



**MOLDOVAN ASSOCIATION
OF PRIVATE ICT COMPANIES**

ICT Sector



in Moldova

POLICY WHITE BOOK 2012



USAID
FROM THE AMERICAN PEOPLE

**Competitiveness Enhancement and
Enterprise Development II (CEED II)**

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I. Introduction

This White Book presents an analysis of the ICT industry and industry's recommendations on short, medium and long term policies. The White Book was developed by the Moldovan Association of Private ICT Companies (ATIC), with the support of the Competitiveness Enhancement and Enterprise Development Project II (CEED II), funded by the United States Agency for International Development (USAID).

A. About ATIC

ATIC is an umbrella association of the private companies operating in the information technology and communications sector, set up in 2008 with the purpose of facilitating the dialogue between ICT companies and the Government of Moldova.

ATIC's mission is to foster the development of the Moldovan ICT industry through viable partnerships between private companies, similar organizations, government bodies and international organizations, to contribute to increasing industry competitiveness and companies' capacities. At the same time, ATIC aims at expanding the market, attracting investments in the sector and participating in decision-making at national and international levels. ATIC cooperates closely with the government and educational institutions to promote IT education, enhance labor force and support the ICT industry.

At the end of 2012, ATIC had 38 member companies, which employed a total of 8000 people and accounted for 50% of the overall ICT volume. The major goal of ATIC is to maintain a business environment favorable for ICT companies.

The main activities of ATIC are the following:

- improve the image of ICT domestically and abroad,
- cooperate with government and educational institutions to improve the quality of IT education,
- support the establishment of partnerships in ICT,
- get involved in improving the business environment in the ICT industry,
- cooperate with the government bodies in identifying solutions to enhance the quality and quantity of ICT graduates and professionals,
- sustain the dialogue between the ICT industry and the government bodies to improve the business environment, attract investments and support the industry.

B. Comparative Analysis of the White Book 2008-2012

In 2008, the first Policy White Book was developed by ATIC, with support from USAID CEED Project. The goal of that publication was to clearly define the national ICT sector as one of the most productive sectors of the economy, to identify its development opportunities for the following 3 years, and to make strategic recommendations for improving the business environment in the sector.

List of actions:

Actions	Expected results	Success Indicators	Status
Establish clear priorities for public-private partnerships and a focal point for communication with the Government (ICT Association)	Constructive dialogue	ICT sector has well defined priorities	Achieved
	Strong private sector commitment to information society development	ICT sector has a single point for communication with the Government	Achieved by establishment of ATIC
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	Partly achieved through additional courses initiative Not achieved in terms of curriculum.
Develop an 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	A sound ICT sector profile developed and used by the Government and private sector	Achieved by USAID CEED II
Invest in world recognized technologies, quality models and standards	Improved international competitiveness	Number of companies certified	Unmonitored
		Number of people certified per recognized technology	Partly achieved
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	Ongoing

ICT Sector Priorities for Government Intervention

Actions	Expected results	Success Indicators	Status
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	Achieved
Initiation of effective public private dialogue for ICT sector development	Sustainable and efficient strategy implementation	Number of meetings. Number of issues discussed. Number of issues solved	Achieved
Prepare an action plan to protect intellectual property rights, within a public-private partnership	Design a systematic approach to solving the issues related to intellectual property piracy	The plan adopted in 12 months	Unachieved
Modernization of education:	Fast track for education modernization		
<ul style="list-style-type: none"> update the register of professions 		Updated register of ICT professions used by the educational sector within 12 months	Ongoing. Discussion started in 2012
<ul style="list-style-type: none"> form a working group to aid in cooperation between the ICT sector and universities 		Specific actions from the ICT sector included in the educational process	Ongoing
<ul style="list-style-type: none"> identify and address immediate problems for inefficient education input/output 		Input/output problems analyzed and addressed	Ongoing
<ul style="list-style-type: none"> modernize the ICT curriculum 		Curriculum for ICT universities modernized	Ongoing Started in 2012

Eliminate barriers for ICT sector growth:	Proper fiscal and administrative environment	Growth of the ICT sector	
<ul style="list-style-type: none"> effective growth driven regulation aiming at reducing interconnect fees on the communication market, to ensure rapid market growth 		Interconnection fees trend	Achieved
<ul style="list-style-type: none"> improve and eliminate bureaucratic procedures that regulate the building of ICT infrastructure, i.e. the prohibition on placing ICT infrastructure within 10 km of national borders 		Time and efforts to obtained approval for building ICT infrastructure	Unachieved
<ul style="list-style-type: none"> introduce a quality based criteria in state ICT procurements 		% of state procurements in the ICT based on quality criteria	Unachieved
<ul style="list-style-type: none"> eliminate the possibility for cross subsidies of the state owned enterprises and their transformation to budget sponsored institutes or private enterprises 		% of the ICT state procurement executed by private companies or independent market entities	Unachieved
<ul style="list-style-type: none"> 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.) 		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	Unachieved

Strategic interventions			
<ul style="list-style-type: none"> Strategic alliances with world recognized ICT universities and institutions 	Direct access to modern education	Eased penetration of broadband	Ongoing
<ul style="list-style-type: none"> Creation of excellence centers in cooperation with international organizations 	Direct access to modern technologies	Number of students with world recognized diplomas	Unachieved
<ul style="list-style-type: none"> Business and technology incubators 	Growing number of ICT companies and ICT employees	Number of companies and number of experts trained in /applied certain technologies; number of new ICT companies, number of new employees	Partly achieved. In terms of technologic incubators, there is only one under the Moldovan Academy of Science
<ul style="list-style-type: none"> Technology Parks 	Excellent business environment for mature domestic and international ICT companies	Volume of direct investment in ICT companies. Number of companies in Tech Parks	Unachieved

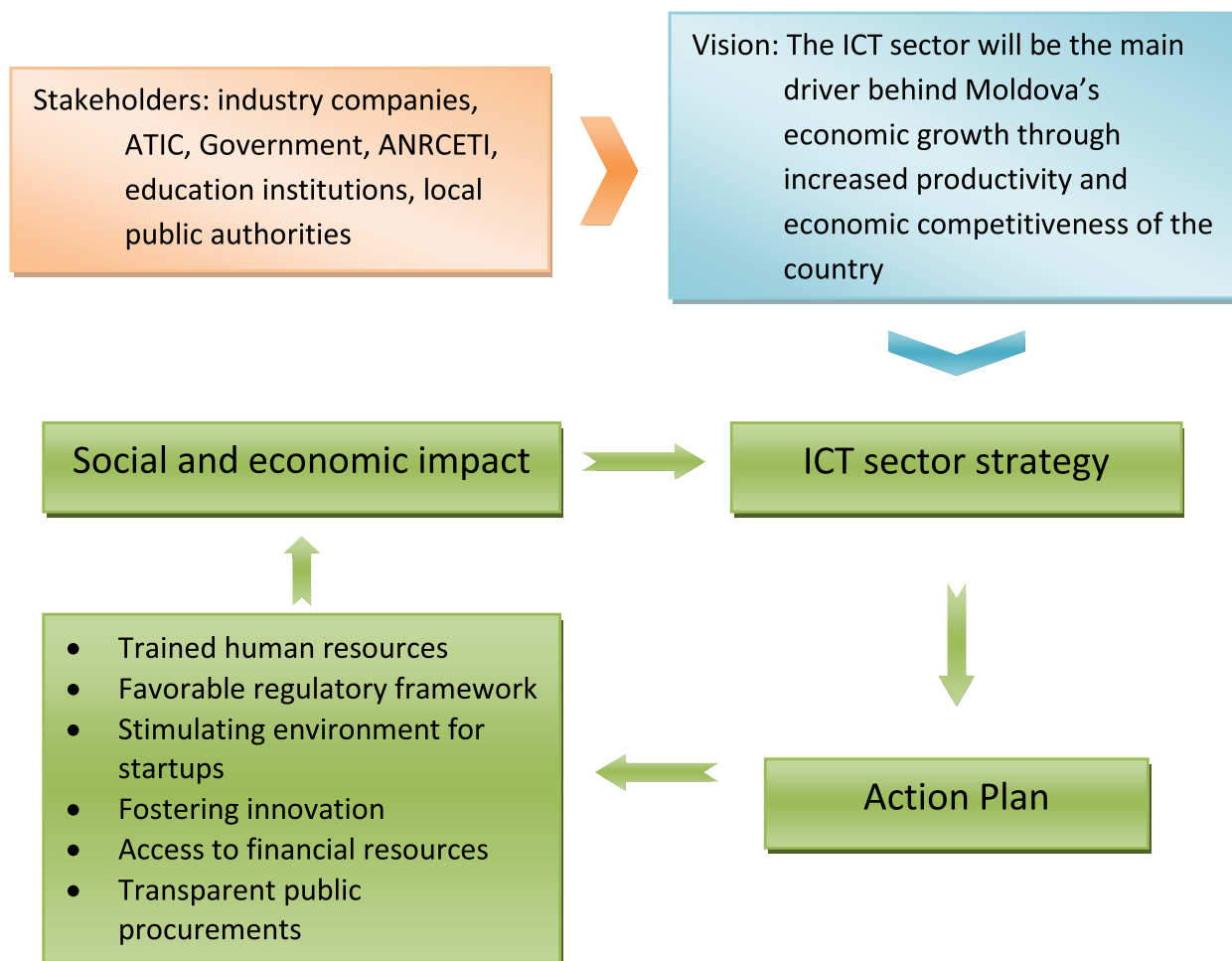
The first White Book proposed a series of recommendations most of which have unfortunately not been implemented so far. However, a number of proposals have been put into effect:

1. Since 2009, the National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI) has published financial reports on its incomes and expenses. This allows for a higher level of confidence in the use of taxes paid by the electronic communications providers to the Agency's budget. The publication of expenses increases the transparency of the Agency's activity and eventually raises its efficiency.
2. From 2010 to 2011, the excise taxes for video and web cameras were reduced and then totally eliminated. Thus, most webcams are now imported by legal means and the price thereof has reduced significantly.
3. From 2009 to 2011, concrete actions were undertaken in terms of the interconnection, including access to the local loop and colocation, which has contributed significantly to reducing the broadband internet tariffs.
4. Number portability is currently under implementation and starting with May 2013 it will be a mandatory requirement.
5. In 2010, the Law on Preventing and Combating Cybercrime was published and is currently implemented.
6. ANRCETI has initiated the regulatory framework for issuance of licenses to use the radio frequency sub-band 3750 – 3800 MHz (for service provision in WiMax standard). However, it is assumed that licenses will be used based on competition, not for free as the 2008 White Book was suggesting.
7. The government has extended the application of tax incentives on software companies.

C. Logics of the White Book

This White Book has the following logics:

Chart 1 Logics of the White Book



D. Goal and Objectives of the White Book

This White Book provides an overview of the ICT sector development in Moldova.

The document is expected to strengthen the dialogue between the ICT business and the Government and to allow supporting government policies based on the real needs of Moldova's ICT industry.

The paper intends to present the existing situation in the sector, the achievements and failures in improving the business environment to transform it into one which is more attractive for investments, and the bottlenecks to sector development, as well as recommendations intended to contribute to increasing ICT's share as compared to other industries.

II. Executive Summary

In 2011, Moldova had a significant increase of its Network Readiness Index: from the 97th to the 78th position among the total number of 140 countries. This enhancement was due particularly to the development of telecommunication infrastructure in the past two years, where Moldova's ranked 41st. Business usage has an alarming level (120th position), caused by the weak capacity of companies to absorb new technologies and modest efforts to train their staff.

Mobile telephony penetration rate doubled from 2007 to 2011, exceeding the level of 100 subscribers per 100 inhabitants. The number of internet users also doubled in the same period. The share of households having a computer and internet access increased, positioning Moldova ahead of some Central European countries such as Bulgaria, in 2011. Broad band internet access increased in the past four years from 1.4 to 9.9 subscribers per 100 inhabitants.

From 2008 to 2010, the cost of telecommunication services reduced significantly, placing Moldova among the top 10 countries as regards the dynamics of price reduction for such services. Thus, in 2011 Moldova stepped up to the 8th position among the 142 countries as regards the affordability of ICT services. The reduction of the consumption basket for telecommunication services was caused particularly by the decrease of the broadband internet price. The costs for fixed telephony in Moldova are rather symbolic, while mobile telephony remains one of the most expensive in the CIS countries.

Of the total 829 enterprises operating in the sector, about 55% are ICT service-providers (K72 according to CAEM 2005) involved in software development and computer maintenance. The number of these enterprises had the most dynamic increase in the sector: over 17% annually from 2005 to 2009. Telecommunication companies accounted for the biggest share of employees - 41% of the overall number of over 22 thousand. Over two thirds of the latter are employed by S.A. Moldtelecom.

In 2011, ICT had a contribution of approximately 6.8% to the GDP, which decreased compared to 2009. Telecommunications accounted for the biggest share (about 80%), being also the subsector that generated the reduction of the value added in the sector. According to official estimates, slightly over 0.8% of the GDP or about 12% of the value added in the sector is generated by the software development and computer maintenance companies. In reality, this figure could be twice higher.

Foreign trade by ICT companies increased significantly in the past years. The export of information and informatics services had impressive growth trends, increasing over 13 times from 2005 to 2011.

ICT companies account for over 5% of the contributions to the social insurance and health insurance budgets.

Unlike the trends observed in other regional countries, the rate of enrolment in tertiary education reduced in the past years. Apparently, the number of students is sufficient to satisfy the demand existing on the information technology market. However, in reality, only a small number of graduates are capable of performing the current tasks, most of them requiring preliminary training before employment. Most software companies organize trainings for their newly hired staff, thus reducing the gap between the skills of the current employees and those of the freshly employed graduates.

From 2009 to 2011, Moldova's rank as regards business environment fell from the 94th to the 106th position. The situation in terms of the effectiveness of legal bodies (Parliament), the law on ICT sector, legal independence and intellectual property protection worsened as compared to other countries.

