

TRENDS IN THE DEVELOPMENT OF THE MARKET FOR INTERNET ACCESS SERVICES IN THE REPUBLIC OF MOLDOVA

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Abstract

The paper presents a brief overview of the current development of the Internet access market in the Republic of Moldova. The actuality of the research is determined by the cardinal transformations in the evolution of the society and its transformation into the information society. The main purpose of the research is to highlight the main characteristic trends of the development of the Internet services market in the Republic of Moldova. For this purpose, mathematical tools for comparative data analysis were used. The official statistical data of National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI), published during the years 2013-2018, were analyzed. The key trends and issues facing this market are highlighted and discussed. Following the analysis of the evolution of the market for fixed and broadband Internet access services, it was found that this market is a constantly growing dynamic, on which it directly influences new developments in the field of information technologies, which stimulate the constant development of the market infrastructure. The global income of companies from providing Internet access services is increasing with an annual rate of about +200 million lei over the last 5 years. In 2018 this income constituted 2348.0 million lei or 1.23% of GDP. Changes that have taken place in consumer preferences are highlighted and analyzed, and aspects related to the prospects for the development of the Internet access services market in the Republic of Moldova are examined

Key words: *Internet, services, market, current state, trends*

JEL Classification: *L860*

INTRODUCTION

The development of the Internet in the Republic of Moldova started in the early 90's of the 20th century. The history of the development of the Internet infrastructure in the Republic of Moldova has been studied in more details in the previous work [3]. We will mention only the main technological achievements, which have determined the formation and development of the modern infrastructure of the computer networks in the Republic of Moldova.

First, we will mention the implementation of Internet access services based on xDSL technologies. The first ISP (Internet Service Provider) companies, that offered this service, were the companies "Relsoft Communications" (since 1995), SA "Moldtelecom" (since 1998), "Arax" (since 1999) and "Interdnestrcom" (since 2000). Later on the Internet access services market launches the companies "Starnet" (since 2003) and "Sun Communications" (since 2004).

The first fiber optic line FTTB (Fiber To The Building), which interconnected the municipality of Chisinau with the municipality of Bucharest, was put into operation in 1996. In the early 2000s, SA "Moldtelecom" develops the national network of digital transmissions on optical fiber and SDH multiplexing equipment. In 2004, SA "Moldtelecom" launches the broadband Internet service using ADSL technology, and in 2006 it completes the construction of the telecommunications network in the CDMA2000 standard, in the 450 MHz frequency band, for the provision of fixed telephony and wireless services, which allowed the company to launch on March 1, 2007 the mobile phone service under the Unité brand.

In 2006, the company "Starnet" begins the construction of an FTTB ring in Chisinau and develops the metropolitan private fiber optic network. An FTTB network of the company "Arax"

becomes operational at the end of 2007. From 2007 the companies "Starnet" and "Arax" start offering the services of Internet access on fiber optic channel at high speeds. SA "Moldtelecom" launches in 2008 the MaxFiber fiber optic Internet access service.

In 2008, mobile operators SA "Orange Moldova" and SA "Moldcell" launch mobile Internet services based on 3G and 3.5G technology. In 2009 is launched by the company "Starnet" social project "Wi-Fi for Chisinau" with the opening of 6 areas of free Internet access via Wi-Fi in Chisinau. The idea was subsequently taken over and developed by the companies "Orange Moldova" and "Moldcell" by creating free Wi-Fi Internet access points in educational institutions and in various locations in Chisinau. SA "Moldtelecom" starts offering mobile Internet access services in UMTS standard in 2010.

As a result of the development of the infrastructure of the metropolitan fiber optic networks, the Republic of Moldova ranks 2010 in third place in the world after the speed of Internet access, and the ISP companies start offering the Internet access packages by fiber optic at speeds of 100 Mbit/s. Since 2012, mobile companies in the Republic of Moldova have been implementing LTE mobile networks, which has allowed the speed of access and the quality of Internet services offered by these companies to be considerably increased.

In the context of the above facts, it is of interest to analyze how the Internet access services market has evaluated over the last few years, to highlight the main trends and problems present on this market, to identify preferences for Internet service consumers and to find out the current level of communication networks in the Republic of Moldova and the prospects for developing this infrastructure.

