REGULATING THE ELEPHANT IN THE ROOM

A thematic analysis of Artificial Intelligence as a policy problem

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Summary of thesis

Keywords   Artificial Intelligence, AI, challenges, policy, policy problem

Purpose: Firstly, this thesis aims to study Artificial Intelligence (AI) by examining the challenges with the Artificial Intelligence Act (AIA) from the perspective of the Swedish stakeholders. Secondly, the thesis discusses potential solutions to improve the AIA based on the framed solutions proposed by the Swedish stakeholders. Lastly, it provides recommendations for policymakers to contribute knowledge on how to create effective policies concerning complex problems surrounded by a high level of uncertainty.

Theory: The theory used to understand the kind of challenges the stakeholders identify with the AIA connect to challenges with AI such as regarding (1) the problem with defining AI, (2) the pacing problem, (3) AI technology implementation, (4) AI law and regulations, (5) AI ethics, and (6) AI society. Challenge (3)-(6) originates from the Four-AI-challenges model. The theory on challenges with AI will be presented in chapter 2. The theory used to understand AI as a policy problem, suggest policy solutions and provide recommendations for policymakers is theory on (1) policy making, (2) policy problems, (3) framing of policy problems, (4) complex policy problems, and (5) factors to create effective policies. This theory can be found in chapter 3.

Method: To examine the challenges with the AIA, a thematic qualitative analysis of the Swedish stakeholders' comment letters, was performed. In order to study AI as a policy problem and discuss the suggested solutions, an analysis of the constructed frames was conducted.

Results: The findings obtained in this thesis suggest that the kind of challenges with the AIA as framed by the stakeholders are: (1) the definition of Artificial Intelligence, (2) the implementation, (3) regulatory issues, (4) ethical questions, and (5) societal impacts.

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1. Introductory chapter

The introductory chapter will be used to introduce the topic of the thesis. The chapter begins with the introduction of the research topic of interest. After this, the outline of the study will be explained followed by the purpose and the research question. The chapter continues with a background to the development of digital technology policies within the European Union (EU). The background is used to create an understanding for the development that led to the policy in focus. Lastly, the delimitations with the thesis will be described.

1.1 Introduction

Artificial Intelligence (AI) is rapidly increasing its influence on society and humans (Wirtz et al., 2019). Moreover, the expectations for AI-technologies and the opportunities they may bring are huge. These technologies are predicted to contribute greatly to society and to improve the quality of life by promoting economic growth, reduce costs, and increase quality and efficiency in both the public and the private sector. However, the rise in AI has also brought questions regarding how policymakers can manage the potential risks and challenges these technologies entails (Wirtz et al., 2020). Prominent AI-experts and tech industry executives have even gone as far as to argue for a temporary six-month pause in the development of AI to be able to control the associated challenges (Future of Life Institute, 2023). The rapid development of AI could arguably be seen as a problem that needs to be managed (Marchant, 2020).

This debate highlights the need to find a solution on how to manage the fast development of AI but at the same time utilize the benefit of these technologies. Thus, AI could be considered as a policy problem which requires to be handled. The reason for this is that a policy problem can be understood as a situation where a need or opportunity for improvement exists, which has not yet been fully addressed through policy actions (Peters, 2018). One way to address a policy problem is therefore to use policymaking to try to solve the issue in question. Taeihagh (2021) also explains that developing policies in the field of AI is important to enhance the benefits and at the same time manage the challenges these technologies entails. Hence, the title of this thesis 'Regulating the elephant in the room'.

To accommodate the issue of balancing the opportunities with the challenges, the European Commission (EC) proposed a new risk-based policy for harmonized rules regarding the development and use of AI within the EU in 2021 (European Commission, 2021). The proposed Artificial Intelligence Act (AIA) strives to improve the internal market by building a uniform framework that aligns with the values of the EU. Thus, the AIA will strive to balance the benefits of AI with the potential challenges it poses and promote responsible and ethical practices. The Act is expected to be the first international legal framework in the field of AI (European Commission, 2022). The ambition of the EU is thus to set the standard for the development and use of AI and become a global leader that others can follow.

In a complex environment such as the field of AI, policies can be used to try to find solutions to difficult problems (Taeihagh, 2021). By designing a policy well, it could hopefully solve the issues it strives to address (Howlett & Mukherjee, 2018). The challenge though is that policy problems usually are complex and concern a high level of ambiguity and uncertainty. The policymaking process also often involves a variety of stakeholders with different conflicting interests and values and the problems usually lack clear solutions. These characteristics are typical for wicked problem (Head & Alford, 2015; Peters, 2018). However, most policy problems do not meet all requirements to be considered as wicked (Peters, 2017). Nevertheless, they can still be complex policy problems that can have elements of wickedness and be difficult to manage. Developing an effective policy therefore becomes a difficult task to manage and several factors need be handled to succeed with the policymaking (Howlett & Mukherjee, 2018).

