

Robot Journalist or Human Journalist?: An Analysis is Over News Articles

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Abstract

Technology and humans have been in constant interaction in the historical process. So much so that with every technological progress, mankind has entered a new revolutionary era; first the Agricultural Revolution, then the Industrial Revolution and finally the Information Revolution. Thanks to information technologies, society is connected with information networks. The information society demands the continuous production of information with an insatiable appetite. The media, which has been undertaking the responsibility of enlightening the public for hundreds of years, is experiencing a transformation with technology and as a result, practices in journalism are constantly changing. The profession of journalism has a convergent relationship with computer engineering. “Robot journalists” can now produce the news that were made by humans for hundreds of years. The “Algorithms” which were previously used to edit/arrange the news, can now be used in writing the news. Thousands of news from the world's most important agencies and newspapers, such as Associated Press, Reuters, and The Washington Post, are now being written by robot journalists. With the developed software, these robots can organize financial data, write news about sports and even election results, and provide information to the public in just a few minutes after an earthquake. The Los Angeles Times was able to write news about all the homicides in the California area without any delay, with the use of A.I. journalism. In short, “robot Journalism” revoked the previous argument that “robots can only be manual labour workers” and this argument is now replaced by; “robots are capable of intellectual work.” The development of “robot journalism” that marked the first quarter of the 21st century scares human journalists day after day; for many remark that they will face the risk of losing their jobs in the near future. This study comprises the comparison of the news sample written by robot journalists with the news written by human journalists and its analysis by a group of journalist candidates.

Keywords: Robot Journalist, Artificial Intelligence, News, Information, Technology.

Introduction

With industrialization, the bourgeoisie aspired to establish its own sovereignty and in order to achieve this, they aimed to abolish the imperial structures under the rule of the aristocracy. However, the nation-states established during this period could not keep up with the growing structure of capitalism. In the last quarter of the 20th century, liberal policies and technological developments in the field of communication paved the way for capitalism. Advancements in new communication technologies have opened the door to a new era in journalism. Man has now transferred his speed to the machine, and the urge for fast access to information has compelled him to a full cooperation with machines.

Traditional media has transformed with the speed of technology. When the messages produced by new technologies reach the masses, a dynamic interaction occurs. It can be summarized as follows: “Internet technology is radically different from traditional communication tools. Traditional communication tools are based on a vertical structure. Produced messages are transmitted in a linear way from a particular center to heterogeneous social segments, defined as public. Neither this public has any effect on message production nor the traditional transmission offers any possibility for feedback. The public feedback to any communication channel still needs another communication channel. The Internet has increased the possibilities of intervention/interference between message production and message reception (Timisi, 2003: 124).

With the help of internet technology, news reach its readers faster, cheaper, easier and in a medium where the perception of time and space changed. The fact that the target readers are shifting from passive to active, and that the news is available at any time and anywhere, journalism has reached a whole new level.

Castells calls this new phase "information age" based on information channels and evolving networks through information and communication technologies. Castells says that in the information age, with the presence of networks, society transformed into a network society (Özçetin, 2018: 262). This context; "the addition of robot journalism to newsroom practices as a non-human actor" is also a comprehensive and important tool in explaining the transformation of journalistic practices and in understanding the new generation of news production processes (Akyazı, 2018: 17). Castells says that "news feeds are information flows between nodes/knots and these circulate in the connection channels between nodes/knots" (akt. Özçetin, 2018:262). In the "information age" that Castells draws attention to, the birth of a huge "information industry" is underlined. "With the new information technologies humanity is now under siege by the information industry. After Frankfurt School's "culture industry" concept, we can define the period we are in, as the "information industry" concept. A huge industry has emerged with the opportunities that information technologies offer for the production and distribution of information (Güngör, 2011: 323). "In the traditional journalism concept, actors are seperated into following categories: Resources, journalists and readers-viewers. But all three of these actors are human. "Advances in new communication technologies reveal the inadequacy of traditional readings/perceptions based on these rigid analytical categories."

