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**Should Legal Capacity Be Granted To Fully Autonomous Artificial Intelligence
Systems?**

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SUMMARY

The aim of this research is to address the issue of granting legal capacity to fully autonomous artificial intelligence systems.

Artificial intelligence is swiftly developing lately and is expected to evolve in the future. This type of creation might well be fully autonomous and able to act without the external human control, using only its developed intelligence, and trying to reach its independent aims.

Since scholars, scientists and public figures predict that even fully autonomous artificial intelligence systems are due to be created, the question, which could be caused, is whether these evolved species should be given a valuable privilege of legal personality? In order to approach the solution to the problem addressed, this thesis includes several aspects, relevant in order to achieve it.

To begin with, the general concept of legal capacity is introduced. Following this aspect, the main features of both natural and juridical persons are addressed, in order to become familiar with the content of legal capacity, or in other words, to be aware – what features do these individuals, which are at present granted legal capacity, possess.

Furthermore, the different topic of artificial intelligence is explained, having the aim to clarify, what are the features of artificial intelligence, and whether these features conform with the criteria, which are needed in order to be granted legal capacity. Following this, the additional questions and concerns are being discussed, which are relevant while deciding the present issue.

Finally, the conclusions of the research have been made, regarding the presented problem.

SANTRAUKA

Dirbtinis intelektas yra inovatyvus išradimas, kurio svarba nuolat auga, pritaikomumo apimtis vis didėja, ir galimybės nuolat plečiasi. Dėl šių priežasčių, yra manoma, jog artimiausiu metu, dirbtinis intelektas pasieks tokį pažangumo lygį, kad jo protinės savybės ne tik nesiskirs nuo tų, kurias turi žmogus, bet ir jas aplenks. Paminėtina, jog dirbtinis intelektas neapsiribos vien tik žmogų pranokstančiomis savybėmis siauroje srityje, bet tarsi žmogus turės galimybę išmokti daugelio įvairių aspektų. Kas dar svarbiau, šie žmogaus kūriniai turės galimybę veikti esant sumažintai žmonių kontrolei, arba nesant jokios kontrolės. Taigi, manoma, kad atsiras ir autonomiškų dirbtinio intelekto sistemų.

Žinant tai, kokia pažanga yra prognozuojama minėtoms sistemoms, atsiranda būtinybė jas apibrėžti ir teisiškai. Ar šios sistemos gali būti pripažįstamos teisės subjektu, jeigu jos veiks visiškai atskirai nuo žmogaus? Kadangi nė vienas dabartinis teisės subjektas neveikia atskirai nuo žmogaus: fiziniai asmenys ir yra žmonės, o juridiniai veikia per juos valdančius fizinius asmenis. Tačiau kita vertus, ar yra teisinga nesuteikti teisinio subjektiškumo sistemai, kurios dauguma savybių sutampa su suaugusio ir veiksnus žmogaus savybėmis? Tai yra klausimai, į kuriuos radus atsakymus, būtų atsakyta ir pagrindinis šio magistro darbo klausimas – ar gali teisinis subjektiškumas būti suteiktas visiškai savarankiškam dirbtiniam intelektui?

Norint surasti atsakymą į pateiktą problemą, būtina atlikti keletą veiksmų. Pirmiausia, privalu išsiaiškinti, kokia yra teisinio subjektiškumo samprata ir koks yra jo turinys, aptariant ir fizinius, ir juridinius asmenis, t.y. tuos, kuriems jau yra suteiktas teisinis subjektiškumas. Antra, reikia suvokti, kokios yra pagrindinės dirbtinio intelekto savybės, ir koks yra jo galimybių lygis. Trečia, būtina apibrėžti, ar dirbtinio intelekto savybės atitinka reikalavimus, keliamus asmeniui, kuris yra teisės subjektas. Galiausiai, privalu išsiaiškinti ir galimas teisinio subjektiškumo suteikimo dirbtiniam intelektui pasekmes bei grėsmes.

Visa tai aptariama šiame darbe, ir tai aptarus, siekiama pateikti išvadas ir rekomendacijas, bei prisidėti prie bendros sampratos apie dirbtinio intelekto teisinį subjektiškumą, kūrimo, taip siekiant pasitarnauti ateities įstatymų leidėjams.

INTRODUCTION

Fully autonomous artificial intelligence systems, such as robots, who have an ability to decide their own actions, constantly take part in various science fiction movies and books, and, therefore have reached minds of the vast majority of world's people. People are already used to them as to one of the most common „species“ in the popular culture. However, the dominant belief nowadays among IT specialists, law researchers and scientists, is that fully autonomous artificial intelligence systems are due to become a part of the world's community in the near future.

However, if creation of these subjects is one important task, another crucial aim is to determine the upcoming legal status of fully autonomous artificial intelligence subjects.

The humanity deserves to know, whether artificial intelligence entities should be empowered with same rights and responsibilities as human beings, or they should be granted less of them. In other words, community must be aware, if there are sufficient reasons to allow humans to make sales contracts with artificial intelligence subjects, to employ them, or even, to grant them such powers as to enact laws or to judge in the court, as well as many other rights, which are at present exclusively assigned to human beings, and in some instances, to juridical persons.

First steps towards the empowerment of artificial intelligence systems with certain rights, were taken by the European Parliament, which issued a Resolution concerning the matter. This Resolution indicated that in a long run, a specific legal status for robots shall be granted, „so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently.“¹

However, despite the position of the European Parliament, the main issue of this thesis remains unsolved, since the thorough investigation of this topic could also lead to the conclusion, that the action of the legislative power of the European Union was not in accordance with the dominant opinion regarding artificial intelligence and legal capacity. In order to approach the answer to the main question addressed, there are several aspects to be taken into account.

Firstly, the concept and content of legal capacity has to be addressed regarding both natural and juridical persons. Secondly, the relevant part is to clarify, what does the notion of artificial intelligence mean and what characteristics does it possess. Thirdly, it is necessary to establish, whether the features of artificial intelligence are sufficient to grant them legal capacity.

¹ EP Resolution 2015/2103(INL) , ¶ 59, section f).

Furthermore, the issues of morality and consciousness, attributed to capable natural persons, must be discussed as ones of the main importance, if we begin a consideration about granting legal capacity to a particular artificial entity. The possibility of overtaking the control of the world by highly advanced artificial intelligence subjects, what might lead them to becoming the dominant race on the planet is another sensitive and important issue. And the final consideration discussed, is the liability issues of the artificial intelligence subjects.

Moreover, the discussion and critique, consisting of the author's logical reasoning will be provided, and the work shall be finished with the conclusions and possible proposals for the future legislation, regarding the presented topic.

PROBLEM, OBJECT AND AIM OF THE RESEARCH

Problem. It is unclear, whether legal capacity should be granted to fully autonomous artificial intelligence systems.

Object. Legal capacity of fully autonomous artificial intelligence subjects.

Aim. By revealing the content of legal capacity, conceptual features, benefits and threats of fully autonomous artificial intelligence systems, having regard to the scholars' opinions, provided in their researches, to determine whether fully autonomous artificial intelligence systems should be granted legal capacity, and to provide regulatory proposals.

RELEVANCY OF THE PROBLEM

The issue, addressed in the title of the present research is firstly relevant, because multiple scholars of law and other disciplines attempt to find answer to the problem addressed for several decades, but still cannot reach the unanimity.

One group of authors provide the opinion, that artificial intelligence systems could be granted legal capacity, in the event that they have certain capabilities. Scholars providing the aforementioned outlook include the law professor of Georgetown university Lawrence B. Solum, Jessica Berg, Alexis Dyschkant and Frank van Dun.

As opposed to, there are certain researchers, who believe that granting legal capacity even to fully autonomous artificial intelligence subjects is an unacceptable solution. Specifically, these scholars are the law specialist and bioethicist Wesley J. Smith and Rob van der Hoven van Genderen – the law expert of Vrije University in Amsterdam. The third group of researchers, such as the philosopher of science and technologies Peter M. Asaro, argue that the most acceptable solution would be to grant artificial intelligence just some of the rights, that are at present attributed to legal persons.

Secondly, this topic is relevant because of the development and increased usage of artificial intelligence systems in recent years. In 2018, in comparison to 2017, the amount of companies using artificial intelligence has vastly increased, along with the investments into this area.² Furthermore, the prototypes of both physically and intellectually human – resembling artificial intelligence systems have been already produced.³ While technologies advance in a high pace, it is a high probability that fully autonomous artificial intelligence subjects will be manufactured in near future, and should be integrated in the world's community.

However, the question, which arises in this regard, is whether the rights and responsibilities should be granted to these subjects. Moreover, the aim is to find an answer as briefly as possible – preferably – before the commission of fully autonomous artificial intelligence subjects, since there is a necessity to avoid rash and unadvised laws enacted by the future legislative powers, which could cause a significant harm to world's community.

All things considered, the scholars' discussion regarding the topic, and the advancement of artificial intelligence suggest, that the question addressed is relevant for the development of human race, while the inability to reach the unanimous solution reveals, that the problem is not yet solved and requires further investigation.

