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Some Aspects of Russian Telecommunications

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Abstract

Two articles under the same title, “Telecommunications in Russia,” were published in *IEEE Communications Magazine* in 1992 and 2000, respectively [1, 2]. From the beginning of this century Russian telecommunications has undergone significant changes. Some of them related to mobile networks and Internet are briefly described in this article.

Introduction

Formerly, an acceptable measure of telecommunications evolution on the whole was the modernization level of the national public switched telephone network (PSTN). Nowadays, a similar approach is impossible. In particular, mobile communications up to 2000 was embryonic. Right now mobile operators are considered the main players in the telecom market.

Internet Protocol (IP) applications are examples of the next important tendency in Russian telecommunication evolution. Primarily, Internet and voice over IP (VoIP) services are of interest.

This article consists of two parts, excluding “Conclusions” and “References.” The first part deals with statistics. Some

Indices	2001	2002	2003	2004
Domestic and international long-distance (ILD/DLD) calls, number per inhabitant	26.8	35.6	40.8	45.1
Telegrams, number per inhabitant	0.34	0.33	0.29	0.24
Fixed telephony penetration, %	24.1	25.4	26.6	28.4
Mobile communication penetration, %	5.3	12.3	24.7	51.5
Internet penetration, %	3.2	5.6	8.3	12.9

■ **Table 1.** *Telecommunications statistics*

tables and diagrams present the evolution of the Russian telecommunications. There are three subsections in the second part of the article. Milestone events in evolution related to fixed telephony, mobile communications, and the Internet are described.

Statistics

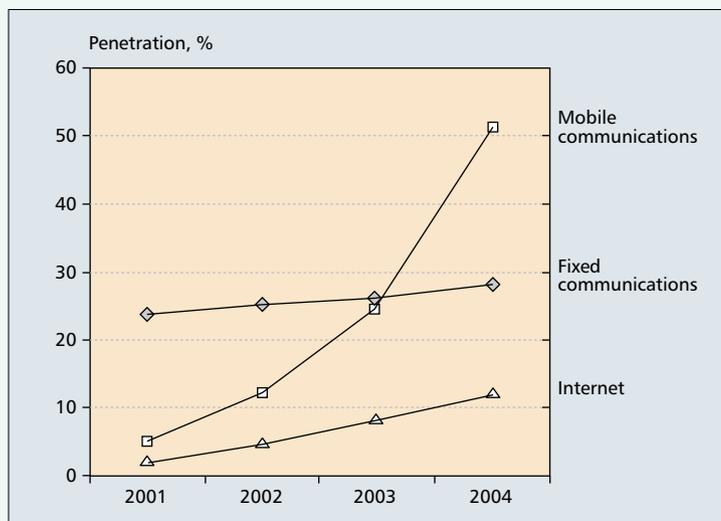
Table 1 presents the main telecommunication statistics. This table was compiled on the basis of information published by state structures and regional telecommunications operators [3–5].

ILD/DLD refers to all types of connections established with a subscriber located outside the given city or rural district. The portion of international calls is less than 10 percent. About two-thirds of international calls are established to subscribers in the Commonwealth of Independent States. ILD/DLD traffic continues to grow. On the contrary, telegraph traffic shows permanent decline.

Three curves related to penetration are shown in Figure 1. The rate of growth related to mobile communications was unexpected. It is not inconceivable that the curve shown presents too optimistic an estimation of the mobile market. This problem is discussed later. Growth of fixed communications was expected. Reliable estimation of the Internet market is very complicated. Some considerations concerning this vital issue are presented later.

Some statistics related to the first quarter of two years are given in Table 2. Probably, the growth process of ILD/DLD calls is approaching saturation. The portion of international traffic has been slightly reduced. Total telegraph traffic has confirmed its ten-

(Continued on next page)



■ **Figure 1.** *Market penetration.*

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dency to decrease. However, this process is slower for international telegrams.

Revenues from different services are significant indicators for operators. For this reason, a revenue structure allows the optimal company policy to be defined. In the Russian telecom market, Moscow plays an important role. From the beginning, many new services have been introduced by metropolitan operators.

