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SCIENTIFIC COMMUNICATION IN MEDIATIZED WORLD
THE VISUAL INTERFACES OF SCIENCE AND THEOLOGY

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Abstract

The aim of the article is to answer the following questions: what can digital media that are focused on multiplication of visual content bring into this complexity of comprehension? Can we imagine that Science will be dominated by visual forms? Can an image be implemented into cognition and scientific dispute in this era of its ever-growing dominance? Is an image already a full-fledged interface of science, or are scientists strongly attached to textual interface, to the linearity of an argument contained in the alphabetic characters, forming words, only from time to time enriched by an image - an illustration, a diagram, a graph - where words reach their limits of their effectiveness as information and knowledge carriers? Do the digital media and the opportunities they generate, open scientists to visuality? The qualitative research conducted by the authors shows that scientists see the possibility of effective use of visual forms in scientific publications on the Internet. However, they see visuality as a supplement to the scientific text. They mention the appropriate methodology, the use of the review process and the scientific apparatus as the basic conditions for the scientificity of publications. In the future, presentation of results and arguments based on visualizations will have to exceed the habits that accompany the process of editing printed magazines, established citation standards, bibliographic specifications and – what is extremely important - habits associated with the reception of the 'printed text'. Visibility will have to be present in scientific publications at the stage of preparation, conception and publication, not only as an image, but as an integral part of the publication and the process of its creation.

Keywords: media, studies, visuality, mediatisation theory, visual abstracts

1. Introduction

In Stanisław Lem's story 'How the World Was Saved', published in the volume 'The Cyberiad', the designer Trurl creates a machine that could do

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everything starting with the letter 'n'. When she was asked to do 'nauka' (science), "The machine whined, and in a trice Trurl's front yard was packed with naturalists. They argued, each publishing heavy volumes, which the others tore to pieces; in the distance one could see flaming pyres, on which martyrs to Nature were sizzling; there was thunder, and strange mushroom-shaped columns of smoke rose up; everyone talked at once, no one listened, and there were all sorts of memoranda, appeals, subpoenas and other documents, while off to the side sat a few old men, feverishly scribbling on scraps of paper." [1] Although Klapaucius, the passionate Trurl's opponent, was not satisfied with the result of the machine's work, screaming that 'Nauka (science) is something completely different!', he was not able to present his own idea on how to materialize and visualize this complex concept and - despite everything - it was quite abstract.

For an outside observer, 'nauka' (science) in Lem's story is a kind of chaotic, branched and delaminating activity. It appears as a methodological feud and demonstration of extremely opposite theories. It stands for either intense emotions that are consuming producers and recipients of Science, or withdrawal, alienation, or even religious concentration and devotion to Science. These are emotions that validate the analogies between the influence of Science and religion on human communities and emotions that accompany conflicts between Science and pseudo-sciences. One more factor has recently fallen into this crucible: i.e. internet platforms (Google, Facebook, Twitter, etc.). It is observed that their impact on societies is more massive than the authorities of Science or religion [2, 3], whereas the global and networked distribution of information content is becoming increasingly relevant also for practicing science. However, after all 'Science is totally something else!' What - then?

Jan Woleński draws attention to the complexity of the concept of science, which can be analysed from the epistemological perspective as a way to explore the world, while in terms of Anthropology, as a sphere of culture. According to other criteria, the research on Science can be divided into the Philosophy of Science, the psychology of science and the sociology of science. In the sociological sense, science consists of some complex of people called scientists, scientific institutions and relevant individual or group actions and their results. Lists of scientific disciplines, headings in library catalogues, programs of congresses and scientific conferences, university workers, fields of study, lists of scientific journals and many other things derive from it. The shape and boundaries of this complex are determined by various factors such as history and tradition of scientific research and types of academic education. We can call it science in the sociological and/or institutional sense. This concept of science is defined rather by enumerating elements than specifying a set of features. While the methodological approach to science is shaped by conceptual analysis, the sociological is determined empirically [4].

