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**Car innovations & autopilot:
perception through the media in Kazakhstan**

Due to the high cost of cars with autopilot in Kazakhstan (from 22 million tenge), personal reviews and comments on social networks about it are not common. Therefore, media texts remain the main source of information about self-driving cars. These texts are creating a defined communication environment on the topic. To date, public perception formed under the media influence has a bias towards negative. With the help of content analysis I have studied journalistic texts about car autopilots, published in domestic electronic media. According to the final results of the research: Kazakhstani mass media rarely publish materials on this particular topic; they can not maintain neutrality when covering the topic of autopilots (only 16%); domestic journalists more often resort to the use of words with negative labeling (55%); in a positive light the topic is given only by business media; the audience under the media influence and in the created communication environment gradually forms a negative attitude towards the autopilot system.

Key words: mass media, new technologies, cognitive perception, self-driving car, journalistic text.

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**Автомобильдік инновациялар және автопилот:
Қазақстандағы БАҚ арқылы қабылдау**

Қазақстанда автопилотпен жүретін автомобильдердің қымбаттығына байланысты (22 миллион теңгеден бастап), әлеуметтік желілерде осы тақырып бойынша видеолар, пікірлер мен түсініктемелер кең таралмайды. БАҚ мәтіндері қарапайым азаматтардың көпшілігі үшін автопилотпен жүретін көліктер туралы негізгі ақпарат көзі болып қала береді. Дәл осы мәтіндер белгілі бір тақырыптық коммуникациялық ортасын жасайды. Бүгінгі таңда бұқаралық ақпарат құралдарының ықпалымен қалыптасқан қоғамдық пікір теріс бағытта айтарлықтай артықшылыққа ие болды. Осы мақалада біз контент-талдауды қолдана отырып, ең танымал (рейтинг бойынша) қазақстандық электрондық БАҚ-та жарияланған автопилоттар туралы журналистік мәтіндерді зерттедік. Сонымен, зерттеудің қорытынды нәтижелері бойынша: 1) қазақстандық бұқаралық ақпарат құралдары осы тақырып бойынша материалдарды сирек жариялайды; 2) оны қамту кезінде бейтараптық сақталмайды (жалпы таңдауда 16%); 3) ақпараттық мәтіндерді жазу кезінде отандық журналистер жағымсыз бояумен сөздерді жиі қолданады (жалпы таңдауда 55%); 4) тақырыпты жақсы жағында тек іскери мен бизнес БАҚ-тар ұсынады; 5) қазақстандық аудитория бұқаралық ақпарат құралдарының әсерінен және қалыптасқан коммуникациялық ортада біртіндеп автопилот туралы жағымсыз қатынасты қалыптастырады.

Түйін сөздер: масс-медиа, жаңа технологиялар, танымдық қабылдау, өздігінен жүретін автокөлік, публицистикалық мәтін.

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Автомобильные инновации и автопилот: восприятие через СМИ

Из-за высокой стоимости автомобилей с автопилотом в Казахстане (от 22 млн. тенге) отзывы и комментарии в социальных сетях по данной тематике не имеют широкого распространения. Медiateксты остаются основным источником информации об автомобилях с автономным управлением для большинства рядовых граждан. Именно эти тексты и создают определенную тематическую коммуникационную среду. На сегодняшний день общественное мнение, сформированное под влиянием СМИ, имеет значительный перевес в негативную сторону. В рамках данного исследования при помощи контент-анализа были изучены журналистские тексты об автопилотах, опубликованные в самых популярных казахстанских электронных СМИ. Итак, согласно итоговым результатам исследования: 1) казахстанские медиа редко публикуют материалы по данной теме; 2) не выдерживается нейтралитет при ее освещении (16% из общей выборки); 3) отечественные журналисты при написании информационных текстов чаще прибегают к употреблению слов с негативной окраской (55% из общей выборки); 4) в позитивном свете тема подается только деловыми СМИ; 5) казахстанская аудитория под влиянием СМИ и в созданной коммуникационной среде постепенно формирует негативное отношение к системе автопилот.

Ключевые слова: масс-медиа, новые технологии, когнитивное восприятие, самоуправляемый автомобиль, журналистский текст.

Introduction

As C. Happer and G. Philo said, the media play a central role in informing the public about what happens in the world, particularly in those areas in which audiences do not possess direct knowledge or experience (Happer& Philo, 2013). A car autopilot system is exactly such area for the country.

