

Artificial Intelligence, between Opportunity and Challenge

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Abstract: *As part of the 4th Industrial Revolution, the emergence of Artificial Intelligence will change almost all economic activities, and it will create enormous social and economic opportunities. It will also pose major challenges, accompanied by ethical dilemmas. The present study focuses on the perceptions of current employees predominantly from the IT area, on the development of AI. The aim is to capture the attitudes they have towards the emergence and the development of AI, the impact that it might have on certain sectors of social life and people in general. We sought for the 280 online surveyed subjects to have been employed for at least 6 months, assuming that being already anchored in their professional lives might reduce their biasness. The working methodology allowed us to process and interpret data both quantitatively and qualitatively. The results of the study could be used to predict possible changes that could occur in the future as an effect of the development of Artificial Intelligence, but also to reduce the negative impact that it could have.*

Keywords: *Artificial Intelligence; impact; social life; employed.*

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Introduction

At the moment, Artificial Intelligence may be one of the most attractive subjects for researchers from almost all fields. We find ourselves at the stage in which digital evolution is enhancing human abilities and slowly replacing people in many activities. We still do not know yet what humanity will look like in the age of artificial intelligence and what changes it will effect on the structure of society. The development of AI poses certain existential questions to which we still do not have an answer. There are many fields in which AI applications are expected to have a positive impact on society: transportation (autonomous, electric vehicles, predicting and avoiding traffic jams, etc.), medicine (disease monitorization and treatment, reducing faulty diagnoses, etc.), economy, environment protection (reducing pollution), citizen safety, etc.

Nevertheless, there are also fears connected to AI development, such as intelligent weapons, human replacement, cyber-attacks etc. (Nadimpalli, 2017; Osoba & Welser IV, 2017; Scharre, 2016). Stephen Hawking, Elon Musk, Steve Wozniak, or Bill Gates (Musk, 2014; Gates, 2008) are just some of the personalities that have openly shared their concerns about super-intelligent AI systems. Even if at the moment we find ourselves at the stage in which we can only talk about narrow AI (Kurzweil, 2005), we are moving fast towards the development of artificial general intelligence (AGI), namely AI machines which could be as intelligent as humans, and could carry out any intellectual task (Pennachin & Goertzel, 2007). Elon Musk together with Microsoft are currently investing a billion dollars in this business.

The way in which AI is perceived by the public may very well influence the way in which AI is developed, implemented, and regulated. During the *Artificial Intelligence and the Future of Humans* study, carried out in 2018, 979 pioneers of technology, innovators, developers, business and political leaders, researchers, and activists answered questions regarding the challenges and fears they had about the development of AI. They also put forth a number of suggestions about a better future.

“The five most-often mentioned concerns were: 1) the use of AI reduces individuals’ control over their lives; 2) surveillance and data systems designed primarily for efficiency, profit and control are inherently dangerous; 3) displacement of human jobs by AI will widen economic and digital divides, possibly leading to social upheaval; 4) individuals’ cognitive, social and survival skills will be diminished as they become dependent on

AI; and 5) citizens will face increased vulnerabilities, such as exposure to cybercrime and cyberwarfare that spin out of control and the possibility that essential organizations are endangered by weaponized information. A few also worried about the wholesale destruction of humanity.” (Anderson & Rainie, 2018).

During a study on AI carried out in Romania (Gherheș & Obrad, 2018), we noticed that there is a positive attitude towards the emergence of AI, since it is considered as having a positive influence on society. Most respondents describe themselves as optimistic when thinking about what might happen in the future due to the development of AI. However, another study reveals the opposite sentiment: that devices equipped with AI will affect interpersonal relationships, that there will be fewer jobs for people, that economic crises will emerge, that it will be used to manufacture intelligent weapons, increase military conflicts, take control of humanity and, last but not least, destroy mankind. (Gherheș, 2018a). Another likely scenario is that the development of AI devices will lead to the advent of sophisticated robots, and new jobs. The participants believe that, in the future, AI development will lead to better medical care and that human health will improve. The respondents also believe that human comfort will increase and that entities / devices equipped with AI will exceed human intelligence, becoming independent and capable of thinking and acting by themselves. (Gherheș, 2018b).