The proposed AI policy, the AIA, has received criticism from both scholars and the media for not being effective enough to be able to handle the challenges associated with AI (Barkane, 2022; Diaz, 2023; Hacker, 2021; Raposo, 2022; Rising, 2022; Van Kolfschooten, 2022; Varošanec, 2022). One major challenge concerns the definition of AI, which is claimed to be too broad and vague to be effective (Raposo, 2022). Another insufficiency concerns the regulation on harmful practices that is considered to not protect citizens' fundamental rights enough (Barkande, 2022; Hacker, 2021; Raposo, 2022; Van Kolfschooten, 2022). In addition, the requirements regarding accountability and transparency are perceived as non-effective (Raposo, 2022; Varošanec, 2022). The AIA is also accused of overlapping with other

legislations and territories of other institutions which could create conflicts between both norms and institutions (Raposo, 2022).

Thus, it is reasonable that the EU wants to create a policy to be able to utilize the benefits with AI, meanwhile manage the emerging challenges. However, the issue is not only to find the right solution, but the key is also to identify the right problem. Therefore, the policymakers must both define the policy problem accurately and design the policy well to be able to create an effective policy. In order to improve the draft of the AIA and develop an effective policy, the EU could take advantage of the opinions from relevant stakeholders it has received after member states, for instance Sweden, have had the AIA under public consultations. This thesis is based in this need for improvement and will address this issue by studying AI as a policy problem from the perspective of the Swedish stakeholders and examine what kind of challenges they identify with the AIA.

1.2 Outline of the study

This thesis will study policymaking in the context of AI with a dual focus. The study will examine how the Swedish stakeholders define AI as a policy problem, in particular concerning their identification of challenges associated with the AIA. By examining the perspectives of these stakeholders, the study aims to gain understanding for what kind of challenges remain to be addressed by the policy to create an improved policy. This will be done by using theory on challenges with AI, see chapter 2, and thematically analyse these challenges. The thematical analysis will be conducted on the comment letters that the Government Offices of Sweden has received from Swedish stakeholders after having the Act referred for consultation, see Appendix 1. The comment letters are of interest to study as the local stakeholders are the ones who will implement the policy on the street-level. The empirical analysis of the challenges can be found in chapter 5.

The examination of AI as a policy problem will take place in the analytical discussion in chapter 6. The discussion will be based on the findings from the empirical discussion which are used to understand how the stakeholders define AI as a policy problem through the identified challenges with the AIA. Here, the theory concerning policymaking, see chapter 3, will be used as a framework for the analytical discussion. Thereafter, the study discusses the potential

solutions framed by the Swedish stakeholders that suggest how to improve the policy to make it more effective. By taking advantage of the theory on policy framing in chapter 3, these solutions will be identified through looking for proposed policy interventions in the data. In the conclusion, this thesis provides recommendations for policymakers that can be used to create more effective policies in complex and uncertain environments. The recommendations will proceed from the empirical and analytical discussion.

1.3 Purpose and research question

Firstly, this thesis aims to study AI as a policy problem by examining the challenges with the AIA from the perspective of the Swedish stakeholders. The study therefore helps to identify stakeholders' perspectives on the policy problem and their concern on potential challenges the AIA might entail. Secondly, the thesis also discusses potential solutions to improve the AIA based on the framed solutions proposed by the Swedish stakeholders. The aim regarding this is to provide insight into how the AIA can be improved to become a more effective AI policy. Lastly, the thesis provides recommendations for policymakers to contribute knowledge on how to create effective policies concerning complex problems surrounded by a high level of uncertainty.

The research question has been developed from the first part of the purpose and is as following:
> ➢ How do the Swedish stakeholders define Artificial Intelligence as a policy problem; in particular, what kind of challenges do they identify with the Artificial Intelligence Act?

As the AIA is in its development phase, it is still possible to influence the Act. Thus, this study will use this opportunity to contribute knowledge that is useful for policymakers when going forward with making the policy. The study is relevant for both policymakers and society as it addresses critical issues that connect to the development of an effective AI policy, which is becoming increasingly important as AI rapidly increase its influence on society. In addition, the study is of relevance to scholars as it contributes with valuable knowledge regarding policymaking in complex environments that is surrounded by a lot of uncertainty.

