What ethical concepts are of key importance to analyze digital ethics awareness within SMEs?

Tim Kogelman
University of Twente
PO Box 217, 7500 AE Enschede
the Netherlands
t.m.h.kogelman@student.utwente.nl

ABSTRACT

Implementation of digital ethics in small and medium enterprises (SMEs) can make sure a SME does get a competitive advantage. Currently there is no standard method available for the analysis of digital ethics awareness. The purpose of the paper is aimed at clarifying how digital ethics awareness can be analyzed within small and medium enterprises. This will be achieved by creating a self-assessment questionnaire (SAQ) for companies to get a clear overview of their current awareness of digital ethics in their own company. The questionnaire can also serve as a starting point for a SME to improve their digital ethics awareness or even their implementation of digital ethics. A systematic literature review has been carried out to identify the ethical concepts that are of key importance for the analysis of digital ethics. Based on the findings of this review, a list of different 'digital ethics areas' is derived. Eventually the paper presents the self-assessment questionnaire for companies which gives a comparative calculation for each of these areas.

Keywords

Ethical concepts, digital ethics awareness, digital ethics analysis, small and medium enterprises, SME, data ethics, self-assessment questionnaire

1. INTRODUCTION

The world is becoming more and more digital every day, which results in more and more digital data every day. Since the field of digital innovation is relatively new, the long-term effects of its growth on the societal environment are not fully known yet. To make sure SMEs are able to make the most of this uncertain future, SMEs should be aware of (their current implementation) of digital ethics, since an appropriate implementation of digital ethics in a SME can lead to a competitive advantage for that company [4]. The paper presents a self-assessment questionnaire (SAQ) to do a self-analysis of a company's current digital ethics awareness. The paper uses the ethical concepts that are of key importance for the analysis of digital ethics awareness. Firstly, the paper will give a general definition of ethics. Although it is hard to provide such a general definition of ethics, it can be put as: "moral beliefs held by a group or community (what is good and bad or right or wrong) and a definition of the moral duties (to do or not do certain actions that stem from those beliefs)" [14]. Trying to do the right thing digitally, among other things, can be described by digital ethics. The definition of digital ethics will be explained more elaborately in the following paragraph. After that, the key problem and research questions will be clearly stated in section 2. Section 3 will discuss the methodology used

> ### The YouTube misinformation case
>
> YouTube collects data of their users to, among other things, display a list of recommended videos when someone has finished watching a certain video. This list is not made by a real person but by a digital algorithm. The main goal of this algorithm is to keep users on YouTube as long as possible by showing equal or even more spectacular recommendations, so that users will be urged to watch another video and YouTube can show more advertisements.
> When watching a video about the COVID-19 Virus, it may not only show the dangerous things about the virus but also videos which say the virus is completely fake. This can result in users believing the virus is fake, which can have big negative societal consequences, like refusing to take a vaccine. Eventually this may cause more people to die than necessary.
> Would it not be better for the world if companies, besides or instead of making as many money as possible, tried to do the 'right' thing?

in the paper and section 4 will present the results followed by the discussion in section 5.

1.1 Context

The YouTube case, as displayed in the grey box above, is an example of choosing between making as much money as possible or doing the 'right' thing morally. This is consistent with the definition of ethics given in the previous paragraph. However, ethics are not just about making the 'right' moral choices. A lot of (digital) choices that have to be made by companies do not have a 'right' answer. For example, when a driverless car is in a situation where an accident is unavoidable, should it always choose to protect the passenger, or should it choose to safe as many people as possible? And, who is responsible for the decision that the car makes? [7] Another case, where digital ethics play a role, can be found in digital health care. There is an app available that can perform skin cancer screening by analyzing photos. This app is making use of artificial intelligence (AI) in a way that makes sure the app is able to "give a result as good as that of an experienced dermatologist." [4] The problem is that "even the programmers of the app cannot understand the patterns the AI recognizes and why it comes to a particular conclusion." [4] Since it could be about matters of life and death, we should ask ourselves if we want to replace human experts by AI agents. Also, what happens when the algorithm gives a false result, who will be responsible?

The point of these examples above is to show that (digital) ethics are not only about moral choices. Therefore, an analysis of digital ethics awareness should not only focus on the moral choices a company makes, but it should take more ethical values into account.

