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## Algorithms of the Web

The tendency referred to as the interfacing of media, that is the creation of an interactive bond between humans and techniques of conveying various messages, may begin the discussion of the algorithmization of internet space<sup>1</sup>. Radio or television on demand, podcasts and Internet television are ways of transmitting audio-visual content, which is shaped by users through their choices. Applications and programs suggest the content that we may find interesting, worth watching or listening, to according to our previous decisions. The predictions of the Australian journalist and prophet-philosopher David Tow are thus coming true; Jacek Dąbala quotes them in his book, in the chapter devoted to axiology and prospects of the media. One of them concerns the automation of information and entertainment distribution, which will absorb the recipient at times adjusted to the rhythm of his work and rest<sup>2</sup>. Such phenomena were only supposed to appear starting from 2030. Judging from the functionality of e.g. Google Now, the personal assistant which is available on mobile operating systems, it seems that the future has arrived far sooner than anticipated. This idea is reinforced by another example, which shows that the present has overtaken D. Tow's forecasts by at least a dozen years. He predicted that after 2040, unwanted advertisement and persuasion will belong to the past – they will be channelled on demand in special profiles, and media will use artificial intelligence and programs to deliver desired content to recipients based on their individualised features<sup>3</sup>. The inbox service already tracks user's activity in order to decide which e-mails are to be flagged as more important, when to inform about postponed notifications and automatically organize messages, recognizing which concern business trips, shopping, finances or offers. The examples analyzed in this article will show that the media have already been using artificial intelligence for a few years.

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<sup>1</sup> See more on the subject of interfacing in: J. Dąbala, „Media i dziennikarstwo. Aksjologia – warsztat – tożsamość”, Universitas, Cracow 2014.

<sup>2</sup> See: *ibid.*, p. 37.

<sup>3</sup> These and other visions of internet space's future see: D. Tow, “Future Web”, [www.f2050.blogspot.com](http://www.f2050.blogspot.com) [access: 27.03.2015].

The dynamic processes of supporting our actions by artificial intelligence make it difficult to even explicate the risks. Putting too much faith in technological development may result in the defeat of basic humanistic values<sup>4</sup>. The compilation of human and cybernetic knowledge often makes it impossible to determine if the decisions we make are independent or dictated by artificial intelligence.

There is no doubt that, because of computerized semantic analyses, the user of the Internet is surrounded (not only in the sense of media) by artificial intelligence, which is possible only by means of full surveillance (anonymity on the Internet has been illusory for a long time). Recipients who use the Internet, particular search engines and tools of communication receive content and services adjusted to their profile, preferences, interests or previously made choices. All that information is available to algorithms, which are integrated with portals and websites.

The algorithms which track tastes, preferences and user's choices make it possible to "personalize the offer, adjusting it to the information collected about the needs and interests of the user, who can influence the content he/she receives with options provided by the software"<sup>5</sup>. The mechanisms of textual recommendation, geolocation mutations (adjusting the information to the user's location), aggregated filtering or recommendations resulting from the user's profile, are all used to that end<sup>6</sup>.

Present-day websites and web portals have become increasingly humanoid, automating many processes and limiting the real user's interference in decision making. This not only applies to the way in which the recipient uses the Web, but also to the sender's creative process. Lev Manovich claimed that "numerical coding of media and the modular structure of a media object allow the automation of many operations involved in media creation, manipulation and access"<sup>7</sup>; he also distinguished two types of automation of media creation: "low-level" and "high-level". The first process concerns the modification or creation of media objects with simple algorithms or templates which are used in image editing software, word processors, multimedia presentation creators or websites<sup>8</sup>. "High-level" automation, by contrast, requires: "a computer to understand, to a certain degree, the meanings embedded in the objects being generated, i.e. their semantics"<sup>9</sup>; chat room "bots" were the first widely known example of this.

The automation of operations performed by the recipient and of the way in which he/she uses the Internet media results directly from the process of per-

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<sup>4</sup> J. Dąbala, op. cit., p. 41.

<sup>5</sup> K. Jakubowicz, „Nowa ekologia mediów. Konwergencja a metamorfoza”, Wydawnictwo Poltext, Warsaw 2011, p. 90.

<sup>6</sup> See: *ibid.*, pp. 90–91.

<sup>7</sup> L. Manovich, „Język nowych mediów”, transl. P. Cypryański, Oficyna Wydawnicza Łośgraf, Warsaw 2011, p. 97.

<sup>8</sup> See: *ibid.*, pp. 97–98.

<sup>9</sup> *Ibid.*, p. 98.

sonalization, which consists in the fact that the mass media adjust themselves to the needs of individual people. “The principle of personalization governs both Niagaro.pl and the Internet radio station Last.fm, wherein [...] the profile of the station is shaped not by the broadcaster but by the listener”<sup>10</sup>.