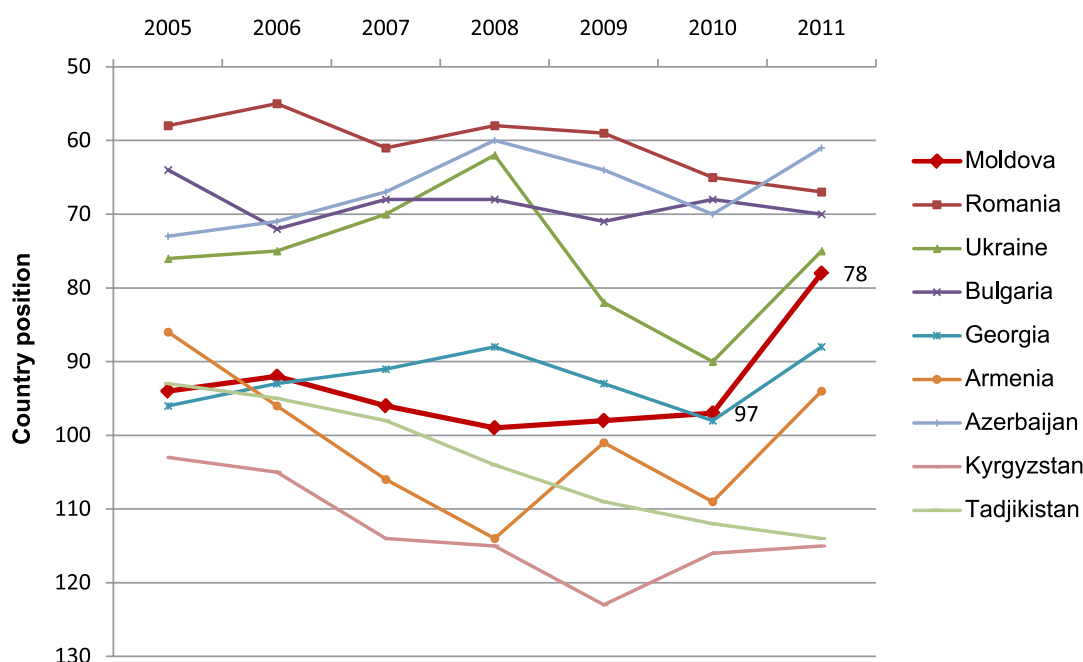
III. Moldova ICT Development in Regional and Global Comparison

A. Network Readiness Index

The efforts undertaken in the recent years to boost the ICT sector infrastructure contributed to raising Moldova's position in international rankings.

Following a slow fall during 2007-2009, Moldova stepped up to the 78th position in the Network Readiness Index, getting close to its neighbors - Romania and Ukraine, which are much more economically developed.

Chart 2 Evolvement of countries ranking in the Network Readiness Index



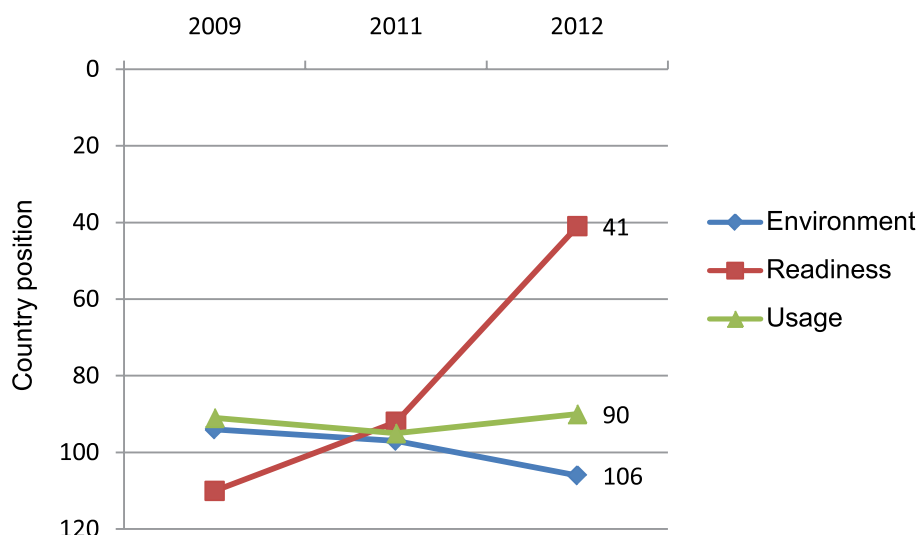
Source: INSEAD, *The Global Information Technology Report, 2012*

An analysis of the Index components reveals that the growth was due to a substantial improvement of the ICT infrastructure. Over three years, Moldova moved 69 positions up, ranking 41st in terms of the network readiness component. The fall of the environmental (political, regulatory, business, and innovation) component from the 94th to the 106th position is alarming.

Network Readiness Index (NRI) measures economies' capacity to fully use ICT for enhancing country's competitiveness. Since 2002, NRI has been developed by World Economic Forum in cooperation with INSEAD and used by politicians and other stakeholders to identify the strengths and weaknesses to monitor the effect of the undertaken actions.

NRI is calculated based on ten criteria which include four areas: environment, capability, usage and impact. The study presented in 2012 was conducted in 2011 on 142 countries.

Chart 3 Evolution of Moldova's ranking in terms of Network Readiness Index components



Source: INSEAD, *The Global Information Technology Report, 2012*

B. Business Usage

According to the 2012 INSEAD research, the weakest pillar of network readiness is Business Usage. For this component, Moldova ranks 120th out of 142 countries or 33 positions lower than in 2009, behind CIS countries with similar development levels such as Armenia (104), Azerbaijan (72), Georgia (109), Tajikistan (111), and its neighboring countries - Romania (91), Bulgaria (101), and Ukraine (76).

Two factors have contributed significantly to diminishing this index:

1. Firm-level technology absorption capacity reduced from 4.26 to 3.9 from 2009 to 2012. Moldova ranked 126th, leaving behind only two CIS countries: the Kyrgyz Republic and the Russian Federation.
2. Investment by enterprises in staff training and development is one of the lowest in the world – 118th position behind Romania (79), Georgia (106), Armenia (105), and Ukraine (117). The main reason being that most companies do not perceive training as bringing any value.

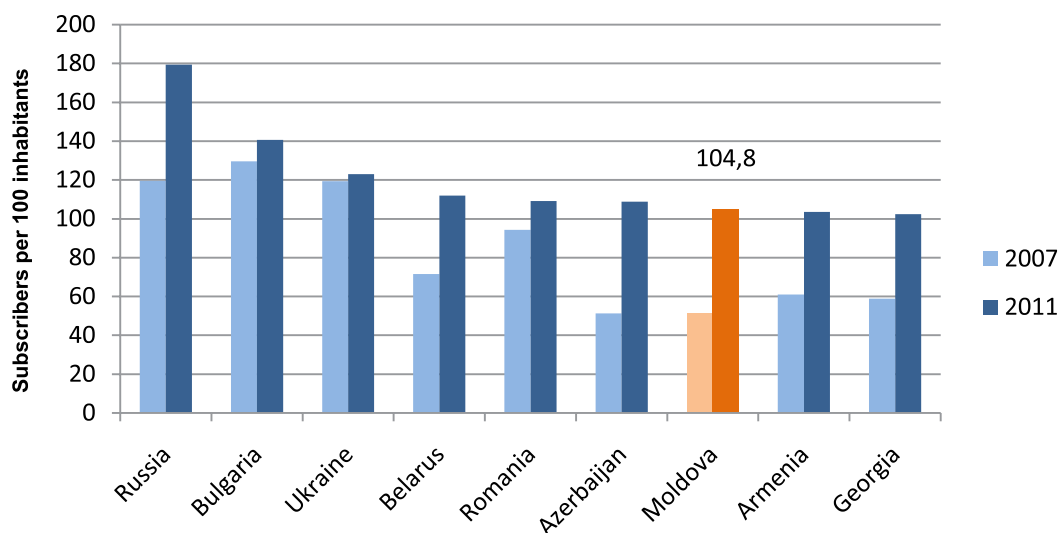
The other two factors – Capacity for innovation and Extent of Business Internet Use – have modest scores, ranking Moldova on the 107th and 109th positions respectively.

C. Individual Usage

In terms of individual usage, Moldova had a slight progress from the 80th to the 71st position from 2008 to 2011, according to the INSEAD research.

Mobile telephony penetration rate doubled during the past four years, bringing Moldova close to its neighbors – Romania and Ukraine, and ahead of two CIS countries with similar development levels - Armenia and Georgia.

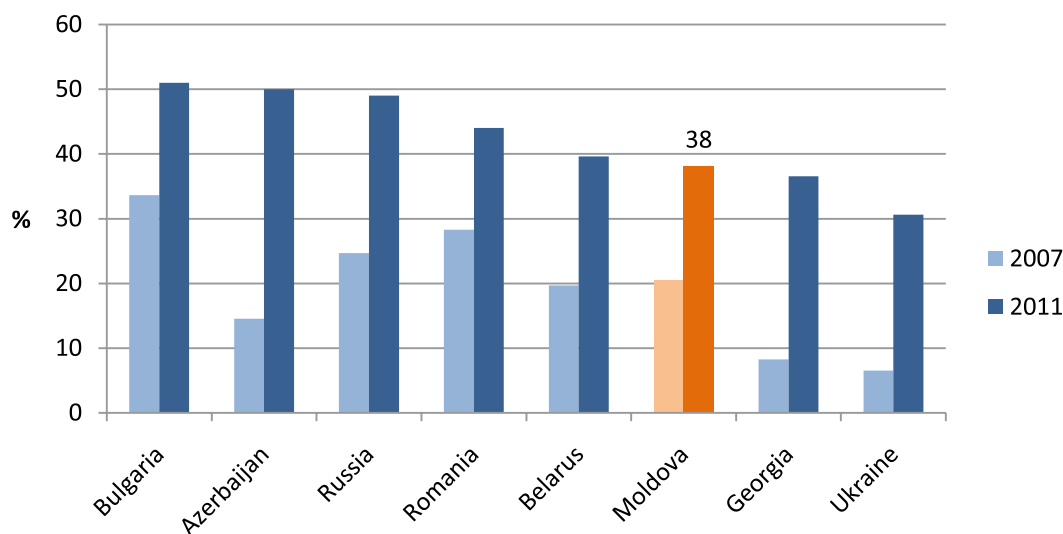
Chart 4 Evolvement of mobile telephony penetration rate by countries



Source: International Telecommunication Union (<http://www.itu.int/ITU-D/ict/statistics/>)

Between 2008 and 2011, the share of Moldovan population using Internet almost doubled. A similar trend existed in the neighboring countries. Internet is used by approximately 38% of the national population.

Chart 5 Internet Users

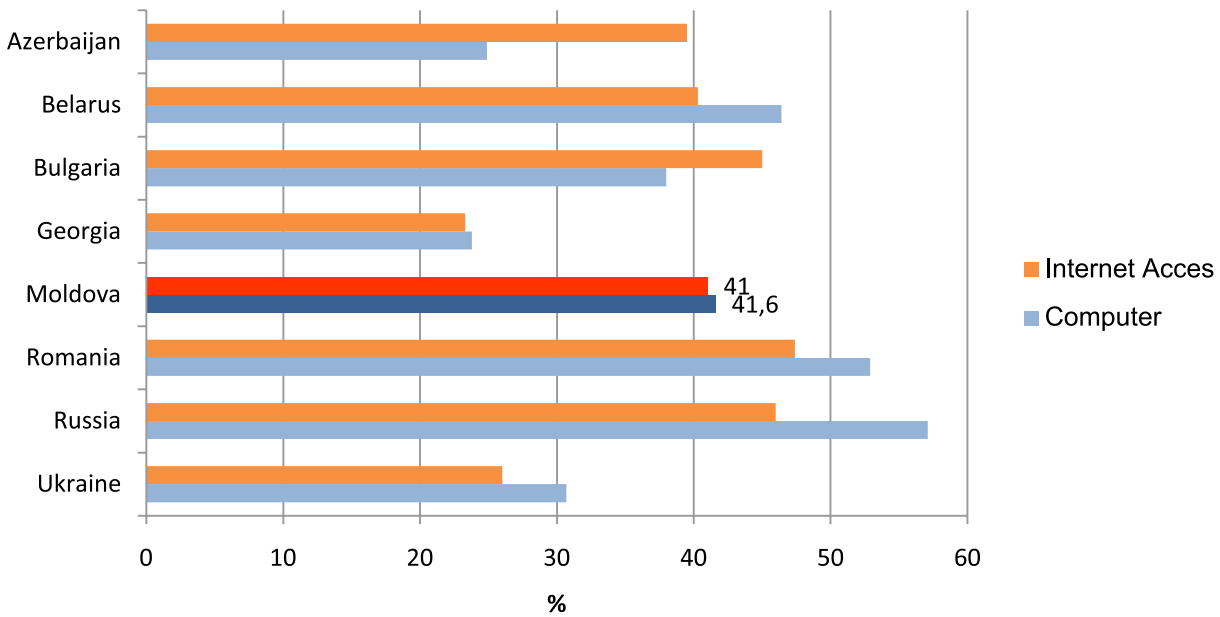


Source: International Telecommunication Union (<http://www.itu.int/ITU-D/ict/statistics/>)

Remittances from migrants contributed to increasing the share of household having a personal computer. This, along with families' need to communicate cheaply with members abroad, led to a considerable increase of the share of people having access to Internet.

Thus, from 2007 to 2011, the share of households having a computer increased from 23% to 41.6%, and the share of those that have access to internet – from 16% to 41%.