1.4 Background to the development of digital technology policies within the EU

In the 2010s, the EU began to focus more on digital technology and developed initiatives that could drive the development and promote policymaking in the field (Carlsson & Rönnblom, 2022). AI was not an established policy area then and the attention was instead on technologies concerning digitalisation and information and communication technology. Between 2010 and 2015, the EC initiated and revised the action plan on eGovernment, established a High-Level Expert Group on Scientific Data and published a strategy for a Digital single market. In 2017, the EU declared their focus on promoting a more coherent and stronger 'Digital Europe' (European Council, 2017).

It was not until the mid-2010's that the EU identified AI technology as a policy area in need of attention (Carlsson & Rönnblom, 2022). Several EU institutions then began to request an ethical perspective on AI. As a result, the EC developed its first strategy on AI in 2018. The strategy highlighted the importance of collaboration, capacity-building and increased accessibility (European Commission, 2018). In addition, the strategy stressed the need to establish a legal framework for trustworthiness and ethical AI. At this point in time the High-Level Expert Group on AI was also established (Larsson, 2020). The group launched Ethics Guidelines for Trustworthy AI with a focus on accountability, data protection, and transparency in 2019.

In the same year, von der Leyen (2019) described the political directions for her presidency at the EC and explained that she would work to develop a harmonized strategy for AI within the EU. As a result, the White paper on AI was published in 2020 (European Commission, 2020). The aim with the paper was to highlight how AI technology could be used to a greater extent but also how the potential risks could be managed. The European Parliament (EP) then called for a new legal framework on AI that could regulate legal obligations and ethical principles for the development and use of AI. Thereafter, the EC got tasked to develop a legal framework, which resulted in the AIA being introduced in 2021 (European Commission, 2021). Globally, this would be the first legal framework concerning AI and the potential risks associated with these technologies (European Commission, 2022). The ambition of the EU was for Europe to become a global leader in the development and use of trustworthy AI.

The AIA will be used to regulate the development and use of AI technologies within the EU (European Commission, 2021). The regulation has four objectives which concerns that the AIA should promote: (1) safety and respect fundamental rights, (2) legal certainty, innovation, and investments, (3) governance and law enforcement, and (4) a single market with safe and trustworthy AI. The EC explains that the definition used for AI in the AIA strives to be future-proof and technologically neutral to be suitable for the fast pace of technological development in AI.

In the AIA, AI systems are defined as

> […] software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with […]. (European Commission, 2021, p.39).

The approaches and techniques mentioned in the definition are:

> (a) Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning; (b) Logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems; (c) Statistical approaches, Bayesian estimation, search and optimization methods. (European Commission, 2021, p.1).

Furthermore, the AIA has a risk-based approach where AI technologies are divided into the categories minimal- or low-risk, high-risk and unacceptable-risk (European Commission, 2021). The minimal- and low-risks are not regulated in the Act but are encouraged to voluntarily have codes of conduct where the requirements for high-risk AI are applied. The high-risk AI poses a threat to health, safety, and fundamental rights and meets stricter requirements and assessments to limit potential errors and to promote accountability and transparency. The category of unacceptable-risks consists of technologies that will be prohibited as they violate fundamental rights.

1.5 Delimitations

The study is delimited to examining the research question from the perspective of the Swedish stakeholders through their comment letter. By using comment letters, insight into the opinions of the implementers on the street-level regarding the AIA is accessed. The comment letters are

especially fruitful as they provide a broad picture of the present challenges from different perspectives on the street-level with stakeholders from both the public and private sector.

If the stakeholders in other countries have different challenges they found pressing, the delimitation of only looking at the Swedish stakeholders might overlook some issues. However, due to the principle of public access to information and secrecy present in Sweden, the Swedish comment letters were accessible and rich in information. The comment letters were also written in languages that I master, which was beneficial.

In addition, the study does not examine the perspectives of the members states which could have been useful. My perception though is that the comment letters written by the stakeholders are more detailed and nuanced in comparison to the memorandums written by the Swedish Government concerning the AIA. If this is similar for other countries as well, the comment letters could be a better choice to gain a deeper picture of potential challenges. These were the reasons for examining the Swedish stakeholders' comment letters.

2. Theory on challenges with Artificial Intelligence

There is a great need to develop effective regulations in the rapidly changing field of AI (Taeihagh, 2021). To accommodate this need and become a global leader by developing the first international legal framework concerning AI, the EC is in the process of creating the AIA (European Commission, 2022). However, the present form of the AIA has been accused of not being effective enough, in particular in managing challenges concerning AI (Raposo, 2022).

