



Humans of the European Data Economy Ecosystem - What Do They Demand from a Fair Data Economy?

Minna M. Rantanen, Jani Koskinen

► To cite this version:

Minna M. Rantanen, Jani Koskinen. Humans of the European Data Economy Ecosystem - What Do They Demand from a Fair Data Economy?. 14th IFIP International Conference on Human Choice and Computers (HCC), Sep 2020, Tokyo, Japan. pp.327-339, 10.1007/978-3-030-62803-1_26 . hal-03525260

HAL Id: hal-03525260

<https://inria.hal.science/hal-03525260>

Submitted on 13 Jan 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Humans of the European Data Economy Ecosystem - What do they demand from a fair data economy?

Minna M. Rantanen^[0000-0001-8832-5616] and Jani Koskinen^[0000-0001-8325-9277]

University of Turku, Turku School of Economics, Turku, Finland
{minna.m.rantanen, jasiko}@utu.fi

Abstract. Personal data has become a commodity that can be used to create more value and growth in business within the data economy ecosystems. Although individuals are part of these ecosystems, they and their needs and demands are often neglected in the research and practices. In this study, we thematically analyse the demands of Europeans from Finland, France, Germany and the Netherlands (n=4,792). The results show that the Europeans demand more transparent communication and ways to be active parts of the European data economy in the order it to be fair. We suggest that there is a need for more transparent deliberation in order to grant the humans of the European data economy what they want so that it can be fair.

Keywords: Data economy, Ecosystems, Europe, Human-centric, Demands, Thematic analysis.

1 Introduction

Data - especially personal data - have become a commodity that can be used to create more value and growth in business. This development has lead to the development of data economy ecosystems which rely on trading and analysing personal data. Data economy ecosystems are networks that are formed by different actors using data as their main source. Actors and stakeholders of these ecosystems are indirectly and directly connected. Actions of the actors within the network are guided by official and unofficial rules such as legislation and norms [1].

In the past, there has been a lot of discussion and research about the different forms of data economy ecosystems. Big data, open data, governmental data, small data, and personal data can all have their economies, but can and often are connected in some form or way [2]. Whereas different types of data and technical solutions of data economy ecosystems have had attention [3], there is still a lack of a more holistic view.

However, this more holistic view has still left the individuals in the mere role of data subjects [4]. Thus, they are not seen as active actors of the data economy ecosystems but as sources of different kinds of data that can then be used to create more business value. Individuals, however, are not in an inactive role in data economies due to the pervasiveness of technology that allows monitoring, measuring and analysing personal data [5, 6].

People also have become increasingly aware that tech companies collect and distribute their data with third-party data brokers and advertisers. People have become more aware that their data has value and that they should have the right to control them [7]. Data is also seen more than ever as the property of the individuals - although legally it rarely is the case [8].

Personal data analytics hold promises for many benefits, but it has been argued that the current personal data economies are also enabling a new form of digital enslavement since they diminish the autonomy of individuals and societies at large [9]. Thus, there can be larger impacts than just endangered privacy of an individual. For example, in recent years micro-targeting of social media users has been used for influencing opinions, especially in politics [10].

Thus, individuals are often both sources and targets of the data economy ecosystems, although they are rarely seen as active actors of data economy ecosystems. This does not seem fair. However, fairness often is a subjective judgement when there are no established norms about what is right or wrong. Thus, we should consider what is seen as fair in the context of data economy ecosystems by focusing on individuals. Hence, in this paper, we focus on the individuals and their demands from fair data economy ecosystems. Acknowledging individuals' needs is crucial to the future of data economy ecosystems since viable personal data economy ecosystems rely on the cooperation of individuals and organisations.

In this paper, we focus on the empirical research of the demands and needs of the individuals in the context of the fair data economy ecosystem. We limit this research on Europe since the European Union is attempting to enforce the human-centric perspective as part of their data economy ecosystem. [11, 12]. Thus, our research question is:

RQ: What do the Europeans demand from a fair data economy ecosystem?