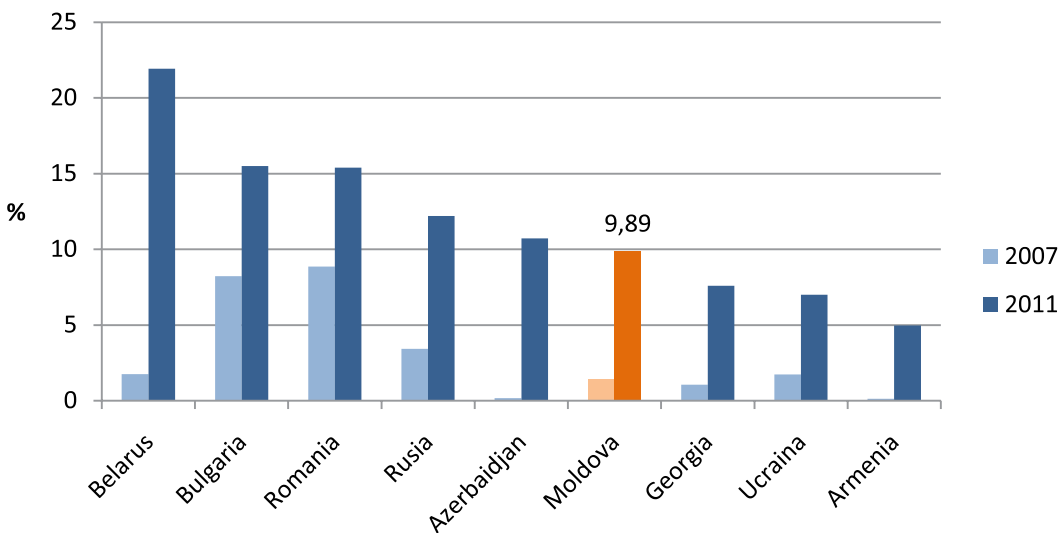
Chart 6 Share of households having a computer and internet access in 2010



Source: INSEAD, *The Global Information Technology Report, 2012*; ITU, *Measuring the Information Society, 2012*

In the past four years, the number of broadband Internet users in Moldova increased significantly from 1.4 to 9.9 per 100 inhabitants. The high rate of households using computers will prompt broadband internet expansion in the future.

Chart 7 Broadband Internet access



Source: International Telecommunication Union (<http://www.itu.int/ITU-D/ict/statistics/>)

D. Government Usage

From 2009 to 2012, Moldova moved up from the 103th to the 94th position in terms of usage of ICT technologies by the government. The improved rating was due primarily to an impressive growth in the number of online services provided by the Government – from the 112th to the 82nd position. However, Moldova's performance in terms of the importance that the Government places on the ICT sector is weaker – 108th position.

IT-related expenditures in education, public healthcare and public administration varied in the past five years between 10% and 18% of the total expenses of legal entities in the corresponding areas. The breakdown of expenses in the public sector differs from the overall breakdown. Therefore, legal entities other than the ones mentioned above spent 32% of the IT budget for purchasing computer equipment and 26% - for software, while public sector entities spent 48% of their total budget for equipment and only 12% (or for times less) for software. Only 1% of the public sector's budget was allotted for the design and development of information systems.

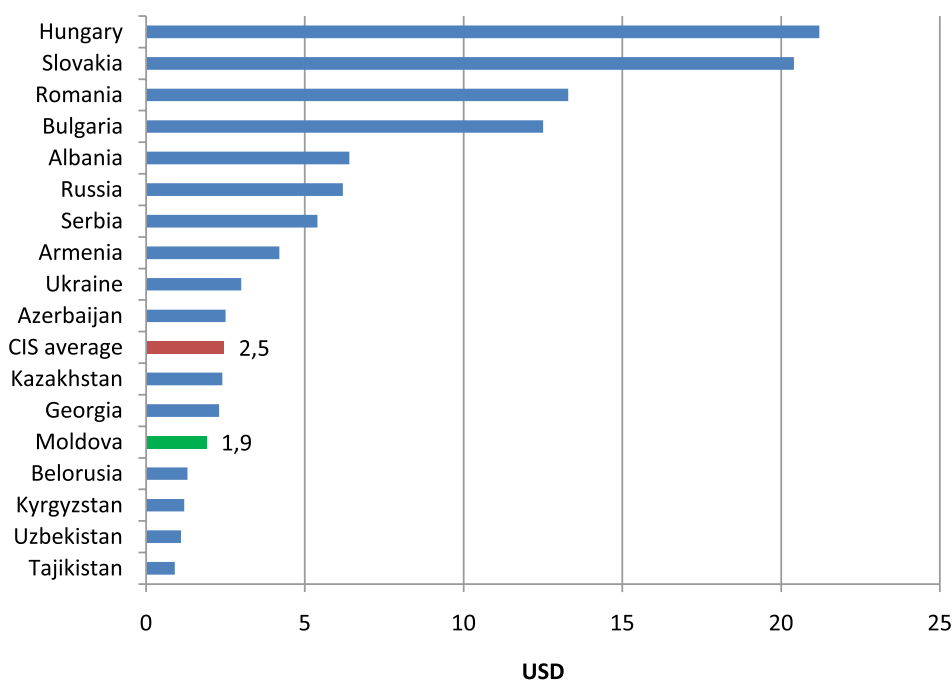
E. Affordability

From 2008 to 2010, the cost of telecommunication services reduced significantly. According to a research by the International Telecommunication Union (ITU) conducted in 2011, the ICT Price Basket (IPB) reduced by approximately 50%, placing Moldova on the 9th position among 165 countries. The price reduction for the telecommunication services was due primarily to a reduction of the price of broadband Internet by 3.7 times.

According to the 2012 INSEAD research, Moldova ranks 8th out of the 142 countries in terms of the rate of increase of ICT service affordability.

The absolute cost of fixed telephony services is low – 24% lower than the CIS average. Of the CIS countries, only Belorussia, Kyrgyzstan, Uzbekistan and Tajikistan have lower tariffs for the fixed telephony.

Chart 8 Cost of fixed telephony basket

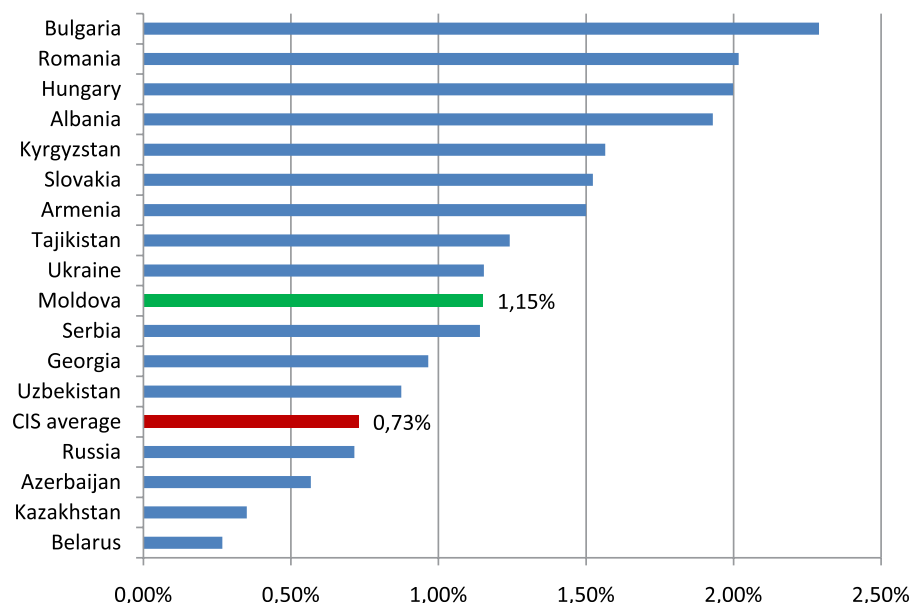


Source: ITU, *Measuring the Information Society, 2011*

In relation to the Gross National Product (GNP), this cost exceeds the cost average in the CIS countries, while being much lower than the cost in the Central European countries, even in relative terms.

However, access to fixed telephony, including the low tariffs applied by operators, have a lower impact on information technology development. Moreover, at international level, the low demand for fixed telephony has determined a decrease in the number of subscribers since 2007¹.

Chart 9 Cost of fixed telephony basket in relation to GNP

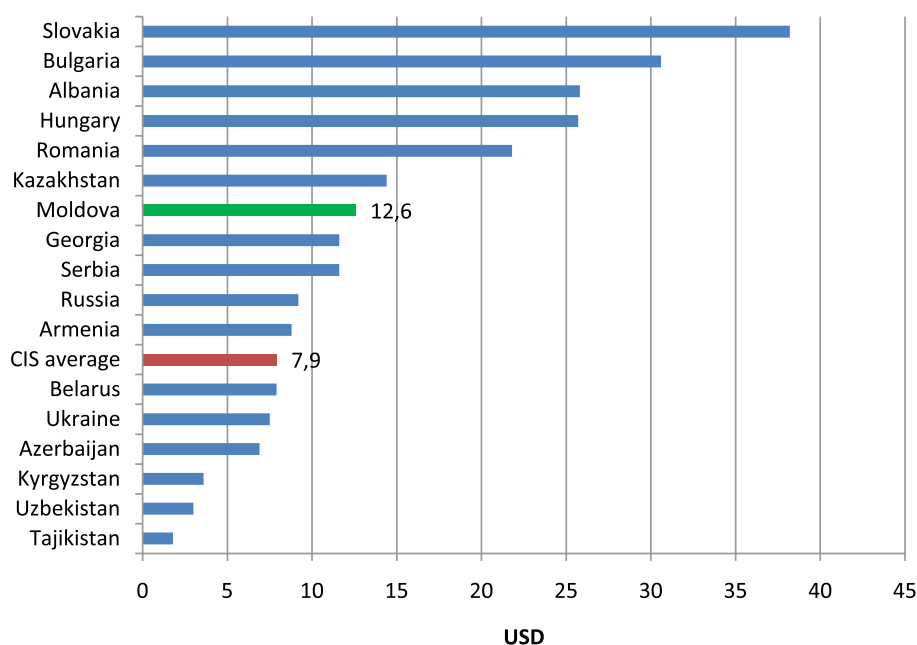


Source: ITU, *Measuring the Information Society, 2011*

Compared to 2008, the fixed telephony cost in relation to GNP per capita went down from 1.8 to 1.15%. This was due to both the decrease of the basket in absolute terms, and the GNP growth per capita.

Tariffs for mobile telephony provided by Moldovan operators are considerably higher than in most CIS countries.

Chart 10 Cost of mobile telephony basket

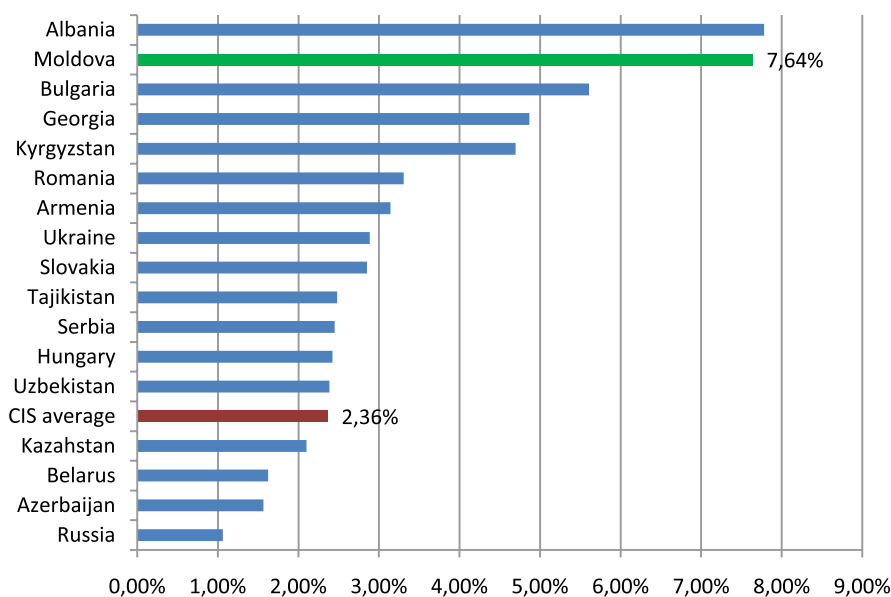


Source: ITU, *Measuring the Information Society, 2011*

In relation to GNP, the cost of mobile telephony is high: about 3.5 times higher than the average for the CIS countries and almost twice as much as in most countries of Central Europe.

¹ ITU, *Measuring the Information Society, 2011*

Chart 11 Cost of mobile telephony basket in relation to GNP



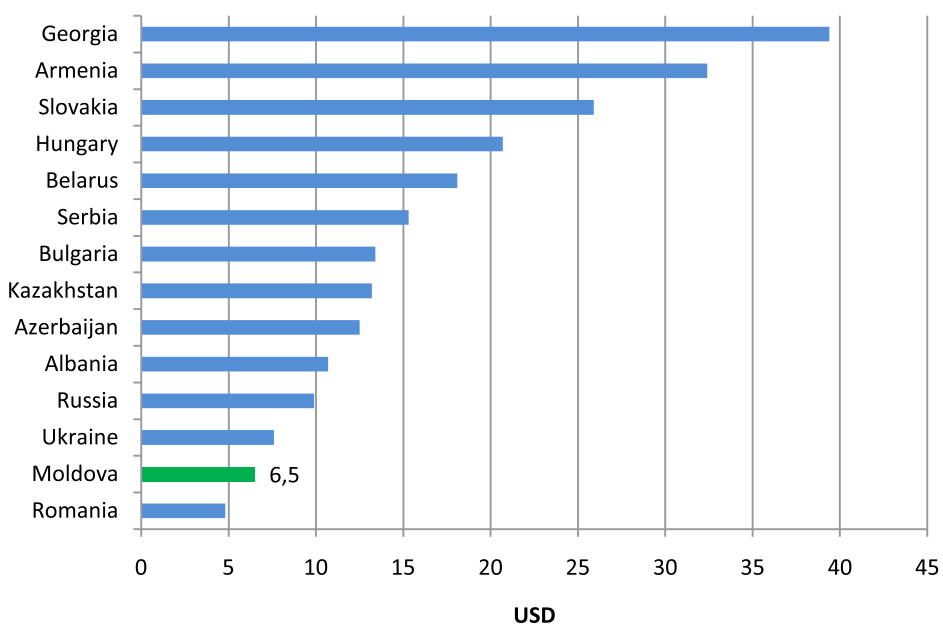
Source: ITU, *Measuring the Information Society, 2011*

Compared to 2008, the mobile telephony cost in relation to GNP reduced by one third (from 12% to 7.64%), which was mainly caused by an increase in the GNP rather than the reduction of absolute costs.