And what can digital media that are focused on multiplication of visual content bring into this complexity of comprehension? Can we imagine that Science will be dominated by visual forms? Can an image be implemented into cognition and scientific dispute in this era of its ever-growing dominance? Is an image already

a full-fledged interface of Science, or are scientists strongly attached to textual interface, to the linearity of an argument contained in the alphabetic characters, forming words, only from time to time enriched by an image - an illustration, a diagram, a graph - where words reach their limits of their effectiveness as information and knowledge carriers? Do the digital media and the opportunities they generate, open scientists to visuality?

The authors of this article were inspired by these questions when starting an interdisciplinary pilot research conducted among Slovak, Czech and Polish scientists, incidentally participating in events (conferences, publications, colloquia) organized as a part of VEGA projects performed at the Institute of World Literature SAS during recent years. The draft of a hypothesis assumed a potentially great openness of science people to the new technologies and visual interfaces. It was verified during the conducted research in the form of extensive interviews. However, we are aware of the fact that such research may only touch the surface of the problem. Nevertheless, we consider our study as the indication of an interesting and intellectual area of research and development of Science, especially Media Studies and Humanities.

Some opinions obtained during the research were presented in the article published in 'World Literature Studies' [5] in 2017. In this article, we aim to examine the results of our research in retrospect. Next, we want to compare them with a few attempts of departing from a purely textual interface in scientific publications, where (dynamic or static) image plays a merely servile and illustrative function of the text - for the sake of the entire use of visual or audio-visual forms in a scientific discourse.

2. Analysis

According to the authors of the present study, interface is a concept, which appears crucial for understanding the idea of visuality in Science and is mainly associated with information technology. Most dictionary definitions of the word 'interface' have technological and material connotations, which reduce them to a device or software that enables human connection with the machine. However, there are many broadening interpretations of this term - the "interface of culture" [6] is one of them. This term is not limited to technological understanding. In a broader sense, an 'interface' is a place and a manner of contact and interaction [7]. The concept of cultural interfaces is found quite far from the mainstream of our considerations, for example in the theory of literature [8] or Management sciences. At that point it refers to the theory of crossvergence: here culture becomes the meeting point (interface) between various values, influences, ethnic, religious, economic and historical circumstances, etc. (Crossvergence is a state between convergence and divergence. It causes the formation of the so-called hybrid cultures, which at the management level of an organization means the emergence of a new organizational culture that not so much combines the cultures of two different countries but creates a new culture, which often even integrates contradictions between given cultures [9].) It occurs on both, the macro level, i.e. in the

communication between corporations, and the micro level - in relations between individuals [10]. Derrick de Kerckhove presents the understanding of human communication, showing the influence of the alphabet on the functioning of the human brain. Thus, the phonetic alphabet in his approach would be one of the original interfaces (in a broad sense). Kerckhove considers the alphabet as the most important concept that occupies the mind, soul and body of a person in every culture until the invention of electricity. According to him, language, which is an integrated way of information processing, is therefore software that controls the human psyche and affects the way of thinking [11]. He claims that "The alphabet is like a computer program, but more powerful, more precise, more versatile and more comprehensive than any software yet written. A program designed to run the most powerful instrument in existence: the human being. The alphabet found its way in the brain specify the routines that would support the firmware of the literate brain-frame. The alphabet created two complementary revolutions: one in the brain and the other in the world." [11]

On the other hand, this approach implies a close correlation between language and the alphabet with speech and phonetics. However, Linguistics considers the relationship between language and speech as fundamental. Writing is only a system of signs used to record a phonetic expression. Image writing, based on pictograms is regarded as incomplete, as proto-writing, while complete writing is subject to the phonetic rules [12].