MATERIAL AND METHOD

The paper analyzes the statistical data regarding the evolution of Internet access services in the Republic of Moldova during 2013-2018. For this purpose, the official statistical data, provided by The National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI), which are published on the official website of the agency (<https://www.anrceti.md>) under form of annual statistical reports. Also, a series of macroeconomic indicators were used, published on the official website of the National Bureau of Statistics of the Republic of Moldova (<http://statistica.gov.md>). The comparative analysis of the data was performed using the mathematical and computer tools for statistical analysis of the data sets, and the results are presented in graphical form.

RESULTS AND DISCUSSIONS

Wired and mobile Internet access services are the most dynamic markets in the electronic communications sector. In 2018, the main indicators (number of users, data traffic, sales volume) increased significantly, being influenced by the increased demand for Internet access services, the development of access infrastructure based on 4G and fiber optic technologies, the wide use of services communication alternatives (Viber, Skype, WhatsApp etc.) and intensifying the competition between the service providers. The overall income of the ISP companies from the Republic of Moldova in 2018 constituted **2348.0 million lei**, up by 229.9 million lei (10.9% annual growth) (Fig.1). The capacity of external fixed Internet access channels in the Republic of Moldova amounted to 541.7 Gbps, registering a spectacular annual growth of + 52.0% [1].

In 2018, **88 ISP companies** were active in the market for **fixed Internet access services** in the Republic of Moldova. The most important players in the market of fixed Internet services are SA "Moldtelecom" (63.7% market share); SRL "Starnet" (20.9% market share) and SRL "Sun

Communications” (3.5% market share). We mention that during the last years there is a tendency of constant decrease of the market share held by the company "Sun Communications" (in 2016 the market share of the company was 5.3%). The other 85 alternative providers had insignificant quotas in 2018 totaling 11.9% of the fixed Internet services market [1].

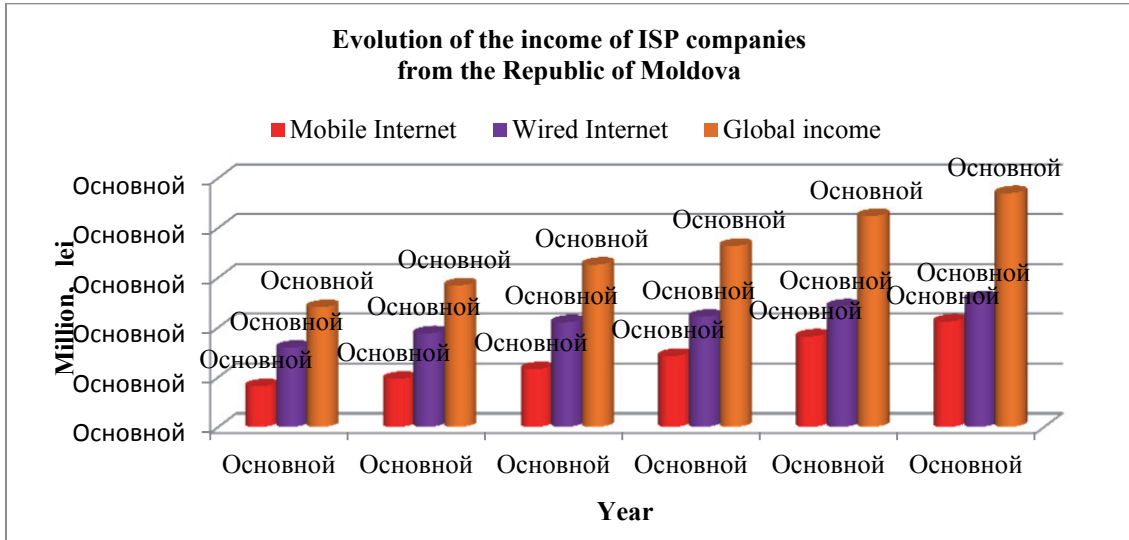


Fig.1 Evolution of the income of ISP companies from the Republic of Moldova [1]

The evolution of revenues from **fixed Internet** access services is shown in Fig. 2. According to the statistical data of The National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI) in 2018, the market value increased, compared to 2017, by 6.6% and constituted **1289.5 million lei** [1]. From the analysis of the graph in Fig. 2 it is observed that a positive trend of increasing the revenues of ISP companies persists on the market.

