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Artificial Intelligence and Citizen Participation in EU Policymaking

Master Thesis

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Abstract

This thesis examines citizen participation methods of the European Union, namely the European citizens' initiatives and Public Consultations, and explores options and propositions on how to increase and enhance citizen participation through Artificial Intelligence but also at potential barriers that might exist. This is done through exploratory research based on two case studies supported through data gathered in semi-structured interviews and document analysis. The final propositions are furthermore validated through an expert.

Research shows among others the potentials of intuitive and dynamic AI, detection of classic triggers, additional mechanisms such as model cards and explainable AI to increase transparency, as well as maintaining a human in the loop for decision making processes.

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ABBREVIATIONS

AI	Artificial Intelligence
AGI	Artificial General Intelligence
ANI	Artificial Narrow Intelligence
ASI	Artificial Superintelligence
dNNs	deep Neural Networks
ECAS	European Citizen Action Service
ECI	European Citizens' Initiative
EP	European Parliament
EU	European Union
DG	Directorate-General
ICT	Information Communication Technology
ML	Machine Learning
NGO	Non-Governmental Organization
XAI	Explainable Artificial Intelligence

1. Introduction

This thesis deals with possibilities and challenges for citizens' participation on an EU level in policy making supported by Artificial Intelligence and on this basis aims to propose additions and changes to already existing participatory tools in the EU legislative process.

1.1. Problem Statement

The European Union's policy-making process is characterized by a top-down approach. The right to initiate legislation is solely held by the European Commission. Nevertheless, there are a few tools already within the legislative process that encourage citizen participation on a European level, namely the European Citizens' Initiatives and Public Consultations. Following the premise that the European Union is willing to encourage citizen participation as outlined by the Treaty of Lisbon (Amending the treaty on European Union and the treaty establishing the European Community, 2007), Article 8A where it is stated that "[e]very citizen shall have the right to participate in the democratic life of the Union" and that "[d]ecisions shall be taken as openly and closely as possible to the citizen", the question arises whether new, technology-based ways of citizen participation could be explored in order to facilitate such an open citizen participation process.

Democracy and the tools to achieve a democratic society are continuously developing, be it with changes in eligibility to take part in certain processes but also especially new technological opportunities. Recently, the idea of deploying Artificial Intelligence (AI) to facilitate policy- or even decision-making through citizen participation, gained interest. However, Artificial Intelligence should not be seen as a cure for all deficits within society or a silver bullet. However, it is recognized that it holds a lot of potential on the area of politics (Sætra, 2020).
While there is a vast amount on research in the area of Artificial Intelligence, academic literature on how AI can be used to increase citizen participation in political processes is still lagging behind (Savaget et al., 2019).

In order to investigate the area of Artificial Intelligence in citizen participation further, concepts such as transparency and accountability are driving factors which potentially have an immense role in whether this technology has a future in citizen participation and policy making or whether it will be disregarded due to a lack of citizens' trust.

In this thesis, the current citizen participation tools on an EU level such as European Citizens' Initiatives as well as Public Consultations will be analyzed and set into perspective in the policy cycle with possible implications in future participation opportunities through the findings of the case studies which are AI based citizen participation projects.

1.2. Research Question

In order to examine the above stated problem, the following research question will be guiding through the Master thesis:

What are opportunities and barriers for Artificial Intelligence in contributing to increase and enhance citizens' participation in EU policymaking?

Furthermore, the following sub-questions will specify the topic and objective further:

- How could the current EU policy making process and existing citizen participation tools be complemented by AI?
- What mechanisms would guarantee transparency and data protection in the involvement of citizens in policy making processes?
- How could accountability and ethical usage be secured?

The goal of this research is to have as a first step a list of opportunities and barriers to citizen participation supported by Artificial Intelligence. These would then be turned into propositions of how the existing tools and processes on an EU level could be complemented with transparency and accountability being at the center of these deliberations.

1.3. Structure of thesis

In order to answer the research questions, the first part of the thesis discusses the literature review which is composed of three main themes: Citizen participation, Artificial Intelligence, and EU policy making. In the course of this chapter, the overlaps in the various topical areas are also discussed. First, within citizen participation, general concepts of participation, Arnstein's (1969) ladder of participation and the further development of it by Cardullo and Kitchin (2019) as well as a few insights into the field of eDemocracy and eParticipation are

elaborated on. Next, Artificial intelligence and different ways of categorizing it are pointed out. Moreover, the concept of explainable AI and a research study including AI and citizen participation are further discussed. As the third topic, this thesis looks into the European Union and its legislative process, ordinary but also citizen driven, as well as several policy proposals involving Artificial Intelligence and ethical use. Consequently, the main concepts of the literature review are summarized in the theoretical framework which the interview questions in the following chapters are based on.

This thesis is exploring two use cases of Artificial Intelligence, and the results derive from semi-structured interviews as well as partly on document analysis. The results are set into context with the theoretical framework and the various concepts of citizen participation, Artificial Intelligence, and EU policies.

Finally, the propositions which are drawn from the results for potential use of Artificial Intelligence tools in European Citizens' Initiatives and Public consultations in the EU are validated through a European Commission expert working on public consultations and Artificial Intelligence as a tool.

2. Literature Review and Theoretical Framework

The following chapter will revolve around the three major topics of this thesis, namely citizen participation, Artificial Intelligence, and EU policy. While each topical area is described on its own, including giving important definitions, categorizations, and connected concepts, the overlaps between the three main topics which are relevant in the context of this thesis are furthermore reviewed as well. As such, the overlap between citizen participation and Artificial Intelligence is described in chapter 2.2.3., the connection of citizen participation and EU policy is discussed through European Citizens' Initiatives and Citizen consultations in chapters 2.3.2. and 2.3.3. . Chapter 2.3.4. is concerned with the relation of the EU and AI and touches on new developments in legislation. For better understanding, the following figure shows the interplay of the topics and the correlating chapters and sub-chapters:

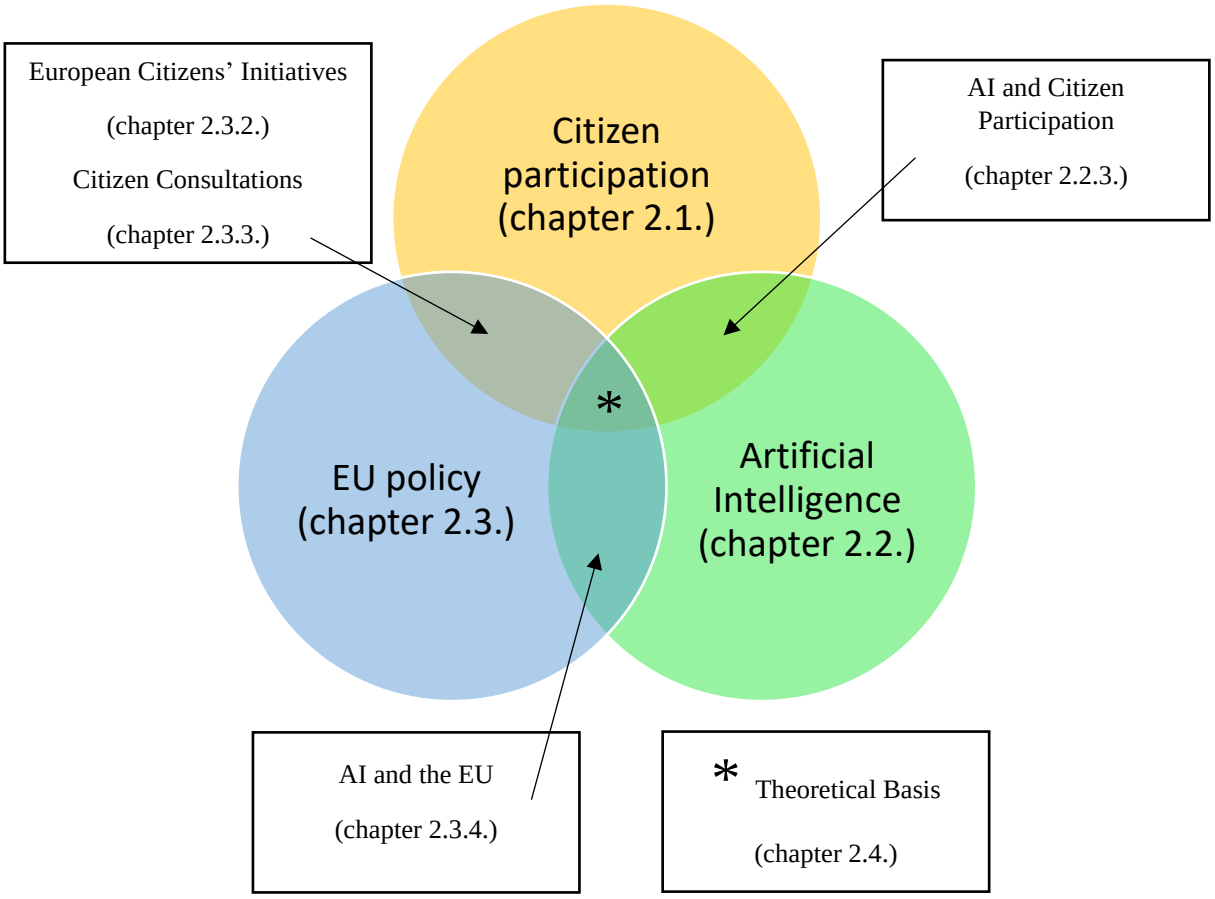

Figure 1. Literature review: Overview main research topics

The final sub-chapter (2.4.) will elaborate on and summarize all major aspects of these three themes for the subsequent research. It will therefore serve as theoretical basis for the case studies and the semi-structured interview questions.

2.1. Citizen Participation

The following chapter will discuss citizen participation, especially with focus on ICT and citizen interaction. First, citizens and their representation in policy making as a concept is elaborated on and also what potential groups participation might not be able to reach or represent. Next, the ladder of citizen participation by Cardullo and Kitchin (2019) is described. Finally, eDemocracy and eParticipation are discussed.

2.1.1. Citizens, Participation, and Representation

Lindquist et al. (2013, p. 29) explained that "there is no such thing as an average citizen". Furthermore, they explain the nature of citizens within political discourse which is marked through the "intensity preference" meaning that people have different priorities on various issues, not caring about everyone to the same extent (Lindquist et al., 2013, p. 29).
Albert et al. (2021, p. 120) cite H. Kennedy (2016) that when discussing the concept of citizen, they "mean 'citizens, publics, social groups and communities' in other words, social actors that are not necessarily professional scientists".

Gamper (2015) explains that through various governance structures, citizens also act in different contexts and therefore also in differing roles, depending on these contexts. "As a consequence, citizens appear in various forms of demos, such as local, regional or federal citizens, Union citizens or even cosmopolitan citizens who are either represented or participate directly" (Gamper, 2015, p. 73).

Nevertheless, inequality in political and participatory representation has been a topic for a long time. Even in 2006, the European Social Survey, evaluating forms of political participation in 24 different countries, found that the lower the income of citizens, the lower the chances of participation. In contrast, higher income households have a higher participation rate (Lindquist et al., 2013).

As Lindquist et al. (2013, p. 1) point out, expectation about governments needing to be more connected to its citizens have increased in the course of the early 21st century. This is viewed as potentially decreasing "distrust of citizens in government and build constructive support through better policy and higher quality services" (Lindquist et al., 2013, p. 1).

Lindquist et al. (2013) furthermore describe the Models of Democracy by Held (1987). For the purpose of this thesis, especially the "protective model of democracy" which can be described as "a competition between elected leaders involving organized group engagement" is of interest (Lindquist et al., 2013, p. 26). It is built on an understanding of democracy that needs to keep broad citizen participation to a minimum due to fears of negative effects while still keeping the public feeling engaged and that they can have an influence (Lindquist et al., 2013).

> "The goals of this form of democracy were to protect liberties (both of property and of human rights), and to construct stable government." (Lindquist et al., 2013, p. 35)

In contrast to the first model, the "developmental framing" is another way of looking at democracy and participation. Lindquist et al. (2013) describe this other model based on the understanding of democracy "as a fundamental human right" as follows:

> "Citizen engagement is central to this understanding of democracy because […] it builds better human beings and a better society. The goals […] are to create legitimate and effective outcomes, but stemming from shared learning and exchange of interests and ideas." (Lindquist et al., 2013, p. 26)

Lindquist et al. (2013) also elaborate on the disappointments citizens can face in participatory processes as they might have the chance to give their input but barely have the power to take decisions themselves. These are more often done by representatives.

Michels (2011) on the other hand explains that participation can also bring a positive outlook on democracy and decision making in addition to several other positive side effects of that participation, as is entrenched in the believes of participatory democrats. One of the side effects is educational, as citizens improve their "civic skills" and gain experience in participation in decision making (Michels, 2011, p. 278). Another positive effect of participation of citizens is that it has an "integrative function", meaning citizens can develop a feeling of belonging and being part of a community by actively shaping it (Michels, 2011, p. 278). Finally, public participation in decision making also leads to greater legitimacy of the decision made (Michels, 2011). More concretely, citizen participation: "gives citizens a say in decision-making (influence); contributes to the inclusion of individual citizens in the policy process (inclusion); encourages civic skills and virtues (skills and virtues); leads to rational decisions based on public reasoning (deliberation); and increases the legitimacy of decisions (legitimacy)" (Michels, 2011, p. 279).

Likewise, Oni et al. (2016, p. 473) stress that one of the advantages broad participation can have is that the decisions made by the government are more preferred by the public and furthermore, according to them including citizens' ideas and preferences in the "decision-making process, produces better policy outcomes and thus more benefits to the society". Besides that, an elevated level of trust and legitimacy of the government are positive results citizen participation can have (Oni et al., 2016).

Michels (2011) moreover also deliberates on four different forms of citizen participation, depending on whether they are targeted at a concrete outcome or decision in contrast to a process or opinion formation. Moreover, Michels (2011) distinguishes between individual and collective participation forms:

	Individual	Collective
Outcome/decision-making	Referendums	Participatory policy making/ interactive governance
Process/opinion formation	Deliberative surveys	Deliberative forums

Figure 2. Forms of citizen participation, retrieved from Michels (2011, p. 280).

Referendums: They give citizens the opportunity to directly influence decisions by voting on them. These can be "binding or non-binding" (Michels, 2011, p. 280).

Deliberative surveys: Similar to referendums, deliberate surveys try to elicit the opinions of individual citizens, however, the goal is not a concrete decision in the end. "A random, representative sample of the population is first questioned on a particular issue. Members of the sample are then invited to gather to discuss the issue at stake. After the deliberations, during which people have had the time and the opportunity to become more informed and more engaged by the issue, the sample is again asked the original questions in order to see if opinions have changed" (Michels, 2011, p. 280).

Participatory policy making/Interactive governance: As opposed to the previously discussed two forms of participation, here the citizens are viewed as a collective. In this first form, a larger group of citizens is able to advise decisionmakers and governments in order for them to take more informed decisions. The clear goal is again to have a decision at the end (Michels, 2011).

Deliberative forums: Finally, deliberate forums also approach citizens as a group rather than individuals but do not have the target of a concrete decision but rather focus on the exchange and deliberation of opinions and ideas. "[T]he exchange of arguments are more important than decision-making" and therefore also only a limited number of people is involved whose goal is "to reach consensus in a deliberative forum" (Michels, 2011, p. 280).

2.1.2. Ladder of Citizen Participation

The framework on citizen participation this thesis is based on is taken from Cardullo and Kitchin (2019) which was developed as a scaffold of citizen participation in smart cities. It is a further development of Arnstein's (1969) ladder of participation, which is depicted in the figure below and composed of three main categories namely "citizen power", "tokenism", and "non-participation" and eight sub-categories:

Form and level of participation	
Citizen power	Citizen control
	Delegated power
	Partnership
Tokenism	Placation
	Consultation
	Informing
Non-participation	Therapy
	Manipulation

Figure 3. Arnstein's (1969) ladder of citizen participation in planning retrieved from Cardullo and Kitchin (2019, p. 3).

As Arnstein's ladder of citizen participation is an established framework for participation but also relatively old, the decision was made for this thesis to go with a more contemporary revision of the original ladder. As Cardullo and Kitchin (2019) worked out a citizen participation scaffold based on Arnstein but including more detailed categories and taking into account recent developments in information technology, this was deemed the most appropriate framework.