In the Eurobarometer on *Attitudes towards the Impact of Digitisation and Automation on Daily Life* (n.d.), 68% of respondents agree that robots and artificial intelligence are good for society because they help in day to day tasks.

Starting from the ideas above and the conclusions of the aforementioned studies, we set ourselves the goal of eliciting a number of reactions and answers from those who will be the main beneficiaries of AI development: the people employed in IT.

Methodology

Building our work tool started from a number of questions: is there enough information about AI and its applications among the target population? What are the attitudes of employees in the IT sector regarding the emergence and development of AI? What are the opportunities and challenges that AI can bring in the future?

The tool that we used in order to gather the data was the anonymous, online questionnaire, posted on the Isondaje.ro platform (an

online survey service). We opted for the online questionnaire due to it being fast, inexpensive, and the easy access to the database it provides. 280 people answered our questionnaire, which is not a representative sample for the studied population, but due to this being a pilot study, the answers might help sketch certain tendencies vis-à-vis the phenomenon.

One first goal of our survey was to identify the associations that the respondents make when they think of the term “artificial intelligence.” Most respondents (51.8%) envisage robots and computers, first and foremost, categories which are then followed by those associated with science (31.1%).

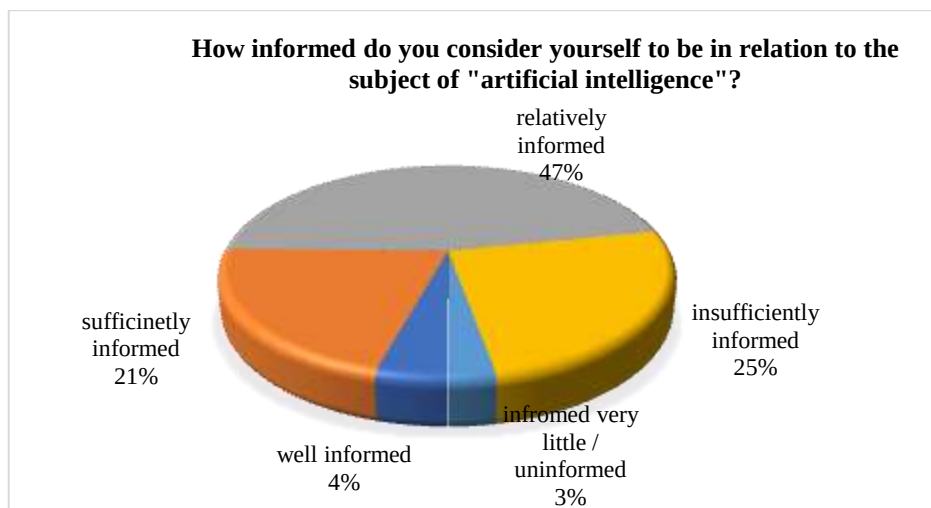


Figure 1. The degree to which the respondents considered themselves informed about AI

As can be noticed in Figure 1, most respondents (47%) consider themselves to be relatively informed about the subject of artificial intelligence. When it comes to the other answer variants, we notice a mirrored distribution, in that the percentage of those who consider themselves very well informed (4%) is almost the same as they one of those who consider themselves uninformed (3%).

We come across a similar situation in the case of those respondents who declare themselves to be sufficiently informed (21%), and those who claim to be insufficiently informed (25%) when it comes to artificial intelligence. The topic has grown in popularity recently, which is why most interviewees declared that they heard about it during the current week (39.3%), and month (29.6%). These categories are followed by those who

say they heard people talking about AI during the past few months (14.3%), and during this year (9.6%).

The perception of the manner in which the topic of AI was presented to them was positive for more than half of those questioned (54.6%). The following category is made up of those who considered that the manner in which the information was presented to them was neutral (40.4%). It seems that only 5% of our respondents consider that AI was presented negatively to them.

