

Ethical justification of the value basis of the European data economy ecosystems

Long paper

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Abstract. Data collection from individuals has become an integral part of society and an asset for global business. This business is realised through data economy ecosystems, which currently are orchestrated from the viewpoint of business. There exist initiatives that aim to change the current situation. One critical component that is missing from data economy ecosystems and development is the values of individuals. To achieve an ethically acceptable data economy, we need to investigate the values of individuals whose data is used. Likewise, those values should be contested, as all values that people may have are not ethically acceptable or possible to implement on a societal level. In this paper, we ethically analyse the individual values that were collected via survey from four European countries. The analysis is based on the three main branches of ethics: Consequentialism, Deontology and Virtue Ethics. It seems that values that individuals have concerning fair data economy are ethically justified and thus should be respected and implemented in policies concerning data economy.

Keywords: Data economy, Ecosystems, Values, Ethics

1 Introduction

We live in a data-driven society, where collection and analysis of data are constant and pervasive. There is a continuous development of data analytics and technology to gather data, which creates new business and industrial domains as well as renews old ones. Thus, data is essential to all aspects of the economy. Also, contemporary business networks enable widespread use and reuse of data. Combining data from different sources can be used to enrich the information to create new value.

This development has led to the emergence of data ecosystems, where a set of actors is working together; directly or indirectly consuming, producing or providing data and other related resources (Oliveira & Lóscio, 2018). Data ecosystems can have many forms depending on what is collected, by who and to what extent. Big data,

open data, governmental data, small data and personal data can all have their own economies which can also be interconnected (Thinyane, 2017).

Especially personal data have become increasingly valuable in the 21st century. In 2011 World Economic Forum called personal data a new asset class that represents post-industrial opportunities affecting all aspects of societies (World Economic Forum, 2011). According to the European Commission (2019), personal data is information that is associated with a specific individual. Thus, personal data includes anonymous information that can lead to re-identification. This definition can also be extended to user-generated content such as blogs, comments, photos, videos, and behavioural data, such as search history, as well as social data, such as contacts on social networking sites (OECD, 2013).

Benefits of personal data economies are assumed to be plentiful. Collection of personal data can provide the businesses additional insight into their clientele and help to provide more personalised products or services that could create more value for the customers as well. However, to fully unlock the potential of the personal data, there is a need for a balanced ecosystem with increased trust between individuals, governments and the private sector. (World Economic Forum, 2011.) Unfortunately, this building of trust has not been successful due to privacy scandals revealed in the past few years.

In this paper, we focus on the European data economy ecosystems developed within the European Union (EU). The EU is aiming for rebuilding the trust towards data ecosystems through human-centric data economy (European Commission, 2020). There is increasing interest in the human-centricity in data economy research. However, the individuals are still often seen merely as data subjects and their active role in the data ecosystems is rarely noted (Koskinen et al. 2019). If we genuinely want to develop the data economies human-centric way, we should not limit ourselves into this view. Instead, we should try to actively acknowledge the individuals and their needs in the development of these systems and govern them accordingly. Thus, we focus on the individuals that are part of data economy ecosystems.

Currently, data economy ecosystems are based on the institutional values of platform orchestrators, such as companies and governments. Since individuals should also be acknowledged, we should consider their values and aim for value congruence in data economy ecosystems. However, not all values are moral values or equally important. As Nietzsche (1913) argues, we should not take (moral) values as granted but be critical towards them and think about *why they are good*. Therefore, we should not take the values of Europeans as given. In other words, we need to justify the values that should be applied in data economies ecosystems. Thus, the research question of this paper is:

RQ: Are the values of the European individuals ethically justified to be the basis of the European data economy ecosystem?

We answer this research question by analysing values that Europeans have expressed towards fair data economy from an ethical perspective. This research continues the work of Rantanen (2019). She noted that the Finnish, the French, the

German and the Dutch seem to have somewhat consistent values in this context (Rantanen, 2019). We analyse these values through three major ethical branches: Utilitarianism, Deontology and Virtue Ethics. The aim is to find out which of the values are ethically justifiable and whether they are instrumental or intrinsic in reaching a good data economy ecosystem. This analysis paves the way for the practical implementation of values in the human-centric data economy. It also contributes to the emerging field of data economy ecosystems from ethical and societal perspectives.