The intention with this chapter is to create an understanding for different challenges with AI. This knowledge will be used to study the research question regarding what kind of challenges the Swedish stakeholders identify with the AIA that will be examined in the empirical discussion in chapter 5. The theory used relates to the issues concerning (1) the definition of Artificial Intelligence, (2) the pacing problem, (3) AI technology implementation, (4) AI law and regulations, (5) AI ethics, and (6) AI society. The last four challenges originate from Wirtz's et al. (2019) Four-AI-challenges model that use a comprehensive perspective on AI challenges for the public sector.

2.1 Definition of Artificial Intelligence

The definition of what AI is, is central to even know what is being regulated (Larsson & Ledendal, 2022). A clear definition also makes it easier to understand AI and its implications. However, this might be complicated to achieve. The definition of AI is therefore perceived as a challenge of interest fort this thesis as the AIA is in the drafting process and it still is possible to influence how AI is defined and what the policy will cover.

One reason for the difficulty in understanding AI is that AI is a complex field where scholars have not yet agreed on a common definition and understanding of the concept (Gasser & Almeida, 2017; Larsson, 2020; Wirtz et al., 2019). In addition, Larsson (2020) explains that a variety of definitions for AI have been used through time, both by scholars and also by governmental institutions. The term AI is thought to date back to 1955 when McCarthy et al. (1955) initiated a research project at Dartmouth College. In the paper, AI was defined as an issue relating to "[…] making a machine behave in ways that would be called intelligent if a human were so behaving" (McCarthy et al., 1955, p. 11). Adams et al. (2012, p.28) on the other

hand define AI as "[…] a system that could learn, replicate, and possibly exceed human-level performance in the full breadth of cognitive and intellectual abilities.". Furthermore, Rosa et al. (2016, p.6) portray AI as "[…] programs that are able to learn, adapt, be creative and solve problems.". Kaplan and Haenlein (2019) have a similar interpretation of AI and define it as a system that can interpret and mimic data and solve problems through adapting the knowledge that it learns. Thierer et al. (2017, p. 8) instead define AI as "The exhibition of intelligence by a machine. An AI system is capable of undertaking high-level operations; AI can perform near, at, or beyond the abilities of a human.". Russel and Norvig (2016) take another approach and describe AI based on four categories, namely as systems that think and act humanly and systems that think and act rationally.

Wirtz et al. (2019) claim that it is relevant to first understand the terms of 'intelligence' and 'artificial' to then combine these to better understand what AI is. The authors define intelligence as both the capability to interact and learn and then use that knowledge, but also the ability to handle uncertainty and artificial as a human-made replica. The authors then continue by combining different scholars' definitions to create a broader, integrative understanding of AI. This results in the definition that AI is "[…] the capability of a computer system to show human-like intelligent behavior characterized by certain core competencies, including perception, understanding, action, and learning." (Wirtz et al., 2019, p. 599).

As seen above, scholars perceive the definition of AI very differently. Larsson et al. (2020) explain that it is important to find a working definition for AI and not use a definition that lists all possible digital systems. The reason behind this explanation is that AI is a phenomenon in movement that will continue to evolve (Larsson et al., 2020; Larsson, 2020). Haenlein and Kaplan (2019) also discuss the issues with trying to regulate AI as it independently and continuously evolves. Kaplan and Haenlein (2019) therefore question how strictly or vaguely AI should be defined.

Kaplan and Haenlein ask:

> Should AI be vaguely defined for legal purposes with the risk that everything could count as AI, or defined narrowly, focusing only on certain aspects? Or perhaps no definition is better in the hope that we know it when we see it. (Kaplan & Haenlein, 2019, p.22).

The reasoning behind this quote is the difficulty in regulating fast-developing AI technologies that continues to autonomously develop (Haenlein & Kaplan, 2019). It is also challenging to balance having a broad enough definition to future-proof the definition but at the same time also avoid that everything counts as AI.

This issue in balancing the definition is also present for the AIA as it is argued to be too broad and cover technologies that would not typically be considered as AI (Raposo, 2022). The argument for choosing a wide definition is that it future-proofs it and potentially stretches the life of the AIA. However, Raposo states that when regulating fast-developing technologies, the legislation will always become outdated at some point. The different potential approaches towards the definition are therefore seen as of interest to examine further in the empirical discussion in chapter 5.

2.2 Pacing problem

Ludlow et al. (2015) explain that regulatory regimes must be able to adapt to innovative evolutions and create a direction for emerging technologies. The issue for policymakers to keep up regulations with the technological development is called the pacing problem (Ludlow et al., 2015; Marchant et al., 2011; Swedish Agency for Growth Policy Analysis, 2022). This problem is seen as a challenge of interest fort this thesis to examine based on the AIA. The reason for this is that the EC is trying to regulate an emerging technology in the form of AI, which potentially could be affected by the fast pace.

