

# Analysis of Information Requests of Primary Schoolchildren on the Internet

Kremleva L.V., Bederdinova O.I.

Institute of Shipbuilding and Marine Arctic Technology  
Northern (Arctic) Federal University named after M.V.  
Lomonosov, NArFU  
Severodvinsk, Russia  
L.Kremleva@narfu.ru

Bederdinova M.V.

Department of Information Technology and Management  
Saint-Petersburg State Technological Institute (Technical  
University), SPSTI  
Saint-Petersburg, Russia  
maria.bedaa@yandex.ru

**Abstract**—Modern information society is characterized by rapid and wide spread of the Internet in all spheres of human life. Intellectualization of Internet technologies suggest that the children's Internet sector is "younger" and younger schoolchildren are active consumers of media content. The study aims to assess the indicators of basic needs identified in information requests, and the degree of popularity of Internet technologies and Internet services among primary schoolchildren. The data were collected by the survey method conducted for primary schoolchildren aged from 7 to 10 years. 63 schoolchildren participated in the survey. The questionnaires developed by the author covered a range of issues related to the time and goals of Internet content consumption, awareness of schoolchildren about online risks and others. It was found that the Internet is used by primary schoolchildren to study (50% on average), to search for information (60%), to communicate (about 50% of children aged 9–10 years). Primary schoolchildren actively use social networks: on average, about 60% communicate in the social networks V Kontakte (Vk). It was found that children start to realize the online risks by the age of 10 years. The study confirmed the hypothesis that the Internet has covered all the areas of interests of primary schoolchildren – 100% of children use the Internet daily. It is concluded that there is a need for comprehensive protection of primary schoolchildren from possible online risks associated with uncontrolled use of Internet services.

**Keywords**—Internet services, online services, younger schoolchildren, sociological survey, cloud technologies, online risks

## I. INTRODUCTION

Modern level of development of the information society is characterized by rapid development of media and communication systems and technologies. The most important of them is the Internet, the global information network, which has become daily reality of most people. The Internet has a significant impact not only on economic, but also on social environment of the individual, primarily through the change and rapid development of various forms of communication. As shown in [1], "...informatization, technologization, computerization, information and communication revolution ... are the factors that determine the basic transformations in communications." The Internet has been developed for almost 50 years from the medium of information exchange to distributed high-tech artificial intelligence systems, which undoubtedly increases its effect on various social groups and

various aspects of life activity. As indicated in [2, p. 153], "... the mentality of the global network is an internal part of the individual, a new psychotype has formed ...". Various concepts are widely used in the scientific literature [3–7], such as "media man", "media space", and "media environment", which indicates that the impact of media information on formation and activity of the individual should be adequately estimated. In the context of the above, researchers particularly focus on the children's Internet segment [8, 9]. According to [10], the average age of Internet access in Russia is 10 years.

Intellectualization of Internet technologies suggest that the children's segment of the Internet is "younger" and younger schoolchildren (aged 7–10 years) are also active consumers of the media content. It is rather difficult to predict changes that are caused by rapid emergence of innovations in this segment of the Internet, especially when it comes to primary schoolchildren. In the scientific literature, research data on information needs of this age category, its social, physiological and emotional characteristics related to media content consumption are extremely fragmentary [11–15]. Apparently, this is due to the conceptual complexity of psychological, pedagogical and sociological studies of the issues related to the use of the Internet environment by primary schoolchildren. However, it should be noted that a negative informational and psychological impact of the Internet on children and adolescents is studied actively enough [16–18]. The papers note that children and adolescents are the most vulnerable group of Internet users [18, 20–22]. At this stage, the issues of Internet consumption by primary schoolchildren and closely related issues of the impact of information risks and online threats on personal development of children need to be studied, and in addition, science based management of these processes should be provided [23–25]. It is important to reliably assess data on online services that are popular among schoolchildren and the goals of their using the Internet to identify the effects of information consumption. In this regard, the study aims to estimate the basic needs identified in information requests, and the degree of popularity of Internet services among younger schoolchildren. The study is of current relevance since data on this issue are fragmentary and insufficient.

