THE POSSIBLE LEGAL IMPLICATIONS THAT ARTIFICIAL INTELLIGENCE POSES IN THE NEAR FUTURE

Therese Lia

ABSTRACT

With artificial intelligence, meaning the development of computer systems to perform tasks that would normally require human intelligence and judgment, now permeating many areas including healthcare, business, education and finance, its regulation has now become more vital. This is especially so in light of the risks it poses and the lack of current legislation dealing with such risks. In light of this, this Article seeks to examine two of the most salient issues which crop up in this regard, those being its personality and accountability. Besides such discussions, the author will also provide recommendations as to how a balance may be struck between not stifling AI innovation and protecting the public from the dangers AI poses. Finally, the author proposes the 'corporation approach' so that AI would be able to own property and be civilly and criminally liable like corporations, whilst ensuring that enough human oversight is present.

KEYWORDS: ARTIFICIAL INTELLIGENCE – ACCOUNTABILITY- COMPUTER SYSTEMS

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1. Introduction

According to the Oxford Dictionary, artificial intelligence is defined as '*the theory and development of computer systems able to perform tasks that normally require human intelligence and judgment, such as visual perception, speech recognition, decision-making, and translation between languages.*'[59] Artificial intelligence is increasingly permeating every aspect of our society including areas such as:

- Healthcare: Examples include chatbots which help customers make appointments; virtual health assistants providing basic medical feedback; and IBM Watson[60] which examines patient data and other available data sources to form a medical hypothesis.

- Business: Machine learning algorithms are being integrated into analytics and CRM platforms [61]to uncover information on how to better serve customers. Furthermore, chatbots have been amalgamated into websites rendering immediate service to customers.

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[59] Dundas Lawyers and +Malcolm Burrows, 'Artificial Intelligence – Introductory Thoughts On The Legal Issues | Brisbane Lawyers | Dundas Lawyers' (*Brisbane Lawyers | Dundas Lawyers*, 2019) <https://www.dundaslawyers.com.au/artificial-intelligence-introductory-thoughts-on-the-legal-issues/> accessed 4 March 2019.

[60] Watson is an IBM supercomputer that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a "question answering" machine. ('What Is IBM Watson Supercomputer? - Definition From Whatis.Com' (*SearchEnterpriseAI*, 2019) <https://searchenterpriseai.techtarget.com/definition/IBM-Watson-supercomputer> accessed 4 March 2019.)

[61] Customer relationship management (CRM) is the combination of practices, strategies and technologies that companies use to manage and analyse customer interactions and data throughout the customer lifecycle, with the goal of improving customer service relationships and assisting in customer retention and driving sales. ('What Is CRM (Customer Relationship Management)? - Definition From Whatis.Com' (*SearchCRM*, 2019) <https://searchcrm.techtarget.com/definition/CRM> accessed 4 March 2019.)

- Education: AI can automate grading, assess students, and adapt to their needs, whilst helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track.

- Finance: Personal finance applications, such as Mint or TurboTax, collect personal data and provide financial advice. Other programs such as IBM Watson have been applied to the process of buying a home. [62]

Since AI may be misused or behave in unpredictable and potentially harmful ways, questions on the role of the law, ethics and technology in governing AI systems are more relevant than ever before.[63] Surprisingly, despite its vast use and potential risks, there are few legal provisions governing its use. Moreover, where laws do exist, they typically relate to AI indirectly only; such as the US Fair Lending regulations[64] which require financial institutions to explain credit decisions to potential customers, and which limit the extent to which lenders can use deep learning algorithms. Another example is the EU GDPR[65] rules, which put strict limits on how enterprises can use consumer data, impeding on the training and functionality of many consumer-facing AI applications.[66]

This paper seeks to discuss the future of AI legislation with respect to these two interconnected issues:

A. Personality

B. Accountability

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[62] Margaret Rouse, 'What Is AI (Artificial Intelligence)? - Definition From Whatis.Com' (*SearchEnterpriseAI*, 2019) <https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence> accessed 4 March 2019.

[63] Corinne Cath, 'Governing Artificial Intelligence: Ethical, Legal And Technical Opportunities And Challenges' (2018) 376 Royal Society Publishing <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6191666/> accessed 4 March 2019.

[64] Equal Credit Opportunity Act (ECOA)/Regulation B and the Fair Housing Act (FHA).

[65] EU General Data Protection Regulation (GDPR) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ 2 119/1

[66] Margaret Rouse, 'What Is AI (Artificial Intelligence)? - Definition From Whatis.Com' (*SearchEnterpriseAI*, 2019) <https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence> accessed 4 March 2019

The first issue, meaning that of personality, relates to whether artificial intelligence should possess any legal status, and if so, what form this legal status should take - a natural person, a legal person, an animal or an object, or whether a new category should be created for the adequate attribution of its rights and responsibilities in society.