This article demonstrates the mechanisms of the most popular web portals and social networking websites, proving that futuristic visions of media development presented a few years ago are already becoming real – according to the division introduced by L. Manovich – both on the low level and the high level. The issues of media personalization and individualization of the message and – more extensively – recommendation mechanisms will also be discussed.

### **The false whisper marketing, recommendation systems and price comparison websites as shopping assistants**

Online shopping is considered to be less time consuming and, above all, more accurate. The user has access to hundreds of products within a given category in one place and can freely compare them, both in terms of their parameters and other users’ reviews. As well as the scoring system, opinions gathered on special websites called “price comparison websites” play a major role. Our choice of a vacuum cleaner or a TV often depends on opinions of other users. “Social shopping websites let us share the knowledge of travel agencies’ offers, shops, services and products. As recently as two years ago, this field was dominated by discussion forums, wikis and blogs”<sup>11</sup>. With time, the situation began to change in favour of price comparison websites. The convenience of being able to exchange opinions on different products with other users is simultaneously very dangerous. Different studies indicate that as many as 80% of people who shop online also read the reviews posted by other users. It is said that even half of these recommendations may be fake<sup>12</sup>. The rate of people who actually trust this information is equally high. 72% of Polish users declare that they trust the contents available on the Internet, which is much more than the European average of 49%<sup>13</sup>. In 2012, Nielsen prepared a report on the basis of a survey conducted online, which tested 28,000 people from 56 countries. Its results show that we

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<sup>10</sup> K. Jakubowicz, op. cit., p. 19.

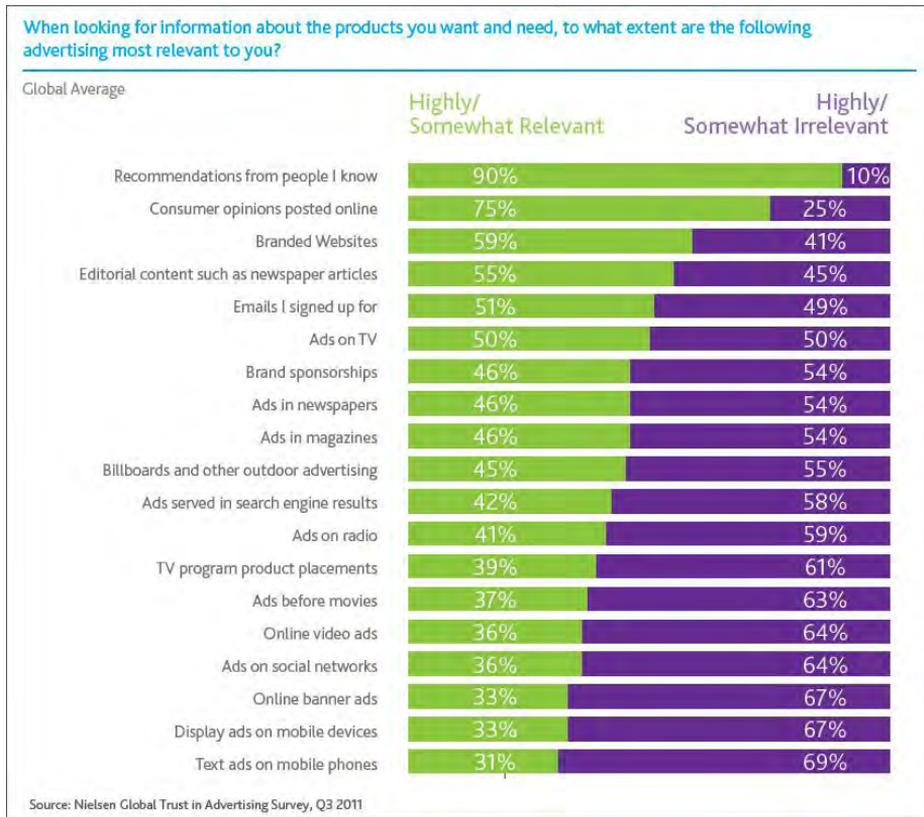
<sup>11</sup> M. Janiszewska, „Nadchodzi era prosumenta”, *Pro-test* 2008, No. 5, [http://www.pro-test.pl/article\\_article/7170,0/Trendy+konsumenckie\\_Nadchodzi+era+prosumenta.html](http://www.pro-test.pl/article_article/7170,0/Trendy+konsumenckie_Nadchodzi+era+prosumenta.html) [access: 6.12.2014].

<sup>12</sup> See: B. Rak, „Social media lekiem na internetowe rekomendacje?”, *Socjomania* 2010, <http://socjomania.pl/social-media-lekiem-na-internetowe-rekomendacje/> [access: 27.03.2015].