II. RESEARCH METHODS

Data were collected by sociological survey of primary schoolchildren aged from 7 to 10 years. 63 schoolchildren involved in the survey were divided into 3 groups: Group I – age 7–8 years (2nd grade), 42%; Group II – age 8–9 years (3rd grade) –30%; Group III – age 9–10 years (4th grade) – 28%. Parents wrote consent for the survey. The survey was conducted anonymously.

The developed questionnaires contained closed questions with the most complete sets of all possible answers. This made it possible to eliminate the ambiguity of the responds. Before the survey conducted in the presence of teachers, schoolchildren were given explanations on some terminological aspects of the questions. Table 1 presents the questions and sets of answers used in the survey.

TABLE I. QUESTIONS IN THE QUESTIONNAIRE FOR PRIMARY SCHOOLCHILDREN

Question number	Question	Possible responses
1	How much time do you use the Internet per day?	<ul style="list-style-type: none"> <li>• Up to 2 hours</li> <li>• 2 to 6 hours</li> <li>• More than 6 hours</li> </ul>
2	Do parents control your use of the Internet?	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
3	For what purpose do you use the Internet?	<ul style="list-style-type: none"> <li>• For study</li> <li>• To search for non-academic information</li> <li>• For communication</li> <li>• For fun</li> <li>• For creativity and self-development</li> </ul>
4	Do you use social networks?	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
5	If you use social networks, which ones?	<ul style="list-style-type: none"> <li>• VKontakte (VK)</li> <li>• Classmates</li> <li>• Twittwr</li> <li>• Facebook</li> <li>• Instagram</li> </ul>
6	If you play online games, list them.	List by yourself
7	Identify the main cloud services that you use most frequently.	<ul style="list-style-type: none"> <li>• Online Games</li> <li>• Skype</li> <li>• Electronic diary</li> <li>• Storage on network drives</li> <li>• Not using</li> </ul>
8	What is dangerous about the Internet?	<ul style="list-style-type: none"> <li>• A lot of unnecessary information</li> <li>• I communicate less with classmates and friends</li> <li>• Internet addiction</li> <li>• Time consuming</li> <li>• Negative health effects</li> <li>• Quarrels with parents</li> </ul>

When the questionnaires were processed, the contingency tables were constructed and the frequency analysis was performed. The age groups of schoolchildren mentioned above were used as a resultative attribute. Answers to the questions in nominal scales were used as a factorial attribute. The statistical significance of frequency indices for the groups of schoolchildren surveyed was assessed using the Pearson criterion ( $\chi^2$ ) with  $p < 0.05$ . The resulting indicators were calculated in percentages.

III. RESULTS AND DISCUSSION

The results of the processed responses about time spent on the Internet are presented in Fig. 1a. According to the above data, the time spent by children on the Internet increases by the age of 10 years, and the number of children who spend more than 6 hours surfing the Internet increases by 10 years by 21%. At the same time, control over the time spent by the child on the Internet performed by parents increases on average by 45% (Fig. 1 b).

