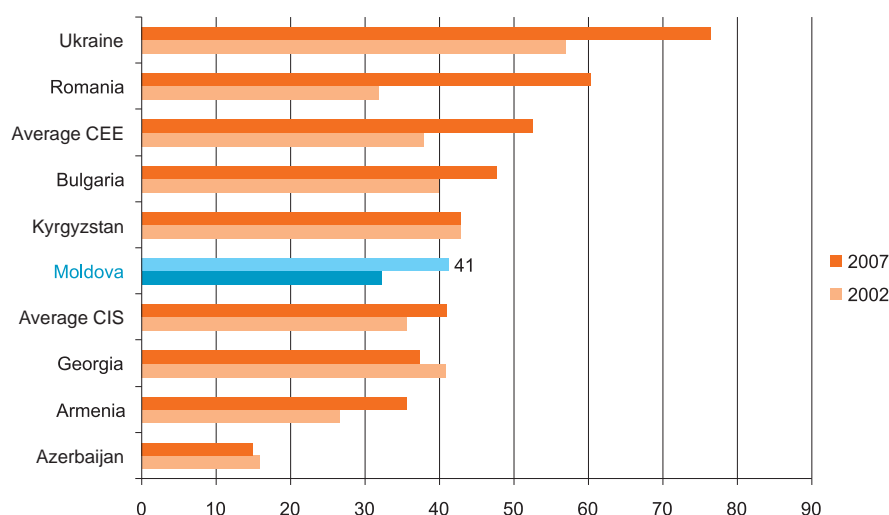
VII. Human Capital as a Critical Input to the ICT Sector

Increasing number of graduates

The availability of a sufficiently large number of educated professionals is one of the prerequisites for successful ICT sector development. Looking at tertiary enrolment ratio (41%¹⁰), Moldova is comparable to CIS countries but is lower than CEE countries.

There has been a growing supply of ICT specialists from higher and professional education institutions over the past five years. In 2003, a total number of 770 persons graduated from ICT-related fields in universities, while in 2007 the number of young specialists climbed up to 1540 people. Taking into account the relatively small size of the ICT labor market, this number would seem to be quite reasonable, with the main problem related to the quality of the specialists.

Chart 18 Gross tertiary enrolment rate



Source: ITU "Measuring Information Society: the ICT Development Index", 2008

Problems and challenges

- There is a clear problem of skills mismatch and general poor quality of the graduates. Those graduates who are talented may find decent employment, but most of the young ICT specialists either leave the sector to find alternative employment or even leave the country. Usually, after working for several years abroad and in completely different sectors, their ICT training becomes outdated. The educational system in the telecommunication sub-sector teaches outdated technologies, which is also true for the software sub-sector. The telecommunication companies do not have access to qualified human resources and often are forced to train young specialists themselves.

¹⁰ ITU, "Measuring Information Society: the ICT Development Index", 2008.

- There are several reasons why young ICT specialists have poor skills. First, the curriculum is outdated and not relevant to the market. Second, teachers are normally not working in the industry, which results in mismatch between students' theoretical knowledge and hands-on, practical experience. Most graduates are not accustomed to teamwork and have poor communication and language skills. It is equally important to mention that the typical study period within universities for training ICT specialists is too long (4 years on average). In fact, institutions of professional and vocational education are almost absent when it comes to supply of technical specialists for the ICT sectors.
- There are not yet strong and productive relations between employees and employers; rather they are weak and frequently antagonised. Human resources in the sector fluctuate greatly, with informal working arrangements frequently substituting formal contractual agreements. The labor regulatory framework is very complex and companies have difficulty firing personnel because of the rigid provisions in the labor code. The official register of occupations in ICT is not relevant to the market. Many occupations typical for ICT companies do not exist in the official register or in universities curricula.