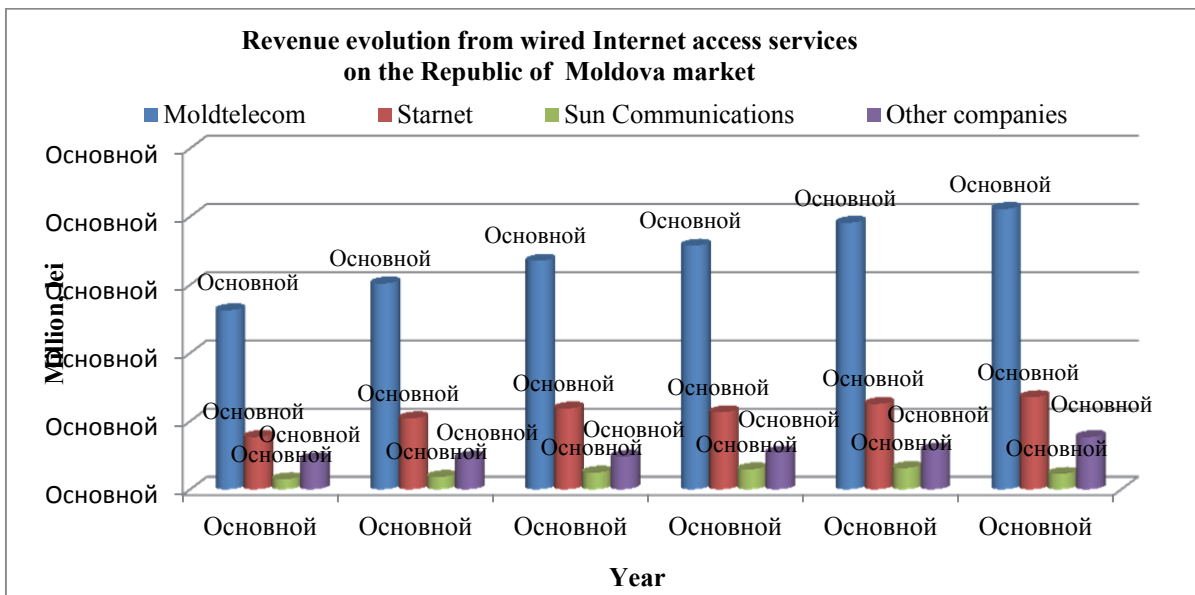


Fig.2 Revenue evolution from wired Internet access services on the Republic of Moldova market [1]

The **mobile Internet** access services are offered by the three national mobile operators: SA "Orange Moldova", SA "Moldcell" and SA "Moldtelecom" (Unité). In 2018, the total volume of revenue obtained by the three mobile communications providers from the sale of mobile broadband Internet access services (through 3G, 4G networks and modems / cards / USB - dedicated access) increased, compared to 2017, by **16.5%** and totaled **1058.5 million lei** (Fig.3).

The revenues of SA "Moldcell" from the sale of these services increased by 15.5% and made up about 293.5 million lei, of SA "Orange Moldova" - by 19.0% and reached 663.2 million lei and those of SA "Moldtelecom" - by 4.6% and totaled 102.1 million lei (Fig.3). The shares of the market for mobile Internet services in 2018 were 62.6% at SA "Orange Moldova" and 27.7% at SA "Moldcell". SA "Moldtelecom" (Unité) is still in a negative trend of losing the market, showing a decrease in the presence on the mobile Internet market from 17.9% in 2014 to 9.6% in 2018 [1].

