

Growth and Opportunities in Mobile Internet Market in Bulgaria

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Abstract Nowadays, Internet and mobile technology have changed our way of both doing business and dealing with our daily routine activities. Mobile Broadband Internet represents the fastest growing segment of the European broadband market. Currently, mobile Internet services represent the most promising revenue stream for mobile operators. The present article discusses Bulgaria's performance against each dimension of the Mobile Connectivity Index (MCI), highlighting the country's challenges and achievement. The results show that Bulgaria is seriously lagging behind both the leading countries and European Union (EU) Member States.

Keywords Mobile Internet, Mobile subscribers, 4G and 5G

JEL L81, L86, L96

1. Introduction

Use of the Internet has exploded in recent years. Rapidly evolving network and computer technology, coupled with the exponential growth of the services and information available on the Internet enable hundreds of millions of people to have fast access to a huge amount of information from anywhere and everywhere.

According to the last report Digital in 2018 more than 4 billion people around the world are using the Internet. Over half of the world's population is now online, with the latest data showing that nearly a quarter of a billion new users came online for the first time in 2017. Much of 2018 year's growth in Internet users has been driven by smartphones and mobile data plans. More than 200 million people got their first mobile device in 2017, and two-thirds of the world's 7.6 billion population now have a mobile phone [1].

The Internet and mobile technology have changed our way of both doing business and dealing with our daily routine activities. There is no doubt that the mobile Internet service is moving toward the new generation on which enables mobile users to enjoy a variety of new and upgraded multimedia mobile services.

The global mobile Internet industry comprises consumer spending to access Internet through mobile phones, smartphones and tablets via 3G, and higher network.

Mobile Internet services are defined as the wireless access to Internet content via mobile devices that enables people to access information, products, and services available on the Internet without temporal or spatial restrictions.

Mobile Internet technology has two main characteristics:

- Mobility, which refers to the ability to communicate, inform, transact and entertain at any place at anytime on the move without fixed Internet access;
- Personalization - the mobile device is personal in that it is always available on a person and retains its personal identity [2].

Nowadays, mobile Internet diffusion is far outpacing fixed Internet access. In late 2010 the number of broadband Internet subscriptions over mobile technologies overtook the number of subscriptions over fixed technologies [3]. Mobile subscriptions rose from 61% of all broadband connections in developing countries to 84% in 2016. Moreover, "mobile only" subscribers account for a large percentage of the growth. According to latest data, there were approximately 792 million mobile-only subscribers in 2017. This is of special concern because mobile is the primary means by which new Internet users - particularly those with lower incomes and/or in developing countries - are getting online [4]. This is an incredibly positive development, given that, for many users, mobile Internet access currently represents the only viable and/or affordable means of getting online. In such cases, some form of Internet access is better than none. There is compelling evidence across a variety of contexts that mobile Internet access can provide those without traditional forms of Internet access with opportunities to become better integrated into social, economic, and political life [5].

Experts portend a promising future for mobile Internet usage, as global mobile data traffic is expected to increase nearly sevenfold till 2021. According to the Statistical Postal Data for 2018, the global mobile population

amounted to 3.7 billion users. Mobile devices accounted for 49.7 percent of web page views worldwide, with mobile-first markets such as Asia and Africa leading the pack. Kenya registered the highest rate of Internet traffic coming from mobile devices; followed by Nigeria, India, Singapore, Ghana, and Indonesia. The Americas and Europe have the highest mobile broadband subscription penetration rate, around 78.2% and 76.6% respectively [6].

The rapid progress in mobile technologies, the growing affordability of smart devices, and the increasing use of mobile application stores are acknowledged as the main drivers of mobile Internet growth. Mobile broadband Internet represents the fastest growing segment of the European broadband market. Currently, mobile Internet services represent the most promising revenue stream for mobile operators [7].

Hence, the objective of this article is to examine the current conditions in the Bulgarian Mobile Internet Market and to emphasize its most characteristic aspects that can attribute to a stable and profitable Mobile Internet Market. The article discusses Bulgaria's performance against each dimension of the MCI, highlighting the country's challenges and achievements.