Policy solutions

- Liberalize the educational sector to enable more private and foreign capital to enter the market, streamline the educational institution accreditation and assessment procedures, and recognize international standards and certificates (eventually by setting up an Independent Accreditation Agency, at least for the ICT sector);
- Develop, in partnership with universities and eventual an independent accreditation agency, a set of ICT engineer formation standards adapted to EU standards;
- Set up Steering and Advisory Committees in universities composed of educators and representatives from the ICT sector in order to improve the selection process for students wishing to enter ICT faculties;
- - Adapt university and college ICT curriculum to the market needs with industry support and enrich technical courses with interdisciplinary knowledge (project management, business process analysis) and communication skills (especially speaking and writing in English) and develop occupational standards;
- Aptitude testing should be implemented at relevant universities as a condition of entry for all technical and engineering courses. The limited number of places will be allocated to students who have the potential to be effective engineers and who are likely to have the motivation to enter employment in the ICT sector after graduation
- Increase wages for university professors and research staff to retain talented people, and ensure more intense engagement of the teaching staff in international academic exchange and in practical work in national or foreign ICT companies and projects;
- Create excellence centers within existing Moldovan universities in partnership with international universities and foreign and domestic ICT companies. Establish strategic alliances with global players generating ICT knowledge with the aim of transferring best-practice and state-of-art knowledge;
- Revise the official register of occupations in order to adapt it to the current market realities and practices of the ICT companies.
- Revise the labor immigration policy regime for high-skilled ICT professionals and lecturers in order to facilitate the knowledge transfer and capitalise on the improved quality of local specialists.
- Conduct traceability studies on the career paths of the ICT graduates in order to find out the weaknesses of the ICT education sector and reduce the mismatches with the labor market demand.



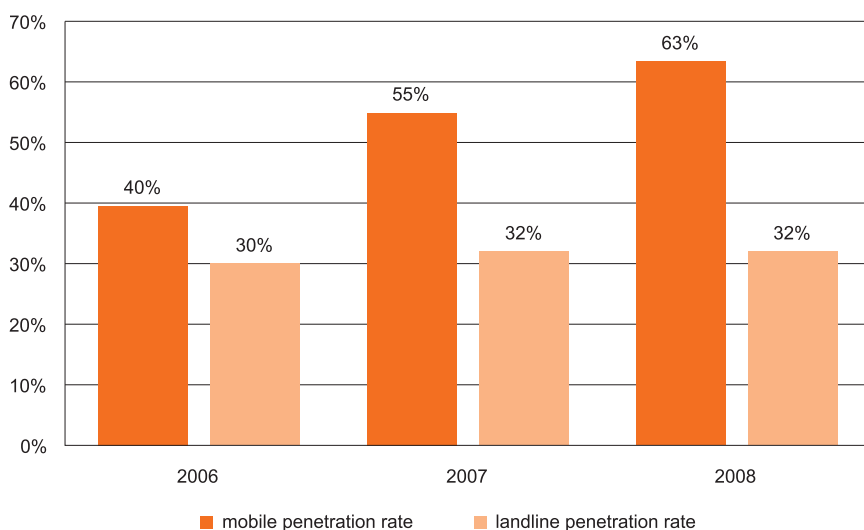
VIII. Telecommunications - Base of a Competitive Economy

Low broadband and telecommunications penetration

Telecommunications is the backbone of the Moldovan ICT sector and of the whole economy. Statistical data show rapid growth of the Internet and mobile telephony in the past 4-5 years. For instance, the internet penetration rate has grown more than 10 times during 2004-2007, from 2.02% to 22.7%. However, it is worrying that broadband connections still have a marginal share in the market (1.4% in 2007 and 3.2 in 2008 as compared with 0.1% in 2004).

The fixed telephony penetration rate has grown at a less impressive rate as compared with the internet penetration. On the other hand, in 2000-2008 the mobile penetration rate has grown very fast, adding between 8 and 15 percentage points each year.

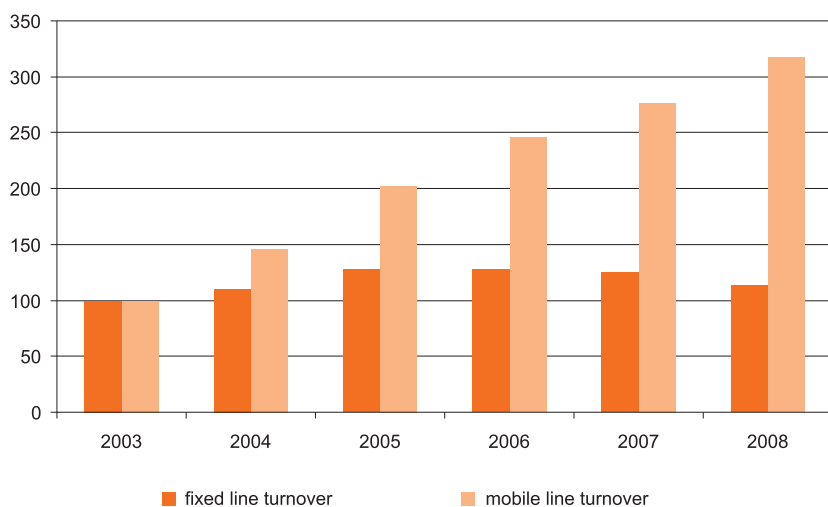
Chart 19 Mobile versus fixed penetration rate