The following figure shows Cardullo and Kitchin's (2019, p. 5) scaffold of smart citizen participation. It divides citizen participation into four main categories "citizen power",

"tokenism", "consumerism", and "non-participation", and further narrowing it down to nine levels discussed in detail below. Moreover, Cardullo and Kitchin (2019) describe the role citizens take in the various forms of participation, how they are involved, and the political discourse or framing this is embedded in. Finally, the modalities of the participation forms are highlighted.

<table>
<tr><th colspan="2">Form and Level of Participation</th><th>Role</th><th>Citizen Involvement</th><th>Political discourse/ framing</th><th>Modality</th></tr>
<tr><td rowspan="3">Citizen Power</td><td>Citizen Control</td><td>Leader, Member</td><td rowspan="2">Ideas, Vision, Leadership, Ownership, Create</td><td rowspan="2">Rights, Social/Political Citizenship, Commons</td><td rowspan="3">Inclusive, Bottom-up, Collective, Autonomy, Experimental</td></tr>
<tr><td>Delegated Power</td><td>Decision-maker, Maker</td></tr>
<tr><td>Partnership</td><td>Co-creator</td><td>Negotiate, Produce</td><td rowspan="2">Participation, Co-creation</td></tr>
<tr><td rowspan="3">Tokenism</td><td>Placation</td><td>Proposer</td><td>Suggest</td><td rowspan="4">Top-down, Civic Paternalism, Stewardship, Bound-to-succeed</td></tr>
<tr><td>Consultation</td><td>Participant, Tester, Player</td><td>Feedback</td><td rowspan="2">Civic Engagement</td></tr>
<tr><td>Information</td><td>Recipient</td><td rowspan="2">Browse, Consume, Act</td></tr>
<tr><td>Consumerism</td><td>Choice</td><td>Resident, Consumer</td><td>Capitalism, Market</td></tr>
<tr><td rowspan="2">Non-Participation</td><td>Therapy</td><td rowspan="2">Patient, Learner, User, Product, Data-point</td><td rowspan="2">Steered, Nudged, Controlled</td><td rowspan="2">Stewardship, Technocracy, Paternalism</td></tr>
<tr><td>Manipulation</td></tr>
</table>

Figure 4. Scaffold of smart citizen participation retrieved from (Cardullo & Kitchin, 2019, p. 5)

Non-participation:

This first category in Cardullo and Kitchin (2019) is the lowest on the ladder, being composed of 'Manipulation' and 'Therapy'. Citizens are not able to participate but are rather controlled, "nudged and steered towards specific sets of behavior, practice, and conduct" (Cardullo & Kitchin, 2019, p. 3). They are therefore in the role of "Patient, Learner, User, Product", or "Data-point" (Cardullo & Kitchin, 2019, p. 5). All of this is done through a top-down approach. An example can be that "citizens become subject to a modulation of their actions through software-mediated systems designed to produce particular regulatory outcomes that actively shapes behavior" (Cardullo & Kitchin, 2019, p. 5).

Consumerism:

In this second category, citizens are rather consumers who can take choices in for example on services or products rather than directly influencing decisions. This still entails a vast number of constraints, as the system in which they can make this choice is pre-determined and also the selection that citizens can choose from is limited. This approach again is described as top-down and paternalistic (Cardullo & Kitchin, 2019).

Tokenism:

This category of participation consists of three levels, namely 'Information' in which citizens are the recipients of top-down information delivery and therefore again like the previous category are involved through consumption of this information; 'Consultation' in which citizens are participants, sometimes testers or players and the aim is to get feedback from them; and finally 'Placation' which gives citizens the chance to take the role of proposing and suggesting certain things (Cardullo & Kitchin, 2019, p. 5). While the first two can be located in the area of civic engagement, the third level is already part of participation and co-creation in the political discourse. Nevertheless, all levels of tokenism are still top-down and therefore set in a specific pre-defined system (Cardullo & Kitchin, 2019).

Citizen Power:

Finally, the highest form of citizen participation is citizen power, composed of the three levels: 'Partnership', 'Delegated Power', and 'Citizen Control' (Cardullo & Kitchin, 2019, p. 5). On the level of 'Partnership', citizens have the role of co-creators who negotiate and produce output together with governments. The next step on the ladder 'Delegated Power' gives citizens the power of being decisionmakers and "genuine specified powers within a co-shared initiative" (Cardullo & Kitchin, 2019, p. 9). Finally, 'Citizen Control' puts citizens in the lead. The previous two open up the opportunity for citizens to contribute with "ideas, vision[s], leadership, [and] ownership" (Cardullo & Kitchin, 2019, p. 5).

2.1.3. eDemocracy and eParticipation

As elaborated above, citizen participation can be realized in various ways and also more recently, be enabled through technology and new innovations. But while the goal towards more eDemocracy is recognized by many governments in their eGovernment strategies, the concrete tools and technologies needed for its implementation are not as well elaborated on (Oni et al.,

2016). As a consequence to negative effects this has, Oni et al. (2016, p. 458) stress the importance to have a "clear and understandable" eDemocracy strategy which focuses on concrete feasibilities within the area of eParticipation in the decision-making process.

Maier and Reimer (2010, p. 46) point out the possibilities but also the heightened expectations that come with the use of Information Communication Technology (ICT) for citizens but also for businesses "to use ICT to participate in decision-making at all levels". How this can be put into practice could be observed in various trials "at national and local levels across Europe" (Maier & Reimer, 2010, p. 46).

Nevertheless, David (2018) also explains that next to the advantages, eParticipation can have the same shortcomings as regular participation. One of the major downsides is what David (2018, p. 90) calls "NIMBY" short for "Not in My Back Yard", meaning that participation is very much based on self-selection of citizens which can have a negative effect on representativeness. Sometimes important views cannot be recorded because they are not raised or underrepresented like "minorities, those with disabilities, elderly", and "youth" (David, 2018, p. 90). However, ICT might not be the silver bullet answer to enhancing involvement of those under- or not represented groups. Nevertheless, it is in the responsibility of governments to lessen barriers for participation, even those that might arise due to deployment of ICT tools (David, 2018).
As Maier and Reimer (2010, p. 47) explain, the main "target groups" for eParticipation are not government or political party led initiatives but rather bottom-up citizen initiatives. They find the role of governments as secondary and state that "[g]overnments should play a limited role" while they should nevertheless still be involved but rather in "a collaborative working environment" (Maier & Reimer, 2010, p. 47).

Some of the barriers for "user acceptance" for the participatory tools according to Maier and Reimer (2010, p. 47) include "too close alignment with governmental requirements" as opposed to "citizens' needs", "little guidance to the drivers and participants of an initiative throughout its lifecycle", "lack of transparency with regard to the underlying mechanisms of the initiative", "lack of traceability of one's contributions and feedback", and "lack of opinion aggregation and visualization".

On the other hand, it is also important to take a closer look at the advantages eParticipation and eDemocracy can have. One argument that is often placed in favor of ICT supported participation is that is provides a location and time independent way of taking part in decision-making, as citizens can use the tools wherever and whenever they find time as opposed to having to go to specific administrative buildings (David, 2018).

David (2018, p. 92) moreover views the deployment of ICT tools in participation processes as great opportunity to improve engagement due to:

> "benefits that are commonly attributed to communication, consensus building, and collaboration in addition to ICT specific benefits: high-quality policies; the prevention of a stalemate; innovative and creative ideas; diversity of ideas; single and double loop learning; social, intellectual, and political capital; co-production of knowledge and therefore greater governmental capacity; buy-in; better responses to change and conflict; and spin-off partnerships and collaborations".

2.2. Artificial Intelligence

Artificial Intelligence is not a concept that has only emerged within the last decade, but it has been discussed for over 60 years. While AI is a broad term, in popular culture it gained attention in 2016 through winning the game AlphaGo, a highly complex game, against the best human player (*Artificial Intelligence*, 2021). Nevertheless, even before the victory of an algorithm over the human mind, the potential of AI was starting to receive recognition. In this respect, developers started to see advantages in terms of efficiency in deploying machine learning (ML) as a method instead of operating the traditional manual mode (Jordan & Mitchell, 2015).

As outlined, there are various definitions for Artificial Intelligence as well as Machine Learning. Landgrebe and Smith (2019) state that

> "[a]n AI application is a computer program that can create an output in response to input data in a way that is similar to the ways humans react to corresponding environmental stimuli." (Landgrebe & Smith, 2019, p. 1)

On the other hand, Machine learning itself, a basis of Artificial Intelligence, was also defined by Joshi (2020) as an algorithm or program which learns to "produce a behavior that is not explicitly programmed by the author" (Joshi, 2020, p. 4) and therefore can go beyond the initial targeted use. This is one instance that shows the boundaries of AI and ML as concepts are rather fluent and depend on the researchers' judgement. ML is not a clear-cut area of research, but needs to be considered rather interdisciplinary (Jordan & Mitchell, 2015). Furthermore, Jordan and Mitchell (2015) state that:

> "As a field of study, machine learning sits at the crossroads of computer science, statistics and a variety of other disciplines concerned with automatic improvement over time, and inference and decision-making under uncertainty." (Jordan & Mitchell, 2015, p. 256)

It needs to be pointed out that the field is much broader than can be discussed through the content of this chapter and even thesis, and includes use in natural sciences, education, psychology, mathematics and statistics, as well as economics and organizational studies (Jordan & Mitchell, 2015; Joshi, 2020).

This diversity can be exemplified by one real-world use case of Artificial Intelligence, namely language processing. Landgrebe and Smith (2019, p. 12) found seven criteria that language processing systems should meet which could potentially also be of importance for other Artificial Intelligence uses. These criteria comprise:

1) "*Exactness*: [it] needs to be able to be exact where necessary and not always restricted to the merely approximative",

2) "*Information security*: [it] needs to avoid insecurities of the sort which arise, […] when even slight perturbations lead to drastically erroneous outputs",
3) "*Robustness*: [it] needs to be able to work reliably in a consistent way even given radical changes of situation and input, or to detect critical changes and report on its own inability to cope",
4) "*Data parsimony*: [it] needs to be trainable with thousands to millions of data points (rather than billions to trillions […])",
5) "*Semantic fidelity*: [it] needs to be able to incorporate contextual interpretations of input situations",
6) "*Inference*: [it] needs to be able to compute the consequences of given inputs in a way that allows the system to distinguish correlation from causality",
7) and "*Prior knowledge usage*: [it] needs to be able to use prior knowledge to interpret situations" (Landgrebe & Smith, 2019, p. 12)

As diverse as the fields of use of AI, are the views on it: They span from positive to dystopian. Savaget et al. (2019) point out that the effects AI can have on democracy must be investigated closely and elaborate on two scenarios: A positive wherein AI enhances democracy, enables marginalized groups to gather information and articulate needs, and increases transparency in decision making; the other scenario is a negative view, in which deploying AI-based technology is compared to opening Pandora's box, resulting in spread of fake news, citizen manipulation, and the reinforcement of "filter bubbles". This chapter also partly touches on potential safeguards of Artificial Intelligence so it will not become a threat to democracy as a whole but more a tool for enhancing democracy.

2.2.1. General Overview

As is pointed out by various researchers, the field of Artificial Intelligence and Machine Learning has become increasingly written interesting, which also entails dilution of these concepts, making it impossible to give a simple, all-entailing answer to what Artificial Intelligence is (Joshi, 2020; Landgrebe & Smith, 2019; Huang & Rust, 2018; Jordan & Mitchell, 2015). The following chapter will elaborate on a selection of categorization methods, to define different degrees of Artificial Intelligence. Some of the listed methods of categorization are relatively common and often used, whereas some are less predominant. This elaboration does not aim to be complete but rather provide an insight into various views and therefore visualizing the complexity and variety within the field of AI. The choice was made on the basis of usage within relevant papers as well as some more unique categorizations which can be viewed as complementary to the predominant ones.

Categorization	Categories	Based on
1. Progression	Artificial Narrow Intelligence; Weak AI	Girasa (2020); Searle (1980)
	Artificial General Intelligence; Strong AI	
	Artificial Superintelligence	
2. Learning type	Supervised algorithm	Jordan and Mitchell (2015); Joshi (2020)
	Unsupervised algorithm	
	Reinforcement learning	
3. Time-based	Static	Joshi (2020)
	Dynamic	
4. Intelligences	Mechanical	Huang and Rust (2018)
	Analytical	
	Intuitive	
	Empathetic	
5. Comparison to Human Performance	dNNs with higher efficiency	Landgrebe and Smith (2019)
	dNNs with higher effectiveness	
	AI with higher efficiency and higher effectiveness	

Table 1. Selection of ML and AI categorization methods. Author's own summary based on the researchers mentioned.

1. Progression

This first kind of characterization is often used in online articles on Artificial Intelligence, outside of academia (for instance: Dickson, 2017; Svityk, 2016). The three main types of AI are illustrated by Girasa (2020, p. 11), namely Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Superintelligence (ASI):

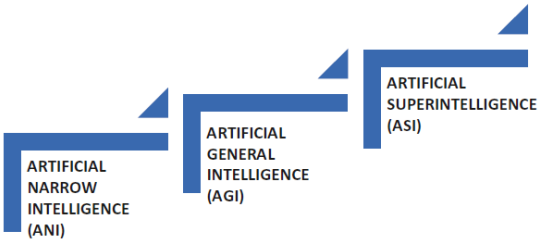

Figure 5. Types of Artificial Intelligence retrieved from Girasa (2020, p. 11)

The first stage of Artificial Intelligence is described as ‘narrow’, sometimes also as ‘weak’ (Searle, 1980). This type of AI is concerned with carrying out simple tasks, therefore not being applicable in a broader context. Examples include “playing chess against human experts, making sales predictions, autonomously driving automobiles, and may […] include speech and image recognition” (Dickson, 2017, cited by Girasa, 2020, p. 11). Searle (1980, p. 417) states that weak AI can be viewed as a tool used “to formulate and test hypotheses in a more rigorous and precise fashion.”

The second stage of AI is Artificial General Intelligence, or ‘strong’ AI. This type aims to mimic the working of the human brain (Girasa, 2020). Therefore, AGI is assumed to be able to “understand and have other cognitive states (Searle, 1980, p. 417).

The last stage is Artificial Superintelligence, which is characterized by exceeding the capacity of a human brain, especially in social and creative matters (Girasa, 2020). As ASI is not yet developed and still a futuristic concept, Girasa (2020) furthermore cites Tegmark (2018) who wrote about what effects the development of an ASI could potentially have on humanity as a whole. Effects could be severe if ASI is used to inflict totalitarianism upon people or on the other hand if it would support the empowerment of the population (Girasa, 2020).

2. Learning Type

Another comparably common way how to categorize Artificial Intelligence is based on its learning type. Researchers generally distinguish between three different types, namely Supervised learning algorithms, unsupervised learning algorithms, and reinforced learning algorithms (Jordan & Mitchell, 2015; Joshi, 2020).

Supervised learning requires a certain degree of guidance, and the most described example is classification. Hereby, the algorithm learns through a set of data often referred to as training data to label further new data, known as test samples, based on the information the algorithm was taught (Joshi, 2020). Jordan and Mitchell (2015, p. 257) list “spam classifiers for e-mail, face recognizers over images, and medical diagnosis systems for patients” as typical examples for such supervised learning algorithms.

The second type is unsupervised learning algorithms. While the main use of algorithms is supervised and therefore requires training data, unsupervised learning is being pursued and its aim is to discover patterns for instance (Jordan & Mitchell, 2015). This kind of algorithms is particularly useful when no or not sufficient labeled training data is available. The purpose of

deploying unsupervised algorithms is to cluster data or to find underlying structures (Joshi, 2020).

Finally, the third type is reinforcement learning algorithms. It can be considered a type in between supervised and unsupervised learning. Jordan and Mitchell (2015) state that with this type, the training data serves merely as indication of correct or incorrect output and not as defining instances for labeling, in contrast to supervised learning. Joshi (2020) furthermore stresses that the interaction with the environment is key in this algorithmic learning type and ensures continuous updating of what is desired behavior.

With all three learning types it needs to be pointed out that the boundaries can be fluent and some examples of algorithm might consist of a mixture of these types (Jordan & Mitchell, 2015).

3. Time-based

Another way to categorize Artificial Intelligence is based on time. According to Joshi (2020), there are two different classifications, namely static and dynamic learning. Static learning occurs, when data through either supervised or unsupervised learning is used to train a model which can then in turn also operate for future data due to its durable validity. It is static, since the data "is taken as a single snapshot and the properties of the data remain constant over time (Joshi, 2020, p. 11).