2. Mobile Internet Usage. Global Perspective

Mobile technology must be highlighted as an outstanding phenomenon that has forever changed society. 2017 was a milestone year for the mobile industry. The number of people connected to mobile services exceeded 5 billion globally. This means that two out of three people in the world had a mobile subscription at the end of 2017. According to experts forecasts in 2025 the mobile industry will reach new major milestones across key indicators – unique subscribers, Internet users and 4G/5G connections. The number of mobile subscribers will reach 5.9 billion by 2025, equivalent to 71% of the world's population [8].

Mobile Internet market will add 1.75 billion new users over the next eight years, reaching a milestone of 5 billion mobile Internet users in 2025.

Mobile Internet adoption will increasingly become the key metric by which to measure the reach and value created by the mobile industry, including its contribution to the sustainable development. Mobile Internet also contributes to developments in the wider digital ecosystem, as mobile Internet users are target market for e-commerce and a range of digitally delivered services and content [9].

According to the latest report of GSMA Intelligence in 2019 4G will become the leading mobile network technology worldwide by number of connections - more than 3 billion. At the same time, the mobile industry continues to make progress with 5G. A number of mobile 5G commercial launches are expected over the next three years in North America and major markets across Asia and Europe. China, the US and Japan will be the leading countries by 5G

connections in 2025, while Europe as a whole will continue to make progress with 5G deployments [9].

The Global Internet subscriber penetration rate for 2017 by types of technology is presented at Figure 1.

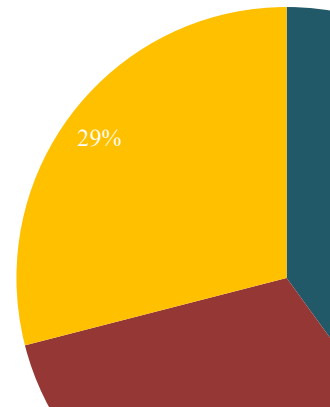


Figure 1. Global Internet Subscriber Penetration Rate for 2017

According to the forecasts in 2025 the Global internet subscriber penetration rate will be 71%. Which represents a growth with 5% as it compared to 2017 (Figure 2).



Figure 2. Global Internet Subscriber Penetration Rate 2017-2025

The distribution between the types of technology is presented at Figure 3.

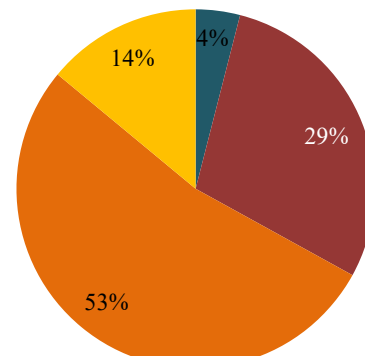


Figure 3. Global Internet Subscriber Penetration Rate for 2025

Internet subscriber penetration rate in Europe for 2017 is the highest (85%) and the experts predict that this tendency will remain till 2025 (88%). The Europe region is expected to hold a significant market share in 5G, because countries like the United Kingdom and Italy are making efforts to test 5G networks in 2018 and launch 5G smartphones by next year (Figure 4).

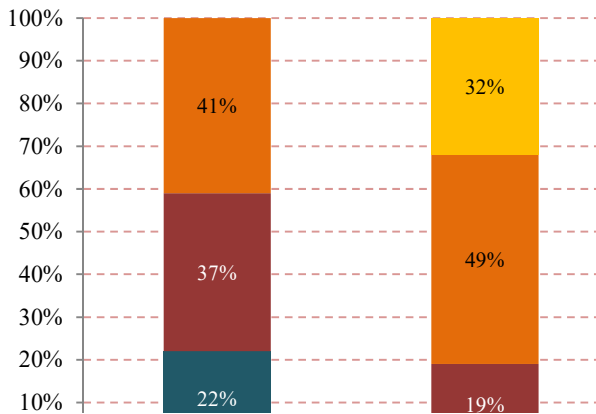


Figure 4. Internet Subscriber Penetration Rate in Europe

In terms of mobile penetration rate it is expected that the rate will reach 61% globally and 82% in European countries (Table 1).

Table 1. Mobile Internet Penetration Rate

Region	2017	2025
Global	43%	61%
Europe	72%	82%

In 2017 the number of people connected to mobile services surpassed 5 billion globally. Looking out to 2025 mobile subscribers is expected to reach 6 billion, with 1.2 billion 5G connections (Figure 5).