The second issue, that of accountability, is important for whilst artificial intelligence and machine learning algorithms continue to progress in their decision-making processes, they will not always be understandable to human beings, as is what happened in the Google Brain neural net case. Accountability will hence be explored in relation to the fields of civil liability and tort as well as criminal liability.

In Malta a document establishing an ethical framework for AI was published in October 2019 as part of Malta's AI strategy to ensure that AI development is ethically aligned, transparent and socially responsible.[67] In order to have trustworthy AI this document lays out a number of principles which need to be kept in mind;

1) Performance and safety – This includes accuracy, reliability and reproducibility, resilience to attack and security as well as a fallback plan and general safety.
2) Fairness and lack of bias – This includes stakeholder participation as well as accessibility and universal design.
3) Accountability – This centres around auditability, redress, minimization and reporting of negative impacts.
4) Wellbeing – It is important to have sustainable and environmentally friendly AI, with consideration to social impact as well as society and democracy.
5) Explainability and transparency – This includes elements of traceability, explainability and communication.
6) Privacy and data governance – Consideration must be had to privacy and data protection as well as access to data.
7) Human agency – This requires consideration to fundamental rights and human agency as well as an element of human oversight.

2. Personality

According to Bertrand Liard, *'We may get to a point where AI is as smart as a human and requests the same rights as people – as dramatized in the late Isaac Asimov's*

[67] Malta AI Taskforce, 'Malta Towards Trustworthy AI' (2019).

novels.'[68] In fact, one of the fundamental issues which AI poses, especially in light of its present developments and in light of its future anticipated developments is personality. The issue of personality, which will become more prevalent as technology moves from Soft AI to Hard AI[69], begs the question whether AI should possess any legal status, and if so, what form should this legal status take – that of a natural person, a legal person, an animal or an object, or whether a new category with its own specific features and implications should be created for the attribution of rights and duties.[70]

The issue of personality goes hand in hand with the issue of ownership, as without an established legal personality of some kind, AI cannot own property, or have rights in intellectual property, copyright or patent claims. As it currently stands, AI does not usually have rights in this regard as countries such as France[71] and the UK[72] stipulate that the author or creator must be a human being.[73] This means that if an AI in such countries was an author of some creative work or an inventor, it could not be protected by patents unless some human intervention took place in the process.[74] However, if the legal status of natural persons is granted to AI, it would be able to possess rights in such countries. AI's legal establishment as a natural or legal person would also mean that it could possibly sue or be sued or be a party in legal proceedings.

[68] Nick Ismail, 'The Legal Implications Of 'Creative', Artificial Intelligent Robots' (*Information Age*, 2019) <https://www.information-age.com/legal-artificial-intelligence-123476391/> accessed 4 March 2019.

[69] AI can be categorised as either weak, meaning AI systems designed and trained for a particular task (for example virtual personal assistants such as Apple's Siri), or strong, meaning AI systems with generalised human cognitive abilities.

[70] Mirjana Stankovic and others, 'Exploring Legal, Ethical And Policy Implications Of Artificial Intelligence'.

[71] See Article L111-1 and Article L111-3 of the French Intellectual Property Code 1992.

[72] See the Copyright Designs and Patents Acts 1988, Section 9(1).

[73] On the other hand, United States IP law has granted rights and legal responsibilities to non-human entities, namely corporations and it would thus be possible for AI to possess rights if it is granted the status of a corporation. Similarly, the World Intellectual Property Organization (WIPO)'s definition of intellectual property refers to "creations of the mind" but does not explicitly require that the "mind" be human.

[74] Nick Ismail, 'The Legal Implications Of 'Creative', Artificial Intelligent Robots' (*Information Age*, 2019) <https://www.information-age.com/legal-artificial-intelligence-123476391/> accessed 4 March 2019.

Rothenberg[75] identifies three ways AI could possess legal personality in the context of civil law:

1. Agency Status
2. Legal Corporation Status
3. Natural Person Status

2.1. AI Recognised as Agents

This kind of relationship would entail AI conducting deals on behalf of its employer, a relationship which would be governed by agency law of the respective jurisdiction. Weak artificial intelligent robots have already been acting as agents for their principals in numerous industries including as robo-bosses of human employees,[76] robo-guards in prisons[77] and robo-traders in the stock-market.[78]

This agency-employer relationship between AI and their agents has also been the subject of some US cases including, State Farm Mutual Automobile Insurance Company v. Bockhorst[79] and the McEvans v. Citibank, N.A.[80], in which the courts found that the respective companies were liable to a third party for errors caused by their robotic programs. The former case concerned the defendant, an insurance company, whose computer reinstated the plaintiff's insurance policy retroactively. Whilst the defendant argued that the computer error should not bind it, the defendant was still liable for the mistake. Similarly, in the latter case, the defendant was held to