The revenue structure for the Moscow telecom market is given in Figure 2. These data were determined for the first quarter of 2005. Undoubtedly, mobile communications is a very attractive segment of business. On the other hand, low revenues generated by intelligent network (IN) services, integrated services digital network (ISDN), and pay phones were unexpected.

Micro distribution of the main types of telephone traffic is interesting. The situation is food for thought. It must be emphasized that narrative traffic consists of three main components. The sources of this traffic are the telegraph network, data transmission systems, and Internet. Broadcast revenues are some of the incomes generated by all services related to television and sound systems.

Evolutions

Fixed Telephony

It is interesting to glance over the forecasts made near 10 years ago for the Russian PSTN. Most predictors had expected a capacity explosion. Nevertheless, fixed telephony market grew slowly. There are three main reasons for this phenomenon. First of all, investment opportunities were limited. In the second place, IP technologies have led to recession in demand for the traditional PSTN. Finally, mobile communications affect fixed telephony.

The last reason is well known. However, at least one aspect is very important for the Russian telecom market. The connection fee of the Russian PSTN exceeds \$200. A potential subscriber of PSTN has to solve a simple problem: what is to

be done? The first solution is as follows:

- Buy a terminal (the cost of ordinary telephone set is about \$10),
- Pay the connection fee established by the operator (more than \$200).
- Pay monthly for local service (e.g., in St. Petersburg, the applicable rate is approximately US\$6 regardless of local traffic volume).
- Pay for ILD/DLD calls and value added services in compliance with the tariff established by the PSTN operator.
- On the other hand, a subscriber may choose a different solution. This solution will be based on the following:
 - Buy a cell phone (the cost of an unsophisticated terminal telephone set is about \$70).
 - Pay connection fee established by operator (in some cases \$0).
 - Pay every month for services (this value depends on the tariff system, but it is possible to choose a free of charge scheme).
 - Pay for local traffic (e.g., in summer 2005, one mobile operator established a price of \$0.02/min).
 - Pay for ILD/DLD calls and value added services in compliance with the tariff established by the mobile operator.

These considerations allow one to see the simple inequation in optimal solution choice. In many cases the second solution, based on connection to a mobile network, is more attractive. It is an established fact that potential subscribers from the waiting list have turned down a proposal to connect to the PSTN. Therefore, fixed telephony players (mainly PSTN operators) must revise their financial and technical policies.

Mobile Communications

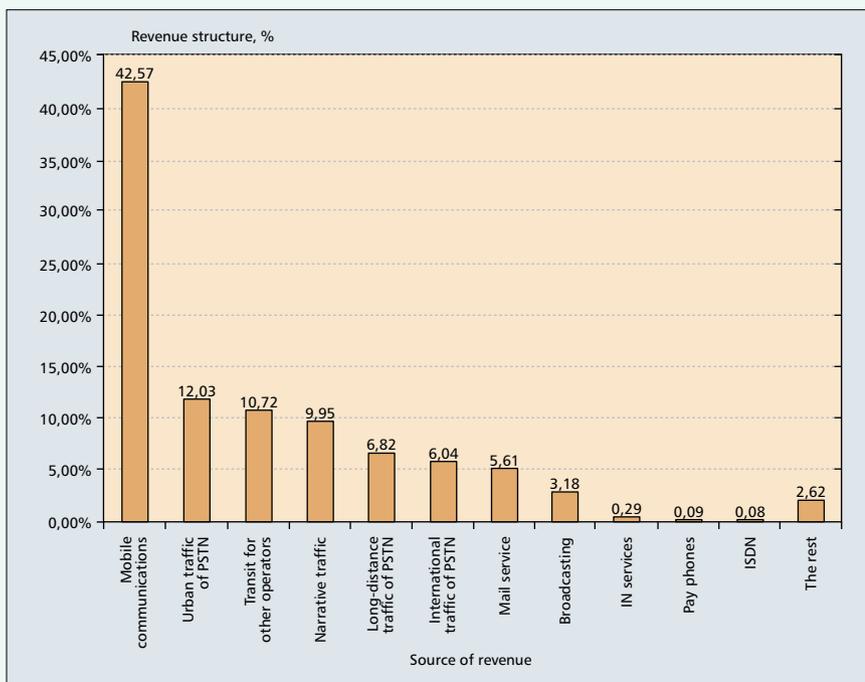
In major publications, euphoria is the leitmotif for mobile market development in Russia. There is no doubt that the announced number of connected terminals has permanently increased. On the other hand, counting subscribers was substituted by recapitulation of sold SIM cards. As a result, a significant difference showed up in a public opinion poll.