Absolute tariffs for broadband internet are the lowest in CIS and lower than in Central European countries except Romania.

The cut of tariffs for broadband internet led to a significant increase of the share of households having access to internet from 16% in 2008 to 41% in 2011.

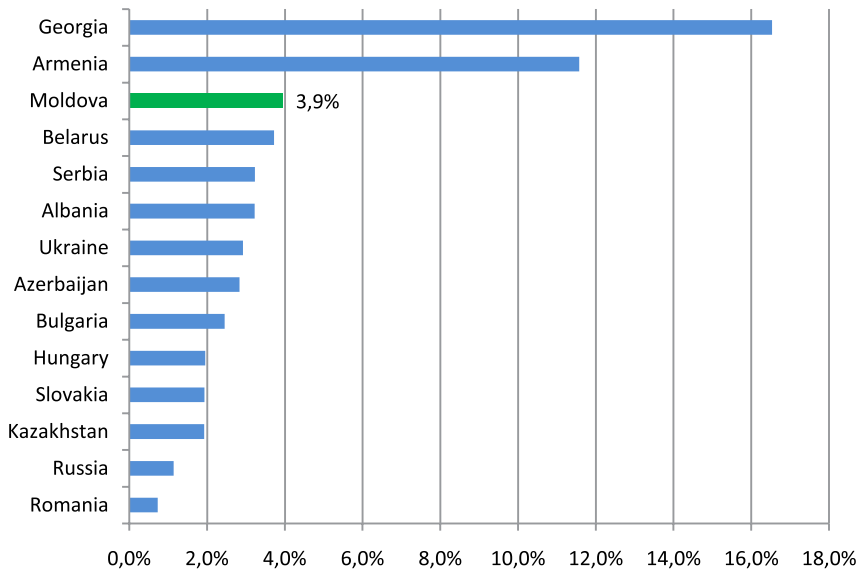
Chart 12 Average monthly tariff for broadband Internet



Source: ITU, *Measuring the Information Society, 2011*

Relative tariffs for broadband Internet (in relation to GNP) are comparable to the ones in many CIS countries and slightly higher than those in Central Europe.

Chart 13 Average monthly tariff for broadband Internet, in relation to GNP



Source: ITU, Measuring the Information Society, 2011

In relation to the GNP per capita, the cost of broadband internet decreased significantly compared to 2008 – from 18.5% to 3.9%.

IV. ICT Industry Competitiveness

A. Industry Structure

The structure of the ICT industry is diversified, comprising the manufacture of equipment, provision of services, wholesale and transport. Thus, in the Classification of Economic Activities of Moldova (CAEM) there is no separate ICT section. This makes it difficult to conduct analyses, even at the level of some general indicators such as the gross value added, the share in GDP or the sales.

There is no clear definition of the ICT industry. For purpose of this study, the following sectors of the national economy (according to the CAEM 2, 2005) have been included in ICT.

- 30000 Manufacturing of office equipment and computers
- 31300 Manufacturing of insulated wire and cable
- 32000 Manufacturing of radio, television and communication equipment and devices
- 33200 Manufacturing of instruments and appliances for measurement, verification and control
- 33300 Manufacturing of industrial process control equipment
- 51840 Wholesale of computers, peripherals and software
- 51850 Wholesale of other office machinery and equipment
- 51860 Wholesale of other electronic equipment and components
- 64200 Telecommunications
- 71330 Renting of office equipment and computers
- 72000 Computer equipment and related activities

Unlike the 2008 White Book, this study does not include code 1543 – wholesale of electrical household appliances and radio and TV devices. Having an insignificant share in the overall ICT trade, this subsector has a weak influence on the general data, which allows for data comparability.

The main activity of most of the industry companies – 829 or 55% – is the provision of ICT services, including development of software, consultancy, and computer maintenance. From 2005 to 2011, the number of such enterprises increased by approximately 17% annually.

Telecommunications is practiced by about 460 enterprises, with no change compared to 2007. The number of enterprises wholesale trading ICT products, particularly computers, peripherals and software, increased by approximately 10% annually from 2007 to 2011.

The number of enterprises manufacturing equipment designed for the ICT industry decreased in 2011 compared to 2007, accounting for only 5% of the total number of existing ICT companies.

Table 1 Structure of the Moldova ICT sector, number of enterprises

CAEM Code	Sector	2005	2007	2011
Manufacturing		75	89	77
30000	Manufacturing of office equipment and computers	9	9	7
31300	Manufacturing of insulated wire and cable	3	5	4
32000	Manufacturing of radio, television and communication equipment and devices	30	37	21
33200	Manufacturing of instruments and appliances for measurement, verification and control	30	33	36
33300	Manufacturing of industrial process control equipment	3	5	9
Wholesale		86	118	159
51840	Wholesale of computers, peripherals and software	77	103	135
51850	Wholesale of other office machinery and equipment	5	7	10
51860	Wholesale of other electronic equipment and components	4	8	14
Telecommunications		358	466	460
ICT services		376	519	829
TOTAL		895	1192	1525

Source: National Bureau of Statistics

About 22.3 thousand people are employed in ICT companies, slightly (5%) more than in 2007. The number of ICT professionals employed in the IT departments of companies that carry out various activities other than ICT should be also taken into account. The number of such employees is comparable to those working in the ICT companies – about 10 -15 thousand persons.

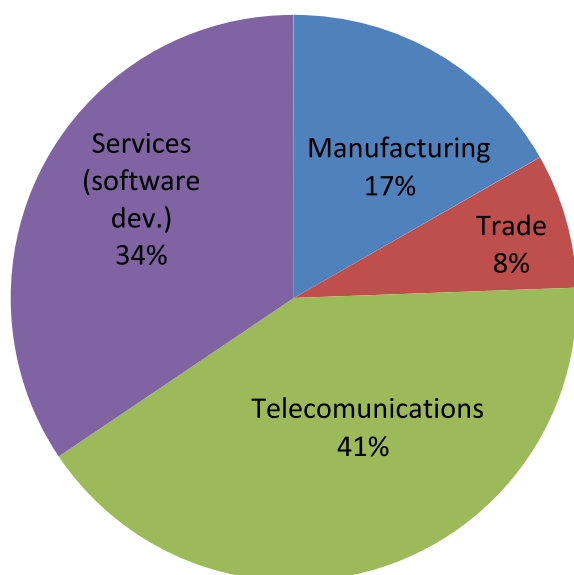
Table 2 Number of employees in the ICT industry

CAEM Code	Sector	No. of employees
Manufacturing		3726
30000	Manufacturing of office equipment and computers	67
31300	Manufacturing of insulated wire and cable	1 859
32000	Manufacturing of radio, television and communication equipment and devices	184
33200	Manufacturing of instruments and appliances for measurement, verification and control	1 522
33300	Manufacturing of industrial process control equipment	94
Wholesale		1712
51840	Wholesale of computers, peripherals and software	1 043
51850	Wholesale of other office machinery and equipment	642
51860	Wholesale of other electronic equipment and components	27
Telecommunications		9 157
ICT services		7 664
TOTAL		22 259

Source: National Bureau of Statistics

Over 41% of the ICT industry employees work in telecommunications, of which two-thirds are employed by S.A. Moldtelecom, and 34% work in ICT services (software development, computer maintenance, etc.)

Chart 14 Breakdown of employees by sub-sectors



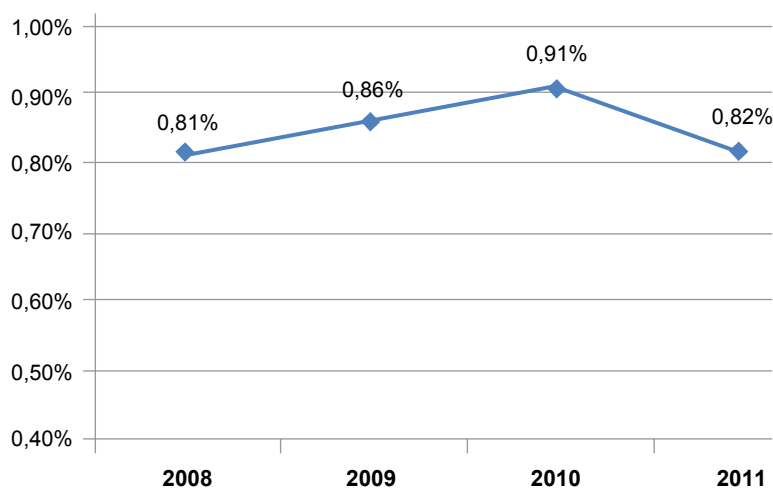
B. Contribution to GDP

There are two reasons why it is not possible to establish with high precision the ICT industry contribution to GDP. As mentioned above, according to CAEM, the ICT industry is broken down by sub-sectors: manufacturing, services, wholesale and communications. Therefore, the calculation of the gross value added at a two digit-level by the National Bureau of Statistics is too synthetic to allow establishing the ICT industry's contribution.

The second reason is the high share of the "grey" market, which consists primarily of the import of equipment which was not been subject to customs clearance and the provision of undeclared services.

The only ICT sub-sector the value added of which is calculated by the National Bureau of Statistics is IT service provision (section K72 of CAEM 2005), namely consulting on computer equipment, software development, computer maintenance, etc. Following a growth during 2008-2010, the software sector slowed down in 2011. Although the value added in this area increased by 3% in 2011 compared to 2010, in terms of current prices, this growth was lower than the GDP growth.

Chart 15 Share of IT services in GDP

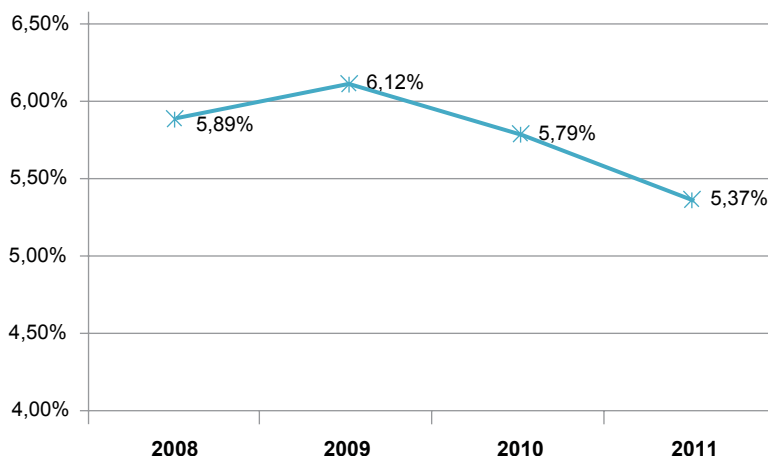


Source: Calculations based on the data from the National Bureau of Statistics

Telecommunication services are included in the statistical calculations together with the postal services, in section I64, according to CAEM 2005. However, knowing that telecommunications (group I642 of CAEM 2005) account for about 89-95% of the ICT services², we can calculate with a high probability the gross value added generated by this sub-sector.

² The share of telecommunications reached its minimal value of 89.1% in 2009 and its maximal value of 94.6% in 2008

Chart 16 Share of telecommunications to GDP

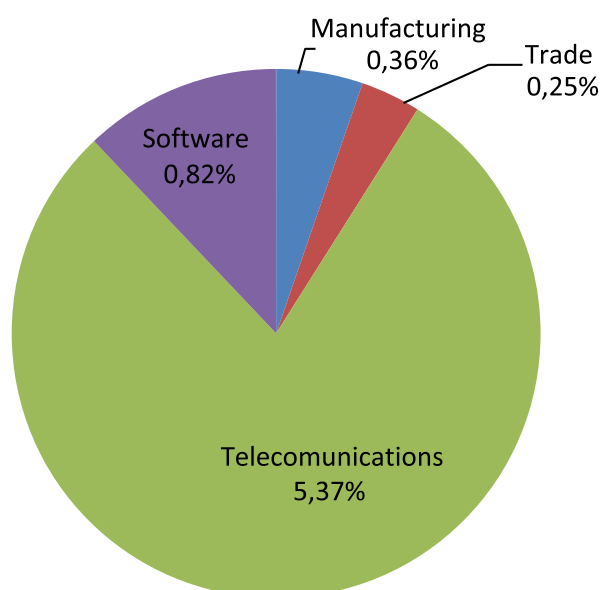


Source: Calculations based on the data from the National Bureau of Statistics

In 2011, the added value generated by enterprises manufacturing IT equipment accounted for about 0.34-0.37% of the GDP, which was higher than in the previous years. However, it should be noted that around 95% of the respective value was generated by the enterprises manufacturing wire and isolated cables (group D 313) and the manufacturers of measuring devices and tools (group D 332). The other 5% or less than 0.02% of the GDP resulted from the activity of enterprises producing computer and office equipment, radio, television and communication equipment and devices, and equipment for control of industrial processes.

Usually the ICT' wholesale sub-sector is the most difficult to assess. An analysis of the sales in this sector, admitting that 12-15% of them are value added, reveals a modest contribution of about 0.22-0.27% to the GDP, of which the sale of peripherals, computers and software accounts for 96%. This industry segment is the most affected by the black market actions. However, even admitting that half of the computer imports are unregistered, the contribution of this segment to the GDP would not exceed 0.5%.

Chart 17 Contribution of ICT to the GDP, by areas, 2011



Therefore, the overall contribution to GDP of the four ICT sub-sectors – services, manufacturing, telecommunications and wholesale – is about 6.8%. This figure represents the registered value of the industry and does not include the undeclared activities of businesses. Nevertheless, even a possible “adjustment” of the value added for the IT sector would not change its share in the GDP because:

- 1) telecommunication, which is a fully transparent segment, accounts for the biggest share (5.4%);
- 2) in order to ensure data comparability, the increase of the absolute value added for the industry should be accompanied by an increase in the absolute value added for the other sectors of the national economy. Thus, the share could even decrease.

Source: Calculations based on the data from the National Bureau of Statistics

C. Foreign Trade of ICT

As shown in the table below, the export of ICT services increased considerably in the past years. The biggest share belonged to the communication services, which also includes postal services.

It should be mentioned that the informatics and information services increased over 13 times from 2005 to 2011; their share in the overall export of services increased from 0.9% to 5.4% due to the fact that both the actual volume and the declared valued of exports grew.