To answer this question, we analysed the open responses of a survey regarding a fair data economy conducted by TNS Kantar for Suomen itsenäisyysrahasto (henceforth Sitra). The data was collected from Finland, France, Germany, and the Netherlands. In total, the survey received 8,004 responses. In this paper, we analyse 4,792 open answers regarding fair data use and minimum requirements for fair data label using thematic analysis [13] to find out what people would demand from data economy ecosystems.

This study contributes to the emerging field of human-centred data economy ecosystems and provides insight into the needs of the individuals through their demands. It also gives an insight into the Europeans view on what a fair data economy ecosystem would be like and paves the way for future research about fairer data economy ecosystems.

The rest of this study is structured as follows. The next section shortly introduces related research about the European data economy. In the third section, the research process is presented, and it is followed by the results section. In section five, the results are discussed further. Finally, conclusions are presented in section six.

2 Background

The data economy is the area of growing interests in research and business fields. Likewise, the governments are giving more and more attention to the data economy and noted the need for regulation and policies for it. Especially, European Union has given strong focus on data economy and use of information in the Europeans single market strategy [14], data portability in GDPR [12], and free flow of non-personal data in the Regulation (EU) 2018/1807 [11].

We are focusing on EU as it has been the forerunner in its aims and strategies for the human-centric data economy. European Commission [15] stated in the data strategy that:

“The objective of the European data strategy is to make sure the EU becomes a role model and a leader for a society empowered by data. For this, it aims at setting up a true European data space, a single market for data, to unlock unused data, allowing it to flow freely within the European Union and across sectors for the benefit of businesses, researchers and public administrations. Citizens, businesses and organisations should be empowered to make better decisions based on insights gleaned from non-personal data. That data should be available to all, whether public or private, start-up or giant.”

Despite the hype, the data economy is still a new research field that lacks the consistent terminology and does not have established the clear boundaries what belongs to the data economy. Thus, we need to define, what we mean by data economy and what it is in this context.

Data economy as a concept is misleading since it is often used to describe a system of humans and technologies rather than an abstract economy. Thus ecosystem metaphor is often used to describe its ever-changing form and balance. Oliveira et al. [4] describe 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”*. This definition reveals the multitude of actions in a data economy and is our used definition here.

However, in this paper, we focus our research on personal data and use of those in the data economy and thus do not consider non-personal data. By personal data, we refer to *“any information that relates to an identified or identifiable living individual”* as defined by the European Commission [16]. The data is not personal if it is anonymous and cannot be traced to individual anymore. However, if the person can be re-identified, it remains personal data. This is problematic as in many cases anonymous data can be traced to individual and thus should be considered as personal data [17]. However, this is out of the scope of this paper and thus not considered further. It must be noted that we use the term personal *data* since it is commonly used, although it would be more accurate to talk about personal information.

Gathering personal data should rely on people’s willingness to disclose them. If data is not shared, then it cannot be analysed, and the potential value is not actualised.

Thus, we need to understand the individuals in the context of personal data economy ecosystems.

In this paper, we consider this issue from the perspective of fairness. Fairness is the quality or state of being fair, especially referring to impartial treatment [18]. However, what constitutes as fair treatment in a data economy ecosystem is biased by the focus on the business side of data economy ecosystems. Thus, there is a need to evaluate what the individuals whose data is used judge as fair. In other words, what they demand from a fair data economy ecosystem. Thus, to develop and govern a fair data economy ecosystem, there is a need to understand the perspective of individuals.

3 Research process

Empirical material for this research was collected by Kantar TNS for Sitra. They conducted an online questionnaire in Finland, France, Germany, and the Netherlands in late 2018. The questionnaire aimed to clarify the use of digital services and attitudes towards the collection and use of personal data amongst Europeans. Focus on the questionnaire was on how individuals experience the potential use of their data from the perspective of data protection and privacy.