[75] David Marc Rothenberg, 'Can Siri 10.0 Buy Your Home? The Legal And Policy Based Implications Of Artificial Intelligent Robots Owning Real Property.' (2016) 11 Washington Journal of Law, Technology & Arts

[76] 'Meet The New Boss: The World'S First Artificial-Intelligence Manager?' (*Finance.yahoo.com*, 2015) <https://finance.yahoo.com/news/meet-the-new-boss-the-worlds-first-128660465704.html?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAIsDTCfxceXBoHAeKb3w2JPLrbrkIXOnP8LJdtWzhojbDtXgQYGtRRXoYEPAk-fX924IpibYk-YBhHQN9a-lNgvkFkeYIvHFWeWgLqiod9HVUjL53rduE-XGLcYk2YhKGv__g3NivajHSXxfAnYwQjnpZIMVvYAokdWfIT_DIGZl> accessed 4 March 2019.

[77] James Trew, 'Robo-Guard The South Korean Correction Service Robot Says 'Stay Out Of Trouble' (Video)' (*Engadget*, 2015) <https://www.engadget.com/2012/04/15/robo-guard-south-korean-robotic-guard/> accessed 4 March 2019.

[78] Rob Langston, 'Trading In The 21St Century - Raconteur' (*Raconteur*, 2014) <https://www.raconteur.net/finance/trading-in-the-21st-century> accessed 4 March 2019.

[79] *State Farm Mut Auto Ins V Bockhorst* [1972] 10th Cir, 453 F2d (10th Cir).

[80] *McEvans v Citibank* [1972] 10th Cir, 408 NA NYS2d (10th Cir).

be liable for the customer's lost funds, even though it was the ATM machine which made an error. This was because the ATM was acting as the defendant' agent, having the authority to receive money from third parties on the defendant's behalf.

Whilst these cases involved rudimentary robotic tools working for their companies and whilst AI has not yet been formally established as an 'agent', these cases may establish a framework for the future in which robots create duties and liabilities for their agents and in which an error by a robotic tool creates liability for the principal, in the case that no human agent caused the mistake. However, in order for AI to be able to formally act as an agent the definition of 'person' under agency law would need to be updated.[81] Furthermore, the question as to who should be liable if the agent acts fraudulently can be answered by looking at the agency law of the respective jurisdiction.[82]

2.2. AI operating property in a manner similar to a corporation

According to Rothenberg, corporations have seven common attributes:

i. They are a legal entity separate and distinguished from their shareholders.

ii. They have the capacity of continued existence independent of the lifetime or personnel of its shareholders.

iii. They have the capacity to contract.

iv. They have the capacity to own property in its own name;

v. They have the capacity to commit torts;

vi. They have the capacity to commit crimes, but only such crimes where criminal intent is not a necessary element of the crime; and

vii. They have the capacity to sue and be sued.

[81] For example Article 1856, Civil Code (1870), Chapter 16 of the Laws of Malta

[82] Maltese agency law can be found in Articles 49-56, Commercial Code (1857), Chapter 13 of the Laws of Malta, as well as Articles 1856-1872, Civil Code (1870), Chapter 16 of the Laws of Malta.

Willick recognises three other essential elements for corporations; that they exist as an organised whole, pursuing a legal interest; that they possess a definite aim and that society must place enough value in the pursued aim to warrant legal protection.[83] Regardless of which approach is taken, artificial intelligence would be able to satisfy all these elements. From this it follows that AI should be granted artificial personhood[84]; in the author's opinion, this should happen when AI possesses certain cognitive abilities, such as when it reaches Type 3 or Type 4.[85]

It is important to note that this approach is limited in some ways. This is because corporations are not as free as natural persons - there is an element of human guardianship which allows dual oversight by both the shareholders and the board. In order to do away with most of this human oversight, another approach would be needed, that is the approach that AI can own property like a human being.

2.3. AI owning property like natural persons

The third and most novel idea is that of AI owning property like natural persons. In this third hypothesis, AI may buy as much property as it can afford like any natural person and it would hold the rights and liabilities for it.[86] This approach may be difficult to implement due to the fact that real property law is not simply about ownership, and granting AI the right to own property like a natural person may go against the traditional view of property rights which entails that *'they promote and protect the self-respect and autonomy for individuals*.'[87]

[83] Marshal S. Willick, 'Artificial Intelligence: Some Legal Approaches And Implications' (1983) 4 AI Magazine.

[84] F. Patrick Hubbard, 'Do Androids Dream?: Personhood And Intelligent Artifacts' (2011) 83 Temp. L. Rev.

[85] Present AI has only yet reached the Type 2 Category, possessing memory of past experiences in order to inform their future decisions. Type 3 AI meaning AI with their own beliefs, desires and intentions as well as Type 4 AI involving AI systems with a sense of self and consciousness, do not yet exist.