Source: National Agency for Regulation in Electronic Communications and Information Technologies

The fixed telephony market has grown only 27% in real terms in 2003-2006 and underwent a deep recession in 2007-2008. This is in line with the global trends on this market. According to recent data, the incumbent Moldtelecom operator accounts for 97% of the market. Sales on the mobile telephony market have grown 5.6 times in real terms in 2004-2008 with the penetration rate growing from 13.9% to 67.8%. This level corresponds to such countries as Morocco, Belarus, and Albania but it is worrying that the growth rate has slowed down in 2008 and is expected to slow even more in 2009. This will hinder Moldova's convergence towards levels of penetration within the region (Ukraine 120%, Romania 106%, Russia 120% and CEE average 102%). The market is clearly dominated by Orange (est.68% in 2008), followed by Moldcell with about 27%, Unite (operated by the Moldtelecom) with about 4.6%, and Eventis with a negligible share of 0.3%.

Chart 20 Sales growth, 2003=100%



Source: ATIC estimates based on National Agency for Regulation in Electronic Communications and Information Technologies

Problems

- Moldtelecom has excessive market power and prohibits the development of the market. According to interviews with the different operators (both members and non-members of the Association) and according to recent sector research¹¹ the incumbent operator:
 - cross-subsidizes its low retail tariffs with higher interconnection charges and discriminates via its price policy;
 - has high bandwidth prices to destinations both within and outside the country that reduces independent operators' margins and distort the competitive playing field;
 - blocks access to its facilities such as exchanges or local loops for independent operators that restrict their ability to compete;
 - owns most of the rights-of-way to existing buildings;
 - is not currently obliged to provide operators with interconnection and access to its facilities under clear terms and at reasonable costs;
- Among other administrative burdens there are a number of barriers that affect the building of the telecommunication infrastructure, such as:
 - difficulties in getting rights-of-way in sewage ducts or other public infrastructures owned by the railways, municipalities, forestry administration and private owners, not to mention the difficulties to get the right of purchase or rent the land in cities centres;
 - application of irrelevant regulatory rules to telecommunication infrastructure; for instance telecommunication towers are qualified as building objectives and are subject to complex building legislation; it is very difficult to get the land rezoned for new tower locations; optical cable is subject to ecological expertise; towers have to be certified as being in accordance with sanitary standards; building telecommunication infrastructure closer within 10 km from the state border is subject to very complicated procedures and approvals, which in fact are prohibitive;
 - the legal provisions regulating the regime of selling, usage, and damage compensation for the land used for construction of the telecommunications infrastructure are not clear;

¹¹ World Bank, Moldova Telecom Sector Diagnostic Note, August 7, 2008.



- A significant barrier affecting the growth of mobile telecommunications market in Moldova lies in poor regulation of the interconnection rates. This spoils conditions for free competition and enables big market players to exert even higher influence.
- Existing business models of current operators based on relatively high prices (as compared with the real income) which hinder further development of the broadband penetration rate, especially in rural areas.
- Among the main obstacles for the telecom sector development are the difficulties to obtain ownership over the land in order to build necessary infrastructure (towers, pillars, cables etc.). More specifically, the incumbent services provider enjoys specific rights in this regard which are disadvantaging other players on the market. Unclear division of responsibilities among various public authorities and lack of transparency of bureaucratic procedures generates high transaction costs and demand for informal payments.