The survey included four sections: 1) background information, 2) rights in relation to data, and attitudes towards terms of use and privacy settings, 3) trust towards service providers and increasing trust, and 4) disclosure of information and its management and the concept of fair data service. The survey included 23 questions, of which two were open questions. Additionally, one of the questions included a possibility to clarify the answer. In total, there were 8,004 respondents who answered the open questions 4,792 times.

Since we focus on demands on towards a fair data economy, we focused our research questions about this particular topic. Demands for fair data economy were addressed in following open questions (n=4,792). The questions are:

Q21: Service providers collect a lot of data of you. In your opinion, how should this data be managed for you to feel that it is fair for you?

Q23: If services that use personal data would have a “fair data” label, what would be the minimum requirement for it?

This study continues the work previously done by the authors. Rantanen [19] studied the values of the Europeans in the context of the fair data economy. She noted that in Finland, France, Germany and Netherlands, individuals value autonomy, protection their privacy, security, transparency, trustworthiness, benevolence, and justice. During this analysis, it became apparent that there are cross-cutting demands for a fair data economy in this data set.

In this paper, we focus on demands towards fair data economy by using qualitative analysis of the open answers. Respondents are identified in the original set by country

and an ordinal. These identifications are utilised in this analysis as well. The full data set is available: <https://www.sitra.fi/en/publications/use-digital-services/>.

The research process followed the basic steps of thematic analysis [13]. First, the authors familiarised with the data set and then identified and coded the themes in each answer. After initial coding of the data set, the authors discussed the codings and similar themes were combined. Nvivo Pro 12 was used in the coding.

4 Results

Thematic analysis resulted in seven distinguished themes:

- User's control over data and data sharing
- Transparency and being informed
- Security
- Trust and fairness
- Compensation or benefits for users
- Supervision and rules
- Negative attitudes towards data collection and data economy

It is noteworthy that these themes are partly overlapping. In the following subsections, these themes are presented and analysed in further detail.

4.1 User's control over data and data sharing

User's control over data and data sharing are often seen as qualities that are demanded from a fair data economy. Respondents from all countries highlighted that they should consent to the data collection or at least have some power over data sharing.

"To ask the user beforehand for their informed consent (and every time it is useful), to clearly explain how they are used and what for, to clearly lay out which actions to take to amend or delete them, to mention how long they are stored for." (Q23, FR365)

As it becomes apparent from the answer above, there is a demand for not only asking for permission to collect and use data but also to have control over it, and it should be service providers' responsibility to explain how it could be done clearly. Some respondents elaborated the idea that there should be mechanisms beyond consent:

"Data security and appropriate use of data is primary. Similarly, information about who is collecting and what data about it should be easily available, what it is used for and how I can influence the volume and nature of the data collected with my own choices and have it erased if I want." (Q21, FI610)

Erasing the information and correcting it when necessary, naturally requires a possibility to see what is collected. Respondents did not limit the power over data sharing to the services providers that they are in direct contact with, but also stated that they should also decide whether or not the data are shared or sold to third-parties.

“It should guarantee that the consumer has access to editing their own data, erasure, etc. It should also guarantee who it discloses data to, and to my mind, it might also be good to have automatic approval as an option, as well as manual approval, so that you can decide which third parties you want your data to be disclosed to.” (Q23, FI474)

Thus, there is a demand for not only to mechanisms of viewing and controlling data but also transparency through out the data economy ecosystems. Respondent GER251 summarizes this demand as follows:

“It [fair data collection] should happen in a transparent way and I should have the opportunity at any time to undertake changes or deletions. And the provider must always specifically get my permission if he wants to pass on the data to third parties.” (Q21, GER251)

Being able to give informed consent for any data sharing, the possibility to edit and remove information, supervision of personal data and its correctness tie seem to tie into preserving one's autonomy and privacy in a data economy ecosystem. It is also apparent that the individuals see their information as their property and thus, feel that they should be able to control it.

4.2 Transparency and being informed

Whereas the previous theme was about the need to gain control, this theme is about being aware of what is happening to the personal data in a data economy ecosystem. Naturally, this theme overlaps with the previous one by being an enabler of power. However, the responses that expressed a demand for transparency and being informed were common. Especially in France, the need to being informed was more often mentioned than a need to control data.