This paper concentrates on digital ethics awareness, which can be defined as: "Digital ethics is about responsible and sustainable use of data. It is about doing the right thing for people and society" [15]. Another definition is: "Digital ethics concerns the question of which values we want to live up to in a digital world, in order to positively shape society through technological innovations." [4]. In short, implementing digital ethics in your company in the right way can make sure that:

- The company can potentially gain an competitive advantage, by being more trustworthy than their competitors, which will lead to attracting more customers [4].
- The company could stay ahead of the law, since lawmaking is always in development in the digital field. Currently the law in this field is focusing mostly on privacy, but in the future other concepts like transparency could also become part of it. Eventually, the company might even get some influence on future policy making [4].

2. PROBLEM STATEMENT

Though there is some research carried out about digital ethics [4], [8], [15], methods to analyze the level of digital ethics awareness are, to our knowledge, lacking. Big tech companies like YouTube and Facebook are becoming more and more aware of the opportunities and problems that implementing digital ethics bring with them and they also do have the resources to develop particular strategies for this. Opposed to these big companies, SMEs often lack the resources to develop an own strategy, therefore it is not known by most SMEs how they can gain competitive advantage by implementing digital ethics. That is why the paper is concentrating on analyzation of digital ethics awareness especially for SMEs. The resulting SAQ can provide a SME with an overview of their current implementation and foundation to develop their own digital ethics strategy.

2.1 Research question

The main research question of this paper is: What ethical concepts are or key importance in order to analyze digital ethics awareness within SMEs. Three sub questions were used to be able to answer to the main question:

1. What are the key ethical concepts regarding the analysis of digital ethics awareness?
2. Which areas of a company have to be analyzed and how should the key ethical concepts be divided among these areas?
3. How to analyze and calculate a comparative score to these identified areas?

3. METHODOLOGY

A combination of three methods were used to gather the desired results for answering each of the sub questions mentioned above, the number of the method aligns with the number of the sub question:

1. A systematic literature review to identify the ethical concepts that are of key importance for digital ethics analysis;
2. The identification of 'digital ethics areas' by assigning the key ethical concepts to predefined areas. These areas are predefined to make sure the analysis covers all parts of a company;
3. A self-assessment questionnaire based on desk research, will be presented. It will contain example statements for each 'digital ethics area' that can be used to calculate a comparative score for each area.

3.1 Systematic literature review

The usefulness of a systematic literature review can be described as follows: "A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed."[16]

To identify the ethical concepts that are of key importance for the analysis of digital ethics awareness, a concept matrix is used. This is made by using "a logical approach to grouping and presenting the key concept you have uncovered." [16] In total, 14 articles were reviewed. 3 articles had digital ethics as their main topic and 2 articles had ethics in general as their main topic. Subsequently, 9 articles in the adjacent field of artificial intelligence (AI) were reviewed , since research is lacking in the digital ethics field. The articles were selected in a way that makes sure that the concepts were approached from as many different angles as possible. The relevance of the articles can be found in appendix A.

As already mentioned, articles 1 till 3 are used to find the most important concepts for digital ethics, articles 4 and 5 focus on ethics in general and its concepts and article 6 till 14 are used to check whether the concepts found in the first three articles are also discussed in the adjacent fields. Also, this last group of articles are used to check whether one or more concepts were not found in the first three articles. Since the AI ethics field is an adjacent study field where a lot more research has been carried out than the digital ethics field, it makes the most logical comparison. The final result of this method was developing a concept matrix (table 1). After discussing the concept matrix, the concepts that were identified will be explained more elaborately.

3.2 Identify digital ethics areas

The first step of this method will be to make sure every aspect of a company is covered in the analysis. Therefore the key areas of digitization will be used, which were identified in an article especially for digitization in SME's [3]. The areas are:

- Strategy and leadership
- Company culture and organization
- IT infrastructure
- Process and operations
- Product (use face)

This subsection will also explain why it is considered logical to place a certain concept in one or more digital ethics area(s). The result of this method will be a table with the concepts per area, which can be found in table 2.