Generally, the respondents manifested a positive attitude towards the accelerated development of AI. By cumulating the answer variants *a good thing* and *a relatively good thing* to the question aimed at uncovering the respondents' attitude (*In your opinion, the accelerated development of artificial intelligence is...*) we obtain a total score of 65.6%, which demonstrates that more than half of the interviewees view the development of AI positively. There is also the category of those people who believe that the accelerated development of AI is a rather bad thing, but their percentage stands at only 7.2.

Closely connected to this subject is the fact that for more than half of the respondents (67.9%) the accelerated development of AI does not represent a reason for concern (*Are you worried about the rapid development of artificial intelligence?*). There is, however, a category of people who claim to be concerned about the development of AI (24.3%), to which we can add the category of those who are undecided (7.9%).

A confirmation of the respondents' positive attitude towards the emergence and development of AI devices results from their answers to the question *Do you believe that the development of artificial intelligence will influence society's evolution positively?* By analyzing the results, we find that 65.4% of respondents are optimistic about AI's influence on society. The pessimists register only a score of 20.7%.

As you can see in the figure below, the year when most respondents think that AI will exceed human intellectual performance is 2030 (21.4%). A more long-term perspective, the year 2100, is taken into consideration by 15% of the respondents, whereas 11.8% believe 2050 to be the watershed moment. We can't afford to neglect the category of those who don't know/won't answer, representing almost a third of all answers (33.2%).

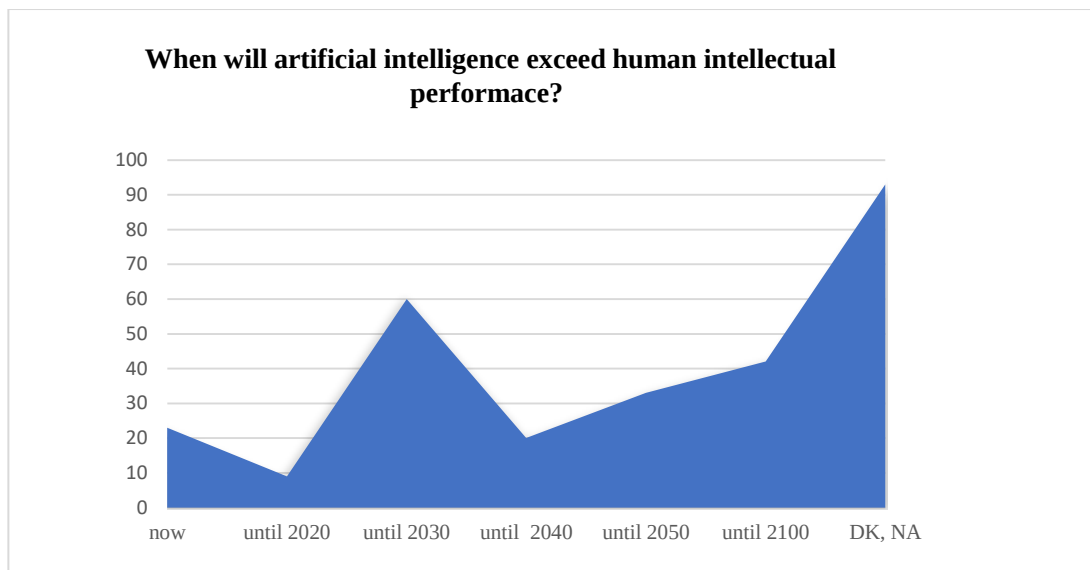


Figure 2. The estimated moment when AI will exceed the intellectual performance

When they had to answer in what fields they believe AI will outperform humans, as we can notice in the table below (Table 1), more than half of the participants consider that, in the future, artificial intelligence will overtake humans first and foremost in the automotive industry, followed by agriculture, banking, fire-fighting, and public transport. At the other end, the fields where more than 50% of people believe that AI will not be superior to humans are: artistic creation, education, citizen safety. Medicine/surgery also registered a high score (46.1%). Surprisingly, when it comes to the military field, only 41.8% of participants consider that AI will be superior to humans, even though it is well known that the military industry is investing heavily in AI. The military is the field with where most interviewees opted for the *don't know/won't answer* variant.