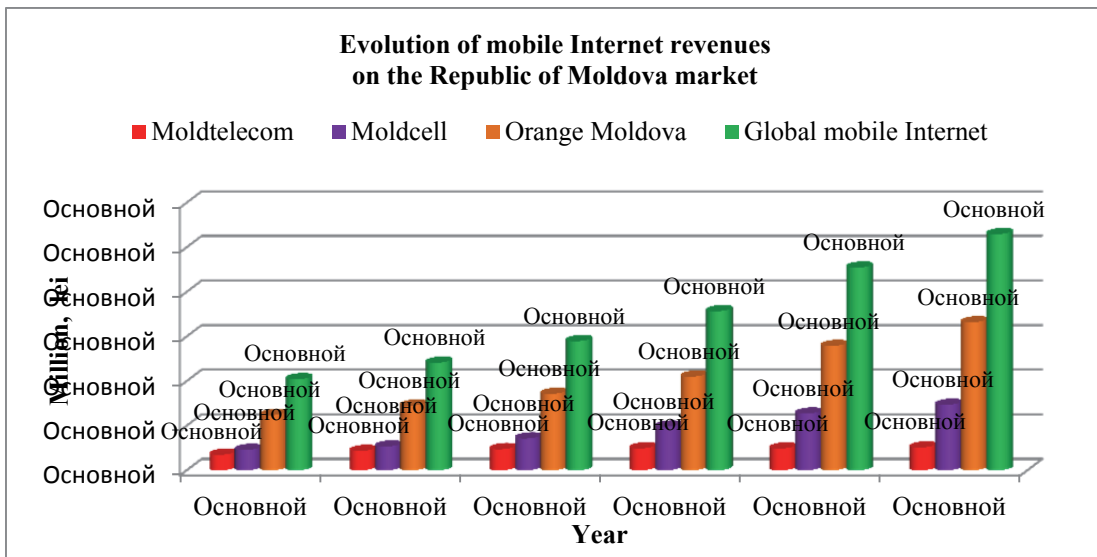


Fig.3 Evolution of mobile Internet revenues on the Republic of Moldova market [1]

As a result of the increase in revenues from the sale of **fixed Internet** access services, the average monthly income per subscriber for the respective services increased, compared to 2017, by 1.2% and constituted 179.1 lei (Fig.4). The average monthly income per subscriber to the **dedicated mobile Internet** services constituted in 2018 the amount of 78.4 lei, attesting to a slight annual growth of 0.1%. Similarly, there was an average monthly increase in revenues for smart phone users equal to **34 lei** per subscriber.

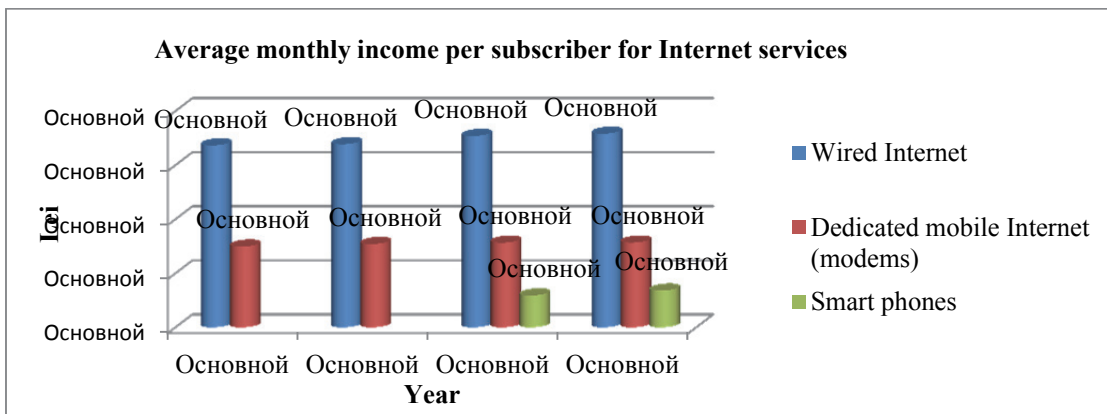


Fig.4 Average monthly income per subscriber for Internet services [1]

The number of Internet users in the Republic of Moldova is constantly increasing over the years (Fig. 5). Thus, in 2018 **623.1 thousand** unique users of fixed broadband Internet and **2948.2 thousand** users of mobile broadband Internet were attested [1]. As a result of the increase in the number of users, the penetration rate of mobile broadband Internet access services, compared to 100 inhabitants, increased by 14.59% and reached **83.0%**. The penetration rate of Internet access services at fixed points constituted **17.5%**. Of the total number of users 60.6% were domiciled in urban areas and 39.4% - in rural localities [1].