<sup>13</sup> See: “Badanie European Trusted Brands, prowadzone przez Reader’s Digest”, after: „Raport Marketing Szeptany”, prepared by „Interaktywne.com”, <http://interaktywne.com/biznes/artykuly/epr/szeptanie-jest-w-cenie-raport-interaktywne-com-16973> [access: 27.03.2015].

put the most trust in opinions of the people we know, then in opinions of other users. 36% of respondents trust the advertisements on social networking websites and 50% believe e-mails they subscribed to (Tab. 1). Over the last three years, the level of trust in press and television advertisement has fallen by 14%, in radio advertisement by 13% and trust in opinions expressed on-line has remained unchanged (70%), while the trust in personal recommendations increased slightly (by 2%).

Table 1. The source of information about products and opinions we consider important



Source: Nielsen Global Trust, nielsen.com.

While direct advertisements in social channels are not very effective, the information that our friends “like” a product or gave it a positive review appears to be more important (more on that in the latter part of the article).

The fall of trust in traditional advertisements and its simultaneous increase with reference to opinions and recommendations is used by marketers, often in a dishonest way. As a result of the growing popularity of so-called whisper marketing, many companies have abused it as an additional source of income:

The deal is simple– we hire a person (mainly students) to talk about a given product on the Internet [...] The people who decide on buying such a service (often for a few thousand zlotys) do not really know what they are paying for – the whisper marketing and popular spamming are separated by a very fine line<sup>14</sup>.

The users who look for information concerning particular products very often come across blogs, which are considered to be among the most independent Internet media.

Blogs quickly became a platform for sharing one's own knowledge and observations on different subjects with other Internet users [...]; they enable a two-way communication, instantaneous feedback, shorten the distance between the sender and the recipient, who is under the impression of being closer to information, which seems more reliable than that presented in traditional media<sup>15</sup>.

Blogs must also be treated cautiously, because of phenomena such as “flogs”, i.e. fake blogs created by manufacturers or advertising agencies, in which the author is invented, and the contents falsely praise given products or services.

### **Filmweb, Netflix i BookMatch**

In 2010, the biggest Polish film website Filmweb.pl thoroughly changed its appearance, but also functionality – interactivity, personalization and interaction between users was emphasized. A service called “Gustomierz” (eng. taste-o-meter) was introduced and updated two years later. It is an original “engine” of the portal, which allows for a precise calculation of probability that a given film suits a user's taste. This unique algorithm, which takes 130 million votes into account, generates over 11 billion personalized recommendations for Filmweb users. Thanks to this function, the portal suggests films that the user may find interesting, gives hints as to what to watch at the cinema, and what may be worth watching on TV. There are many users who claim that the algorithm's suggestions are often wrong. It is difficult to resist the impression that it narrows cognitive horizons and confines the user to a limited range of genres, themes or directors and actors. The algorithm predominantly suggests films which bear the closest resemblance to those the user gave the best score. The same goes for people working in the film industry – if

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<sup>14</sup> B. Rak, *Social media*, op. cit.

<sup>15</sup> P. Szews, „Mikroblog – odmiana blogu czy oddzielny gatunek?”, *Acta Universitatis Lodzian-sis. Folia Litteraria Polonica* 2013, No. 2: „Dziennikarstwo”, pp. 272–273.

given actors, directors or screenwriters were marked as “favourite”, then the website will most likely recommend the productions in which they participated. The chance that the user will be presented with a genre alternative to his favourite yet equally valuable in cognitive and artistic terms, which features less popular actors, is very slim. The risk of receiving suggestions representing only one film genre or productions of low quality but starring a chosen group of actors is very high, on the other hand.

This tool may also be easily used to advertise new cinema, DVD or BluRay releases in a disguised way by means of presenting them to the user as “recommended for him/her” or “in his/her taste”. The statement of the tool’s creators is very telling:

Since Gustomierz™ has access to the richest film database and 130 million votes, it knows your taste in films best. Consequently, it makes it possible to create rankings (for example of the most awaited or the best scored films). It also allows to create full film maps with variables such as your age, favourite film genres etc.<sup>16</sup>

The algorithms which recommend the contents and products not only analyse the user’s behaviour, but also try to find his Internet sibling, that is a person with the same tastes and behaviours. It finds correlations and stores the user’s history, which makes its predictions so accurate. This is not a futurist’s dream, all of this already works<sup>17</sup>.

Recommendation “engines”, such as “Gustomierz”, have been present on websites and in applications for a long time. Once our favourite series ends, the website Tract.tv, similarly to Netflix, immediately finds other suggestions that will arouse our interest. Music streaming applications also include advanced recommendation systems based on songs, albums and performers we listen to using our computer or mobile device. This kind of solution has also been introduced to YouTube, where after every video we watched similar ones are displayed in the menu next to the player. The home page is personalized on the basis of the activity within the website – “recommended”, “recommended videos for you”, “recommended channel for you”, “non-stop playlists based on a song or artist”<sup>18</sup>.