Table 1 The fields in which AI is believed to become superior to humans

		Yes	No	DK/NA
In which of the following field do you believe that artificial intelligence will exceed humans?	the automotive industry	87.1%	6.8%	6.1%
	courier and package delivery services	62.5%	28.2%	9.3%
	public transport	53.6%	34.6%	11.8%
	medicine/surgery	35.7%	46.1%	18.2%
	the military	41.8%	36.1%	22.1%
	agriculture	66.1%	20.0%	13.9%

the banking system	65.7%	21.4%	12.9%
citizen safety	29.6%	52.5%	17.9%
fire-fighting	55.7%	30.4%	13.9%
education	21.8%	63.6%	14.6%
artistic creation	13.9%	76.1%	10.0%

Another important detail highlighted by the study was that 56.1% of the respondents totally agree that AI should replace humans in certain jobs and activities. Only 19.6% disagreed with this idea, while only 12.5% declared themselves indifferent. The respondents' confidence in AI carrying out certain tasks is very high (34.6%), or total (in 29% of the answers) especially when it comes to administrative work in public institutions. When it comes to AI performing surgery on a relative, the scores were 10.4% for *total trust*, and 22.9% for the *a lot of trust* answer variant. 8.6% of the respondents trust AI completely to give a medical diagnosis, whereas 33.6% declare themselves as having a lot of trust in AI to do this. AI piloting a passenger airplane scored 13.9% for the total trust answer variant, and 30.4% for the a lot of trust answer. For these two answer variants, AI driving a vehicle scored 16.1% and 33.9%, respectively.

Closely connected to this, another question posed to the questionnaire respondents was whether they would agree with their family using an autonomous (i.e. self-driving) car, if they knew that the accident risk was lower for these types of cars than for those with a driver. By adding up the number of answers for *a very high degree* and *a high degree* answer variants, we can observe a preponderantly positive attitude towards this idea. The category of skeptical answers scored 29% of the total, by cumulating the answer variants *to a small degree* and *to a very small degree*.