[86] Gabriel Hellevy, '*"I Robot-1 Criminal" – When Science Fiction Becomes Reality: Legal Liability Of AI Robots Committing Criminal Offences,*' (2010) 22 Syracuse J. Sci & Tech L., 1.

[87] Larry May, 'Corporate Property Rights' (1986) 5 Journal of Business Ethics. Also Article 1 of protocol 1 **ECHR**: "Every natural or legal person is **entitled** to the peaceful enjoyment of his possessions".

However, the author argues that the argument that respect to property is based on respect to human beings should not exclude AI from owning property. This is because in many jurisdictions artificial persons possess the right to own property, despite being artificial persons. Moreover, the creators of AI, like the creators of legal persons, are natural persons.

There are several arguments which can be made in favour of AI owning property like natural persons. Whilst some argue against this hypothesis on the basis of AI's lack of cognitive abilities, this is not true for AI has developed cognitive abilities that are far beyond the minimum mental requirements. In fact, AI researchers tend to see the distinction between AI technology and human brains as merely formal and Dr. Frederick Hayes-Roth maintains that *'The brain is an existence proof for a gargantuan machine that we have yet to build*.'[88]Furthermore, mental capacities or the lack of them should not be a single deciding factor since children and disabled people can own property (with limitations),[89] despite the fact that their cognitive properties are not as developed.

Moreover, despite fears that granting AI the right to own property like natural people would be granting unhindered freedom, there will still be some form of human oversight, even if AI owns property like a natural person. This is because the Government could still oversee the property and it has the ability to seize any property as long as certain factors are met. This means that AI's property could be seized if a danger emerged, as long as AI was provided with just compensation.[90]

Another alternative argument made in favour of AI possessing such autonomy is that cited by Willick.[91] Willick states that in cases of severe injuries suffered by human beings, mechanical parts may be required for the person's loss. These leave his legal status untouched. Thus, in such a way, since a human being does not surrender his right to legal recognition when replacing a human part with a machine, machines should be granted recognition in the same way natural human beings are.

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[88] Technology Review, Jan 1981, p.82

[89] In the UK, a minor under the age of 18 cannot own land or property in the UK, so it would have to be owned in trust by trustees, e.g. parents, for the beneficial ownership of the 13-year-old. Under Maltese law, Article 967 (3) of the Civil Code, cited above, says that certain categories are incapable of contracting (i) Minors (ii) Persons interdicted or incapacitated (iii) Generally all those to whom the law forbids certain contracts. It is to be noted that this does not exclude the right to inherit property however.

[90] Under Maltese law this is found in Article 37 of the Constitution of Malta.

[91] Marshal S. Willick, 'Artificial Intelligence: Some Legal Approaches And Implications' (1983) 4 AI Magazine.

3. Accountability

Accountability is important as artificial intelligence and machine learning algorithms will continue to progress in their decision-making processes,[92] but will not always be understandable to human beings. This is because, though knowledge is inserted in machines by humans, machines are taught to think independently and on a scientific level, we may not be able to understand how they come to the decisions they make.[93] One such example is the Google Brain neural net, tasked with keeping its communications private, which independently developed its own encryption algorithm.[94] Realising the fact that AI-equipped computers can make economic, medical, legal and other judgements which may impact on people, Bobrow has stated *'We mustn't give machines authority without responsibility.'*[95]

One such area wherein liability/ accountability as regards to AI will be prevalent, will be in the field of autonomous vehicles. Whilst self-driving cars may seem like a faraway possibility, they are in actual fact a present reality, as autonomous car technology is being developed by the likes of Lexus, BMW and Mercedes, amongst others.[96] In response, four states in the US (Nevada, Florida, California and Michigan), Ontario in Canada, the United Kingdom, France and Switzerland have created rules for the testing of self-driving cars on public roads. However, these laws do not tackle issues about responsibility and assignment of blame for an accident for self-driving and semi self-driving cars[97], and it remains to be seen whether Courts will rely on the principles

[92] Keith Shaw and Editor-in-Chief Keith Shaw, 'Legal And Safety Issues Are Looming Around Ethics, AI And Robots' (*Robotics Business Review*, 2019) <https://www.roboticsbusinessreview.com/events/legal-and-safety-issues-are-looming-around-ethics-ai-and-robots/> accessed 4 March 2019.

[93] 'Artificial Intelligence: The Real Legal Issues - Osborne Clarke' (*Osborne Clarke*, 2017) <https://www.osborneclarke.com/insights/artificial-intelligence-the-real-legal-issues-an-article-by-john-c-buyers-osborne-clarke-llp/> accessed 4 March 2019.

[94] More information about Google Brain can be found on: Tiernan Ray, 'Google Brain, Microsoft Plumb The Mysteries Of Networks With AI | Zdnet' (*ZDNet*, 2018) <https://www.zdnet.com/article/google-brain-microsoft-plumb-the-mysteries-of-networks-with-ai/> accessed 4 March 2019.