As in the case of film websites with in-built recommendation algorithms, the users of music or music and video services (e.g. YouTube) also unwittingly limit their cognitive horizons and assume a passive or scarcely critical attitude towards the lack of an alternative to what is suggested. Although navigating the services is obviously still not automated, the user is progressively weaned from

<sup>16</sup> <http://www.filmweb.pl/news/Ruszy%C5%82+Gustomierz+2.0-76603> [access: 27.03.2015].

<sup>17</sup> P. Grabiec, „Zastanawiasz się, co nowego przeczytać? Zapytaj bibliotekarza. Uzbrojonego w algorytmy”, <http://www.spidersweb.pl/2014/11/bibliotekarz-uzbrojony-w-algorytmy.html> [access: 27.03.2015].

<sup>18</sup> See: YouTube.com

such a manner of using the website or application and grows accustomed to the simplified reality, flattened by the image of the world which is adjusted to their point of view<sup>19</sup>.

There are alternatives to algorithmic recommendation systems on the Internet as well. One such example is the BookMatch service, developed by Brooklyn Public Library<sup>20</sup>:

The user can comfortably ask BookMatch for a free recommendation of a book from a professional librarian without moving from the chair. It is enough to fill in a short form and a list of five books which should interest the user will be sent by e-mail<sup>21</sup>.

It is not as fast as automatic recommendations, but there is a human being on both sides, which gives the service a personal character, and every message is personalized and signed by the librarian who helped. However, BookMatch recommendations are also an outcome of the combination of human knowledge and the work of algorithms. Many librarians use computer systems which let them find the most relevant results. A library employee partially relies on the choices made by computers, yet the final decision belongs to him – which information to send and which proposals are good or bad.

### Google Now and Inbox

The giants of the Internet world gather a lot of information about us. They profile us, research our tastes and interests. Not out of the goodness of their hearts, obviously. There is big money in it. Stepping into the big data area and analysing users' behaviour, one may not only make the online service better, but also offer something very valuable to advertisers. Luckily, the analysis of that data often creates an added value for the user<sup>22</sup>.

The development of mobile technology and the availability of Internet on smartphones has caused an increase in the number of applications which are supposed to make their users' lives easier. They assist with home budget, car fuel management, shopping, inform about police patrols, detours, collisions and speed

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<sup>19</sup> See more on changes in present-day media in the interview with Jerzy Baczyński, the editor-in-chief of „Polityka” weekly — <http://kulturaliberalna.pl/2012/08/28/koniec-mediow-masowego-r-azenia-z-erzym-baczynskim-rozmawiaja-ewa-serzysko-i-lukasz-pawlowski/> [access: 26.03.2015].

<sup>20</sup> <http://www.bklynlibrary.org/bookmatch> [access: 27.03.2015].

<sup>21</sup> P. Grabiec, „Zastanawiasz się”, op. cit.

<sup>22</sup> Ibid.

cameras. Mobile operating systems include even more useful tools, which are simply supposed to make everyday life easier. Let us choose Google Now as an example, the assistant which according to the developer will inform the users about what interests them before they even think about that: “Instead of talking to the phone to get information, the information will be provided before we ask for it”<sup>23</sup>. Until now, mobile phones featured so-called voice assistants<sup>24</sup> – the user would give a voice command, which was realized in the browser or phone’s functions (e.g. searching for key words). The current solution is even more complex and its

uniqueness consists in the fact that when we start the day, we already get the information about the weather and traffic or potential detours on our route to work. When we are in the city during the day, we get information about the timetable of the bus stop we are near or about recommended restaurants around<sup>25</sup>.

This situation is nothing more than utilizing the information gathered by the device during its use. As an example, the service is integrated with the calendar or e-mail, which is based on correspondence conducted via Gmail, so the application will remind us about a meeting someone mentioned in a message.

Electronic mail is still among the most popular forms of communication on the Internet; it is used by organizations, universities and companies, being the easiest way of sharing files and communicating on the Web. The recently introduced application Inbox by Gmail, presented as “the inbox that works for you”<sup>26</sup>, urges to take a new look at this type of service. This intelligent inbox automatically categorizes messages according to subject, content, user’s activity in services, shopping, travels and others. It is possible to reserve a table in a restaurant we have visited recently, automatically trace the delivery of products we ordered online or display a route to a hotel where we booked a room, directly from the inbox level. The application also enables the user to add reminders depending on the context of received messages: “For instance – we set a reminder that we have to call the tax office. Inbox will provide the telephone number and inform us about the opening hours of the office”<sup>27</sup>. In the case of Inbox, the management of the mail is entrusted to Google’s algorithms, which help to organize the correspondence. This shortens the time it takes the user to interact with the inbox<sup>28</sup>.