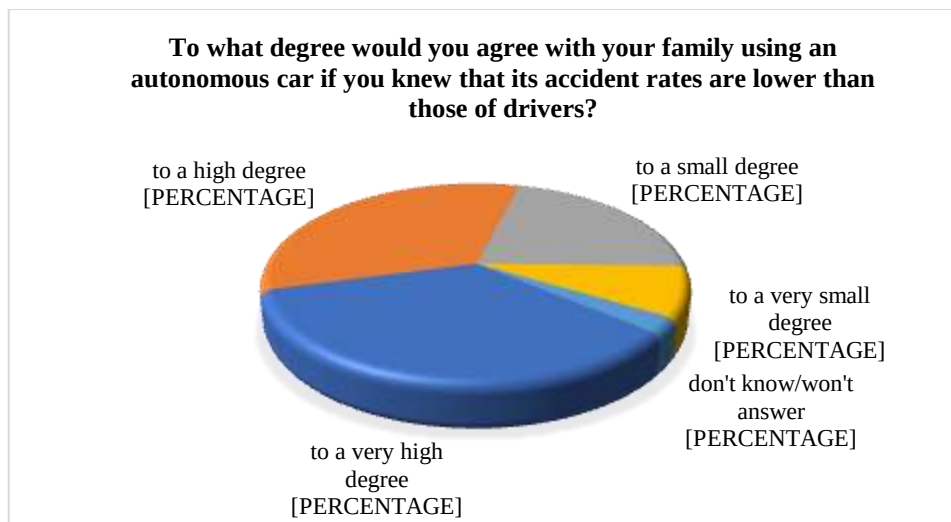


Figure 3. Permission to use an autonomous car by your family members

What are the most likely consequences of AI development in the future? How will the new technologies change our lives? Will new jobs appear? Will we learn how to use material resources more efficiently? Will human comfort increase? Will human life expectancy increase? These were the questions that the respondents were asked, with emphasis on the most probable results of AI development and its benefits in the future. The probability of building sophisticated robots garnered most answers by cumulating the *quite likely* and *very likely* answer categories (87.1%). Another positive consequence of AI development is the emergence of new jobs, as illustrated by the figure below. The high percentages scored by the *quite likely* (33.6%) and *very likely* (48.9%) answer variants lead us to the conclusion that in the respondents' opinion this is a very probable outcome. There are studies (The Future Laboratory and Microsoft, n.d.) which foresee that 65% of today's pupils are likely to have jobs that are not yet in existence.

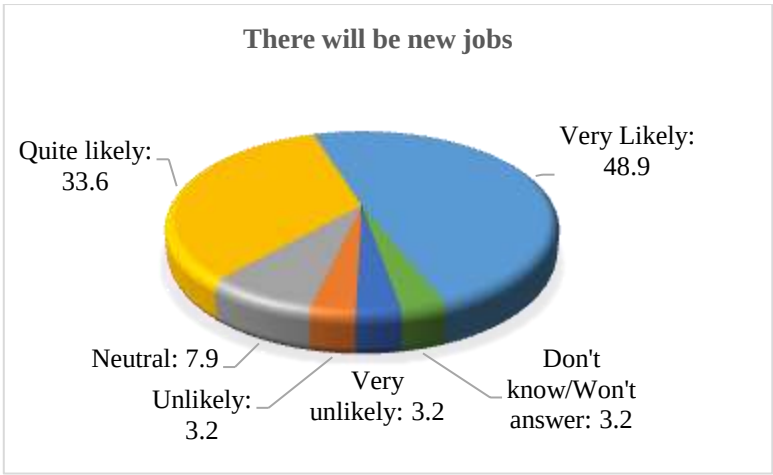


Figure 4. Estimating the chances of emerging new jobs in the labor market

Enhancing human comfort is also considered to be a possible consequence of AI development. 38.6% of our respondents consider this very likely, while 43.9% believe the outcome is quite likely.

Table 2. Perception of AI development on healthcare and the use of material resources

What do you believe will be the most likely consequences of AI development?	Medical services will improve	We will use natural resources more efficiently
Very unlikely	3.9%	5%
Unlikely	3.6%	7.9%
Neutral	9.3%	11.8%
Quite likely	45.7%	37.9%
Very likely	33.6%	32.1%
Don't know / Won't answer	3.9%	5.4%
Total	100.0%	100.0%

In our participants' opinion, using material resources more efficiently (Table 2) is a possible consequence of AI development (as you can in the table above, more than two thirds of those interviewed believe this is likely). In close connection to this, the decrease of pollution is another scenario that our respondents were asked to consider. However, the numbers are not that high. Each of the answer variants, very likely and likely, scored 23.2%. The skeptics represent 27.5%, which tells us that almost one third of all the

respondents are reluctant to believe that pollution will decrease in the future as a result of AI development.

Table 3. Perception regarding AI development and its effects on human abilities and health

What do you believe will be the most likely consequences of AI development?	Human health will improve significantly	It will lead to the appearance of humans who enhance themselves with the help of technology
Very unlikely	4.3%	7.9%
Unlikely	10.4%	7.1%
Neutral	12.5%	16.8%
Quite likely	35.7%	31.8%
Very likely	32.9%	27.9%
Don't know / Won't answer	4.3%	8.6%
Total	100.0%	100.0%

A high degree of confidence in the scenario that human health will improve significantly due to AI also registered high scores. Observing the data in Table 3, we can see that almost two thirds of our participants see this as a likely outcome. Similarly, more than half of our interviewees believe that the development of AI will lead to the appearance of individuals who will enhance their abilities with the help of AI.