However, as it developed, the characteristics of writing underwent some changes. In the 7th century in Western Europe, there appeared space in writing in the form of a blank between words, punctuation, capital letters, colours and notes in a margin. It allowed recognizing words by their shape, i.e. scanning the text with the eyes, without whispering the text silently (which was a common practice before). There appeared also new phenomena such as: alphabetically arranged glossaries, the practice of visual copying of books, illustrations... Therefore, written texts acquired completely different properties than spoken ones. Although in the colloquial meaning written text is identified with linearity and is contrasted to visuality, this is not true. Even in the case of a 'pure' text, devoid of any illustrations, we are still dealing with its spatiality. Linearity is violated by the end of each line, when the eye meets the typographic form of the font and the spatial location of the text on a page [12]. For writers, this is an invitation to create communication situations in which the external form of the text becomes an integral part of the message, which was reflected, among others, in the existence of visual poetry: both in a printed (analogue) and digital form [13]. Visuality of the contemporary poetry corresponds to geometrical or painting abstractions. In turn, it shifts our considerations towards intermediality - understood not so much as media convergence, but as a 'dialogue' between the media, leading to the concepts of intertextuality and intersemioticity. Such understanding of intermediality allows us to include visual poetry, visual music, art of light, intermedial photography, film, video, video clips, television art, computer animation, interactive cinema, net art, holography, theatre, ballet and multimedial performative performances into intermedia [14]. It significantly broadens our understanding of visuality. At present,

however, in the post-digital era, this visuality is often technologically mediated. The images and simulators created by screens and monitors create and impose a dominant model of world participation and giving it informative and entertaining sense and order, which Anglo-Saxon literature defines as visual culture. Images, which are essentially visual simulations, seem to appropriate all other communication codes and formulas. Graphic interfaces of digital media play a significant role here, which puts visuality on a pedestal, making it the dominant feature of the cultural presence of digital media [6].

This observation is quite important, especially because we are highly determined to find the role of visual/image content in today's world. It turns out that the digital iconosphere also - at least since the spread of electronic media - is making significant, noticeable changes in the external world and in our brains. It is believed that there is a noticeable impact of the new media technologies on changing our perception of the world, which is manifested, inter alia, in limitation, perhaps leading soon to the disappearance of tolerance of linearity [15]. The role of individual order is taken over by simultaneity and multiplicity. Text is more and more consumed by 'skimming' the eyes on screens composed of artefact pixels, and thus impermanent assimilation. Therefore, we are witnesses and participants of the transition from narrative language to synesthetic vision; from typical linguistic analysis to audio-visual orality, indeed, some researchers are demanding the perception of smells, tactile sensations [16]. Typical reading (combined mainly with close reading) is gradually expanded, hybridized by active interpretation, a peculiar construction based on continuous navigation through the decentralized text, dispersed in the message, structurally more similar to navigation in hypertext than the perception of a coherent, linear notation of a language expression (such problems were given a lot of attention in the 1990s). Thus, a traditional reading is gradually replaced by an active interpretation, a peculiar construction based on continuous navigation on a decentralized text. It is then dispersed in the message, structurally more similar to hypertext than to traditional, textual, linear notation and repetition? [16]

Nowadays, visual and audio-visual technology is becoming more and more technologically mediated. Therefore, we come to the key question contained in the title of this article: questions about the interfaces of science in the era of ubiquity and the progressive dominance of multimedia, in the era of changing communication methods and habits and communing with information and culture, as well as science; in the era of post-digitalism, understood as such a high level of saturation of human everyday life with media technology that it becomes imperceptible to the mind - we notice it only when we experience discomfort arising from its lack [T. Goodwin, *The three ages of digital*, blog entry 'techcrunch.com', 23.06.2016, https://techcrunch.com/2016/06/23/the-three-ages-of-digital/, accessed on 24.08.2017].