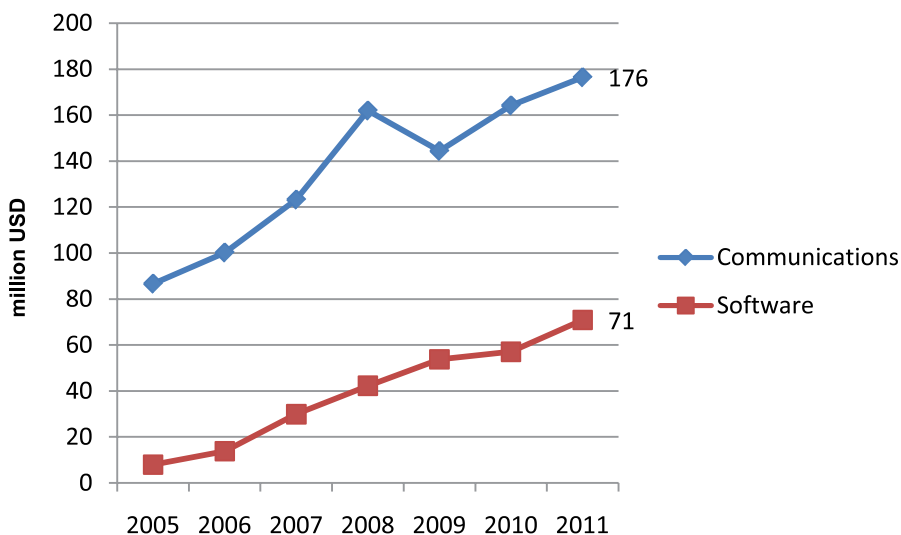
Table 3 Foreign trade of IT and communication services, mln USD

	2005	2006	2007	2008	2009	2010	2011
Communication services							
Export	59.37	71.19	85.67	114.56	105.21	126.05	133.96
Import	27.28	29.00	37.55	47.37	39.15	38.13	42.46
Informatics and information services							
Export	3.64	7.97	14.27	26.27	29.75	33.42	47.84
Import	4.40	5.89	15.65	15.99	23.98	23.63	22.99

Source: National Bank of Moldova

Import of ICT services also increased, though less than exports. Thus, from 2005 to 2011, foreign trade of communication services doubled and that of informatics and information services increased almost nine times.

Chart 18 Foreign trade of ICT services



The figures above show the official exports. However, in this industry, the share of undeclared activities is significant. Usually in such cases outsourcing is done through specialized websites like www.odesk.com, and the payment is made by wiring directly to the provider. According to certain sources, in 2009, the IT outsourcing market volume in Moldova was about 54 mln USD³, twice higher than the official figures.

³<http://ceeo.org/assets/Uploads/CEEITOREview2010.final.pdf>

Because of the issues related to the bookkeeping of foreign trade of services, a large amount of service exports and imports avoid bookkeeping and reporting to the government institutions. In order to register in the books the expenses or revenues from the international trade of services, companies should submit supporting documents regarding the transactions made, namely to conclude a Statement of delivery and acceptance. Usually this is hard to achieve and sometimes even impossible (i.e. for electronic trade). Thus, it is easier for businesses to register a company abroad to deliver software, while the incomes are transferred into the country by semi-legal ways, avoiding reporting to the State Tax Service.

It is also difficult to assess the value of the imports and exports of ICT equipment. The Standard International Trade Classification (SITC) does not have a separate section for this subsector. On the other hand, the data from the Customs Department are not accurate, given the high share of unregistered imports. However, it is possible to follow the trend by analyzing the two chapters that include the import of ICT equipment: 75 - Office machines and automatic data-processing machines and 76 Telecommunications and sound-recording and reproducing apparatus and equipment.

For both chapters, imports, even if partly registered, exceed considerably exports: 44 times for chapter 75 and 12 times for chapter 76. Imports increased during the period of 2003-2011 but not significantly, following the overall import trend for the country. The share of the abovementioned chapters in the total imports varied between 3.07% and 3.74% during the said period.

According to some estimates, the hardware market accounts for about 100 mln USD, inclusive of VAT. Based on this data one can estimate the level of imports, which satisfies this market virtually entirely.

An analysis of the value added by the manufacturing ICT companies and the amount of VAT transferred to the budget, we can estimate that at least 90% of the industry products are exported. The biggest share of exports belongs to the enterprises manufacturing insulated wire and cables and the manufacturers of instruments and appliances for measurement, verification and control.

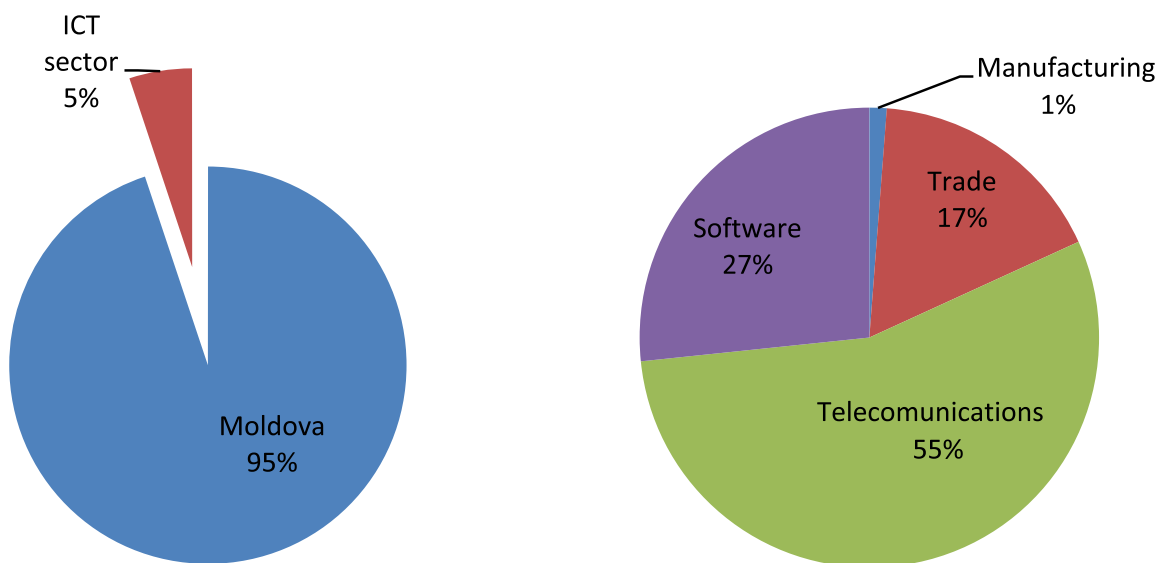
D. Contribution to the State Budget and the Social Insurance Budget

ICT accounts for about 5.4% of the VAT collected in 2011 to the State Budget or over 577 mln lei. The telecommunications sub-sector is responsible for the biggest share of this amount – over 55%. Though the value added in telecommunications suggests a bigger share of the VAT paid (about 79%), the actual share is lower, given the fact that the value of exports in telecommunications exceeded by far the value of imports, the former being VAT exempted.

Trade, through having a modest share in the industry's value added, has a significant share in the VAT transfers to the budget, since most of the products sold come from imports.

Manufacturing companies have not made significant VAT payments, given the high share of exports in this subsector.

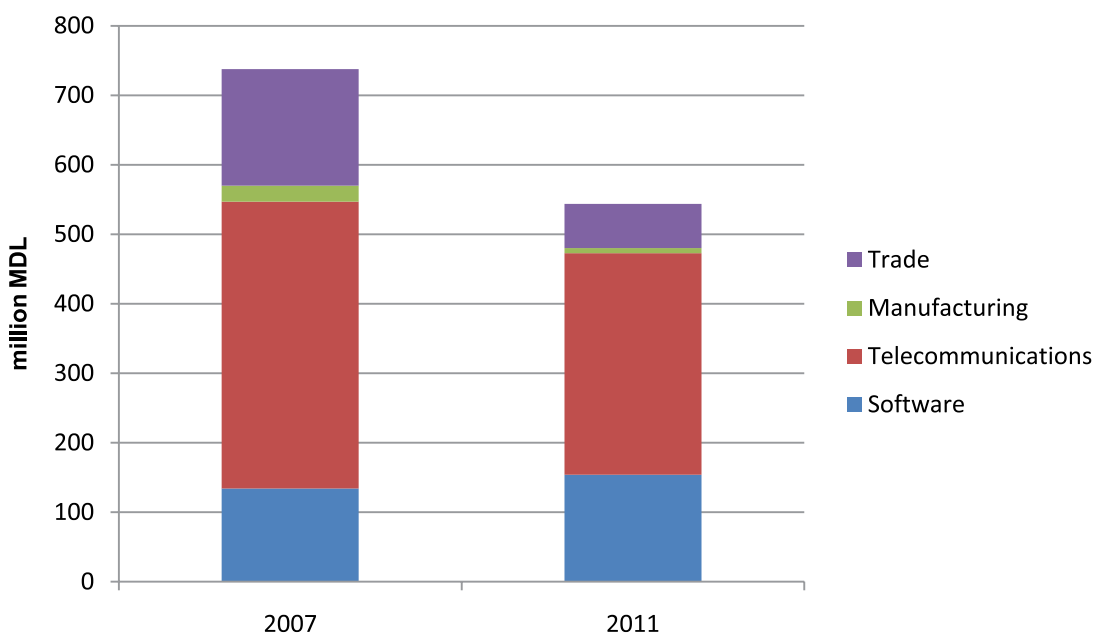
Chart 19 Share of ICT in the total VAT paid



Source: Calculations based on the data from the National Bureau of Statistics

The share of ICT in the total VAT paid reduced significantly compared to 2007– from 9.7% to 5.4%. This was due to both the reduced absolute transfers and the increased transfers made by other industries.

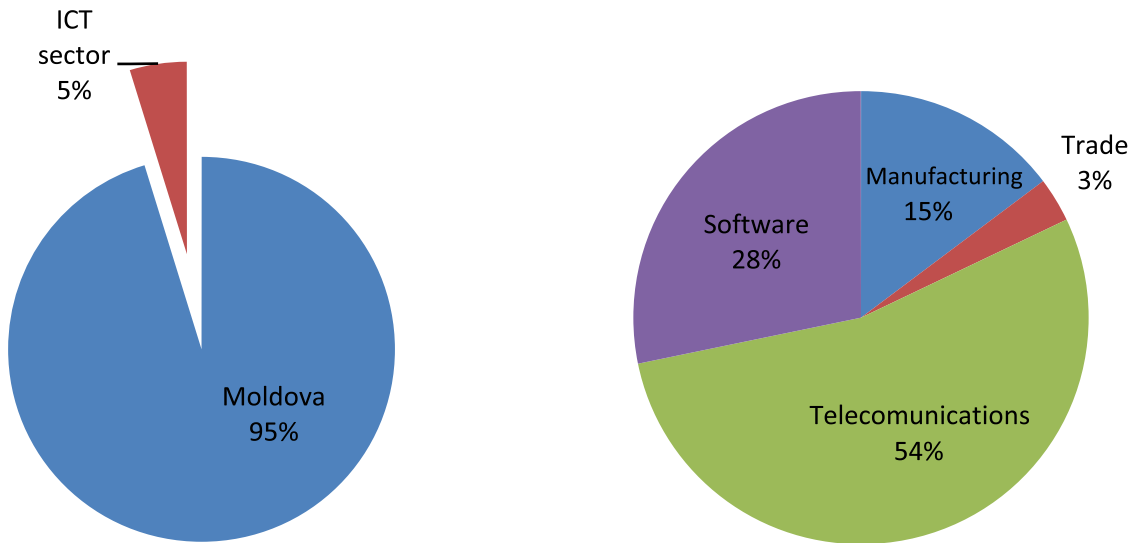
Chart 20 Evolvement of the level of VAT paid by the ICT sector



The situation of the amount of social insurance contributions paid by the ICT sector is similar: about 5% of the total for the country. The share of manufacturing is high due to the big share of salary expenses in the value added by this sub-sector.

In 2011, the overall amount of contributions paid by the ICT sector was 330 mln MDL.

Chart 21 Social insurance contributions paid by the ICT sector

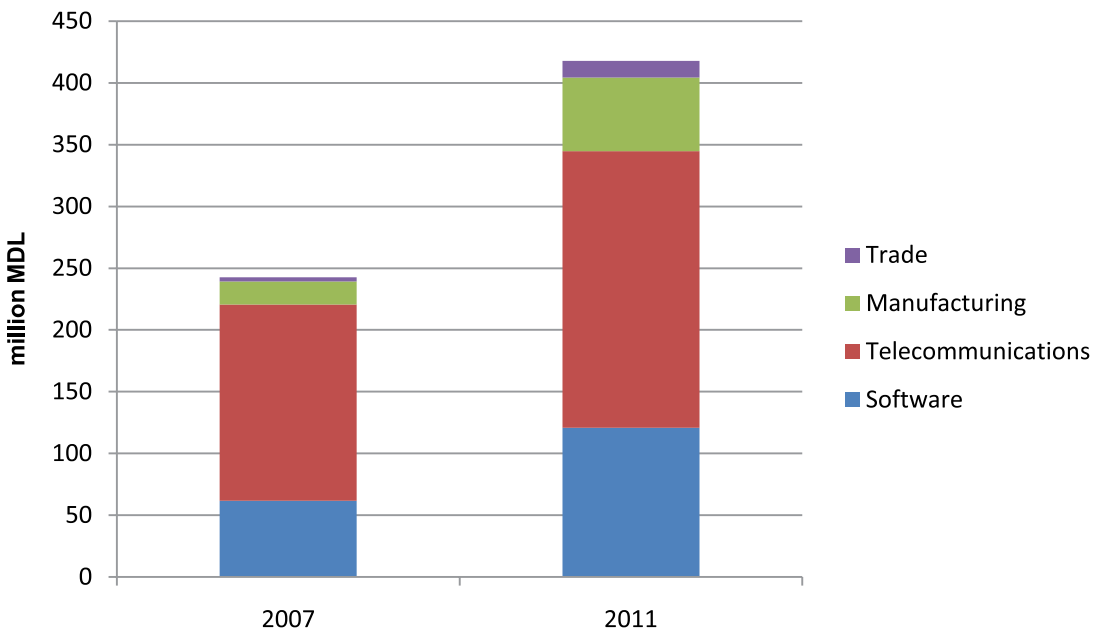


Source: Calculations based on the data from the National Bureau of Statistics

The contributions to the health insurance budget in 2011 amounted to 88 mln lei. The share thereof in the total health insurance contributions paid in the country and the breakdown by ICT sub-sectors are similar to the ones existing for the social insurance.

