Internet of Things and Ethical Concerns

Odyssefs Diamantopoulos-Pantaleon

Research Paper

PH 2003 Internet and Philosophy

Dr. Giannis Stamatellos

Deree – The American College of Greece

Spring 2021

Words: 3737

Abstract (202 Words):

In this paper we are going to analyze the new technology called Internet of Things (IoT), explore several ethical concerns that are closely connected with IoT, discuss the position held by Utilitarianism and Kantian Ethics and finally give my opinion on the matter. In the first chapter of the research paper, we are going to explain what the Internet of Things is and show why it is so pivotal for today’s society. In the second chapter we are going to present the ethical concerns that are associated with the Internet of Things, such as privacy protection, and explain why they are important. In the third chapter there will be a discussion of Utilitarianism and its variances and we will show why Utilitarianism would consider moral the act of illegal data collection. In the fourth chapter there is going to be a presentation of Kantian ethics which will showcase Kant’s moral principles and explain why this principle would oppose data trafficking. Finally, in the fifth chapter, I am going to voice my own opinion and discuss whether the use of the Internet of Things is ethical and what it is needed in order to draw the best out of the Internet of Things.

INTRODUCTION

The Internet of Things (IoT), or as otherwise called the Internet of Objects (IoO), is a new

development of the Internet that has entered almost all areas of human life, such as business, industry, healthcare, transportation, and education, and is expected to change everything in society including ourselves.[[1]](#footnote-1) According to Spyros Tzafestas, in his work Ethics and Law in the Internet of Things world,[[2]](#footnote-2) “The IoT can be described as objects in our environment being connected so as to provide communication and services. IoT involves a huge number of connections of things to things and things to humans and so it is more complex than the Internet”. As indicated above, in IoT there are three kinds of interaction, human to human, human to things and things to things. Consequently, since IoO does not only contain relations between things but also relations between things and human beings, we should consider the philosophical and the ethical issues of IoT cohabitation with humans. In order to be a part of the Internet of Things network an IoT customer has to sign a contract with an IoT provider which contains a lot of rules about their relationship. Users sign this contract, which contains the rules that are also known as ‘terms of use’, before using IoT devices and services and most of them either do not completely understand them or are not fully reading them. Very often, these terms imply that users give companies broad rights to data collection, sharing, and use. It is extremely likely that if users had completely understood the risks and the possible damages that these terms could cause, they might have never agreed with them. [[3]](#footnote-3)We can reasonably infer that it is essential to review the IoT and understand the risks involved in the use of such a technology. In this paper, the aim is to explain in more detail what is the Internet of Things and examine if its use is ethical, based on the Utilitarianist and Kantian moral theories and my own point of view.

INTERNET OF THINGS EXPLAINED

In order to understand why Internet of Things is so important, we have to explore its structure and its applications. According to Oracle[[4]](#footnote-4), a huge company that among others is offering services in the domain of big data, “The term Internet of Things describes a vast network of physical objects, that are equipped with sensors, software, cameras, and other technologies for the purpose of connecting and exchanging data with other devices and systems, located all around the world, over the internet.”[[5]](#footnote-5) Also, as Steve Ranger writes at ZDNet, “Connecting all these different technological gadgets adds a level of digital intelligence to tools that would otherwise be dump, enabling them to communicate real-time data without involving a human being”.[[6]](#footnote-6) All these objects create a vast new electronical world, where digital systems can exchange information and use this data to “adjust each interaction between connected things”[[7]](#footnote-7), while at the same time interacting with human agents that wish for their services. In other words, the Internet of Things accomplishes to connect the physical and this new electronical world and make them cooperate. These devices range from ordinary household objects that we use every day, like freezers, ovens, and heaters, to extremely sophisticated and complex tools, like factory machines that are used for mass production, smart watches and smart glasses. Based on the statista website it is calculated that currently there are over 11.7 billion active IoT devices and it is projected that by 2025 this number is going to triple and rise to an astonishing 30.9 billion! [[8]](#footnote-8)The benefits that accompany the expansion of the Internet of Things depend on the implementation. Agility, efficiency, and information gathering are what have mostly contributed to IoT’s success. [[9]](#footnote-9)For example, companies add sensors to their products so that they can transmit back performance data. Such data is extremely helpful to companies, which can then improve their product based on the feedback they have received or help them predict when a device is about to produce a critical error and replace it before any damage is done. However, great technological achievements are always accompanied by scary scenarios. More specifically, according to Bruce Schneier[[10]](#footnote-10), there are IoT devices for everything, sensors which collect data, smart houses and digital personal assistants that are always watching and listening to potential commands and devices which perform manual tasks. Schneier argues that we can conceive the IoT as a huge global robot that we have accidentally created, which slowly but surely integrates more and more devices and becomes essential for our civilization. Of course, this raises many concerns, since if every tool is becoming digital, then computer security is now everything security. [[11]](#footnote-11)Imagine if during a surgery there was a cyber-attack and suddenly some of the IoT devices used in the operation stopped. The results would be fatal and disastrous and unfortunately this is not its only downside. Private information breaching, illegal activity monitoring and device breakdown are some of the problems associated with IoT and are sure to raise more and more concerns as the IoT network grows. Regardless, IoT’s rapid expansion in both the civilian and the industrial sector is proving right all the people who claimed that it is going to become one of the cornerstones of modern days civilizations and precisely because of this accomplishment we ought to critically evaluate it.