Therefore, we are entering the area of a broadly understood interactivity, which in the era of computer technologies has strongly entered the area of communication, becoming the supreme principle of communication in some areas. This can be easily seen in the area of interactive multimedia art, where the

recipient's involvement and undertaking a communication game by him causes that the recipient begins to be presented in the context of actions that belonged exclusively to the creator of the work (e.g. typing a piece of code in a computer game, limited decision on the direction of reading the literary hypertext, active tracking of the process of creating generative texts through selections...) Multimedia, therefore, distorts traditional communication between the artist and the recipient: in multimedia art an artist instead of a traditional work of art, which is the subject of hermeneutic interpretation and the reason of aesthetic experience, creates a context, and space for interaction [17]. It should be noted, however, that while such process is acceptable in the field of art, it is rather difficult to imagine it in the area of Science, where there is still a very strong attachment to logic of reasoning, theory, paradigms, definitions, syllogisms, etc. In the approach described above, we would be dealing with post-science or even pseudoscience.

We are also convinced that while such experiments could be allowed in some areas of the Humanities, related to art, in the case of biological, chemical, medical, engineering and technical sciences such an approach would not be justified and the freedom to manipulate facts and their interpretation could even lead to tragedy.

But also here arises a question whether or not practicing science involves something analogous to the processes described in art and language communication? Maybe in this respect 'science is something different!' than what we are used to in the culture of speech and press? It turns out that digital tools penetrating into the research field of these hard disciplines and their technical variants not only introduce a specific kind of interactive computer-mediated communication, but also cause the emerging of new digital versions of disciplines (digital biology, digital architecture a pod.) or sub-disciplines (Internet Law, Internet marketing, etc.). One of the manifestations of this phenomenon is the growing importance of the participation of software tools and simulations in research processes of scientific disciplines (and especially in the process of searching for empirical solutions). The process of producing subsequent simulations - that is, HCI (Human – computer interaction) - is accompanied by software-generated visualizations - we can call them cognition interfaces. As it turns out, the image material, which is an integral sum of research, has interested new media researchers and those researchers who are trying to determine how new media theories affect designing of knowledge. The phrase 'knowledge design', which indicates computing the entanglement of contemporary Humanities, appears in place of the general concept of science [18]. According to J. Schnapp, Science must face new challenges today: "how to construct arguments that zoom back and forth between the micro, the meso, and the macro, perhaps even overleaping those middle layers of analysis and narrative that once constituted the home turf of the arts and humanities disciplines? How to weave together forms of visual and verbal (and - why not? - acoustical, tactile, and olfactory) evidence? How to chunk information in a world that demands short as well as long forms, and where iterative and multichannel publishing is increasingly the norm?" [18, p. 5-6]

3. Research and discussion

When it comes to visuality in scientific disciplines, it is worth asking the question what opens scientific disciplines to visuality. L. Manovich asks: "Can we differentiate information visualization from information design?" and he gives an affirmative answer. It seems that 'visuality' is to be understood not only as an image examined from the perspective of aesthetics, image anthropology, etc., but mainly as a specific, since digitally created, visual information (this is not the same as visualization of information - infovis). It is about semiotic mediation, i.e. presenting large sets of visual information through a machine image. He defines information visualization as a 'mapping between discrete data and a visual representation', although he claims: "My definition does not cover all aspects of information visualization – such as the distinctions between static, dynamic (i.e. animated) and interactive visualization – the latter, of course, being most important today" [L. Manovich, *What is Visualization?*, 2010, http://manovich.net/index.php/projects/what-is-visualization, accessed on 24.08.2019].

In our study, we asked respondents the following questions:

1. Do you imagine your discipline of science in the visual form?
2. Do you think that in your field it will be possible for a multimedia journal to exist? Could the scientific publications in your field have other multimedia/visual form? What criteria should such publication meet to be treated as scientific (review, annotations, what else?)
3. Could the visual form of scientific publication exist independently or only as a complementation, component or comment? What other function may it have (i.e. clarification, facilitation of the understanding)?

As for the first question, the answers were divided and varied: from categorical denials, through conditional and open to such possibility, to very open to such eventuality.

Sceptics emphasized that the humanities are based on a linear text; that visualization would cause cutting off from the scientific achievements that appeared in the text form.