Both the amount of social insurance and health insurance contributions increased by approximately 74% compared to 2007.

Chart 22 Evolvement of social insurance contributions and health insurance premiums paid by the ICT industry



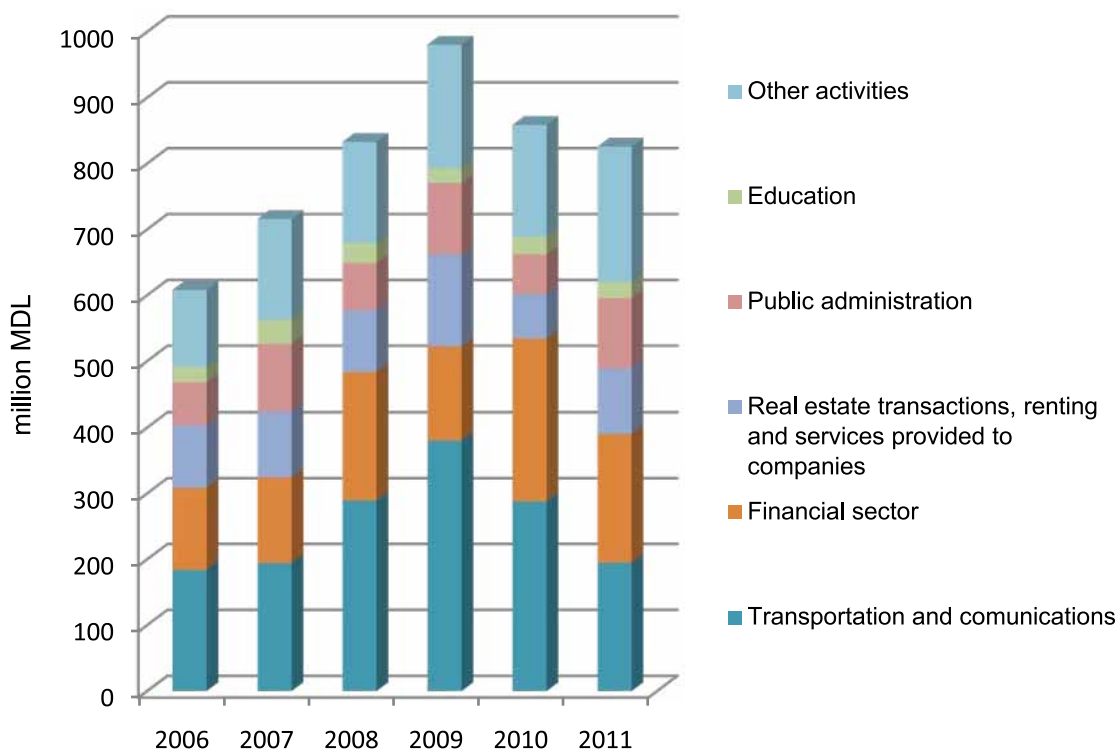
In addition to the abovementioned, the ICT industry paid in 2011 about 597 mln MDL. A big part of these are payments to the Republican fund and the local funds for population support.

E. Impact on the Other Sectors of the National Economy

Until 2009, the consumption of information technologies in the national economy sectors increased continuously, particularly due to the growth of consumption in transports and communications. However, in 2010 IT consumption started to decline mainly due the reduction of IT consumption by half in transports and communications from 2009 to 2011. For the rest of sub-sectors, the level of consumption remained virtually the same.

The growth of investments in telecommunications during 2008-2009 and the decrease thereof during 2010-2011 may be explained by the fact that mobile operators made investments in the 3G infrastructure.

Chart 23 Expenses by the national economy sectors for information technologies



Source: National Bureau of Statistics

1. Impact on Enterprises (at micro level)

The applications developed by the ICT sector have an important impact on enterprise productivity.

The economic and financial analyses or the technical and economic feasibility studies enable accurate decision-making, which leads to maximization of sales and minimization of expenses. In a rapidly developing world, not only the accuracy of actions is important, but also the timeframe in which such actions are taken. The development of management information systems enables decision-making in a timely manner. Information systems allow signaling when a decision is not made on time or is incorrect.

The costs for promotion through Internet (e-mail, websites, social networks, twitter, etc.) are considerably lower than those for promotion through hard copies. In addition, the scope of advertising is much wider.

Information technologies enable automating not only decision-making, but also the production process. High productivity allows reducing direct unitary costs, and thus increasing enterprise competitiveness.

Information technologies have generated a strong trend of enterprise activities globalization. Companies are permanently looking for information about various providers in their search for cheaper and more qualitative raw materials, better labor force, cheaper financial sources, more promising markets, as well as for information about the best practices in the field. Experience, as a critical factor for a company's success, gradually yields up to the capacity of rapidly finding the necessary information and applying it adequately.

2. Impact on the Education System

The use of IT makes information more attractive, helps the education process become more appealing and turns it from an obligation to a pleasure. Thus, students are those who request information, becoming active consumers in the process of education.

Information technologies allow finding the necessary information rapidly. As a result, the efficiency of the entire education process increases.

In the modern world, having the capacity to memorize information is not as important as having the ability to easily find information. The use of information technologies increases considerably the ability of students to find useful information when needed.

3. Impact on the Public Administration

Not less important is the use of information technologies in public administration. This eliminates the need to submit to various institutions piles of documents generated by other entities or which have already been submitted to other government bodies. It also allows for a more rapid analysis of documents (there is no need for several agencies to examine the same document) and saves the time of businesses, which will not have to go to different government agencies to ask for approvals and coordination. Increasing the efficiency of civil servants will allow reducing the number thereof and increasing the salaries for the remaining staff.

The use of new technologies increases significantly the capacity of citizens and of various entities to get involved in decision-making by the government bodies.

V. Potential for Growth

A. Global Trends

According to Gartner Inc., the IT market will grow by around 3.5% annually in the following three years, reaching 4.4 trillion USD in 2015. Although currently they have an insignificant share in the overall IT market, “cloud” services will increase by 20%, reaching in 2015 a sales value of about 180 billion USD, according to the report presented by Gartner Inc. Given the fact that there is little knowledge about Moldovan companies on the international market, the sales in cloud computing create favorable conditions for export. The marketing effort required for cloud sales is lower than the one needed for individual product sales. The software developed may be placed in cloud as services.

Another relatively open segment that requires small investments are the mobile applications. An IDC report estimated this market at 35 billion USD in 2014. This however requires a high marketing effort. The risk of creating software that is not successful on the market is relatively high. According to the estimations of the Central and Eastern European Outsourcing Association (CEEEOA), there has been a trend of outsourcing market growth. This market includes small projects for small and medium companies, representing a promising opportunity for Moldova.

The share of software designed for the banking, financial and insurance sectors is continuously growing. Customers appreciate highly companies that have extensive knowledge and experience in specific areas. Usually software companies in Moldova are actively involved in developing software for the financial-banking sector, which is an important competitive advantage. Compared to the Asian countries, Moldova is closer to Europe both geographically and culturally. Labor force in Moldova is considered of high-quality while relatively cheap. Many foreign companies consider moving their offices close to the EU. Software companies in the EU and North America see Central and Eastern Europe as a more convenient option than Asia due to a much more cooperative and result-oriented labor force. Another advantage for the European companies is the small time zone difference, which makes communication easier.

Following an increase by 43% of the software exports in 2011, in 2012 the growth pace is expected to slow down to the level of 2009-2010 – about 12-13% per year.

B. Changes on the local market

In November 2012, ANRCETI granted two licenses for the 4th generation of mobile telephony to Moldcell and respectively Orange companies, which provide mobile telephony services on the Moldovan market and which will modernize their existing networks based on the LTE technology. According to the terms of the license, by December 31, 2015, the license holders will have to cover an area inhabited by at least 25% of the population. Therefore, in the following two-three years, a growth of investments in telecommunications is planned.

The new generation of technologies will enhance significantly the quality of mobile internet access, will facilitate the interactivity and the capacity of data transfer, the organization of videoconferences on mobile phones and use other modern mobile applications. Recently, ANRCETI announced its intent to make available to the telecommunication providers the radio frequency sub-band 3750-3800 MHz in order secure public networks and services for electronic communications via terrestrial mobile networks for broadband radio access. According to the proposal of ANRCETI, companies that currently provide mobile communication services will be bound to secure coverage by BWA services on at least 30% of the territory of Moldova, within 18 months after they get the BWA license. The other companies will be bound to secure coverage by BWA services for at least 30% of the territory of Moldova within 36 months after they get the BWA license. ANRCETI considers that the issuance of such license will contribute to attracting investments in the development of new Internet access technologies, which, in their turn will stimulate competition on the market of public broadband Internet services, particularly those provided in the rural areas.

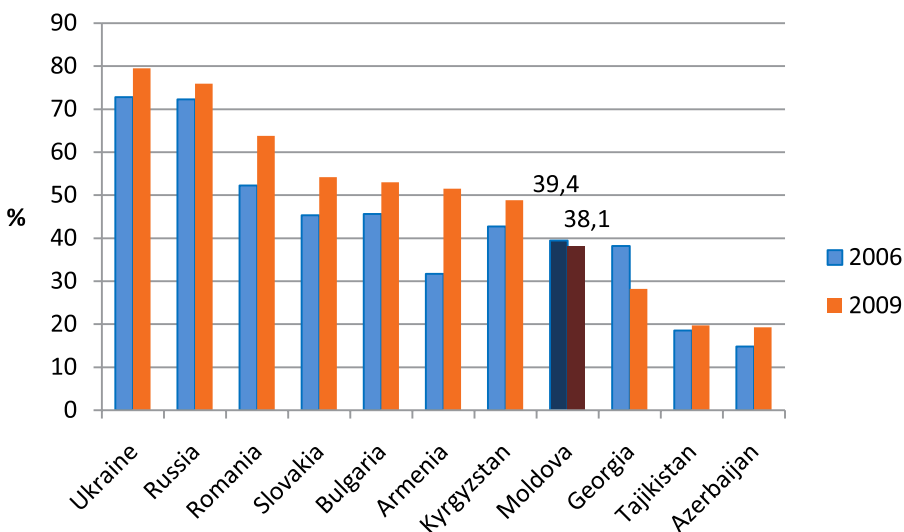
VI. Competitiveness Factors

A. Human Capital - a Critical Factor in the ICT Sector Development

The ICT industry, particularly the service provision sub-sector (software development, computer service, etc.) involves a lot of human capital. A key factor for the sector development is the skills and knowledge of the IT engineers and professionals.

Traditionally, the enrolment rate in the tertiary level of education in Moldova is quite high. In the past five years, following the establishment of limits for student intake in the tertiary education, the enrolment rates have lowered compared to the Central Europe and CIS countries.

Chart 24 Rate of enrolment in tertiary education



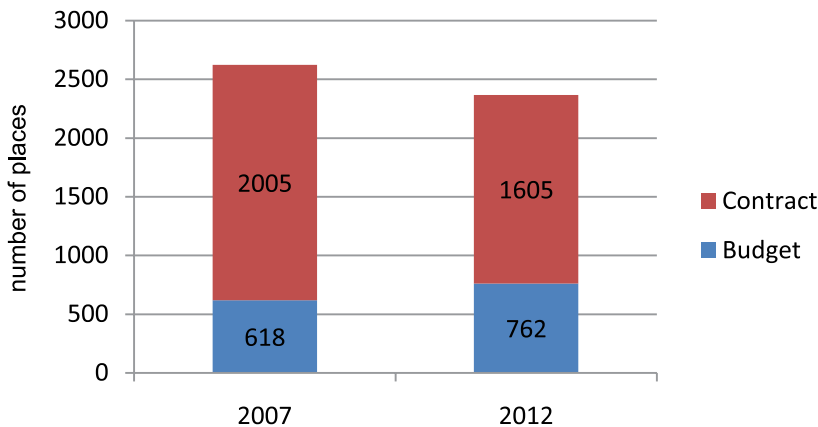
Source: INSEAD, *The Global Information Technology Report*

Similarly to other specialties, the enrolment of students at ICT faculties decreased, while the share of the latter in the total enrolment remained virtually constant – 11%. In 2007, 2 623 places were provided, while in 2012 the number of places decreased to 2 367. However, the number of places funded from the state budget increased from 618 to 762.

These figures include the following specialties: electronics, optoelectronic systems, tele-radio-communications, microelectronics and nanotechnologies, computers, information technologies, automatics and informatics, information security, informatics, cybernetics and economic informatics, applied informatics, and biomedical systems engineering.

However, even the places available are not totally filled. Thus, in 2012, out of the 2 367 places provided, only 1 930 have been filled.