The paper is structured as follows: the next section handles the background for data economy ecosystem and the values behind them. In section three, we analyse human values implicated by Rantanen (2019) through the three main ethical theories. In section four, we compare and discuss the results of the analyses. Finally, we conclude in section five with the results of the complete analysis and future research.

2 Background

2.1 Data economy ecosystems

Focus on this paper is on data economy ecosystems which use personal data. Data economy or data ecosystems as research field are still in their infancy, and thus, there is no consensus about the terms. Hence, we need to define what we are discussing in this paper. A data economy can be interpreted as an institution of data resource management. The European Commission (European Commission, 2017) describes data economy as something that is characterised by an ecosystem of different types of market players collaborating to ensure that data is accessible and usable to extract value from data. This definition is a rather abstract way of describing data economy and its ecosystems.

An ecosystem is a metaphor used to describe complex systems that are ever-changing. Oliveira et al. (2019) define data ecosystems as “*socio-technical complex networks in which actors interact and collaborate with each other to find, archive, publish, consume, or reuse data as well as to foster innovation, create value, and support new businesses.*” (Oliveira et al., 2019, p. 1.). This definition extends the previous definition by acknowledging the socio-technical nature of these systems and being more detailed with the actions that are done with and to data.

As it might be noted, there is not much difference between terms data economy and data ecosystem. If a data economy is seen as something that is characterised by the ecosystem of collaborating market players and a data ecosystem is a socio-technical network of actors, then it seems arbitrary to separate these concepts. It is more accurate to talk about data economy ecosystems when we are talking about socio-technical system around a data economy and its value creation processes as a whole. It must be noted that a data economy ecosystem also incorporates official and unofficial rules that direct the actions in it (Koskinen et al., 2019). Thus, the data economy ecosystems have also a normative side that regulates the action in them.

Personal data is one of data types collected, stored, traded and analysed in data economy ecosystems. Personal data is information that is associated with a particular

individual (European Commission, 2019). In a data economy or data ecosystem literature, the individuals whose data is in concern are often called “data subjects”. A data subject is any person whose personal data is being collected, held or processed (EU GDPR Compliant, 2020). Although this term is precise in a legal sense, it does make the individuals seem like passive instances that are mere resources of the personal data. However, this is not the case, since personal data economy ecosystems also require cooperation from individuals. For example, giving consent to use personal data and disclosing correct information depends on the individuals and their willingness. Individuals are also consumers of the products and services affected by data analysis. For instance, Aguilera et al. (2017) call individuals prosumers of data economy – hybrids of producer and consumer. Thus, it should be acknowledged that individuals are not mere data cattle, but active actors of the data economy ecosystems.

Lately, personal data and ways that they have been used in the data economy ecosystems have provoked a lot of discussion and distrust. Cases such as the Cambridge Analytica scandal have shown the dark side of current practices in data economy ecosystems. Micro-targeting voters based on personal data analytics has also showcased how personal data economy ecosystems can be used to shape whole societies (Papakyriakopoulos et al., 2018). Thus, critical issues of data economy ecosystems are not just about the individuals but also about societies.

These discussions have raised awareness both about the value of personal data as well as ethical issues related to the data economies. People have declared that they do not trust tech companies with their data. However, for instance, in the case of Facebook, this distrust has not made people vanish from the service *en masse*. Facebook’s robust marketplace with little to no competition undoubtedly plays its part (see, e.g. Härkönen et al., 2019), but not rebuilding the trust makes their position more easily disturbed if and when more trustworthy companies enter the markets.

The EU has been aiming to rebuild trust through human-centric data economy, where individuals (data subjects) have more power over their personal data (European Commission, 2020). However, the research on this field seems scarce and superficial. Ethical issues of data ecosystem governance have been handled, but mainly as mentions (Rantanen et al., 2019). Hence it seems that there is a need for a more holistic approach that acknowledges the individuals as well as ethical aspects of data economy ecosystems.