In contrast to static learning where the model is trained once and then can be operated without diminished effectiveness, dynamic learning bases its models on continuous training with new data due to the vanishing validity of older data used (Joshi, 2020). As typical examples for dynamic learning, Joshi (2020, p. 12) mentions "weather forecasting" and "stock market predictions".

4. Intelligences

Another approach to categorizing Artificial Intelligence is based on the idea of the existence of different intelligences. Rust and Huang (2014) take a look at AI in relation to human intelligence and elements related to it. They base their AI categories on the assumption that different intelligences replace different jobs in consequent stages (Huang & Rust, 2018).

The four intelligences determined by Huang and Rust (2018) are mechanical, analytical, intuitive, and empathetic. They differ in the degree of intelligence displayed and time it would take to develop them (see figure below).

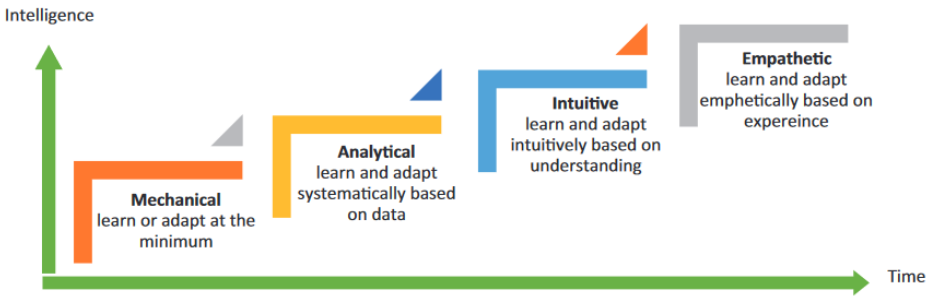

Figure 6. The four intelligences retrieved from Huang & Rust, 2018, p. 158)

The first stage of intelligence according to Huang and Rust (2018) is mechanical intelligence. It is characterized by only a limited degree of adaption; nevertheless it is "precise, consistent, and efficient" in "simple, standardized, repetitive, routine, and transactional tasks" (Huang & Rust, 2018, p. 157).

The second stage of intelligence is analytical, which displays a higher intelligence than the previous mechanical; however, it also takes more time to develop. Learning within analytical intelligence follows an orderly manner relying on data and defined rules (Huang & Rust, 2018). Tasks that are carried out through analytical intelligence are more complex and "require logical thinking in decision-making" (Huang & Rust, 2018, p. 157).

The third type of intelligence is intuitive (Huang & Rust, 2018). This more complex intelligence "learns and adapts intuitively based on understanding" (Huang & Rust, 2018, p. 157), and is according to the authors associated with neural networks and deep learning. The tasks that can be executed by intuitive intelligence systems are even more complex, often depending on environmental interactions, and can involve decision-making (Huang & Rust, 2018).

Based on Huang and Rust (2018), the highest type of intelligence is the empathetic intelligence. Learning in this stage is "based on experience", "[e]motion recognition, affective computing, and communication style" (Huang & Rust, 2018, p. 157). In addition to the previous intelligences, emotion and empathy are factors for decision making (Huang & Rust, 2018).

The authors point out that the intelligences are not necessarily evolutional, meaning that one AI takes over completely after the next stage AI is developed but rather the different intelligences can exist in parallel, serving different purposes (Huang & Rust, 2018)

5. Comparison to Human Performance

Finally, Artificial Intelligence can be differentiated in comparison with human performance. Landgrebe and Smith (2019) elaborate on three categories in this aspect: deep Neural Networks

(dNNs) which are more efficient than humans, dNNs which are more effective than humans, and AI which is more effective as well as more efficient than humans.

dNNs which are more efficient than humans typically comprise of easily machine-readable digital data. These dNNs are employed for repetitive activities, as for example in "complex industrial automation tasks" (Landgrebe & Smith, 2019, p. 3).

The second kind of dNNs are the ones more effective than humans. These are employed for "hypothesis-based pattern identification" (Landgrebe & Smith, 2019, p. 3), for example to discover correlations between variables and aspects.

Third, Landgrebe and Smith (2019) enumerate AI which is more effective and more efficient than humans. According to the authors, this can be realized through reinforcement learning (Landgrebe & Smith, 2019), which was already elaborated on in previous categories.

2.2.2. Explainable AI (XAI)

As was made apparent through the various means of categorization for AI, the field is very broad and due to its complexity can seem too difficult to understand. Here the concept of Explainable Artificial Intelligence, short XAI, comes in.

Since AI systems can make recommendations and decisions influencing people's lives, these systems also need to provide an explanation as to on what basis and how certain decisions were made as well as making behavior of AI systems more intelligible to people through giving explanations (Gunning et al., 2019). Barredo Arrieta et al. (2020, p. 83) furthermore stress that XAI "enable[s] humans to understand, appropriately trust and effectively manage the emerging generation of artificially intelligent partners" while simultaneously "produc[ing] more explainable models while maintaining a high level of learning performance".

Gunning et al. (2019) point out that the explanation of AI is dependent on the user and their expectations as well as abilities and can therefore vary greatly in different contexts and domains. Effective explanations therefore need to consider these users and their background knowledge since these factors highly influence the explanation needs.

One of the most cited papers on XAI according to Web of Science is "Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges towards responsible AI" by Barredo Arrieta et al. (2020). The authors elaborate on two different concepts in XAI, interpretability and also explainability in AI systems. They underline the importance of interpretability, as a passive characteristic of making sense for users, in designing AI systems

as it can even support the implementation process through ensuring impartial decision making, strengthening robustness of systems, and making sure that "only meaningful variables infer the output" (Barredo Arrieta et al., 2020, p. 83). This more passive interpretability is also described as transparency, while the active counterpart would be explainability which comprises "any action or procedure taken by a model with the intent of clarifying or detailing its internal functions" (Barredo Arrieta et al., 2020). Transparency is achieved if the model or process in question is understandable by itself, which Barredo Arrieta et al. (2020) divide in three subcategories of transparency and one extra category ('Post-hoc explainability'):

1) "Simulatability": This comprises the capability of humans to simulate or think through a model, therefore complexity being a main factor. This translates into "simple but extensive rule based systems" not being part of this transparency category due to their high number of rules which can no longer be comprehended by a human.
2) "Decomposable models": This means that all parts of models ("input, parameter and calculation" (Barredo Arrieta et al., 2020, p. 88)") can be understood individually by humans without needing to utilize additional tools.
3) "Algorithmically transparent models": This "deals with the ability of the user to understand the process followed by the model to produce any given output from its input data" and results in the user being able to "understand how the model will act in every situation it may face" (Barredo Arrieta et al., 2020, p. 88). A major issue in order to be algorithmically transparent is that models must "be fully explorable" through "means of mathematical analysis and methods" (Barredo Arrieta et al., 2020, p. 88)
4) "Post-hoc explainability": Barredo Arrieta et al. (2020, p. 88) describe this as models which are not interpretable per se and therefore need various ways of improving interpretability "such as text explanations, visual explanations, […] explanations by example, explanations by simplification" to only name a few options.

Gunning et al. (2019) explain that according to them, the major issue XAI has to address is the conflicting concepts of accuracy on the one hand and interpretability on the other hand and that tradeoffs always have to be considered when aiming for more interpretable models.

Barredo Arrieta et al. (2020, p. 108) also point out future aspects that need to be considered in interpretability such as "data privacy, model confidentiality, fairness, and accountability". In their opinion, "A responsible implementation and use of AI methods in organizations and

institutions worldwide will be only guaranteed if all these AI principles are studied jointly" (Barredo Arrieta et al., 2020, pp. 108–109).

2.2.3. AI and Citizen Participation

Through a literature search on Web of Science using a keyword search of 'Artificial Intelligence' and 'Citizen Participation', only one article was found by Savaget et al. (2019). This article is relevant for this thesis, as the authors also investigated how Artificial Intelligence could be deployed to enhance citizen participation, namely participation of civil society through open data. The authors chose a multi method approach, first carrying out a literature review which turned out the same results as the literature review carried out for this thesis, namely that the current field of Artificial Intelligence literature does not mention political participation as one way of usage; furthermore, they carried out an exploratory case study, using interviews and observations to gather data on the selected project in Brazil.

Savaget et al. (2019, p. 370) point out that AI and ML can enable citizen participation in tackling "stable and predictable problems for which large volumes of data are relatively easy to collect". Through new legislation, public institutions were obligated to provide open data to the public. Although this meant that the manner in which data was manually processed before was no longer sustainable, the researchers nonetheless found resistance from the administrative side to the deployment of new technologies for data processing in the Brazilian case study.

The authors used the case study to elaborate a framework on key characteristics of potential use of AI to enable citizen participation, including the main areas of funding, governance, human resources, operations, public relations, and scaling up; as well as the respective dominant traits of these areas and likely characteristic features:

Focal areas	Dominant traits	Descriptive features
Funding	Decentralized	Crowdfunding
		Third sector and individuals
		In-parallel for-profit services
Governance	Horizontal	Ethics and clear goals
		Organizational culture
		Workflow
		Curate and review
		Partnerships
Human Resources	Diverse	Multidisciplinary
		Sofa activism
		Safety net
Operations	Lean	Fill gaps
		'Small is beautiful'
		System flow
		Pilot and experiment
		Immediacy, practicality and malleability
Public relations	Openness	Funding accountability
		Open code
		Legality and liability
		Report findings
Scaling up	Distributed	Replicability
		Adaptability
		Spill-over

Figure 7. Key characteristics of diffused political participation enabled by AI retrieved from Savaget et al., 2019, p. 375).

The authors conclude by pointing out the potential of Artificial Intelligence in political participation, especially in combination with open data, and empowering citizens in the future:

> "[They] can enable civil society to participate in political affairs without requiring physical groupings of individuals. Citizens can thus become more politically active than by merely choosing representatives, instead monitoring activity and pressing for desired changes in public administration." (Savaget et al., 2019, p. 378)

2.3. EU Policy

This chapter examines the third area of interest to this thesis, namely EU policy. Not only is the general policy making process outlined, but also pointed out how citizen participation is enabled in this process, focusing on European Citizens' Initiatives and Public Consultations. Finally, the European Union's work on policy in the field of Artificial Intelligence as well as the standards it set are summarized.

2.3.1. EU Policy Making Process

The following chapter will cover the basics of an ordinary legislative process within the European Union and due to the limitations of this paper, will not go into detail of each stage in the procedure and exclude special cases. As stated, this will solely cover the ordinary legislative process.

The EU policy making process will be discussed based on the policy cycle model of Howlett and Giest (2015). They describe a five-stage circular model comprising 'Agenda setting', 'Policy formulation', 'Decision making', 'Policy implementation', and 'Policy evaluation'. The first stage of agenda setting not only involves the realization of a gap in legislation or sensing of a problem by the policy makers but also putting forward solutions. Next, in the policy formulation stage, various stakeholders lobby for different options and suggestions to be included in the proposal. Thirdly, the decision on the policy is made by official actors of the responsible governmental body. After the decision, in the policy implementation stage, the policies are put into place by governments through using various public administration tools. Finally, the policies are evaluated in terms of the results achieved and monitored, be it through official governmental bodies or through civil society actors. This can lead to the initiation of another policy cycle (Howlett & Giest, 2015).

For this thesis, only the first three stages, namely agenda setting, policy formulation, and decision making will be discussed in the EU policy making process. The other two are out of scope, since every national parliament has different processes of implementing EU legislation and the monitoring process is also highly dependent on the kind of law that was passed. Therefore, discussing these two stages would go beyond the thesis' objectives.

1. **<u>Agenda setting</u>**

Strategy setting of the European Union is done jointly by all institutions, namely the European Parliament (EP), the European Council, the Council of the European Union, and the European Commission. While on the one hand, priorities are communicated by the political leaders of the

EU countries, making up the European Council, the President of the European Commission also elaborates on the Commission's priorities, first at the beginning of the new term and also during the annual speech on the State of the Union in the EP. These priorities are in accordance with discussions carried out between the Commission, the Council and the political groups within the European Parliament (European Commission, NaN).
Before a major legislative proposal is put forward, an impact assessment is carried out within the Commission to show the "economic, environmental and social effects of the proposals" (European Commission, NaN).

The sole right to initiate the legislation process on the EU level, corresponding to Howlett and Giest's (2015) first stage of 'Agenda setting', is held by the European Commission, as laid out in the Treaty of Maastricht and reconfirmed by the Treaty of Lisbon (2007). In the Treaty of Lisbon in Article 3, it is moreover specified that drafts for legislation can be proposed either by the Commission itself, the European Parliament, a group of member states, European Central Bank, and the European Investment Bank (Amending the treaty on European Union and the treaty establishing the European Community, 2007) as well as upon request of citizens' initiatives (European Parliament, 2021a). Nevertheless, the two main institutions suggesting new legislative initiatives are the European Parliament and the Council (European Parliament, 2021a).

2. Policy formulation

Following Howlett and Giest (2015), the second stage of the policy cycle is the Policy Formulation, which in the case of the European Union involves the European Commission, the European Parliament, and the Council, but also partially the national parliaments of the EU member states.
Before a proposal can be discussed in the European Parliament and the Council, a decision needs to be made on the European Commission's side. This is done through the College of Commissioners which consists of one Commissioner per EU member state. Decisions are made either through written procedure, meaning there is "no discussion among Commissioners" or through oral procedure which entails a discussion of the dossier (European Parliament, 2021a).

One of the main principles the European Union follows is the principle of subsidiarity. Member states through their national parliaments have eight weeks after the law is proposed by the EU to reason why this legislation interferes with the subsidiarity principle (European Parliament,

2021a). If one third of all parliaments agree that subsidiarity is not respected, the legislation must undergo a reviewing process, which is referred to as 'Yellow card'. If a simple majority of all national parliaments considers the proposal to interfere with the subsidiarity principle, it has to be "re-examined by the Commission", which is referred to as 'Orange card' (European Parliament, 2021a). After the reviewing as well as the re-examination process, the Commission has the right to "maintain, amend or withdraw the proposal", having to give reasons behind the decision in case of keeping it (European Parliament, 2021a). If a simple majority of the European Parliament and 55% of the Council decide the proposal interferes with the principle of subsidiarity, it is discarded (European Parliament, 2021a).

3. Decision making

After the European Commission initiates legislation, in ordinary legislative procedures which cover 85 policy areas, the first reading of the proposal takes place in the European Parliament where it is discussed in a parliamentary committee appointing a rapporteur responsible for creating a report and drawing up amendments to the proposal. Subsequently, the European Parliament votes on the proposal as well as on the amendments. The approved text, which can also include the amendments, is sent to the Council, which starts work on the Commission's proposals at the same time as the Parliament (European Parliament, 2021a). In the case that the EP and the Council cannot agree on passages of the proposal, it enters into a second reading (European Union, 2021a). If no common position can be reached directly, negotiations continue. The procedure in which the Council, the Parliament, and the Commission negotiate is also referred to as 'trilogues'. In the case that the Council cannot agree on certain amendments proposed by the Parliament after the second reading, a 'conciliation' is launched, consisting of "negotiations between the two co-legislators in the framework of the Conciliation Committee" (European Parliament, 2021b). This Conciliation Committee comprises an equal number of Members of Parliament and Council representatives. If the Committee cannot agree on a common text, the legislative procedure ends, and the proposal is rejected. If on the other hand, the Committee can reach an agreement, then the text is entered into a third reading in the EP and the Council. At this third reading, no amendments can be added by either one of the institutions anymore. Only if both approve the proposal will the proposal be adopted (European Parliament, 2021a).

Proposals can be rejected by either the EP or the Council at any point within the process. If this happens or no compromise between the institutions can be reached, the legislative proposal is not adopted. The European Commission has to in turn open a new legislative procedure if a new proposition is put forward (European Parliament, 2021a).

After the legislative act is adopted through the College of Commissioners, it is published in the Official Journal of the European Union (European Parliament, 2021a).