The pacing problem concerns the inability to keep up the pace of legislation with the speed of the technological development (Kaal, 2016; Ludlow et al., 2015; Marchant et al., 2011; Swedish Agency for Growth Policy Analysis, 2022; Thierer, 2020; Wallach & Marchant, 2018). The difference in pace makes it difficult for policymakers to understand and regulate new innovations (Swedish Agency for Growth Policy Analysis, 2022). In addition, policymakers are also challenged as they must balance conflicting interests such as innovation and safety. Though, Ludlow et al. (2015) also explain that it is important to develop a regulatory framework that can benefit from the emerging technologies but at the same time manage the risks.

One approach to develop a more sustainable and future-proof policy is to keep the regulation technologically neutral (Butenko & Larouche, 2015). Technological neutrality means that policies and regulations are neutral towards technologies used and instead focuses on achieving desired outcomes, which makes the policies more sustainable over time. The reason for this is that if the regulation is technological precise, the policy risk becoming outdated faster as the regulatory targets, the technologies, might change quickly. Hence, a technologically neutral regulation is argued to be more future-proof and less sensitive to variation.

Furthermore, the Swedish Agency for Growth Policy Analysis (2022) states that the pacing problem creates policy challenges that need to be addressed to succeed with a policy. Taeihagh et al. (2021) identify four different policy challenges relating to the pacing problem. These concerns (1) asymmetries in policy, (2) policy uncertainty, (3) structural policy dynamics, and (4) errors in design of interventions and policy responses. The first policy challenge concerns asymmetries in policy and states that asymmetry arises from the difference in knowledge between the regulator and the developer in relation to how the high-tech innovations operate, how they can be used and the consequences of them. The developer can then use this information advantage regarding the innovation's potential and limitations in their favor. As technological development is intensifying, it becomes increasingly difficult for policymakers to try to regulate a field where they do not know what is possible or feasible. The second policy challenge relates to policy uncertainty which occurs as regulators are unaware of the nature of a certain policy problem that they want to address. This could make it difficult to know what regulation could be implemented to solve the challenge. In addition, the uncertainty also lies in the challenge of predicting the development and implications of a certain policy. If the policymakers are aware of the uncertainty when regulating innovations, this might create a sensible approach. Another policy challenge connects to structural power dynamics. This challenge concerns the struggle between different groups, where some are benefited from the development and use of technologies while others lose. The power dynamics can affect political decisions and result in either too many regulations of technologies or not enough regulations. The last policy challenge concerns errors in the design of interventions and policy responses and it relates to the balance that policymakers need to be mindful of between economic interests and interests of society and citizens that are affected by the technologies. This trade-off

therefore also risks overregulating friendly technology, which inhibit innovation and delay the deployment and underregulating inferior innovations that are harmful to society and citizens.

The different issues concerning the pacing problem will be used to examine what kind of challenges the Swedish stakeholders identify in the empirical discussion in chapter 5. This is useful to understand how the pace might be perceived as a challenge for the AIA in terms of both the fast-development, in creating a technologically neutral Act and regarding the four policy challenges mentioned by Taeihagh et al. (2021).

2.3 Four-AI-challenges model

Wirtz et al. (2019) explain that AI has potential to contribute to society and citizens. However, several challenges with AI also need to be managed in order to not obstruct the implementation of AI technologies. Wirtz et al. therefore argue that there is a growing demand to understand the scope and impacts of challenges connected to AI, especially for the public sector. To contribute with knowledge, they examine the literature on challenges connected to AI in the public sector and create a model that describes AI- challenges in the public sector. The model is called the Four-AI-challenges model and builds on the categories (1) AI technology implementation, (2) AI law and regulations, (3) AI society, and (4) AI ethics. Each of these challenges also has sub-challenges. The Four-AI-challenges model is comprehensive and is therefore perceived as useful to examine what kind of challenges the Swedish stakeholders identify with the AIA. Hence, this thesis will proceed from the model when examining the challenges highlighted in the comment letters. The challenges are also complemented with other perspectives on challenges as the data highlights other relevant challenges.

2.3.1 AI technology implementation

The implementation of AI technology poses a major challenge to the public sector (Wirtz et al., 2019). To utilize the potential with AI, it is important to have a deliberate process at the implementation stage. In relation to this, the authors identify the sub-challenges (1) AI safety, (2) system/data quality and integration, (3) financial feasibility, and (4) specialization and expertise.

AI safety concerns general security issues and is focused on ensuring that the impact and performance of AI technologies are safe (Wirtz et al., 2019). Security risks occur if AI learns bad behavior or if it misunderstands context or given information. On the same topic, Bostrom and Yudkowsky (2014) also highlight that it is important from a safety perspective that AI technologies are robust against manipulation. When implementing AI technology, it is therefore important to prevent risks and ensure safe functions of the applications (Wirtz et al., 2019).