In 2018, the total volume of traffic generated by mobile broadband users increased by 12.2% compared to 2017 and amounted to **49050 TB** (Fig. 6). The volume of traffic generated by mobile Internet users via smart phones constituted **35631 TB** (an annual increase of **59.2%**) [1]. A user who accessed the mobile Internet from the smart phone generated an average monthly traffic of about **1.5 GB**, 51.1% more than in 2017.

In 2018, the number of subscribers to the fixed Internet through fiber optics (FTTx) was 394.2 thousand (+ 13.4% annual growth). At the same time, the number of subscribers connected to the network based on xDSL (Digital Subscriber Line) technologies decreased by 5.5% and totaled about 182.2 thousand, and of those connected by coaxial cable it increased by 6.4% and totaling over 44.3 thousand. The share of FTTx connections in 2018 constituted **63.3%**, that of coaxial cable - **7.1%**, and of xDSL connections decreased to **29.2%** [1].

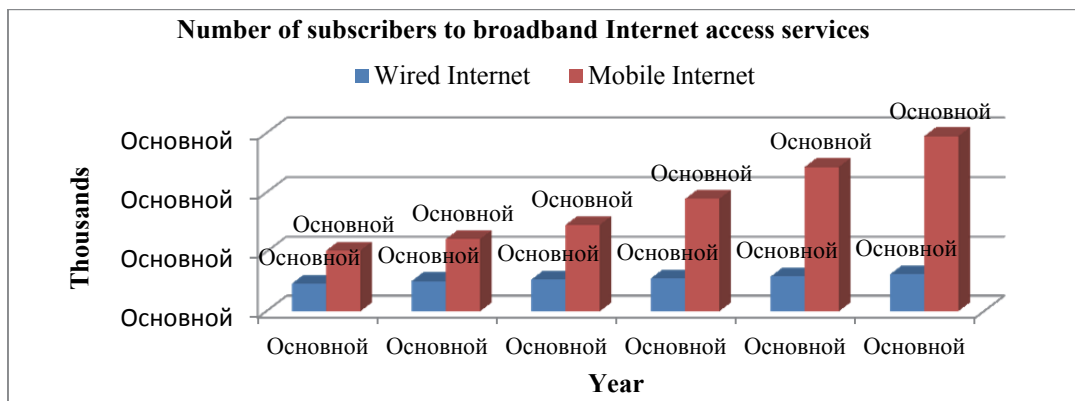


Fig.5 Number of subscribers to broadband Internet access services [1]

Of all the fixed Internet connections, **10%** are connections with speeds over 100 Mbps, **54.4%** are connections that allow speeds between 30 Mbps and 100 Mbps, **31.2%** - connections with speeds between 10 Mbps and 30 Mbps, **1.3%** - connections with speeds between 2 Mbps and 10 Mbps, the other about **3%** being connections with speeds up to 2 Mbps [1].

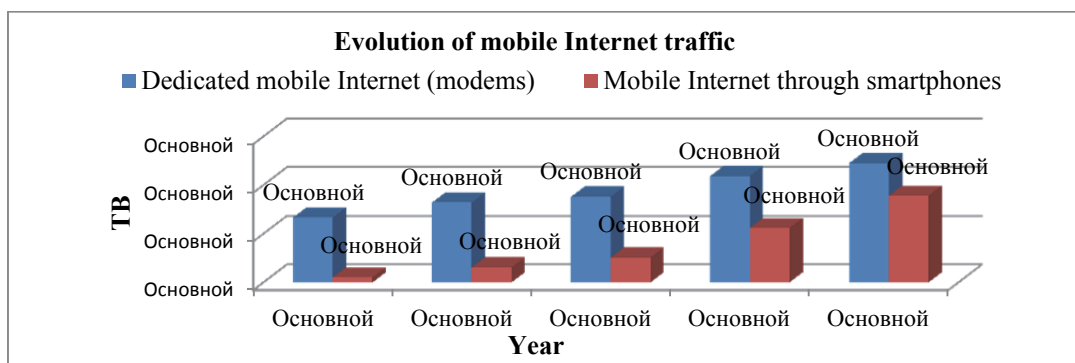


Fig.6 Evolution of mobile Internet traffic [1]