Policy solutions

- While the formal institutional framework in Moldova is relatively advanced and in compliance with the core EU regulations, the main problem is with its effective implementation¹². In this regard, the full involvement and cooperation between National Agency for Protection of Competition and National Regulatory Agency for Electronic Communications and Information Technology is of crucial importance. The Ministry of Economy and Trade should be at least as important a participant to the market dialogue as Ministry of Information Development.
- Moldtelecom exert such big market power that apparently it can defy even the decisions of the National Regulatory Agency. Besides, the National Regulatory Agency is only formally independent as all board members are nominated and removed by the government (rather than Parliament), and the government is keen to promote the interests of Moldtelecom. It is necessary to adopt a clear political decision regarding full governmental support for an independent regulatory body and to keep Moldtelecom out of regulatory affairs.
- The National Regulatory Agency for Electronic Communications and Information Technology has to enforce full access of all market players to Moldtelecom's infrastructure at reasonable prices and under transparent conditions.
- The National Regulatory Agency for Electronic Communications and Information Technology has to prohibit subsidising prices for domestic calls and subscription plans on the fixed telephony market with higher prices for inbound and outbound calls.
- The National Regulatory Agency has to adopt an interconnection rate policy that would enable the telecommunication market to grow by increasing the number of subscribers. In this context, the two critical issues are to ensure portability of numbers and symmetric and predictable interconnection rates for all mobile operators.
- The National Regulatory Agency and Ministry of Information Development have to promote streamlining of the regulatory framework regulating the building of the telecommunications infrastructure inside the country and develop connections with external channels (e.g. abolishing the ecological expertise, easy passage of the public and private propriety with telecommunication infrastructure under reasonable prices, easier access to border-adjacent territory for development of telecommunication infrastructure, etc.).
- Promote regulatory norms ensuring easier use of existing transport infrastructure (national and local roads, and railroads) for cable laying and tower building;
- The National Regulatory Agency should consider issuing free licences for Broadband Wireless Access technologies to mobile operators with clearly stated service obligations. Obviously, the licence terms should be attractive enough to encourage investment but in the same time aggressive enough to minimize the real costs of broadband services and dramatically increase penetration rate (up to 20%) in the next 24 months.

¹² EBRD, "Comparative assessment of the Telecommunications sector in the transition economies", December 2008, page 36.