“That each provider collecting our data asks for our opinion and explains clearly and simply what they are being used for.” (Q21, FR253)

Many of the respondents wished that the purpose of data collection were more comprehensible in general and expressed their frustration towards current ways of communicating:

“Open and clear, that is, saying in plain language which data and for what purpose it will be used. Very many data protection approval policies are complicated

legal jargon that you have to read many times to really get the essence. These should be expressed more clearly and concisely.” (Q21, FI60)

Clearness and easiness of being aware of the personal data that is collected were also often seen as something that is not currently seen as sufficient or fair. Many of the respondents wished for better usability in the ways of obtaining their data:

“First, currently, the statutory information about the use of your own data is often ultimately difficult and bureaucratic to obtain. This should be made considerably easier. Second, the fact that I have to review long lists of different purposes of data use and amount of advertising on each site I visit is far from easy and user friendly. It feels like it was intentionally made as difficult as possible so that as many as possible would just automatically accept everything. A central, neutral and non-commercial service in which I can specify at least broader guidelines on what I want to allow in terms of the use of my data would make it a lot easier.” (Q21, FI166)

Informing users about changes is also seen as part of transparency. Thus, transparency is seen as a continuous action, not just static statements that are occasionally approved:

“Open and transparent towards the clients, that at all times you can gain insight into your data and can remove them, that they never share your information with third parties without your personal consent, that they don’t just change the conditions without informing you about it.” (Q23, NE269)

Thus, transparency and being informed are inherently linked with understandable information about personal data use. This information is crucial in making decisions about whether not people consent to give their information to the service providers and thus, in the use of data economy ecosystems.

4.3 Security

Respondents from all the countries highlighted security and/or privacy as a feature of the fair data economy. It is clear that data security—protecting data from unauthorised access and data corruption—is and should be sufficient in any technological solution. Many of the respondents just stated that the requirement for the fair data economy or fair data label is that the system is secure.

Anonymity was often seen as a means to security, although there was little variance in opinions about what kind of information should be anonymous. Type of information that should be anonymous varied a lot from names, phone numbers, and addresses to medical and financial data.

“To commit to store them securely, to not share any sensitive information (address, phone number, medical and financial data for instance) and to really delete any data deleted by the user.” (Q23, FR381)

Also confidentiality and not sharing the data forward intentionally or unintentionally were often mentioned.

“Confidential data is not disclosed to other parties without permission, and no access for inappropriate people.” (Q21, FI318)

Some respondents also demanded absolute security without any possibility that data is leaked, which unfortunately is an impossible promise. However, some took into account the possibility of information leaks and called for honest communication in these cases.

Wishes for restrictions to the times that the data is kept and where and by whom they are analysed were also commonly seen as a security measurement. Many requested that the data should be stored only limited time, and it should have a clear purpose.

“[D]ata should be kept for a limited time, a minimum period of time for specific reasons, then regularly deleted.” (Q21, FR171)

Some of the respondents note the possibility of human errors as part of security, which in some cases, also means that people would only want their data to be handled via technical solutions, such as artificial intelligence. In contradiction, others stated that their personal data should only be handled by human beings. In general, answers incorporating security were vague and showcase that the understatement about data security varies a lot despite it being seen as an important aspect of the data economy.

4.4 Trust and fairness

Trust, fairness and other issues concerning responsibility were often mentioned in the answers. Trust and trustworthiness were generally seen as keeping one's promises. Promises and knowing that they are kept require transparency since without it cannot be known what is promised.

“[Being] trustworthy is keeping promises and not amending the terms and conditions in the middle of everything.” (Q23, FI271)

Adjectives used to describe fair data management were plenty. Honest, ethical, moral, respectful and appropriate were often used without further explanations:

“To sell information ethically and not first and foremost to make money.” (Q23, FR457)

“With the greatest respect. Not for the services, apart from the usually obligatory need to give my data.” (Q21, NE560)

Some respondents highlighted the fair treatment of the employees in data economies. Likely, a fair data label was intuitively linked to the fair trade label. Nevertheless, fair treatment of all parties -- including employees -- was seen as an important part of the fair data economy.