<sup>23</sup> J. Rybczyński, „Google Now podoba mi się bardziej od Siri, o ile faktycznie będzie działać jak obiecują”, <http://antyweb.pl/google-now-podoba-mi-sie-bardziej-od-siri-o-ile-faktycznie-bedzie-dzialac-jak-trzeba/> [access: 6.12.2014].

<sup>24</sup> Apple’s “Siri”, Samsung’s “SVoice” and LG’s. “QuickVoice”.

<sup>25</sup> J. Rybczyński, op. cit.

<sup>26</sup> <http://www.google.com/inbox/>.

<sup>27</sup> <http://www.appki.com.pl/aplikacje/inbox-by-gmail/#> [access: 26.03.2015].

<sup>28</sup> See: P. Grabiec, „Google Inbox czy Gmail – co wybrać?”, *PC World*, <http://www.pcworld.pl/artykuly/399862/Google.Inbox.czy.Gmail.co.wybrac.html> [access: 6.12.2014].

The time required for an interaction between the user and the inbox is shortened by the automation of some operations, which is only possible when the algorithms read into” the contents of our messages and take particular actions – this means that for this solution to work correctly, the entire correspondence of the reader must be transparent and viewable. It must be remembered that Google’s popular service Gmail also analyses the incoming messages, which is confirmed by the information in the settings: “Gmail analyses your new incoming messages to predict what’s important, considering things like how you’ve treated similar messages in the past, how directly the message is addressed to you and many other factors”<sup>29</sup>.

### EdgeRank, AdWords and AdSense

In the paragraph devoted to price comparison websites and the user’s ability to add opinions, it was mentioned that social media are safer in this context, since they make it possible to verify the identity of the message’s author. Indeed, it may be assumed with high probability that the profile of the person we are talking to at the moment is real, even though such communication is mediated<sup>30</sup>. Social networking websites owe their success and dynamic growth to the sense of being controlled by communities, which can freely and voluntarily create circles of interests (e.g. Google+), networks of contacts (Facebook) or lists of people they want to receive messages from (Twitter). Every user has a sense of control over the sources of information, their kinds and the thematic categories they belong to, e.g. by liking a page on Facebook, “following” accounts on Twitter, subscribing to channels on YouTube or adding new profiles to circles on Google+. On the one hand, this limits the contents the user may not be interested in, but on the other, leads to unwittingly sharing information about oneself, one’s interests and predispositions: “The more developed and complex society becomes, the more knowledge of itself it produces: of its interests, structure, pace of its changes”<sup>31</sup>. In other words, the more active we are on social media, and the more we use the tools they offer us, the more information about ourselves we give to advertisers.

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<sup>29</sup> Gmail.com.

<sup>30</sup> The present-day interpersonal communication is currently being redefined by social media, where the Internet and tools it offers often replace direct communication in favour of mediated one, which may be referred to as CMC (*computer mediated communication*), that is communication via computers. This type of communication is also described as *face-to(via monitor)-face*.

<sup>31</sup> K. Krzysztofek, „Społeczeństwo w dobie internetu: refleksyjne czy algorytmiczne?”, in: „Re: Internet – społeczne aspekty medium”, ed. Ł. Jonak i in., Wydawnictwa Akademickie i Profesjonalne, Warsaw 2006, p. 29.

Researchers have been discussing the possibility of using these media as a platform for whisper or viral marketing for a long time<sup>32</sup>.

As long as adjusting the contents of advertisements and sponsored messages compatible with the user's interests is not a serious threat, apart from the risk of previously unplanned additional expenses, the processes which shape the world view and the image of the surrounding reality and determine the criteria of acknowledging the information as important, less important or trivial, may be much more dangerous. Treating social networking websites as sources of information reinforces these concerns. In comparison with traditional media, these types of websites are "ranked third with 27,8%, losing 1% to newspapers and over 30% to television news. However, they overtake radio, other printed materials and alternative sources by over 10%"<sup>33</sup>.

The hypothesis that society is heading towards algorithmization was formed by Kazimierz Krzysztofek, who claimed that in the future, this process will exceed its real needs, even though computer and Internet users have already become increasingly algorithmized<sup>34</sup>. The author defined the algorithm as "a method of behaving, which contains all computational formulas and determines their order and conditions of their use"<sup>35</sup>. Equally important is the observation that people "throughout the majority of their history were programmed by common cultures and social structures, which did not leave much space for individual decisions or private consciousness and identity"<sup>36</sup>.

Commonality is also present in social networking websites, in which, though the elements of individualism are retained (the ability to freely create one's profile), there is a distinct tendency to create common structures (the aforementioned Google+ circles, Facebook groups and Twitter lists). Social media noticeably contribute to the algorithmization of society. This concerns the situation in which websites not only recommend the content that the user should find interesting, but also decide which communication should be received and which rejected, determining the importance of all material published within their limits. Everything is regulated by the so-called edgeRank, i.e. the algorithm defining which posts (and in what order) appear in the user's news feed. It assesses if a given entry is attractive to fans and if so, then to what group of them. The posts which stand out must therefore be attractive to the user – interesting, engaging, and encouraging interaction. EdgeRank directly affects the reach of posts (the frequency of their display).