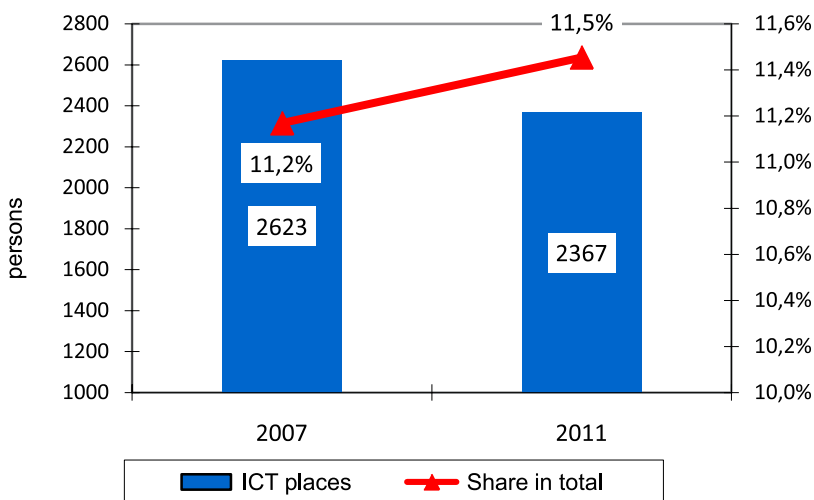
Chart 25 Number of places approved for the ICT specialties



Source: Government Decisions on approval of the Education Enrolment Plan

Apparently, the number of graduates is sufficient to ensure the demand on the IT market. However, the teaching methods and the curriculum are obsolete. Only a small number of graduates are able to perform the job-related tasks, most of the students requiring additional training before employment. The strict requirements imposed by the Ministry of Education, the poor financing and the low flexibility of teachers maintain this status quo, increasing the gap between the demand by companies and the supply by educational institutions. The cooperation between the private ICT sector and the teaching staff is very poor.

Chart 26 Evolvement of the share of places provided for ICT specialties



Most software companies organize training programs for their new staff, thus reducing the divide between the existing and the new coming employee, in terms of knowledge.

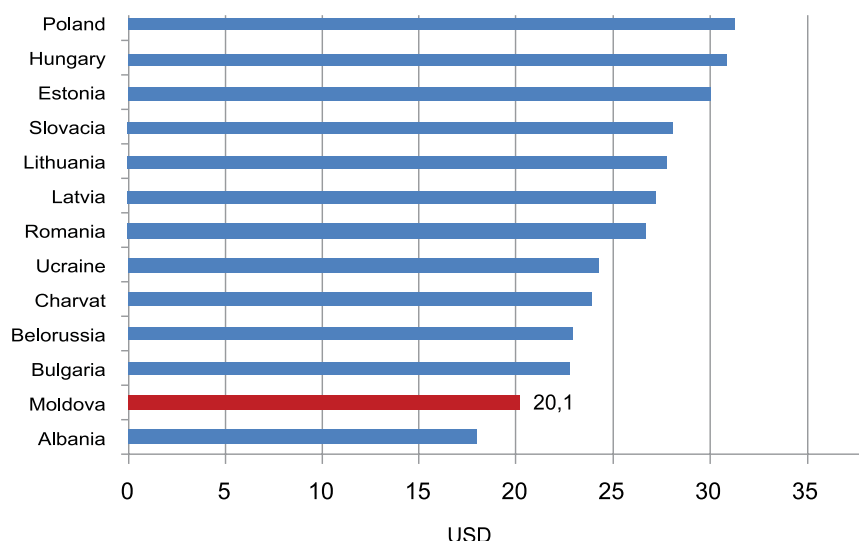
There are very few specialized training centers, but graduates are unaware even of these.

A lot of the programmers choose to provide subcontract services to foreign companies. Unfortunately, most often those programmers are not fresh graduates, but former employees of software companies. This affects even more the availability of skilled human capital for the local companies.

According to some sources, the number of Moldovan professionals providing outsourced IT services is about 1600. The average rate per hour for programmers in Moldova is lower than the one for the same professionals in the Central Europe countries.⁴ The most reasonable explanation for that is the low awareness about Moldova.

⁴ <http://ceeo.org/assets/Uploads/CEEITOREview2010.final.pdf>

Chart 27 Average rate per hour for Moldovan programmers



Source: CEEOA, *Central and Eastern Europe IT Outsourcing Review, 2010*

B. Business Environment

As shown in the study presented by INSEAD⁵, in the recent years Moldova’s rank in terms of “business environment” fell from the 94th to the 106th position from 2009 to 2011.

Table 4 Moldova’s position by business environment components, as part of the Network Readiness Index

Component	Position in the 2009 Report	Position in the 2012 Report
Effectiveness of law-making bodies	76	99
Laws relating to ICT	91	101
Judicial independence	111	132
Intellectual property protection	70	110
No. of procedures to enforce a contract	27	18
No. of days to enforce a contract	25	20

Source: INSEAD, *The Global Information Technology Report, 2012*

The situation in terms of the effectiveness of the law-making body (the Parliament), the laws relating to ICT, the judicial independence and the intellectual property protection has worsened.

1. Government Regulation

The continuous movement of the ICT sector to the grey economy, as well as the awareness about the opportunities that might arise if this sector is supported have prompted the Government to start reforms in 2005 to reduce significantly the fiscal burden for software developers. The results did not take long to appear: investments in the sector have increased and most software companies have stopped hiding the salaries they pay to programmers. As a result, from 2005 to 2011, the registered exports of software services increased 13 times.

Most of the interviewed companies have mentioned the reduction of the fiscal burden. On the other hand, the fiscal regulations are not stable, which creates problems for the tax administration and reduces the abovementioned advantage.

⁵ INSEAD, *The Global Information Technology Report, 2012*

Telecommunication companies pay 2.5% for their revenues from mobile telephony services to the Ministry of Labor, as these are still considered luxury services.

In general, the legislation on electronic communications is aligned to the EU regulation framework of 2003. Currently, the EU 2009 regulation framework is in process of adoption. The main document regulating this area is the Law on Electronic Communications No. 241-XVI of 15/11/2007. Based on this law, ANRCETI was established as an independent regulating authority on the market of electronic communication and information technology services.

According to the respective law, the provision of electronic networks and services may be initiated without any prior approval, just upon the notification of ANRCETI. Within seven days, ANRCETI informs the supplier whether or not it meets the requirements.

By Law No. 241, the Universal Service was defined, as well as the requirements and the way in which such service is secured. The services included in the minimal set of the universal service are the following:

- access to public electronic communication networks at a fixed location;
- information on the subscribers and availability of subscriber registers;
- access to paid public telephones, including free access to emergency services.

The Decision of the ANRCETI Administration Council No. 12 of 31/01/2009 sets forth the principles and procedures regulating interconnection, including access to the local loop and colocation. From May 2013, the number portability will become a requirement.

Currently the Moldovan law provides for two types of licenses:

1. License granted by the Licensing Chamber for import, export, design, manufacturing and sale of cryptographic and technical means for information security, of special technical means for secret obtaining of information, provision of services in the field of cryptographic and technical security of information.
2. License granted by ANRCETI for services of development, implementation and securing operation of nationally important automated information systems, including software.

Following the reforms undertaken in the past two years, the procedures at the Licensing Chamber have been organized according to the one-stop-shop principle. As reported by most enterprises holding a license in ICT, the procedures existing at this agency are fluidized and do not create any problems.

However, enterprises face difficulties when obtaining the license from ANRCETI. On the one hand, the nationally important activities are not well established, and on the other hand, the procedures are burdensome, a lot of additional documents certifying the capacity of the enterprise to perform the licensed activity are requested. The Decision of the ANRCETI Administration Council No. 33 of 04.11.2010 sets forth only the requirements which the license holder should meet, without indicating specifically the list of documents to be submitted in order to get the license, and the activities considered as nationally important. The ambiguity in defining the respective activities has led to the fact that licenses are required for the participation in any tender organized by public institutions. According to the interviewees, contrary to the provisions of the legislation in force, the procedures used by ANRCETI do not follow the one-stop-shop principle.

The service-provision or retail/wholesale trade activities may be performed only by enterprises holding specific licenses. Contrary to the legislation in force, the procedure for obtaining permits from local public authorities is not organized according to the one-stop-shop principle. Before submitting their documents to the mayor's office, enterprises have to obtain signatures and approvals from different bodies, including from the district mayor's office. Another problem faced by enterprises selling hardware is the requirement to hold both a trade authorization and a maintenance authorization. This is nonsense because both activities are carried out within the same space, while the enterprise has to obtain approvals from the National Public Health Centre, the Civil Protection and Emergency Situations Service, as well as from other government bodies two times.

2. Infrastructure

Ninety percent (90%) of the internet and transport services are ensured by three operators: Moldtelecom, Starnet and Orange. The high competition has determined a considerable reduction of prices in recent years. ICT companies are generally satisfied both by the availability of networks and the rates perceived.

There have been no complaints about the power supply; however, only in very few cases facilities have backup power sources. For many of the investors this condition is unacceptable.

The high supply of spaces for rent determines low rental rates. It is relatively easy, particularly for small companies, to find spaces for rent equipped with the necessary infrastructure. However, some companies find it useful to create an IT park that would secure access to high-speed Internet and other services useful for the ICT companies.

3. Access to Finance

The existing funding sources are bank loans and owner's investments. Generally, it is relatively difficult for companies to access loans because of the lack of collateral to secure repayment of the loan. This is even more complicated for software developing companies, which invest money in the form of wages and do not own current or fixed assets to be pledged as collateral. Even for the hardware companies, the purchased goods may be pledged as collateral at just 40% of their market value.

There are no government programs or funds to support financing of the ICT business by the banks.

4. International Bodies

Of all donors operating in Moldova, only the World Bank; USAID, through its CEED II Project; and the EBRD have shown interest in supporting the ICT sector.

The objective of the Competitiveness Enhancement and Enterprise Development II (CEED II) Project is to support Moldova's efforts of creating a strong, diversified and export-oriented economy by increasing the competitiveness and efficiency of the key industries. CEED II targets six industries: apparel and textile, fashion accessories, home furnishings, information technology, wine and tourism. Some of the project activities aim at improving the dialogue between the abovementioned private sectors and the Government of Moldova and supporting the associations and unions created within the respective industries. The following actions have been established as important for increasing competitiveness: improve business processes, use advanced technologies, improve product and service quality, develop human resources and promote products.

The goal of the World Bank (WB) is to reduce poverty. One of World Bank's projects focused on e-governance, having two components:

- e-leadership capacity and enabling environment, that provides support to the E-government Centre, which was recently established, and
- e-services development, that provides support for 1) establishing and implementing the M-Cloud and 2) developing a selected number of e-government services and shared applications to be delivered through multiple channels, including government portals and mobile phones.

It is expected that most applications used for the above-listed purposes would be developed by local companies.

In the recent years, the European Bank for Reconstruction and Development has become the biggest investor in the Central and Eastern Europe, supporting economies by bearing the investment risk when it is too high, in order to make certain sectors attractive.

EBRD has actively supported ANRCETI. The BAS program funded partly by EBRD supported projects for implementation of management information systems (about 46% of the total number of projects).

5. Market Changes

The globalization of the programming services' market has considerably changed companies' operation. The developing markets such as Apple App Store, Android market, Amazon Marketplace, oDesk.com, freelancer.com and others provide new export opportunities for local companies. "Cloud" sale has become a common practice in Moldova, used both for selling and purchasing products.

6. Public Procurement

ICT companies consider that public procurements lack transparency. Most of the market players believe that the Technical Specifications are prepared in such way as to favor a specific bidder. Another issue is the fact that the Public Procurements Agency tends to select the lowest priced bid even to the detriment of quality. In this way the Agency makes sure it would not have any troubles latter on, after the audit by the Court of Accounts.

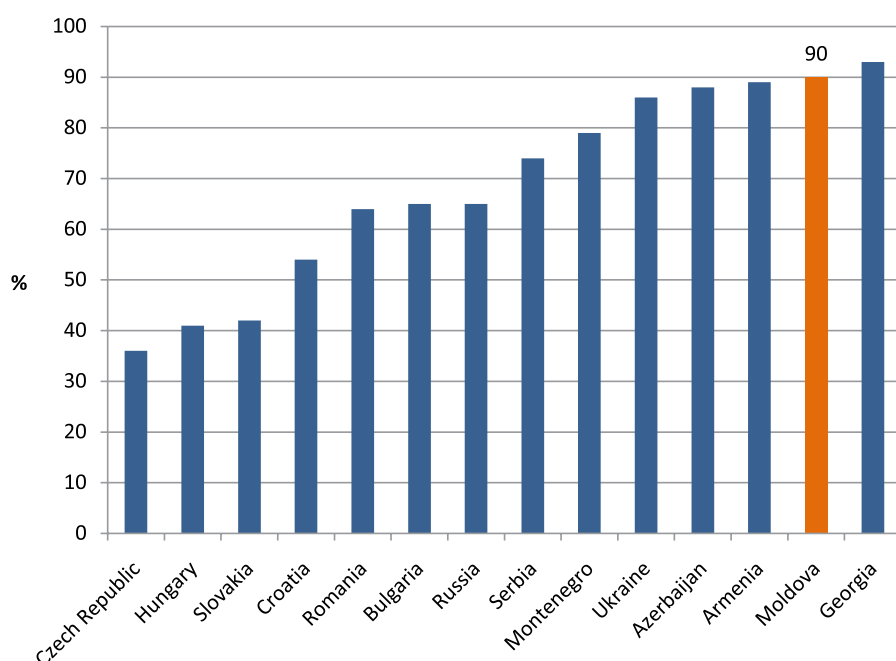
There is no database with the ICT projects implemented by the government institutions. This engenders situations when Technical Specifications are implemented form the scratch, without benefiting from similar developments performed earlier in the respective area.

No post-sale audits are performed; therefore it is not ensured that the requirements are met. It is often difficult even for the beneficiaries to establish whether the provided programming service meets the technical requirements.

7. Intellectual property protection

As shown in the study presented by INSEAD⁶, Moldova's rank fell from the 70th to the 110th position in terms of "Intellectual property protection". The survey findings reveal a software piracy rate of about 90%. This virtually does not differ from the piracy rates in the CIS countries, except Russia. The chart below shows a huge difference between the piracy rates in Moldova and in the Central European countries.

Chart 28 Software piracy rate in the CIS and Central European countries



⁶ INSEAD, The Global Information Technology Report, 2012

The National Association of Private ICT Companies has already proposed a draft Law on amendment of certain legal acts, particularly the Law No. 139 of 02.07.2010 on Copyright and Related Rights. The draft has been developed with the participation of the twinning project experts of the National Copyrights Association and other private sector representatives.