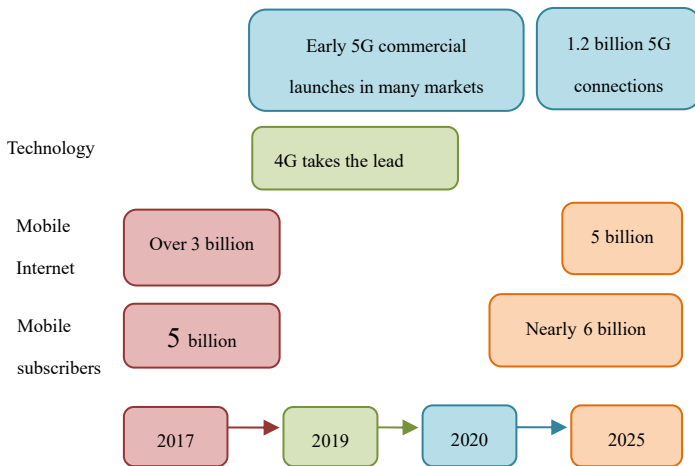


Figure 5. Major Mobile Milestones over the Period to 2025

Most of the 1.75 billion increases in the number of mobile Internet users between 2017 and 2025 will come from China, India and Sub-Saharan Africa [9]. Key drivers of this growth are: increasing population coverage of 3G and 4G networks, more affordable smartphones and data tariffs, and an increasing willingness among users to consume social media and a range of services and content online.

In terms of number of mobile connections, 4G will become the lead mobile network technology in 2019 and will continue to dominate over the period to 2025. The 4G technology has been driving and enabling the transition from

the connected consumer to the digital consumer during 2010-2020, the new 5G technology will play a key role in the transition to the augmented consumer in the near future.

In 2014 GSMA Corporation started to calculate Mobile Connectivity Index. The Mobile Connectivity Index measures the performance of 150 countries, accounting for 98% of the world's population, against the four key enablers of mobile Internet connectivity: infrastructure, affordability, consumer readiness and content) (Table 2) [10].

Table 2. Mobile Connectivity Index

Infrastructure	Affordability	Consumer readiness	Content
<ul style="list-style-type: none"> Mobile infrastructure; Network performance; Other enabling infrastructure; Spectrum. 	<ul style="list-style-type: none"> Mobile tariffs; Handset price; Income; Inequality; Taxation. 	<ul style="list-style-type: none"> Basic skills; General equality. 	<ul style="list-style-type: none"> Local relevance; Availability.

The *Infrastructure* enabler includes improvements in 3G/4G/5G coverage, network quality and spectrum availability. *Affordability* is connected with mobile data plans and device becoming more affordable, especially for lower income groups (assisted by reduction in consumer taxes). *Consumer readiness* reports improvements in literacy and education levels. The *Content* enabler reports content being developed within countries in local languages, for example mobile applications, websites, social media and E-Government services.

The Mobile Connectivity Index Indicators are summarized in Table 3.

Table 3. Mobile Connectivity Index Indicators

Enabler	Dimension	Indicator
Infrastructure	Mobile Infrastructure	2G network coverage
		3G network coverage
		4G network coverage
		Years since 3G network launch
	Network performance	Mobile download speeds
		Mobile upload speeds
		Mobile latencies
	Other enabling infrastructure	International bandwidth per user
		Number of secure servers
		Access to electricity
Spectrum	Number of Internet exchange points	
	Digital dividend spectrum	
	Other spectrum below 1 GHz	
Affordability	Mobile tariffs	Cost of entry usage basket (100 MB)
		Cost of medium usage basket (500 MB)
		Cost of high usage basket (1 GB)

	<i>Handset price</i>	Cost of entry-level handset
	<i>Income</i>	Gross National Income (GNI) per capita
	<i>Inequality</i>	Atkinson Measure of Inequality in Income
	<i>Taxation</i>	Cost of taxation
Cost of mobile-specific taxation		
Consumer readiness	<i>Basic skills</i>	Adult literacy rate
		School life expectancy
		Mean years of schooling
		Tertiary enrolment rate
	<i>Gender equality</i>	Gender literacy ratio
		Gender years of schooling ratio
		Gender bank account ratio
		Gender labour participation ratio
	Gender GNI per capita ratio	
Content	<i>Local relevance</i>	Top-level domains per capita
		E-government services
		Mobile social media penetration
		Mobile application development
	<i>Availability</i>	App accessibility in first language
		Number of apps accessible in first language
		Accessibility of top 400 ranked Google Play apps in any language
		Accessibility of top 400 ranked Apple Store apps in any language

The score fall within the range of 0 to 100. Countries are divided into five groups depending on the Index values achieved:

- 0-20 Discoverer;
- 21-40 Emerging;
- 41-60 Transitioner,
- 61-80 Advanced,
- 81-100 Leader.