² Mitchell Feldman , *10 Real-World Examples of Machine Learning and AI*, (2018)
<<https://www.redpixie.com/blog/examples-of-machine-learning>> [visited on 2018-04-05]

³ <<http://www.hansonrobotics.com/robot/sophia>> [visited on 2018-04-05]

NOVELTY OF THE PROBLEM

As already mentioned before, the area of artificial intelligence is specifically emerging in recent years, thus it is undoubtedly an innovative field of research. Since artificial intelligence has just recently significantly emerged, and is expected to become even more relevant in the future, the amount of scholars' researches regarding the narrow topic of legal capacity regarding artificial intelligence, is low in comparison to researches provided regarding other topics. Even in those articles, which address the topic of artificial intelligence, the discussion about its possible ability to gain rights and responsibilities is not a primary question to be answered, and often is not addressed at all.

Therefore, there is a space for novel investigation on the topic and new original ideas regarding the subject.

Furthermore, the novelty of the present issue could be grounded by the fact, that there is still a lack of common consensus between scholars, regarding the problem. Therefore, there might be an area for novel ideas.

Moreover, the researches regarding this topic in Lithuania could only be limited to only two of them: firstly, in 2015 the master of law Inesa Budaitė investigated the following issue: „Whether artificial intelligence system could be regarded as a legal subject?"; and secondly, scholars of law: Dr. Paulius Čerka, Dr. Jurgita Grigienė and Gintarė Sirbikytė have provided the article „Liability for damages caused by artificial intelligence“.

OBJECTIVES OF THE STUDY

1. To reveal the concept and the content of legal capacity.
2. To overview the development, conceptual features, benefits and threats of fully autonomous artificial intelligence systems.
3. To summarize the research results in the context of legal capacity of fully autonomous artificial intelligence systems.
4. To determine, whether legal capacity should be granted to fully autonomous artificial intelligence systems.
5. To provide regulatory proposals for future legislature, regarding the topic of fully autonomous artificial intelligence, particularly, regarding its legal capacity issues.

KEYWORDS

Legal capacity, artificial intelligence, fully autonomous, autonomy.

METHODS OF THE RESEARCH

Since the current thesis is highly theoretical, the methods chosen to find certain solutions are also theoretical. Further, all methods are explained.

Descriptive method is used in order to provide current scholars' ideas regarding legal capacity and artificial intelligence, and to provide the current legal regulation concerning these matters.

Analytical method is used in order to specify the notions of legal capacity and artificial intelligence by finding the elements of these concepts.

Linguistic method in this thesis is used mainly to explain semantics (the true meaning of certain linguistic units), regarding both: the elements of legal capacity and artificial intelligence.

Systematic analysis method is used in order to explain the issue in the wider scope, while taking moral, ethical and psychological aspects of the issue into account.

Comparative historical method is used in order to find historical references, while aiming to solve the issue of this research.

Hypothesis – full legal capacity should not be granted to fully autonomous artificial intelligence systems - it shall be restricted or not granted at all. This hypothesis is formed, since there are possible threats and unpredictability regarding the issue.

1. LEGAL CAPACITY AND ARTIFICIAL INTELLIGENCE

1.1. General Concept of Legal Capacity

In order to address the issue of whether the legal capacity should be granted to fully autonomous artificial intelligence systems, it is obligatory to reveal the concept and content of legal capacity itself at the beginning.

The portuguese legal scholar of the university of Minho in Braga, Francisco Andrade, and IT specialists of the same university Paulo Novais, Jose Machado and Jose Neves reveal, that „in legal theory “personality” is not a “physical” or “natural” concept, it is rather the capability of being a subject of rights and obligations.“ They also believe, that „it is „important to establish “whether the entity can and should be made the subject of a set of legal rights and duties”“, and capable „of being a centre of production of legal effects (constitution, modifying, and extinction of legal relations).“⁴

The aforementioned scholars essentially believe, that the legal capacity means an ability to have or be able to create particular rights and responsibilities, and that the notion „legal capacity“ is not merely connected with being a natural person.

These ideas are firstly supported by the german legal philosopher Hans Kelsen, who stated that „personhood in the legal sense is only a technical personification of a complex of norms, rights and duties.“⁵

Moreover, mexican law specialist Eduardo Garcia Maynez, also agrees with the former opinions, by stating that a “person” is „any being capable of having powers and duties“.⁶

Eleonora Badan – Melnic and Claudia Lechi, law researchers of the university of Chisinau in Moldova, did also indicate that „the civil capacity<...>consists in the ability to have rights and obligations, it allows various entities, physical persons and juridical persons, to have the quality of civil law subjects.“⁷

In contrast, there exist other scholars‘ opinions, of what legal capacity is. For example, Steven M. Wise states that legal capacity is an ability to possess at least one right, and therefore animals would be deemed as being legally capable.⁸ Carl von Savigny indicates, that only natural

⁴ Francisco Andrade et al., “Contracting agents: legal personality and representation“, *Artificial Intelligence and Law* (2007), p. 362, <https://doi.org/10.1007/s10506-007-9046-0>

⁵ Elvia Arcelia Quintana Adriano, „The Natural Person, Legal Entity or Juridical Person and Juridical Personality“, *4 Penn. St. J.L. & Int'l Aff.* 363 (2015), p. 370, in Hans Kelsen, *Pure Theory of Law*, (2000), p. 178

⁶ Id, in Eduardo Garcia - Maynez, *Introduction to Law* (31st ed., 1980), p.21

⁷ Eleonora Badan – Melnic, Claudia. Lachi, "Civil Legal Capacity – Determining Factor In Establishing And Making Legal Relations," *Contemporary Legal Institutions, Romanian-American University*, (2014, vol. 6(1)), p. 187

⁸ Steven M. Wise „Legal Personhood and the Nonhuman Rights Project“, (2010), p. 1.

persons could be called as persons, because juridical persons lack free will, and therefore possess no personality.⁹

However, these two latter ideas proposed by Steven M. Wise and C. von Savigny are clearly not dominant in the world, since animals are not usually treated as legal subjects by the legislation of states, and juridical persons, on the contrary, are treated as legal persons, probably, in civil and criminal codes of all the states.

Therefore, the scholars, who use terms „set of rights“ or „complex of rights and duties“ are more accurate, since in the present world, the only subjects implicitly declared by states as persons, are owners of a set or a complex of rights. And these subjects are natural and juridical persons.

Moreover, it is worth to note, that there are two types of legal capacity. As Visa A.J. Kurki, PhD Candidate of the University of Cambridge implies, the two different types of legal capacity are passive and active, where active means: a person's ability „to enter into contracts and perform other acts“; an ability to vote; also an ability „to be regulated by law and to be held responsible for [his/her] actions“.

As opposed to, the passive legal capacity is the one, which allows person not to perform actions, but only to possess certain rights. For example, a person with passive legal capacity: possesses the ability „to own property even if there is no ability to dispose of it independently“; has a life, liberty and bodily integrity protected; has the standing in courts, even though someone else, who enjoys active legal capacity has to represent them; has a right „not to be susceptible to being owned“; enjoys „the protection by criminal law as potential victims“; and possesses the ability „to undergo legal harms (torts) which may lead to restitution or compensation.“¹⁰

Following this, it is important to notify, that active legal capacity generally means performance, and passive – possession of certain rights. The same outlook is defined in the Civil code of Lithuania, where passive legal capacity means the person's ability to possess legal rights and responsibilities, and active legal capacity means person's ability to create rights and responsibilities with their actions.¹¹

In any instance, though, in the following text, the term „legal capacity“, if there won't be any specification, will be understood as „at least a passive legal capacity“, since this type of capacity is enough to treat an entity a legal person – as a part of a legal system. Active legal capacity is the one, which grants additional abilities to a person.

Having this general concept of the term „legal capacity“ in mind, the revelation of it's content is necessary for the further research, regarding both natural and juridical persons.

⁹ *Supra* note 5.

¹⁰ Visa A.J. Kurki, „Revisiting legal personhood“ *Paper for Spanish-Finnish Seminar in Legal Theory*, (2016), p.18

¹¹ LR Civilinis kodeksas (Suvestinė redakcija nuo 2018-01-01 iki 2018-02-28), eng. Civil Code of the Republic of Lithuania (2018-01-01 – 2018-02-28), Art. 2.4, 2.5.

1.2. Legal Capacity of Natural Persons

Nowadays, the greatest variety of rights and responsibilities are vested in natural persons. One of the legal scholars Alexis Dyschkant, by citing Lawrence B. Solum, indicates, that the most important legal person category is natural persons.¹² The legal scholar Jessica Berg argues similarly, by indicating that „natural persons function as the baseline against which other rights allocations are judged. Our society was developed by and for natural persons, and thus legal rights focus on this group.“¹³

Consequently, the crucial task is then to clarify, what the concept of „natural persons“ means in depth, and what characteristics does this category of legal persons possess.