With regards to journalistic practices and digital technologies, traditional approach sees mass media as tools for distribution of information". Actor network theory refers to the collaboration of robots and people who use them in the newsroom, and in this new dimension the production process of the news reaches a new phase (Narin, 2017). Digital journalism began in the world in 1995, when the Washington Times and the New York Times, and in continental Europe, when Herald Tribune and Daily Mirror, released the news as is, in the Internet. Aktüel magazine set the beginning of this phase in Turkey in 1995, followed by Lemar magazine, Zaman, Milliyet, Hurriyet and Sabah newspapers (Fırlar & Deniz, 2010:315). Networking between algorithms and data sources is important in robot journalism. Robot journalism prepares the news by going through several stages: In the first stage, data is drawn, location and historical information are added, in the second stage, interesting events are determined and statistical data is activated, in the third stage, news value criteria are transferred, that is, whether if news is of significance, in the fourth stage, news is written, and its accordance to news principles is overseen, in the fifth stage, if required, editorial screening is carried out and news is published.

Today, in 5 countries which develop content management system for robot journalism, there is a total of 11 companies 5 in Germany (AX Semantics, Text-On, 2 txt NLG, Retresco, Textomatic), 2 in the USA (Automated Insights, Narrative Science), 2 in France (Syllabs, Labsense), 1 in the UK (Arria), 1 (Tencent) in China. Eight can produce content in one language and others also in different languages. However, none of these companies solely produce journalistic content, but simultaneously serve various sectors with their technologies such as; portfolio analysis in the financial sector, product promotions, patient follow-up charts for use in the health sector.

Artificial intelligence analyzes and transforms statistical data into news more accurately than humans. (Steiner 26, gmail) Following up on this fact, Narrative Science and Automated Insights, which develop content management systems in the United States, produce media texts from sports and financial data. Each of these two companies produced original software for this conversion (124, page 26 gmail).

While Statsheet produced sports-based texts in 2007, it went beyond sports news in 2010 and found a new name to highlight this expansion: Automated Insights. (107, page 26 gmail) Automated Insights not only produces content for the media, but also prepares financial statements and balance sheets. Automated Insights produced 1 billion texts at a rate of 2000 text per second with the Wordsmith program developed in 2014 (Dierickx, 2015). Associated Press also uses news produced by Automated Insights.

Narrative Science was founded in 2010 by Northwestern University and La Medill School of Journalism. Larry Birnbaum and Kris Hammard, the leading researchers of the company, expressed

that they believe a robot will receive the Pulitzer Prize in the near future (Dierickx, 2015). Narrative Science has a wide range of important media clients, including Forbes, Fox, Associated Press, Publica, Los Angeles Times and Yahoo.

The Washington Post used the robot “Heliograph” at the 2016 Summer Olympics in Rio and the 2016 US Elections, and the Washington Post was awarded for its election work. In China, a robot, wrote the news about “Spring Festival,” comprising of 300 characters, in one second. Although in terms of speed, the robot's superiority as compared to humans is undoubted (Dierickx, 2015), the subject of speed has been criticised in every period in history. Kafka said “The masses rush, run, trot through the age they live. They are delusional about moving forward, but they don't do anything but walk the same pace and fall into the void (akt. Virilio, 2003:40). The French thinker Paul Virilio, who is interested in new communication technologies, draws attention to information abundance and speed with these words: “With the introduction of information highways, the number of passengers traveling alone in their own rooms increased. The distant descendants of the silent reader, these travelers will alone suffer the consequences of all communication disorders that have arisen during the last few centuries.” (Virilio, 2003: 40).

Professor Wan Xiaojun of Beijing University emphasized that speed is not everything. Professor Wan Xiaojun acknowledges the robots' superiority in analysis, but whether robots are able to reflect on people's views is a crucial shortcoming, hence, robots cannot replace journalists, he declared) (Dierickx, 2015).