2.3.2. European Citizens' Initiatives (ECI)

One means for citizens to participate in policymaking in the European Union is through so-called European Citizens' Initiatives (ECI). The right for citizens to actively make their voices heard is also enshrined in the Treaty on the European Union:

> "The institutions shall, by appropriate means, give citizens and representative associations the opportunity to make known and publicly exchange their views in all areas of Union action. The institutions shall maintain an open, transparent and regular dialogue with representative associations and civil society." (European Union, 2016)

A European Citizens' Initiative needs to be signed by at least one million citizens (European Union, 2016). Already in 2011 the importance of online and digital tools for participatory democracy was pointed out and therefore collection systems for the purpose of collecting signatures online as well as offline were suggested (Regulation (EU) No 211/2011 of the European Parliament and of the Council of 16 February 2011 on the citizens' initiative, 2011). Nevertheless, the general rules for ECIs also changed overtime and in 2019, renewed rules were proposed to make initiatives "more accessible [to as many citizens as possible], less burdensome and easier to use for organizers and supporters" (European Union, 2019). Furthermore, the aim was to enable a better follow-up to the initiatives and to encourage debate on the subjects (European Union, 2019). In order to achieve the set goals, the leading principles for the ECI process according to the general rules are effectiveness, transparency, clarity, simplicity, user-friendliness, accessibility for persons with disability and proportionality (European Union, 2019).

Information as well as support to citizens is made available by the Commission. It furthermore provides an "online collaborative platform" including a "dedicated discussion forum" about the ECI, which "should be open to citizens, groups of organizers, organizations and external experts

with experience in European citizens' initiatives" and which should all "be accessible to persons with disabilities" (European Union, 2019).

Every European citizen is eligible to support an ECI with their signature provided they are of voting age for the European parliament; therefore, this minimum age threshold varies between the different EU member states. Nevertheless, the EU also enables member states to set the minimum age to support ECIs to 16, even if the voting age is above, in order to enhance youth participation in decision-making processes (European Union, 2019). For a European Citizens' Initiative to be considered by EU lawmakers, they need to gain a certain amount of support. As already stated, at least 1 million citizens have to sign the initiative; furthermore, signatories need to come from at least one fourth of EU member states. To guarantee representativeness and proportionality, a minimum amount of these member states is required. This amount is calculated by the Members of the European Parliament "multiplied by the total number of the Members of the European Parliament" (European Union, 2019). This results in different signature thresholds ECIs have to gather to be successful in a member state.
Moreover, the signatures need to be collected in a specific time frame, namely within 12 months, starting from the collection initiation date. This can be decided on by the initiators of the ECIs, who only need to notify the Commission 10 days before that date. The European Commission in turn informs the member states of the chosen date (European Union, 2019).

After initiating the signature collecting process, the ECI initiators are entitled to participate in a public hearing at Union level to enhance public awareness and encourage debate on the subject. This is coordinated through the European Parliament, which should organize a public hearing in the first three months after the ECI is submitted and try to ensure balanced representation of various stakeholders and interest groups (European Union, 2019).
Within six months, the European Commission has to respond to valid initiatives and state "in a clear, comprehensible and detailed manner the reasons for its intended action" and whether it will initiate a legal proposal (European Union, 2019). If no legal proposal is intended, the Commission has to reason this decision (European Union, 2019).

Finally, the general rules of European Citizens' Initiatives state that:

> "In order to contribute to the promotion of active participation of citizens in the political life of the Union, the Commission should raise public awareness about the European citizens' initiative, making particular use of digital technologies and social media, and in the framework of actions to promote

> Union citizenship and citizens' rights. The European Parliament should contribute to the communication activities of the Commission." (European Union, 2019)

This pointing towards the opportunities of technology as a means to raise public awareness of citizen participation could be viewed as going beyond regular social media and press communication. The potential of certain technology to connect people and distribute information could be of interest there as well.

2.3.3. Consultations

Another means of participation in EU policy making are consultations. In the Treaties, it is stated that: "The European Commission shall carry out broad consultations with parties concerned in order to ensure that the Union's actions are coherent and transparent." (European Union, 2016)

As stated in the Treaty of Lisbon, before the European Commission can propose new legislation, they are obligated to carry out a consultation, with an exception for urgent legislative acts which nevertheless need to be argued (Amending the treaty on European Union and the treaty establishing the European Community, 2007, p. 150). Consultations can include the "obligatory impact assessment, reports by experts, consultation of national experts, international organizations and/or non-governmental organizations (NGOs), consultation via Green and White Papers" (European Parliament, 2021a).

The type of consultation most relevant to this thesis are Public Consultations. Not a lot of information of how public consultations are designed and carried out are publicly available but the European Commission states that "[t]hrough public consultations you can express your views on the scope, priorities and added value of EU action for new initiatives, or evaluations of existing policies and laws" (European Commission, 2021a). The ongoing public consultations can be accessed online under "Have your say" by the European Commission. The consultations include a summary of the initiatives or proposals, the topic of the consultation and the type of act this consultation aims to support, for example a proposal for a regulation or a report. It also includes an overview of the timeline of the proposals so that citizens and businesses are informed about further steps (European Commission, 2021e).

Consultations also have to consider "regional and local dimensions" of the proposal in question (Amending the treaty on European Union and the treaty establishing the European Community, 2007, p. 150).

Another form of 'consultation' which is launched before the legislative proposal is put forward to the Commission college is the inter-service consultations, in which all Commission departments (Directorate-Generals, DGs) are consulted so that all aspects are considered (European Parliament, 2021a).

2.3.4. Artificial Intelligence and the EU

> "AI is a set of technologies of strategic relevance and the European Union must act as one to harness the benefits of AI. To succeed, the coordination of AI policy and investments at the European level is essential. This will enable the latest technologies to be developed and adopted through Europe's global competitiveness and leadership. Such coordination will allow Europe to seize the benefits of AI for the economy, society and the environment and help to promote European values worldwide." (European Commission, 2021b, p. 8)

The following chapter will look closer into EU policies and communication surrounding Artificial Intelligence, as this can serve as an indication of the general willingness of the European Union on how to deploy Artificial Intelligence in the future. Moreover, it points out the possibilities and boundaries within the European framework of how to use AI properly. The relation to US-American and Chinese policies and practices on Artificial Intelligence is out of scope due to the limitation of this thesis. Nevertheless, the elaboration on the relationship between the European Union and Artificial Intelligence, especially the proposal of the Artificial Intelligence Act, can sketch a holistic picture of the EU values behind its policies on this technology. It needs to be stressed that this part of the thesis was written in July 2021 and is therefore only based on the proposal of the Artificial Intelligence Act by the European Commission, not the final version, which still needs to go through the regular European legislative process and is open for amendments by the Council and the Parliament.

In April 2021, the European Commission presented a new package revolving around Artificial Intelligence, which included a new proposal on an Artificial Intelligence Act, a revised

coordinated plan on Artificial Intelligence and communication which underlines the European approach to AI.
In this communication, the many benefits that the EU could potentially take advantage of through AI were pointed out, be it “less pollution”, “fewer traffic deaths”, “improved medical care”, “enhanced opportunities for persons with disabilities and older persons”, “better education”, and what is especially relevant in the light of this thesis is “more ways to engage citizens in democratic processes” and many more (European Commission, 2021b). An important aspect of the EU’s desired approach to AI is human-centric and focused on trustworthiness and transparency while still acknowledging the potential risks of AI such as “the opacity of many algorithms” (European Commission, 2021b).

In the White Paper released by the European Commission in February 2020, two main concepts are introduced: “The ecosystem of excellence” and “the ecosystem of trust” (European Commission, 2020, p. 3). The former one describes mobilization of “resources […] along the entire value chain, starting in research and innovation” as well as the creation of “the right incentives to accelerate the adoption of solutions based on AI, including by small and medium-sized enterprises (SMEs)” (European Commission, 2020, p. 3). The other one is concerned with establishing EU-wide rules in order to protect “fundamental […] and consumers’ rights” and therefore creating trust in citizens and businesses to use Artificial Intelligence (European Commission, 2020, p. 3). To create trust, the European High-Level Expert Group on AI laid out Ethics Guidelines which will be discussed further below.

To reach the target of establishing the aforementioned Ecosystem of excellence, a high amount of investment is required. Therefore, the European Commission communicated that it intends to invest 1 billion Euros per year as well as taking steps in mobilizing further private investments in research and development (European Commission, 2021b).

As laid out in the Revision of the Coordinated plan on Artificial Intelligence, there are four key areas which the European Commission proposes to focus on together with the EU member states. These four areas are titled: “Set enabling conditions for AI development and uptake in the EU”, “Make the EU the place where excellence thrives from the lab to the market”, “Ensure that AI works for people and is a force for good in society”, and “Build strategic leadership in high-impact sectors” (European Commission, 2021a, p. 4). More precisely, the four areas describe:

1) Setting enabling conditions for AI includes "acquir[ing], pool[ing] and shar[ing] policy insights" by the EU member states; taking advantage of data, including data sharing; and foster[ing] critical computing capacity" (European Commission, 2021a, p. 6).
2) Making "the EU the place where excellence thrives from the lab to the market" (European Commission, 2021a, p. 16) comprises closer collaboration with stakeholders, through various partnerships and expert groups, such as for example the "the European High Performance Computing Joint Undertaking" (European Commission, 2021a, p. 17); the further development of a network of "AI excellence centers" (European Commission, 2021a, p. 19); "Provid[ing] tools through an AI-on-demand platform and an environment for developers to test and experiment, and for SMEs and public administrations to take up AI" (European Commission, 2021a, p. 20) one example being "Digital Innovation Hubs" (European Commission, 2021a, p. 22); and the "fund[ing] and scal[ing of] innovative ideas and solutions for AI" (European Commission, 2021a, p. 24).
3) The EU's human-centric approach of "ensur[in] that AI works for people and is a force for good in society" (European Commission, 2021a, p. 26), including fostering and promoting talent, "develop[ing] a policy framework to ensure trust in AI systems", and "promot[ing] the EU vision on sustainable and trustworthy AI in the world" (European Commission, 2021a, p. 27).
4) And "build[ing] strategic leadership in high-impact sectors" including "climate and environment", the health sector, robotics, "law enforcement, migration and asylum", mobility, and "sustainable agriculture" (European Commission, 2021a, p. 37).

Due to their great impact on an EU level as well as their relevance to this thesis, the Guidelines for Ethical Use (High-Level Expert Group on Artificial Intelligence, 2019) and the Proposal for an Artificial Intelligence Act (Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, 2021) are described further in detail.

1. Guidelines for Ethical Use

As stated, already before the European Commission released its proposal for the Artificial Intelligence Act in 2021, the High-Level Expert Group on Artificial Intelligence, which was set up by the European Commission, published and provided guidelines for ethical use of AI (High-Level Expert Group on Artificial Intelligence, 2019). The guidelines follow the European

Commission's human-centric approach to AI and set out three main components which have to be ensured throughout AI's usage, namely lawfulness, ethical use, and robustness (High-Level Expert Group on Artificial Intelligence, 2019).

The paper includes two main chapters on the "foundations of trustworthy AI" and the "realization of trustworthy AI" (High-Level Expert Group on Artificial Intelligence, 2019, p. 8). The following figure serves as an overview of the main points:

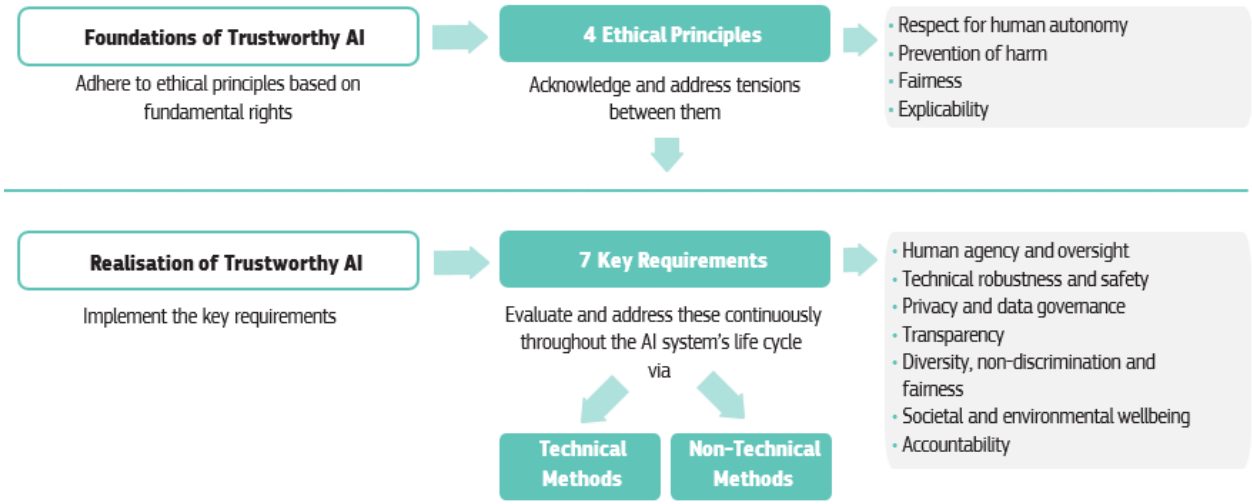

Figure 8. The Guidelines as a framework for Trustworthy AI retrieved from (High-Level Expert Group on Artificial Intelligence, 2019, p. 8)

As can be seen in the figure above, according to the High-Level Expert group on AI, the foundation of trustworthy AI is based on fundamental rights. In the case of the European Union, this is ensured through its treaties and the EU Charter (High-Level Expert Group on Artificial Intelligence, 2019). In respect to this, an important factor they elaborate on is that life decisions have to be based on free will of each individual and not lead by manipulation, as well as inclusive and non-biased (High-Level Expert Group on Artificial Intelligence, 2019). It is furthermore explained that:

> "AI systems must not undermine democratic processes, human deliberation or democratic voting systems. AI systems must also embed a commitment to ensure that they do not operate in ways that undermine the foundational commitments upon which the rule of law is founded, mandatory laws and regulation, and to ensure due process and equality before the law" (High-Level Expert Group on Artificial Intelligence, 2019, p. 11)

Out of these fundamental rights, the High-Level Expert Group on Artificial Intelligence four main ethical principles which are “respect for human autonomy”, “prevention of harm”, “fairness”, and “explicability” (High-Level Expert Group on Artificial Intelligence, 2019, p. 8). The first principle, “respect for human autonomy”, entails that all people need to remain in full control and self-determined while interacting with Artificial Intelligence and must not be kept from exercising their democratic rights. For the expert group, this can be guaranteed through “human oversight”, therefore having a human in the loop (High-Level Expert Group on Artificial Intelligence, 2019, p. 12).

The second principle, “prevention of harm”, aims at ensuring that vulnerable groups are especially accounted for in the development but also the deployment of AI. “Particular attention must also be paid to situations where AI systems can cause or exacerbate adverse impacts due to asymmetries of power or information, such as between employers and employees, businesses and consumers or governments and citizens” (High-Level Expert Group on Artificial Intelligence, 2019, p. 12).

The third principle, “fairness”, is described by the High-Level Expert Group on Artificial Intelligence stresses the importance of unbiased AI which should prevent “discrimination and stigmatization” (High-Level Expert Group on Artificial Intelligence, 2019, p. 12). Furthermore, people should be able to “contest and seek effective redress against decisions made by AI systems and by humans operating them” (High-Level Expert Group on Artificial Intelligence, 2019, p. 13).

Finally, the last ethical principle they describe is “explicability”, which means that decisions and processes by Artificial Intelligence need to be transparent as well as explainable to those affected by them (High-Level Expert Group on Artificial Intelligence, 2019, p. 13).

After having established the foundations of trustworthy AI, these principles need to be translated into requirements to realize trustworthy AI. Therefore, the High-Level Expert Group on AI set seven key requirements which must be continuously re-evaluated. The seven requirements include: “Human agency and oversight”, “Technical robustness and safety”, “Privacy and data governance”, “Transparency”, “Diversity, non-discrimination and fairness”, “Societal and environmental wellbeing”, and “Accountability” (High-Level Expert Group on Artificial Intelligence, 2019, p. 14).

2. Proposal for a Regulation laying down harmonized rules on Artificial Intelligence (Artificial Intelligence Act)

In April 2021, the European Commission proposed harmonized rules for high-risk use cases of AI. Nevertheless, it also elaborated on prohibited uses of AI and on use cases of AI that pose limited risk but still have to obey certain rules (Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, 2021).

The following pyramid shows the various use cases of AI and how the European Commission views its distribution, namely that there is only a limited amount of prohibited AI uses while the majority are minimal risk.