On the other side, we noted enthusiastic statements, pointing to the increasingly common visual presentation of research results (including visual abstracts in magazines). There were also given the examples of scientific comics, films containing lectures and presentations. The majority of statements indicating both profits and difficulties in practicing science in a visual form was found somewhere between scepticism and enthusiasm. They can be reduced to a simple statement: 'Yes, but...', with 'but' usually pointing to the subsidiarity of the image to the text in the scientific argument or other possible difficulties. The second question also showed several hesitations and reservations. Most people do not know these type of writings, although at the same time they expressed the desire to know them if they do exist or will appear. One of the most representative answers was the opinion of a Polish scientist dealing with literary studies: "I understand the concept of multimedia differently, and visuality differently, hence yes - for a multimedia publication, and no – for only visual one. The publication

must meet scientific criteria, no matter if it is to have a traditional or multimedia form. If we consider that a review is a condition of being scientific, then multimedia scientific publications must also be subject to review, information about it should be part of such publication." (Individual In-Depth Interview 7_W_PL conducted 17.06.2017, Woman, Poland, Humanities) The topic of scientific publication is also examined by a Slovak researcher dealing with marketing: "I think the criteria should not differ from the usual criteria and requirements for scientific publications (double blind review, scientific structure of the paper - abstract, keywords, introduction with theoretical analysis of the topic, methodology, discussion, limits, conclusions; etc.)" (Individual In-Depth Interview 14_M_SK conducted 11.06.2017, Man, Slovakia, Management). A beginning sociology researcher from Slovakia, a doctoral student, spoke in a similar vein: "I think it would have to meet exactly the same criteria that 'classic', printed publications must meet. In addition to professionalism and academic ethics (correct citation, bibliographic standard), they should certainly undergo linguistic editing and have an editor. They must be quotable, i.e. they should meet all formal requirements of periodicals (publisher, periodicity, stable link, eventually ISSN)." (Individual In-Depth Interview 2_M_SK conducted 10.06.2017, Man, Slovakia, Sociology) At the same time, there was a concern that such publication could be distrustedly accepted by a conservative scientific community, attached to the text, and as a result it could fail.

Even more reservations appear in the third question. Respondents are almost unanimous: any visual or multimedia forms of scientific publications are unlikely to exist - however, they can play a complementary role. It is positive if they bring some added value. Nevertheless, they spoke with great kindness about visual abstracts: such as a graphic or video, although at the same time they raised reservations that one of the main difficulties in producing scientific content in graphic or multimedia form could be the inability to use software in processing graphics and video. It is surprising that our interlocutors could not imagine a change in thinking about a scientific publication and they even imposed some habits acquired when using printed publications on some imaginary visual format. They showed no interest in an active participation in the process of finding the format for this type of publication. Besides, they did not realize the difficulties related to the development and creation of a suitably adapted solution for the interface. The description of experimenting in the field of scientific communication initiated by 'The American Historical Review' illustrates how difficult, complicated and demanding of media competence and practical skills this task would be [W.G. Thomas, *Writing A Digital History Journal Article from Scratch: An Account*, http://digitalhistory.unl.edu/essays/thomasessay.php]. The editors of this magazine convinced several researchers to prepare a series of peer-reviewed scientific publications that are totally 'born digital'. As a result of this initiative, several projects were implemented: Robert Darnton (2000): 'An Early Information Society: News and the Media in Eighteenth-Century Paris' [19], Philip J. Ethington produced a sophisticated hypertextual work in 2001 on 'Los Angeles and the Problem of Urban Historical Knowledge' [20], William G.

Thomas: 'The Differences Slavery Made: A Close Analysis of Two American Communities' published in 2003 in the American Historical Review [21]. The basic dilemmas that the aforementioned authors solved were also touched upon by our respondents in relation to the 'imaginary' visual publication.