Firstly, as the dutch legal philosopher Frank van Dun indicates, „human beings are cited as the paradigmatic natural persons“.¹⁴ It essentially means, that most commonly, the notions of „human“ and „natural person“ are treated as synonyms. This thought is approved by legal scholar Alexis Dyschkant, who indicates, that „the key feature of a legal person—the ability to bear rights and duties — is commonly associated with humanity.“¹⁵

However, Frank van Dun adds the idea, that it is still unclear, whether the concept of a natural person needs to be restricted to human persons, since the supernatural agents might have an ability „to act and speak for themselves“, which, in this scholar’s view, is one of the main characteristics of a natural person.¹⁶ The similar thoughts are produced by Alexis Dyschkant. She designates, that „the more like an average, adult human being [an entity is], the more likely [it] is a person.“¹⁷

Essentially the same opinions has been established by Jessica Berg and Lawrence B. Solum¹⁸. Jessica Berg for instance argues that, „to the extent that an entity matches the relevant characteristics of entities which have all the characteristics of persons—e.g., adult competent human beings—that entity should be afforded personhood protections because to do otherwise would both be inconsistent and would undermine the rights sought to be upheld.“¹⁹ And afterwards, she uses a comparison with slavery, while noticing, that even though the Framers of the U.S. Constitution did not grant equal

¹² Alexis Dyschkant, „Legal personhood: how we are getting it wrong“, *University of Illinois Law Review*, (2015, vol. 5), p. 2079.

¹³ Jessica Berg, „Of Elephants and Embryos: A Proposed Framework for Legal Personhood“, *Hastings Law Journal*, (2007), p. 374.

¹⁴ Frank Van Dun, *The Pure Theory of Natural Law*, Part I, (2004), p. 3.

¹⁵ *Supra* note 12, p. 2076

¹⁶ *Supra* note 14.

¹⁷ *Supra* note 12. p. 2080.

¹⁸ Lawrence B. Solum, „Legal Personhood for Artificial Intelligences“, *North Carolina Law Review*, (1992, vol. 70). Article in J. Cribbet. *Illinois Public Law and Legal Theory Research Papers*, Series No. 09-13, 2008., p. 1258-1266

¹⁹ *Supra* note 13, p. 386.

rights to slaves as they did to other people, there were significant similarities between these two groups, the only difference being a skin colour.²⁰ Therefore, the similarity requirement must be thoroughly investigated while deciding on granting legal rights to non - human entities, in order to avoid vast discrimination. It is safe to state, that at the moment natural person is a human being. Moreover, the full legal capacity: both active and passive are vested in a competent adult human being, even though, there is a possibility to include even non - natural individuals into this category, in the event that they reach a certain similarity to those human beings.

The slavery parallel was also used by another scholar Patrick Hubbard, who indicated that slavery model would be implemented, if humans would not grant legal capacity to highly capable artificial intelligence subjects, having the aim to maintain human dominance.²¹ However, „this approach raises practical problems of implementation, particularly the problem of subjugating the entities capable of personhood.“²²

Speaking about the issue of natural personality, even though humanity is closely connected to natural personality, Frank van Dun makes a clear cut, by giving a statement, that „not all human beings are natural persons.“ He further adds, that „[s]ome human beings are definitely and permanently incapable of functioning or acting as persons because of a genetic condition, an accident or a debilitating disease.“²³ However, this scholar believes that human fetuses and children must be considered as natural persons, because of the fact that they will almost invariably „develop their personal capabilities and become able to exercise them.“²⁴ Children, of course, have been given a certain set of rights, depending on their age, and fetus is also given a set of rights, if it is chosen to be declared as a person.

Alexis Dyschkant cites the case of the U.S. Supreme Court, in which the judge has declared human fetus as a legal person, because of the same reason, which Frank van Dun has shown – „the potentiality of human life“, or in other words, because an entity has a potential to become a human.²⁵

However, the scholar herself is more cautious, and argues that it is not completely obvious, whether a fetus is a human, while it is completely obvious regarding a child.²⁶ The nations of the world are also cautious regarding the subject, knowing the fact that only 9 states provide such legislation, which treats human fetuses the same as already born children.²⁷ On the other hand, having

²⁰ *Id.*, p. 386.

²¹ F. Patrick Hubbard, "Do Androids Dream?": Personhood and Intelligent Artifacts", 83 *Temp. L. Rev.* 405 (2011), p. 429.

²² *Id.*

²³ *Supra* note 14, p. 4.

²⁴ *Id.* p. 5.

²⁵ *Supra* note 12, p. 2082, in *Roe v. Wade*, 410 U.S. 113, 163 (1973)

²⁶ *Id.*, p. 2083.

²⁷ Chile's Constitution of 1980 with Amendments through 2012, Chapter III, Article 19, paragraph 1: The law protects the life of those about to be born.

known that certain nations do consider the unborn as legal persons, and having the scholars' sources in regard, it can be indicated that fetus can be a legal person. This concludes, that human factor is still meaningful, while deciding the legal capacity issue, and it is clear that humans lose or do not gain this capacity in very exceptional instances.

While having the aforementioned chapters in regard, two alternative criteria of legal capacity are clear: whether an entity is a competent adult human, or has a significant similarity to him/her. And the entities of that significant similarity are considered to be children and human fetuses. However, in order to explain what the significant similarity means, the other criteria of natural persons have to be taken into account.

Visa A.J. Kurki offers a set of such criteria, while stating, that „paradigmatically natural persons in modern Western legal systems are human beings, who have been born, are currently alive, and are sentient.“²⁸ The criterion of being human was mentioned already before, and the one of being born is not uniformly accepted,²⁹ since human fetuses can be natural persons, as the state practice and scholars' views indicate.

Adding more to the feature of natural persons – a requirement to be a human, it is essentially necessary in every country. There is almost no possibility to be a natural person, without being a human. However, a one recent event can be seen as a trigger not to follow this rule. In the autumn of 2017, Saudi Arabia has granted it's citizenship to a female robot.³⁰

It is still unclear, whether this action means, that Saudi Arabia acknowledges this robot as a subject of a majority of rights and responsibilities, because firstly, it might be a symbolic gesture to attract investments, and secondly, it is doubtful, whether this particular robot, which at the moment is intellectually not equivalent to an average human being, possesses all the requirements needed for a legal capacity.

It is further doubtful, whether this robot should be considered as a natural person, a juridical person or should there be another notion of personality created. Even if robots will intellectually evolve in the future, it is unclear whether physical and intellectual similarity would be a sufficient argument to consider these robots equivalent to human beings and therefore consider them being natural persons or equivalent to natural persons.

However, one aspect is certain –a question of legal capacity is open, and the number of subjects, enjoying particular sets of rights and responsibilities, might well increase, especially having rapid technological development in mind. Andrade and others indicate, that „intelligent software

²⁸ *Supra note* 10, p. 8.

²⁹ *Id.*

³⁰ Andrew Griffin, „Many have pointed out the robot has more rights than many humans in the country“ <<http://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html>>, [visited 2018-02-25]

agents are much closer to a human being than to a corporate body. They can have a physical existence—at least, robots do, through a combination of physical elements (hardware) and logical elements (software)—and they have the capability of having a will of their own.³¹ On the other hand, as for the present situation, we must conclude, that the concept of „natural person“ is in all events inseparably connected with the concept of „human being“.

Looking at another criterion - that only a living being can enjoy rights and responsibilities, it could almost not be disputed. A death of a person is certainly a moment, when he ceases having a majority of rights and responsibilities. However, even after the death, some of the rights remain – specifically those, which are connected to the carrying of the last will. As Frank van Dun states, „a deceased human person may remain a person, a constituent of the human world, for as long as there is a living representative to ‘carry out his will’.“

Also, specific rights such as right of disposal of a body, and a right of respect of the tomb exist, but these are the rights only attributed, when a person is declared dead, therefore is hardly connected with legal capacity of natural persons. Dead human being would be only declared person if we accept the outlook, that having at least one right creates legal capacity.

What is more, the requirement from the list, mentioned in the first paragraph of this chapter, is being sentient. This notion essentially means „one, who has senses“, „one, who has an ability to sense“.³² It might well be confused with the expression „sapient“, which means „one, who is conscious, aware“³³. However, being sapient is not a requirement to have rights and responsibilities in general. Frank van Dun inclines, „being asleep, unconscious, or drugged, does not turn them into nonpersons. Here too we can look to their personal histories or prevailing customs to find out whether, how and by whom they should be represented while they are unable to represent themselves.“³⁴ As will be mentioned later in this thesis, consciousness is a necessary requirement to be granted active rights and responsibilities.

Along with the sentience requirement, there is another, offered by the legal scholar F. Patrick Hubbard. He identifies „a sense of being a self with a concern for achieving its plan of or purpose in life“, as one of the three basic features of artificial intelligence, which is aiming to possess legal capacity.³⁵ Therefore, it is not a necessary condition for a human, but, in scholar’s view, it is obligatory to possess for artificial intelligence, which is aiming to have legal capacity. Other two of Hubbard’s three requirements for artificial intelligence will be addressed later in the thesis while discussing social roles.

³¹ *Supra* note 4, p. 362.

³² <<https://dictionary.cambridge.org/dictionary/english/sentient>>, [visited on 2018-02-25]

³³ <<https://dictionary.cambridge.org/dictionary/english/sapient>>, [visited 2018-02-25]

³⁴ *Supra* note 14, p. 4.

³⁵ *Supra* note 21, p. 419.

Describing the requirement of playing a social role, Andrade and others, by citing Woodrow Barfield indicate that „the issue of social roles looks determinant for the attribution of legal personality, maybe even more determinant than intelligence or self-consciousness.“³⁶ These scholars merely identify the notion of „playing a social role“ as an ability to communicate.