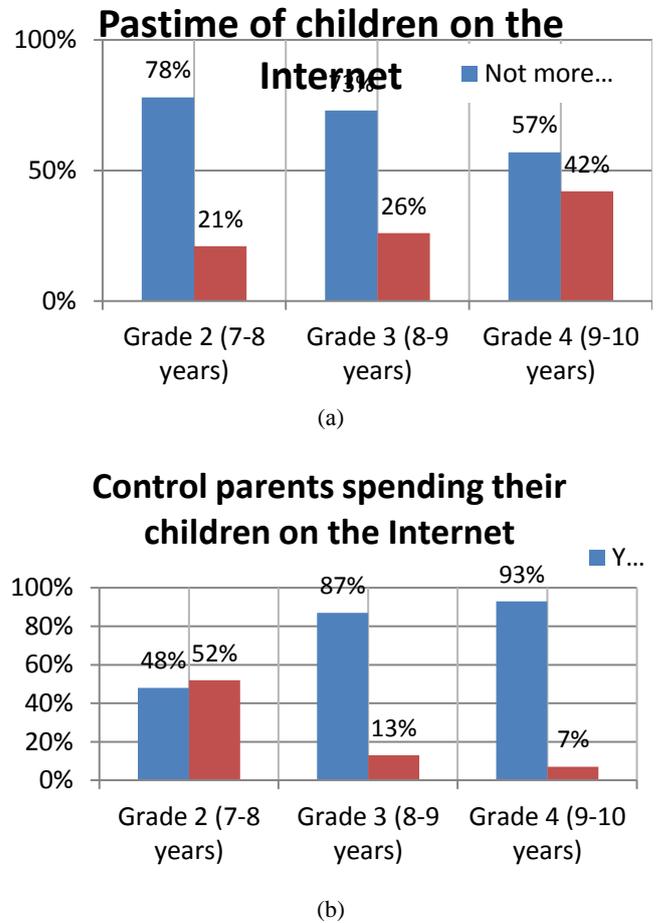


Fig. 1. Pastime of children on the Internet (a) and control by parents (b)

The Internet and online services provide great opportunities for studying, information retrieval, communication, entertainment and creativity. Fig. 2 presents the results of processed responses of schoolchildren for the target group of respondents. According to the survey, the Internet is used by 13% of children at the age of 7–8 years, by 53% of children at 8–9 years, and 43% of children at 9–10 years (Fig. 2).

An average of 50% of the children surveyed in this age category use online services for entertainment, including children aged 7–8 years (57%), 8–9 years (47%), and 9–10 years (71%). For studying and searching for information, children of 2nd and 3rd grades use the Internet more time – 65% and 67%, respectively. An average of 23% of the children surveyed in this age category use the Internet for creativity and self-realization.

For communication, children use mainly the social network VKontakte (7–8 years old (43%), 9 years old (60%), 10 years old (86%)), but by the age of 10 years they begin to communicate more actively on Odnoklassniki (from 9% in 2d grade to 43% in 4th grade). Such social networks as Twitter, Instagram and Facebook were not mentioned in any of the questionnaires.

### Goals of using the Internet

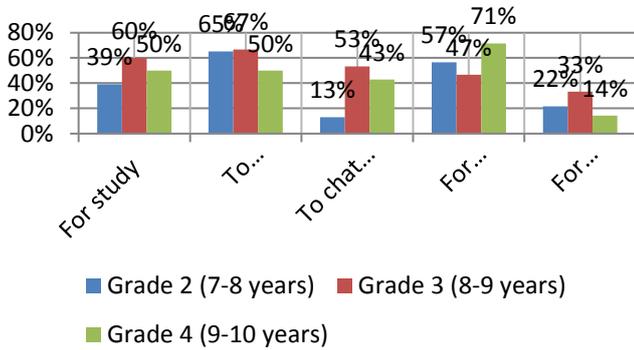


Fig. 2. Goals of using the Internet.

Cloud technologies that employ software and hardware resources to provide the user with Internet services are currently widely used. Examples of cloud technologies for young users are online games, electronic diary, skype and storage on network drives. The survey of children revealed that the majority of primary schoolchildren actively use cloud technologies but know nothing about them (88% of the respondents). Based on the analysis performed in the study, it was found that primary schoolchildren have the highest demand for online games (on average, 70% of the respondents). These are the most common online games: Avatar (on average, 28% of the total number of respondents), Minecraft (on average 40%), and The Sims (on average 31%).

There is increasing interest in electronic diaries. Electronic diary is used by 26% of respondents aged 7–8 years, 67% of children aged 9 years and 57% of those aged 10 years old. An average of 38% of respondents in the studied age group use Skype (Fig. 3).