According to official statistics 3,848 thousand passenger cars are registered in the Republic of Kazakhstan for the first half of 2018. Also, according to the data, there are 19.9 units of private cars per 100 people of the permanent population in the Republic (<http://stat.gov.kz/official>). Statistics on the number of cars with autopilot does not exist. But, following the results of the first half of 2018, the most sold cars in Kazakhstan were Lada, Toyota and Hyundai (Russak, 2018). None of the mentioned car brands use the autopilot system. From the above, it follows that the journalistic texts are one of the most powerful sources of information and the system of influence on the formation of views and assessments in this particular area. This is what dictates the choice of the research topic.

If we get consolidated results on the evaluation criteria of media texts, we will receive data on public opinion formed under the media influence.

In this research I consider electronic media, in particular, domestic information and news Internet

portals, as well as websites of famous media in the country. The choice of research material is dictated by its readiness and the ability to assess the level of popularity of articles on the AD (automated driving).

The term “autopilot” has been used for decades within the aircraft industry, enabling pilots to reduce their cognitive load by allowing an aircraft to practically fly itself during “cruising” portions of the trip. The same is now happening as cars with autopilot are rapidly turning into autonomous vehicles, allowing drivers to let the cars drive themselves on certain portions of the trip, like freeways (Autopilot review, 2018).

Nowadays scientists define automated driving (AD) as driving in which at least some aspects of the dynamic driving tasks occur without driver input. AD has evolved rapidly due to advances in microprocessors, sensors, geodetic information systems, telecommunications and related technologies (Noy et.al., 2018). With the other words, we will speak about cars, which can drive themselves, but they are not fully independent.

Cars of this type exist and are sold in Kazakhstan (<https://astanatesla.kz>), but compared with neighboring Russia (where cars with automatic control systems that will drive on public roads in Moscow and Tatarstan will receive a special sign with the letter “A”, meaning "Autonomous driving" (Gronsky, 2018)), there no one official document,

law or by-law on such cars in the Republic (<http://online.zakon.kz>).

According to X. Krasniqi and E. Hajrizi, the major transformation that is happening now from vehicles driven by humans to vehicles now driven by themselves will have a long term impact on society (Krasniqi&Hajrizi, 2016). So, this article aims to explore the influence of journalistic texts about autopilot car systems on the public opinion. I will give an objective quantitative assessment of used positive/neutral/negative keywords in media publications on car innovations & autopilot.

Literature review

In the scientific literature, the spectrum of problems of using autopilot is widely reported.

First of all, the introduction of automated vehicles to road traffic is motivated by several predicted beneficial outcomes (Maurer et.al., 2015; Stanton & Young, 1998), such as mitigating the negative effect of routine drives on drivers' health and compensating the negative effects of predicted increase in passenger traffic by increasing traffic efficiency (Payre et.al., 2014; Roberts et.al., 2011). It is assumed that fully automating the driver's tasks will reduce human error, such as speeding or distraction, and, thereby, the number of fatalities further still (Körber et.al.,2018).

Cars today already include many semi-autonomous features, like assisted parking and self-braking systems. And completely autonomous vehicles - able to operate without human control - are rapidly becoming more of a reality... What technology makes self-driving cars possible? It's really three technologies: sensors, connectivity, and software/control algorithms. A good overview of European progress in this field of research gives the European roadmap smart systems for automated driving (Dokic et.al., 2015).

Two of the most talked about self-driving advancements come from Google and Tesla. They take different approaches: Google is using lidar (a radar-like technology that uses light instead of radio waves) sensor technology and going straight to cars without steering wheels or foot pedals. Tesla has rolled out a software system called Autopilot, which employs high-tech camera sensors as a car's "eyes," to some of its cars already on the market (Gupton, 2017). Other car trademarks are also moving in the direction, for example, "nuTonomy", "Uber", "BMW".

A key technology for autonomous driving is the real-time high-definition (HD) map. This

technology covers three main challenges for autonomous driving. The first challenge addressed is the capability of a vehicle to localize itself with high precision in relation to its environment. The second challenge is to solve the problem of recognition and reaction to events appearing on the road beyond the reach of onboard sensors, in a range of more than 200 m ahead or around corners. The third challenge concerns the vehicle's capability to drive in accordance with the needs of passengers and other traffic participants (Redzic&Rabel, 2015).