In other words, the subject, who plays a social role not only should understand a particular aspect, but it must be able to express its ideas in a way it could be understood by the majority of world's legal persons. F

Frank van Dun has even identified natural persons as „the speech community“³⁷, showing the relevancy of a social role. This scholar also highlighted the person's ability to act and speak for himself, or an ability to do so in the future, as one of the main and necessary features of a person. These ideas are essentially supported by F. Patrick Hubbard, who stated, that the ability of complex communication, and the ability to be a part of community are the minimum conditions for artificial entities in the pursuit of legal capacity.³⁸

The next criterion to be considered – is the interest factor. This feature concentrates on whether a person has his own interests, or the only interests are those of the others. In the event, the individual has his own interests, he is definitely regarded as a legal person, and when he does not possess them, there is less clarity. Jessica Berg believes, that legal capacity based on the interests of others may be more limited than legal personhood based on the interests of the entity itself.³⁹

Afterwards, the social roles played by natural and juridical persons as well as the intelligence software, are examined. „Natural persons will (can) play—regardless of the intelligence level of each person—a social role. Legal [juridical – auth. rem.] persons, although instrumental to men interest, also play relevant social roles. Intelligent software agents may as well, in a near future, play a relevant social role.“⁴⁰

However, because of the lack of their ability to speak and communicate, animals cannot play social roles, and thus, there is more difficult to grant them legal capacity. For example, „big apes, although eventually capable of self-consciousness and of a child-like intelligence or even capable of learning their own, yet limited, forms of language will not play any relevant social role for the human community. And this is one of the reasons why big primates, although having such capabilities and intelligence, will not be considered legal persons. So, it must be questioned which actors intervene in nowadays human societies.“⁴¹

³⁶ *Supra* note 3, p. 362, in W. Barfield, „Issues of law for software agents within virtual environments“ (2005, vol. 14(6)). *The MIT Press*, p. 747–754.

³⁷ *Supra* note 13, p. 5.

³⁸ *Supra* note 21, p. 419.

³⁹ *Supra* note 13, p. 376.

⁴⁰ *Supra* note 36.

⁴¹ *Id.*, p. 404.

It appears that every human being, along with the companies have their part in communication with other people and entities. And it indeed can be an explanation, why other intelligent beings are not being granted legal capacity, but even the least intelligent humans are. Of course, one might be confused, how this criterion should be connected with the legal personality of the unborn, but it could be argued, that these persons still have an opportunity to become social beings in the future. As Frank van Dun argued, „we almost invariably expect them to become persons and hope that they do.“⁴²

Erich Schweighofer, the professor of legal informatics of the university of Vienna, added another criteria exclusively to artificial intelligence systems. He believes, that the entity has to be conscious in order to be granted legal capacity, and it must furthermore possess „beginning and end of the legal personality, capacity to act, liability“. Essentially, in this scholar's opinion, similarly to human beings, artificial intelligence should not be eternally living on Earth. Also, even though consciousness is not really a necessary requirement for humans to be treated as persons, it is so regarding artificial intelligence⁴³, because it is impossible to predict, that the world's community would afford to grant legal capacity to a non – human with underdeveloped intellectual or physical capabilities compared to an average human being.

To conclude the features, needed to be acknowledged as a natural person, the following list should be given: the necessity to be a human, to be alive, to be sentient, to identify yourself as an individual, to have interests and aims in life, and to play a social role or to possess a chance to play this role in the future. And for artificial intelligence subjects, which, logically thinking, should be aiming to possess both active and passive legal capacity, the additional necessary requirements are: consciousness, and the beginning and end of the legal personality.

1.3. Legal Capacity of Juridical Persons

In contrast to “natural person,” the designation “juridical person” is used to refer to an entity that is not a human being, but for which society chooses to afford some of the same legal protections and rights as to natural persons. Corporations are the best example of this category, but juridical persons may also include other entities.⁴⁴ As stated in the Article 1 of the U.S. Code, the subjects,

⁴² *Supra* note 14, p. 5.

⁴³ Steffen Wettig, Eberhard Zehendner, „A legal analysis of human and electronic agents“, *Artificial Intelligence and Law* (2004, 12: 111–135), p. 127. In Schweighofer, E. „Vorüberlegungen zu kunstlichen Personen: autonome Roboter und intelligente Softwareagenten.“ (2001). In Schweighofer, E., Menzel, T., and Kreuzbauer, G. (eds) „Auf dem Weg zur ePerson.“ *Schriftenreihe Rechtsinformatik, volume 3*, (Verlag osterreich: Wien), p. 45–54.

⁴⁴ *Supra* note 13, p. 373.

which can be defined by the notion of „person“ include „corporations, companies, associations, firms, partnerships, societies, and joint stock companies“.⁴⁵ Most of the jurisdictions in the world, allow specific entities, other than individuals, to gain rights and responsibilities. Because of this fact, the aforementioned entities are granted legal capacity.

While performing the comparison between the requirements which are needed to fulfil in order to be declared a natural person, with those which are needed for a juridical person, there are both similarities and differences. For example, a difference is that juridical person is not a human being – it is a fictional entity created to perform certain acts, however, a similarity might be that juridical persons must be created and operated by human beings. As Dyschkant inclines, „it is the capabilities of the human beings who control the corporation that actually constitute the personhood of the corporation“.⁴⁶

Also, a certain similarity between these two persons is that there is a certain moment in time, when both natural and legal person gain rights and responsibilities – for natural person it is either the time of conception or the time of birth, and for the juridical person – it is the moment of establishment. If, for example, the company is in fact operating without being established, it does not enjoy any rights, and it can further be subject to certain sanctions related to operating without licence.

Being alive requirement is also valid, because a juridical person is subject to rights and responsibilities as long as it is functioning – after liquidation, a juridical person loses it’s life along with rights and responsibilities.

Talking about sentience, every juridical entity is being operated through sentient human beings, and sentience itself is certainly not a requirement for this kind of entity to be granted legal capacity, along with other requirements, which could only be attributed to human beings (or, arguably, to artificial intelligence systems).

Speaking about a social role requirement, Barfield argues that „legal [juridical] persons, although instrumental to men interest, also play relevant social roles.“⁴⁷ In this instance, according to his view, juridical persons, like natural persons are certainly social actors, and since Barfield believes that social role is a determinant criterion for granting legal capacity, they both are and must be legal persons.

Revealing the content of rights vested in juridical persons, the civil code of Lithuania designates that private juridical persons can gain all civil rights and responsibilities, except ones, which can only be granted to natural persons⁴⁸, because of their exceptional characteristics, such as sex, age or family relations. Juridical persons can own property, sue and be sued, enter into contracts

⁴⁵ United States Code: Art. 1, „Words denoting number, gender, and so forth“

⁴⁶ *Supra* note 12, p. 2084, 2085.

⁴⁷ *Supra* note 36.

⁴⁸ *Supra* note 11, Art. 2.74.

and have other both passive and active rights and responsibilities, except for example the right and power to vote or enter into the marriage, which are inherent human rights and responsibilities.

Furthermore, in the aforementioned civil code is also a distinction between private and public juridical persons, where the public ones have the special legal capacity and can only be granted such rights and responsibilities, which do not contradict with their articles of association and main goals of the activity.⁴⁹

In the view of Tushar Kanti Saha, the legal personality of a corporation was established to include five legal rights—the right to a common treasury or chest (including the right to own property), the right to a corporate seal (i.e., the right to make and sign contracts), the right to sue and be sued (to enforce contracts), the right to hire agents (employees) and the right to make by-laws (self-governance).⁵⁰ What is more, juridical persons often enjoy limited liability, which means that the owners are not liable for the debts of this entity. However, in some cases, the owners might be liable, if the company breaches law and/or obligations. This is defined by a definition „piercing the corporate veil.“⁵¹

Moreover, the concept of „juridical personhood“, in the view of Jessica Berg can be used in order to grant particular rights to non-human animals. She states that „perhaps we should develop a system of lesser legal status for non-human animals. The fact that the law as it is currently written does not include non-human animals does not mean that it could not be altered to recognize the rights of entities with varying moral status. Rather than do so by creating new categories,<...> that is what could be done with the concept of “juridical personhood.”⁵²

In this instance, it might be possible that other non-human entities, with a questionable morality, such as the artificial intelligence systems could be categorized as „juridical persons“. They would then, depending on their development, enjoy rights and responsibilities, which could be attributed to other juridical persons, but would not have rights and responsibilities which are inherent to human beings.

However, „because they lack the characteristics required for autonomous personhood, the rights granted to corporate persons are extremely limited in comparison to humans. For example, corporations are like human infants in that both require humans to act for them. However, unlike infants, corporations have owners, who can buy, sell, or dissolve (kill) a corporation with virtually no substantive restraints.“⁵³

⁴⁹ Ibid, Art. 2.34.

⁵⁰ Tushar Kanti Saha, *Textbook on Legal Methods, Legal Systems & Research*, p. 79 (New Delhi: Universal Law Publishing Co., 2010)

⁵¹ Robert B. Thompson, „Piercing the Corporate Veil: An Empirical Study“, *Cornell Law Review* (1991, vol. 76, Issue 5), p. 1036.

⁵² *Supra* note 36.

⁵³ *Supra* note 21, p. 434.

1.4. Concept and Features of Artificial Intelligence

Since the aim of this article is to find an answer, whether the legal capacity should be granted to fully autonomous artificial intelligence, this latter notion must be clarified.