The next sub-category relates to the system or data quality and integration (Wirtz et al., 2019). Thierer et al. (2017) describe data as the driver of the AI system. This means that the intelligence of the AI is dependent on the intelligence of the available data (Wirtz et al., 2019). If the quality of the data is low or untrusted, it affects how smart the AI system can become and might lead to failure in the implementation process. Thus, Mehr (2017) states that it is central to collect, store and use unbiased, high-quality data to succeed with the implementation of technologies.

Another sub-challenge concerns the financial feasibility of the implementation (Wirtz et al., 2019). The budget is one major challenge in this aspect, and it is vital to examine the total costs and expected revenues before implementing the AI to see if the application will be profitable. Two major cost drivers are the great investments needed to collect and store data and the highly demanded AI experts that are capital intensive in terms of both education and salaries. Hence, the financial feasibility is important for the implementation of AI technologies.

Wirtz et al. (2019) also identify specialization and expertise as one important sub-challenge. As the use of AI applications has exploded in recent years, the demand for AI specialists and experts that can support the development and implementation has also rapidly increased. However, as the demand is high and the supply is low, there is a gap in experts that can facilitate the development and implementation of AI. Accordingly, it is vital that governments promote education and competence-building in AI to be able to implement these technologies.

2.3.2 AI law and regulations

AI law and regulations concerns the challenges connected to the governance of AI and the capacity to administer and control the AI systems (Wirtz et al., 2019). In the light of this, Wirtz

et al. observe the sub-challenges (1) governance of autonomous intelligence systems, (2) responsibility and accountability, and (3) privacy/safety.

The sub-category regarding governance of autonomous intelligence systems concerns the challenge in managing and controlling decision-making and actions connected to the black boxes of AI (Wirtz et al., 2019). This means that stakeholders need to consider values such as accountability, fairness and transparency when handling AI and develop mechanisms that are coherent with these values to be able to reduce risks and failure (Gasser & Almeida, 2017). Thus, the challenge regarding law and regulations is to develop standards that can ensure these values and at the same time establish flexible systems for governing the AI.

The second sub-challenge regarding responsibility and accountability relates to the issue of establishing a distinct legal status (Wirtz et al., 2019). Here. the issue is to decide on who is responsible over the decision-making and effects of the AI technology. For instance, is it the AI itself that is accountable for negative externalities? Or could it be the authorities, the designer, or the operator that have to take responsibility over potential failures? Johnson (2015) questions if developers or operators can be responsible for actions of autonomous AI as they might not be able to control or foresee its actions. However, this is not the common understanding as De George (2003) argues that humans should always be accountable for the technologies' implications. To make clear who is responsible and avoid gaps, it is therefore important that policymakers clarify the legal status (Johnson, 2015; Wirtz et al, 2019).

The last sub-challenge relating to law and regulations concerns privacy and safety (Wirtz et al., 2019). Privacy violations are unlawful surveillance or wrongful intrusions or interference in the individual's actions. To promote privacy and safety, data should be collected and managed with consent and be processed in line with existing regulations. The issue for policymakers is to create a policy that can balance the development of sophisticated AI systems that can ensure privacy and safety with a flexible system that can adapt to new technological developments.

2.3.3 AI ethics

One major challenge that Wirtz et al. (2019) discuss regards AI ethics and states that it is important to develop AI that can be justified ethically. In addition, the developer should also

create AI that has embedded ethical principles and can recognize norms and standards. This challenge includes the sub-challenges (1) AI rulemaking for human behavior, (2) compatibility of machine versus human value judgment (3), moral dilemmas, and (4) AI discrimination.

The sub-challenge regarding AI rulemaking for human behavior concerns the implications that AI-made decisions might lead to (Wirtz et al., 2019). This covers the process when AI tries to mimic humans and think and act rational, but instead misunderstand the given information, which causes damage. To avoid this, it is important that the data used for the AI is not biased or of low quality. Another challenge regarding this is that human behavior might be affected by irrational characteristics such as emotions or consciousness (Banerjee et al., 2017). These traits might be difficult to achieve for the AI and it is questionable if it is possible to justify AI's rulemaking for human behavior as it cannot feel emotions (Wirtz et al., 2019).

Another sub-challenge relates to the compatibility of machine versus human value judgment (Wirtz et al., 2019). This challenge arises because these judgments differ as humans have specific traits and principles that machines lack. Turilli (2007) thus argues that it is important to impose the ethical principles of humans to the AI to promote ethical practices. However, it could be difficult to define and develop these human principles (Mittelstadt et al., 2016).