[95] N.Y. Times Magazine, Dec. 14, 1980, p. 62.

[96] Curtis Moldrich and Victoria Woollaston, 'Driverless Cars Of The Future: How Far Away Are We From Autonomous Cars?' (*Alphr*, 2018) <https://www.alphr.com/cars/1001329/driverless-cars-of-the-future-how-far-away-are-we-from-autonomous-cars> accessed 4 March 2019.

[97] Some car designs sidestep this issue by staying in autonomous mode only when hands are on the wheel (at least every so often), so that the human driver has ultimate control and responsibility.

of *res ipsa loquitur* to attribute fault to the autonomous vehicle. Another area where revision of legal provisions will become necessary in the face of developing AI is data protection law. This is because AI requires access to data – machines cannot 'learn' unless they have large data sets from which to discern patterns.

3.1. Civil and Tort Accountability

The more autonomous AI becomes, the more difficult it may become to hold individual creators liable for their increasingly less foreseeable actions, rendering ordinary rules on liability insufficient. New rules are necessitated in order to determine whether the particular AI is responsible for its acts or omissions, and whether, for policy reasons it would be best for it to bear responsibility or whether it would be best for a strict liability system to be imposed on the creator. If the purpose is to incentivise due care, a strict liability regime backed by insurance may be most efficient.

Current US law traditionally finds liability, where the developer was negligent or could foresee harm. For example, the Court in the US case *Jones v. W + M Automation, Inc*,[98]did not find the defendant liable where a robotic gantry loading system injured a worker as the court found that the manufacturer had abode by regulations. Under US Law, in strict liability claims, it has to be proven that the product which the defendant had sold was defective and unreasonably dangerous at the time it passed on to the plaintiff, without enduring any substantial changes and that such defect was the proximate cause of the plaintiff's injuries. Under negligence claims, the plaintiff would be required to show how the manufacturer failed to exercise reasonable care in making the robot, which he had a duty to exercise – and as a result, the plaintiff suffered damages.[99]

Under the current EU legal framework, robots cannot be held liable per se for acts or omissions that cause damage to third parties. Liability rules cover cases where the cause of the robot's act or omission can be traced back to a specific human agent such as the manufacturer, the owner or the user and where the agent could have foreseen and avoided the robot's harmful behaviour.[100]

Manufacturers, owners or users could be held strictly liable for acts or omissions of a robot if, for example, the robot was categorised as a dangerous object or if it fell within

[98] *Jones v W + M Automation, Inc* [2006] NYS 2d App Div, 818 396 (NYS 2d App Div).

[99] These would be determined by state laws, and there may be variance between states.

[100] Mirjana Stankovic and others, 'Exploring Legal, Ethical And Policy Implications Of Artificial Intelligence'.

product liability rules. Regarding the latter, Council Directive 85/374/EEC[101] can cover damage caused by a robot's manufacturing defects and on condition that the injured person is able to prove the actual damage, the defect in the product and the causal relationship between damage and defect (strict liability or liability without fault).

In the scenario where a robot can make autonomous decisions, traditional rules will not suffice to bring about a robot's liability, since they would not make it possible to identify the party responsible for providing compensation and to require this party to make good the damage it has caused. Thus, despite the Liability for Defective Products Directive[102], current EU law would not suffice to tackle any damage brought about by robots which can learn from their past experiences and which experience the environment in an unforeseeable manner, for this would entail a certain degree of unpredictability in their behaviour.[103] Regarding contractual situations, the traditional contractual provisions will become inapplicable in the face of AI designed to negotiate and conclude contracts.[104]

Difficulties thus lie in the situation present under both US and EU law – which exclude AI bearing responsibility. This is because what if the manufacturer's conduct did not cause the damages in question? What if he exercised reasonable care or did not know what the robot or AI in question was capable of doing? Should liability be strict in such cases or should it rest on the victim?[105] These difficulties are amplified in the field of reinforcement learning, in which there is no fault by humans.[106]

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[101] Liability for defective products [1985] OJ 2 210/29.

[102] *Ibid*

[103] Mirjana Stankovic and others, 'Exploring Legal, Ethical And Policy Implications Of Artificial Intelligence'.

[104] For example, in the Maltese context, elements such as capacity, consent and vices of consent, would be rendered meaningless.

[105] See Section C. Conclusion and Recommendations for proposed solutions.

[106] Reinforcement learning shifts the focus to experience-driven sequential decision-making, rather than pattern recognition, moving AI into making actions in the real world. (Source: David Marc Rothenberg, 'Can Siri 10.0 Buy Your Home? The Legal And Policy Based Implications Of Artificial Intelligent Robots Owning Real Property.' (2016) 11 Washington Journal of Law, Technology & Arts pp. 6).