ETHICAL CONCERNS ON INTERNET OF THINGS

Before discussing Utilitarian and Kantian ethics we ought to present some of the most important problems that Internet of Things faces. First of all, we have to pose the question of why it is necessary to think about ethics in Internet of Things. Unfortunately, there is no single answer. One way to approach this would be to claim that we are experiencing a huge growth in this field that is going to result in enhanced humans and smart systems, devices, and organizations, meaning that we have to think about how we are going to bring the best out of IoT and not the worst. [[12]](#footnote-12)One of the major problems of IoT is privacy protection. When a device is collecting information about a client, the client cannot be absolutely sure that the company is gathering only data that it is permitted to collect. There are times where against the user’s will and knowledge, personal information is being gathered. [[13]](#footnote-13)Another important concern is data security and data usability. [[14]](#footnote-14)Companies are going to get a huge amount of personal data that is going to get used, hopefully, for product optimization, which is going to be extremely vulnerable to external threats. Customers have no way to confirm that the protocols in place are going to ensure that the data is not going to get used by unauthorized third parties or illegally distributed by the company. Additionally, data that is collected with the excuse that it is going to improve the everyday user experience is another ethical problem that we must evaluate[[15]](#footnote-15). Providers, like Netflix, are going to argue that by collecting all the application data they are going to offer a more personalized experience which is going to greatly benefit the customers. This could lead to issues of Trust and Safety, since customers are obligated to trust impersonal colossal companies with their data while bearing the risk of data breach which could even lead to safety issues.

UTILITARIANISM ON INTERNET OF THINGS

Utilitarianism is one of the most powerful and persuasive approaches to normative ethics in the history of philosophy. In general, Utilitarianism is considered to be the view that the morally right action is that action which produces the most utility for the greatest number of people possible. [[16]](#footnote-16)There are many different views of this theory, but in this section, we are going to examine what the two mainstream theories of Utilitarianism think about the Internet of Things. The first theory is Act Utilitarianism, which examines if an action is moral based on a single action.[[17]](#footnote-17) For example, lets have the case where a doctor abducts a patient who came for a regular checkup at the hospital in order to take one of his kidneys and save another person’s life. An act Utilitarianist would argue that this action would benefit more people and produce more happiness and thus it is moral. The second theory is known as Rule Utilitarianism and it examines if an action is moral based on its consequences if it were to become a rule that everyone would follow. [[18]](#footnote-18)On the given example, a Rule Utilitarianist would consider this action immoral, because if it were to become a general rule then this could possibly mean the collapse of the medical system, since everyone would be too afraid to go the hospital. That would cause more damage since more lives would be lost than saved.