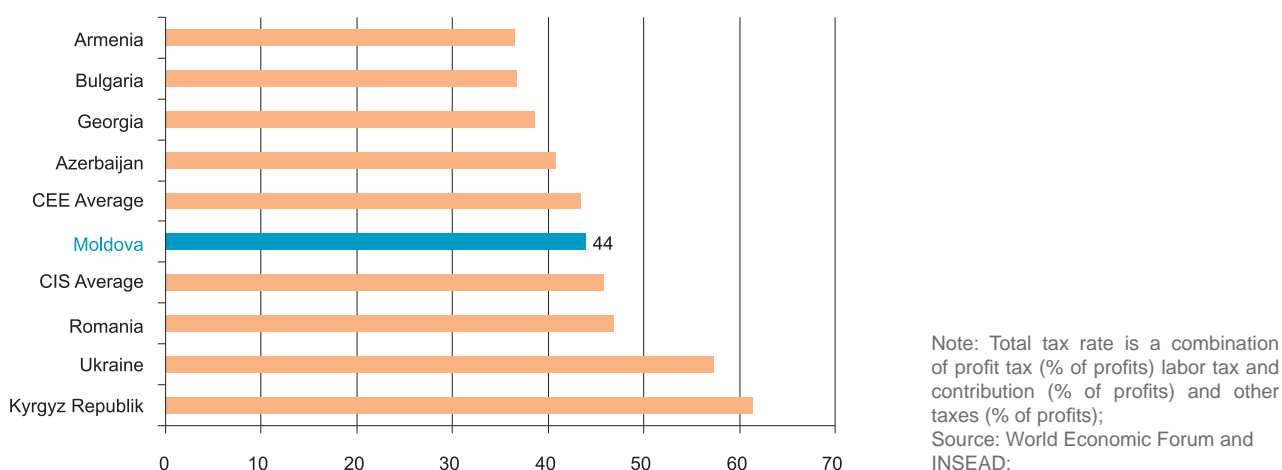
IX. Fiscal and Trade Climate

Relatively low tax burden with inefficient and hesitant regulations

In 2005, a general reform of the business regulatory framework started in Moldova. This reform has positively affected the Moldovan ICT sector. Because of the sophistication of the software industry, it is impossible to highly regulate it and the Moldovan government has a clear understanding of this. In the last two years, the administrative burdens on software companies have lessened. The requirement to obtain a general licence for the provision of IT services has been abolished and presently only a license for cryptography and information security is compulsory. The legal framework of the telecommunication activities has improved as well after adopting a new law on electronic communications in 2008. Another positive change is that the National Regulatory Agency has recently started a dialogue on improving regulation of the telecommunication sector in order to develop the market. The Ministry of Information Development has created a working group for further development of the Strategy for Development of the ICT sector and has included representatives of business and civil society. Despite the positive trends in the ICT regulation environment the telecom regulator ANRTI has not performed direct market interventions in order to lower the price levels, to regulate the monopolies and to increase the sector competitiveness.

In Moldova the tax burden is not as high as compared with other countries (Chart 21). Software companies do not pay the general social fund tax of 23% of the wage bill but instead pay 23% of a fixed base calculated as two average monthly salaries. As average wages in the software sector are higher than average wages in the economy, this creates some advantages for the software companies' employees and makes the sector attractive for young specialists. Also, the income of software company employees is subject to an income tax exclusion for five consecutive years. Before January 1, 2008 software development companies were subject to income tax exemption for a five-year period upon submitting an application to the tax authorities. This exemption served as a development stimulus for some software companies. Import tariffs for the ICT related goods are very low in global comparison, which serves as positive condition for further development of the sector. However, ICT companies understand that in long run these tax incentives, when they are removed, may have negative impact on their competitiveness.

Chart 21 Total tax rates in transition countries



Problems

- It is crucial for the National Regulatory Agency to maintain effective and productive dialogue with market operators regarding the regulation of the markets.
- Presently the Association is not yet the voice of the whole ICT community. This may undermine the effective dialogue with the national regulator and with the government on the subjects related to regulation of the ICT sector. There are no effective mechanisms for public-private dialogue and of public-private partnership for discussion and implementation of ICT strategic development of Moldova.
- Despite relatively low tax rates, the fiscal administration framework in Moldova is quite complex, giving rise to high administrative costs for tax accounting and reporting. For companies that export goods and services, getting VAT reimbursement is very difficult. It became even more difficult during the current global financial crisis.
- Significant problems arise from the mismatch between the NACE 2005 edition and provisions of the Tax Code. The latter is not updated to the NACE codes and definitions of the economic activities.
- Taking advantage of the income tax exemptions for IT has been less attractive since January 2008 when a zero corporate income tax was implemented. The current fiscal policy does not provide any clear timeframes for which the zero corporate income tax will be applicable and whether after a normal tax rate is reinstated the tax facilities for the ICT will remain in force. At the same time the legal provision of the 5% withhold payment from the billed amount as advance income tax payment is still in force.
- A number of fiscal facilities are still in place but the companies have to provide many documents and observe a number of additional conditions in order to make use of them. This creates significant administrative burden for the companies wishing to benefit from the tax exemptions. Also, the beneficiary companies are closely scrutinized by the fiscal authorities, thus creating additional administrative burdens.
- Providers of electronic communication services are subject to administrative charges imposed by the National Regulatory Agency for Electronic Communications and Information Technologies. These are de facto taxes. For 2009 the payment rate was established by the Agency in amount of 0.15% of the revenue incurred by providers of electronic communications networks and services. While these procedures are in line with current EU practice, there is no financial transparency in the income and expenditures of the National Regulatory Agency and therefore it is not clear for the public if administrative costs and charges are in balance.
- According to the national legislation, providers of mobile telecommunication services have to transfer 2.5% of their monthly revenues from sales of telecommunications services to the Republic Fund for Social Support of the Population¹³. Telecom providers have to report monthly to the Tax Office on these payments. While the telecom companies have a high sense of social responsibility, there are three reasons of concern: a) these payments are not universally paid by all companies in the economy, but only by companies from two sectors, including mobile telecommunications; b) there is limited fiscal transparency on the use of the Fund, while governmental reports suggest that social protection policy is highly ineffective and unfair¹⁴; c) while being the biggest contributors to the social protection funds, the mobile telecommunication companies are not represented in the Boards of Directors and have not been invited.
- Because of the rigid trade policy regime some bizarre situations are occurring. For instance, web cameras are presently subject to very high import duties because they fall in the same import categories with high-end video and photo-cameras. With import prices of the web cameras ranging from 5 to 20 USD dollars these items are subject to an excise tax of 33 Euros. For instance, this excise has encouraged grey import of web cameras and low-end video and photo-cameras.