However, despite these criticisms, it is an undeniable fact that today many media organizations benefit from robot journalists especially in certain branches. The Washington Post uses journalist robots for high school football games, similarly The Associated Press for baseball games. In fact, it was argued that one of the professions that robots could not take on until recently was journalism, whereas developments in recent years suggest that this may not be the case. Kristian Hammond, co-founder of Narrative Science, said that in 15 years, ninety percent of the news will be written by computers (Hürriyet gazetesi, 2015).

The ease of use of robot journalism in sports news is explained as follows: for example, it is stated that it is easy for robot journalists to reach information such as the frequency of the match between two teams in a football match, who scored in which match, how many goals they scored, and how many red or yellow cards they received. When artificial intelligence combines these statistical results with stereotypical indexes, the robot journalism texts are produced (Narin, 2016). In general, if we look at the negative impact of robots on world employment, we can see that there are reports saying 60 thousand people have been sacked in China, and the number of employees at Foxconn, which supplies electronic materials to Apple and Samsung, has dropped from 110,000 to 50,000. Regarding the expulsion of 60,000 people working at Foxconn, Chinese government official Xu Yulion said that they have achieved such savings because they have increased the number of robots in the manufacturing department. It is argued that other companies will execute the same practice eventually.

According to a study conducted in 15 countries with 65 percent of the world's workforce, 5 million people will be unemployed until 2020 with the increase in the use of robots. (Digitalage, 2016). Actually, robot journalism does not aim at large masses, on the contrary, the intention is to reach smaller crowds with numerous amount of news. Contrary to traditional journalists' who target large masses with fewer news based on long and time consuming researches, robot journalism does not aim masses. This argument is supported by the Reporters and Data and Robots (RADAR) project, funded by Google and run by the UK-based PA news agency; artificial intelligence can produce 30,000 news per month, managed by a team of 5 people, and the team's news is divided into health, economy, police- courthouse. (Hürriyet gazetesi, 2017). Los Angeles Times journalist Ken Schwencke woke up in March 2014 with a 4.7-magnitude earthquake. He found the news written on his computer and announced it to the public well before other news organizations, and when he explained this, he said, “It all happened in three minutes.” (Oremus, 2014). It was an artificial intelligence text, written by an algorithm called Quakebot. Because artificial intelligence took this information from the earthquake warning system of the US Geological Research Center and placed it in a pre-prepared template when the earthquake is over a certain magnitude.

Although journalist Ken Schwenke says that the purpose of the algorithm is to give basic information about an event, and from this information, it will convey the details of the earthquake to other journalists, still it cannot eliminate the questions in mind: “Will artificial intelligence replace human journalists?” (Bramlett, 2014). Nowadays, The Los Angeles Times’ news robot “Quake Bot” still tweets about earthquakes of magnitude 3 or more in 3 minutes and delivers them to readers. “Bot” receives the news from the US Geological Survey Earthquake Warning System.

Another medium where artificial intelligence journalism is used is forensic reports. With the data received from the Los Angeles Forensic Medicine authorities since 2010, the location of the murder, the victim's gender, race and criminal record can be accessed. Robot journalism is used most commonly in news about finance, sports, weather and elections.

Research

The research problem in this study is the the comparison between 2 news articles on the same subject; one of which was written by a robot journalist used by the Los Angeles Times and the other was written by a human journalist, and to define the differences of these 2 articles. The study focused on objectivity, clarity and the differences. Whether the journalist candidates see these algorithms as a threat to their jobs was questioned as well. 12 Communication Faculty students participated in this focus group study. The age of the participants varied between 21-24; 4 of which were women and 8 were men. The focus interview lasted about 1 hour.

The reason 4th grade Communication Faculty students were selected, is that they have learned the criterion of journalism, they know the techniques of article- writing, and that they will probably start working in the sector in the near future. The reason focus group study is chosen is to allow the research subject to analyze the views, attitudes and trends of the targeted public. In focus group work, group members influence each other's thoughts in the natural environment, so that group members can present a variety of ideas (Akşit, 1992). Group study was done with a moderator. Opinions/ideas were recorded during the study to allow for more detailed analysis.