Modern computer technologies enable use of the mobile Internet for communication, study, information retrieval, and self-development. According to the results of the survey, about 40% of respondents aged 7–8 and 10 years, and 60% of children aged 9 years actively use the mobile Internet.

The increasing popularity of the Internet shows negative aspects of its use and parents' concern about the danger of Internet addiction. About 50% of children aged 9 and 10 years realize this danger, and 13% of children aged 8 years are aware of the danger of Internet addiction (Fig. 4).

All children in the age group from 7 to 10 years are aware of the online threats associated with the Internet, and by the age of 10 years, schoolchildren are more aware of harmful effects of the Internet in terms of health and quarrels with parents caused by long time spent on the Internet (79%). on the average,

57% of respondents mention the possibility of Internet addiction, and 29% of children state that the Internet can restrict face-to-face communication. 47% of children aged 9 years consider Internet addiction and a great waste of time spent online to be the main threats. About 40% of children aged 9 years note negative effect of the Internet on health and vision, and 20% of children indicate risks of being imposed unnecessary and harmful information. Children aged 7–8 years generally highlight risks associated with health (39%) and significant waste of time (26%).

### Use of "cloud services"

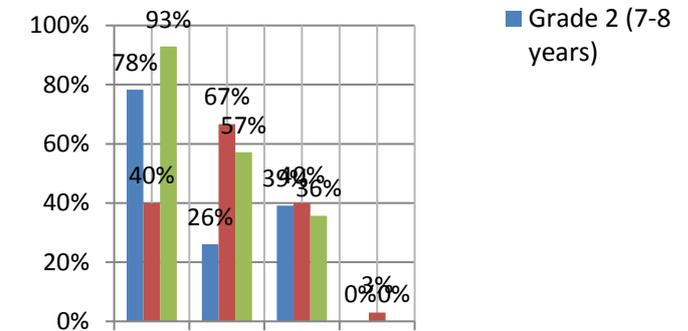


Fig. 3. Use of cloud services by primary schoolchildren.

Games was the most popular: Sky, Google Drive, Windows OneDrive, etc

### Internet Threats

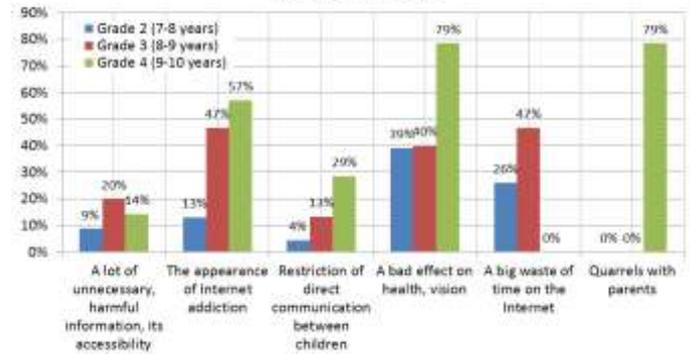


Fig. 4. Analysis of the awareness of Internet threats by younger schoolchildren.

Based on the above, it can be concluded that children aged from 7–8 years to 10 years are aware of online threats associated with the Internet. At the same time, they consider that the Internet is crucial for self-development and study.

Thus, the conducted study showed that 100% of children use the Internet every day, and the time spent on the Internet increases from 2 to 6 hours by 10 years, as noted by 42% of respondents aged 10 years. In addition, parents' control of time spent on the Internet by 10-year-old children increases by 45% compared to that for 7–8-year-old children. The Internet is used by primary schoolchildren for educational purposes (50% on average), information retrieval (60%), communication (about 50% of children aged 9–10 years and only 13% of children aged 7–8 years), entertainment (58%), creativity and self-realization

only about 23% of the respondents. Primary schoolchildren actively use social networks: on average, about 60% of respondents communicate on the social network VKontakte. It should be noted that all schoolchildren have not yet reached the age of 14 years when they are permitted to register in social networks. It was determined that the following cloud technologies are in demand among primary schoolchildren: online games (70% on average), electronic diary (about 50%), and Skype (38%). The advent of the mobile Internet started its active penetration into the life of primary schoolchildren. About half of the respondents (50%) use the mobile Internet.