According to the last GSMA report the global leaders are: Australia (88.9), New Zealand (87.8), Iceland (86.6), Singapore (86.5), Norway (86.4), Denmark (84.5), Sweden (84.3), Canada (84.3), Finland (84.2), United Kingdom (84.2), Netherlands (84.2), Ireland (83), South Korea (83.4), Switzerland (83.7), Austria (82.4), United States of America (81.7), Belgium (81.6), Luxembourg (81.4) and Japan (80).

The only two countries that have MCI below 20 are Niger and Chad.

The most improved countries for the period 2014-2018 are presented in Table 4.

Table 4. Improvement in Mobile Connectivity Index

MCI	Infrastructure	Affordability	Consumer readiness	Content
Montenegro	Morocco	India	Guatemala	Montenegro
Georgia	Turkey	Nepal	Guinea	Serbia
Ethiopia	Belize	Sierra Leone	Iran	Azerbaijan
Mongolia	Tunisia	Angola	China	Georgia
Serbia	Bhutan	Sri Lanka	Senegal	Bosnia

The results show that there is a strong positive correlation between index score and mobile Internet penetration. The index is therefore an effective tool to identify priorities to drive mobile Internet adoption.

3. Mobile Internet Growth in Bulgaria

Mobile telecommunications in Bulgaria are provided by three active operators: A1 (the first GSM operator, part of A1 Group), Telenor (the second-largest mobile operator, owned by Telenor) and Vivacom (the former fixed incumbent, Bulgarian Telecommunications Company). The privately owned Long-Term Evolution (LTE) operator, Max Telecom, although still operational, at the beginning of 2017 faced serious financial difficulties, and has shut down all its offices and stores. A fifth company, Bulsatcom, announced the deployment of a 4G network in 2015, and was expected to actively enter the telecom sector in 2017. However, it faced difficulties related to the launching of the first Bulgarian commercial satellite, which affected and has so far delayed its entry into the mobile services market. The leading three operators have 2G/3G network coverage exceeding 99 percent both in terms of population and territory. Package services experienced a considerable growth in 2015 and are now the second-largest segment immediately after data access [11].

The first 4G network in Bulgaria was launched in 2014 by Max Telecom, followed by Telenor, A1 and Vivacom at the end of 2015 and the beginning of 2016.

Mobile Data Speed (4G Speed) of operators across Bulgaria ranks 9th in the world, according to Global State of Mobile Networks Report. The average Smart LTE download speed across the country is 33.3 Mbps. Faster internet speed is delivered only in Singapore, Netherlands, Norway, Republic of Korea, Hungary, Belgium, Australia and New Zealand. The global leader's Smart LTE speed has topped the list with 44.31 Mbps, while world average smart speed is now 16.9 Mbps [12].

The 4G Availability metric tracks the proportion of time users have access to a particular network. The result of Bulgaria is 73.96%. The highest result has South Korea, with 97.49%. Bulgaria is ranking number 45th among 150 countries.

According to Google Consumer Barometer the mobile Internet user penetration rate in the beginning of 2018 is highest in United Arab Emirates (96%), followed by Saudi Arabia (88%) and Netherlands (80%) [6]. The penetration rate in Bulgaria is 53% (Figure 6).