Table 4. Perception of AI development on people's longevity

What do you believe will be the most likely consequences of AI development??	Human life-expectancy will increase	People will become immortal
Very unlikely	6.8%	63.9%
Unlikely	17.1%	12.1%
Neutral	20.7%	10.7%
Quite likely	25.7%	3.2%
Very likely	22.1%	2.9%
Don't know / Won't answer	7.9%	7.1%
Total	100.0%	100.0%

Besides the fact that the future will see substantial improvements in human health as a result of AI development, about 50% of our respondents consider that human life-expectancy will also increase (Table 4). The same thing cannot be said about the assertion that people will become immortal,

where all answer variants garnered only 6.1%. Moreover, almost two thirds of the participants believe it is very unlikely to happen in the future.

Table 5. Perception about the development of AI regarding social equity and work performance

What do you believe will be the most likely consequences of AI development??	There will be more social equity	People will no longer have to work. Robots will do the work for them
Very unlikely	15.4%	16.1%
Unlikely	28.9%	28.8%
Neutral	27.5%	22.1%
Quite likely	10.7%	21.1%
Very likely	8.6%	9.8%
Don't know / Won't answer	8.9%	4.3%
Total	100.0%	100.0%

There is not a lot of optimism regarding social equity (Table 5), most respondents declaring themselves neutral towards this idea (27.5%). By cumulating the numbers for the *quite unlikely* and *very unlikely* answer variants, we obtain a score that corroborates the statement above. The idea that in the future robots will do most jobs so people no longer have to work is also a scenario that most respondents do not agree with. Although there are many studies foreshadowing the replacement of humans with robots, it seems that our research participants are not that convinced by these predictions. Only 30.9% of them believe this will happen, 34.9% are skeptical, whereas 22.1% declare themselves neutral.

The list of scenarios that we put forth to our respondents included a set of possible negative consequences that might come about in the future as a result of AI development. The most believable scenario to our participants is that AI will be used to create intelligent weapons (Figure 5), as shown by the high scores registered on both *very likely* (45.7%) and *quite likely* (31.1%) answer variants.

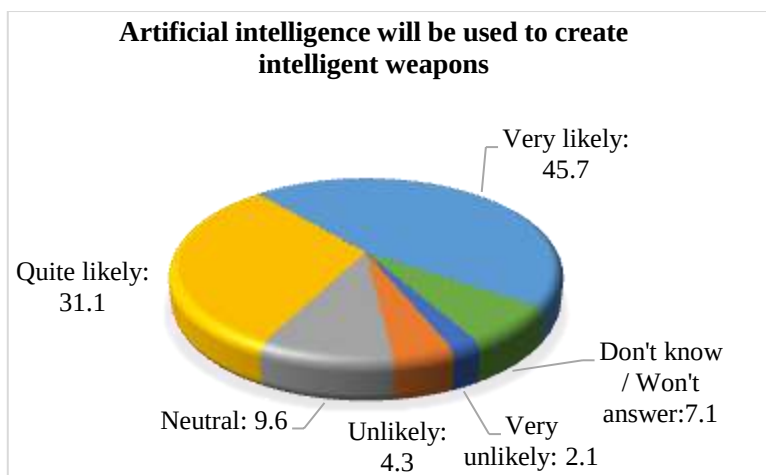


Figure 5. Consequences of AI development

Another situation that our respondents consider likely in the future is that there will be fewer jobs for people. Cumulating the numbers for those who declared that this outcome is *quite likely* and *very likely* yields a score of 72.8%. The third scenario for which the *quite likely* and *very likely* answer variants scored high was the one in which international cyber-attacks were going to take place. In this case, the two answer variants mentioned before cumulated 69.3%. In the respondents' opinion, it is very probable that in the future intelligent weapons will be controlled by people (cumulating the *quite likely* and *very likely* answer variants yielded 64.7%). This is connected to the conviction that AI will be used to create intelligent weapons.