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<sup>32</sup> Cf. W. Gustowski, „Komunikacja w mediach społecznościowych”, *Novae Res – Wydawnictwo Innowacyjne*, Gdynia 2012, p. 141.

<sup>33</sup> P. Szews, „Serwisy społecznościowe jako źródło informacji dziennikarskiej”, *Kultura – Media – Teologia* 2014, No. 4, p. 95.

<sup>34</sup> Por. K. Krzysztofek, op. cit., pp. 30–31.

<sup>35</sup> Ibid., p. 31.

<sup>36</sup> Ibid.

Although the post aggregating tool was created for the comfort of users, who were supposed to stop receiving information of no interest to them, a question arises whether we are not dealing with the artificial narrowing of horizons and, generalizing, restricting users to sites which they “like” or comment upon. EdgeRank simultaneously imposes a formulation of messages that ensures they reach as many users as possible, which is not always synonymous with their contents being the most interesting – they are simply the most creatively edited. If one were to consider social networking sites, which are an important part of the new media, in terms of theories created with reference to traditional media, then, for example, the *agenda setting*<sup>37</sup> theory could be brought up. Facebook, Twitter and YouTube influence public opinion, directing the readers’ attention to particular topics and events, suggesting “interesting personalities” or “interesting themes”, recommending the next film to watch or arranging the order and kind of posts published on the wall.

It should be remembered that the algorithmic sequence of posts on the Facebook wall, which is not accidental, is not only characteristic of this website. The sequence of results returned by Google’s search engine, in which “Internet users type 85% of all searches generated on earth”<sup>38</sup> is also intentional. Even though an ordinary user could think that the initial results are the most accurate<sup>39</sup>, they are often influenced by web positioning companies and SEO specialists (*Search Engine Optimization*). Positioning comprises:

processes aimed at ensuring that a given website achieves the highest possible position in organic results of search engines for chosen words and key phrases. This is an element of the widely understood Internet marketing.<sup>40</sup>

The second risk which stems from using the world’s most popular search engine is the AdWords advertising system, i.e. the advertisement “created for the user of the Internet who assumes the *lean forward* position – oriented on solving the problem”<sup>41</sup>. It consists in displaying offers in search results which are connected with the currently sought topic or related to an article the user found interesting. The effectiveness of a seemingly disguised advertisement is much higher because of this, especially since it often constitutes a valuable complementation of the wanted content. This solution is very beneficial to advertisers because the

<sup>37</sup> For more on the subject see: P. Szews, „Serwisy społecznościowe”, op. cit., p. 100.

<sup>38</sup> L. Olszański, „Media i dziennikarstwo internetowe”, Wydawnictwo Poltext, Warsaw 2012, p. 54.

<sup>39</sup> One must admit that Google works on that, limiting the activities of web positioning companies and adjusting its search engine to generate the most accurate “organic” results.

<sup>40</sup> “Optymalizacja dla wyszukiwarek internetowych” [entry], [http://pl.wikipedia.org/wiki/Optymalizacja\\_dla\\_wyszukiwarek\\_internetowych](http://pl.wikipedia.org/wiki/Optymalizacja_dla_wyszukiwarek_internetowych) [access: 6.12.2014].

<sup>41</sup> L. Olszański, op. cit., p. 54.

payment for advertisements is calculated on the basis of clicks (payment for the result). The other solution, introduced by Google, which may be misleading to inexperienced users of the Internet, is AdSense, i.e. blocks of text or images, whose contents are adjusted to the websites we are currently visiting (contextual advertisement), giving the impression of additional articles which further explore the subject we are concerned with.

### “Robo-journalism”

Due to the present-day tendencies of journalism, journalists are no longer attached to one title or medium but are often present in several publications, building their *personal brand*. They are also active on social media, which allows them to easily gather a group of recipients committed to their name or work. The audience which follows Twitter or Facebook accounts constitutes the capital of particular journalists. Eryk Misiewicz called such journalists, along with their brand and audience, “informational Siri”<sup>42</sup> and predicted that: “The name of the magazine or station they work for will not be important. We will buy newspapers, weeklies, monthlies, access to paid websites with their analyses and commentaries only to get to know their texts and opinions”<sup>43</sup>. Two years have passed since the author’s considerations, and one may readily name at least a few journalists who play the role of informational guides, organizing the world of information.