Now that we have established the difference between the two main theories, we are going to approach the IoT ethical issues with the tools that Act, and Rule Utilitarianism has equipped as with. [[19]](#footnote-19)Regarding privacy protection, Act Utilitarianism would argue that the action is moral since the information most of the time is gathered without knowledge of the individual and most of the time there are no bad aftereffects for the user which means that usually there is no unhappiness produced. At the same time, though, there is a much greater possibility that the data is going to be used for product optimization which is going to produce happiness for the individual and other customers. Rule Utilitarianism, on the other side, to perceive it as a moral action, would have to examine its effects if it became a rule that all companies would follow. If such a thing were to happen, customers would most probably start noticing that they are being monitored without their permission, leading them to stop using the application, which in turn would result into a lot of unhappiness, since the employees would lose their jobs and the customers would stop enjoying the pros of the product. A topic where both Act and Rule Utilitarianism would agree with is that companies not investing in their data security is immoral. Data loss or alteration could result into great unhappiness and would definitely do more harm than good. These theories would also find common ground on data collected for user experience and would both consider this a moral action, since this data would contribute to creating a personalized experience which would care about each customers personality and culture and would create more utility. Lastly, Act Utilitarianism would definitely disagree with Rule Utilitarianism in data usability. Illegal distribution of data by a company would be approved by Act Utilitarianism as that would give more information to other companies about a customer and thus improving his/her general life experience by a huge margin. A Rule Utilitarian, on the other side, would have to consider the risk of this information being used in a harmful way and would conclude that if it were used as a rule then there would not benefit the overall utility and for that reason it is immoral.

KANTIAN ETHICS ON INTERNET OF THINGS

Kant is one of the most influential and controversial philosophers of history and Kantian ethics are just a part of his huge contribution to philosophy. Kant believed that certain types of actions, such as murder, were absolutely prohibited, even in cases where the action would yield more utility than the alternative. In other words, Kant strictly disagreed with the Utilitarianism approach and that is why his theory is an example of a deontological moral theory. [[20]](#footnote-20)To evaluate if a decision is moral, Kant argued that we must ask ourselves two questions. Firstly, can we rationally will that everyone act as we propose to act? Furthermore, does our action respect the goals of human beings rather than merely using them for our own purposes? [[21]](#footnote-21)If the answer to either of these questions is no, then Kant would argue that the action is immoral. More specifically, Kant conceived that there was a supreme principle of morality, and he referred to it as “The Categorical Imperative”. The CI is composed of commands that you have to accept unconditionally.[[22]](#footnote-22) For example, if the CI states that “you should not steal”, then even if you want to steal because it will benefit you, you may not steal. The CI’s connection to morality, according to Kant, is that morality is such that you are commanded by it and you cannot opt out of it, just like the CI.[[23]](#footnote-23) One of the formulations of the Categorical Imperative is that “Formula of Universal Law”. This formula states that you should "Act only on that maxim through which you can at the same time will that it should become a universal law [of nature]". [[24]](#footnote-24)It may look similar to Rule Utilitarianism but there is a main difference. This difference can be located on the way those two theories determine what is moral. Kant looks only at the human intentions of the particular action, while Rule Utilitarianism worries only about producing the maximum amount of Utility.

It is reasonable to assume that Kant’s view on the ethical dilemmas of Internet of Things would differ. [[25]](#footnote-25)To begin with, I believe that Kant would be critical of companies’ for exploiting their power in order to acquire more data and satisfy their own interests. As mentioned above, one of the questions he requests us to ask when considering if an action is moral, is whether that action respects the goal of human beings rather than merely using them to achieve a certain goal. When it comes to privacy protection, Kant would probably judge the action of gathering such data immoral, since collection of data without the consent of the customer, that may also include private information of others around him who are not customers, cannot be thought as an action that profits human wellbeing. Another point is that if it were to become a universal law then nothing good would come out of it. It is also a fact that Kantian ethics would command companies to invest everything they have on data security, since it is of outmost importance the protection of human beings and the motivation of protecting them is definitely moral. Furthermore, based on the principle, that we must not use human beings for our own profit, Kant would absolutely judge as immoral the act of data usability and trading among companies since it looks like modern “human trafficking”. Lastly, Kantian Ethics would perhaps judge as moral, the collection of data that has to do with user experience, if and only if their sole purpose were to improve the product and offer a better life to the customer. More specifically, if Internet of Things objects, such as smartwatches and smart sunglasses, collected data about the features of the applications that the customers were using and then the company only used this information to focus on improving and customizing those features to the likings of each customer, then Kant would agree that this is an ethical action.