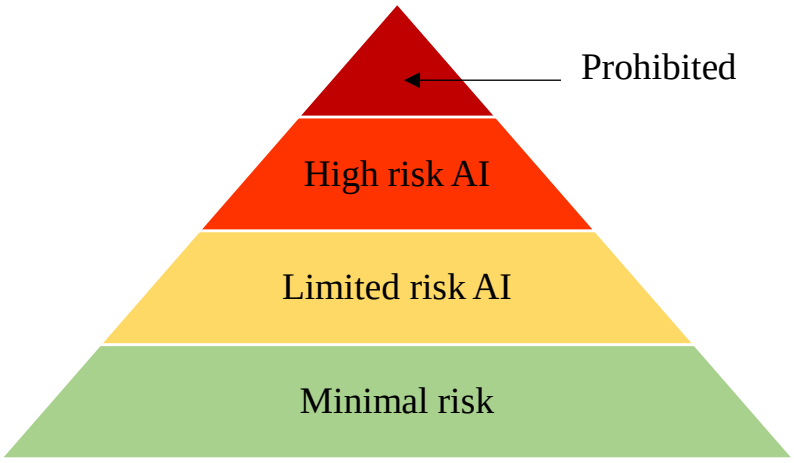

Figure 9. A risk based approach, based on European Commission, 2021c).

The four categories are described as the following:

- **"Unacceptable risk"**: These include Artificial Intelligence that poses a "threat to the safety, livelihoods and rights of people" (European Commission, 2021c). Therefore, they European Commission plans to generally ban this kind of use. Specifically, these can include "social scoring by governments" or "toys using voice assistance" which can encourage certain dangerous actions (European Commission, 2021c).

- **"High-risk AI"**: Several sectors were identified as high-risk and therefore the AI used needs to meet strict rules before being placed on the market and used. These sectors include "critical infrastructure", "educational or vocational

training" for example AI that determines whether someone gets access to a university education or not, "safety components of products", "employment, workers management and access to self-employment" which might for example use AI for recruitment processes, "essential private and public services" including credit scoring, "law enforcement" potentially interfering "with people's fundamental rights", "migration, asylum and border control management", and finally also "administration of justice and democratic processes" (European Commission, 2021c).

If AI falls in these categories of uses, certain obligations apply including but not limited to ensuring a good quality of training data sets to mitigate biases and discrimination, documenting and logging for the results but also to prove compliance with the regulations, providing "clear and adequate information to the user", guaranteeing "appropriate human oversight", and further measures aimed at guaranteeing "robustness, security and accuracy" (European Commission, 2021c).

For completeness reasons, a special case of Artificial Intelligence use is remote biometric identification which is always considered high risk and therefore has to meet strict obligations (European Commission, 2021c). As the regulation is still under negotiation between the European institutions and this use case is not directly relevant for the thesis, the specificities here will not be discussed in detail.

- **"Limited risk"**: Certain AI uses are not per se considered of risk but they are required to meet some transparency measures. These use cases include chatbots which have to indicate that users interact with an algorithm rather than an actual person, as well as AI produced deepfakes which need to be marked as such artificially generated images etc. (European Commission, 2021c).

- **"Minimal risk"**: The majority of applications using Artificial Intelligence fall in this category which do not need to meet specific additional criteria, besides potentially already existing product safety regulations (European Commission, 2021c).

2.4. Theoretical basis

Citizen participation

The citizen participation scaffold this thesis and therefore also the theoretical framework are based on is by Cardullo and Kitchin (2019) who derived it from Arnstein's (1969) ladder of participation. It is composed of four main categories, namely 'Non-participation', 'Consumerism', 'Tokenism', and 'Citizen Power' and nine different levels of participation. 'Non-participation' is characterized by citizens being nudged and controlled in their behavior rather than actively taking part in decision-making. 'Consumerism' is a step higher up on the ladder, nevertheless, citizens can still only choose from different services and products and not take direct influence on decisions (Cardullo & Kitchin, 2019).

'Tokenism' is composed of three levels. While the lowest one 'Information' has citizens as receivers of information, the other two 'Consultation' and 'Placation' already give citizens more influence namely through the possibility of giving feedback and suggesting new things. Nevertheless, 'Non-participation', 'Consumerism', and 'Tokenism' are entirely top-down and therefore any participation is set in a pre-specified arena (Cardullo & Kitchin, 2019).
Finally, 'Citizen Power' describes the bottom-up approach of citizen participation and involvement. Hereby, the citizens are actively shaping policy through co-creation, making decision, and being in the general lead of the decision-making process itself (Cardullo & Kitchin, 2019).

Artificial Intelligence

Part of the theoretical basis on the Artificial Intelligence topical area are the five categorizations described and explained in chapter 2.2.1.. These different ways of categorizing AI were according to progression, learning type, time-based, different kinds of Intelligences, and in comparison to human intelligence.
When looking at AI from a progression angle, there are three different subcategories, namely Artificial Narrow Intelligence or Weak AI, which is concerned with carrying out simple tasks, Artificial General Intelligence or Strong AI, which tries to mimic the human brain, and thirdly Artificial Superintelligence, which supersedes the human brain capacities (Girasa, 2020; Searle, 1980).

Another way to look at AI which was described in the previous chapter was according to the learning type. There are again three different learning types that can be observed: Supervised algorithms which need training data to then in turn produce output such as labeling new data; unsupervised algorithms, which are mainly used to find patterns; and finally reinforcement learning, which is a mixture of both types (Jordan & Mitchell, 2015; Joshi, 2020).

Artificial Intelligence can also be categorized time-based. As elaborated on in the previous chapter, there is static learning, which means the data used to train the algorithms signifies a snapshot with durable validity, while on the other hand dynamic learning is based on continuously added new data due to otherwise vanishing validity (Joshi, 2020).

The previous chapter also explained the categorization of Artificial Intelligence according to different types of Intelligence, namely mechanical, which "learn[s] or adapt[s] at the minimum"; analytical, which "learn[s] and adapt[s] systematically based on data"; intuitive, which "learn[s] and adapt[s] intuitively based on understanding"; and finally empathetic which "learn[s] and adapt[s] emphatically based on experience" (Huang & Rust, 2018, p. 158).

The final way to categorize AI was to place it in comparison to human intelligence. Three different sub-categories were explained, including deep Neural Networks with higher efficiency than humans, deep Neural Networks with higher effectiveness than humans, and AI with higher efficiency and higher effectiveness (Landgrebe & Smith, 2019).

Policy-cycle:

The five stage policy-cycle model by Howlett and Giest (2015) was discussed and the three first stages, namely "Agenda setting", "Policy formulation", and "Decision making" were elaborated on in the EU policy-making process. As was explained in the previous chapter, the two final policy-cycle stages are out of scope as from an EU policy-making process point of view the responsibility lies mainly with the national governments and administrations.

For this thesis, the three first stages in the EU policy-making cycle are of interest, in order to analyze at what stage potentially citizen participation could be enhanced through Artificial Intelligence. The following is a short summary of the three stages:

First, Agenda setting: In the EU, the European Commission has the sole right to initiate legislation (Amending the treaty on European Union and the treaty establishing the European Community, 2007). Other European institutions as well as citizens through the so-called

European Citizens' Initiatives can ask the Commission to propose legal drafts (European Parliament, 2021a).

Second, Policy formulation: At this stage, the three institutions, namely the European Commission, the European Parliament, and the European Council are involved, as well as partially national parliaments of the member states (European Parliament, 2021a). Any proposal first needs to still be decided on by the European Commission (European Parliament, 2021a).

Finally, Decision making: The main decisions if a proposal is finalized or rejected are made jointly by the European Parliament and the European Council. After both approve a negotiated text, it is adopted and published in the Official Journal of the European Union (European Parliament, 2021a).

3. Methodology

Following the pragmatic philosophy, which is primarily focused with outcomes of practice and going beyond "abstract general principles" (Rescher, 2016, p. 1), the research goal in this thesis aims to investigate practical aspects of the application of Artificial Intelligence in the democratic process. Due to a lack of research theory on Artificial Intelligence tools deployed by the European Union to enhance and increase citizen participation in EU policy making, the approach in this paper needs to be inductive, developing generalizations from concrete observations, in contrast to a deductive approach which derives from generalizations to specific instances (Rescher, 2016).

For this thesis, case studies provide the basis of the research. Alternatives that were considered included a survey, which was not employable due to the lack of access to enough people involved in the work with Artificial Intelligence tools connected to citizen participation. Due to a concern on privacy issues, the path of contacting participants of AI supported projects to receive survey responses, was not considered further.

Yin (2018) states that case studies are concerned with empirically researching certain phenomena and their contexts, in particular if the distinction between the two is not clear-cut. In the case of the research of this thesis, the phenomenon under investigation is the use of Artificial Intelligence tools in citizen participation; however, the different context hereby is vital in drawing and understanding commonalities to deduce potential barriers and opportunities in order to answer the research question. In line with Yin (2018), Thomas (2020, p. 5) furthermore describes the main focus of case studies to be "the uniqueness of the phenomenon and the phenomenon in its completeness as a means of understanding some topic of theoretical interest." According to Yin (2018, p. 39), the phenomenon usually focuses on current events and unlike experiments does not require researchers to control "behavioral events" (Yin, 2018, p. 39). As described, the unit of research is a unique case, which does not negate examining more than one case per research, making the comparison between the cases more important (Thomas, 2020, p. 11). Simons (2020) points out that case study itself does not in turn require a certain method but that the methodology used can vary between case study researches carried out. Furthermore, Simons (2020, p. 679) specifies that the key aspect about a case study "is its singularity and the concept and boundary of the case". Considering all aspects of case studies and especially since context is a vital element in answering the research question of barriers and opportunities, carrying out case study research was deemed most appropriate.

The following chapter discusses the research methodology of this thesis. First, the main aspects of a multiple case study are described. Next, the data collection and data processing are described, comprised of document analysis and semi-structured interviews. Subsequently, the process of validation of the results is discussed. Finally, this chapter elaborates on the limitations that this choice of methodology entails.

3.1. Multiple Case Study

For the purpose of achieving more confidence in the results, Miles and Huberman (1994) suggest a multiple case study. They furthermore stress that through adding another case to the research, the "precision, the validity, and the stability of the findings" (Miles & Huberman, 1994, p. 29) can be enhanced. In order to achieve valid and reliable results in this novel research field, the choice was made to focus on multiple cases.

As there is no underlying hypothesis that the research question tries to validate, theoretical or purposive sampling was not applicable, since that mode of selection aims to achieve comparability to theory (Barbour, 2020). However, due to the limited amount of citizen participation projects enabled or supported through AI found, the decision was made primarily on availability and only two cases were selected in the end.

The figure below (Thomas, 2020, p. 13) displays the various types of case study. Following this typology, the case study research of this thesis is elaborated on and analyzed in detail, from the subject to the purpose, the approach and finally the process.

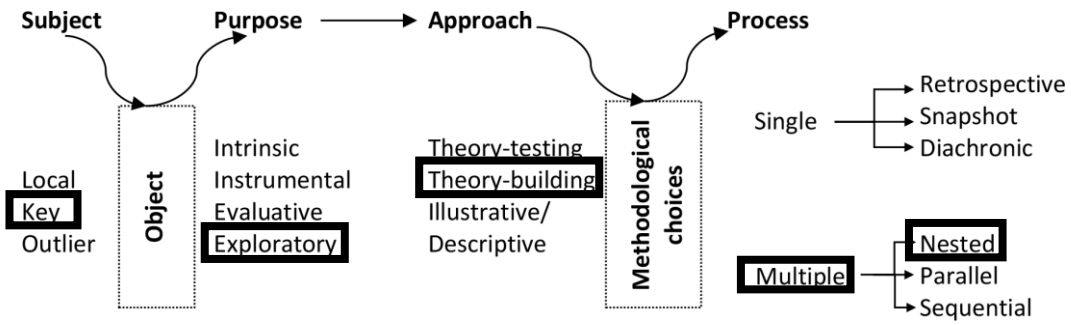

Figure 10. A typology of case study based on Thomas (2020, p. 13)

The specific reasoning behind the selection was elaborated on above; nevertheless, the projects – or subjects – studied are furthermore selected due to their exemplary characteristics of using Artificial Intelligence for citizen participation initiatives and potentially bring light about the

area through in-debt analysis (Thomas, 2020). Therefore, according to Thomas (2020), this the subjects can be classified as 'key cases'.

Since the research question this thesis is based on aims to develop propositions, among others also potentially for future research, the purpose can be described as exploratory (Yin, 2018). Gerring (2004) points out that often case study research in social sciences are concerned with testing already existing theories whereas the exploration and proposition of new theories is just as important. He underlines that even classic works once derived from new ideas. "Path-breaking research is, by definition, exploratory" (Gerring, 2004, p. 349). Exploratory research, nevertheless, is never aimless and always needs to have a purpose (Yin, 2018). "One successful outcome might include the identification of the propositions to be examined in the later study" (Yin, 2018, p. 62). In the case of this thesis, the purpose is to generate a list of possibilities and challenges for citizens' participation on an EU level in policy making supported by Artificial Intelligence and on this basis propose additions and changes to already existing participatory tools in the EU legislative process.

The approach of this case study research could be described as theory-building. Following the work of Lijphart (1971) also incorporated as one of the sources for Thomas' (2020) typology, this thesis is most comparable to 'hypothesis-generating' a subcategory of theory-building. According to Lijphart (1971), hypothesis-generating case studies do not require to be based on an initial hypothesis but rather aim at formulating one in the course of the research which can in turn be tested in subsequent research.

Finally, the process in this thesis is a multiple case study, more precisely a nested study. "A nested study is distinct from a straightforwardly multiple study in that it gains its integrity, its wholeness, from the wider case" (Thomas, 2020, p. 13). The value of the research comes from the comparison of the different 'nested' elements within a case. In this thesis, the main elements of comparison are the manner of use of AI and the role of citizens in the process.

Case Study Selection Criteria

Due to the specificity of this thesis, being interested in not only use cases involving the public sector policy making process but also citizen participation, the sample size to choose from was very limited. As Yin (2018, p. 146) explained about the "one-phased approach" of case study selection, when the number of potential cases is very limited, "the screening may consist of querying people knowledgeable about each candidate" but "an extensive screening procedure that effectively leads to a 'mini' case study of every candidate case" is "to be avoided". This goes hand-in-hand with pre-defined screening criteria (Yin, 2018), which for the case studies

in this thesis was that it needed to be citizen participation projects, either broad participatory projects or consultations, using Artificial Intelligence as a tool. The range of level of governance in which the projects were carried out was not an important factor, as the replicability and scalability was to be investigated in any case. Consequently, Yin (2018, p. 146) also stresses that in a multiple-case study, researchers should then "select cases that best fit [the] literal or theoretical replication design", which for the purpose of the thesis is one case for each of the participation options, broad participation and consultation.

Many hours of online research using the keywords "Artificial Intelligence", "citizen participation", and "project" were not as successful as anticipated. As was already stated before, the fact that there is only a small number of projects that fit in this category is also reflected in the lack of theory built up in this area as well which led this thesis to be highly exploratory. Nevertheless, in the end three cases that met the criteria were contacted. One of the cases, which would have been a national citizen participation project, never elicited a response, even after multiple attempts of contact.

In order to get viable results, fortunately two cases comprising two different collection purpose methods, were investigated closely. One of the cases can be considered closer to the ECI while the other one is an example for public consultations, supported by AI.

3.2. Data Collection

Qualitative research enables a deep insight into elements under investigation (Miles & Huberman, 1994). Therefore, as already elaborated on thoroughly in the previous sections, qualitative methods can provide a more holistic picture. Especially the context surrounding the cases can be of special interest and better taken into account with qualitative methods (Miles & Huberman, 1994).

For this research, a qualitative multi-method is chosen to acquire a holistic insight into the multiple cases. In contrast to the mixed method approach, this selected one does not require mixing quantitative and qualitative methods (Plano Clark & Creswell, 2011). Due to the lack of quantitative data available in the area under investigation such as for example user data, the thesis is based on qualitative data. The reason for choosing multiple methods instead of a mono-method approach was to ensure that the results are valid and reliable. Seawright (2016) describes triangulation as one of the merits of such a multiple-method approach, namely that it

enables looking at one research problem or research question through different methods, evaluating whether the same results can be achieved in the end.
Furthermore, as there were time constraints with this research, no longitudinal research involving following persons or organizations for a longer period, was possible, therefore a cross-sectional analysis was carried out (Saunders et al., 2009).