In 2005 the well-known national Levada Center [6] published a report related to mobile market estimations. There is essential contradiction between statistics presented by mobile operators and the Levada Center results. Figure 3 illustrates this clearly seen distinction.

Growth of the Russian mobile market is accompanied by decrease in the average revenue per user (ARPU). In 2004 ARPU was \$11.9 [7]. It was 21 percent lower than ARPU calculated in 2003.

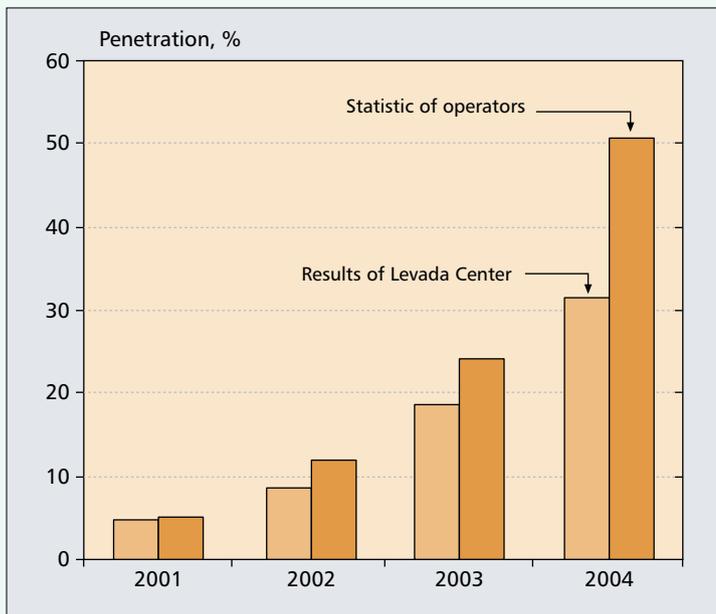
Indices	1st quarter, 2005	1st quarter, 2004
ILD/DLD calls, mln. hours	69.6	100.2%
Including international calls, mln. hours	4.8	97.7%
Telegrams, mln.	7.7	85.6%
Including international telegrams, mln.	0.3	92.1%

■ Table 2. Statistics for the first quarter, 2005 and 2004.



■ Figure 2. Revenue structure for the Moscow telecom market, first quarter 2005.

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■ **Figure 3.** Two estimates of the Russian mobile market.

There is noticeable variance in ARPU throughout all federal districts. Information published by iKS-Consulting [7] is reproduced in Fig. 4. Two estimations are given for each district: ARPU per month in U.S. dollars/value of annual income (in millions of the USA dollars). Indicated data correspond to 2004.

All mobile operators try to raise ARPU. First, they pin their hopes to mobile content. According to a prediction pub-

lished by RosBusinessConsulting [8], total income of mobile operators in Russia would increase to \$11.5 billion in 2005. At the same time, many experts consider that in 2005 the number of mobile subscribers would exceed 100 million. In this case ARPU will go lower than \$10.