Findings

In the focus group study participants were shown two articles and were asked to answer related questions. One of these were written by a human journalist the day of the earthquake, the other one, on the same subject, was written by a robot journalist.

The human journalist’s article is as follows:

A 4.4-magnitude earthquake shook the Los Angeles area on Monday morning, tremour caused people to wake up just before sunrise but no immediate reports of serious damage was received.

The earthquake, centered about 6 miles north-northwest of Westwood and about 15 miles northwest of downtown Los Angeles, happened at 6:25 a.m. the U.S. Geological Survey said.

"I sat up in bed, waited a second, then put my head down again and that was it. I wasn't really worried," a man walking his dog in downtown Los Angeles less than an hour after the quake told CNN affiliate KTLA. He didn't provide his name. CNN's Alan Duke said he was half awake in his Hollywood Hills home when he felt a tremour that lasted a few seconds.

"It was just a rude wakening," Duke said. "The sliding-glass doors were just rattling like somebody had slammed into them. Nothing fell off the walls". The USGS's online ShakeMap showed that strong to moderate tremours would have been felt near the epicenter, with lighter vibrations felt in Los Angeles proper.

Geophysicist Paul Caruso said that generally, significant damage nor casualties are not to be expected with earthquakes weaker than a 5.5 magnitude, though results vary by region, often depending on construction techniques and various rock formations underground.

“At least six aftershocks followed the quake Monday morning, the strongest of which was a magnitude 2.7”, said Egill Hauksson, a California Institute of Technology seismologist (CNN, 2014)

The second article of the same subject which was written by an algorithm is as follows:

“A shallow magnitude 4.7 earthquake was reported monday morning five miles from westwood, california, according to the u.s. geological survey. the temblor occurred at 6:25 a.m. pacific time at a depth of 5.0 miles.

According to the usgs, the epicenter was six miles from beverly hills, california, seven miles from universal city, california, seven miles from santa monica, california and 348 miles from sacramento, california. in the past ten days, there have been no earthquakes magnitude 3.0 and greater centered nearby.”

This information comes from the usgs earthquake notification service and this post was created by an algorithm programmed by an author” (Bramlett, 2014).

Istanbul Aydın University Faculty of Communication Grade 4 journalist candidates, 4 women and 8 men, ages ranging between 21 and 24 were asked research questions related to these two texts:

- 1- Which article was written by a robot?
- 2- Which article did you find more clear and comprehensible?
- 3- Which article is more enjoyable to read?
- 4- Which article is more objective?
- 5- Do you think robot journalists can take the place of human journalists and if they can pose a threat to your career?
- 6- Do you think robot journalists have shortcomings, if so, what are they? Do you think they have superior qualities, if so, what are they?

Initially, participants were not informed by whom the news was written and were asked to make a guess. 10 people answered the question “Which was written by a robot?” correctly and 2 people gave the wrong answer. The participants’ explanations who have the right answer were as follows;

- “I recognized the robot journalism because it was short, with precise information and exact results” (Abdülkadir).
- “The robot journalist is sharper and unfeeling/insensitive. In the death and massacre news, the robot journalist will only tell us that there is death, whereas the emotion is important and must pass on to the reader” (Zeynep).
- “I understood from the phrase “it was a rude awakening” that the news was written by a human being because it’s a feeling” (Samet).
- “I understood from the numbers, there are too many numbers, ...conclusions based on precise information. This could only be written by a robot” (Erdinç)
- “ Earthquake shook the Los Angeles area and tremour caused people to wake up just before sunrise”; this sentence describes imagery, therefore cannot be written by a robot” (Yiğit).