In line with Simons (2020, p. 692), at the beginning of the data collection and analysis process, data reduction and transformation to "themes that can encapsulate the overarching meaning" needs to be carried out. In the case of this thesis, a preliminary selection of data is done through the choice of methodological approach. The overarching themes the data is analyzed by are extracted from the theoretical framework elaborated on in the previous chapters.
An important aspect of the data selection and processing is the pursuit of internal validity. Here, the focus lies on whether the methods and parameters used ultimately measure what they intend to measure (Pruzan, 2016). To ensure internal validity, precision and accuracy of measurement are vital (Pruzan, 2016), which will be ensured through a thorough investigation on the reliability and accuracy of data sources. Nonetheless, the availability of sources is a major factor in the selection.

3.2.1. Semi-structured Interviews

While interviews are sometimes viewed as time-consuming, they can provide valuable and rich data for researchers (Gillham, 2000). Gillham (2000, p. 10) even points out that interviews potentially enable researchers to acquire better and less abstract insights in comparison to other data collection methods. He furthermore recommends opting for interviews if only a limited amount of people can give information and "[e]veryone is 'key' and [one cannot] afford to lose any" (Gillham, 2000, p. 11).

Therefore, for the primary research method, semi-structured interviews were chosen. While this type of interview can be considered to be located midway between the structured and unstructured interview, authors such as Brinkmann (2013) argue that this scale needs to be viewed as a continuum rather than clear cut categorization. Furthermore, they suggest that a flexible structure is important in these interviews to leave space for the interviewees to voice their opinions and set their own foci in line with their perspectives. In addition to this, the role of the interviewer in semi-structured interviews allows for more control over the situation as

opposed to unstructured interviews and increased importance in knowledge-production in itself in contrast to the more passive role in structured interviews (Brinkmann, 2013).

Selection Interviewees

The interviewees were selected solely on the basis of accessibility and expertise. Due to the very limited number of potential cases using Artificial Intelligence for citizen participation in policymaking, there were also not many experts that could be interviewed. As the organizations of the case studies are rather small to medium, not more information would have been extracted by talking to more people from the same organization.

The selection procedure of the experts was carried out by the organizations contacted, with the request of gathering the best insight into the cases therefore needing the best informed and most knowledgeable expert available. The interviewees of the cases were the ones put forward thereafter. The interview transcripts were shared with the supervisors of this thesis and available upon request.

Interview Questions

Misoch (2019) suggests to structure interviews in four main sections: 1) the information phase, 2) the warm-up, 3) the main part, and 4) the wrap-up. The first stage aims to give general information about the project to the interviewee and clear all data protection issues. In the first round interview questions listed in the section below, this part is not explicitly mentioned but nevertheless carried out in each interview. Second, Misoch (2019, p. 71) advises to enable an open introduction into the topic with a warm-up question, facilitating an easing into the interview setting. In the questions of the first round of interviews, these are the 'General' questions. Third, the main part is structured according to certain topic areas leaving options of modification if needed in the interview situation. The fourth and final stage aims to conclude the interview and gives the interviewee the opportunity to point out and talk about aspects that were not explicitly mentioned in the interview (Misoch, 2019, p. 71).

Based on results in the academic database Web of Science, only the paper by Savaget et al. (2019) discusses citizen participation in combination with Artificial Intelligence. Due to the lack of broad research in the area, the questions in this thesis needed to be designed to acquire an overview while not neglecting important details that might shed light in the narrow field of research.

The following questions are posed in the first round of semi-structured interviews. In the tables below, the questions according to the thematic categories are listed. In the first column, the underlying area of interest for the research is pointed out. Slight variations between the interviewees are anticipated. The structure of the interview follows the areas focused on in the theoretical framework.

Area of interest	Questions
Contextualization of Case	**General**
Organization	Could you please briefly describe your organization and its general aim?
Project	Could you describe the project in brief? What was the purpose and intention behind the project initially? What was your organization's role in the project? Were there any partners involved? - If yes: What was their role?

Table 2. Semi-structured interviews 1 questions: General information.

The first set of questions aim to ease into the interview and get more insights into the projects which might not be detectable online through the organizations' web presences. Furthermore, the context in which the project was carried out, including partners, is aimed to be elicited.

	Citizen participation
Based on Smart citizen scaffold by Cardullo and Kitchin (2019)	How were citizens able to participate? Did citizens/the targeted group respond well to your project? - Why do you think that was/was not the case? What were some challenges you faced in engaging citizens?
Based on Smart citizen scaffold by Cardullo and Kitchin (2019)	Was there a specific group of citizens you tried to engage with? How did you reach them?

Table 3. Semi-structured interviews 1 questions: Citizen participation.

The second sets of questions is then based on Cardullo and Kitchin's (2019) Smart citizen scaffold, trying to categorize the extend of citizen participation possibilities in the selected cases to draw conclusions on potential participation roles of citizens in other, larger scale projects.

	Artificial Intelligence
Based on Artificial Intelligence: General Overview	Why did you decide to explore the use of AI in your project? What were the advantages of AI? What kind of AI did you use? Were there other potential options? - If yes: Which ones and why did you decide against them?
Main research question: Challenges for AI	What were the challenges you discovered in the use of AI? Did you face any barriers (national or EU-wide) in planning and executing your project? (technological, legal etc.)
Based on research questions	How do you consider the relation of citizens and AI in your project? Were there concerns before using AI? (f.ex. privacy, transparency, accountability) How did you approach data-protection? Did transparency and accountability play a role in the development and execution of the project?

Table 4. Semi-structured interviews 1 questions: Artificial Intelligence.

These questions set to answer the sub-research questions, namely "What mechanisms would guarantee transparency and data protection in the involvement of citizens in policy making processes?" as well as "How could accountability and ethical usage be secured?" by extracting the learnings from the projects of the interviewees in these aspects. Furthermore, the theoretical framework these questions are based on is the general overview of Artificial Intelligence categories and types of algorithms.

	Follow-up & Scalability
Contextualization of Case	What were the outcomes of your project? Could you elaborate a bit on its impact? Did you have contact with policy makers before/during/after the project? - If yes: How was the involvement of the policy makers?
	If you were planning another similar project, would you change anything? - If yes: which ones and why?

Main research question: Opportunities for AI	Do you think AI could potentially be used in broader citizen participation projects? - Why/why not?
Main research question: Opportunities for AI on European scale	Do you think a project like yours is scalable onto a broader EU context? - Why/why not?

Table 5. Semi-structured interviews 1 questions: Follow-up & Scalability.

Finally, the last set of questions are very important to set the focus on a future vision of AI use in citizen participation. Furthermore, it aims to give input to answer the main research question on opportunities in using AI in broader, EU level initiatives.

3.2.2. Document Analysis

As one component of this thesis, document analysis was chosen as a complementary research method. Bowen (2009, p. 27) describes document analysis as "systematic procedure for reviewing or evaluating documents, both printed and electronic". Also, Simons (2020, p. 689) describes that documents can prove to be highly valuable "for understanding the policy context".

Further stressing the importance of complementary methods of data collection, Bowen (2009) explains that the data analyzed through document analysis is often combined with interviews or even observations "to minimize bias and establish credibility" (Bowen, 2009, p. 38).

It was important to not only rely on the interviews themselves, as subjectivity can be a limitation for such research (Simons, 2020). Therefore, for this thesis the official websites of the organizations involved and the project websites themselves were taken into account. Moreover, one final report by the DEEP-Linking youth project (case 1) and several news articles on their website about further progress in the project as well as a presentation on the Einwendungsmanagement Online (case 2) that were accessible were also used to gather a better understanding of the cases. Information hereby was as Bowen (2009) suggested primarily complementary to the information gathered in the interviews, as all interviewees were giving even further information than was publicly accessible through the various documents. Nevertheless, cross-checking and analyzing the content and information gave the interviews even more credibility and lessened the risk of subjectivity potentially transported through interviews.

3.3. Expert Validation

As a second stage of this research, expert validation of the propositions was collected. This is necessary to explore external validation. According to Miles and Huberman (1994, p. 11) verification can serve to establish "intersubjective consensus" and reason that the final results need to "be tested for their plausibility, their sturdiness, [and] their confirmability" which all comprise the result's validity. Only after all data collection is finalized can verification be carried out (Miles & Huberman, 1994).

Therefore, after compiling all data from the document analysis and the interviews, the discussion and propositions were drafted based on the theoretical framework. Subsequently, an expert in the field of Artificial Intelligence and European Commission Public Consultations was interviewed to find out whether the propositions are feasible as well as important from a European Commission point of view.

3.4. Limitations

While the use of case studies in research might seem useful, there is also criticism about its limitations on generalizability of the results (Thomas, 2020). Nevertheless, especially in social sciences case studies are used as "one of the principal means by which inquiry is conducted" (Thomas, 2020, p. 2).

In the case of this thesis, the aim of the expert validation is to give it better generalizability of the results. Nevertheless, there are concerns in the research community on what happens when there is no agreement in the results that are drawn (Seawright, 2016). In this thesis, however, only one expert was consulted for validation, as accessibility to qualified persons in the field of European policymaking and Artificial Intelligence tools for citizen participation is very limited. For future research, the results could be further verified.

The selection of the cases also was strongly influenced by accessibility, as there are not yet many citizen participation projects aimed at policymaking which are supported by Artificial Intelligence tools. In the public sector, there were a greater number of examples using AI to improve services for citizens than those where citizens influenced policy in one or the other way. Moreover, not all organizations which would be of interest to investigate AI supported citizen participation were responding to requests made.

Furthermore, opting for interviews as a primary source of data poses further limitations to the study, including the danger of not being able to assess whether interviewees are truthful "in contexts where people may be identifiable" (Simons, 2020, p. 683). This always can be an issue, nevertheless, through the additional document analysis, many facts could be checked beforehand.

As Simons (2020, p. 683) stresses, qualitative research methods always involve a certain degree of subjectivity of "participants and of the researcher. Simons (2020, p. 683) furthermore explains that "Such subjectivity needs to be disciplined, of course, through procedures that examine the validity of individuals' representations of "their truth" and demonstrate how the researcher took a reflexive approach to monitoring how his or her own values and predilections may have unduly influenced the data".
Due to the constraints of the thesis' research focus, the conscious choice was made to focus on the side of the AI tool providers and carry out qualitative interviews. This leaves space for more quantitative research methods, involving citizens taking part in consultations and initiatives to gather their input for more thorough research.

4. Case Studies

4.1. Case 1: DEEP-Linking Youth

The first case this thesis explores is the DEEP-Linking Youth project which was concluded in 2017 and involved several citizen participation and student organizations operating across Europe. Its aim was to find out about the priorities and ideas on Erasmus and other student mobility programs. In the following, the main organizations participating in the project, the project stages as well as the results of the interviews will be elaborated on.

4.1.1. Organizations

The DEEP-Linking Youth (short for Digital Ecosystem for EParticipation Linking Youth) project was carried out as a cooperation by seven different partners (European Citizen Action Service, 2021a), established in several European countries with different working focuses. In the following, the different partner organizations are described to understand their role and interest in the project.

(1) Citizens.is – Citizens Foundation

Citizens.is was founded in 2008 and is a non-profit foundation, based in Iceland. They state that their mission is "to connect governments and citizens by creating open state-of-the-art engagement platforms and offering consultation on how to best plan & execute successful citizen engagement projects" (Citizens Foundation, 2021a).

One of their longest ongoing projects is 'Better Reykjavik', which was initiated in May 2010. It is a digital platform that gathers solutions for urban issues from the citizens themselves in a co-creation manner. Therefore, they use a "unique debating system, crowd-sourcing of content and prioritization, submission of multimedia content, and extensive use of AI to improve the user experience as well as content submitted" (Citizens Foundation, 2021b).
According to them, they could reach over 70.000 people, which in regards to the population that is 120.000 is more than 50%, and 10.000 ideas were submitted to the platform (Citizens Foundation, 2021b).

(2) European Citizen Action Service (ECAS)

The European Citizen Action Service is also a non-profit organization, based in Brussels. They state that they have almost 30 years of experience in the field of participation. Their mission is

described as “empower[ing] citizens in order to create a more inclusive and stronger European Union by (i) promoting and defending citizens’ rights, [and] (ii) developing and supporting mechanisms to increase citizens and citizen organizations’ democratic participation in, and engagement with, the EU” (European Citizen Action Service, 2021b).

(3) Erasmus Student Network (ESN)

The Erasmus Student Network is a European student association, founded in 1989 and according to them located in 42 countries, in over 1.000 different higher education institutions, and with more than 15.000 active members (Erasmus Student Network, 2014).
Among the aims of advocating for students’ rights and trying to improve the integration of international students in local communities, they also state that they value “volunteering and active citizenship” (Erasmus Student Network, 2014).

(4) The Consultation Institute (TCI)

The Consultation Institute was founded in 2003 and is also a non-profit organization, which specialized in stakeholder consultations in the “public, private and voluntary sector” whereby they rely on best practices worldwide. While they are non-profit, they offer paid membership to access their trainings (The Consultation Institute, 2020).

(5) Civil College Foundation (CCF)

The Civil College Foundation is described as a “Hungarian adult education organization for community development, community work and citizen studies” (European Citizen Action Service, 2021a). They were established in 1994 and have worked on participation in decision-making nationally as well as internationally (European Citizen Action Service, 2021a).

(6) ProInfo Foundation

ProInfo Foundation is an NGO, based in Bulgaria and founded in 2005. Their objective is “the creation of an information and communication environment beneficial for the development of active civil society” (European Citizen Action Service, 2021a).

(7) GONG

Founded in 1997 in Croatia, GONG describes itself as civil society organization carrying out research and education for public advocacy. Their focus is “enhancing democratic processes

and institutions as well as developing democratic political culture and encouraging active and responsible participation of citizens in political processes" (GONG, 2021).

4.1.2. Project: DEEP-Linking Youth (2017)

The DEEP-Linking Youth project had the goal of investigating "how e-participation can foster young people's empowerment and active participation in democratic life" (European Citizen Action Service, 2021c) and provide content through the different online channels after analysis as a "Digital Dashboard" for policy-makers. This should give an insight into youth's concerns and their perspectives on educational mobility programs (European Citizen Action Service, 2021c).

One objective was to display the views of youth that is not directly involved in the policy- and decision-making process. The Digital Dashboard was intended as an "online monitoring platform" (European Citizen Action Service et al., 2017, p. 3) which looked at online discussions and posts about the Erasmus and Erasmus+ program and other mobility programs. This was done through automatically scanning public social media posts such as on Twitter. Especially the challenges youth had to face abroad was of interest (European Citizen Action Service et al., 2017). It was carried out between December 1st 2015 until November 30th 2017 (European Citizen Action Service et al., 2017).

The project was carried out in 6 stages: (1) "Mapping exercise", (2) "Content Creation and Digital Dashboard initial phase", (3) "Distribution and Monitoring", (4) "Empowerment of young people to create digital content from youth to youth", (5) "Engagement of policy-makers and launch of Digital Dashboard", and (6) "Analysis and report of the experiences" (European Citizen Action Service, 2021d).

(1) Mapping exercise: First, the relevant stakeholders and key actors in the field of youth mobility and youth policies were identified and mapped, in order to target the right persons for the following stages and exercises. Furthermore, the mostly used platforms and terminology used in the context of youth mobility was investigated (European Citizen Action Service, 2021d).
(2) "Content Creation and Digital Dashboard initial phase": Second, the Digital Dashboard which intended to show discussion topics and content on the issues identified in real-time, especially focusing on Erasmus and student mobility. During that phase, a beta version of the dashboard was launched (European Citizen Action Service, 2021d).

(3) "Distribution and Monitoring" of the content discussed on the platforms that were identified at the first stage which were named "digital ecosystem" (European Citizen Action Service, 2021d).
(4) "Empowerment of young people to create digital content from youth to youth": The organizations involved in the project organized so-called "Boot Camps" in Croatia and Hungary, both locations of one of the project partners, with youth in order to debate about Erasmus+ and mobility in general (European Citizen Action Service, 2021d).
(5) "Engagement of policy-makers and launch of Digital Dashboard": Next, online consultations with policy-makers were held and the final Dashboard was launched in Brussels (European Citizen Action Service, 2021d).
(6) "Analysis and report of the experiences": Finally, a "publication of E-participation guidelines for policy-makers, recommendations on learning mobility and a final Social Intelligence report based on the two-year experience" was released (European Citizen Action Service, 2021d).