2.2 Values as the basis of human-centric data economy

Technology is never value-free (Kling, 1984; Nissenbaum, 2001). Values direct our actions and decisions on an individual level. Thus, values also affect the development of artefacts such as technology. Values build into the technology are often related to reliability, efficiency and correctness, although there are plenty of stakeholders whose values could and should be considered (Friedman et al., 2017). Thus, if we want to design and govern human-centric data economy ecosystems, we should consider the values of the human-beings as a basis of these ecosystems instead of the traditional values of institutions or businesses.

Values have been studied in the context of technology and information system both in theory and practice (see, e.g. Brey, 2017; Rose et al., 2015), but there is still little knowledge about the values of individuals who are not employees. Thus, in the context of data economy ecosystems, we should study the neglected stakeholder group of individuals who are both consumers of services and producers of data. We should aim to find the value basis for data economy ecosystems that is in congruence with their values to assure that a data economy ecosystem is indeed fair to all.

In this paper, we continue the work done by Rantanen (2019). She studied the values of the Finns, the French, the German and the Dutch in the context of a fair data economy. She noted that European individuals expressed rather similar values towards fair data economy in seven different themes. The seventh theme “Negative attitudes towards data economy and data sharing” did not provide enough information about values to be analysed further. (Rantanen, 2019.) These values and themes that they are related to are presented in Table 1.

Table 1 Value themes and basic values of Europeans (Rantanen, 2019)

	Conservation		Self-enhancement		Openness to change	Self-transcendence	
	Conformity	Security	Power	Hedonism	Self-direction	Universalism	Benevolence
User's control over data and data sharing			x		x		
Transparency and being informed	x	x	x		x	x	
Security		x	x				
Trust and fairness				x	x		x
Compensation or benefits for			x	x	x	x	x
Supervision and rules	x	x					

It must be noted that the values presented are based on Schwartz’s theory of basic values. Schwartz (2012) has found that ten universal values can be found in any culture. These values can be divided into four categories: conservation, self-enhancement, openness to change and self-transcendence. (Schwartz, 2012.) Rantanen (2019) noted that all value categories Schwartz’s (2012) theory are represented in values of Europeans in the data economy context. However, values of tradition, achievement and stimulation were not identified from the answers. Based on these results, it seems that power and self-direction are the most common values. In addition to the basic values, there were clear indications of individuals valuing autonomy, privacy and justice as part of a fair data economy. (Rantanen, 2019.)

It must be acknowledged that despite the existence of universal values there are and will be differences between values of different cultures and even differences between individuals’ values and the cultural values of their society (see, e.g.

Schwartz, 1999). There are several reasons why we study values from the individual level and aim to generalise them into the “cultural values” of the European data economy. First, we limit our view on Europe, because here the development of own data economy ecosystem is under development and here the cultural values, in general, are rather close to each other. Likewise, the European approach – which emphasises individuals rights¹ – can be seen as a needed counterforce for the American and Asian model for the data economy. Second, individual values in regard of the fair data economy ecosystem are rather similar to each other (Rantanen, 2019), which can indicate that we could reach a common and justifiable value basis of data economy ecosystems in Europe.

Additionally, values are often in close connection to each other, and it is possible that some values are instrumental to other or values. For instance, transparency can be seen as an instrumental value since it makes other values possible in the context of data economy ecosystems. (Rantanen, 2019.) Likewise, values can create tensions that should be taken into account (Friedman, 2017). For instance, enforcing security in technology can lead to the diminishing of ease-of-use or vice versa. Thus, there is a need to find a delicate balance between different values.

Naturally, the values implemented in technology should be good (see Brey, 2017). In order to find out which values are good, some justification is necessary because not all values are moral values. Moral values can be described as values that have some “oughtness” in them (Kant, 1788; Rokeach, 1973). For example, universalism and benevolence are often considered as moral values. However, the moral nature of values, such as power, depends on the context and how the values affect actions. In the next section, we focus on the ethical justification of values by briefly analysing the values found by Rantanen (2019) through three major ethical theories. Each of these theories has a different view on what is good, and even high-level analysis should show whether or not these values can be justified to be the basis of European data economies.

3 Analysis through three major ethical theories

As noted in the introduction, values can be ethically justified or not. Thus, to know what values are worth supporting, we need to conduct an ethical analysis of the values to justify them. We will analyse the values from following three ethical branches: Consequentialism, Deontology and Virtue Ethics which are the “big three” ethical theories and thus provide a proper basis for ethical analysis.