3.2. Criminal Accountability

Whilst a guilty robot appears to be fictional today, there is nothing unrealistic about such a possibility with the on-going technological progress.[107] In fact, CNBC reported an incident involving online 'bots', wherein an automated online shopping bot, set up by a Swiss art group, using its weekly allowance of $100 worth of Bitcoin, to purchase illegal items from the 'dark web'. Whilst the Swiss police confiscated the robot and its illegal purchases, no convictions were made.[108]

Whilst it is true that in cases wherein a robot 'commits' a crime' because it was deliberately programmed to do so, the person behind the robot can be held responsible according to existing criminal law.[109] The issue lies when a robot commits a crime with criminal intent, intent which cannot be traced back to a single programming operation.

In the author's opinion, the viable approaches which can be taken with reference to the notion of guilty robots are the following:

1. The traditional approach to criminal law which excludes the hypothesis that robots can ever be found guilty;
2. The notion that guilty robots may be a possibility if they ever evolve as moral beings;
3. A third route would be to avoid strict liability but to impose functional equivalents, which are free from academic debates pertaining to criminal responsibility but would still ensure that the aim of criminal law is satisfied.

According to existing traditional accounts, robots cannot be made criminally responsible. This, according to Gless, Silverman and Weigend, is due to the fact that they are not conceived as morally responsible agents and they cannot be the addresses of retribution in the form of punishment, meaning they do not have the capacity to understand the concept of punishment.[110]

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[107] Monika Simmler and Nora Markwalder, 'Guilty Robots? – Rethinking The Nature Of Culpability And Legal Personhood In An Age Of Artificial Intelligence' [2018] Criminal Law Forum.

[108] Arjun Kharpal, 'Robot With $100 Bitcoin Buys Drugs, Gets Arrested' (*CNBC*, 2015) <https://www.cnbc.com/2015/04/21/robot-with-100-bitcoin-buys-drugs-gets-arrested.html> accessed 4 March 2019.

[109] Sabine Gless, Emily Silverman and Thomas Weigend, 'If Robots Cause Harm, Who Is To Blame? Self-Driving Cars And Criminal Liability' [2016] SSRN Electronic Journal.

[110] *ibid*.

The reason why traditional criminal law denies the existence of a guilty robot is free will. A robot is not 'a person with free will' and the requirement of *mens rea* in criminal law which requires one to intend or knowingly risk whilst being aware of the consequences, cannot be satisfied for robots. However, it is to be said that this theory is flawed for it is not clear what distinguishes an intelligent system from a criminally responsible human being, and it is to be said that at a certain stage, especially at Level 4, robots will not substantially be different to human beings.[111]

Whilst Gless and Weigend argue that intelligent agents do not meet the criteria to qualify as a person because they are not aware of their freedom and they do not possess the capacity to grasp the concept of rights and obligations, the author contends that free will is a sociological concept, and not a biological one. Hence, it would not be possible to draw the line at which point technology has advanced to such an extent that robots possess such free will, and because of this a new determiner should be used such as a sufficient standard of mental capacity.[112]

Moreover, it cannot be said that criminal responsibility has been limited to human beings, for many legal systems have attributed criminal responsibility to legal persons.[113] Thus, non-human entities are already accepted as subjects of criminal law in many countries[114] and there should be no reason why criminal responsibility of robots cannot develop as a notion. Furthermore, whilst some argue that robots are not punishable this argument is flawed, seeing as legal persons are punished, and seeing as the focus of punishment nowadays is not merely as retribution but also as a form of rehabilitation.[115]

It is to be noted that the development of a robot with criminal responsibility would entail it being recognised as a person under law.[116] If a robot is judicially recognised under a person under criminal law, this means that it could be both the victim and the

[111] Monika Simmler and Nora Markwalder, 'Guilty Robots? – Rethinking The Nature Of Culpability And Legal Personhood In An Age Of Artificial Intelligence' [2018] Criminal Law Forum.

[112] *ibid.*

[113] Muller, 'Roboter Und Recht Eine Einfuhrung' (2014) 5 Aktuelle Juristische Praxis.

[114] Ibid. and T. Weigend, 'Societas Delinquere Non Potest ?: A German Perspective' (2008) 6 Journal of International Criminal Justice.

[115] Mike C. Materni, 'Criminal Punishment And The Pursuit Of Justice' (2013) 2 Br. J. Am. Leg. Studies pp. 263-304.

[116] Jakobs, Staatliche Strafe: Bedeutung und Zweck (2004), pp.40-41

perpetrator of a crime. Boundaries might need to be applied as to which AI would fall under such 'persons' and which AI (for example weak AI) fall out of such a scope.