PERSONAL REMARKS

So far, we have examined the way Utilitarianism and Kantian ethics would react to various ethical dilemmas regarding the Internet of Things. In general, Utilitarianism would probably be in favor of using the Internet of Things and would also encourage companies to occasionally trespass the terms that the user and they have agreed on, as that would probably yield more utility. On the other hand, Kant would not agree with this view and would consider the Internet of Things immoral, since humans are used as means to an end and that is completely unacceptable. As previously mentioned, the key difference is that Kant looks towards the intentions of an action, while Utilitarianism only cares about the consequences. I would argue that Kant’s system is way more consistent than its competitor. While it is certainly true that predictions based on accurate data can often be correct, I find that it is extremely hard to trust that those predictions are going to be correct every single time. Furthermore, I believe that even though predictions can be a great tool to help us understand the consequences of our actions, by no means should our decisions about morality depend entirely on them. However, Kantian ethics also have an Achilles’ heel. This Achilles heel is the strictness of their nature. If we take as an example the phrase “Lying is wrong” then to consider whether this is moral, we have to replace it with the rule “It is permissible to lie. However, a human can lie without following that rule. A person could instead follow another rule which pertains only to specific circumstances, like “We should lie when it comes to saving a human life”. In other words, Kant’s weakness is the stiffness of his theory which does not leave any room for human adaptation. As always, I think that the truth is always somewhere in between the extremes, which in this case are Kant and Utilitarianism. Frankly, we should always be on the lookout for extreme consequences that the Internet of Things could cause, like the illegal data trafficking, where humans are used in order for the company to profit. Nevertheless, if we followed this narrow-minded method and refused to be part of anything that could potentially threaten humans when not used correctly, then technology would have never advanced. Every new technology has tremendous capabilities and is entirely on us to use it correctly. In my humble opinion, I think that Kant was right in prioritizing the human agent and considering an action as moral only if it respects and does not manipulate humans, but we cannot take away that sometimes a small immoral action that disagrees with the general rule can satisfy both parties regardless of the intention, just like the user experience data! That is why I believe that it is perfectly fine for the Internet of Things to be used, as long as companies are honest with their clients. The terms of use should be crystal clear and should by no means be violated. I dare to say that many customers would up to a certain point agree to the processing of their data as long as it would also benefit them. That is precisely why I believe that a consensus must be found where both the company and the customers are satisfied. If we were able to achieve such a state, everyone would benefit from the Internet of Things and its incredible capabilities.

CONCLUSION

All in all, in this paper we explained why the Internet of Things is an exciting new technology and we showed that it is going to become part of our daily life and tomorrow’s society. However, as with every new technology, we must be willing to face the problems that come with it. The Internet of Things produces a lot of ethical concerns about data privacy, data useability and trust between companies and customers. In this paper we explored two of the most famous moral theories, Utilitarianism and Kantian ethics, and their answers to the ethical dilemmas posed by IoT. We concluded that Utilitarianism would consider ethical the illegal use of data as long as it produced more utility, while Kant would believe the action to be immoral as the companies aim is to use the data for their own benefit. Finally, we concluded that if the companies and the customers managed to reach a consensus then everyone would benefit from the Internet of Things.

BIBLIOGRAPHY

* “What Is the Internet of Things (IoT)?” *Oracle*, [www.oracle.com/internet-of-things/what-is-iot/](http://www.oracle.com/internet-of-things/what-is-iot/) .
* Ranger, Steve. “What Is the IoT? Everything You Need to Know about the Internet of Things Right Now.” ZDNet, ZDNet, 3 Feb. 2020, [www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/](http://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/) .
* Palmer, Danny. “The Internet of Things? It's Really a Giant Robot and We Don't Know How to Fix It.” ZDNet, ZDNet, 8 June 2017, [www.zdnet.com/article/the-internet-of-things-its-really-a-giant-robot-and-we-dont-know-how-to-fix-it/](http://www.zdnet.com/article/the-internet-of-things-its-really-a-giant-robot-and-we-dont-know-how-to-fix-it/) .
* Johnson, Robert and Adam Cureton, "Kant’s Moral Philosophy", The Stanford Encyclopedia of Philosophy (Spring 2021 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/spr2021/entries/kant-moral/>.
* Driver, Julia, "The History of Utilitarianism", The Stanford Encyclopedia of Philosophy (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2014/entries/utilitarianism-history/>.
* “Q1:&nbsp; Could I Rationally Act on My Maxim in the PSW?” KANTIAN ETHICS, [www.csus.edu/indiv/g/gaskilld/ethics/kantian%20ethics.htm](http://www.csus.edu/indiv/g/gaskilld/ethics/kantian%20ethics.htm) .
* Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, [www.mdpi.com/2624-6511/1/1/6/htm](http://www.mdpi.com/2624-6511/1/1/6/htm) .
* Department, Published by Statista Research, and Mar 8. “Global IoT and Non-IoT Connections 2010-2025.” Statista, 8 Mar. 2021, [www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/](http://www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/) .

1. . Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-1)
2. Professor at the National Technical University of Athens. For more information visit: <https://www.ece.ntua.gr/en/staff/37> [↑](#footnote-ref-2)
3. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-3)
4. For more information on the Oracle company visit: <https://www.oracle.com/corporate/> [↑](#footnote-ref-4)
5. “What Is the Internet of Things (IoT)?” Oracle, www.oracle.com/internet-of-things/what-is-iot/ . [↑](#footnote-ref-5)
6. Ranger, Steve. “What Is the IoT? Everything You Need to Know about the Internet of Things Right Now.” ZDNet, ZDNet, 3 Feb. 2020, www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/ . [↑](#footnote-ref-6)
7. “What Is the Internet of Things (IoT)?” Oracle, www.oracle.com/internet-of-things/what-is-iot/ . [↑](#footnote-ref-7)
8. Department, Published by Statista Research, and Mar 8. “Global IoT and Non-IoT Connections 2010-2025.” Statista, 8 Mar. 2021, www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/ . [↑](#footnote-ref-8)
9. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm .. [↑](#footnote-ref-9)
10. For more information visit: <https://www.schneier.com/blog/about/> [↑](#footnote-ref-10)
11. Palmer, Danny. “The Internet of Things? It's Really a Giant Robot and We Don't Know How to Fix It.” ZDNet, ZDNet, 8 June 2017, www.zdnet.com/article/the-internet-of-things-its-really-a-giant-robot-and-we-dont-know-how-to-fix-it/ . [↑](#footnote-ref-11)
12. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-12)
13. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-13)
14. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-14)
15. Tzafestas, Spyros G. “Ethics and Law in the Internet of Things World.” MDPI, Multidisciplinary Digital Publishing Institute, 12 Oct. 2018, www.mdpi.com/2624-6511/1/1/6/htm . [↑](#footnote-ref-15)
16. Driver, Julia, "The History of Utilitarianism", The Stanford Encyclopedia of Philosophy (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2014/entries/utilitarianism-history/>. [↑](#footnote-ref-16)
17. Driver, Julia, "The History of Utilitarianism", The Stanford Encyclopedia of Philosophy (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2014/entries/utilitarianism-history/>. [↑](#footnote-ref-17)
18. Driver, Julia, "The History of Utilitarianism", The Stanford Encyclopedia of Philosophy (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2014/entries/utilitarianism-history/>. [↑](#footnote-ref-18)
19. The rest of the paragraph contains my personal interpretation of Act and Rule Utilitarianism and how this theory would react to the problems posed by the Internet of Things. [↑](#footnote-ref-19)
20. Johnson, Robert and Adam Cureton, "Kant’s Moral Philosophy", The Stanford Encyclopedia of Philosophy (Spring 2021 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/spr2021/entries/kant-moral/>. [↑](#footnote-ref-20)
21. “Q1:&nbsp; Could I Rationally Act on My Maxim in the PSW?” KANTIAN ETHICS, www.csus.edu/indiv/g/gaskilld/ethics/kantian%20ethics.htm . [↑](#footnote-ref-21)
22. “Q1:&nbsp; Could I Rationally Act on My Maxim in the PSW?” KANTIAN ETHICS, www.csus.edu/indiv/g/gaskilld/ethics/kantian%20ethics.htm . [↑](#footnote-ref-22)
23. “Q1:&nbsp; Could I Rationally Act on My Maxim in the PSW?” KANTIAN ETHICS, www.csus.edu/indiv/g/gaskilld/ethics/kantian%20ethics.htm . [↑](#footnote-ref-23)
24. Johnson, Robert and Adam Cureton, "Kant’s Moral Philosophy", The Stanford Encyclopedia of Philosophy (Spring 2021 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/spr2021/entries/kant-moral/>. [↑](#footnote-ref-24)
25. The rest of the paragraph contains my personal interpretation of Kantian Ethics and how this theory would react to the problems posed by the Internet of Things. [↑](#footnote-ref-25)