¹ See European Commission (2007). “Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions "building a european data economy" COM/2017/09 final

3.1 Consequentialism

Consequentialism defines good through the consequences of actions, and Utilitarianism specifically states the greatest good to be that which brings the greatest happiness to the community (Bentham, 1829). While there are various formulations and tweaks of Bentham’s Greatest Happiness Principle, the original gives a simple yet effective framework for a high-level examination of basic values. Consequentialism, by its nature, does not work in absolutes – good and bad are quantifiable, and as such it will provide an understandable way to compare differences between values.

While a data economy that leverages user data for profit without regard to harm or consent is not inherently wrong under Utilitarianism (nothing is), any suffering or unhappiness caused by such a system weighs ethically against it. An analysis of the major themes in Table 2 includes the possibilities of happiness and unhappiness (here meant as anything opposed to happiness) acting on such values provides.

Table 2 Utilitarian analysis of the themes of values

Theme of values	Utilitarian analysis
User’s control over data and data sharing	+ personal agency leads to happiness through individual needs
Transparency and being informed	+ makes regulation possible + feeling of security
Security	+ decreases the possibility of unhappiness due to data misuse + decreases unhappiness due to breaches
Trust and fairness	+ equality and fairness directly contribute to subjective happiness + inner changes lead to values in other themes
Compensation or benefits for users	+ direct happiness in small amounts, indirect consequences <u>challenging to assess</u>
Supervision and rules	+ bolsters security and trust, but no direct effect on happiness
Negative attitudes towards data economy	+ no data collection would make breaches of trust impossible - no data collection would also prevent positive benefits and advancements

Under Utilitarianism, all values are considered instrumental to the Greatest Happiness Principle. As might be noted from the table, all themes seem to have the potential to create happiness, excluding the possibility that data is not collected at all. Thus, it seems that from a Utilitarian perspective, the values of individuals are ethically justifiable. Some of the major themes overlap (e.g. user control and transparency) and others have relational dependencies (e.g. transparency and supervision), which makes exact analysis difficult. When one value is necessary for

another, the secondary value's positive consequences can, to a degree at least, be added for the benefit of the primary value.

Through a high-level analysis, it would seem like Security has the largest possibility for reducing unhappiness caused by data misuse and data breaches. But other values such as transparency, and supervision and rules support security, which adds to their consequentialist importance. No data collection at all would lead to no misuse of any kind, but it would also prevent data economy ecosystems from creating any benefits.

Notably, the analysed values do not include values that might be guiding the corporations taking part in the data economy, such as capital gains and job creation. However, the happiness created by corporate gains can be seen to be included in compensation and benefits, to some degree. And money itself is not happiness, so these positive consequences are diluted to whatever instrumental value wealth has in connection to happiness. Likewise, though the user happiness brought by compensation and benefits to users might be direct, it seems instrumental and relatively small – quickly offset by any major unhappiness due to data misuse and data breaches.

This high-level analysis would suggest that the most important themes are those of security, and its requirements: transparency, supervision and rules, and user control. While trust and fairness might not have direct short-term consequences, they clearly contribute in a major way to the fulfilment of other values. They will possibly be a practical requirement for the required changes in corporate culture, work methods, etc. for actualising other values. Thus, values presented by Rantanen (2019) seem to be justifiable from the Utilitarian perspective, and some themes could produce or preserve more happiness than others.

3.2 Deontological ethics

Deontology defines good through the intent of the actions; whether we would follow the general ethical rule voluntarily, and keeping in mind that humanity (or rationality) in rational beings is valuable in itself (Kant, 1785, 1788). While others, most notably Rawls (1999) have reformulated deontological ethics to some extent, the original idea of a categorical imperative, a universal law through which other rational beings are treated ethically has remained the carrying force of the theory. According to deontological ethics, all actions should be based on these rules, and the actors follow them autonomously, and as consequences are never entirely predictable, this ought to be the basis of right actions, not the consequences (which, of course, are still meaningful).

Deontology is divided into categorical imperatives and rules derived from those. None-the-less, the rules themselves are always intrinsic, such as “lying is wrong”, or “murder is wrong”, as they need to be universal, treat humanity in a person as a value in itself and be followed autonomously, after understanding the right thing to do. According to Deontology, there can, of course, be other values, which are not moral. Kant, for example, handles these in his various writings (e.g. Kant, 1785, 1788), but these values are always superseded by moral values.