¹³ Law on Republic Fund and local funds for social support of the population, no.827 of 18/02/2000.

¹⁴ Law on approval of the National Development Strategy, nr. 295 of 21/12/2007, Annex 1, page 11.

- Companies involved in import, assembling and retail sales of the computer hardware are subject to complex standardisation requirements even though the part used for equipment assembly are standardised according to EU or international requirements.

Policy solutions

- Association will improve dialogue with the Fiscal Authorities and Ministry of Economy and Trade to clarify all aspects related to tax administration and at the same time will train its members on proper application of the legal framework. This will help eliminate the excise for web cameras and low-end video and photo equipment and prevent occurrence of such bizarre issues in the future.
- At the same time, it is necessary that Moldovan government ensure predictability of the tax policy and refrain from adopting unexpected decisions affecting tax environment.
- It is necessary to state clearly in the fiscal code the status of software products (either product or service or distinct position) and to simplify VAT administration.
- Simplify conditions for software companies to benefit from fiscal facilities on social insurance contributions and income tax of the employees.
- The Moldovan government should decide in favour of equal treatment of all economic agents concerning payments to the Republic Fund of Social Protection of the Population.
- In order to ensure necessary financial transparency, the National Regulatory Agency should publish detailed budgetary annual reports highlighting the structure of its income and expenditures. This will consolidate the public's confidence and guaranty that administrative charges are balancing the costs of market regulation.
- Update of the Tax Code specific provision according to the NACE 2005 edition definitions of the economic activities.



X. Government as Customer/Competitor for the ICT Companies

A positive context driven by growing demand

The public sector is an important customer for the Moldova's ICT industry. In 2007 the public sector (including public administration, health sector and education sector) accounted for more than 20% of the total expenditures for computer hardware and software reported per economy¹⁵. Within the public sector, the public administration is the largest buyer of IT products and services. In 2004-2007 the total governmental expenditures for hardware and software have grown 2.2 times in real terms, with expenditures for IT systems design and development showing a record 11-fold growth (see Chart 16 previous chapter)¹⁶. We expect the domestic IT market to keep growing in the future as a result of evolving central public administration reform and constantly rising needs to develop public services. This means that the government will continue playing important role in development of the IT sector. The driving role of the government becomes even more important under the current conditions of the financial crisis that shrinks external demand.

Opportunistic role of the Government as an ICT customer and ICT supplier

- The public sector is not only an important customer for IT industry but also a competitor. The main problems that keep the government from being a more important ICT market are in the area of public procurements. In this area there is unfair competition from state-owned software developing companies. These competitors are winning the most important tenders as they are operating under subsidized costs and enjoy close political or institutional connections with the procuring authorities. Low transparency of public tenders undermines the financial efficiency because very frequently public companies winning tenders sub-contract private companies to accomplish the tasks. There is no clear set of criteria used to select the winner, and usually the price is the main criterion considered by the buyers. This has negative effects on those private companies whose comparative advantages are more in the quality of human resources, advanced knowledge, and particular expertise rather than low costs.
- Provision of telecommunication services to public entities is another area dominated by public companies, mainly by the Moldtelecom. The mechanism of unfair competition is largely the same as described the bullet above.
- Another significant challenge for the ICT sector is that private software developing companies are not allowed to compete for attracting public money allocated for R&D activities. In order for a research company to benefit of R&D funds it has to be accredited as research organization by the National Academy of Sciences and for this it has to meet many criteria, such as a certain amount of employees holding PhD degrees and others. In case of the IT companies this condition is not relevant because what they are doing as daily business is advanced and practically-oriented research and technological development. In EU countries about 1/3 of the total R&D budget is for ICT-related research and production.
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¹⁵ National Bureau of Statistics, 2008 Statistical Yearbook of Republic of Moldova, table 19.1.3 "Expenditures of the legal persons for informational technologies".

¹⁶ Ibid.