3.3 Create self-assessment questionnaire

To make it possible to do an analysis on a certain area, the paper proposes to set up a self-assessment questionnaire, with a framework inspired by the article mentioned in the previous subsection [3]. This questionnaire contains several statements per area which can be answered on a five-point Likert scale, where answering true results in 5 points and answering false results in 1 point for a specific statement

After answering all statements, an average score can be calculated for each area and plotted in a Radar chart. The paper will show a fictional example of such a Radar chart, which gives a total overview of the current level of digital ethics awareness for a certain SME. It makes it easy to see what areas are already good enough for the company and what areas might need improvements. The statements of an area that needs

improvement can serve as a starting point for a company to develop a digital ethics (improvement) strategy. The result of this method will be a list of example statements per area and an example Radar graph.

4. RESULTS

4.1 Systematic literature review

The result of the systematic literature review is presented in two subsections. The first section discusses the concept matrix (table 1). Also, an explanation will be given why the concepts were chosen and what conclusions can be drawn based on the concept matrix. The second subsection will explain the ethical concepts found using the literature review.

4.1.1 Concept matrix

The resulting concept matrix based on the literature review can be found in table 1 at the bottom of this page. The second row contains the articles that were reviewed. Each article is numbered, followed by the first author of each article and its year of publication. The ethical concepts can be found in the first column. Furthermore, the matrix contains marks, each mark means a certain ethical concept was discussed in a certain article. The last column shows for each concept how many times a concept has been discussed. The ethical concepts were sorted from most to least references.

The concepts that were selected for the matrix were chosen from the first three articles which were about digital ethics theory [15], digital ethics in practice [4] and digital ethics policy making [8] since these articles were the ones that focused especially on digital ethics. The ethical concepts are: human being at the center; individual data control; transparency and explainability; accountability; equality; leverage existing structures; staff involvement and value-oriented product development.

The last column of the concept matrix shows that all concepts found in the digital ethics articles were discussed in the articles of adjacent fields. Also, no other concepts regarding digital

ethics awareness were found. This means that the chosen ethical concepts are suited for the analysis of digital ethics awareness.

Four concepts were discussed in nine articles or more namely: human being at the center; transparency and explainability; accountability and equality. This can be explained by the fact that these concepts are pointing at the core of ethics in general, therefore they were discussed in many of the articles in adjacent fields.

The other four concepts were discussed in seven articles or less. Individual data control was found in the digital ethics theory article [15]. It is a very specific concept and therefore not discussed in all articles, it could have been included in most articles without changing the message of those articles though. The other three concepts are: Leverage existing structures, Staff training and value-oriented product development. These concepts were found in the digital ethics in practice article [4]. Since most articles are only about (ethics in) theorem these concepts were discussed less. It does not mean these concepts are less important. For a company to really profit from the implementation of digital ethics, it is a necessity to have an appropriate implementation in theory and in practice [4].

4.1.2 Explanation of concepts

In this second section the selected concepts will be explained more elaborately based on the definitions that were used in the different articles used in the concept matrix. The order in which the concepts are explained is the same as the order of the concept matrix.

Accountability

"Accountability is an integral part of all aspects of data processing, and efforts are being made to reduce the risks for the individual and to mitigate social and ethical implications." [15] Accountability means that a company does take responsibility. Taking responsibility increases trustworthiness of a company and therefore the company can make the most of the opportunities offered by digitalization [4]. Also, companies

Table 1. Concept matrix containing concepts about digital ethics per article

Concepts	Articles														Total
	1. (Tranberg, 2018) [15]	2. (Burden, 2019) [4]	3. (Hasselbalch, 2019) [8]	4. (Snow, 2020) [14]	5. (Baraibar-Diez, 2017) [1]	6. (D' Acquisto, 2020) [6]	7. (Etzioni, 2017) [7]	8. (Hummel, 2020) [9]	9. (Madianou, 2021) [12]	10. (Lee, 2020) [11]	11. (Clarke, 2019) [5]	12. (Barredo Arrieta, 2019) [2]	13. (O' Sullivan, 2019) [13]	14. (Larsson, 2020) [10]	Total
Accountability	X	X	X		X	X	X	X	X	X	X	X	X	X	13
Equality	X		X	X		X		X	X	X	X	X	X	X	11
Transparency and explainability	X	X	X		X	X		X		X	X	X	X	X	11
Human being at the center	X		X		X	X	X	X	X	X			X		9
Value-oriented product development		X	X					X		X	X	X		X	7
Individual data control	X					X	X		X	X	X				6
Leverage existing structures		X									X		X	X	4
Staff involvement		X	X								X				3

not only have to make sure it is implemented in their own company, but they have to assure its subcontractors and partners have the same standards [4] [15].