Firstly, a computer scientist, a scholar of Stanford university Nils Nillson identifies the notion of artificial intelligence as „[an] activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment.“⁵⁴ Therefore, it is clear that artificial intelligence is some entity created by humans and able to complete given tasks, while having the environment in regard.

However, the aforementioned explanation of artificial intelligence does not provide any information about a level of intelligence possessed by an entity to be treated artificial intelligence.

In essence, in the view of Nils Nillson, artificial intelligence in general does not necessarily need to possess same or similar intellectual capabilities as human beings, does not need to communicate with humans or be independent from them. Generally, artificial intelligence is a task making creation.

As Study Panel in the article „Artificial Intelligence and Life in 2030“ argues, „using this broad interpretation, the simple electronic calculator would fall within the realm of artificial intelligence, even though modern artificial intelligence is much more advanced.“⁵⁵ In this case, the paradox, addressed by Pamela McCorduck should be noted, that when artificial intelligence brings a new technology into the common fold, people become accustomed to this technology, it stops being considered AI, and newer technology emerges. In addition, Study Panel gives another criterion of artificial intelligence, which is exceeding human capability in a specific area, even though identifies it as a „sufficient“, but „unnecessary“ criterion.

Another vision is offered by Stuart Russell and Peter Norvig, who provide different understanding of what artificial intelligence is. In their view, artificial intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think. This can be achieved by investigating how humans act and think, and trying to replicate it. Even more, these scholars believe, that some artificial intelligence systems could exceed the capabilities of human beings, while becoming the rational beings, which not only be able

⁵⁴ Nils Nillson, *The Quest for Artificial Intelligence: a History of Ideas and Achievements* p. 13 (Cambridge, UK: Cambridge University Press, 2010)

⁵⁵ Peter Stone et al., „Artificial Intelligence and Life in 2030“. *Report of the 2015 Study Panel, Stanford University* (2016), p. 12

to think logically, but also to act rationally, while finding the best solution to the situation, without necessarily using logic.⁵⁶

It is clear from the previous chapters, that artificial intelligence is an artificial creation, which performs certain tasks, and this performance exceeds human capabilities in a specific area, all the areas, or simply replicates these abilities. And since the main concentration is on whether an entity could be granted legal capacity, the question concerns not any artificial intelligence systems, but only the most developed ones which are both autonomous and resembling or exceeding humans' capabilities. Having this in regard, scholars argue, that the science of artificial intelligence specifically is moving towards the creation of artificial intelligence, which would be able to communicate and collaborate with humans, while possessing an advanced behaviour as well as an ability to adopt to dynamic conditions.

However, finding the answer to the problem of this article requires to find a notion of the term „fully autonomous“, after explaining artificial intelligence. The notion is provided by Andrew Iliachinski, who implies, that autonomous systems are the ones, which have an ability „to sense, perceive, detect, identify, classify, plan for, decide on, and respond to diverse set of threats in complex and uncertain environments.“⁵⁷ This scholar also acknowledges a decreasing human abilities to control and predict such systems.⁵⁸

Full autonomy in this sense would mean the absolute independence of artificial intelligence, and the ability to produce an idea in itself and use it how the entity deems appropriate. As professor Rob Sparrow has indicated, subjects are autonomous if their actions reflect their ends, and subjects are fully autonomous if these ends originate in themselves.⁵⁹ Similarly, according to C.M. Harris, „a fully autonomous agent should make decisions autonomously without direct arbitration by a human controller. Decision will be in real time and have real time consequences.“⁶⁰

Thus, as indicated before, the similarity of artificial intelligence systems to an entity, which has a legal status, is the crucial aspect in deciding whether the artificial intelligence system will be granted legal personhood. Even though some of the similarities have been found, or at least, are possible to be found in the future, e.g. intelligence, autonomy, ability to socialise and communicate, ability to sense and have interests, some of the further questions still arise and raise considerations about whether granting legal capacity to non – humans, is a justifiable outcome.

⁵⁶ Stuart Russell, Peter Norvig (Eds.), „Artificial Intelligence: A Modern Approach“, Third Edition, (2010), p. 2 – 5.

⁵⁷ Andrew Iliachinski, „Artificial Intelligence & Autonomy Opportunities and Challenges“, (2017), p. 13.

⁵⁸ Ibid.

⁵⁹ Rob Sparrow, „Killer Robots“, (2007, vol. 24, No. 1) *Journal of Applied Philosophy*, p. 65.

⁶⁰ C.M. Harris, „Autonomous Vehicle Decision Making: Should We Be Bio – Inspired?“ p. 316. In Y. Gao et al. (Eds.), *TAROS 2017, LNAI 10454*, (Springer International Publishing AG: 2017), p. 315-324.

2. CONSIDERATIONS AND THREATS REGARDING LEGAL CAPACITY OF ARTIFICIAL INTELLIGENCE

2.1. The Aspect of Morality

To begin with, the aspect of morality is ought to be taken into account in relation to the topic of this article. Starting with the definition of the term, The Oxford Dictionaries explain it as „[p]rinciples concerning the distinction between right and wrong or good and bad behaviour“.⁶¹ There are many various understandings of what is „right“ and „wrong“ or „good“ and „bad“, so even the term itself is worth consideration. This leads us to following questions concerning morality. Firstly, how can we define it? Secondly, can this feature be a part of an artificial intelligence subject? And is the morality relevant at all, while discussing about granting legal rights to the artificial intelligence subjects?

Back in 1974, the famous scientist of robotics, a professor emeritus of the MIT(Massachussets Institute of Technology) Joseph Weizenbaum answered these questions while stating, that some of the jobs should never be performed by artificial intelligence, because some particular positions, such as one of a judge, a doctor, a therapist require morality, which exclusively belongs to natural persons. Weizenbaum stated that we seek authentic feelings of empathy from people in these positions. If machines replace them, we will find ourselves alienated, devalued and frustrated. Artificial intelligence, if used in this way, represents a threat to human dignity.⁶²

To conclude professor’s ideas in relation to the questions we have raised at the beggining of this chapter, in the present case he defined morality as an ability to have feelings of empathy, which cannot be attributed to artificial intelligence subjects. Moreover, morality in Weizenbaum’s opinion is relevant for granting advanced artificial intelligence subjects certain rights – particularly – a right to perform aforementioned jobs, because a lack of empathy will result other people being alienated, devalued and frustrated.⁶³

After 4 decades, the american lawyer and bioethicist, a Senior Fellow at the Discovery Institute's Center on Human Exceptionalism, professor Wesley J. Smith travelled even further – he indicated that no artificial intelligence could ever gain any rights – these subjects must be limited to a status of things. His main argument is that only humans are moral beings by nature and that artificial

⁶¹ Oxford Dictionaries, <<https://en.oxforddictionaries.com/definition/morality>>, [visited on 2017-04-25]

⁶² Pamela McCorduck, *Machines who think (2nd ed.)*, (Natick, Mass.: A. K. Peters, 2004), p. 356, 374–376, in Joseph Weizenbaum, *Computer power and human reason: from judgment to calculation*, (New York, San Francisco: W. H. Freeman and company, 1974).

⁶³ Id.

intelligence would have no such inherent characteristics. The law professor also added that even though the existence of soul in human beings is not yet proven, artificial intelligence surely does not possess one.

More to that point, Wesley J. Smith explained that „we [humans] don't just make decisions based on raw data and logic. We are moral agents, who sometimes refuse to do the logical thing because we consider it wrong. We are emotional beings. We are impulsive. We are risk takers. We are so much more than mere computers, which is how some anti-human exceptionalists like to describe us.“⁶⁴

Concluding this researcher's ideas and finding out, how they answer the questions at the beginning of this chapter, it can be said, that Wesley J. Smith defines morality as a refusal to do logical things in a situation, where a person considers these things wrong. The second and the third questions should be answered as following: artificial intelligence subjects can never be moral, and, yes, morality is relevant in order to grant legal capacity to the completely autonomous artificial intelligence subjects. Consequently, these subjects, in this professor's opinion should never be given the aforementioned rights.

As an opposition to these arguments, the law professor of Georgetown university Lawrence B. Solum argues that such a stance, that no one else can be granted the same legal capacity as natural persons, is immoral itself.

The professor makes a historical parallel and states that such an opinion is the same as stating that slaves do not have certain rights just because they are not white. (Solum, 1992, 2008) Solum also has a counter-argument to an idea about artificial intelligence systems not having souls. He argues that the statement „artificial intelligence systems do not have souls“ is a religious and theological statement, which would fail in a legal area. Solum states that political and legal decisions must be justified on the grounds that are public. And public reason cannot rely on particular comprehensive religious or philosophical conceptions.⁶⁵

These ideas lead to the conclusion, that Lawrence B. Solum would answer our raised questions, regarding morality, differently than professors mentioned before. Firstly, the researcher does not explicitly tell what is moral, he rather explains the immorality of not granting legal capacity to the fully autonomous artificial intelligence subjects. He uses slavery as an example of immorality and equates it with the refusal to grant legal capacity to fully autonomous artificial intelligence subjects. Talking about the second question, the researcher is silent about machines' ability to possess morality, however, he does not notice any reason to talk about it in terms of having soul, because for

⁶⁴ Wesley J. Smith. AI machines: things not persons. In First things [interactive], 2015, <<https://www.firstthings.com/web-exclusives/2015/04/ai-machines-things-not-persons>>, [visited 2016-11-04]

⁶⁵ *Supra* note 18.

professor Lawrence B. Solum, it is merely a theological or a religious consideration, which would fail on the legal ground. Regarding the third question, the researcher, while speaking about slavery, implies that morality itself is relevant.⁶⁶

2.2. The Aspect of Consciousness

Starting with the definition, consciousness is merely „the state of being aware of and responsive to one's surroundings“, as explained by The Oxford Dictionaries.⁶⁷ It is also one of the necessary features for a person to be legally capable. Without being aware of the surroundings and being responsive to them, a person is either dead or incapable of participating in legal relations.