To the question “Which article did you find clearer and more comprehensible?” ; 10 people found the robot article more comprehensible, while 2 people found the human article clearer and more comprehensible. The reasonings of the students who found the robot journalists’ article more comprehensible are as follows:

- “When I get to the end of a long text, I forget its beginning, I think the long texts are more complex, the robot’s news is short and concise so it is more comprehensible” (Gökhan).
- “To better understand the contents of the article, I would prefer the one written by the robot journalist” (Abdülkadir).
- “The article written by the human has more interviews, it’s ok if I don’t read interviews, what matters is that I get to the essence of the article” (Yiğit).

To the question “Which article is more enjoyable to read?” 11 of the participants said that reading the article written by the robot was more enjoyable because it was short and to the core and that it didn’t exhaust the reader. The only person that said that the humans’ article was more enjoyable said that the reason is because it was descriptive and included interviews.

To the question “Which article is more objective?” all the participants said that the robot journalists’ article is more objective. They said that the reason of their choice is that the robot journalists’ article was void of subjective descriptions. Furthermore they stated that feelings cloud humans’ objectivity.

To the question “Do you think that robot journalists can take the place of human journalists someday, do you think that it is a threat for your profession?” 10 people said that even though there might be a threat in some journalism branches, but not in all. However, 2 people said that robot journalism is a threat to all human journalists.

- “Robots may be used in some news. There will always be a need for an element of conscience, emotion and a human in journalism. That’s why I think it won’t pose a threat” (Yiğit).
- “I think it’s definitely a threat in some branches. I think they will replace journalists in sports, economy, technology, breaking news, weather and crime news.” (Eray).
- “Robot journalists cannot completely replace people because robots cannot give the desired emotion completely, robots can only report on data, therefore, they’re not a threat to human journalists” (İsmail).
- “It poses a great threat to my profession, there will be nothing we can do, robots will do all the work” (Merve).

To the question “Do you think robot journalists have shortcomings, if so, what are they? Do you think there are superior aspects of robot journalism, if so what are they?” participants stated their reasons;

- “It has shortcomings because it cannot convey feelings and thoughts. This is their deficiency and their most distinctive difference from the human journalist. Their superiority is that its data is clear. Its short and concise. Its objective. Its fast information is an advantage. Also people of power can use them for their own benefit” (Samet).
- “Deficiencies of robot journalists; they cannot describe a story like a human journalist, but only gives data, there is no feeling, resource usage is limited, can be exploited through manipulation. Their superiorities are; news are short and concise, most importantly, the news come out fast” (Yiğit).
- “Robot journalist has shortcomings. Firstly, it can not incorporate feelings of conscience in its news, It can’t describe its story like journalists. The news needs to be checked on because the robot cannot fully investigate the news. Their superiorities are; possibility of instant sharing by writing short news. Speed is important in the news industry” (Eray).
- “Its drawback is that it is not capable of emotion and it can not describe as well as humans. In the future it can be abused with the input of some people. Also it can not check on its article. Its advantage is that it has the capability to be objective and impartial. And fast. (Abdülkadir).
- “Its downsides are that it is far from carrying any emotion, it is monotonous, and it is not descriptive. In the future, it can be wrongly manipulated and can be exploited by the power groups as a propaganda tool. Its advantage is that it provides instant information quickly. It is also far from bias in the news. No editor is required” (İsmail).
- “Robots only work on data. There is no emotion and it gives clear information, it reflects the truth rather than telling a story. They can work 24 hours as working hours. They may be far superior to man, but the lack of emotion can be a downside. The speed of the robot can eliminate the need for humans. The news needs to be checked. Robots getting information from different sources will be worse than people. Robots have limited use of resources. In the future robots can be manipulated for making biased news” (Erdoğan).
- “The shortcomings of the robot journalist come from the lack of storytelling. On the other hand, its superiority lies in giving the news objectively, obtaining a plain and precise result and its speed. The robot may not be able to check the news from several sources. Can be abused with negative manipulation in the future” (Samet).
- “The advantage of robot journalism is that there is miniscule space for error but definitely lacking values of conscience” (Dilara).
- “Shorter narrative, information utilizing direct data; so it’s fine but it never gives the feeling that a normal human gives, and this doesn’t attract me. Robot Journalism is less likely to make mistakes. Its speed is also an advantage. The robot journalist cannot check the news from several sources. After a short time the robots can be used as per the governments’ benefits” (Zeynep).
- “Speed is a plus. But it can never give the sentiment a human does” (İrem).