- At the stage of the editorial process - to what type of classifications deciding about release to print they belong - to the category of submitted, reviewed articles, or so-called ordered articles?
- At the citation stage - there emerged ambiguities in the formal categorization of projects placed on the website - are they electronic sources or articles in a scientific journal? There appeared also some specific problems, which, due to the lack of empirical evidence, were not explicitly addressed and emphasized in the interviews.
- In the process of designing projects, it turned out that the consistent use of available digital formats cannot be combined with the structure of printed articles. Is it worth considering, however, how an article in the digital environment should refer to printed forms and structures? Because actually it was about 'something completely different': how can a digital form of presentation be used to support the planned concept of argumentation. (We wanted to explore how we might integrate the digital form of presentation with the argument we hoped to make.) Because it was about using the hypertext structure in argumentation, it was necessary to break up the linear narrative and use hyperlinks. The use of hypertext mechanics placed high demands for content reception on the reader, because reading the links of cybertext might be tedious and sometimes time consuming.
- The peer-review process of articles was carried out on the website. Therefore, it turned out that the review of the digital form should take place at both levels: the assessment of arguments and the suitable method of using the medium (digital techné).

Therefore, we should not be surprised by the dominance of the text in scientific journals, regardless of whether they are published in paper or electronic publications. Many magazines, although referring to images and visuality in their titles, remain faithful to the textual form (e.g. 'Images. The International Journal of European Film, Performing Arts and Audiovisual Communication', published by the Adam Mickiewicz University in Poznań, https://pressto.amu.edu.pl/index.php/i/index). Paradoxically, it is much easier to adopt visual form of scientific publication in sciences such as Mathematics, Medicine, Chemistry and Physics than in Humanities. There are a few multimedia humanistic and theological journals. Below are the examples that we were able to find. One of the first multimedia scientific journals was probably 'Audiovisual Thinking. Journal of Academic Videos', published on the Internet in 2010-2014 [https://www.audiovisualthinking.org]. Publishers in their manifesto encouraged to present the results of their research in a multimedia form, with the following requirements: "Submissions should: be (audio)visual; disseminate new observations, knowledge, insights or theories, thereby adding to the existing body of knowledge; acknowledge previous knowledge, insights or theories, and build upon this

existing body of knowledge; credit all sources and references, be they visual, written or oral; be self-critical and self-reflective; form a coherent piece of media, that is possible to store as one computer file which can be easily shared" [*The Academic Video Manifesto*, https://www.audiovisualthinking.org/about/manifesto/, 05.09.2019].

The magazine's website also points to a number of technical tools that could be useful in creating scientific multimedia content. However, the magazine stopped publishing in 2014. 'JoVE' [https://www.jove.com/journal] - a biological, chemical and medical sciences journal, coped much better with a challenge of multimedia. It has currently published almost 11,000 scientific articles in video form. Impact Factor was 1,108 for 2018. Articles are published in the form of video films lasting several minutes and recorded by the authors and at the same time, the article also has a text form available on the website. Each article is assigned a DOI number and the editors give clear guidelines on how to cite texts. The combined form of publication (text + video) is offered by the 'VIEW Journal of European Television History and Culture'. As the publisher writes, "In offering a unique technical infrastructure for a multi-media presentation of critical reflections on European television, the journal aims at stimulating new narrative forms of online storytelling, making use of the rich digitized audio-visual collections of television archives around Europe". However, according to the publisher, visual elements are not aimed to be just an addition to the text: "All articles in the journal must make use of audio-visual sources that will have to be embedded in the narrative: not as 'illustrations' of an historical or theoretical argumentation, but as problematized evidence of a research question" [https://viewjournal.eu/about/].