“No child labour, no wages that are abnormally low, employees being treated well.” (Q23, NE223)

Answers within this theme describe how the data economy should be to be trustworthy and fair. However, the answers give little insight into how these aspects can be actualised. It seems that the Europeans want data economy ecosystems to be just, but how the just behaviour can be incorporated into the data economy ecosystems and communicated to users is still fuzzy. Nevertheless, people demand ways to assess the trustworthiness and fairness of the practices. This is not possible without transparent communication.

4.5 Compensation or benefits for users

The respondents were generally aware that their data has value and requested that they should also benefit from enclosing it. Some requested monetary compensations, such as a respondent from Germany:

“I want to be informed every time MY data earns money, and additionally, I would like 50% of the money earned with my data transferred to my account!” (Q21, GER196)

Most often, the respondents did, however, request other kinds of benefits than money. Benefits suggested varied greatly from premiums to improving quality of life to better personalisation.

“Data should be managed to know me better, and therefore, help improve my quality of life.” (Q21, FR87)

Better personalisation of advertisement was also often seen as a possible benefit for disclosing data. However, current personalisation was seen insufficient.

“I benefit personally, for example, personalised offers and advertisements. While the targeting of advertisements is possible, I still get car and nappy advertisements even though I don’t have a driver’s licence or children.” (Q21, FI233)

Respondents also noted services that collect data should be free of charge and that a fair data economy should not demand monetary investments from the users. How-

ever, using freeness as a way to justify collecting personal data and benefiting from it was not seen as sufficient practice:

“It is fine if money is earned with the data. It is not okay to make out you are offering a free service.” (Q21, GER239)

Although the majority of respondents mentioning benefits demanded benefits for themselves, some highlighted the common good instead of the hedonism. These respondents seemed to feel that it is fair to use their data if it benefits societies and/or humankind instead of seeing data merely as a business resource. For example, scientific research was often mentioned.

“To make the world a better place but not for your own interests.” (Q21, NE498)

Thus, it is clear that people understand the value of their data and want something in return for disclosing them. Despite the varying ideas about those benefits, it seems again that the benefits should be transparently and honestly communicated to the people.

4.6 Supervision and rules

Some respondents highlighted the supervision and/or obedience of rules as the main issues of a fair data economy. These respondents noted that the actors should follow the laws and regulations. Also, several respondents noted that the institution supervising a data economy ecosystem should be an independent instance, such as a non-profit organisation and/or government.

“Checks by a government agency that is accountable to the politicians, for a customers’ council, and in the public through the media.” (Q21, NE68)

“To have a central supervising organisation appointed by the government. It has branches that are specialised in data collection for healthcare, terrorism and other security, as well as statistics about education. These should supervise the private service providers that have to work according to strict guidelines.” (Q21, NE482)

Some respondents also noted that there should be sanctions when someone is not obeying the agreed rules.

“Hefty sanctions and compensation to users if it is found that misuse has taken place.” (Q23, FI92)

“[A]nyone who messes up is out, and it is published.” (Q23, GER7)

These kinds of answers showcase that the respondents have at least some trust in legal systems that regulate data economies. However, it must be many respondents

described the ideal situation and not the current one. For these legal systems to provide the justice that the respondents describe, there is still a lot of work to be done. Again, it is apparent that supervision and compliance require openness and transparency from legislators and organisations practising in data economies.

4.7 Negative attitudes towards data collection and data economy

Although the majority of the answers were solution-centred and somewhat positive, some of the respondents were strictly against any data collection or pessimistic about the possibility of fair data economy ecosystems.

“It would be fairest if you were to not collect and use any data at all.” (Q21, GER262)

Some also showed pessimistic or negative attitudes towards the fair data label, mainly because they did not feel that it would have any effect on the data economies.