“It has its flaws. Even though you should be as objective as possible, a news article should include some feelings. Its advantage is that its cheap and fast. News should pass an “editorial” process” (Merve).

- “No matter how technology advances robot journalism can never relay an emotion. It cannot evaluate on a conscientious level. Its advantage is that its cheap and it can stay objective. But it can also be exploited in the interests of power” (Gökhan).

Conclusion

The media industry is undergoing a major transformation with the digital age. Algorithms transform huge amounts of data into new information and deliver it to readers without human touch. Will these computer softwares cooperate with real journalists, or will the journalism profession be turned over to robots and become impossible to be done by people over time?

In our study, the difference between robot journalism and human journalists was examined; robot journalism is evaluated in a structure which is faster, more economical, based on short-objective-precise results, open to manipulation of certain authorities, eliminating the editorial process, and does not incorporate feelings and thoughts such as interviews. The participants stated that they evaluated human journalists in a form that is marked by elements such as emotion-thought and conscience, full knowledge of the editorial process and ability to follow up the intellectual aspect of the news.

It was observed that journalist candidates, who are the last representatives of Generation Y, who participated in the study, are in an endeavour to reach new information and be aware of multiplicity of things happening in the world-probably because of their age. Therefore, they find it unnecessary and boring to read news texts which are long, containing emotion and idea, therefore, they prefer to access the actual information in short, clear sentences.

It is worth remembering the findings of the French thinker Paul Virilio who observed the matter of speed with criticism; In his book “Speed and Politics”, Paul Virilio mentions that as soon as the Nazi government seized power and provided sports and transport services to the German proletariat, the goal of the authority was to evacuate the streets without the need for suppression. To this end, Hitler persuaded 170,000 Germans to buy a German Volkswagen where there was no single vehicle around. In the USA, Ford's serial car production started in 1914 and the country was reshaped and it was enough to change the life style of the Americans. According to Virilio, commodities that promise speed have been used by the authorities as an indirect means of oppression on peoples and have diverted man from his real goal. Of course, the importance of speed in modernity cannot be denied. In today's world, speed is the factor that makes robot journalism stand out. However, speed is extremely open to manipulation as it can bring unsupervised journalism and eliminate the editorial process.

Although digital technology regulates how news is written, how fast it is produced and consumed, journalism is a process that requires different elements. In addition to speed, creativity, ethics and legal responsibility in news texts are open to discussions and should be seriously studied. While the press should be accountable for the news it makes for the public, in the event of a misinformation in the news; “who will be the responsible party in terms of legal and public accountability”, is an issue that should be discussed.

The journalist not only transmits the tangible, but there are also the immaterial issues that the public needs to know; this requires serious, systematic research. How far can robot journalists reach in this expertise of human journalists? This question has not yet been answered.

The participants in the study did not see robot journalism as a serious threat to their profession and the reason for this was based on the fact that the robot journalist did not have conscience and emotion and was not competent in the stages of news follow-up; but their personal choice of reading robot-produced articles creates a paradox.

Most of the participants said that the article written by the algorithm was more objective and more enjoyable to read. However, the fact that the sample news took place in Los Angeles, far from their own geography, makes them to remain insensitive even in a disaster such as an earthquake. Therefore, in the opposite situation, with the occurrence of the disaster in their own geography, it is

probable that journalist candidates will want to reach more into emotion-thoughts and more detailed journalism information through interviews.

Although it is one of the most important tools supporting the information society as it is stated in the Unesco Mass Communication Declarations, internet does not contribute much in conveying the vital problems faced by humanity.