It is definitely easier to find scientific journals that use a visual or multimedia form for displaying labelled quantitative data [22] or editing abstracts (interestingly, a strong support for this form of presenting research results came from the medical community in science). It is an increasingly common form of synthetic presentation among the authors and editors of scientific journals of the most important content of the article, especially in the social media. As a research conducted by A.M. Ibrahim et al. showed, attaching visual abstracts to information about articles on Twitter increased interest in them (manifested by clicking a link) by 2.7 times. There has also been a significant increase in other interactions: re-tweets and likes [23]. A.M. Ibrahim is also the author of a comprehensive guide on creating visual abstracts [24] and introduces them in his magazines, finding an increasing number of followers. So how can a visual abstract be defined and what are its main functions and goals? Peter Gloviczki and Peter F. Lawrence agree that "a visual abstract creates an easily understood infographic of the key findings of a study" [25]. In turn, Vahagn C. Nikolian and Andrew M. Ibrahim consider a visual abstract as "a visual representation of the key research findings of an article typically found in the abstract" [26]. Elsevier's guidelines for creating such abstracts define them as "a single, concise, pictorial and visual summary of the main findings of the article" (it is worth adding that Elsevier uses the term "a graphical abstracts" [https://www.elsevier.com/authors/

journal-authors/graphical-abstract, 09.10.2019]. Therefore, one can be tempted to create an exhaustive definition of a visual abstract. According to the authors of this article, a visual (graphic) abstract is a single infographic, which in a maximally simplified form, while minimizing the role of text for the sake of an image, transmits key information about the scientific article, its subject and key findings, replacing (or supplementing) the abstract in a purely textual form. However, contrary to expectations, creating a good visual abstract is not easy. The main problem is the need to condense maximum information in a fairly small space, while maintaining clarity and transparency. Nikolian and Ibrahim mention the following as necessary elements of visual abstract:

- summary of key question being addressed;
- summary of outcomes;
- identification of author, citation;
- states outcomes comparison;
- visual display of outcome;
- data of outcome [26].

Undoubtedly, the use of visual abstracts facilitates the synthetic and quick transmission of information on the content of an article, which can encourage potential readers to read its full version. For scientists, this is not insignificant, because in the era of a rapidly growing number of scientific publications, it is more and more difficult to break through to the public and their scientific community with the results of their research. Therefore, the increase in visibility, increase in the number of citations, and thus - building by scientists their position as experts is at stake. Therefore, it seems that visual abstracts, despite numerous difficulties in their creation, will permanently prevail in the world of scientific publications. (For example, time consumption, the necessity to use graphic programs, a problem with copyrights to graphics or illustrations, or with obtaining free clipart, a problem with spatial and visual composition as well as readability, and others.) In the case of online magazines, it seems a matter of time for the abstracts to emerge in the form of a 'multimedia story', i.e. "some combination of text, still photographs, video clips, audio, graphics and interactivity presented on a Web site in a nonlinear format in which the information in each medium is complementary, not redundant" [J. Stevens, *Tutorial: Multimedia Storytelling: learn the secrets from experts*, https://multimedia.journalism.berkeley.edu/tutorials/starttofinish/, 09.10.2019]. This form of abstract should not be confused with the so-called video abstracts, which often boil down to the author's reading of a text abstract and must be treated as an oral form of text abstracts [https://onlinelibrary.wiley.com/page/journal/14678535/homepage/bjet_video_abstracts.htm#, 09.10.2019].

And what does the visuality of theology look like against this background? At first glance, it could seem that visuality has such long traditions in this field of science (e.g. the Bible Pauperum or icon theology) that it is something obvious. However, this is not so. The term 'visual theology' often appears even in book titles [27-29], but often focuses on Theology contained in works of art [30]. Or perhaps - as W. Kawecki prefers - one should rather "analyse the art of the image