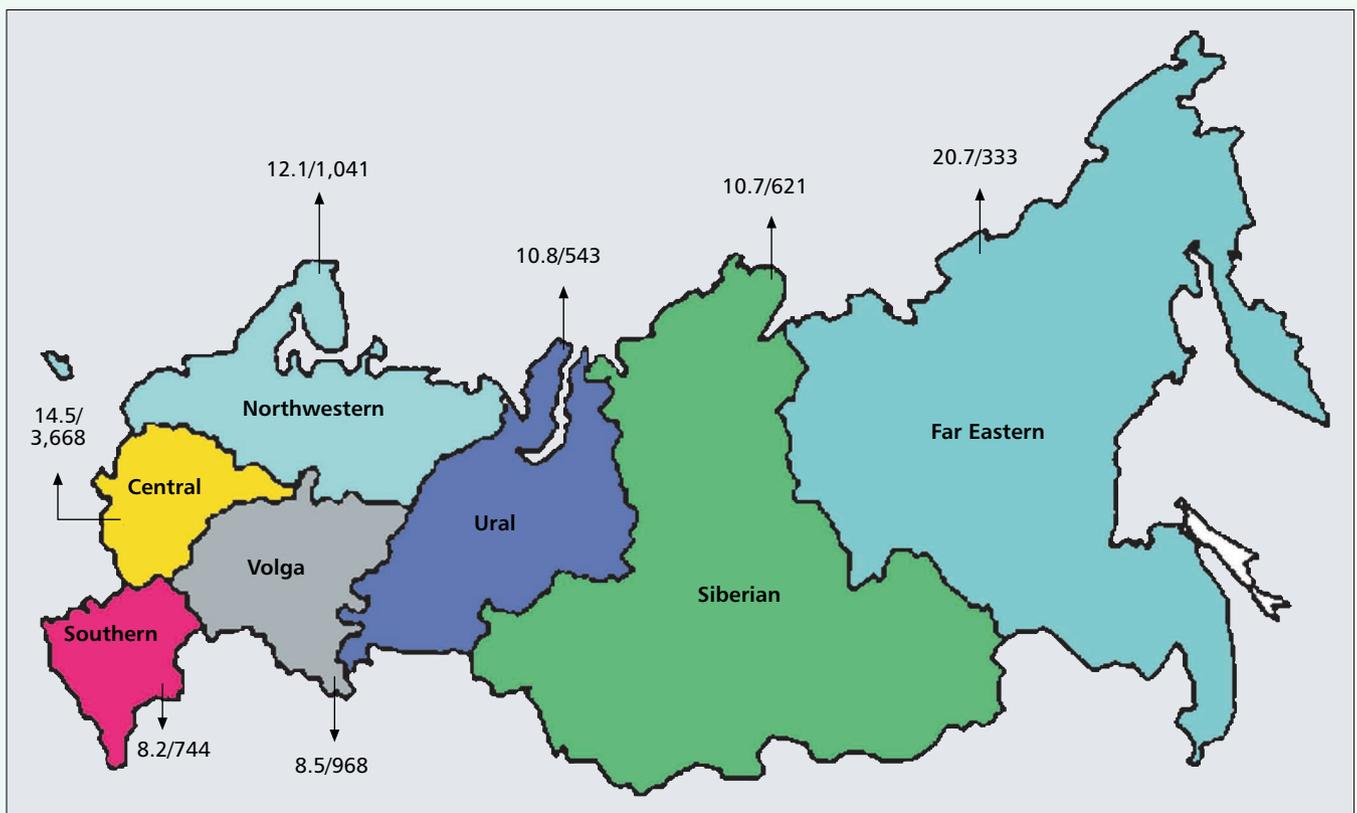
Internet

In the middle of 2005, the Internet market was estimated at 18 million users. Moscow's users were approximately 20 percent of these. This information was published by the fund Public Opinion. Evidently, it is very difficult to receive reliable data. There are relatively easy methods to calculate with needed accuracy the number of subscribers for PSTNs and mobile networks. These methods are based on quantity of sold numbers or SIM cards, respectively. IP addressing is not suited to calculation of users. Number of used personal computers does not allow us to estimate the Internet market as well.

For these reasons, it is necessary to estimate Internet and information technology (IT) markets using other indices. Possible candidates are traffic, number of sites, and income. At present, objective methods for analysis of the Internet and IT markets are elaborated.

At the beginning of 2005, according to a survey carried out by J'son & Partners and VoxRu.Net, dialup remained the leader in means of home access. Two-thirds of home users had dialup access. Less than 4 percent of users had installed asynchronous digital subscriber line (ADSL) equipment. Home networks usually based on Ethernet standards provided access for nearly 20 percent of Internet users.

An important application of IP technology is as an effective tool for speech traffic service. At present, VoIP solutions



■ **Figure 4.** ARPU per month and annual income for all federal districts.