Social media have launched a discussion about the changing role of journalism; the disappearance of professionalism, intensification of infotainment content, and a decrease in the quality of journalism are often mentioned. Unidirectional visions of the world have been replaced by a multidirectional perspective, which is dominant primarily in social media: “While the identity and ideology of journalism assumed unidirectional presentation of a particular issue, the modern media are turning into a network of multi-directional exchange”<sup>44</sup>. According to Tadeusz Kononiuk, the journalist’s function of safeguarding the information disappears, which is indirectly responsible for the development of the media network and anti-institutional and anti-professional tendencies of the Internet<sup>45</sup>. The ques-

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<sup>42</sup> Siri is a personal assistant and knowledge navigator, which is available on Apple iOS operating system. The application answers questions, responds to instructions and performs actions by means of voice commands. (“Siri” [entry], <http://pl.wikipedia.org/wiki/Siri> [access: 3.12.2014].

<sup>43</sup> E. Mistewicz, „Czas Informacyjnych Siri”, *Nowe Media* 2012, No. 2, pp. 23–28.

<sup>44</sup> T. Kononiuk, „Profesjonalizacja w dziennikarstwie. Między modernizmem a ponowoczesnością”, Oficyna Wydawnicza Aspra JR, Warsaw 2013, p. 192.

<sup>45</sup> Ibid.

tion posed by the author is whether in the digital world of networks of the twenty-first century, where there is more and more free information on the Internet, it is possible to retain the quality of available content and cultivate the traditional functions of journalism. The author ponders the situation in which the majority of the content will be free and asks who will pay reporters, correspondents, and investigative journalists. It appears that those fears are not exaggerated, quite the opposite; perhaps in the future the role of a journalist will be limited to moderating discussions or inserting entries into algorithms which manage the information. “The development of artificial intelligence may mean that in the near future, computer algorithms will replace humans in different jobs. It seems that one such job might be journalism”<sup>46</sup>.

Christer Clerwall’s study showed that a computer algorithm may be more precise, reliable and objective than an actual journalist<sup>47</sup>. The results of his research were astonishing, since it turned out that an article written by a real journalist was evaluated mostly as “well written”, “clear” and “pleasant to read”, while the content generated by software was judged as “descriptive”, “informative”, “accurate”, “believable” and “objective”. The “Los Angeles Times” newspaper was the first to use an algorithm created by a journalist and programmer Ken Schwencke, which automatically generated a short article describing an earthquake. As soon as three minutes later, the report appeared in the paper<sup>48</sup>. This was the first case, aside from sport-related issues, in which artificial intelligence was used to generate an article. The tool was dubbed Quakebot. It downloads the data from the US Geological Survey and chooses the information relevant to inhabitants of areas endangered by earthquakes. The text it generates is handed over to an editor, who decides about the publication of the article.

The case of the “Los Angeles Times” is not isolated – the Associated Press agency<sup>49</sup> started using a similar solution; it published 300 reports within the first three months, and this number is supposed to increase 15 times thanks to the use

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<sup>46</sup> J. Moll, „Sztuczna inteligencja może w przyszłości zastąpić dziennikarzy”, <http://tylko-nauka.pl/wiadomosc/sztuczna-inteligencja-moze-w-przyszlosci-zastapic-dziennikarzy> [access: 6.12.2014].

<sup>47</sup> Ch. Clerwall asked 45 students to choose and read one of two summaries concerning a National Football League (NFL) match – one of them was written by a “Los Angeles Times” journalist, the other was created by generative software. Having read the texts, the students were supposed to assess the article on the basis of its content and credibility, and describe it with one of 12 words: *objective, trustworthy, accurate, boring, interesting, pleasant to read, clear, informative, well written, useful, descriptive* or *coherent* (ibid.).

<sup>48</sup> See: <http://www.bbc.com/news/technology-26614051> [access: 4.12.2014].

<sup>49</sup> The lead of the article draws attention – *Algorithms may have written more of what you read than you think*. See: F. Diep, “Associated press will use robots to write articles”, <http://www.popsci.com/article/technology/associated-press-will-use-robots-write-articles?dom=PSC&loc=recent&lnk=4&con=associated-press-will-use-robots-to-write-articles> [access: 4.12.2014].

of advanced algorithms. Artificial intelligence will generate analyses of financial results<sup>50</sup>.

While concerns as to the quality of journalism and the very role of journalists are legitimate, humans will still serve as gatekeepers. Their decisions will involve accepting materials produced by algorithms or selecting the collected data. It must be noted, however, that entire sections are already being run by algorithms and special software (e.g. the sports section of Yahoo); and the journalist as a mediator of information is brushed aside in this case. This is because the technologies are faster, research is more efficient, and information is published more quickly. The risk is in the increase in the amount of Internet content devoid of in-depth analyses, domination of so-called soft news at the expense of articles devoted to particular issues, and the emergence of “culture of argument rather than verification of facts”<sup>51</sup>.