Data economy, which uses user data for profit without regard to harm or consent is inherently wrong according to Deontology. The targets of the use are not considered as meaningful and valuable beings in themselves, but only as a means to an end: profit; which itself is only of instrumental value, not intrinsically valuable. The categorical imperative needs to be applied to each situation to find any definitive answer. As the themes of values all are situational, they are analysed further in Table 3.

Table 3 Deontological analysis of the themes of values

Theme of values	Deontological analysis
User's control over data and data sharing	The users ought to by default have control over their data to respect their autonomy and to respect them as persons with individual agendas.
Transparency and being informed	To be able to make ethical deductions based on what the data is being used, the users should have access to how their data is used, lest they are treated merely as a means to an end.
Security	In a perfect world, all would act according to the categorical imperatives. However, in this world, many make decisions heteronomously, due to external pressures, and thus security must be looked after.
Trust and fairness	Especially according to Rawls, fairness is a central value in society and should be one of the carrying forces in any situation.
Compensation or benefits for users	When compensation or benefits to users are applicable through profit or other benefits to the handler of the data, it is fair to compensate the targets; however, this is situational, the categorical imperative needs to be applied to find a definitive answer.
Supervision and rules	Again, due to the heteronomousness of the world, this is necessary – although we all should make autonomous decisions, in an imperfect world this is not always possible.
Negative attitudes towards data economy	And again, these negative attitudes, according to Deontology follow from the imperfect world and its heteronomousness; as we cannot trust all actors in the data economy to function autonomously according to the categorical imperative(s), these are unfortunately justified.

Thus, in a deontological framework, it is hard – if not impossible – to say which of the previous values would be more important than others; in all of them the categorical imperative ought to be followed when needed. Maybe the compensation or benefit value can be, at least at times, not according to the categorical imperative, as long as the previously pointed out rules on what is right and what is wrong are followed. However, it seems that all the themes are justifiable from the deontological perspective. The categorical imperative should be followed, and it is not in contradiction with the needs of individuals expressed in Rantanen (2019).

3.3 Virtue Ethics

Unlike a Consequentialist and Deontological approach, Virtue Ethics is not focusing on outcome or duty. Virtue Ethics is based on that we should cultivate and practice virtues (making good choices based on those virtues) in our life to achieve ethical, good life. Aristotle used term *telos* that means the main purpose of people –that is a good life in contexts of ethics. Aristotle stated that the highest good to be aimed is the *Eudaimonia* that is practising such character traits that are needed to have a life at its best (Aristotle et al., 1976).

Alisdair MacIntyre is a philosopher that can be seen as one of the most influential virtue ethicists alive. MacIntyre's main claim is that we have lost the moral language and are focusing on wrong issues when creating the rules or looking for consequences of our actions (MacIntyre, 1981). By him, we should instead focus on our own character and personhood – when we develop ourselves as a person, the ethical life will follow. Even if this view can be criticised, it is a relevant approach as it sets people as actors in such a position that they cannot exploit or use ethics as a mere tool. Virtue Ethics emphasises the self-investigation that seeks to bring forth the good characters and drop the bad ones.

However, MacIntyre sees the self-investigation and development of character are not done in isolation but in a societal environment as we live amongst others, and our actions will affect others. In this paper, we look at Aristotelian Virtue Ethics from the perspective of MacIntyre instead of Nietzsche. MacIntyre argues that to see ethicality, a conception of rational enquiry needs to be embodied in a tradition of society (see Korkut, 2012). Data economy and its rules cannot be based on individual values of everybody, as data economy ecosystems are based on cooperation in a network, not on individualism that Nietzsche emphasises. The value basis has to be based on some kind of consensus which must be contested and rationally argued². Thus, we see that Nietzschean approach of values would lead the infertile outcome as the pure individualism is not offering a plausible way to organise ethical data economy ecosystems. After all, data economy ecosystems are based on an interaction between different parties at largest on the global level.

² Actually, this is very Habermasian approach that is visible in Discourse ethics. However, we do not go further in this approach in this paper as it would lead us to the endless road.