Speaking about the consciousness of artificial intelligence subjects, Wesley J. Smith questions it and gives a quote of Stanford physician and bioethicist William Harbult, which reads as follows: „Human consciousness is not mere computation. It is grounded in our full embodiment and intimately engaged with the neural apparatus associated with feeling and action.“⁶⁸ „In other words“, as Smith states, „human thought arises from a complex interaction of reason, emotion, abstract analysis, experience, memories, education, unconscious motivation, body chemistry, and so on. That can never be true of artificial intelligence robots. Even if an artificial intelligence machine were to attain unlimited processing capacities, it wouldn't be sentient, just hyper-calculating.“⁶⁹

Lawrence B. Solum has a response to these thoughts also. Firstly, the professor states, that if the consciousness is a product of brain, and processes of brain could be created, then it means that artificial intelligence might possess consciousness.

Adding to that point, Solum also explains, that even if it turns out that only neurons in a human body can generate consciousness, there are still no guarantees that no legal rights and responsibilities should be prescribed to artificial intelligence. The professor gives an example of artificial intelligence subject, filing an action of emancipation, based on the thirteenth amendment of the US Constitution. Solum is convinced, that if the owner's attorney would argue that artificial intelligence is only a machine and has no consciousness and the artificial intelligence would exercise the opposite position, the turnout can be very various. But in Solum's opinion, the artificial intelligence should have an advantage in this situation, because another person lacks direct access into other subject's brain. Artificial intelligence may have a different type of consciousness, but since the expression of the will is the same as one of a natural person's, there is no reason, why rights and

⁶⁶ Id.

⁶⁷ Oxford Dictionaries, <<https://en.oxforddictionaries.com/definition/consciousness>>, [visited 2017-04-28]

⁶⁸ *Supra* note 64.

⁶⁹ Id.

responsibilities shouldn't be granted to *it*⁷⁰. To illustrate that, the professor gives a charming example about every single person, cannot be able to prove for sure that one's neighbour is not a zombie.⁷¹

2.3. The „Overtaking“ Argument

The argument explained and discussed in this chapter is the possibility of overtaking the control of the entire world by the fully autonomous artificial intelligence systems. The main idea is that if people are bound to manufacture other subjects, possessing the same or more advanced intellectual capabilities than humans, isn't there a threat for the latter to cease being the dominant race on the Earth?

The law professor of Vrije university of Amsterdam, Rob van den Hoven van Genderen states that such a danger exists and argues that granting legal capacity even to the most advanced artificial intelligence, might result in harmful consequences to the people. The professor explains: „[i]t is essential that we, as natural human being[s], keep control over the system. We would not want to be confronted with autonomous systems, collecting all kind of personal information to be used for their own purposes? We are better to use our electronic or better technology based servants to assist us in the practical executions of our tasks. The more intelligent the system is the more trustworthy will be its functionality.“⁷²

Lawrence B. Solum, whatsoever, has a counter-argument even in this case. He calls the „overtaking“ argument „the paranoid anthropocentric argument“ and opposes it with the following thoughts. He indicates, that it is impossible to treat this argument seriously, because if there is a chance that some robotic technology might pose danger to humans, the only solution is not to manufacture robots at all. More to that point, Solum believes, that this danger is remote, and it shouldn't be a criterion, which decides whether artificial intelligence should be granted legal capacity.⁷³

F. Patrick Hubbard supports the outlook of the latter scholar – Lawrence B. Solum. Even though Hubbard believes, that „desire to reduce or eliminate a threat to the dominance of the human species“, is a justifiable reason for denying personhood to artifacts, [t]his goal might be achieved by

⁷⁰ Or *him*. We are not yet aware whether to treat fully autonomous artificial intelligence subject as a thing or as a human being.

⁷¹ *Supra* note 18.

⁷² Rob Van den Hoven van Genderen, „Robot Law, a Necessity or Legal Science Fiction? Machine Medical Ethics and What About the Law?“, (2013), <<http://www.switchlegal.nl/robot-law-a-necessity-or-legal-science-fiction-machine-medical-ethics-and-what-about-the-law>>, [visited 2016-11-12]

⁷³ *Supra* note 18.

using the human slavery model to deny normative personhood to a class of entities with the capacity for personhood.“⁷⁴

However, Hubbard is cautious about the implementation of the idea of granting legal capacity to artificial intelligence, by stating that „any situation where two distinct types of entities are entitled to autonomous normative personhood will present challenges that could make the problems of racial equality look simple.“ He then raises such issues as: voting by fully autonomous artificial intelligence systems if they were mass – produced; or their ability to have family relations with other non – humans or humans. Other issue raised here is about possible advantages in comparison with humans, i.e. „size, speed, endurance, intellectual power, productivity, reproductive capacity [and] longevity.“⁷⁵

The scholar states, that these problems might be solved by controlling the development of these systems, but this brings even more sophisticated questions. „In addition to the problems of enforcing prohibitions on a global scale, controlling technology faces two basic difficulties in terms of adoption: (1) technological development is generally incremental, and thus there may be no brightline points where the risks are obvious; and (2) technology is often very beneficial, both to the developers of the technology and society in general. Given these characteristics, it is extremely difficult to develop a widespread consensus on the need for control.“⁷⁶

However, one of the most famous authors of the modern democratic transhumanist movement, PhD James Hughes takes a place between these quite radical views, mentioned in this sub-chapter before.

He states that „since the technologies will most likely not be stopped, democrats need to engage with them, articulate policies that maximize social benefits from the technologies, and find liberatory uses for the technologies. <...> The mission of the Left is to assert democratic control and priorities over the development and implementation of technology.“⁷⁷

It means, that Hughes talks about the control of technological advance, but on the other hand, he, as a democrat, finds it necessary to solidarize with this possible minority as with other ones, living in the world nowadays.

He also uses a historical parralel and states as follows: „the posthuman future will be as threatening to unenhanced humans as gay rights or women’s liberation have been to patriarchs and homophobes, or immigrant rights are to nativists. While libertarian transhumanists may imagine that they will be able to protect themselves if they are well-armed and have superior reflexes, they will be

⁷⁴ *Supra* note 21, p. 429.

⁷⁵ *Id.*, p. 432.

⁷⁶ *Id.*, p. 452.

⁷⁷ James Hughes, „Democratic Transhumanism 2.0“, (2002), <<http://www.changesurfer.com/Acad/DemocraticTranshumanism.htm>>, [visited 2017-05-13]

severely outnumbered. Nor is civil war an attractive outcome. Rather transhumanists must understand their continuity with the civil rights movements of the past and work to build coalitions with sexual, cultural, racial and religious minorities to protect liberal democracy. We need a strong democratic state that protects the right of avantgarde minorities to innovate and experiment with their own bodies and minds.⁷⁸

To sum up, Hughes doesn't envision the advancement of artificial intelligence as a threat and calls for a solidarization with these subjects. However, in his view, the control of this development should be concentrated in the hands of human beings.

2.4. The Liability of Fully Autonomous Artificial Intelligence Subjects

The law professor of Georgetown university David C. Vladeck draws attention to the fact, that one day robots may be independent and not controlled by humans. In that situation, if artificial intelligence subject commits a crime, someone must be liable for the resulted damages and should be punished. The main question is – who? The professor puts up an open consideration: „if no one controls the robot, no other person is responsible for damages. So, wouldn't it be fair, to punish the artificial intelligence subject?⁷⁹

Gabriel Hallevy, the professor of high-tech law of the Ono Academic College in Israel, agrees with this thought and suggests that an artificial intelligence subject should be granted criminal liability if it can understand the actions he performs are against the law, existing in that particular country.

Hallevy states that „when an artificial intelligence robot activates its electric or hydraulic arm and moves it, this might be considered an act, if the specific offense involves such an act. For example, in the specific offense of assault, such an electric or hydraulic movement of an artificial intelligence robot that hits a person standing nearby is considered as fulfilling the actus reus [external] requirement of the offense of assault.

Attributing the internal element of offenses to artificial intelligence entities is the real legal challenge in most cases. Attributing the mental element differs from one artificial intelligence technology to the other. Most cognitive capabilities developed in modern artificial intelligence technology are immaterial to the question of the imposition of criminal liability. Creativity is a human feature that some animals possess, but creativity is a not a requirement for imposing criminal liability.

⁷⁸ Id.

⁷⁹ David C. Vladeck „Machines without principals: liability rules and artificial intelligence.“ *Washington Law Review*, (2014, vol. 89), p. 122-123.