Along with huge opportunities of the Internet, a negative impact of the Internet should not be neglected. All the respondents noted harmful effect of the Internet on health and vision, and by the age of 10, 79% of children are aware of its danger. About 14% of respondents believe that the Internet provides a lot of unnecessary and harmful information, 47% of children aged 9 years, and 26% of children aged 8 years claim that they spend a lot of time on the Internet. By the age of 10, 29% of children understand that Internet addiction leads to restriction of face-to-face communication. About 79% of ten-year-olds consider quarrels with their parents to be one of the main risks of spending time on the Internet.

#### IV. CONCLUSION

Thus, it can be argued that the scientific hypothesis was confirmed and the Internet has currently affected all the spheres of interest of primary schoolchildren. The Internet provides children with the opportunity to explore the world, make new friends, communicate, educate, and have fun. However, risks of using the Internet by children should not be ignored. Therefore, it is necessary to protect primary schoolchildren from possible risks imposed by the Internet. The risks of using the Internet by primary schoolchildren can be eliminated, firstly, through control by parents or close relatives. Secondly, this problem can be solved through dissemination of knowledge about Internet addiction by means of explanatory conversations, information lectures and other activities conducted not only by teachers, class teachers and psychologists of schools, but primarily by parents.

The results of the study can be applied in children's educational institutions to plan educational activities in information security and information risk management.

#### References

- [1] Ye.S. Tsymbalenko, "Transformational phenomena in media communication," *Universum: Philology and Art History: electron. scientific journals* [Universum: Filologiya i iskusstvovedenie: elektron. nauchn. zhurn. - in Russian], vol. 14, no. 12, 2014.
- [2] E.I. Pronin and E.E. Pronina, "Media psychology: the latest information technologies and the human," *Social Sciences and Contemporary World* [Obshchestvennye nauki i sovremennost' - in Russian], no. 2, pp. 151-161, 2013.
- [3] N. I. Klushina, "Mediation of modern culture and Russian national style," *Russian Speech* [Russkaya rech - in Russian], no. 1, pp. 66-73, 2014.
- [4] E. G. Nim, "Media Space: Main Research Areas," *Business. Society. Power* [Biznes. Obshchestvo. Vlast' - in Russian], no. 14, pp. 31-41, 2013.