As can be seen from the short review of literature, no scientific work specifically concerns media coverage of this topic. From the above follows the scientific novelty of this work, not only for Kazakhstan.

Material and method

As a main method in this research I will use the content analysis. The following interpretation of this method will be used: content analysis is a research technique used to make replicable and valid inferences by interpreting and coding textual material. By systematically evaluating, qualitative data can be converted into quantitative data. The method has been used frequently in the social sciences (<https://www.terry.uga.edu>), specifically here for media & communication research.

The following statement also contributed to the choice of this research method: content analysis is a class of research methods at the intersection of the qualitative and quantitative traditions. It is promising for rigorous exploration of many important but difficult-to-study issues of interest to organizational researchers in areas as organizational cognition, behavior, human resources, social-issues management, technology and innovation (Duriau et. al., 2007). After all, the human perception of the new technology through the media will be discussed.

As the material of the study domestic journalistic texts, published in the media in the public domain were selected. The sample was made based on the rating, i.e. popularity of content on a particular topic (car autopilots). The popularity of a text was determined by the position of the link to the source according to search engine data on a query by keywords: Kazakhstan, autopilot, car. Data valid on July, 2019. In this study, only text data on Russian language since 2018 were used, excluding video and photos, materials on other languages.

The calculation also did not include materials that were borrowed from other foreign media or translated. Only author's journalistic texts are considered.

Results and discussion

The most popular electronic media in Kazakhstan were reviewed. Not all of them publish information on this concrete topic. Media, which for 2018 published articles on autopilot were: *Tengrinews.kz* (news portal), *Zakon.kz* (informational portal), *Ktk.kz* (commercial TV channel), *Kapital.kz* (business portal), *24.kz* (round-the-clock news channel).

All of the above media are popular according to Kazakhstani rating. Internet statistics service (<https://www.zero.kz>) and have a different focus.

The choice of keywords from the text was made using a computer program. Evaluation of words and phrases was made at the expense of their cognitive component.

The main results of the research are presented in the Table 1.

Table 1 - Data of content analysis of Kazakhstani media texts on the car autopilot

The name of edition	Positive	Negative	Neutral
Tengrinews (Tengrinews.kz)	intellectual car computer system	liability for traffic violations	technical operation
	the driver does not get tired while driving on the highway	lack of direct legal prohibition	combined machine control
	moving independently in traffic jam	the same cruise control	Test Drive
	distinguishes road markings	need to correct movement	
number of keywords	4	4	3
Zakon (zakon.kz)	modern technologies	driving license deprivation	active mode
		special parking place	motion sensors
		"pressed" to the roadside	
number of keywords	1	3	2
Ktk (ktk.kz)		criticized the autopilot system	
		drove into a car standing next to the place of another accident	
		autopilot does not make the car completely autonomous	
		emergency	
		similar accident	
		the driver died	
		sensors do not recognize the white truck in sunny weather	
number of keywords	0	7	0

Kapital (kapital.kz)	keep itself in the chosen lane	the new system is still limited in its capabilities	auto control technology
	maintain a speed limit based on traffic signs	the driver will have to keep his hands near the wheel	several onboard cameras
	stop at traffic lights	serious restrictions	central server
	serial autopilots	requires touch to the steering wheel	
	Safe Vehicle Management Technologies		
	several major concerns		
	Pedestrian and cycling detection system		
	help to prevent collisions		
	pedestrian recognition system		
	will warn the driver about the danger		
	will stop the machine in dangerous situation		
number of keywords	11	4	3
24.kz (24.kz)	can correct car course or use brakes	banned the sale of devices	electronic assistant system
		not designed to work without human intervention	
		confuse	
		you need to keep your hands on the wheel and be ready to take control	
		illusion	
		driver distraction	
		unacceptable	
		risk for owners and other road users	
		disables an important defense mechanism	
		criticized	
		cars equipped by it more than once got into accidents	
		in fatal accident	
		often ignore recommendations	
	accused the media of excessive attention		
number of keywords	1	14	1
Total:	17	32	9

So, according to results *Tengrinews.kz* uses an equal number of positive and negative words and phrases when covering the topic of autopilots. The number of neutral keywords differs only by one unit.

Zakon.kz prefer brevity when covering this topic. The ratio of keywords with different estimated markers does not vary greatly.

Ktk.kz for the period under review, published one material about the collision of self-driving car with another vehicle. The material used only words and phrases that are negative.