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are widely used for IL/DLD traffic. By a rough estimate, every 10th IL/DLD connection is established using VoIP equipment. In some cases the variation of prices between the PSTN and VoIP network is exponential. On the other hand, the quality of speech transmission does not always comply with subscriber demands.

Generally IT is associated with the Internet. On the other hand, some directions of IT are considered independent business. A typical example is software design. Russia is going to essentially increase export of its software. At the end of 2004, the Minister of Information Technologies and Communications held a press conference. He estimated the annual income generated by IT services to be \$8 billion.

Research holding ROMIR Monitoring [9] has carried out a survey related to Internet service expenses. It appeared that only 9 percent of Russians spend more than \$35 for the Internet. The expenses of 33 percent of users lay in a range from \$10.5 to \$21.

The main direction of further evolution is the creation of so-called IT parks. These will have status similar to a special economic area established to boost investment in modern technologies. IT parks are an ambitious plan with a view to build up our own "Silicon Valleys."

Conclusions

Analysis presented in [1] made it clear that Russian telecommunications did not correspond to the main demands of customers. All players of the telecom market by common effort have changed the level of national telecommunications. Nowadays, most of the problems mentioned above have been solved. However, new problems have appeared. Analysis of the proposed decisions will be the subject of the next article.

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Biography

NIKOLAY SOKOLOV received a Ph.D. degree in electrical communications from St. Petersburg Telecommunication University in 1982. He joined the Research and Development Centre of Telecommunications (LONIIS) in 1974. Currently, he is a senior member of scientific staff. He is also a part-time professor at St. Petersburg Telecommunication University. His research interests are in the field of telecommunication evolution and network planning. In 1995 and 2000 he was the Guest Editor of Feature Topics published in *IEEE Communications Magazine*. He is the author of three books.

Report on the TELSIS 2005 Conference Prof. Bratislav Milovanovic, TELSIS 2005 Chairman

The series of biennial conferences on telecommunications in modern satellite, cable and broadcasting services called "TELSIS" started 12 years ago at the Faculty of Electronic Engineering in Nis, Serbia and Montenegro. This year's conference, TELSIS 2005, was the 7th in series and it was held from 28 to 30 September 2005 in Nis, Serbia & Montenegro. As earlier, it was organized by the Faculty of Electronic Engineering under the technical co-sponsorship of the IEEE MTT-Society, Communications Society, AP-Society and IEEE Region 8, and in co-operation with IEEE Section, MTT Chapter and Communications Chapter of Serbia and Montenegro.

Around 190 papers were submitted to the conference, covering a wide range of topics. Each paper within the contributed papers category was reviewed by at least three members of International Review Board. Finally, the conference program comprised 135 papers, of which 15 were invited ones. The authors of papers are from nearly 30 different countries over all 5 continents. All accepted contributed and invited papers were published prior to the conference. The Conference Proceedings will be distributed as an IEEE publication (Book Broker Post-conference Distribution Program). All conference papers will be available on IEEEExplore web site, as well as in IEE INSPEC database.

TELSIS 2005 started on Wednesday, September 28, with an Opening Ceremony. After that, Prof. Jan Zehentner from Czech Technical University in Prague, IEEE Region 8 MTT-S Chapter Coordinator, presented an invited plenary speech called: "Planar Transmission Lines in MW and MMW Circuits".

During the three conference days, the papers were presented within 12 parallel oral sessions and 6 poster sessions. In addition, the technical program included two workshops and a round table. The first workshop was related to the Advances in Mobile Communication Technologies and the speakers were Prof. Branko Kolundzija, Prof. Liljana Gavrilovska and Prof. Yiannis Vardaxoglou. The second workshop was oriented to actual topics in Broadband Wireless Communications and the lecturers were the leading domestic experts. Several additional events (commercial presentations, journal presentations, meetings etc.) took place as well.

The social program was rich as always and included a welcome cocktail, a nice musical performance, a guided sightseeing tour, a reception at the Mayor of Nis and a conference banquet. TELSIS 2005 gathered many people that work in the field of telecommunications and it was a good opportunity for many contacts. It has been evaluated as a leading scientific conference in the field of modern telecommunication technologies in South-eastern Europe. In addition, the participants have emphasized that they enjoyed a very pleasant atmosphere and outstanding hospitality during the conference.

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