Equality
The equality concept can be described as follows: "When processing data, special attention should be paid to vulnerable people, who are particularly vulnerable to profiling that may adversely affect their self-determination and control or expose them to discrimination or stigmatization." [15] Additionally, "Paying attention to vulnerable people also involves working actively to reduce bias in the development of self-learning algorithms [15].

Transparency and explainability
Despite the fact that at first glance it may seem odd to combine two different concepts, we chose to do this because they serve the same goal: "Data processing activities and automated decisions must make sense for the individual. They must be truly transparent and explainable." [15] The YouTube case, as presented before, illustrates this as well. Imagine that they decide to publish their algorithm for recommending videos, they are then able to claim that they are transparent. The problem is that only experts will be able to understand the algorithm, therefore it does not meet the requirements of this ethical concept.

Human being at the center
This concept can be described the following way: "Human interests always prevail for institutional and commercial interests." Therefore the human being should be at the center of data processing and should always have the primary benefit of data processing [15]. Also the policymaking regarding digital ethics is aimed at "a human-centric distribution of power" [8] to make sure human interests prevail.

Value-oriented product development
Only the user or manufacturer of a machine can be held responsible for their actions, therefore it is "crucial to incorporate ethical principles into the design and development." [4] Value-oriented product development is a way to achieve this. An example of this is ethics by design, this theory takes sensitivity towards digital ethics into account from the data selection and conception stages, which are the first stages of the design process [4].

Individual data control
Individual data control means that: "The individual has the primary control over the usage of their data, the context in which his/her data is processed and how it is activated." [15] Or to put it in different words: "data flows shall be controllable by the individuals whose data is being processed, which from our perspective involves the right to know and to affect which kind of person-related inferences can be drawn on basis of their data." [9]

Leverage existing structures
"Implementation of strategies for digital ethics should build on existing resources and expertise, and make appropriate use of them." [4] This means that companies should avoid making parallel structures. Integrating in existing structures makes sure the acceptance within the current workforce will be higher and it automatically raises awareness of the opportunities and challenges that digital ethics bring with them among all staff [4].

Staff involvement
A very important aspect of bringing digital ethics in practice is that it has to be integrated in the company culture. Therefore, "Developing knowledge and expertise at all levels of the company is crucial to avoid unnerving or overburdening employees when dealing with digital ethics challenges [4]. It means that the (new) strategy should be clear to all staff and staff should have the opportunity to follow digital ethics (awareness) training.

4.2 Derive digital ethics areas
Table 2 shows the assignment of the ethical concepts to the five predefined areas that were already mentioned in section 3.2. This section will briefly explain why each assignment is considered logical.

4.2.1 Strategy and leadership
The strategy of the company should be aimed at creating value for their customers. Therefore, the human being could be placed at the center of the strategy. By using a form of value-oriented product development, a company makes sure this is achieved. Another necessity is that the (digital) strategy is made transparent and explained in a way that can be understood by all employees, stakeholders and customers. The strategy has to state what the companies' responsibilities are and what responsibilities the stakeholders and the customers have. Lastly the company should ensure that they do not develop a new parallel strategy for implementing digital ethics, the current strategy and leadership have to be adapted.

It is very important that all (new) parts of the strategy are completely supported by the company leadership. If the

Table 2. Assignment of digital ethics concepts per area

Strategy and leadership	Company culture and organization	IT infrastructure	Process and operations	Product (use face)
Human being at the center	Human being at the center	Individual data control	Human being at the center	Human being at the center
Transparency and explainability	Transparency and explainability	Transparency and explainability	Transparency and explainability	Individual data control
Accountability	Accountability	Accountability	Accountability	Transparency and explainability
Equality	Leverage existing structures	Leverage existing structures	Equality	Accountability
Leverage existing structures	Staff involvement		Leverage existing structures	Equality
Value-oriented product development			Value-oriented product development	

leadership of a company does not follow all guidelines that are part of the strategy, it cannot be expected that other members of the company will do this [4]. Furthermore, it should be clear which member of the leadership is responsible for what part of the implementation or maintaining of the digital ethics standards.

