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Post mass media in the modern informational society "Journalistic text in a new technological environment: achievements and problems"

AUGMENTED REALITY TECHNOLOGY AS A WAY TO INCREASE THE VALUE OF INFORMATION

Eugenia Yudina (a)*
*Corresponding author

(a) Chelyabinsk State University, 129, Bratiev Kashirin, Chelyabinsk, Russia

Abstract

The article reveals the concept of augmented reality and considers the possibility of widespread implementation of the technology in print media as a tool to increase information content without additional costs. The digital revolution has created a completely new reality in the global information space. Firstly, it deals with the fall in printed media circulation. Secondly, it concerns the phased disconnection of analogue television in 2019. Thirdly, it involves the information content availability due to the ubiquitous spread of mobile communication channels. The task of the print media publishers today is to find new ways to attract and retain audience. One of such methods is the augmented reality technology implementation, which allows, with the help of mobile devices and software, to visualize objects, reconstruct events, to turn a familiar by experience reader into an interactive content user. The aim of the present research is to study the technology of augmented reality and the prospects for its media implementation. A method of analyzing scientific and analytical materials, relevant statistical data and indicators, as well as a method of studying, analyzing and forecasting trends are applied for the present study. The study has found that the search and new technologies appliance contribute to the formation of a new image of printed media in the context of globalization. That attracts additional audience while reducing the print space.

Keywords: Augmented reality, virtual reality, media, content, wow-effect.

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1. Introduction

The last five years, the printing industry of the Russian Federation has been in a crisis situation. According to Roskomnadzor, since 2014 the number of registered print media has decreased from 63.5 thousand to 46. According to RACA, over the same period, the decline in advertising in print media is 45.5% or 15 billion rubles. The loss of advertising budgets by editors has affected both the circulation of press and the cost to the final consumer. Thus, the total circulation of print media over the previous five years has decreased by 37.8%, or 0.9 billion copies. The fall is also recorded along the line of retail circulations, which is a "minus" of 40% or 0.6 billion copies (Oskin, 2019; Varykhanov, 2019).

These statistics are not only the result of the active development of the Internet and digital technologies.

The state of the publishing business in Russia is influenced by the following destructive factors: legislative restrictions on advertising, which are: a ban of foreign citizens from becoming founders of the media in the Russian Federation, a limit on the share of foreign shareholders in the authorized capital of Russian mass media, an increase of subscription rates due to the state subsidies cancellation for delivery of periodicals, a lack of tax preferences, an increase in the cost of production and distribution of printed periodicals at retail and by subscription.

The next global trend, which, according to the author's assumptions, will affect the further development of the publishing business is the phased disconnection of analog television in 2019. The access to TV channels should be provided, due to the transition of 95% of the inhabitants of the Russian Federation (About the Reasons for the Shutdown of Analog Television in Russia and the World Experience of Broadcasting other Standards, n.d.). According to Richter (2010), the transition to digital broadcasting will have an impact on changes in the model of the Russian media system.

The Internet audience expands. Agency *We Are Social* has presented the report "2018 Global Digital", in which experts analyzed the global dynamics of Internet connectivity. So, by the end of 2018, the number of Internet users have amounted to more than 4 billion people. More than two thirds of the world's population have a mobile device, most of which use a smartphone. The smartphone is denoted in the report as the main device for getting online, which has the largest traffic compared to other gadgets altogether (Kemp, 2018).

According to the report "Media Consumption in Russia – 2018" (Media Consumption in Russia – 2018. Recovery of loyalty to advertising on the Internet, 2018) official, analytical and news websites (79%), TV channels (67%), blogs and social networks (30%) have become the main source of information for Russian respondents. Since 2015, the number of respondents who read printed periodicals has decreased (to 44%), and the reading activity of printed media has accelerated significantly (to -26%). In the technological aspect, the spread of smartphones has increased (up to 87%), as well as the share of respondents who connect to the Internet via a smartphone frequently and for a long period of time (up to 57%) (Figure 01).

Research results indicate that printed publications require conceptual solutions that allow to find non-standard approaches to the readers, provide unique content in a convenient and fashionable form, create a new image of printed periodicals. That may include innovative technologies implementation. An example would be the augmented reality technology implementation.