The sub-challenge about moral dilemmas focusses on situations where the AI must make choices that might involve conflicting options (Wirtz et al., 2019). This could also include facing a dilemma where the AI needs to choose between two bad alternatives or make life and death decisions. Hence, it is vital that the AI has ethical reasoning when making decisions

The last sub-challenge regarding ethics relates to AI discrimination and concerns the challenge to prevent AI from acting unequal or unfair and to detect discriminatory behavior (Wirtz et al., 2019). One risk regarding discrimination is that AI systems may profile people and therefore violates ethical principles (Thierer et al., 2017). AI systems are also programmed by humans who might be biased or have discriminatory values, which could influence the systems (Citron & Pasquale, 2014). Even though many attempts have been made to try to counteract AI discrimination, it seems to persist and further detection and implementing mechanisms for prevention of AI discrimination is needed (Mittelstadt et al., 2016).

2.3.4 AI society

The last dimension of challenges raised by Wirtz et al. (2019) is AI society. This perspective focuses on the societal challenges that arise as AI has increased its influence on society and citizens. As the potential risks and damages caused by AI are difficult to predict, this raises concerns for the future. The sub-challenges that connect to society are (1) workforce substitution and transformation, (2) social acceptance/trust in AI, and (3) transformation of human-to-machine (H2M) and machine-to-machine (M2M) interaction.

The sub-challenge about workforce substitution and transformation reflects the consequences AI potentially could have on the labour market (Wirtz et al., 2019). In this regard, people are concerned that AI will lead to increased automation where machines take over humans' tasks. In the long run, people thus fear that this will result in increased unemployment in society. Another challenge concerning the workforce is that it needs to be transformed as new skills related to AI are demanded on the labour market.

Another sub-challenge concerns the need for social acceptance and trust in AI to be able to succeed with the implementation of AI (Wirtz et al., 2019). Issues that could negatively affect the social acceptance and trust in AI are for example regarding the ethics of these technologies, the lack of control of these systems and the negative effect on the workforce. Thus, acceptance and trust are closely linked to other challenges mentioned previously in this chapter such as regarding AI discrimination, privacy, and safety. Accordingly, it is important to reduce the social concerns to promote the acceptance of AI to be able to successfully initiate the future AI.

The last sub-challenge refers to the transformation in interaction between humans and machines and the communication between machines (Wirtz et al., 2019). Even though machines might learn to recognize patterns in speech or gestures, they do not recognize cognitive aspects, which could create miscommunication between the human and machine. The issue regarding communication between machines occurs as humans lack control as they are not involved in the interaction. This might lead to that humans do not understand the interaction, which creates issues concerning accountability and transparency.

To conclude, the challenges in the Four-AI-challenges model are useful to examine the challenges the Swedish stakeholders identify with the AIA in a comprehensive manner. The reason for this is that the four challenges comprise major challenges and consider different angles of potential challenges.

2.4 Summary of theory on challenges with Artificial Intelligence

This chapter contributes with theories on challenges with AI that will be used to examine what kind of challenges the Swedish stakeholders identify in the empirical discussion in chapter 5. The major challenges and their sub-challenges that will be used for the thematic analysis that the empirical discussion will be based on are the themes and codes below in table 1.

Table 1. Challenges with Artificial Intelligence

Major challenges	Sub-challenges
The definition of Artificial Intelligence	➢ Lack of a common definition ➢ Vague and broad definition ➢ High-risk AI ➢ Unaccepted-risk
The pacing problem	➢ The fast development ➢ Technological neutrality ➢ Asymmetries in policy ➢ Policy uncertainty ➢ Structural policy dynamics ➢ Errors in design of interventions and policy responses
AI technology implementation	➢ AI safety ➢ System/data quality and integration ➢ Financial feasibility ➢ Specialization and expertise
AI law and regulations	➢ Governance of autonomous intelligence systems ➢ Responsibility and accountability ➢ Privacy/safety
AI ethics	➢ AI rulemaking for human behavior ➢ Compatibility of machine versus human value judgment ➢ Moral dilemmas ➢ AI discrimination
AI society	➢ Workforce substitution and transformation ➢ Social acceptance/trust in AI ➢ Transformation of human-to-machine (H2M) and machine-to-machine (M2M) interaction.

3. Theory on policymaking

This chapter begins describing the policymaking process to understand where in the process the AIA is located. Thereafter, the chapter continues with explaining what a policy problem is, how it is framed and what a complex policy problem is. This knowledge is used to explain how a complex policy problem can be constructed to analyse the construction of AI as policy problem further on in chapter 6. The last part of the chapter regarding factors to create an effective policy will be used to discuss potential solutions to improve the AIA and recommendations for making effective policies in complex situations surrounded by a high level of uncertainty.