Regarding functional equivalents of a 'personality', Simmler and Markwalder argue that the postulation of a robot as an 'e-person' can work in civil law but not criminal law. This is because unlike civil law, the function of criminal law is not merely to secure payment of damages, but to create stable expectations in the face of an uncertain future, containing foreseeable unavoidable disappointments.[117]

However, arguing once again on the basis of a comparison to a corporation, through the creation of a new personality for AI, it would be possible to attribute criminal responsibility to it where it is most necessary and where it would be feasible, whilst excluding it from crimes which it could not possibly commit. Whilst imprisoning AI for its wrongdoing may or may not make sense depending on the specific AI in question, like in the case of a corporation, other punishments may be attributed, such as heavy fines, loss of licenses, and so on. The author contends that whilst it may be difficult to fit AI in with the traditional theory of criminal responsibility, it does not mean that AI of a certain mental capacity is to be completely exempt from responsibility.[118]

4. Reflections and Recommendations

AI regulation may be hindered by the fact that whilst most technology develops very fast, laws and regulations addressing AI directly are slow. This may be tackled by having legislation which is flexible in interpretation and which provides the space to apply, well-known principles to new concepts.[119]

Choice of law and jurisdiction will definitely play a part in the regulation of the issue.[120] However, since the issue will probably be an international matter, it is suggested by the

[117] Monika Simmler and Nora Markwalder, 'Guilty Robots? – Rethinking The Nature Of Culpability And Legal Personhood In An Age Of Artificial Intelligence' [2018] Criminal Law Forum.

[118] For more details see: Artificial Intelligence and the External Element of the Crime An Analysis of the Liability Problem, Matilda Claussén-Karlsson.

[119] Hélène Beauchemin, 'The Key Legal Issues In AI' (*Stradigi*, 2018) <https://www.stradigi.ai/blog/the-key-legal-issues-in-ai/> accessed 4 March 2019.

[120] Dundas Lawyers and +Malcolm Burrows, 'Artificial Intelligence – Introductory Thoughts On The Legal Issues | Brisbane Lawyers | Dundas Lawyers' (*Brisbane Lawyers | Dundas Lawyers*,

author that an open and accessible task force on AI and ethical and legal issues is employed so as to develop guidelines and protocols on the international stage.[121]

The author further recommends that:

- In questions of both civil and criminal liability, where liability cannot be attributed to the AI agent, Courts should attribute liability to AI as its agent. This would avoid cases wherein no one is held liable, and ensures that the victim is given just compensation. In criminal cases, this can work for the time being for AI is not yet completely independent and unforeseeable and can be linked to its creator.

- As AI becomes more unforeseeable, jurisdictions should pave the way forward to implement the 'corporation approach' in that AI (Type 3 or 4) would be able to own property and be civilly and criminally liable, like corporations. Whilst affording AI a number of rights, this would ensure that AI would be held liable in civil and certain matters, as well as that sufficient human oversight is present.

- The third hypothesis – that AI should have the rights and duties of a human being – should be researched in more detail for the time being with respect to its long-term implications.

- An alternative possibility to solve the accountability problem posed by AI, which might result in accidents and compensation to be paid, is to have a strict liability system, which would be backed by a licensing fund and a certification agency such as Turing Registries[122] or the EU Agency for Robotics and Artificial Intelligence. This solution, which was suggested by the European Parliament Committee on Legal Affairs in its Report on Civil Law Rules on Robotics[123], as well as iTechLaw Conference (2016), would entail an assessment system for robotic devices creating a levy payment which would be necessary for the device to be released into the open market.[124] The

2019) <https://www.dundaslawyers.com.au/artificial-intelligence-introductory-thoughts-on-the-legal-issues/> accessed 4 March 2019.

[121] Keith Shaw and Editor-in-Chief Keith Shaw, 'Legal And Safety Issues Are Looming Around Ethics, AI And Robots' (*Robotics Business Review*, 2019) <https://www.roboticsbusinessreview.com/events/legal-and-safety-issues-are-looming-around-ethics-ai-and-robots/> accessed 4 March 2019.

[122] Curtis E.A. Karnow, 'Liability For Distributed Artificial Intelligences' (1996) 11 Berkeley Technology Law Journal.

[123] 'Civil law rules on robotics', JURI, 2015/2103(INL).

[124] 'Artificial Intelligence: The Real Legal Issues - Osborne Clarke' (*Osborne Clarke*, 2017) <https://www.osborneclarke.com/insights/artificial-intelligence-the-real-legal-issues-an-article-by-john-c-buyers-osborne-clarke-llp/> accessed 4 March 2019.

idea, taken from the New Zealand precedent in the shape of the Accident Compensation Act 1972[125], would be that a fund would be created to enable the payout of compensation in the event a risk transpired. [126]

- Regarding autonomous cars, inspiration may be taken from the UK Government's consultation document on driverless vehicles[127], in which the Government has chosen to address the issue of driverless cars from the perspective of gaps in current insurance coverage caused by fully autonomous driving. This proposal which entails the Motor Insurer Bureau paying out in the usual way and then seeking to recover the losses from the owner of the uninsured vehicle, would avoid a systemic change to the insurance industry in the case of a mixed demographic of driverless cars and human piloted ones. The problem with this proposal would be that it relies on the ability of insurers to subrogate and therefore bring claims of their own against other third parties, including manufacturers, which would prove problematic for insurers if the defect cannot easily be traced.