Since the primary focus of the thesis lies not with student mobility but citizen participation and Artificial Intelligence, the exact results and suggestions on youth mobility of the Digital Dashboard, are not discussed further in this paper. Rather the interviews with one of the partnering organizations, Citizen.is were focused on the three main topics on carrying out the project, namely citizen participation, Artificial Intelligence, and Follow-up & Scalability. The main intention was to find out more about the technical aspects and the interplay between the topics elaborated on in the theoretical framework of this thesis.

4.1.3. Results: Interviews

The following section will present the results of the interviews carried out on this project with a representative from the Citizens Foundation. The focus of this case study was primarily on the technical and citizen participation aspects of the project.

(1) General

Following on what was described in the published project report, the interviewee elaborated on the key deliverable of the project, namely the Dashboard, which was an AI-based monitoring tool to monitor websites and social media feeds. The aim was to understand the specific needs and opinions on Erasmus and other youth mobility programs passively by analyzing the public web about certain subjects. To do this, they used a keyword search connected to Erasmus youth

mobility in many different languages. Then, they had to ensure that only the relevant entries were being taken into account, disregarding entries about the Erasmus university or Erasmus of Rotterdam, unrelated to the current program, since these entries would have overshadowed the voiced of the actual young people who were the target of the listening exercise. The algorithm therefore also acted like a specifically trained "spam filter". Furthermore, they were also using machine translations to ease the use of the Dashboard.

The Citizens Foundation's role in the project itself was on the technological side. Nevertheless, all project partners were working together in training the initial algorithm, while the deeper content analysis was carried out primarily by other partner organizations.
The project was done in collaboration with the Erasmus program, so they also helped through dissemination of the results.

(2) Citizen participation

In the DEEP-Linking Youth project, citizens were not actively able to participate, only passively through the publicly available posts and comments on social media; in contrast to other participatory projects by the Citizens Foundation, such as "Better Reykjavik" which is more about gathering direct input of citizens, therefore engaging citizens more actively and working closely with governments. The interviewee stressed, that the idea of the DEEP-Linking Youth project was to do a social listening exercise and through that bringing the voices of young people talking about Erasmus and youth mobility programs to the attention of policymakers in Brussels.

The response to the project was relatively positive according to the interviewee, who said that this made it possible to show a coherent voice of people publicly discussing these issues and through the tools used bringing people closer to each other and helping with European integration.

As was elaborated above, the project was not intended to have active citizen engagement but rather listening to citizens' public posts. The target group was, nevertheless, young people who had opinions on the Erasmus program or similar mobility programs. As details of online users behind posts are often hard to find out, it was not easy according to the interviewee to build up a vast amount of knowledge on the people included in the project. This was one of the limitations of the technique used.

(3) Artificial Intelligence

To the question of what advantages Artificial Intelligence has, they said that they see a huge opportunity for the users to in the future on the one hand help them sort through information but on the other hand also formulate ideas in a way that law makers and governments can directly understand and use it to make it more likely for citizens to have an impact. The great potential machine learning has, was one of the main reasons AI was used for the project.

In the project a deep learning algorithm was used, which was trained with around 20.000 training data samples. The training was carried out collectively by the partners, as this was still a very work-intensive process in 2017. They had to determine for every sample, whether this was a relevant entry for the project or something else, as mentioned above for example the Erasmus University.

They described the technology used as the basic type of algorithm for classifying texts. In 2017, this was the top of the line and the best option that was available. Since then though, technology rapidly evolved and technologies they use now are based on more adaptable, fast learning algorithms.

As to direct challenges that could arise from using AI, it was stated that caution should always be kept when going more and more into policymaking and the field of democracy, as some negative effects can already be seen on social media and filter bubbles, all there not to serve the people's voices equally and fairly but to maximize engagement. Nevertheless, according to the interviewee there are also solutions to these arising problems through algorithms, for example automatic measuring of toxicity of content.

Another challenge that needs to be addressed when operating with AI is bias. Here the interviewee stressed that it is first and foremost important to be aware of any bias that could be there. Initially, the idea was to present the ideas in a newsfeed style with recommendation system, but this was then not realized, also due to the fact that this could distort the suggestions. Therefore, they opted rather to show it according to time it came in.

When it comes to barriers, be it legal or technological, they said that there are always technical issues to solve that come up in the process, but they would not call them barriers per se. One issue they faced, nevertheless, was that it was not possible to get access to public Facebook

data. Therefore, they had to stick to primarily Twitter, which since then has also gotten more difficult.
Data-protection and transparency were treated with high importance. No personal data and similar data were published, and the algorithm directly made sure these were not displayed.

(4) Follow-up and Scalability

The outcomes were presented in a report and helped the Erasmus administration formulate policy in terms of what the young people were saying and thinking about youth mobility programs. Furthermore, the outcomes were disseminated via letters to policymakers. A novelty was that the policymakers could view the Dashboard in English as well as in French, all because of automatization.

When asked about whether they would change anything if they would be planning another similar project, they said that today's algorithms are already vastly more efficient at interpreting data without needing as much training data as the project in 2017, which still needed 20.000 data sets to be trained. Nevertheless, as already explained above, it has become more difficult to use public posts and data from social media platforms, even Twitter which was mainly used back then would not be easily usable today. Still, there are now even better pre-trained algorithms available, some of which are able to support more than 100 languages, which can help projects that have the same objectives tremendously.

To the question of potential of AI for future, broader citizen participation projects, the answer was very clear:

> "I think it is a huge problem today, when it comes to Artificial Intelligence, and democracy and governments, that governments and democracies are way behind, in a way behind the rest of society like the private sector. And so I think that's something that is both a problem but also a huge opportunity for governments to actually […] try things." "and [some] governments have started to use AI".

Especially through major improvements in machine translations, more participation could be more and more possible according to the interviewee. It can enable people not proficient in the language participate in local politics but also on a European level, this could allow people from different language backgrounds to discuss issues seamlessly and transparently.
The subjective estimation was that the EU is very conscious about AI automation and are investing and supporting various different initiatives in that area.

4.2. Case 2: Einwendungsmanagement Online

The second case this thesis investigates “Einwendungsmanagement Online” by DEMOS. It serves as an example for Artificial Intelligence used in public consultations, in this case consultations on infrastructure projects in Germany. In the following chapter, the organization behind the project, the legalities behind the process and the technological background are elaborated on, primarily based on the interviews conducted with representatives of the organization.

4.2.1. Organization

DEMOS

DEMOS is located in Germany and describes itself as experts for processes in public administration, having gathered experience in many projects digitizing and optimizing processes. They use agile software development methods to ensure transparency and flexibility. Furthermore, they use Artificial Intelligence to make work with big amounts of data more efficient and enable faster progress (DEMOS Deutschland, 2021a).

4.2.2. Project: Einwendungsmanagement Online (2021)

In the following, the Artificial Intelligence tool “Einwendungsmanagement Online” is described, which is used for consultations in large infrastructure projects. As these have to deal with great amounts of data due to high participation rates, intelligent algorithms try to make these processes more efficient (DEMOS Deutschland, 2021b).

4.2.3. Results: Interviews

The interviews were carried out digitally with two representatives of DEMOS and the direct process and tool was demonstrated as well. Some of the questions were not applicable to this specific use case of AI in consultations and are therefore not addressed in the following section.

(1) General

They explained that their project is part of the ‘Planfeststellungsverfahren’ and concerned with ‘Einwendungsmanagement’. Generally speaking, ‘Planfeststellungsverfahren’ are a formal and mandatory process in Germany that has to be carried out among others for new infrastructural projects. In this process, private citizens can send so-called ‘Einwendungen’ in which they state

their opinion and objections to the projects. The goal of such an objection management procedure ('Einwendungsmanagement') is ultimately to provide information on the input provided and distinguish in the planning approval procedure between objections and comments. Objections come from private individuals and comments come from public bodies and authorities.

(2) Citizen participation

In terms of citizen participation, there is no direct contact between DEMOS and citizens, therefore also no specific group is targeted nor is any other specific action taken by them to encourage participation. Citizens are however participating in these planning processes on their own initiative by sending for example letters which in turn are digitized and turned into pdf files. While a lot of comments come from public interest groups, some planning approval procedures can have as many as 100.000 or 50.000 objections.

In the procedure, they provide technical assistance as their service. Since the processes are highly formalized and there are strict rules in place, DEMOS provide the tools to support the planning approval procedure but have no interaction with the citizens. DEMOS work with two different technologies, on the one hand a Web workflow and on the other hand different AI methods, their use is highly dependent on the specific case. As this is a process required in Germany with specific formalities, their experience is based on these national consultations so far.

(3) Artificial Intelligence

To the question why Artificial Intelligence was even considered for this kind of processes, they said that the potential in the field DEMOS operates in is very high. As the technology evolves, a vast number of procedures can be carried out automatically, like for example the detection of essential and non-essential information. In general, they stated that they estimate the time saved through the automation to be up to 90 percent. Through different tools and methods of clustering for instance, 9.000 objections can be sometimes narrowed down to 50 different arguments which is then easier to evaluate than the initial 9.000.

The Artificial Intelligence used detects words in the context they are uttered and understands what is meant. This means that there is no mere matching of keywords or key phrases but an understanding on a semantic level, very dependent on the context. The models they deploy are

furthermore flexible in their functionalities, depending on the authorities. Furthermore, the authorities give them keywords and concepts that are then used to tag different objection topics in order to be able to sort them more proficiently in further steps. Initially, they used to have a worked-out keyword catalogue, which then the AI model was trained with. Now, they use a more dynamic model, which can individually be adapted to the use case keywords provided by the authorities. The reason for switching to such a dynamic model was that they always had to train a new model according to the new keywords needed for the specific cases, which again requires enough training data.

The AI functions best in German as it is trained to the specificities of the German planning procedure, but according to DEMOS, it would be easily adaptable to a multilingual setting. In that respect, they stress that natural language processing nowadays primarily functions through transformers using deep learning.

According to them, they did not face any major barriers or challenges. Nevertheless, they elaborate that some of the elements are not self-learning yet, such as when an address is once not detected properly and has to be matched to the proper category manually. This is still due to the novelty of working with that kind of data as certain data cannot be put into the model without being checked as a model can become worse if false, unchecked data is added.

One aspect that still is worked on when it comes to the deployment of AI is the explainability, namely raising understanding and awareness with the clients that using AI differs to traditional software development, which uses probability.

In terms of data protection there are on the one hand definite official rules in place. Those include that the server has to be located in the European Union and needs to have a specific certification. Also it is strictly specified who can have access to the data and how the certain data can be used and how training can be carried out with them. During ongoing procedures, all data gathered has to be directed to this specific procedure and cannot, and of course are not, stored afterwards. DEMOS therefore do not build up a pool of the data gathered from each of the procedures, as they are also required to delete them regularly.
When it comes to transparency and accountability, their feeling is that a lot is on the way in the field of Artificial Intelligence and decision-making. DEMOS stressed that it is important for them that the assistance systems they provide always have a human in the loop for decisions

that are taken, so certain steps have to be checked before the process can be continued. This means that decisions done by the AI have to be manually checked and approved, because according to them, AI can still make mistakes.
Especially when it comes to the distribution of topics and answering the various objections, this is carried out with a human in the loop and also manually for certain parts in order to have accountability.

They also mentioned as a positive best practice example that some larger firms provide a model card, which shows what data the specific model was trained with so people can see what the predictions are based on and potential biases this might entail. Upcoming regulations in the field are expected by the interviewees in the future.

(4) Follow-up and Scalability

According to the interviewees, there would be a wide range of further possible uses, which they so far have not yet pursued because it was not asked by clients. As one example they explain that currently they use clustering through keywords and the contexts they are derived from, which they then can convert in figures on how many objections were received about which topics. Nevertheless, further processing of the information could be carried out, including but not limited to word clouds.

Further potential for improving the work of organizations concerning citizen participation projects lies within data according to them as data is the most essential for developing algorithms. One major shortcoming currently is the lack of accessibility to appropriate and anonymized or also thematically ordered data sets. It can be observed that the same data sets are reused for many models, either because of their length or because they are the only ones that exist. As creating new data sets is very elaborate, it can be seen as more desirable to create a new model instead of new data sets.
According to them, there is furthermore the need for more clarity and legal security when working with data and data sharing.
Especially public administrations have a lot of data which is not broadly used at the moment. As oftentimes they deal with personal data, it is essential that these get anonymized. However, they see that some administrations start to collect and properly anonymize data so it could be used in the future. A clear strategy is so far not evident to the interviewees. The question remains how it might be possible to build up a data pool to improve AIs without violating any regulation.

One example for data sharing is the European Commission, who have the resources to share data which then in turn can be used to train natural language processing algorithms due to the legal requirements that documents must be provided in all official EU languages. In many public administrations, a data sharing strategy is not even in planning or still to be developed.

Another area where AI can be used more in the field of citizen participation projects is the detection of classic conflict triggers. Through emotional detection and based on the previously acquired knowledge from other participatory projects, arising conflicts could be anticipated well in advance and therefore already plan certain consultations or other participation projects to avoid them.

When asked about the potential scalability to a broader EU context, they explained that they have already looked closer at EU consultations. As the focus there does not lie primarily on whether or not the consulted citizens, organizations, etc. are in favor of a project or against and there is no legal requirement to answer every objection individually but it is rather about understanding and taking in their thematic input. According to them, this would be possible to carry out just as the national consultations they are working with now, as they have the AI supported tools to do clustering, statistics and sentiment analysis. This would also be possible in a multi-lingual context on a European level.

5. Discussion

The following chapter will first discuss the results drawn from the two case studies individually, first the broader citizen participation project which will be set into context to the more similar European Citizens' Initiatives, then the consultations which will be compared to the Public Consultations by the European Commission. In the first two parts, the theoretical framework composed of the three main topical areas of citizen participation, Artificial Intelligence, and the policy-making cycle, are described. While in several cases, there can be an overlap, it is entirely evident, that there are also differences between the European Commission tools and the case studies presented. As such, the analysis according to the three fields serves primarily to contextualize and compare the as-is state and not evaluate them.

Finally, based on the results and the further discussion, the propositions on how the existing citizen participation tools could be enhanced through AI tools are drafted and explained in further detail. All proposals are aimed to enhance, improve, and increase citizen participation.

5.1. Analysis Broad Citizen Participation

The case discussed in this thesis was taking place in the first phase of Howlett and Giest's (2015) policy lifecycle, as the main activity was the social media 'listening' to learn more about the ideas and opinions of people on the Erasmus programs. This is exactly the Agenda setting stage's aim, namely to find a gap in legislation or sensing a problem by the policy makers.
Similarly, European citizens initiatives would also be located in this first stage of the policy lifecycle, since it also includes putting forward solutions to the sensed problems, which in the case of ECIs is done through direct proposals onto the official platform (Howlett & Giest, 2015).

In terms of citizen participation, the case of the DEEP-Linking Youth's first project phase, the social listening exercise which was supported by Artificial Intelligence can be characterized as according to the scaffold by Cardullo and Kitchin (2019) as 'Therapy' as the users were primarily data suppliers and not actively involved in any policy making or furthermore not aware that they were involved. The further stages, which involved bootcamps and workshops then would be closer to the 'Consultation' level of the scaffold as citizens were directly involved and could participate (Cardullo & Kitchin, 2019).

European Citizens' Initiatives on the other hand go further and need to be placed on the level of 'Placation'. Hereby, citizens are directly suggesting ideas and are in the role of the active proposer (Cardullo & Kitchin, 2019).

The Artificial Intelligence tools used can be categorized in several ways. The DEEP-Linking Youth project in terms of progression, it would be part of the Artificial Narrow Intelligence as these are mainly concerned with carrying out simple tasks (Girasa, 2020; Searle, 1980). The learning type would be close to supervised algorithms which need training data to produce output (Jordan & Mitchell, 2015; Joshi, 2020) and as the AI used in the project was still a new technology, a vast amount of this training data was still necessary. It can be furthermore be characterized as static as the data used displayed durable validity which did not change with time (Joshi, 2020). Finally, the algorithms used in the project due to the early stages in which the technology still was at that time would be rather mechanical, which means that it "learn[s] or adapt[s] at the minimum" (Huang & Rust, 2018, p. 158).