Policy solutions

- It is necessary to develop a digital system for advertising and conducting the ICT procurements in order to reduce the human errors and ensure fair and transparent competition from the part of all companies present in the market. (Obviously, this will enhance efficiency and transparency of public tenders in all markets, not only ICT). The development and maintenance of the system itself can be a task accomplished by the domestic IT companies.
- The procurement system should be based on clear and transparent two-stage procedures for selecting the best offer in public tenders (including in procurement of the ICT services). At first stage, the offers should be assessed based on responsiveness to instructions and terms of tenders. At second stage of selection cumulative analysis should be applied in order to select the best company based on balanced criteria e.g. proven expertise of the company (25%), proposed work plan (25%), expertise of personnel (25%) and price (25%).
- The Moldovan government should adopt a policy regarding the restructuring or privatization of state-owned software companies in order to ensure the most efficient use of human and financial resources across the whole sector. This will enable all domestic companies to participate in the development of informational systems, e-government and e-services and thus improve their companies' qualifications. With such a expertise, domestic IT companies will become more competitive in providing services to foreign markets and governments.
- A similar decision should be adopted regarding Moldtelecom. While privatisation may not represent a feasible option at this time given the international financial crisis, its restructure is vitally needed for the telecommunications market in Moldova. In any case, the company has to abide by regulations issued by the National Regulatory Agency because a private monopoly is equally dangerous as a public one.
- It is necessary to allow ICT companies to compete for public funds in the ICT related-areas in the R&D sector without being accredited by the National Academy of Science. In case of the ICT-related R&D activities number of PhD degree holders and other similar conditions are not relevant indicators of the capabilities of the ICT companies.
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XI. Action plan – ICT Industry Priorities

XI.1. Expected Outcomes

Mobile and broadband penetration increased

- Broadband penetration of 20%
- Mobile penetration up to 100%

Improvement of the administrative and fiscal environment for the ICT sector

- Decreasing significantly the share of grey market activities in ICT sector
- Increasing the tax-base of ICT-related companies by 20% in two years as a result of growing companies' turnover
- Harmonisation of the legal and regulatory environment in the areas of education, labor, tax administration , etc. in line with the EU standards (e.g.: classificatory of occupations, classificatory of educational fields)

Transparent and Efficient State Procurement

- Effective procedures for public procurements of ICT products developed and implemented.

Stimulating sustainable growth of the local ICT Market

- Moldovan ICT market will continue to growth by 10% per year.
- Share of ICT in GDP will remain high by international standards (8-10%).
- Maintaining a 5% growth of the employment.
- Preserving a 50% growth of ICT-related exports.
- Growth of legal software usage at least by 5% per year.

Education and Human resources development

- Tertiary enrolment rate growth up to 45%
- Modernization of the university curricula in the ICT in cooperation with the private sector
 - New curricula is adopted
- Engineer aptitudes testing
 - Aptitude testing is developed and implemented

XI.2. List of Actions

Actions	Expected results	Indicators of success
Establish clear priorities for public-private partnerships and a focal point for communication with the Government (ICT Association)	Constructive dialogue Strong private sector commitment to information society development	ICT sector has defined priorities ICT sector has a single point for communication with the Government
Aggregate the current educational needs and ongoing private initiatives in a comprehensive business sector program for partnership with the educational system.	Fast track for education modernization	Major private initiatives in the education field are coordinated in common program with clear goals
Develop a ICT sector profile that demonstrates the capacity and attractiveness of the ICT sector	Increased awareness about the ICT importance. Improved ICT sector visibility and topicality	An ICT sector profile developed and used by the Government and private sector
Invest in world recognized technologies, quality models and standards	Improved international competitiveness	Number of companies certified Number of people certified against recognized technologies
Provide prompt feedback and data about the impact of strategic decisions in the ICT sector.	Strategic decision making process based on detailed impact analysis	Private sector provides constructive feedback about ICT plans and actions

XIV.4. ICT Sector Priorities for Government Intervention

Actions	Expected results	Indicators of success
Establishment of realistic goals and priorities for ICT development and information society based on already developed strategies and the actual needs of the society and business	Strong government sector commitment to the information society strategy development	Realistic strategic priorities for the ICT sector established and used
Institutionalization of effective public private dialogue for ICT sector development	Sustainable and efficient strategy execution	Number of meetings. Number of issues discussed. Number of issues solved.
Prepare an action plan to protect intellectual property rights.	Design a systematic approach to solving the issues related to intellectual property piracy.	Within 12 months, the plan is adopted;
Modernization of education: <ul style="list-style-type: none"> • update the register of professions • form a working group to aid in cooperation between the ICT sector and universities • identify and address the immediate problems for the inefficient education input/output • modernize the ICT curriculum 	Fast track for education modernization	Updated register of ICT professions used by the educational sector within 12 months Specific actions from the ICT sector in the educational process supported Input/output problems analyzed and addressed Curriculum for ICT universities modernized.