Kapital.kz. In the publication of this newspaper clearly prevails positive presentation of material on the autopilot system. We can assume that this is due to the fact that the media is aimed at businessmen, from whom publishers can attract investment in this segment of the Kazakhstan car market, which is not developed.

24.kz. Here there is an absolute prevalence of negative material. Compared to positive and neutral labeling keywords, negative ones are used much more often.

When writing such materials, journalists should adhere to objectivity. Moreover, they know about the increased interest from the consumers of information and the paucity of materials on this topic.

Objectivity means that when covering news, reporters don't convey their own feelings, biases or prejudices in their stories. They accomplish this by writing stories using language that is neutral and avoids characterizing people or institutions in ways good or bad (Rogers, 2018). But in this study, it is easy to distinguish between materials where the autopilot system is described on the positive side and where it is described on the negative.

In essence, journalists themselves give an assessment of this system or events related to it (for example, car crashes). Media workers do not use the comments of specialists or experts. Of course, one of the reasons for this is the lack of such specialists in Kazakhstan. But, on the other hand, in the era of globalization, it is not so difficult to find an expert on autopilots abroad and agree with him on a telephone remote interview, for example. Or, as an option, invite him to a TV or radio studio, paying for the transfer. This will entail certain costs from the editorial office, but at the same time the rating of the media will grow.

There are many so-called traps, because of which journalists who strive for objectivity, all the same, express their attitude to the described technology.

One trap beginning reporters fall into is the frequent use of adjectives. Adjectives can easily convey one's feelings about a subject (Rogers,

2018). When conducting a content analysis on the selected material, the following adjectives in journalistic texts were recorded: intellectual, direct, combined, modern, active, special, similar, new, serious, central, dangerous, electronic, unacceptable, important, fatal. This once again confirms that the authors of the text somehow express their personal point of view.

If we will talk about ethical requirements, journalists also need to follow fairness.

Fairness means that reporters covering a story must remember there are usually two sides - and often more - to most issues and that those differing viewpoints should be given roughly equal space in any news story. When reporter writes his story, he should convey both arguments in a neutral language, giving both sides roughly equal space (Rogers, 2018). In the materials that were analyzed as part of this study, news about autopilot cars were covered without a clear gradation between the two points of view.

In the analyzed materials, keywords and phrases that are divided into positive and negative can also be an example of using a loaded language.

Loaded words are a persuasive technique and have also been called emotive language, high-inference language, or loaded terms. Often, loaded language exists as a substitute for other words or phrases, one more negative or positive than the other depending on the circumstance. A loaded word is chosen because the speaker or writer believes it'll be more persuasive than an alternate neutral word (Your Dictionary, 2018). It turns out that the author of the text does not seek to inform the audience as much as possible, but simply tries to convince the readers of the correctness or incorrectness of using the new system. This is confirmed by low rates of using neutral vocabulary in selected journalistic materials.

While loaded language may have a tendency toward brainwashing (or persuasion), it's not always intended to sway the audience. Sometimes, the speaker or writer is merely trying to inform or motivate an audience. This is known as rhetoric. Rhetoric uses language that appeals to emotions but the main goal is to share logic or values (Your Dictionary, 2018). Indeed, the author, using, for example, the phrase "serious restrictions", appeals more to the emotions of the readership. In this situation, journalist could simply list all the limitations and give the audience the opportunity to decide how serious they are.

According to the final results of the research: Kazakhstani mass media rarely publish

materials on this particular topic; they can not maintain neutrality when covering the topic of autopilots (only 16%); domestic journalists more often resort to the use of words with negative labeling (55%); in a positive light the topic is given

only by business media; the audience under the media influence and in the created communication environment gradually forms a negative attitude towards the autopilot system.

Results as percentages are shown in Diagram 1.