Therefore, in the declaration; education to aspire after a conscious society is recommended, rather than an information society. Moreover, another matter that comes to mind is that the algorithms can be programmed according to who owns them and they are susceptible for abuse. As a conclusion, it is clear that the replacement of human journalists by algorithms can cause enormous problems, hence, in the future of journalism, it appears that the best way to follow for human journalists is to produce news by collaborating with algorithms.

References

- [1] Akşit, B.T. (1992), “Medikal arařtırmalarda etik sorunlar” Türk Tabipler Birlięi’nin düzenledięi “Saęlık Kongresi’ne Sunular bildiri. 8-11 Mart Shareton Oteli, Ankara.
- [2] Akyazı, A. (2018), “Gazetecilikte Dijitalleşme ve Haber Üretimine Yansıması: Robot Gazeteciler”, Dijital Medya ve Gazetecilik, İstanbul: Eğitim Publishing, (der: O. Uçak).
- [3] Bramlett, M. (18.03.2014), “Robot journalist broke the earthquake story before everyone else”, https://laist.com/2014/03/18/prepare_for_your_new_robot_journali.php, (Erişim Tarihi:02.02.2019).
- [4] CNN (18.03.2014), “4.4 magnitude earthquake hits Los Angeles area”, www.edition.cnn.com/2014/03/17/us/california-earthquake/index.html,(Erişim Tarihi: 20.02.2019).
- [5] Digitalage (26.05.2016), www.digitalage.com.tr/insanlarin-yerini-robotlar-aldi-60-bin-kisi-issiz-kaldi/, (Erişim Tarihi: 15.05.2019).
- [6] Fırlar F.B. & Deniz Ş. (2010), “Dijital gazeteler ve Pazarlama: Türkiye’deki Dijital Gazetelerin Pazarlama Dinamiklerinin Deęerlendirilmesine İlişkin Bir Analiz”, Uluslararası Sosyal Arařtırmalar Journal, Cilt: 3/11.
- [7] Güngör, N. (2011), “İletişim – Kuramlar – Yaklaşımlar”, İstanbul: Siyasal Publishing.
- [8] Hürriyet Gazetesi, (17.09.2015), “Robotlar işimizi elimizden alacak” <http://www.hurriyet.com.tr/robotlar-isimizi-elimizden-alacak-mi-40373591>, (Erişim Tarihi: 15.08.2018).
- [9] Hürriyet Gazetesi (01.08.2017), “Robot gazeteciler geliyor, ayda otuz bin haber yapacak”, <http://www.hurriyet.com.tr/teknoloji/robot-gazeteciler-geliyor-ayda-30-bin-haber-yapacak-40536625> (Erişim Tarihi: 23.08.2018).
- [10] Dierickx L. (2014-2015), “Possibilites et limites de la generation automatique de textes dans un contexte journalistique”, Universite libre de Bruxelles: Faculte de philosophie et lettres
- [11] Narin, B. (25.04.2016), “Robot gazeteciler yayılıyor, insan gazetecilerin sonu mu?”, www.journocom.tr/robot-gazetecilik-yayiliyor-insan-gazetecilerin-sonu-mu, (Erişim Tarihi:08.12.2018).
- [12] Narin, B. (2017), “Uzman görüşleri bağlamında haber üretiminde otomatikleşme: Robot gazetecilik” <http://iletisimdergisi.gsu.edu.tr/download/article-file/396150>, (Erişim Tarihi: 15.02.2019).
- [13] Oremus, W. (17.03.2014), “The first news report on the L.A. earthquake was written by a robot”, www.digitalage.com.tr/insanlarin-yerini-robotlar-aldi-60-bin-kisi-issiz-kaldi/, (Erişim Tarihi: 23.09.2018).
- [14] Özçetin, B. (2018), “Kitle İletişim Kuramları”, İstanbul: İletişim Publishing.
- [15] Timisi, N. (2003), “Yeni İletişim Teknolojileri ve Demokrasi”, Ankara: Dost Publishing.
- [16] Virilio, P. (2003), “Enformasyon Bombası”, Çev: İ. Kaya Şahin, İstanbul: Metis Publishing.