Also, Aristotle devoted special attention to virtue-friendship – amongst friendships – which emphasises the critical views of ethical arguments and thus helps one to develop own virtues further (see Cooper, 1977). This is especially relevant in a data economy that is based on the use of data from “everybody”.

The Virtue Ethics gives a proper perspective for the values as it reveals that those are actually based on Consequentialist and Deontological logic. There is an aim to prevent or advance some outcomes or stating rule to be followed. As McIntyre demands the virtues should be visible in practice or those lose their inner value for individual and become mere tools of gaining benefits from outside – values become empty shells. Thus, we want to look Aristotelian virtuous that could be behind of values. In Table 4. we present the values of individuals and those related to the Aristotelian virtues: Courage, Temperance, Liberality, Magnificence, Magnanimity (Pride), Ambitiousness (Honor), Gentleness, Friendliness, Truthfulness, Wittiness, Modesty and Justice. Notably, these virtues are not “extreme”. As an example, courage does not mean to be temerarious. Likewise, it is not cowardness. It means to have the courage to do what a nobleman do even we are feeling fear.

Table 4 Virtues in the themes of values

Theme	Virtue connected to the value
User’s control over data and data sharing	Justice, Liberality
Transparency and being informed	Justice, Truthfulness
Security	Truthfulness
Trust and Fairness	Justice, Truthfulness
Compensation or benefits for users	Justice, Liberality
Supervision and rule	Justice
Negative attitudes	Truthfulness

It seems that an analysis of values is not so easy to conduct as virtues are a character of a person. The values presented in this paper are based on opinions on what is expected from a fair data economy. Thus, the link between those and virtues is somewhat artificial. However, the oversimplified table above presents that Truthfulness, Justice and Liberality are virtues that should be highlighted as those seem to be issues that can be connected with the data economy. Nevertheless, if we take the virtues ethics approach to data economy ecosystems, we should keep in mind other virtues as well.

The lack of virtues and values in current data economy which is based on exploitation on individuals (Couldry & Mejias, 2019) without truly informing them (Lahtiranta et al., 2017) reveals the current problem. We have already entered into an

era of new colonialism: data colonialism, which has normalised the exploitation of human's through personal data (Couldry & Mejias, 2019). The virtues – the lack of it – behind the current data economy is well visible from virtue ethical standpoint that underlines the need for it as one ethical cornerstone.

4 Towards the ethically justified value basis

All three main ethical approaches have different approaches to ethical evaluation, yet it seems that there are many similarities in them, but also some slight contradictions. All three offer some justification for the value themes of Rantanen (2019), with minor differences in the most important value to be addressed. The simplified summary of the analyses of the value themes is presented in Table 5.

Table 5 Summary of the analyses

	Consequentialism	Deontology	Virtue Ethics
User's control over data and data sharing	Fulfilment of the needs through agency leads to happiness.	Respecting user's autonomy and them as persons.	Justice, Liberality
Transparency and being informed	Makes regulation possible and adds to the feeling of security.	Information needed in ethical deduction, if denied people are treated merely as means.	Justice, Truthfulness
Security	Decreases the possibility of unhappiness caused by data misuse and breaches.	A must, since not all act according to the categorical imperatives.	Truthfulness
Trust and Fairness	Directly influence subjective happiness that can affect other values.	Fairness is a central value of society and should always be taken into account.	Justice, Truthfulness
Compensation or benefits for users	Directly increase happiness in small amounts, indirect consequences challenging to assess.	Fair to compensate when possible, but due to different situations, there is a need to apply the categorical imperative to find a definite answer.	Justice, Liberality
Supervision and rules	Reinforce security and trust but do not create happiness directly.	A necessity, although we all should be able to make autonomous decisions.	Justice
Negative	No data collection would	Justified reactions.	Truthfulness

attitudes	make breaches impossible but also prevent positive benefits.		
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These analyses indicate that some core values connect all the value themes and main approaches. First intrinsic and repetitive value justified is autonomy. Autonomy is most clearly presented in Deontological ethics. This is obvious since it is one of the core values of the whole theory. Nevertheless, also the Utilitarian approach highlights agency as a source of happiness, whereas it is inbuilt in the Virtue Ethics approach. Thus, it is justified that the users should have control over their data and data sharing and a possibility to make autonomous decisions. Therefore, autonomy should be part of the value basis of the data economy ecosystems.