as a space and the subject of theological studies" [31]. To what extent, however, can this be analysed apart from words? Theology that is attached to logical arguments, discourses and references to the Bible, can have a serious problem with that. The image here will still be either an illustration for the text or a starting point for reflection expressed in words ... Or maybe the picture should be a theology and catechesis in itself without words, through contemplation, through the experience of beauty? Finally, as Paul Evdokimov notes, „There is an amazing resemblance between aesthetic and religious experience: standing before the material object at the centre of the experience, l'objet d'art, both types of experience assume an attitude of contemplation, even prayer and supplication" [32]. Frequently, religious and mystical experience go beyond the possibilities of language and words. Words are not enough to capture ultimate truths, a picture can express much more. Therefore, should we not explore nonverbal language in theology, i.e. artistic expression in various forms, so that the Gospel, its learning and preaching - in worship, catechesis and theological study - exceeds the limits of language, intellect, religion and sociology, especially where the word becomes difficult to understand [31]. The aforementioned theology of icons or the Bible Pauperum can be a reference point here. At the same time, it should be given its due justice - the idea of the 'Bible Pauperum' was often reduced to illustrations and pictures accompanying a 'serious' text, or treated as a message for 'the little', i.e. illiterate persons. Meanwhile, the Bible Pauperum, due to its rather complicated and thought-out structure of word-picture correlation, was rather a kind of compendium of theology for the contemporary intellectual elite. It made it easier for preachers and teachers to more effectively proclaim the truths of faith to the poor [33]. However, one cannot get away from words in Theology. Despite their imperfections, they are our most precise communication tool. Images are interpreted, but subjectivity cannot be avoided in image interpretation; moreover, internal quasi-mystical experiences without words are generally not transferable. If we try to talk about them, the message is imperfect, mutilated and incomplete. Words cannot express certain experiences ... but words are the only tool that can communicate these experiences in a way that will be understood not only by the experiencing subject [34]. On the other hand – "operating the words of high quality advisably and nobly we rise worth of our heart, beauty and power of thought" [35]. Only words are finally able to tear the frame of subjective experience ...Thus, we finally come to the conclusion that the word and the image are doomed to coexist, to complement each other - also in scientific and theological discourse.

4. Conclusions

The qualitative research conducted by the authors shows that scientists see the possibility of effective use of visual forms in scientific publications on the Internet. However, they see visuality as a supplement to the scientific text. They mention the appropriate methodology, the use of the review process and the scientific apparatus as the basic conditions for the scientificity of publications.

They gladly accept the possibility of e.g. scientific publication in the form of a film with the simultaneous use of a text stream (subtitles) - as an argument, but also as a form of publishing footnotes, links and comments to the text. The interviewees agreed that the text is an integral part of the publication; it was rather difficult for them to imagine only the visual form of such publications, without any reference to the text. As one of the forms of scientific publications was also indicated a situation in which an online publication brings an added value to the paper version. In this case, the paper version could contain the text itself, while the Internet edition could be additionally enriched by charts, films, photographs, additional presentations and materials presented in a visual form. Only one interlocutor showed the awareness regarding the existence of the so-called visual abstracts - as you can see, however, they are popular among medical or chemical sciences, not necessarily in the Humanities and Social sciences, which may sound surprising. The representatives of these fields of knowledge show great attachment to the text. Meanwhile, the development of visual abstracts is a fact - in the era of struggle for the attention of a potential reader, they seem to be a very good tool to promote the results of their research.

In the future, presentation of results and arguments based on visualizations will have to exceed the habits that accompany the process of editing printed magazines, established citation standards, bibliographic specifications and - what is extremely important - habits associated with the reception of the 'printed text'. The experience with the reception of cybertext is no longer enough. It seems that 360 degrees cameras, technologies securing the production of objects in VR space, visualizations of scientific information may be useful for the use of visualization in scientific communication. It seems that the 'visual publication' using digital tools will have to be subject to almost identical criticism, which is expected in relation to Digital Humanities projects (strategy, project infrastructure, possibility of reuse must be assessed). Visibility will have to be present in scientific publications at the stage of preparation, conception and publication, not only as an image, but as an integral part of the publication Visualization is also a challenge for the theological sciences, which should consider and rediscover the possibility of practicing Theology with images, beyond words - or between them. Perhaps a good start would be the introduction of these visual abstracts in theological magazines that could help spread the knowledge of God in social media, while contributing to the growth of religious knowledge and awareness on the Internet.

For theologians themselves, the need to include their theses in a visual form could be a helpful exercise for shaping theological imagination and cognition, which is performed without words - and in case of theological sciences is possible and sometimes even desirable. However, expressing the inexpressible cannot do without words - so the word and the image are doomed to coexist.

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