### Conclusion

The Internet, which allows for the creation of extensive networks of connections, searching for information and entertainment, facilitates and accelerates communication, is so complex, hybrid and dynamically changing that it requires its user to constantly adapt to modifications, new functionalities and interfaces. Along with new applications, web pages or websites, which make people’s lives and ordinary functioning easier, there are new dangers, which stem from users’ ignorance as to the very mechanisms that govern the Web: “This is connected with the fact that – often unknowingly – we are entangled in some game, which takes place behind our backs”<sup>52</sup>. Many of these risks may be avoided by choosing an appropriate way of moving around the Web, because the majority of them are related to using the information we voluntarily make available, share sometimes accidentally (unintentionally – e.g. *cookies*) and sometimes consciously (information concerning interests, products we bought, favourite films or real life events):

We leave a trace every time we log into various websites or search for information, and we can be identified because of that, someone may contact us, spy on our likings, study our preferences, seek our attention or make us interested in a product which perfectly suits our tastes<sup>53</sup>.

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<sup>50</sup> Ibid.

<sup>51</sup> T. Kononiuk, op. cit., p. 201.

<sup>52</sup> P. Laskowski, “Żyć z siecią w tle”, in: „Nowe media i wyzwania współczesności”, ed. M. Sołowski, Wydawnictwo Adam Marszałek, Toruń 2013, p. 125.

<sup>53</sup> Ibid.

The conveniences which surround us on the Internet are often useful, since they shorten the time it would take to look for the most attractive offers, products or contacts, but only if we use them consciously. Otherwise, they may limit the field of individual choices, narrow the horizons of interest, and subject the user to constant surveillance. Currently, the Internet, which was supposed to be a “window on the world” for many users, is changing into a slightly opened vent, limiting the contact with the world according to accidental actions and clicks. The selection of information by programs may lead to a situation in which the user assumes an utterly passive attitude towards culture (music, film), and his/her critical approach and ability to discuss will be restricted by what is being presented; the willingness and capacity to make free choices and decisions will fade away. The tendencies to individualise communication will be the more dangerous, the less active the attitude of their recipients becomes. Perhaps this is how the new role of journalists manifests itself – as those who open new horizons, demonstrate wider understanding of the world, publish different information, present issues in a complex context.

Contrary to what might seem to be the case, in spite of all conveniences, the attention of an Internet user should be much more focused than in the past. Currently, it is a challenge to separate the most valuable content from that chosen by the algorithm of a search engine or a social networking website. It is also increasingly difficult to separate real opinions about products, films or music from automatically generated or sponsored ones.

Universal access to conveniences may result in a decline in activity exhibited previously, when mobile devices were not available [...] it may lead to the formation of an information society, which is not capable of functioning normally without the assistance of mobile devices and technologies<sup>54</sup>. The vision of a phone owner, whose actions and decisions are dependent on suggestions provided by a personal assistant, is not that distant, taking the dynamic development of these functionalities in smartphones or tablets into account. Even a few years ago, people wondered how the world functioned without search engines, and where the information was obtained if Google was not there. Now, it is increasingly difficult to imagine shopping without price comparison websites, choosing a film for the evening without recommendations from a portal, or checking what is happening around the world and among friends on social networks. A separate issue is the direction in which journalism will develop, and what roles will the next generations of journalists play. Will they only moderate discussions and serve as gatekeepers of information gathered, edited and published automatically by software?

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<sup>54</sup> Ł. Łysik, P. Machura, „Rola i znaczenie technologii mobilnych w codziennym życiu człowieka XXI wieku”, *Media i Społeczeństwo* 2014, No. 4, pp. 25–26.

The Internet will still remain our constant companion, and will interfere in our lives to a growing degree, mainly due to the development of mobile technologies and smartphones being constantly connected to it. Even now, normal functioning is difficult without access to the Internet (Internet banking, registration systems, e-mail etc.), and this process will surely move forward. That is why it is very important to be aware of the mechanisms which govern the Web: the fact that privacy on the Internet is harder and harder to maintain, and that it is very rare for anything to be offered for free. The price, in this case, is our data, contacts and interests, information about which we voluntarily share.

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**Algorithms of the Web**

(Summary)

The article tackles the problem of the existence of algorithms in selected services and Internet websites. The interfacing of media is the starting point for this discourse, aimed at presenting the processes of automation in information distribution, the individualisation of messages and profiling in websites. The threats resulting from dynamically developing enterprises aimed at providing the website user with artificial intelligence – in terms of both social networks and mobile applications – are explicated in detail. The examples presented in the article refer to Internet recommendation systems, e-mail applications, voice assistants, and mechanisms responsible for the functioning of social networks. Speculations on algorithms omnipresent on the Web lead us to reflect on how the journalism will be redefined in the future, since it seems that the role of the journalist will be to moderate discussion and select the themes to be discussed; it is quite likely, though, that the themes selected will be compiled by specialised software.

Keywords: new media, algorithms, Internet.