The initiative is now under discussions; its main provisions are as follows:

- exclude the minimal rates established by the Government for the quantum of remuneration
- change the procedure for determining the quantum of remuneration for the reproduction of works on personal interest
- exclude the mandatory condition of indicating the distributor's identity when releasing equipment on the market
- exclude the need to present an evidence regarding the payment of compensatory remuneration by importers
- exclude the provision regarding "the use of software by public authorities based on unique licenses negotiated by the Government with the holders of software at a reasonable price, without prejudice to the interests of the intellectual rights holder"
- change the way of protection of copyrights and related rights through computer networks, namely, hold the web page owner and the hosting service provider accountable and eliminate the accountability of companies which only provide data transfer services (Article 66).

C. Entrepreneurial Skills and Innovations

One of the issues hindering the integration of companies in the global flow is the poor entrepreneurial skills. Only a small number of enterprises are led by persons with international relations experience. Most of the small companies do not have sufficient entrepreneurial skills; this leads to investments in software for the international market, which do not generate sufficient sales for a return on investments.

No cases are known when local companies conduct research and development activities. Usually companies use solutions existing on the international market, by integrating them in their own products.

VII. Recommendations for Short, Medium and Long Term Policies

No	Recommendations	Issue	Institution	Term	Outcome
Strategic					
1.	<p>Create premises for ICT sector development according to the following indicators:</p> <ul style="list-style-type: none"> • Number of industry professionals • Export • Investment • Programs aimed at keeping professionals in the country. 	<p>So far, the ICT sector has developed by itself, with a support in some narrow areas, without having a clear national strategic vision to encourage information technologies and communications in its continuous development in Moldova and without implementing programs that would contribute to enhancing the quality and number of industry professionals, or to increasing industry's share domestically and in terms of exports.</p>	<p>Ministry of Information Technology and Communications, Ministry of Economy</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Increase the number of IT specialists two times in 5 years. • Increase exports up to 200 mln USD in 5 years. • Create an investment fund of minimum 10 million in 5 years. • Increase the industry volume 4 times in 5 years.
Education					
2.	<p>Create a working group of representatives from educational institutions and the ICT sector that will examine and approve the curricula for the ICT specialties.</p>	<p>The industry enterprises are dissatisfied with the knowledge, skills and capacities of the Moldovan ICT graduates. On the one hand, graduates' knowledge is poor and on the other hand the curriculum in the higher educational institutions is outdated.</p>	<p>Ministry of Education</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Curricula brought in line with the technologies on the market. • Lower costs for training of new employees.
3.	<p>Include in the curricula for programmers subjects, which, though not related to the technical field, are required for business development, such as project management, marketing, and communication.</p>	<p>ICT graduates have poor knowledge in business development or project management. ICT is a very specific industry and requires deep knowledge; therefore graduates of other faculties (i.e. economy) are unlikely to start business in this area. The small number of professionals having both good hard and soft skills hinders entrepreneurship development in the industry.</p>	<p>Ministry of Education</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Increased number of enterprises in the industry • Increased efficiency of industry enterprises.
4.	<p>Create mechanisms to stimulate internship training of students.</p>	<p>Managers are not interested to train students who do internship at their company, mainly because they have no guarantees that those students would get employed with their company later. Even if companies accept students for internship, on-job training is rather a formality.</p>	<p>Ministry of Education, Ministry of Finance</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Graduates will become more familiar with the activities within enterprises • Graduates will have better knowledge.

5.	Create fiscal and non-fiscal mechanisms to stimulate ICT enterprises which co-fund student education at ICT specialties.	<p>The change of curricula will have a minor effect as long as teachers' salaries are low; therefore, the teaching method will remain unchanged. Most teachers are not stimulated to apply proper teaching methods or even lack the necessary skills.</p> <p>Enterprises have no say in the selection of students for enrolment, and education institutions are not particularly interested in selecting those who really have the skills and interest for IT.</p>	Ministry of Education	Medium	Increased rate of graduates' "acceptability".
6.	Create premises to encourage private sector ICT professionals to teach IT subjects at universities	<p>Currently, the motivation of private sector professionals to participate in the education of future specialists is incomparable to their motivation for the work they perform at their companies.</p> <p>However, in order to ensure access to the most recent trends, it is necessary to find a way to encourage professionals to participate in the education of future specialists.</p>	Ministry of Education, Ministry of Information Technology and Communications	Medium	Number of professionals from the private sector involved in teaching at university.
Taxes and Fees					
7.	Redirect to the ICT Support Fund the 2.5% tax currently paid to the Republican and local funds for social support of population by companies providing mobile telephony services.	<p>Law No. 827 was approved at the beginning of 2000, when mobile phones were a luxury, being used by less than 3% of Moldova's population. Therefore, the creation of a Fund for material support to the socially vulnerable population, to which the mobile telephony users contributed as well was justified both from social and economic viewpoint.</p> <p>In 2012, when the mobile telephony penetration rate exceeds 100% and most of the vulnerable population uses mobile phones, this tax is not relevant any more. Currently mobile phones are not a luxury but rather a tool which helps saving time in decision-making or accessing information.</p>	Ministry of Finance	Medium	The mobile telephony services will be even more affordable. The Fund for social support of population will be filled from the sale of luxury goods that do not contribute directly to economic development.

8.	Provide incentives to the BPO companies, similar to those existing for the software companies. Namely, calculate the deductions related to staff remuneration based on an the average monthly salary.	<p>It is well known that the BPO subsector is most exposed to the temptation of “hiding” a part or even its entire activity. The reasons are the following:</p> <ul style="list-style-type: none"> • Costumers of this sector are foreign companies which have no relation to the fiscal system of Moldova. • Virtually the entire amount of sales represents the value added by the BPO companies; therefore, BPO’s economic relations with other local companies are minimal. • Insignificant assets are needed for the activities; therefore it is difficult to identify them. Such companies often rent apartments from individuals and are difficult to track. • Employees of such companies are young people, up to 40 years, which are not much concerned about their future retirement pensions. 	Ministry of Finance	Long	<ul style="list-style-type: none"> • Increased revenues to the budget, due to companies which will give up services provided by offshore companies and will legalize their activity • Increased exports, given the fact that companies operating offshore and having a space “hidden” from people are unlikely to be subcontracted, thus losing a lot of contracts.
9.	Eliminate VAT on software designed to increase enterprises’ efficiency, improve the education process or the research and development activities.	The high cost of software is one of the reasons why these are often not used, although they could increase companies’ efficiency and bring return on investments. The piracy rate is 90%.	Ministry of Finance, Ministry of Information Technology and Communications	Long	<ul style="list-style-type: none"> • Increased enterprise efficiency, improved process of education and of research-development activities • Reduced piracy rate.
10.	Maintain a fiscal environment favorable for IT companies.	Moldova would become uncompetitive in relation to other regional countries if fiscal incentives enforced for the IT companies are cancelled. To maintain, stimulate and grow the sector it is necessary to develop and maintain an attractive fiscal package for ICT.	Ministry of Finance, Ministry of Economy, Ministry of Information Technology and Communications	Long	Attractive fiscal package for ICT companies.

Regulatory framework					
11.	Notify the Municipal Council of Chisinau about the inconsistency between the Decision of the Municipal Council No. 13/4 of 27.12.2007 and the legislation in force, particularly the Law No. 231 of 23/09/2010. In addition, MITC will require that the new regulation stipulates expressly that only one authorization may be requested both for trade and for services.	<p>a. The mayor's office obliges companies to attach to the application for authorization approvals from the district mayor's office, the National Public Health Centre, the Civil Protection and Emergency Situations Service, etc.</p> <p>b. Most companies selling hardware provide maintenance services during the warranty and post-warranty period on the same address. It is pointless that an enterprise applies twice for the same authorization/approval from the responsible bodies.</p>	Ministry of Information Technology and Communications	Short	<p>Fluidization and transparency of the authorization obtaining process, which will lead to:</p> <ul style="list-style-type: none"> • saving managers' time in favor of other activities aimed at company development • reduce unofficial payments by companies to simplify the procedures for obtaining authorizations.
12.	Make it possible for the software export to be registered based on supplier's declaration, without requesting Statements of delivery and acceptance.	<p>The Tax State Service requires companies to have Statements of delivery and acceptance for services provided, including abroad. It is unreasonable and usually not even possible for the providers to ask costumers to sign Statements of delivery and acceptance in the case of software sale. Consequently, many enterprises set up companies abroad, which sell software and receive the money, thus avoiding the bureaucratic procedures.</p>	Ministry of Finance, Ministry of Information Technology and Communications	Medium	A part of the service export conducted through e-commerce would become "official" if they were recorded in the company's bookkeeping, and would pay all the due taxes.
13.	Eliminate licenses for services of development, implementation and securing operation of nationally important automated information systems, including software.	<p>ANRCETI has the authority to issue licenses for development of nationally important information systems. However, there is no regulation defining the term <i>nationally important information system</i>. Therefore, the license is required for virtually any tender for procurement of software, regardless of whether the latter may "damage people's rights and health, the environment or the state security"⁷.</p>	Initiative – Ministry of Information Technology and Communications Ministry, Ministry of Economy	Short	<p>Reduced bureaucracy and time spent by ICT companies to participate in tenders organized by public administration authorities. Companies which will provide the respective services will notify ANRCETI in writing.</p>

⁷One of the criteria to determine the types of activities subject to licensing, Art. 4, Law No. 451 of July 30, 2001

14.	Allow for the customs clearance of electronic products imported by airline at the airport's Customs Office.	The airport customs office is not authorized to clear electronic components. When they import components by airline, companies have to rent a vehicle with trailer that can be sealed, to prepare the transit documents on the territory of Moldova and to pay for both the Airport terminal and the Cricova terminal.	Customs Department	Short	The need for a transit declaration will be eliminated and the time and resources of importers of electronic products will be saved.
15.	Revise the National Occupations Register (CORM).	IT has developed and advanced rapidly in the past decade, creating new occupations/positions which imply different tasks than those approved ten years ago in CORM, whose description of the rights and obligations of employees are outdated. The formal approval of the names of IT occupations is also necessary in order to consistently use position names in IT, the standardization according to the widely-accepted IT norms, the occupations on the IT labor market, and to secure permanent professional development of the corresponding specialists.	Ministry of Labor	Medium	CORM will be adjusted to include occupations currently existing in the sector which have not been included in the register. As a result, HR management in ICT companies will be simplified.
16.	Approve the mechanism for revision of the Technical Specifications by the civil society and the line organizations.	The Public Procurement Agency (PPA) does not have sufficient abilities to assess ICT bids. Most ICT companies have complained about a low transparency in PPA's activity.	Ministry of Information Technology and Communications	Short	<ul style="list-style-type: none"> • Technical Specifications complying to requirements • Money savings to the budget.
Public Procurement					
17.	Create and maintain a centralized electronic register with information on the IT projects implemented for government institutions.	Various government institutions request software for their current activity. The issues faced by those institutions are often similar. Thus, some software could be created by simply adjusting the existing ones.	Ministry of Information Technology and Communications	Short	Reduced efforts in case of similar projects; smaller budget resources necessary.

18.	Select a group of experts who will be contracted by PPA when technical expertise is required.	PPA has no sufficient skills to assess bids when it comes to ICT products, particularly programming. On the other hand, any mistake in selecting the successful bid may be considered by the Court of Accounts an attempt to protect certain competitors. As a result, usually the lowest bids are selected.	Ministry of Information Technology and Communications with support from ATIC	Short	The bids with the best price/quality ratio will be selected within tenders. Corruption cases within public procurements will be diminished. Experts' advice will be a consultative one. It is recommended that experts are selected randomly, observing the confidentiality (i.e. the beneficiary and the software companies should not know the expert(s)).
19.	Approve a Government Decision similar to GD No. 834 of 13.09.2010 "On Approval of the Regulation on Public Procurement of Works", which would include software procurement rules similar to those for procurement of construction works, including the guarantee for securing contract execution, monitoring of projects by PPA until the signature of the Statement of delivery and receipt.	PPA does not monitor such projects after implementation. The implemented projects often differ from the Technical Specifications attached to the Contract. Sometimes the beneficiary may find such inconsistencies and sometimes only the provider is aware of them.	Initiative – Ministry of Information Technology and Communications	Short	Number of projects the deliverables of which are inconsistent with the Technical Specifications shall diminish significantly.
Foster Sector Development					
20.	Create a framework favorable for ICT companies' participation in research and development activities.	Moldovan software companies have no sufficient resources to launch such activities because of their limited human and financial capacities and the high risks. IT technology development is due to daily hard work of talented practitioners rather than to amazing discoveries by researchers. Only persons who really feel the market and have extraordinary abilities to find various solutions may be the engine of research and development activities. The current approach used in the state-funded scientific research, which is coordinated primarily by the Academy of Science, deters the participation of companies that do not have on staff people with scientific degrees, even though they might have talented programmers.	Ministry of Information Technology and Communications	Long	The research and development activities could bring huge benefits to the country as we could export intellectual property with considerable value added, rather than just labor force, even if highly qualified.

21.	Create an IT incubator for startups. Information about the incubator and its benefits will be widely disseminated among fresh graduates of IT faculties. The incubator could be co-funded by foreign funders and the state.	Usually startups have neither financial resources nor expertise or skills to get involved in international software trade, therefore they start to crowd on the local market in an attempt to win a bigger share or try to win projects on the European market. In both cases, companies are not grown enough to be able to implement development activities.	Ministry of Information Technology and Communications	Medium	<p>The incubator will provide information about the Western markets which are currently the most promising ones, including about the market trends, information on the most demanded products, the way costumers operate, etc. the incubator members will have the possibility to gain advanced skills of marketing, entrepreneurship, fiscal administration, etc.</p> <p>In addition, they will have better access to the best practices in the industry. They will be able to develop their business ideas and get feedback from industry experts, including from abroad.</p>
22.	Search and propose viable financial products to finance the industry.	<p>It is difficult for the ICT companies to contract bank loans because of the lack of collateral to secure the loan. This is even more serious a problem for the software companies, which invest money (as salaries) to develop software, but have no fixed or working capital to pledge as security.</p> <p>There is no government fund or program to support financing of ICT businesses by the banks.</p>	ATIC, National Bank of Moldova, Ministry of Information Technology and Communications	Long	Additional financial resources could allow companies to not only grow or be stable on the market, but also invest in projects for development of both products and processes in general.

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