Second repetitive and intrinsic justified value is justice. It is one of the virtues and at the core of Deontological ethics as something that should always be taken into account. It can also be argued, that virtue of Liberality is in this context intertwined with justice. In the Utilitarian analysis, justice is more implied, but present since its effect on the subjective happiness if it is not realised in some of the themes such as “Trust and fairness” or “Compensation and benefits to users”. Thus, it can be argued that justice is a cross-cutting intrinsic value in several themes and should be included in the value basis of the data economy ecosystems.

Finally, security is the third repetitive value in all analyses. From the Utilitarian perspective, it is also a moral value since it prevents unhappiness but from other too perspectives is a necessity followed from imperfect or unvirtuous world. However, as a perfect world is a utopia, the security should be acknowledged in all data economy ecosystems in order to protect the privacy of the individuals and data in general. But as security is something that *is used* to protect, it could also be interpreted as an instrument for some other values such as privacy or responsibility. However, we leave this discussion for another time and paper, since security is one of the basic values.

These three values are made possible by other value themes presented. “Transparency and being informed” and “Supervision and rules” are instrumental to autonomy, justice and security. Thus, there needs to be transparency and truthful information in order to autonomy, justice, and privacy to be actualised in data economy ecosystems. To conclude: the European human-centric data economy ecosystem should be based on the ethically justified values of autonomy, justice and security which are made possible with instrumental values of transparency, honesty and supervision.

5 Conclusions and future research

These brief analyses show that there is a need to ethically evaluate the value basis of the data economy ecosystem, but also demonstrates how challenging it is to justify abstract personal values. Nevertheless, these analyses show that all value themes of the Europeans personal values presented by Rantanen (2019) are meaningful, and values behind them ethically justified. Intrinsic values of autonomy, justice and

security and instrumental values of transparency, honesty and supervision should be included in the value basis of the European human-centric data economy ecosystem. Whilst treating people as data objects is wrong, we do not want either a purely individualistic approach, which has its own problems. Instead, we need real change towards a model where there exist real possibilities to influence and value basis that can be commonly accepted and is ethically justifiable. Then we may gain data economy that is not based on exploitation but mutual benefits of different stakeholders

Naturally, due to the immaturity of human-centric data economy ecosystems as a research field, there remains a lot of possibilities for future research. First, how these values can be actualised in data economy ecosystems should be studied. Only then we can make more accurate evaluations from any ethical approach. Second, there should be more empirical research concerning the values of the individuals in the context of data economy ecosystems. Only then we can understand their role in the data economy ecosystems better. Third, all ethical approaches should be further discussed and analysed more closely in order to have a strong and solid philosophical basis for data economy ecosystems.

References

- Aguilera, U., Peña, O., Belmonte, O., & López-de-Ipiña, D. (2017). Citizen-centric data services for smarter cities. *Future Generation Computer Systems*, 76, 234–247. <https://doi.org/10.1016/j.future.2016.10.031>
- Aristotle, Thompson, J. A. K., & Treddenick, H. (1976). *The ethics of Aristotle: The Nicomachean ethics*. Penguin.
- Bentham, J. (1829). *Article on Utilitarianism: Long Version Marginals. Deontology: Together With a Table of the Springs of Action; and the Article on Utilitarianism*, 309.
- Brey, P. (2017). The strategic role of technology in a good society. *Technology in Society*, 52, 39–45.
- Cooper, J. M. (1977). Aristotle on the Forms of Friendship. *Review of Metaphysics*, 30(4), 619–648. <https://doi.org/revmetaph197730450>
- Couldry, N., & Mejias, U. A. (2019). Data Colonialism: Rethinking Big Data's Relation to the Contemporary Subject. *Television & New Media*, 20(4), 336–349. <https://doi.org/10.1177/1527476418796632>
- EU GDPR Compliant*. (2020). What Is a Data Subject? <https://eugdprcompliant.com/what-is-data-subject/>
- European Commission. (2017). *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'BUILDING A EUROPEAN DATA ECONOMY'* (COM(2017) 9 final). European Commission.
- European Commission. (2020). *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF*