For the statement *that artificial intelligence will lead to the escalation of military conflicts*, we notice that the respondents' opinion believe this, too, is a likely scenario in the future (*very likely* – 15%, *quite likely* – 26.1%). These categories are followed by those who are undecided (21.8%). Cumulatively, 29.2% of our interviewees consider that the development of artificial intelligence will aggravate military conflicts.

Table 6. Perception about AI development and interpersonal relationships

What do you believe will be the most likely consequences of AI development??	AI devices and entities will impact inter-human relationships negatively	Losing control over personal information is a risk
Very unlikely	7.9%	7.9%
Unlikely	15.7%	17.5%
Neutral	20.4%	16.4%

Quite likely	21.4%	27.9%
Very likely	29.6%	25.0%
Don't know / Won't answer	5.0%	5.4%
Total	100.0%	100.0%

The risk of losing personal information and the fact that AI devices and entities will have a negative impact on inter-human relationships are other two scenarios that more than half of the participants see as likely in the future (Table 6). The number of respondents who do not believe that in the future inter-human relationships will be impacted negatively by AI devices/entities is relatively small (*very unlikely* – 7.9%, and *unlikely* – 15.7%), which is a somewhat similar situation with the answer variants for those who do not believe that there is a risk of losing personal information (*very unlikely* – 7.9%, and *unlikely* – 17.5%).

Table 7. Possible consequences of AI development

What do you believe will be the most likely consequences of AI development?	Artificial intelligence will consider humans to be a threat	Humanity will be destroyed by AI
Very unlikely	27.5%	23.6%
Unlikely	27.9%	26.4%
Neutral	16,1%	19.3%
Quite likely	11.1%	11.4%
Very likely	7.1%	8.6%
Don't know / Won't answer	10.4%	10.7%
Total	100.0%	100.0%

As you can see in the table above (Table 7), the responses for the scenario in which artificial intelligence will start to believe that humans are a threat embodies a reversal of the attitudes above: 27.9% of the participants consider this scenario *very unlikely*, whereas 27.5% are in the *unlikely* category. These are the answer variants with the highest scores, 55.4%, of all the responses to this question.

The last scenario in our questionnaire was whether humanity will be destroyed by artificial intelligence. Most participants consider the apocalyptic situation as *unlikely* (26.4%) and *very unlikely* (23.6%). At the opposite end, we see a 19.3% score obtained by cumulating the *quite likely* (11.4%) and *very likely* (8.6%) answer variants.

Conclusions

The results show that most participants associate the notion of AI with robots and computers. They also consider themselves as being moderately well informed about AI. Almost 40% of them heard people talk about the subject this week, whereas approximately 30%, this month. In other words, at the moment, AI represents an interesting topic of conversation. More than half of those questioned (54.6%) declared that the information reaching them about AI was positive. It is possible that this positivity has influenced the respondents' positive attitude towards the fast-moving development of AI, since they believe it will have a positive impact on society. The general belief is that AI will surpass humans in the automotive industry, followed by agriculture, the banking system, fire-fighting, and public transportation.

Most respondents who work in IT would agree that AI should replace people in certain jobs and activities. The highest percentages were in favor of AI replacing people in doing all administrative work in public institutions (the respondents' confidence in AI carrying out this task is very high – 34.6% - or total, in 29% of the cases). They also manifested a predominantly positive attitude (68%) towards the idea of their family using a driverless car if they knew that such cars presented a lower risk of accidents.

Regarding the benefits that the development of AI would bring, most interviewees believe that we would have sophisticated robots, new jobs, greater human comfort, more efficient use of material resources, less pollution, and that human health would improve. At the other hand, the greatest fears connected to AI development take the shape of intelligent weapons, fewer jobs, cyber-attacks, losing personal information, and AI devices / entities negatively affecting inter-human relationships, etc.

As we can see, AI elicits both positive reactions towards its development, as well as fears. The manner in which the information about its impact on society will be introduced, will influence the way opinions and behaviors are formed, but also the way in which the population will either accept or reject AI technologies.

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