“It’s all empty words. Empty words. It’s about nothing. It all doesn’t happen so fairly and it will not become so in the future either. Strategic considerations combined with wanting to make a profit, and that’s how it will likely remain.” (Q23, NE175)

“This is a sham anyway. Nobody is prevented from having lucrative trade with data if there is a profit in it for him.” (Q23, GER479)

“Labels are not worth anything. Either they are fake or they are simply bought by companies who can afford to.” (Q23, FR177)

These negative and pessimistic attitudes are no surprise, but make it clear that there is distrust towards data economies. This lack of trust poses a challenge for data economies since, without it, it is likely that people will not take part in data economy ecosystems. Thus, there is a need to regain this trust, which could be achievable through incorporating previous demands to the practices of data economy ecosystems.

5 Discussion

5.1 Findings and implications

The main findings of this research are summarised in Table 1. As it can be noted there are two central issues that connect the demands behind the themes: transparent communication and respective active role of the individuals.

Table 1. Summary of the demands

Theme	Demands for a fair data economy
Control over data and data sharing	<ul style="list-style-type: none"> • Power over data sharing and content • Preserving privacy • Informed and dynamic consent • Possibility to control the content (requires access) • Easy-to-use control mechanisms
Transparency and being informed	<ul style="list-style-type: none"> • Transparency of processes • Ability to see what is collected • Comprehensible and on-going communication
Security	<ul style="list-style-type: none"> • Secure services • Confidentiality, anonymity • Transparent data management • Better understanding of security
Trust and fairness	<ul style="list-style-type: none"> • Trustworthiness of service providers • Clear promises that are kept • Fair treatment of all parties
Compensation and benefits	<ul style="list-style-type: none"> • Concrete benefits for disclosing data • Common good • Clear and honest communication about the benefits
Supervision and rules	<ul style="list-style-type: none"> • Rules and laws are obeyed • Supervision of the system by an independent institution • Sanctions if rules are broken
Negative attitudes	<ul style="list-style-type: none"> • Trust needs to be gained back • More holistic approach than a label needed

Transparency of data economy ecosystems is a central demand both in itself and as an enabler of the other demands. Without transparent communication, people cannot have true control over their data, be genuinely informed, aware of security, able to form trust, be aware of benefits or make assessments about the trustworthiness or obedience. Thus, transparency in all communications is needed, and it should be comprehensible to the users.

The other central demand is that people seem to want ways to be more involved and active in data economy ecosystems. They want to control their data, know what is happening in the data economy ecosystems, benefit from this participation and even participate in the supervision of these systems.

Currently, communication is seen as insufficient and in the worst-case scenario as empty promises that do not provoke any trust. Similarly, ways to influence the data collection and sharing can be limited to either accepting the incomprehensible end-user agreements or not using the services. Some cases you may alter the personal

settings and control how information is used. However, this is not made user-friendly and lay-mans actually cannot gain meaningful and accurate picture of how their information is used and by whom.

Thus, in order to give the Europeans genuine ways to actively participate in the data economy ecosystems, we need to incorporate deliberative, participatory approach in data economy ecosystems and their practices. This approach should support the individual's possibility to influence the processes and practices of the European data economy ecosystems. Of course, there is a difference between intention to participate and actual participation. Nevertheless, there should be a possibility to participate and have an influence if one wishes so.

The deliberative approach is also needed to fight against the negative attitude towards data economy that is most case based on the justified lack of trust and missing possibilities to affect how data economy ecosystems work. People can gain more control over the use of their information by increased knowledge and improved possibilities to affect if deliberative decision making is integrated into data economy ecosystems.

5.2 Limitations and future research

Naturally, there are some limitations to this research. First, the survey was conducted in fairly similar countries, which could have given a too unified picture of the demands of the Europeans. Generalising these results to apply to all Europeans is not possible. Thus, more similar research about the demands of individuals should be conducted in other countries as well to see if there is a pattern.

Second, the answers were often rather vague and thus, left room for interpretations. Because that, there is a need to conduct more in-depth empirical research about the topic to gain a more comprehensive picture of the demands and needs towards fair data economy ecosystems.