4.2.2 Company culture and organization
The organization of a company should be changed in a way that makes sure that everything what a company does should be for the benefit of the customer. This should be done in line with the (new) strategy. By implementing digital ethics in this way, the culture of the company will automatically change. Besides that, it should be totally clear to everyone in the company what the expectations for everyone are and how these can be achieved. Similar to the distribution of responsibilities among company leadership, certain staff members should be made responsible for a certain part of the implementation and maintenance of the digital ethics standards. At first, no new staff should be hired, but the current workforce should be used for this distribution. Furthermore, all staff should be involved in the process and training should be offered to make sure everyone is able to get familiar with the digital ethics standards. Eventually it might be the case that some staff members are not able to adapt to the new standards. If that is the case, the company should consider to replace these staff members. The recruitment process should be adapted in a way that all new employees are willing and able to adapt to the new company culture.

4.2.3 IT infrastructure
The IT infrastructure of a company should be set up in a way that it is always possible for customers to get access and change the data that is being collected by the company or its partners. The company should be totally transparent what data their IT infrastructure collects and explain why this is beneficial for the customers. When collecting data, the company should be aware of the possible vulnerabilities of the digital services they use and provide. It might be the case a company has to use a certain kind of software which discriminates for example, then the company should explain why they have to use this. Also, the company should be in agreement with all their IT partners about what specific responsibilities the company has. The company should make sure their partners apply the same standards. Again, the current IT infrastructure should be adapted to implement the (new) digital ethics standards, no parallel or new structure should be set up.

4.2.4 Process and operations
The process and operations of a company should be in line with the (new) strategy and (new) organization, so that they will provide a beneficial result for the customer. Therefore, the chosen form of value-oriented product development should be implemented in the process and operations. Also, the company should be transparent about their process and operations in a way that stakeholders and customers can understand. It should be clear what the company does and how they do it. Certain staff members should be appointed to be responsible for a certain part of the process or certain operations. Lastly, the current process and operations should be adapted to the digital ethics standards, no new or parallel process and operations should be set up.

4.2.5 Product (use face)
The main goal of the product should be that it creates a benefit for the users. Also, it should be clear to users what digital features the product has and be explained in a way that can be understood by all its users. The customers should know what data the product collects and how they can gain access to and change this data. Furthermore, the product should be unbiased and give the same possibilities to every possible user. It should be clear for the user what the responsibilities of the customer are and what responsibilities the company has for the product. Also try to make the product accessible by as many potential users as possible.

4.3 Self-assessment questionnaire
This self-assessment questionnaire will contain example statements for all the areas that were found in section 4.2. These statements can be used by a company to analyze their own digital ethics awareness. All statements have to be answered on a five-point Likert scale, where answering true results in 5 points and answering false results in 1 point for a specific statement. The average score for each area can then be plotted in a Radar chart (figure 1). This chart can be used to see what areas are already appropriate and what areas need improvement. If a company wants to improve a certain area, the statements of this questionnaire can serve as a starting point for the improvement strategy of a company. Section 4.3.1 shows the statements of the questionnaire per digital ethics area.

4.3.1 Questionnaire statements
Strategy and leadership
1. The strategy of the company makes sure that it is mainly aimed at providing benefits to customers.
2. The strategy is transparent and explained in a way that can be understood by stakeholders and customers.
3. It is clearly stated in the strategy what the company's responsibilities are
4. No vulnerabilities (e.g. biases) are present in the strategy.
5. The existing strategy and leadership structure is used to integrate new versions of the digital ethics strategy.
6. A way of value-oriented product development (e.g. ethics by design) is integrated in the company's strategy.

Company culture and organization
1. The company culture is mainly aimed at generating value for the customer.
2. Everyone working in the company clearly understands what they exactly have to do and how they should do it.
3. It is clearly described who is responsible for what part of the organization, including who is responsible for the implementation of digital ethics (awareness).
4. The company is sure their organization does not have any unwanted biases, for example in the recruitment process. All positions in the organization are equally accessible to equal people.
5. The company has made sure the current organization structure is used when implementing digital ethics.
6. All staff of the company does have access to digital ethics (awareness) training

IT infrastructure
1. The IT infrastructure is set up in a way that all customers are able to get access to their data at any time, they are also always able to change it.
2. It is totally clear to the customers what data is collected and what benefit this data collection creates for the customer.

3. It is clearly stated what responsibilities the company has and what responsibilities the customers have.
4. The current IT infrastructure is used to implement the digital ethics.