- THE REGIONS - A European strategy for data* (COM(2020) 66 final).
<https://op.europa.eu/s/n7iZ>
- Friedman, B., Hendry, D. G., & Borning, A. (2017). A survey of value sensitive design methods. *Foundations and Trends in Human-Computer Interaction*, 11(2), 63-125.
- Härkönen, H., Naskali, J., & Kimppa, K. (2019). Hub Companies Shaping the Future: The Ethicality and Corporate Social Responsibility of Platform Economy Giants. *Proceedings of the 2nd ACM SIGSOFT International Workshop on Software-Intensive Business: Start-Ups, Platforms, and Ecosystems*, 48–53. <https://doi.org/10.1145/3340481.3342738>
- Kant, I. (1785). *Groundwork on the metaphysics of morals* (Various translations used).
- Kant, I. (1788). *The critique of practical reason* (Various translations used).
- Kling, R. (1984). Assimilating social values in computer-based technologies. In *Telecommunications Policy* (Vol. 8, Issue 2, pp. 127–147). [http://dx.doi.org/10.1016/0308-5961\(84\)90032-6](http://dx.doi.org/10.1016/0308-5961(84)90032-6)
- Korkut, B. (2012). MacIntyre's Nietzsche or Nietzschean MacIntyre? *Philosophy & Social Criticism*, 38(2), 199–214. <https://doi.org/10.1177/0191453711427258>
- Koskinen, J., Knaapi-Junnila, S., & Rantanen, M. M. (2019). What if we had fair – people-centred – data economy ecosystems? *Proceedings of IEEE Smart World Conference 2019*.
- Lahtiranta, J., Hyrynsalmi, S., & Koskinen, J. (2017). The false prometheus: Customer choice, smart devices, and trust. *ACM SIGCAS Computers and Society*, 47(3), 86–97.
- MacIntyre, A. (1981). *After virtue* (Various translations used).
- Nietzsche, F. (1913). *The Genealogy of Morals The Complete Works, Volume Thirteen, edited by Dr. Oscar Levy* (8th ed.). T.N. Foulis.
- Nissenbaum, H. (2001). How computer systems embody values. In *Computer* (Vol. 34, Issue 3, pp. 120–119).
- OECD. (2013). *Exploring the Economics of Personal Data*. 220. <https://doi.org/10.1787/5k486qtxldmq-en>
- Oliveira, M. I. S., & Lóscio, B. F. (2018). What is a Data Ecosystem? *Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age*, 74:1–74:9. <https://doi.org/10.1145/3209281.3209335>
- Papakyriakopoulos, O., Hegelich, S., Shahrezaye, M., & Serrano, J. C. M. (2018). Social media and microtargeting: Political data processing and the consequences for Germany. *Big Data & Society*, 5(2), 2053951718811844. <https://doi.org/10.1177/2053951718811844>
- Rantanen, M. M. (2019). Towards Ethical Guidelines for Fair Data Economy – Thematic Analysis of Values of Europeans. *Proceedings of the Third Seminar on Technology Ethics 2019, CEUR-WS*, 43–54.
- Rantanen, M. M., Hyrynsalmi, S., & Hyrynsalmi, S. M. (2019). Towards Ethical Data Ecosystems: A Literature Study. *IEEE ICE/ITMC At: Nice, France, 2019*, 1–9.

- Rawls, J. (1999). *A Theory of Justice* (Revised edition.). Belknap Press of Harvard University Press.
- Rokeach, M. (1973). *The Nature of Human Values*. Free Press.
- Rose, J., Persson, J. S., Heeager, L. T., & Irani, Z. C. I. S. J. R. E. R. (2015). Managing e-Government: Value positions and relationships. In *Information Systems Journal* (Vol. 25, Issue 5, pp. 531–571). <https://doi.org/10.1111/isj.12052>
- Schwartz, S. H. (2012). An Overview of the Schwartz Theory of Basic Values. In *Online Readings in Psychology and Culture* (Vol. 2, Issue 1).
- Thinysane, M. (2017). Small data and sustainable development—Individuals at the center of data-driven societies. *2017 ITU Kaleidoscope: Challenges for a Data-Driven Society (ITU K)*, 1–8.
- World Economic Forum. (2011). *Personal Data: The Emergence of a New Asset Class*.