- In the business field, AI can be improved by having businesses collect more data and collaborating with the Government on figuring out betting regulations in terms of workplace safety in the AI field.[128] Companies should employ AI with the assumption that something will go wrong, so that preventative actions can be taken by business to ensure safety, and evade negligence claims.

- Regarding data protection laws, Governments, especially the EU should carefully assess whether existing data access laws should be updated to reflect the benefits of AI. In the author's opinion, policy frameworks must protect privacy without limiting innovation – this can be done for example through the development of anonymisation techniques. These enable analysis of large data sets without revealing individual

[125] This statutorily settles all forms of personal injury accidents including Road Traffic Accidents and has effectively abolished personal injury litigation in that country

[126] 'Artificial Intelligence: The Real Legal Issues - Osborne Clarke' (*Osborne Clarke*, 2017) <https://www.osborneclarke.com/insights/artificial-intelligence-the-real-legal-issues-an-article-by-john-c-buyers-osborne-clarke-llp/> accessed 4 March 2019.

[127] Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies, Centre for Connected and Autonomous Vehicles, July 2016.

[128] Keith Shaw and Editor-in-Chief Keith Shaw, 'Legal And Safety Issues Are Looming Around Ethics, AI And Robots' (*Robotics Business Review*, 2019) <https://www.roboticsbusinessreview.com/events/legal-and-safety-issues-are-looming-around-ethics-ai-and-robots/> accessed 4 March 2019.

identities. Moreover, to support useful research, governments should provide reasonable latitude in assessing whether data used for AI analysis is within the scope of its original purpose.

- Regard must be had to the principles set out in the 'Malta Towards Trustworthy AI – Malta's Ethical AI Framework, October 2019'[129], which requires that measures are established to ensure traceability, in the design and development phase and the testing and validation phase. AI systems are to be designed with explainability in mind from the outset, by researching and attempting to use the simplest and most interpretable model possible for the application in question, assessing whether it is possible to analyse, change and update training and testing data as well as assessing whether interpretability can be examined after the model's training and development or whether the model's internal workflow can be assessed.

Governments must also ensure the system is auditable, by ensuring that individuals can seek redress, by reporting negative impacts as well as by documenting trade-offs. Redress mechanisms must be established to provide clear information on these to users and affected individuals. A risk or impact assessment of the AI system must be conducted and should include training and education to develop accountability practices. There could also be an 'ethical AI Board' or similar mechanism to discuss overall accountability and ethics practices. Finally, procedures for third parties (e.g. suppliers, consumers, distributors and vendors) or workers must be established so as to report potential vulnerabilities, risks or biases in the AI system.

5. Conclusion

The aim of this article was to examine two of the most salient issues concerning AI – namely personality and accountability. The personality aspect is a building block for the accountability issue as the type of legal accountability AI will be subject to will be assessed depending on whether its legal status is that of a natural person, or a legal person, due to the fact that the former deals with the attribution of its rights and responsibilities in society.

As identified by Rothenberg, legal personality can be dealt with in three ways; agency status, legal corporation status or natural person status. Agency law status would entail

[129] Malta AI Taskforce, 'Malta Towards Trustworthy AI' (2019).

looking at the agency law of the respective jurisdiction in order to answer the question as to who should be made liable if the agent acts fraudulently. The corporation approach entails providing AI with artificial personhood which in the authors' opinion should happen when AI possesses certain cognitive abilities, such as when it reaches Type 3 or Type 4. Due to the fact that there is a human element to this, this approach may be more limited than the natural persons approach, wherein AI could buy as much property as it can afford, like any natural person and wherein it would hold the rights and liabilities for it. Such approach would naturally require a more modern interpretation of property law, especially the peaceful enjoyment of their possessions.

This accountability issue, important as AI and machine-learning algorithms continue to progress in their decision-making processes, especially when it comes to self-driving cars and vessels, will need to be tackled both with respect to the civil aspect as well as its criminal aspect. This is especially so in scenarios when it is not possible to identify the party responsible for providing compensation rendering the liability for the *Defective Products Directive*, insufficient. The traditional notion of free will and *mens rea* might need to be revisited with AI; so does the punishment to be doled out if AI could be found criminally responsible.

Accountability for AI depends on the legal personality AI will possess; whether it is viewed as an agent (as it more or less currently stands), whether it is given the rights and duties of a legal corporation or whether it is given the rights and duties of a natural person. Precisely how law and policy will adapt and advance in AI and how AI will adapt to values reflected in law and policy – depends on a variety of social, cultural, economic, and other factors, and is likely to vary by jurisdiction. A balance must be struck between not stifling AI innovation yet also finding a way to protect the general public from the possible danger AI would pose.