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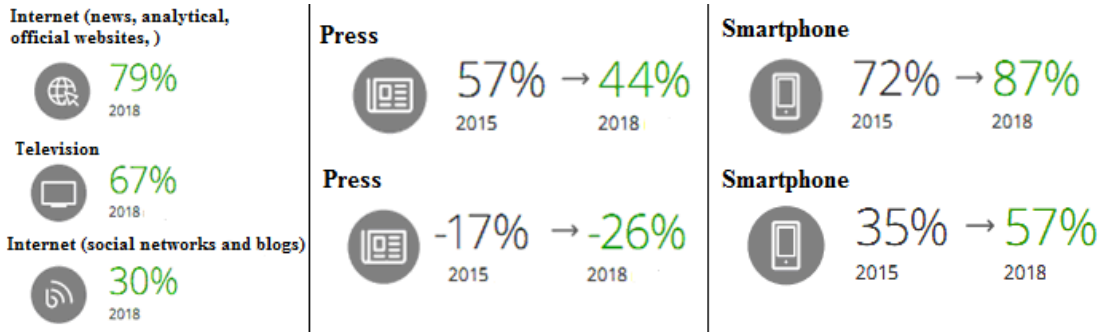

Figure 01. Media consumption in Russia

It is absolutely not important that "the newspapers lose its printed form. As general director of Altapress Purgin notes, the most important thing is its content (Russian Periodicals. State, Trends and Development Prospects, 2017).

2. Problem Statement

Despite the fact that augmented reality is called a new technology that mixes real-time digital information processed by a computer with information, coming from the real world, using appropriate computer interfaces (Stupin, 2012), the term appeared in 1990. Its author is Codel, who worked at Boeing and participated in the development of the helmet-based target indication and flight indication system, aimed at " automatically identifying the object selected by the pilot while displaying signographic and plot information against the background of the external situation observed by him" (Biryukov, 2016, p. 92).

Researcher Azuma (1997) considers augmented reality as a system that combines the virtual with the real; functions in three-dimensional space; interacts with objects in real time.

Stupin (2012) believes that the term *augmented reality* (abbreviated AR) becomes clearer when compared with *virtual reality* (abbreviated VR). In virtual reality, the user is immersed in a virtual environment created on a personal computer. "In the case of augmented reality, virtual elements are superimposed and integrated into real physical space.

In other words, augmented reality turns "an implicit to explicit" (Stupin, 2012) with computer devices such as tablets, smartphones and innovative devices, software (Drokina, 2016).

An example of the AR technology implementation is 2016 with the game *Pokemon Go*, which has received an enormous popularity within a few weeks, and gained about 45 million daily users. The game made AR world famous. Ahonen calls the augmented reality "the eighth mass media" after printing, recording, film, radio, television, mobile communications and the Internet. The scholar assumes that the new technology would grow exponentially (Hobson, 2016).

In February 2019, the gmbox.ru website posted a list of industries in which the capabilities of AR technology are applied (Top-6 Branches of Augmented Reality Implementation, 2019).

Entertainment

The technology allows you to change the picture in a television studio, scenes at entertainment events. Real characters can interact with digital characters. For example, at the World Championships on

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the League of Legends game 2018, a fictional group K/DA were performing with the characters of the game. That is possible through AR-technology.

Portable AR

Microsoft, Apple and Google are aimed at creating a mass product with augmented reality technology. For example, a stand-alone Google Glass device, controlled by gestures and voices, is introduced in 2012. Smart glasses recognized faces, scanned, recorded and transmitted conversations. Subsequent scandals with security leakage, as well as the high cost (around $ 1,500), led to the cessation of sales of the device. However, Google developer continues its work and research in the field of AR.

The Microsoft Hololens glasses, released by Gates, differ from augmented reality devices in that they borrow the ability of head movement in space from virtual helmets. Microsoft Hololens not only process data, but also manage gestures. The device is not initially positioned as “glasses for everyone”, so the cost of $ 3000 does not scare away the potential target audience, that is artists and developers (Microsoft Hololens: review of augmented reality glasses, 2017).

B2B solutions

AR technology is applied by companies for additional visualization of the products. For example, Ikea has created an online catalog that allows a buyer to try on how the selected furniture will look in the appartment. Cadbury has offered its customers a calendar with augmented reality.

Medicine

The most famous fact of applying AR technology is the use of an iPad in 2013 for informational support of a liver surgery. The operated organ was displayed on the tablet screen. The information obtained was supplemented by the results of the examination of the patient and reference data. In 2016, for the first time, in the world, a live broadcast of the operation implementing VR technology and panoramic cameras (Vasilkov, 2016) was conducted at the Royal Hospital of London. The virtual helmet allowed the owner to follow the surgery as well as, get a panoramic picture by an surgeon and his assistant and discuss the chat messages.

Currently, VR and AR technologies are widely applied for educational purposes.

Military industry

VR and AR technologies are applied to train commanders and privates who quickly acquire the necessary skills in conditions close to real, without threat to life and health.