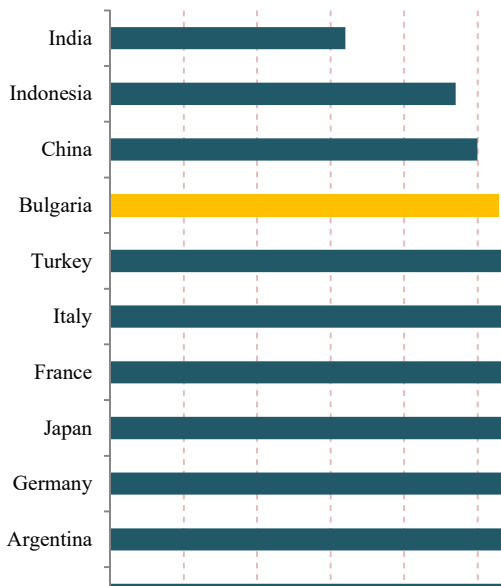


Figure 6. Mobile Internet User Penetration Rate at the Beginning of 2018

The number of mobile Internet users in Bulgaria marked steady growth with more than 25% in comparison with 2015 and reached 3.88 million users at the beginning of 2018. According to Statista in 2022, the number of mobile Internet users is projected to reach 4.18 million individuals. This would be an increase of approximately one million new users (Figure 7).

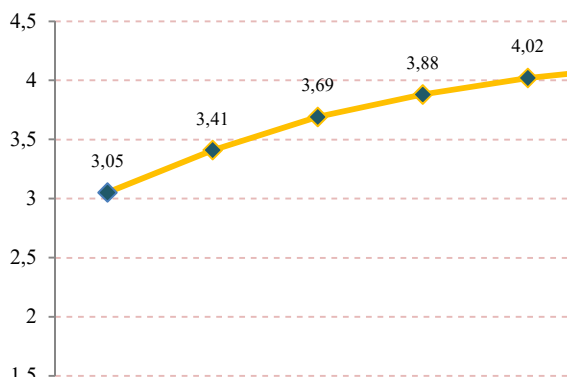


Figure 7. Mobile Internet Users in Bulgaria from 2015 to 2022 (in million users) [6]

According to National Statistical Institute of the Republic of Bulgaria 84.2% of individuals use mobile phones for access to Internet, 35.7% use portable computers and only 12% didn't access to Internet via any mobile device (Table 5). The percentage is calculated on the basis of individuals in Bulgaria who used the Internet.

Table 5. Individuals Using Mobile Devices to Access the Internet in Bulgaria for 2017

Type of mobile devices	2017
Mobile phone (or smart phone)	84.2%
Portable computer (e.g. laptop, tablet)	37.5%
Other devices	2%
I didn't access the internet via any mobile device away from home or work	12%

Despite the fact that mobile phone adoption is near saturated in Bulgarian market and data usage continues to grow exponentially, 12% of the population is not yet access to Internet via any mobile device. (Figure 8). The growth in mobile phone usage is more that 50%. The percentage of people that didn't access the Internet via mobile devices in Bulgaria is still one of the highest in comparison with other EU counties.

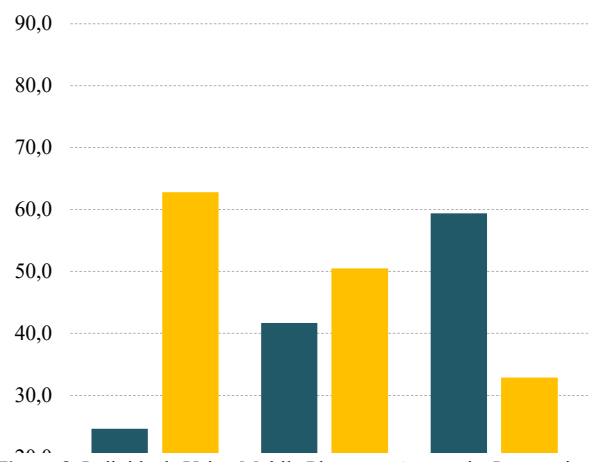


Figure 8. Individuals Using Mobile Phones to Access the Internet in Bulgaria 2013-2017

In terms of MCI, during 2017 Bulgaria ranks last among all European Union member states (Table 6). Bulgaria is seriously lagging behind both the leading countries and EU member states by the level of MCI as a whole.