- [5] E. L. Vartanova, "Media and journalism in the post-industrial society," *Mediascope: electron. scientific journals* [Mediaskop: elektron. nauchn. zhurn. - in Russian], no. 2, 2009.
- [6] V. D. Mansurova, "Media" man as a projection of digital ontology," *Izvestiya of Altai State University* [Izvestiya Altajskogo gosudarstvennogo universiteta - in Russian], no. 2, pp. 116-120, 2010.
- [7] Yu. A. Eliseeva and P. Yu. Tenhunen, "Educational program "Media Communications": domestic and foreign experience in implementation," *Integration of Education* [Integraciya obrazovaniya - in Russian], vol. 20, no. 4, pp. 468-483, 2016.
- [8] H.Cao, Y.Sun, Y.Wan, J.Hao and F. Tao, "Problematic Internet use in Chinese adolescents and its relation to psychosomatic symptoms and life satisfaction," *BMC Public Health*, vol. 11, article 802, 2011.
- [9] L.Cerniglia, F. Zoratto, S. Cimino, G.Laviola, M.Ammaniti and W. Adriani, "IA in adolescence: Neurobiological, psychosocial and clinical issues," *Neuroscience and Biobehavioral Reviews*, vol. 76, pp. 174-184, May 2017.
- [10] G. Soldatova, E. Rasskazova, E. Zotova, M. Lebesheva and P. Roggendorf, "Russian children online: the results of the EU Kids Online II international project Of Russia," Moscow: Foundation for Internet Development, 2011.
- [11] V. Bajdin, "Children under 14 years of age on the Internet: online survey results," *Children in the information society* [Deti v informacionnom obshchestve - in Russian], no. 1, pp. 31-34, 2009.
- [12] I.A. Nezhbeckaya, "Teenagers in social networks: their actions, consequences and possible dangers," *Student: electron. scientific journals* [Studencheskij: ehlektron. nauchn. zhurn.- in Russian], vol. 21, no. 1, 2018.
- [13] A. Yu. Gubanova, "Teens in the Internet environment: communication, reading, behavior," *GGGU Bulletin. "Philosophy. Social Studies. Art Studies" Series* [Vestnik RGGU. Filosofiya. Sociologiya. Iskuststvovedenie - in Russian], vol. 103, no. 2, pp. 131-137, 2014.
- [14] G.U. Soldatova, T.A. Nestik, E.I. Rasskazova and E.YU. Zotova, "Digital competence of adolescents and parents: the results of the national study," Moscow: Foundation for Internet Development, 2013.
- [15] Eh.P. Pecherskaya, V.B. Zvonovskij, D.Yu. Merkulova, V.A. Pleshakov and M.G. Mackevich, "First steps of children on the Internet," *Sociological Studies* [Sociologicheskie issledovaniya - in Russian], no. 12, pp. 74-80, 2014.
- [16] O. Yu. Zotova, "Features of the content of dangerous information for children on the Internet," *Theory and practice of social development* [Teoriya i praktika obshchestvennogo razvitiya - in Russian], no. 19, pp. 233-237, 2014.
- [17] D. A. Puchkova, "Conditions for ensuring the psychological safety of the use of the Internet environment by children of primary school age," *Russian Journal of Humanities* [Sovremennye issledovaniya sotsialnykh problem], vol. 51, no. 7, pp. 293-300, 2015.
- [18] X.Chi, L.Lin and P.Zhang, "Internet Addiction among College Students in China: Prevalence and Psychosocial Correlates," *Cyberpsychology and Behavior*, vol. 9, no. 19, pp. 567-573, 2016.
- [19] G.U. Soldatova and V. Shlyapnikov, "Online threats through the eyes of children and adults," *Children in the information society* [Deti v informacionnom obshchestve - in Russian], no. 21, pp. 44-55, 2015.
- [20] D.R. Hlestova and K.G. Popov, "Protecting children from Internet threats," *Science symbol* [Simvol nauki - in Russian], no. 7-2, pp. 90-92, 2016.
- [21] A.I. Dontsov and E.B. Perelygina, "Tense situations and the significance of stability for psychological security," *Psychology in Russia: State of the Art*, vol. 6, no. 2, pp. 4-15, 2013.
- [22] G.U. Soldatova and E.I. Rasskazova, "Adolescent safety on the internet: risks, coping with problems and parental mediation," *Russian education and society*, vol. 58, no. 2, pp. 133-162, 2016.
- [23] X. Miao, X. Jiang, P.Wang, H. Li, M.Wang and H. Zeng, "Online activities prevalence of Internet addiction and risk factors related to family and school among adolescents in China," *Addictive Behaviors Reports*, vol. 8, no. 18, pp. 14-18.

[24] P.C.-H.Soh, K.W. Chew, K.Y. Koay and P.H Ang, "Parents vs peers' influence on teenagers' Internet addiction and risky online activities. *Telematics and Informatics*," vol. 35, no. 1, pp. 225-236, April 2018.

[25] M. Griffiths, "Does Internet and computer 'addiction' exist? Some case study evidence," *Cyberpsychology and Behavior*, vol. 2, no. 3, pp. 211-218, 2016.