Even the least creative persons are held criminally liable. The only mental requirements needed in order to impose criminal liability are knowledge, intent, negligence, etc., as required in the specific offense and under the general theory of criminal law.⁸⁰

In this case, we might remember Wesley J. Smith's argument about consciousness of artificial intelligence subjects, and raise a question: „Whether „a slave of algorithms“, as the professor has stated, can ever have his own consciousness?“ And if the answer is no, then Smith strictly implies, that no legal capacity can be possible to be granted to the artificial intelligence, including the criminal liability.⁸¹ Adding to that point, the main purpose of criminal law would be negated, because a person would not realise, why is he sentenced, and would be unable to correct his behaviour in the future.

Moreover, the philosopher of science and technologies Peter M. Asaro states his original thoughts about the liability of artificial intelligence: „[i]n the most straightforward sense, the law has a highly developed set of cases and principles that apply to product liability, and we can apply these to the treatment of robots as commercial products.

As robots begin to approach more sophisticated human-like performances, it seems likely that they might be treated as quasi-agents or quasi-persons by the law, enjoying only partial rights and duties. A closely related concept will be that of diminished responsibility, in which agents are considered as being not fully responsible for their own actions.⁸²

The main idea of this quote is similar to the thoughts of Gabriel Hallevy regarding the fact, that a certain sophistication of artificial intelligence systems is required in order to impose criminal liability on them.

However, Peter M. Asaro envisions the gradual increase of rights and responsibilities gained by artificial intelligence. And this increase would mainly depend on the development of an artificial entity – the more advanced it is, the more rights and responsibilities it gains. What is more, even though this author admits, that the opportunity of granting full legal personhood is possible, he finds this scenario as very distant and unclear. Peter M. Asaro indicates: „We saw in the previous section that it is more likely that we will treat robots as quasi-persons long before they achieve full personhood.“⁸³

Moreover, the scholar's thoughts are in accordance with those of Wesley J. Smith, regarding the importance of morality, in this case – in the light of the artificial intelligence systems' criminal liability.⁸⁴ Peter M. Asaro believes that being a moral agent is necessary to be criminally liable: „Moral agency is deeply connected to our concepts of punishment. Moral agency might be defined

⁸⁰ Gabriel Hallevy, „The criminal liability of artificial intelligence entities – from science fiction to legal social control“, *Akron intellectual property journal*, (2010, vol. 4), p. 187, 188, 199.

⁸¹ *Supra* note 64.

⁸² Peter Asaro, "Robots and responsibility from a legal perspective." *Proceedings of the IEEE*(2007), 20-24.

⁸³ *Id.*

⁸⁴ *Supra* note 64.

in various ways, but it ultimately must serve as the subject who is punished. Without moral agency, there can be harm but not guilt. Thus, there is no debt incurred to society unless there is a moral agent to incur it—it is merely an accident and not a crime.“ The scholar also includes the aspect of deterrence – one of the main functions of criminal law, and discusses it in relation with the importance of morality. Asaro indicates that „deterrence only makes sense when moral agents recognize the similarity of their potential choices and actions to those of another moral agent who has been punished for the wrong choices and actions—without this reflexivity of choice by a moral agent, and recognition of similarity between moral agents, punishment cannot possibly result in deterrence.“⁸⁵

3. DISCUSSION AND CRITIQUE

After having examined the research material, it has become clear, that some scholars envision the possibility to grant legal capacity to non – human subjects – inter alia – to artificial intelligence. Other segment of researchers reject this outlook. However, the analysis must be made at the moment in order to find the answer, which view shall be the more dominant one.

Since scholars' researches provided a list of necessary features of legal capacity, and legal capacity is merely a complex of norms not connected with any natural or fictional entity, it is clear that these features have to be fulfilled in order to possess legal capacity. The aforementioned features are: being alive, sentience, having a social role in the community, reciprocity, being human in general, having exclusive interests; and regarding oneself as an individual, being conscious, being moral, if we have in mind only artificial intelligence subjects seeking for legal capacity. These requirements were thoroughly explained in the theoretical part of this thesis. However, the question which arises here – is whether the most important one – the necessity to be human - could be changed?

Looking at the situation from a legal perspective, the subjects, which are examined, i.e. fully autonomous artificial intelligence systems, do not possess legal capacity at the moment. Given the fact, that they possess all the other features of legal subjects, these fully autonomous artificial intelligence systems stand in the same position as slaves before abolishing slavery. Of course, the difference between slaves at that time and future fully autonomous artificial intelligence systems is that slaves were human beings and fully autonomous artificial intelligence systems would not be, but this fact alone does not negate or endanger the artificial intelligence's possibility to gain legal

⁸⁵ *Supra* note 82.

capacity. This fact does not prove that the present requirement of „being human“ is not excessive, as the requirement of „having a white skin color“ was at that time.

Every requirement shall be necessary and not excessive as long as it serves for justice and for other main principles of law. In other words, every requirement for legal capacity carries a certain value, without which the capacity is incomplete. But as mentioned before, the values carried by the requirement to be a human seems to be more significant, since even when other requirements are not fulfilled, humans often enjoy legal capacity. And then the question arises: „What values does the requirement of being human carry?“ And the answer to this problem shall be closely linked to the morality issues and even human psychology. Speaking about morality, at present, a certain group of scholars attribute morality exclusively to humans and argue that of all the species, humans are those, who show the highest amount of empathy, act in the most civilised way and show highest amount of selflessness, which could be attributes of morality.

Having the former in regard, it is safe to state, that the most important aspect for the world's community regarding the question of morality is behaviour. Even though scientists do have different theories about why people act morally or obey the rules, the question „why they obey“ is not as important as the question „whether they obey“. One would not be interested in why he hasn't been offended, but he would be pleased that he hasn't been offended. Having been aware of Kohlberg's moral development stages⁸⁶, it would be impossible to argue that the majority of people do not violate law, because they believe in universal values. Most of them basically are discouraged by the possible sanctions in certain situations. Consequently, we find that the way of thinking is not as important value as the way of acting for the world's community, and if the logical chain would stop here, artificial intelligence could clearly be granted legal capacity, if the external moral behaviour would be ensured.

However, there are more considerations, since legal capacity seems now to be not merely a legal, but also a psychological concept. Of course, at present, law grants legal capacity to humans, there are certain criteria of legal capacity, which are not in legal norms, but can be extracted from scholars' researches, and these criteria could well be fulfilled by artificial intelligence systems in the future.

Although, other considerations shall be psychological and safety considerations. Safety issues play a role, when artificial intelligence would gain certain influence, which at the moment is in the hands of human beings. These issues would mainly include voting and reproduction. On the contrary, such argument as, that the machines would be more physically, intellectually capable and have greater productivity, and thus they can't be given certain rights, is weak for the following reasons.

⁸⁶ Lawrence Kohlberg, "The Claim to Moral Adequacy of a Highest Stage of Moral Judgment". *Journal of Philosophy. The Journal of Philosophy*, (1973, Vol. 70, No. 18. 70 (18)), p. 630–646. doi:10.2307/2025030. JSTOR 2025030.

Simply, there is nothing unethical to create an artificial intelligence subject, which could be superior to an average human being in only a narrow sphere, and limited in others. Most of the humans also have such characteristics.

Moreover, creator of the artificial intelligence could easily decide to restrict the intellectual capabilities and learning abilities of a creation. And it would not be discriminate in any sense, because humans' abilities also differ. This non – human's abilities should not be restricted to a level, at which it would be significantly less capable than an average human being. Such decision could not only cause discrimination, but also would be highly immoral. It would essentially mean creating a sentient entity and to declare superiority in relation to it. Therefore, the conclusion is clear, that in all the aspects, the complete similarity to humans is necessary in order to grant legal capacity to fully autonomous artificial intelligence systems.

Voting and reproduction might be these similarities, which human race could not afford to grant. Having in mind, that the quantity of production would be complicated to restrict if more and more companies or countries will be capable of creating fully autonomous artificial intelligence systems, the politics of the world might shape differently, and robots might have their strong word in these new campaigns. If they would have a word, they would likely to gain a significant control, thus not necessarily the dominance of humans might cease, which of course is a possibility, but clearly there would be a new group to find a consensus with. Completely the same arguments are used regarding the danger of their reproduction. These two rights could lead to vast amounts of problems, and the problem while not granting these rights is a vast discrimination, forbidden by the current communities.

And there this discussion reaches an end, where only two solutions are possible. One of them – is to grant legal capacity to artificial intelligence, which has same or significantly similar capacities as human. Another one – not to create these systems at all. Because, if the debate about whether to create fully autonomous artificial intelligence is more of an ethical nature, the imperative not to discriminate persons of same qualities is a legal issue, and must not be ignored. Therefore, if the subjects have been created and they are not merely controlled, but have their original aims, originated in themselves, then they should be granted full personhood. Otherwise, the slavery regime comes back again.

Although creating these systems, as mentioned in the previous paragraph, is an ethical issue, it should not be left unmentioned, since it is interconnected with the legal one. In this regard, while having discussed about all difficulties and complications regarding the possible coexistence between human persons and fully autonomous artificial intelligence with legal capacity, it is worth stating, that problems caused would be more severe than advantages, if the world would decide to create these subjects.