As for the European Citizens' initiatives, the potential opportunities for the deployment of Artificial intelligence to increase and enhance citizens' participation in these cases is elaborated on in the propositions. At the moment, no Artificial Intelligence is used.

5.2. Analysis Consultations

The case study of the Consultations can be located already in the policy formulation phase as it includes the gathering of input of various stakeholders who lobby for their proposals to be included (Howlett & Giest, 2015).

Public consultations by the European Commission would be partly located in the first stage of agenda setting, as finding gaps in legislation but also problem sensing can be a result of them. Nevertheless, mainly the focus also here lies in the policy formulation stage, as certain groups of stakeholders but also broader consultations can be used to find out more about the priorities within certain fields (Howlett & Giest, 2015).

The degree of citizen participation in the case study, while there is no direct contact between the organization carrying out the analysis and the citizens, is nevertheless on the level of 'Consultation' as the citizens are able to give their feedback to various infrastructural projects which needs to be taken into consideration (Cardullo & Kitchin, 2019).

Likewise, the Public Consultation by the European Commission would also fall in the same level of participation, namely 'Consultation', as feedback is a central part of these consultations.

However, parts can be also considered to be ‘Placation’ as citizens or organizations might be asked to give their own suggestions and proposals (Cardullo & Kitchin, 2019).

The described case’s Artificial Intelligence can be categorized as Supervised algorithm which needs training data to produce output like labeling further data (Jordan & Mitchell, 2015; Joshi, 2020). Another way to look at it would be time-based. Here, the AI would be again static, as the data validity is durable and does not change as opposed to prognosis tools (Joshi, 2020). How much Artificial Intelligence evolved during the years is visible when looking at the kind of Intelligence the AI would be categorized in. In this case, the Intelligence would be closest to intuitive which “learn[s] and adapt[s] intuitively based on understanding” (Huang & Rust, 2018, p. 158). Finally, the AI tool would be a dNN with higher efficiency than humans as is evident when comparing the time savings in contrast to entirely human workforce (Landgrebe & Smith, 2019).
As with the ECIs, the opportunities that can enhance and increase citizen participation through Artificial Intelligence in European Public Consultations are discussed in the forthcoming chapter. Currently, AI is not in use for the consultations, but the technology is in the testing phase.

5.3. Propositions

In the following section, answers to the three main sub-research questions are used to provide recommendations for enhancing and improving citizen participation in the policy-making process. The following three questions will be answered, as well as further additional ideas that emerged:

- How could the current EU policy making process and existing citizen participation tools be complemented by AI?
- What mechanisms would guarantee transparency and data protection in the involvement of citizens in policy making processes?
- How could accountability and ethical usage be secured?

5.3.1. European Citizens' Initiatives

Today, European Citizens' Initiatives can all be accessed through a central website (European Union, 2021c) where citizens can acquire an overview of the ongoing and past citizens' initiatives and the progress they made. Furthermore, European citizens can support these initiatives directly through the platform. Nevertheless, there is no interaction between the supporters, no place of discussion.

One step towards more participation could be the example of the Platform on the Conference on the Future of Europe (European Union, 2021b), which enables citizens to post their ideas on the future of the European Union in 10 different categories, namely "Climate change and the environment", "Health", "A stronger economy, social justice and jobs", "EU in the worlds", "Values and rights, rule of law, security", "Digital transformation", "European democracy", "Migration", "Education, culture, youth and sport", as well as "Other ideas". Not only does it use automatic translation so that citizens with different language backgrounds can participate in discussions, it also enables them to endorse and comment on other people's ideas. The following suggestions are based on potentially transforming the European Citizens' Initiative platform to become more like the Conference on the Future of Europe platform in order to engage more directly with citizens and enable more participation. This could also then potentially be used even before an ECI is launched, to bring citizens with similar ideas together and help them formulate their ideas. The following measures could support the platform:

- **Artificial Intelligence**: deep learning algorithm, use of transformers
  As technology advances, more potential lies within deep learning algorithms, as they become more adaptable and are fast learning. This can on the one hand enable people to formulate ideas into policy language that is usable for lawmakers and governments while on the other hand through natural language processing, it can help people participate in politics even when they are not proficient in a language.

- **Ethical use**: data protection
  This is of course not only an issue of ethical use, as there are clear data protection rules, but automatically filtering out any personally attached data could potentially be an idea on using AI to enable ethically sound citizen participation.

- **Transparency**: counteracting filter bubbles
  In order to improve transparency, filter bubbles should be avoided. One measure with which this was achieved was to show content according to time it was put in the system as opposed to a recommender system.

- **Further idea:** automatic measuring of toxicity of content
  To enable fair, discrimination-free discussions, automatic measurements of the content's toxicity could help responsible people to counteract any form of discrimination or conflict at an early stage before it is too late and enable early intervention.

5.3.2. Public Consultations

The following points could be drawn from the case studies and would be potential recommendations on how especially public consultations by the European Commission could be supported by AI, based on the research of this thesis.

- **Artificial Intelligence**: intuitive, dynamic; use of transformers
  As keyword-focused algorithms might miss certain points, it would be advisable to use intuitive Artificial Intelligence, which focuses on the understanding through a semantic analysis of the context and understanding rather than just predefined words. This keeps

the AI more dynamic. Transformers using deep learning can be especially useful, as public consultations would be multi-language projects.

- **Accountability and ethical use**: human in the loop
  Since major decisions could be based on the results of consultations, accountability for decision that are made needs to be ensured. This could be achieved through always maintaining a human in the loop, monitoring the automated decisions made.

- **Transparency**: model card
  Model cards could be also used for AI use in consultations to make it transparent with what data sets the Artificial Intelligence was trained. This can make potential biases emerging through the training clearer and could also add towards mitigation of them already in beforehand.

Furthermore, new ideas and opportunities on how citizen participation in public consultations could be enhanced and improved were described, such as:

- **Detecting classic conflict triggers**
  Through AI, classic conflict triggers could be detected and help plan future consultation processes in order to avoid conflicts better.

- **Clustering ideas in word clouds**
  Clustering the received ideas in word clouds or other visualization methods could make it clearer for participants of consultations what the outcome might look like in contrast to long reports. It can therefore make consultation results more accessible and lead to more people taking an interest in consultations which could lead to an increased and broader participation.

5.3.3. Further ideas for broad citizen participation on EU level

This section is not specifically targeting European Citizens' Initiatives and public consultations by the European Union but rather ideas that emerged through the interviews to broaden and enable citizen participation through AI on a European level in general. As this goes further into the topic of data, data sharing and open data, and would therefore exceed the scope of this

thesis, it is merely to be taken as an indication of further areas worth researching in. The reason this is included nonetheless is to give a complementary view to the EU policy-making recommendations.

- **Clarity on data sharing**

  Establishing clear rules and therefore legal certainty in data sharing and data use in public participation processes could enable more projects being established.

- **Provide incentives for data sharing**

  Especially public administrations which have access to a vast amount of data that could be very beneficial for participatory projects might need additional incentives to provide anonymized data sets.

- **Provide data sets**

  Furthermore, certain data sets could be provided by public stakeholders, especially in areas where there are not many publicly accessible data sets available. Policymakers would need to consider who to share these sets with but it could be beneficial to provide them to citizen participation projects working with AI in order to improve the processes as access to appropriate and anonymized data sets might deter from working with Artificial Intelligence, even if this could improve participation.

6. Expert Validation

The expert validation was carried out through an interview with an EU expert working on Artificial Intelligence and public consultations within the European Commission. Therefore, the main focus of the validation also lay in the public consultations.

On July 24th, 2021, a new AI tool for consultations was launched to a first internal testing phase. It uses Artificial Intelligence to identify and clear out identical answers, as these are usually a sign of campaigns using bots to automatically give input and potentially leading policymakers to wrong conclusions of actual citizens' and organizations' opinions. Furthermore, the distance between answers and similar concepts can be measured to draw more concrete conclusions. Nevertheless, as this project still is at an early stage, the validation was primarily focused on the priorities and feasibility of the propositions made in this thesis.

The following comments and assessments were given on the propositions made:

- **Artificial Intelligence**: intuitive, dynamic; use of transformers
  This proposition was supported as it has great potential especially for open questions. As was explained, natural language processing through transformers is usually used to extrapolate real meanings of answers in a language neutral way and enable putting together answers from for example different countries.

- **Accountability and ethical use**: human in the loop
  The next proposition of ensuring a human in the loop for when AI is used in such contexts was also supported. Currently, the open consultations always have a human operator, which is important as an additional element to mitigate and analyze risk. One risk could potentially be that humans delegate increasingly decisions or analysis to systems, be it intentionally or for commodity. The expert noted that the human in the loop currently is in place and will stay there. It needs to be ensured furthermore, that the human is in control and has enough information and knowledge to understand when intervention is necessary.

- **Transparency**: model card
  As for the model card to increase transparency, the EU expert suggested to go even a step further aiming at self-explainable AI instead of the model card as this AI tries to

build an answer and an explanation about what features and components were taken into consideration to take certain decisions. This is in contrast to the black box approach, where the reasons behind decisions and predictions are not revealed and the Artificial Intelligence is treated as a black box.

Deploying explainable AI can help make Artificial Intelligence more trustworthy and transparent. Citizens can then understand why and how certain results ended up being proposed leading to more transparent decision making. This could also be done with more complex data and explainable AI describes the features taken into consideration and the parameters which the results are based in. Some contexts are more delicate than others, such as medical decision making but also decisions which policies are based on, therefore explainable AI paired with the aforementioned human in the loop can enhance trust in the decisions made.

Even though this was not worked on extensively on the Commission side so far according to the expert, this path of transparency in AI will likely be taken into consideration in the future. Currently, as AI is not used everywhere and widespread, this has not yet been one of the priorities.

- **Detecting classic conflict triggers**

  The EU expert also stressed the opportunities that lie with sentiment analysis in recognizing and preventing conflicts. Nevertheless, they also stressed that this would need to be controlled a little bit more as this can be a delicate area using AI.

  > "Sentiment analysis creates a sort of new layer of understanding that you need to be sure it is not distorted or false. So, it probably needs to be managed to work out. But it's something new. I'm talking theoretically, because I don't think we're doing this."

In that respect, further suggestion were made going in a similar direction:

- **Creating categories of users**

  Another feature that could be supported by AI in consultation processes would be to create different categories of respondents, such that are rather favorable, unfavorable or mixed and analyze the anomalies there. This would be a sort of identification of respondents that can give answers or the basis for further analysis as to why certain questions are not answered. By broadening the understanding of the different respondents, the consultations could be improved in turn as well.

- **Clustering ideas in word clouds**

  The idea of clustering ideas in for example word clouds was also received positively. It was stressed that this is not tied to the analysis of data but rather realization and visualization, which is described as an important factor as it can help people and experts to draw conclusions, build on ideas and develop insights. This means not so much developing new theories but rather deepen and expand the understanding in a broader manner.

  > "They're no analysis, but they can help developing knowledge on the data. And I think this is an important aspect."

Looking at the results and the evaluation of the expert, all propositions are being considered to be important in using AI in the policymaking process. And while not all of them are yet implemented in current projects within the European Commission, the trend seems to go towards focusing for example on transparency and clustering or visualization for better understanding.

Finally, it was elaborated that it can also be an opportunity for the European Commission to train policy officers in the basics of AI, not to make them technical experts on AI and neural networks but for them to understand the general rules that govern the systems, so they can in the future know when they are applied correctly when moving towards more use of these tools in consultations.

7. Conclusion & Outlook

This thesis looked into the currently existing citizen participation methods of the European Union, namely the European citizens' initiatives and Public Consultations, and explored options and propositions on how to increase and enhance citizen participation through Artificial Intelligence but also at potential barriers that might exist.
The results of this thesis are based exploratory research due to the novel and not yet investigated thoroughly nature of the topic of Artificial Intelligence supporting citizen participation in policymaking, as opposed to the more widely researched AI supporting public service delivery.

The theoretical basis of this thesis is threefold: citizen participation, Artificial Intelligence, and EU policy making. The framework for citizen participation was taken from the citizen participation scaffold by Cardullo and Kitchin (2019) which in turn is based on Arnstein's (1969) ladder of citizen participation in order to compare and analyze different means and options of citizen participation in general. For Artificial Intelligence, different ways of categorization were elaborated on, to acquire a better grasp on the diversity that is the term and concept of Artificial Intelligence and to furthermore be able to describe the AI used in the case studies as clearly as possible. Finally, in EU policymaking, many overlaps with the previous two concepts were discussed, such as the two citizen participation methods in EU policymaking as well as various policies and proposals by the European Commission on Artificial Intelligence and ethical use of it.

As stressed before, the research was based on exploratory methodology, as this is a highly new field of study, which brings a lot of potential but also the disadvantage of very limited theory. Two cases were explored through semi-structured interviews with experts, complemented through document analysis where possible to mitigate the risk of bias and give the interviews more credibility. Moreover, the results proposed were finally validated through an expert working on Artificial Intelligence tools for public consultations within the European Commission, to acquire better insights into relevance and feasibility of the propositions.

The two existing citizen participation options in EU policymaking are the European Citizens' Initiatives (ECI) in which citizens can submit ideas for policy directly to the EU, after collecting enough support signatures from other EU citizens; and public consultations, which are carried out by the European Commission to investigate stakeholders' and citizens' views and ideas in different policy fields before a proposal is submitted by the Commission.

Through the research carried out in the course of this thesis, several propositions to further increase and enhance citizen participation in EU policymaking developed and fitted to the current two participation tools.
First, the Artificial Intelligence described most suitable could be an intuitive and dynamic one, using transformers which might be particularly useful for open questions but also discussion fora. Second, the detection of classic conflict triggers was pointed out as a potential opportunity to use AI in order to recognize and prevent conflicts in early stages of planning but also before conflicts can escalate. This could be useful when planning consultations to already phrase certain questions in a less conflict prone way or to moderate conflicts in discussion settings early on. Third, the creation of user categories supported by AI can be used in consultation processes which can not only be helpful in the analysis of the results but also through a broadened understanding of who the respondents are, the consultations can be adapted and improved in the future. Finally, clustering of ideas in word clouds was described as a good complementary means of visualizing the results to deepen and expand the understanding of respondents' views and needs, as would also potentially be the case with user categorization.

The research also tried to find out about potential barriers in deploying Artificial Intelligence in citizen participation projects. Nevertheless, in the case studies of this thesis, no barriers could be detected by the interviewees. This leaves room for future research to investigate if there really are no major barriers or if these two cases were not representative in this specific aspect.

The mechanisms which guarantee or at least enhance transparency and data protection in these citizen participation methods are only to be seen as complementary to the already existing data protection laws in the EU. Suggestion for broad participation fora to ensure data protection and privacy was to automatically filter out any personally attached data. In this participation instance, transparency could be increase by breaking filter bubbles through not using recommender systems but rather other parameters of choice.
For public consultations, model cards explaining the data each Artificial Intelligence system was trained with was suggested. Moreover, an even more elaborate way to increase transparency in AI in citizen participation might be explainable AI, namely an AI that already tries to build answers and explanations to its features, what it takes into consideration, and how it takes decisions.

Finally, the supported answer given to the question of how accountability and ethical use could be assured was to always have a human in the loop, especially when it comes to critical decisions that are made by AI.

The main limitations of this thesis were rooted in the limited amount of potential case studies to choose from that involve Artificial Intelligence and citizen participation. This resulted also in a small number of potential interviewees that could give their insights on the projects. Nevertheless, the more projects that will emerge in the field, the more research can be carried out and a broader multiple case study could be done.

Future research can investigate the European Commission's project which as elaborated in the thesis was just launched into the testing phase. Here, the influence on the public consultations and particularly the effect that Artificial Intelligence tool has on the outcomes could be looked at closely.

More research could also be done by taking a look at the effects of Artificial intelligence tools for citizen participation from the 'users' side'. Questions could include how the user experience is influenced, if at all, by AI tools and in how far they would have a positive or negative effect on participation in policymaking.

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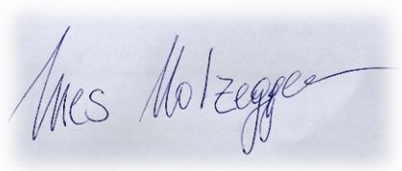

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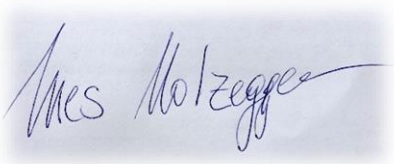

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