According to forecasts, it is planned to allocate $ 1.4 billion for the military industry and production of AR systems by 2025 (ibid.). At the same time, the ratio of software technologies of AR and VR (Figure 02) is estimated by experts as 1: 3 (Ochkova, 2016).

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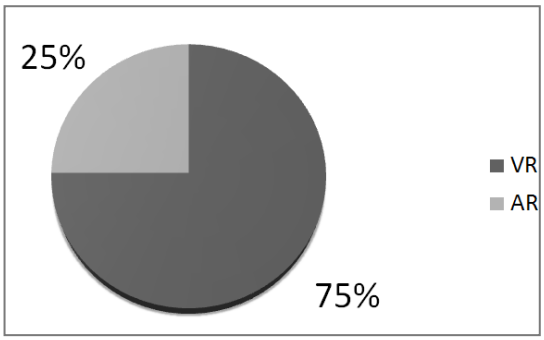

Figure 02. VR and AR software market

Printed products

To gain access to additional information in printed materials, special browsers (blippAR, Wikitude, Layar) are installed on smartphones or tablets. The app scans tags placed in the text or in photographs, for example, in newspapers, magazines, calendars, and other promotional items, with the subsequent revival of information. The packaging of additional content by the AR method (video, audio, access to websites, social networking communities) allows to turn a plane image into a real one and increase the amount of information (Printed Polygraphy Implementing Augmented Reality, 2017), significantly economizing the printing space.

The creators of printed media are moving from paper to digital media, which allows to reach the goals faster and more efficiently. In other words, the combination of the printed with the augmented will create “additional value that cannot be obtained from paper and digital media alone” (Stupin, 2012, p. 77).

3. Research Questions

The factor determining the state of the modern printing market in Russia is the instability of the external environment. They are the depreciation of the ruble, constantly increasing competition, solvent demand drop, imports cost imposition. First of all, it has reflected in the sharp rise of the paper costs and other printing materials. Starting from 2015, the growth in the price of newsprint exceeded 50%. For 2018, the cost of newsprint has increased by 15%, and for January-March 2019 by another 7%. The head of Rospechat Seslavinsky notes that the attempts made to stop the growth are lost, the paper lobby is stronger than the media lobby (Rospechat reported a rise in newsprint prices by more than 50%, 2019).

In a crisis of the printing industry, editorial offices are looking for ways to increase the value of information while saving production costs. A number of publications began to use augmented reality technology as a technological solution.

One of the first AR technology is applied by the magazine MAXIM. In September 2012, an issue appeared with the inscription MAXIM MOTION. In order to see the model moving on the cover, it was necessary to download the application under the same name and move the insertion point. In August 2013, a similar technology was introduced into the Russian version, called MAXIM Ozhivliator (Revitalizer). A way to integrate print and modern technologies is implemented by Esquire publishers, providing an opportunity for readers to share content on a social network (How Augmented Reality is used in the press: learn from the best!, 2014).

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The magazine Marie Claire has applied Aurasma technology to view multimedia content through a smartphone camera.

The technology of augmented reality turns to be introduced both by professional media and publishers of juvenilia. So, in 2016, the Lipetsk Youth newspaper began to use AR technology. The idea of editing an interactive issue for the professional contest Proba Pera has become a permanent format for "revitalizing" the newspaper pages through augmented reality (Rukacheva, 2017).

In St. Petersburg, AR technology is introduced in the newspaper Shag 9¾. The presentation video of the project Shag 9¾. is available on YouTube (Step 9¾, a Unique Project of the Pushkin journalism studio, 2016).

The use of augmented reality technology contributes to the growth of the popularity of school newspapers, the advancement of multimedia technologies, as well as the training of young people for professions that "will be in demand and are not going "live out "their age" (Samoletov, Goreva, & Ivanov, 2017, p. 51).

As an argument in favor of the effectiveness of AR technology, Kornienko and Potapov (2018) state that the appliance of the augmented reality elements in school mass media allows not only to increase the volume and degree of visualization of materials, creating a wow effect, but also to reduce the print space drastically.

For example, the school publication "Nashe vse" (St. Petersburg Secondary School No. 17) has reduced the number of pages to four. At the same time, the following elements of the AR technology are introduced: "revitalization" of images, animated coloring and sports simulators. The main advantages of the newspaper are mobility and interactivity. Using a smartphone and tablet, the reader has access to photos and videos from the events, web pages and communities in social networks, switching to the online newspaper in *.pdf format in four languages (Kornienko & Potapov, 2018).