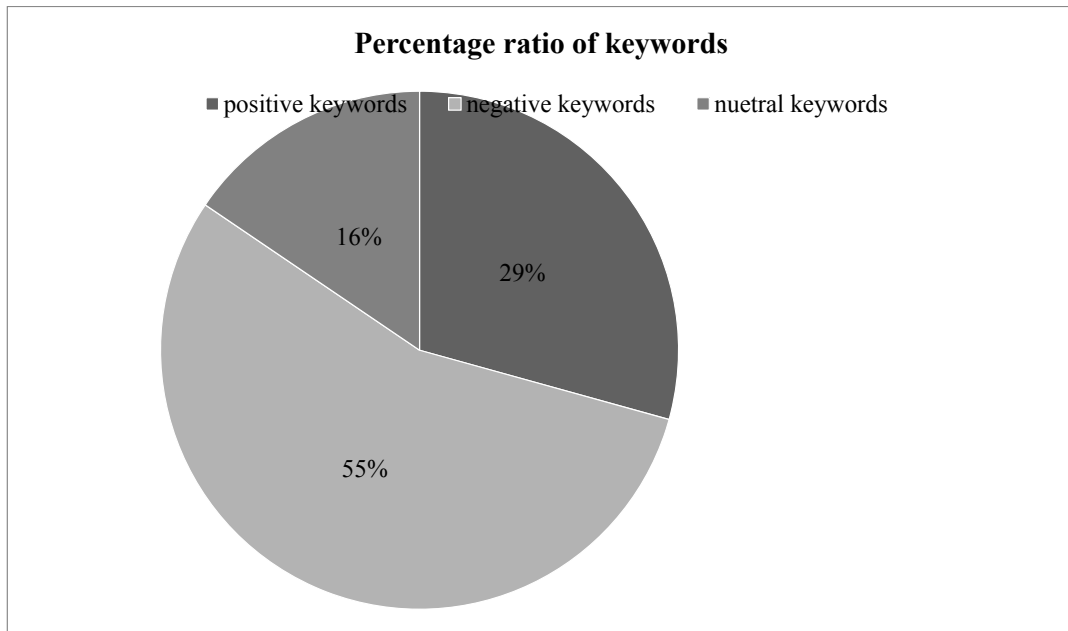


Diagram 1 - Percentage ratio of keywords of different estimated labeling.

This study is limited; firstly, on a territorial basis (Kazakhstan), secondly, on the format of the material under consideration (text), thirdly, language restriction (Russian), fourthly, it has a time limit (2018). The received results can also not be distributed to all Kazakhstani mass media.

Personal assessment is reduced as much as possible through the use of computer programs and apps.

Conclusion

Big car manufacturers and players in other industries have now announced their intention to introduce fully automated cars within the next 10 years (Seif & Hu, 2016).

Let's give some examples: A) *Uber* is actively testing unmanned taxis. B) Residents of one of the villages near the German city of Mannheim are served by the EZ10 electric self-driving bus of the French company *Ligier* (Batalov, 2017). C) American concern *Ford* intends to invest a billion dollars

in the development of cars with autopilot in the next five years (Arosev, 2017). D) KamAZ conducted tests of the first Russian truck with autonomous control in Naberezhnye Chelny. The prototype is based on the serial KAMAZ-5350 (Raspopova, 2015). E) Self-driving car "Odyssey" assembled on the basis of a diesel truck. The machine is equipped with four types of sensors: video cameras, radars, lidars and sonars (Karasev, 2018).

Simply listing these facts already means that the autopilot system in the car is our real future. What will be the views of ordinary citizens on this future reality depends largely on what "notes" (negative or positive) sound in today's journalistic texts.

Due to the high cost of cars with autopilot in Kazakhstan (from 22 million tenge), personal reviews and comments on social networks about it are not common. Therefore, media texts remain the main source of information about self-driving cars. And what these texts will be look like, will affect the perception of media consumers. This will create a defined communication environment.

If we get consolidated results on the evaluation criterion of media texts, we will receive the data on public opinion formed by the media. To date, this perception has a bias towards negative.

Pursuing this study, another problem surfaced - in Kazakhstan there is no journalist who would highlight this topic on an ongoing basis. Highly specialized reporters are generally rare; editorial offices strive to hire universals who can write about everything: from politics to economics, from ecology to new technologies. And this trend is characteristic not only for Kazakhstan, it's becoming global.

For example, member of Tesla Motor Club from Cambridge are also asking to recommend good

objective journalist who are knowledgeable about autopilot (Autopilot & Autonomous/FSD, 2019). This search did not end with success.

In order to write on topics related to engineering and technology, it is necessary not only to keep abreast of new developments, communicate with experts, but also to understand how the introduction of these developments can affect the economic and social situation. This list of skills goes on... The way out of this situation may be additional education for journalists in the form of trainings or seminars.

The results of this study can be used for such journalist's trainings, further research in this area, as well as in studying the part of the Asian's mass media content.

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