CONCLUSIONS

Analyzing the evolution of the market for fixed Internet and mobile broadband Internet access services, we can see that this market is a dynamic one in perpetual growth, on which it directly influences the new developments in the field of information technologies, which stimulate the constant development of the market infrastructure. The global income of companies from providing Internet access services is increasing with an annual rate of about **+200 million lei** over the last 5 years. In 2018 this income constituted **2348.0 million lei** or **1.23%** of GDP (the gross domestic product of the Republic of Moldova in 2018 was **190016 million lei** [4]).

From the analysis of the income structure according to the type of access (by cable or mobile) we can see that during the years 2013-2018 the share of the income from Internet services by cable has decreased from 66.1% to 54.9%. Respectively, the share of revenue from mobile Internet services evaluated from 33.9% in 2013 to 45.1% in 2018. Against the background of the increase of the volume of Internet traffic, generated by the users of smart phones (an annual increase of 59.2%), and with the increase in the number of mobile broadband users (2948.2 thousand mobile Internet users compared to 623.1 thousand single users of cable Internet) we can see a tendency to change the Internet users' consumption preferences, which are oriented towards mobile communication technologies. The number of mobile Internet users in 2018 increased by **2.88** times compared to 2013. At the same time, the number of unique mobile Internet users is **4.73** times higher than that of cable Internet (2948.2 thousand users compared to 623.1 thousand). This fact is largely determined by the ease of accessing the Internet through the use of 4G technology, which ensures a data exchange speed up to 300 Mbps and the good development of mobile telephony infrastructure in the territory of the Republic of Moldova.

However, the penetration rate of mobile broadband access services, calculated per 100 inhabitants, in 2018 constituted only **83.0%**. On average in the European Union this indicator has a value of **96%** [2]. The discrepancy between these two indicators is largely explained by the income level of the population of the Republic of Moldova, especially in the rural area.

Analyzing the structure of mobile Internet traffic during 2014-2018, we see a constant linear increase of dedicated mobile Internet traffic (via modem) and an exponential increase of traffic through smart phones (Fig. 6). This evolution is explained by the fact that mobile phone users in the Republic of Moldova consume and generate more and more multimedia content, using social networks, telecommunications services (Viber, WhatsApp, Skype etc.), online games and various Internet services with multimedia content. A smart phone user generated an average monthly traffic of 1.5 GB in 2018, up 51.1% compared to 2017. This indicator remains lower than the one attested in the European Union (2.4 GB) [2], but it is in an upward trend during the last years.

At the same time, the penetration rate of Internet access services at fixed points in 2018 amounted to **17.5%**. By comparison, in the European Union this indicator was 77%, with the possibility of connecting 97% of households [2]. This indicator indicates a weak development of the fiber optic communications infrastructure on the territory of the Republic of Moldova, especially in the rural areas of the Republic, where fixed Internet access services are provided on the basis of xDSL technology and the use of the existing telephone line infrastructure. In rural areas there is practically no alternative to connecting to another fixed Internet service provider than to SA "Moldtelecom". The use of 3G or 4G Internet, offered by mobile operators, is not always an economically efficient alternative, as the tariff packages contain limitations on the volume of traffic included in the cost of the monthly subscription and may generate additional costs in case of exceeding it.

In the main urban centers the communications infrastructure is at a level above the average level in the European Union. The share of FTTx connections in 2018 constituted 63.3%, with coaxial cable - 7.1%, xDSL connection - 29.2%. For the European Union these indicators are 16% (FTTH / B), 19% (axial cable) and 61% (xDSL) [2].

The prospects of developing the market for Internet access services in the Republic of Moldova are related to the implementation of new communication technologies. One of the basic problems remains the modernization and extension of the infrastructure of the computer networks on the territory of the republic, especially in the rural areas. The expansion of FTTP networks at national level is one of the ways that would allow ISP companies to increase the subscriber base for broadband Internet services and improve the quality of the services offered, including by launching new services. Another direction of development is the implementation in the near future of 5G mobile technologies.

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