The advantages of applying the technology seem obvious. It is enough to place the necessary for "revitalizing" content to the online version and publish an image in a newspaper page with a special tag. When one hovers over the image with a phone or tablet, the "tag" with the help of special software will be decoded, and the user will be redirected via a browser to the editorial website with the posted multimedia materials. Much of the software is available for free. However, the release of a "living" newspaper "is quite laborious" (Samoletov et al., 2017), which affects the insufficiently widespread distribution of augmented reality technology in the production of printed media.

For example, there was a participant of the international contest YUNGa +, which has been held in March 2019 in the city of Chelyabinsk. The competitor was the newspaper of the media center of the Yaroslavl branch of the Russian schoolchildren movement The 76th is in Trend became the only school newspaper from more than two hundred contestants applying on its pages augmented reality technology.

So, on the front page of the newspaper, there is an explanation that when you hover the phone on a photo with the Aurasma  application icon, new technologies will become available. It means that it is possible not only to read what is written, but to see or hear the "supplement to the newspaper." The editorial itself formulates the possibilities of AR technology as follows: "Remember, this newspaper is more than just a newspaper" (Figure 03).

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Materials with a special label are presented on virtually every page of the school newspaper, which significantly increases the amount of content offered for viewing and reading, and increases the value of the information itself.

Figure 03. School newspaper The 76th is in Trend

4. Purpose of the Study

Printed media experience the perforce to search for technological and non-standard ways to attract the attention of readers, under the harsh conditions of a competitive environment with the Internet and social networks.

5. Research Methods

A method of analyzing scientific and analytical materials, relevant statistical data and indicators, as well as a method of studying, analyzing and forecasting trends are implemented.

6. Findings

It seems that the augmented reality implementation has both economic, as well as intellectual and educational benefits:

- by increasing the amount of information without changing or reducing the printed area of the publication;

- due to the targeted impact on the readership, and the formation of interactive feedback with the reader.

7. Conclusion

The augmented reality technology implementation provides printed media with the following advantages: 1) drawing the reader's attention to the original multimedia and multi-format content; 2)

receiving information by the user in real time through mobile devices. Thus, the introduction of augmented reality technology in printed media is an opportunity for publishers to attract additional audience and take steps to turn the publishing industry into a competitive business.

References

Azuma, R. (1997). A Survey of Augmented Reality. *Presence: Teleoperators and Virtual Environment, 6*(4), 255–285.

Biryukov, A. (2016). Tekhnologia Dopolnitelnoi realnosti kak innovatsionnii sposob privlechenia auditorii sredstv massovoi informatisii [Augmented Reality Technology as an Innovative Way to Attract the Audience of the Media]. *Izvestiya vysshikh uchebnykh zavedeniy. Problemy poligrafii i izdatel'skogo dela, 6*, 91–98.

Drokina, K. (2016). Analiz vozmozhnostei primenenia tekhnologii dopolnitel'noi real'nosti v sovremennih usloviah [Analysis of the Possibility of Augmented Reality Technology Implementation under Modern Conditions]. *Mezhdunarodnyy nauchnyy zhurnal «Innovatsionnaya nauka», 2,* 114–116.

Hobson, A. (2016). Reality check: The regulatory landscape for virtual and augmented reality. *R Street*. Retrieved from http:/www.rstreet.org/2016/09/29/reality-check-the-regulatory-landscape-for-virtual-and-augmented-reality/.

Kak dopolnennuyu real'nost' ispol'zuyut v presse: uchites' u luchshikh! [How augmented reality is used in the press: learn from the best!] (2014, 06 October). Retrieved from https://ar-conf.ru/ru/news/kak-dopolnennuyu-realnost-ispolzuyut-v-presse-uchites-u-luchshih.

Kemp, S. (2018, 30 January). Digital trends 2018: 153 pages of internet, mobile, and social media stats. *TNW*. Retrieved from https://thenextweb.com/contributors/2018/01/30/worlds-internet-users-pass-the-4-billion-mark/.

Kornienko, T., & Potapov, A. (2018). Ispol'zovanie dopolnitel'noi realnosti v shkol'nom petchiatnom izdanii [The Augmented Reality Implementation in the School Print]. *Kazanskiy pedagogicheskiy zhurnal, 1*, 121–125.

Mediapotrebleniye v Rossii – 2018. Vosstanovleniye urovnya loyal'nosti k reklame v Internete [Media Consumption in Russia – 2018. Recovery of loyalty to advertising on the Internet] (2018). *Issledovatel'skiy tsentr kompanii «Deloyt» v SNG*. Moscow. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/ru/Documents/research-center/media-consumption-in-russia-2018-ru.pdf.