Process and operations
1. Processes and operations are set up in a way so that their result will be beneficial for customers.
2. The process and all operations are explained in a way that can be understood by all staff and by customers.
3. It is clearly stated which employee is responsible for which process
4. The company has made sure that things like biases are eliminated in processes and operations.
5. Instead of creating a new structure, the current processes and operations are changed to implement digital ethics (awareness).
6. The chosen way of value-oriented product development is fully implemented in the process and operations.

Product (use face)
1. The finished product does provide one or more benefits for customers.
2. Customers know what data is collected by the product and know how to access and change their personal data.
3. It is clearly explained to the customer what the product does (digitally) and how it should be used.
4. The company has stated what their responsibilities regarding the product are and what the responsibilities of the customer are.
5. The company has made sure the product is available and accessible to as many users as possible.

4.3.2 Resulting Radar chart

Figure 1 is an example of a filled-in score Radar chart, which shows the average results of company A per digital ethics area. As already mentioned before, this graph makes it easy to see what areas do already have an appropriate implementation of digital ethics and what areas are lacking this implementation. Company A has a an appropriate implementation in the company culture and organization area and a bad score in the IT infrastructure area. It means that, provided that they want to improve their digital ethics implementation, their main focus has to be on their IT infrastructure. As a starting point they can use the statements of the IT infrastructure area in section 4.3.1. To improve the other areas they can use the statements of the corresponding section as a starting point.
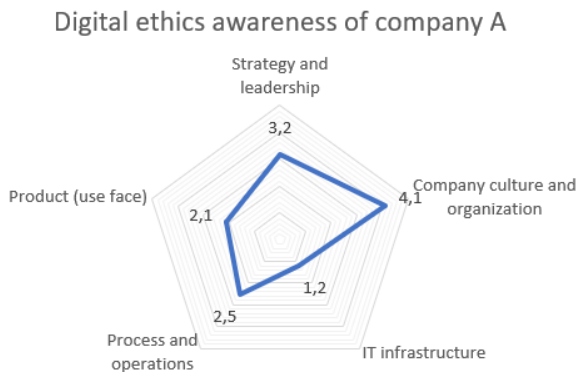

Figure 1. Example Radar chart showing digital ethics awareness for company A

5. DISCUSSION

Since the world is becoming more and more digital each day, the importance of digital ethics is also increasing each day. Big companies like YouTube and Facebook are becoming more and more aware of the challenges and opportunities that digital ethics bring with them. SMEs often lack resources to fully develop an own digital ethics strategy, therefore that is the main focus of this paper. When digital ethics are implemented in an appropriate way: it makes sure the company stays ahead of the law; it might give the company influence on future law making and it can give the company a competitive advantage [4].

Three methods were used to be able to answer the main question of this paper. The main question is: What ethical concepts are or key importance in order to analyze digital ethics awareness within SMEs. The paper uses a systematic literature review [16] to identify the most important ethical concepts regarding digital ethics awareness. The ethical concepts found were: human being at the center; individual data control; transparency and explainability; accountability; equality; leverage existing structures; staff involvement and value-oriented product development. These concepts were assigned to five different 'digital ethics areas' to be able to analyze the concepts. After that the paper presented a self-assessment questionnaire that can be used by companies to do a self-analysis and see in what area(s) improvement is needed.

Lastly, it should be kept in mind that this paper merely functions as a starting point, therefore it has some limitations:

1. Using a SAQ might lead to biased answers, companies should be aware of this when filling in the questionnaire.
2. The statements of the SAQ and the Radar chart are not empirically validated.
3. The SAQ is very general. There should be different versions for different types of SMEs.
4. The questionnaire is a SAQ and its only result is a Radar chart. The questionnaire should be build in a tool or app for a more in-depth analysis of the results.

All these limitations could be addressed in future research.

6. REFERENCES

[1] E. Baraibar-Diez, M. D. Odriozola, and J. L. Fernández Sánchez, "A Survey of Transparency: An Intrinsic Aspect of Business Strategy," *Bus. Strateg. Environ.*, vol. 26, no. 4, pp. 480–489, 2017, doi: 10.1002/bse.1931.

[2] A. Barredo Arrieta *et al.*, "Explainable Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI," *Inf. Fusion*, vol. 58, no. October 2019, pp. 82–115, 2020, doi: 10.1016/j.inffus.2019.12.012.