Eliminate barriers for ICT sector growth:		Growth of the ICT sector
<ul style="list-style-type: none"> effective growth driven regulation aiming at reducing interconnect fees on the communication market improve and eliminate the procedures that regulate the building of ICT infrastructure, i.e. the prohibition on placing ICT infrastructure within 10 km of national borders introduce a quality based criteria in state ICT procurements eliminate the possibility for cross subsidies of the state owned enterprises and their transformation to budget sponsored institutes or private enterprises Eliminate the additional tax burden to the mobile companies (2.5% payment to the Republic Fund for Social Protection, VAT refund time, amortization policy for the SW and ICT etc.) 	Normal fiscal and administrative environment	<p>Interconnection fees trend</p> <p>Time and efforts to obtained approval for building ICT infrastructure</p> <p>% of state procurements in the ICT based on quality criteria</p> <p>% of the ICT state procurement executed by private companies or independent market entities</p> <p>overall tax burden of the communication sector compared to the average for the industry; time and efforts for VAT refund by the ICT companies compared to the other export oriented sectors. Amortization period for SW and ICT aligned with their life cycle.</p>
Strategic interventions		eased penetration of broadband No of Students with world recognized diplomas
<ul style="list-style-type: none"> Strategic alliances with world recognized ICT universities and institutions Creation of excellence centers in cooperation with international organizations Incubators Technology Parks 	<p>Direct access to modern education</p> <p>Direct access to modern technologies</p> <p>Growing No of ICT companies and ICT employees</p> <p>Excellent business environment for mature domestic and international iCT companies</p>	<p>No of companies and No of experts trained in /applied certain technologies No of new ICT companies, No of new employees</p> <p>Volume of direct investment in ICT companies. No of companies in Tech Parks.</p>

XII. Appendixes

XII.1. Summary of the key problems affecting development of the ICT sector in Moldova based on the interviews with ICT companies CEOs.

The representatives of the Moldovan ICT sector identified a number of specific challenges that need urgent actions:

Telecoms

- Limited access to the shared infrastructure, including last mile, does not allow efficient and effective operations of the telecommunication companies
- In an environment of stagnating telecom market the telecom regulator ANRTI does not perform direct market interventions that to stimulate competitiveness and market development regulate the market in order
- The educational system in the telecommunication sector teaches outdated technologies. The telecommunication companies do not have access to qualified human resources.

Software

- IT Education that does not match market requirements results in losses of IT experts and high costs for in-company training of new employees
- IT education access is not aptitude based and many graduates do not pursue a career in the ICT sector on graduation – establishing aptitude testing to current courses entry criteria could deliver more appropriately trained graduates to meet the sector's needs.
- Lack of life-long specialized training centres in Moldova increase the costs of access to knowledge and modern technologies
- Lack of Business - Government partnership, Business-Government interaction, especially related to public tenders and lack of realistic ICT strategy execution about the software development do not allow strategic planning and rapid development of the sector
- Low quality and availability of broadband access reduce the possibilities for value added services export and real time connections with the foreign clients
- Ineffective ICT regulations, licensing and certifications do not support market development and private sector growth
- Complex VAT reimbursement procedures for software export and unclear tax treatment of the costs for acquiring software licenses reduces the available internal funds of the software development
- Low ICT sector profile awareness does not support software export and reduces the sector attractiveness for the young talents.

Hardware

- Black import and black market put barriers to the market grow of the normal companies
- Ineffective trade tariffs, de-facto banning of some items (e.g. web-cams) supports black import.
- Obsolete standards; not compliant with the international standards do not promote quality based competition
- The low education system does not provide specialists that are aware about the modern hardware technologies.