Microsoft Hololens: obzor ochkov dopolnitel'noi real'nosti [Microsoft Hololens: Review of Augmented Reality Glasses] (2017, 25 July). *PlanetVRAR*. Retrieved from https://planetvrar.com/obzor-microsoft-hololens/.

O prichinakh otkluchenia analogovogo televidenia v Rossii i mirovom opite perehoda na drudie standarti [About the Reasons for the Shutdown of Analog Television in Russia and the World Experience of Broadcasting other Standards] (n.d.). Retried from www.wifire.ru/blog/analogovoe-televidenie-v-rossii-otklyuchat.

Ochkova, L. (2016, 25 February). 9 spehr primeneniya virtual'noi realnosti: razmeri rinka i perspektivi [9 Spheres of Application of Virtual Reality: Market Size and Prospect]. Retrieved from https://vc.ru/flood/13837-vr-use.

Oskin, A. (2019, 15 February). Parametri rukotvornogo Krizisa Industrii Petchyatnikh SMI Rossii [Parameters of the Man-Made Crisis in the Russian Print Media Industry]. *Journalist*. Retrieved from https://jrnlst.ru/press-crisis.

Petchyatnya poliraphia s ispol'zovaniem dopolnitel'noi real'nosti [Printed Polygraphy Implementing Augmented Reality] (2017, 26 March). *Journal in vr we trust.* Retrieved from https://vr-j.ru/stati-i-obzory/pechatnaya-poligrafiya-s-ispolzovaniem-dopolnennoj-realnosti/.

Richter, A. (2010). Pravovie aspekti perekhoda na tsifrovoe televidenie [Legal Aspects of the Transition to Digital Television]. *Elektronnyy nauchny zhurnal "Mediaskop"*. Retrieved from http://www.mediascope.ru/правовые-аспекты-перехода-на-цифровое-телевидение.

Rospetchat' soobshila o roste tsen na gazetnuyu bumagu bole tchem na 50% [Rospechat reported a rise in newsprint prices by more than 50%] (2019, 10 April). *Vedomosti*. Retrieved from https://www.vedomosti.ru/technology/news/2019/04/10/798803-tseni-na-gazetnuyu-bumagu.

Rossiiskaya perioditcheskaya petchyat'. Sostoyanie, tendentsii I persepktivi razvitia [Russian Periodicals. State, Trends and Development Prospects] (2017, 07 June). *Federal'noye agentstvo po pechati i massovym kommunikatsiyam.* Retrieved from http://www.fapmc.ru/rospechat/activities/reports/2018/pechat1.html.

Rukacheva, D. (2017). Shkol'naya gazeta s tekhnologieii dopolnitel'noi real'nosti [School Newspaper with Augmented Reality Technology]. *SOYUZ: onlayn zhurnal otechestvennoy zhurnalistiki*. Retrieved from http://mag-union.ru/shkolnaya-gazeta-s-texnologiej-dopolnennoj-realnosti/.

Samoletov, S. A., Goreva, V. B., & Ivanov, D. Yu. (2017). Ispol'zovanie sovremennikh tekhnologii v praktike shkol'nogo mediaobrazovania [The use of modern technologies in the practice of school media education]. *Nepreryvnoye obrazovaniye v Sankt-Peterburge, 2*, 48–52.

Shag 9¾, unikal'nii proekt Pushkinskoi stdii zurnalistiki [Step 9¾, a Unique Project of the Pushkin Studio of Journalism] (2016, 21 December). *Tsentr DYUTT i IT*. Retrieved from https://www.youtube.com/watch?v=bu0G-Q36uBM.

Stupin, A. (2012). Dopolnitel'naya real'nost' v obrazovanii: vozmozhnosti i perspektivi [Augmented Reality in Education: Opportunities and Perspectives]. *Distantsionnoye i virtual'noye obucheniye, 7*, 75–84.

Top-6 otrasliei primenenia dopolnitel'noi real'noti [Top-6 Branches of Augmented Reality Implementation] (2019, 11 February). *Vesti. Ekonomika.* Retrieved from https://vestifinance.ru/articles/114548/print.

Varykhanov, S. (2019, 11 April). V Gossdume obsudili problemi petchiatnih SMI [The Problems of Print Media Were Discussed in the State Duma]. Retrieved from https://gipp/news/novosti-otrasli/v-gosdume-obsudili-problemy-pechatnykh-smi.

Vasilkov, A. (2016, 14 April). Pervaya hirurgitcheskaya opertsia v rezhime VR-online [The First Surgical Operation with the VR-Online Mode]. *Computerra*. Retrieved from https://www.computerra.ru/145072/worlds-first-vr-surgery-online/.