Table 6. MCI Scores of European Union Member States [10]

Country	Infrastructure	Affordability	Consumer readiness	Content
Austria	82.4	74.5	86.0	86.1
Belgium	81.6	73.6	85.4	90.9
Bulgaria	68.6	62.5	72.8	84.7
Croatia	74.1	64.5	80.8	84.0
Cyprus	76.0	66.5	74.4	84.8
Czech Republic	76.3	70.4	84.5	86.4
Denmark	84.5	78.1	81.8	92.6
Estonia	77.7	74.9	79.8	89.1

Finland	84.2	81.0	85.4	92.5
France	79.9	73.0	79.5	86.1
Germany	81.8	75.8	82.3	89.1
Greece	72.4	67.3	66.8	88.3
Hungary	74.7	70.5	82.2	82.3
Ireland	83.0	68.3	85.4	92.3
Italy	74.9	68.4	71.6	82.6
Latvia	73.7	67.0	78.0	88.8
Lithuania	75.3	74.2	77.6	88.4
Luxembourg	81.4	76.2	88.5	78.1
Malta	76.3	66.1	76.0	79.7
Netherlands	84.2	79.3	83.3	88.8
Poland	76.7	66.7	82.8	87.8
Portugal	77.0	70.4	77.9	82.7
Romania	72.4	65.7	83.9	78.9
Slovakia	72.9	64.8	84.1	84.0
Slovenia	77.8	67.5	86.1	91.0
Spain	79.7	71.9	79.0	87.8
Sweden	84.3	77.0	85.2	90.4
United Kingdom	84.2	77.4	84.3	87.5

The results show that the main challenge for Bulgarian mobile operators is the Infrastructure. The score of Infrastructure component is 62.5, which is 8.73 less than the average level for all EU member states. This component measures the availability of high-performance mobile Internet network coverage. According to the results, the main problems of our country are spectrum, which reach only 16.0 scores and network performance with 44.7 scores.

The development of a dynamic and innovative digital economy will facilitate growth and productivity, allow the development of new services by generating additional social benefits and increase the number of jobs, all of which require an available ultra-high speed next generation Internet access. In this regard, the construction of new broadband infrastructure for next generation access, the facilitation of the use of the radio spectrum, and the promotion of the intensive and efficient use of both have to be the priorities of the country.

Affordability component reports mobile data plans and device becoming more affordable, especially for lower income groups i.e. the availability of mobile services and devices at price points that reflect the level of income across a national population. In 2018 affordability component of Bulgaria has 62.5 scores and the country occupies the last place among EU member states.

According to Europe's Digital Progress Report for 2017, packages including mobile broadband on handsets in Bulgaria are significantly more expensive than in the EU-28 on average, costing almost double the EU average [13].

The Consumer readiness element measures the gender equality and basic skills of the population i.e. citizens with the awareness and skills needed to value and use the Internet, and a cultural environment that promotes gender equality. Bulgaria has 72.8 scores and overtakes only Italy.

Content is Bulgaria's strongest MCI's component. The component measures the availability of online content and services accessible and relevant to the local population. In terms of Content the result of Bulgaria is better than the results of Croatia, Slovakia, Romania, Portugal, Malta, Luxembourg and Hungary.

4. Conclusions

Based on this study following conclusions can be formulated:

(1) Mobile Data Speed (4G Speed) of operators across Bulgaria ranks 9th in the world.

(2) The 4G Availability of the country is 73.96% and mobile Internet user penetration rate in the beginning of 2018 is 53%.

(3) The number of mobile Internet users marked steady growth with more than 25% in comparison with 2015 and reached 3.88 million users at the beginning of 2018.

(4) The mobile phone adoption is near saturated in Bulgarian market and data usage continues to grow exponentially, 12% of the population is not yet access to Internet via any mobile device.

(5) Bulgaria is seriously lagging behind both the leading countries and EU member states by the level of MCI as a whole.

(6) The main challenge for Bulgarian mobile operators is the Infrastructure. The score of Infrastructure MCI component is 62.5, which is 8.73 less than the average level for all EU member states. In this regard, the construction of new broadband infrastructure for next generation access, the facilitation of the use of the radio spectrum, and the promotion of the intensive and efficient use of both have to be the priorities of the country.

(7) The affordability component of Bulgaria has 62.5 scores and the country occupies the last place among EU member states. Packages including mobile broadband on handsets in Bulgaria are significantly more expensive than in the EU-28 on average, costing almost double the EU average.

(8) In addition, deeper focus on deploying broadband in rural areas and on developing digital skills and digital services would benefit the country's overall connectivity.

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