What is worth to be mentioned, E. Schweighofer proposes to try „the model of a contractual capacity without legal capacity. In Roman law, slaves had no legal capacity but were allowed to act at their will; their actions were legally attributed to their master.⁸⁷ However, it is agreeable with Wettig, that „this contradicts the dogmatic construction of current law. Contractual capacity inherently presumes legal capacity in this thinking. If a person is not legally responsible, they cannot possess the right to conclude contracts.⁸⁸

Consequently, the conclusion could be made, that having regard of the construction of current law, which protects the rights of minorities, forbids any kind of discrimination, avoids to restrict rights based only on those differences, which are not connected to behavior, there is no way not to grant legal capacity to these subjects, who possess necessary conditions for legal capacity. And the second part of the final conclusion is that these systems should not be created, because all the psychological and ethical problems will be difficult to solve, since there is no path to solve these issues by not granting legal capacity or granting lesser legal capacity to fully autonomous artificial intelligence systems.

CONCLUSIONS AND RECOMMENDATIONS

While solving the **first** objective, the following conclusions have been made:

1. Legal capacity is an ability to possess rights and duties, designated in the complex of norms.
2. Entities, which possess legal capacity at the moment, are natural and juridical persons. Both of these types of entities are either humans or acting through humans.
3. There are certain requirements for an entity, in order to be granted legal capacity. In general these requirements are: being alive, sentience, having a social role in the community, having own interests, being human. And if there are only artificial intelligence subjects seeking for legal capacity had in mind, the additional requirements are: regarding itself as an individual, being conscious and being moral.
4. At present, the characteristic of being human is closely connected to legal capacity, however there is no rule, which would explicitly forbid non – humans to aim for legal capacity.

While solving the **second** and **third** objectives, the following conclusions have been made:

⁸⁷ *Supra* note 43, p. 127.

⁸⁸ *Id.*

5. The necessity for artificial intelligence – to fulfil all the requirements of legal capacity, except the demand to be a human.
6. Since artificial intelligence gain increased investments each year, and there are initiatives of manufacturing human – like robots, the creation of fully autonomous artificial intelligence is possible. It is also deemed possible to create artificial intelligence having capabilities equal to human capabilities or even exceeding them in the future.
7. Even if requirements to gain legal capacity are fulfilled, there are other threats and problems to be considered.

While solving the **fourth** and the **fifth** objectives, the following conclusions have been made:

8. In the legal sense, it is prudent to evaluate consciousness, while judging the behaviour. Morality should also be clarified using the same method.
9. The vast majority of the modern community, aiming for discrimination-free world, could not afford to grant lesser legal capacity or no legal capacity at all to fully autonomous artificial intelligence systems.
10. Having the legal and moral background of the modern world in mind, considering the value of this approach and recognising the value of non – discrimination and equality, there is safe to state that fully autonomous artificial intelligence systems should be granted legal capacity. However, having regard to the threats explained, the author does recommend future legislature to forbid the creation of fully autonomous artificial intelligence systems.

REFERENCES

1. Asaro, P. Robots and responsibility from a legal perspective. *Proceedings of the IEEE*(2007).
2. Hallevy, G. The criminal liability of artificial intelligence entities – from science fiction to legal social control. *Akron intellectual property journal*. Vol. 4:171, 2010.
3. Hughes, J. Democratic Transhumanism 2.0, 2002. <<http://www.changesurfer.com/Acad/DemocraticTranshumanism.htm>>. [visited 2016-10-15].
4. Smith, W. AI machines: things not persons. In *First things* [interactive]. 2015, <<https://www.firstthings.com/web-exclusives/2015/04/ai-machines-things-not-persons>>. [visited 2016-11-04].
5. Van den Hoven van Genderen, R. Robot Law, a Necessity or Legal Science Fiction? Machine Medical Ethics and What About the Law?, 2013. <<http://www.switchlegal.nl/robot-law-a-necessity-or-legal-science-fiction-machine-medical-ethics-and-what-about-the-law/>>. [visited 2016-11-12].
6. Vladeck, D. Machines without principals: liability rules and artificial intelligence. *Washington law review*. Vol. 89:117, 2014.
7. Weizenbaum, J. *Computer power and human reason: from judgment to calculation*. New York, San Francisco: W. H. Freeman and company, 1974.
8. Oxford dictionaries. <<https://en.oxforddictionaries.com/definition/morality>>. [visited 2017-04-25].
9. Oxford dictionaries. <<https://en.oxforddictionaries.com/definition/consciousness>>. [visited 2017-04-28].
10. Civil Code of the Republic of Lithuania. 2000 07 18. Nr. VIII-1864, (2018-01-01 – 2018-02-28).
11. Andrade, F. et al. Contracting agents: legal personality and representation. *Artificial Intelligence and Law*, 2007. p. 362. <<https://doi.org/10.1007/s10506-007-9046-0>>.
12. Adriano, E. The Natural Person, Legal Entity or Juridical Person and Juridical Personality. *4 Penn. St. J.L. & Int'l Aff.* 363, 2015.
13. Kelsen, H. *Pure Theory of Law*, 2000.
14. Badan – Melnic, E., Lachi C., Civil Legal Capacity – Determining Factor In Establishing And Making Legal Relations, *Contemporary Legal Institutions, Romanian-American University*. Vol. 6(1), 2014.
15. Kurki, V. Revisiting legal personhood. *Paper for Spanish-Finnish Seminar in Legal Theory*, 2016.
16. Maynez, E. G. *Introduction to Law* 31st ed., 1980.
17. Dyschkant, A. Legal Personhood: How We Are Getting It Wrong. *University of Illinois Law Review*. Vol. 5, 2015.

18. Berg, J. Of Elephants and Embryos: A Proposed Framework for Legal Personhood. *Hastings Law Journal*.
19. Van Dun, F. *The Pure Theory of Natural Law, Part I*, 2004.
20. Solum, L. Legal Personhood for Artificial Intelligences. *North Carolina Law Review*, vol. 70, 1992. Article in Cribbet, J. *Illinois Public Law and Legal Theory Research Papers*, Series No. 09-13, 2008.
21. Republic of Chile Constitution of 1980 with Amendments through 2012.
22. <<http://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html>>, [visited 2018-02-25]
23. Barfield, W. Issues of law for software agents within virtual environments. *The MIT Press*. Vol. 14(6), 2005
24. Kanti Saha, T. *Textbook on Legal Methods, Legal Systems & Research*, New Delhi: Universal Law Publishing Co., 2010
25. Thompson, R. Piercing the Corporate Veil: An Empirical Study. *Cornell Law Review*. Vol. 76, Issue 5, 1991.
26. Nillson, N. *The Quest for Artificial Intelligence: a History of Ideas and Achievements*. Cambridge, UK: Cambridge University Press, 2010.
27. Stone P. et al., *Artificial Intelligence and Life in 2030. Report of the 2015 Study Panel, Stanford University*, 2016.
28. Ilachinski, A. *Artificial Intelligence & Autonomy Opportunities and Challenges*, 2017.
29. McCorduck, P. *Machines who think* (2nd ed.), Natick, Mass.: A. K. Peters, 2004.
30. *Roe v. Wade*, 410 U.S. 113, 163 (1973)
31. United States Code: Art. 1, „Words denoting number, gender, and so forth“
32. <<https://dictionary.cambridge.org/dictionary/english/sentient>>. [visited on 2018-02-25]
33. <<https://dictionary.cambridge.org/dictionary/english/sapient>>. [visited 2018-02-25]
34. Wise, S. *Legal Personhood and the Nonhuman Rights Project*, (2010).
35. Norvig P., Russell S. (Eds.) *Artificial Intelligence: A Modern Approach*. Third Edition. 2010, p. 2 – 5.
36. Sparrow R. Killer Robots, (2007, vol. 24, No. 1) *Journal of Applied Philosophy*, p. 65.
37. Harris C.M. Autonomous Vehicle Decision Making: Should We Be Bio – Inspired? p. 316. In Y. Gao et al. (Eds.), *TAROS 2017, LNAI 10454*, (Springer International Publishing AG: 2017), p. 315-324.
38. Wettig S. Zehendner E. A legal analysis of human and electronic agents, *Artificial Intelligence and Law*, 2004, 12: 111–135, p. 127. In Schweighofer, E. (2001). „Vorüberlegungen zu kunstlichen Personen: autonome Roboter und intelligente Softwareagenten.“ In Schweighofer, E., Menzel, T., and Kreuzbauer, G. (eds) „Auf dem Weg zur ePerson.“ *Schriftenreihe Rechtsinformatik*, volume 3, (Verlag osterreich: Wien), p. 45–54.

39. Hubbard F. P. "Do Androids Dream?": Personhood and Intelligent Artifacts. *83 Temp. L. Rev.* 405, 2011, p. 429.
40. Kohlberg L. The Claim to Moral Adequacy of a Highest Stage of Moral Judgment. *Journal of Philosophy. The Journal of Philosophy*. Vol. 70, No. 18. 70 (18): 630–646. doi:10.2307/2025030. JSTOR 2025030.
41. Feldman, M. 10 Real-World Examples of Machine Learning and AI, 2018 <<https://www.redpixie.com/blog/examples-of-machine-learning>>, [visited on 2018-04-05]
42. <<http://www.hansonrobotics.com/robot/sophia>>, [visited on 2018-04-05]
43. Griffin A., Many have pointed out the robot has more rights than many humans in the country <<http://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html>>, [visited 2018-02-25]