Nevertheless, this research paves the way for future research about human-centric data economy ecosystems. As the development of the human-centric European data economy ecosystem is actualising, there is also a need for more research on the individuals and their part in it. Additionally, there is a need for finding deliberative practices for human-centric development. Thus, this topic opens avenues for the plurality of topics that should be studied in order to achieve a fair data economy ecosystem.

5.3 Conclusions

This paper studied the demands of the individuals in regard to fair data economy ecosystems. From the 4,792 responses, we found seven distinguished themes that revealed that the respondents have the willingness to be more active actors in order to data economy ecosystems to be fair. The respondents expressed, for example, a demand to gain control over their personal data in theses ecosystems, but also demanded more clear and honest communication from the practitioners.

It is clear, that the current practices on the data economy ecosystems are not transparent or allow enough power to the individuals. In order to achieve a fair data econ-

omy ecosystem, there should be more transparent deliberation about the justified practices of data economy ecosystems. In other words, we should pay attention to the humans of data economy ecosystems.

References

1. Koskinen, J., Knaapi-Junnila, S., Rantanen, M.M.: What if we had fair – people-centred – data economy ecosystems? In: Proceedings of IEEE Smart World conference 2019 (2019).
2. Thinyane, M.: Small data and sustainable development—Individuals at the center of data-driven societies. In: 2017 ITU Kaleidoscope: Challenges for a Data-Driven Society (ITU K). pp. 1–8. IEEE (2017).
3. Oliveira, M.I.S., Lóscio, B.F.: What is a Data Ecosystem? In: Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age. p. 74:1–74:9. ACM, New York, NY, USA (2018). <https://doi.org/10.1145/3209281.3209335>.
4. Oliveira, M.I.S., Lima, G. de F.B., Lóscio, B.F.: Investigations into Data Ecosystems: a systematic mapping study. KAIS. 1–42 (2019).
5. Lammi, M., Pantzar, M.: The data economy: How technological change has altered the role of the citizen-consumer. *Technology in Society*. 59, 101157 (2019).
6. Birchall, C.: ‘Data. gov-in-a-box’ Delimiting transparency. *European Journal of Social Theory*. 18, 185–202 (2015).
7. van Ooijen, I., Vrabec, H.U.: Does the GDPR enhance consumers’ control over personal data? An analysis from a behavioural perspective. *Journal of consumer policy*. 42, 91–107 (2019).
8. Igo, S.E.: Me and My Data. *HIST STUD NAT SCI*. 48, 616–626 (2018).
9. Chisnall, M.: Digital slavery, time for abolition? *Policy Studies*. 1–19 (2020). <https://doi.org/10.1080/01442872.2020.1724926>.
10. Papakyriakopoulos, O., Hegelich, S., Shahrezaye, M., Serrano, J.C.M.: Social media and microtargeting: Political data processing and the consequences for Germany. *Big Data & Society*. 5, 2053951718811844 (2018). <https://doi.org/10.1177/2053951718811844>.
11. Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union. *Official Journal of the European Union*. L305, 59–68 (2018).
12. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 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). *Official Journal of the European Union*. L119, 1–88 (2016).
13. Braun, V., Clarke, V.: Using thematic analysis in psychology. *Qualitative research in psychology*. 3, 77–101 (2006).

14. European Commission: Building a European data economy. European Commission (2019).
15. European commission: 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. , Brussels (2020).
16. European Commission: What is personal data? European Commission (2020).
17. Andrew, J., Baker, M.: The General Data Protection Regulation in the Age of Surveillance Capitalism. *Journal of Business Ethics*. (2019). <https://doi.org/10.1007/s10551-019-04239-z>.
18. Fairness, <https://www.merriam-webster.com/dictionary/fairness>.
19. Rantanen, M.M.: Towards Ethical Guidelines for Fair Data Economy – Thematic Analysis of Values of Europeans. In: *Proceedings of the Third Seminar on Technology Ethics 2019, CEUR-WS*. pp. 43–54 (2019).