[3] F. Blatz, R. Bulander, and M. Dietel, "Maturity Model of Digitization for SMEs," *2018 IEEE Int. Conf. Eng. Technol. Innov. ICE/ITMC 2018 - Proc.*, 2018, doi: 10.1109/ICE.2018.8436251.

[4] D. Burden and M. Savin-Baden, "Digital Ethics," *Virtual Humans*, pp. 181–196, 2019, doi: 10.1201/9781315151199-12.

[5] R. Clarke, "Principles and business processes for responsible AI," *Comput. Law Secur. Rev.*, vol. 35, no. 4, pp. 410–422, 2019, doi: 10.1016/j.clsr.2019.04.007.

[6] G. D'Acquisto, "On conflicts between ethical and logical principles in artificial intelligence," *AI Soc.*, vol. 35, no. 4, pp. 895–900, 2020, doi:

10.1007/s00146-019-00927-6.

[7]   A. Etzioni and O. Etzioni, "Incorporating Ethics into Artificial Intelligence," *J. Ethics*, vol. 21, no. 4, pp. 403–418, 2017, doi: 10.1007/s10892-017-9252-2.

[8]   G. Hasselbalch, "Making sense of data ethics. The powers behind the data ethics debate in European policymaking," *Internet Policy Rev.*, vol. 8, no. 2, pp. 1–19, 2019, doi: 10.14763/2019.2.1401.

[9]   P. Hummel and M. Braun, "Just data? Solidarity and justice in data-driven medicine," *Life Sci. Soc. Policy*, vol. 16, no. 1, pp. 1–18, 2020, doi: 10.1186/s40504-020-00101-7.

[10]   S. Larsson and F. Heintz, "Transparency in artificial intelligence," *Internet Policy Rev.*, vol. 9, no. 2, pp. 1–16, 2020, doi: 10.14763/2020.2.1469.

[11]   M. K. Lee *et al.*, "Human-centered approaches to fair and responsible AI," *Conf. Hum. Factors Comput. Syst. - Proc.*, pp. 1–8, 2020, doi: 10.1145/3334480.3375158.

[12]   M. Madianou, "Nonhuman humanitarianism: when 'AI for good' can be harmful," *Inf. Commun. Soc.*, vol. 24, no. 6, pp. 850–868, 2021, doi: 10.1080/1369118X.2021.1909100.

[13]   S. O'Sullivan *et al.*, "Legal, regulatory, and ethical frameworks for development of standards in artificial intelligence (AI) and autonomous robotic surgery," *Int. J. Med. Robot. Comput. Assist. Surg.*, vol. 15, no. 1, pp. 1–12, 2019, doi: 10.1002/rcs.1968.

[14]   K. Snow and B. Shoemaker, "Defining Cataloging Ethics: Practitioner Perspectives," *Cat. Classif. Q.*, vol. 9374, pp. 533–546, 2020, doi: 10.1080/01639374.2020.1795767.

[15]   P. Tranberg, G. Hasselbalch, B. Kofod Olson, and C. Søndergaard Byrne, *DATAETHICS - Principles and Guidelines for Companies, Authorities & Organisations*, I. 2018.

[16]   J. Webster and R. T. Watson, "Analyzing the past to prepare for the future: Writing a literature review," *MIS Quaterly*, vol. 26, pp. xiii–xxiii, 2002.

APPENDIX A

The articles that were used in the concept matrix can be summarized as follows:

- Article 1: Digital ethics theory: provides theory and concepts about data ethics.
- Article 2: Digital ethics in practice: shows the challenges, opportunities and important concepts when digital ethics are implemented. It provides examples in different industries and environments.
- Article 3: Digital ethics policy making: shows all actors involved in the process of European policy making in the digital ethics field. Also states what concepts these actors keep in mind during this process.
- Articles 4-5 Ethics in general: to find a general definition for ethics and identify the important concepts.
- Articles 6-7 Ethics in artificial intelligence: about incorporating digital ethics into AI.
- Article 8-9 Artificial intelligence for good: about trying to do good using AI.
- Articles 10-11 Responsible artificial intelligence: about making equality and accountability in AI.
- Articles 12-14 Explainable artificial intelligence: focusses on the importance of transparency and explainability in AI.