3.1 Policymaking process

A policy can be understood as "the programmatic activities formulated in response to an authoritative decision." (Matland,1995, p.154). The policymaking process is a complex process that includes different stages (Howlett & Mukherjee, 2018; Peters, 2018; Vedung, 2016). This thesis will take different stages of the policy process into consideration as they are important for the policymaking of the AIA. Though, the focus will be on the definition of the policy problem and the design of the policy as that aligns with the research question and the stage in the policymaking process the AIA is located in.

The policymaking process and the initiating of new legislation can be traced back to societal changes and begins with concerns to examine a certain problem (Luimes, 2023). The first step of the process is usually that a problem in need of solving gains attention (Luimes, 2023; Peters, 2018; Vedung, 2016). This was also the case for the AIA as the EC identified the need to create a policy that utilizes the benefits of AI but at the same time manage the risks (European Commission, 2021). The process continues with relevant stakeholders trying to decide how to rectify the problem. The next step in the policymaking process is to design the policy in an effective way to be able to solve the policy problem (Howlett & Mukherjee, 2018; Peters, 2018; Vedung, 2016). This is where the AIA is now as it is in the drafting stage (Government Offices of Sweden, n.d.). After the EU has decided on the policy, it enters into force in Sweden. The next step in the process is the implementation of the policy (Howlett & Mukherjee, 2018; Peters, 2018; Vedung, 2016;). Implementation can be understood as "to carry out, accomplish, fulfil, produce, complete." a policy (Pressman & Wildavsky, 1973, p.xiii). The local stakeholders on the street-level are the ones implementing the policy in practice (Lipsky, 2010). However,

policymakers can try to influence the implementation by steering the policy in the desired direction (Lundquist, 1972).

3.2 Policy problems

Peters (2018) explains that a policy problem can be understood as when a need, opportunity or value for improvement exists but has not yet been fully addressed through policy actions. This thesis will therefore argue that AI could be considered as a policy problem which requires to be handled. Thus, the AIA is the EU's response to manage the problem. Knowledge about policy problems, how they and their solutions can be framed, how they are complex and what factors that can support the creation of an effective policy is valuable to fulfill the purpose of this thesis. Accordingly, this sub-chapter will explain theory on this subject further.

Policymaking is a way to try to solve a policy problem, even though it might be difficult (Peters, 2018). Furthermore, defining the policy problem is a fundamental part of the policymaking process and it is vital to be able to create an effective policy (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). According to Brunner (1991), the risk with not defining the policy problem well is that the policy might not be effective in solving the problems it aims to address. In addition, an effective policy requires knowledge of what the actual issue is which the policy strives to address to be able to find a suitable solution to the problem (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). The risk is otherwise that the optimal solution is being delayed as the incorrect definition might lead to involving tools and stakeholders that are not appropriate or relevant (Peters & Howlett, 2005). Consequently, it is challenging to define the policy problem in a meaningful way.

3.2.1 Framing policy problems and solutions

A policy problem is recognized as something that does not just exist, but rather something that is framed and constructed by the stakeholders (Luimes, 2023; Wolman, 1981). This is due to the fact that problems can be understood from different perspectives and have implications for multiple values or factors (Chong & Druckman, 2007; Luimes, 2023). The depiction of a matter is therefore understood as framing. Framing can be explained as "the process of selecting, emphasizing and organizing aspects of complex issues according to an overriding evaluative or

analytical criterion." (Daviter, 2007, p. 654). This definition portray framing as a form of sense-making of reality (Luimes, 2023).

In framing, some aspects of an issue and reality are emphasized while other parts of the issue and reality are left out (Luimes, 2023). Knowledge, interests, beliefs, and values are structured as part of the frame for the framing of the policy problem and the solutions. Accordingly, frames translate a situation perceived as uncertain or problematic into a policy problem (Laws & Rein, 2003). When the policy problem has been framed, dimensions that are relevant from a policy perspective are evaluated to be able to decide on their causes (Turnpenny et al., 2015). The better the understanding of the causes, the higher is the probability that the policy will succeed with managing the problems it aims to address (Wolman, 1981). However, the causes of the problem can also be understood differently depending on interests and perceptions (Turnpenny et al., 2015). Thereafter, the appropriate policy responses need to be decided on. The frame implies potential policy actions (Laws & Rein, 2003). Thus, these also involve disagreements on what response is the most suitable (Luimes, 2023; Turnpenny et al., 2015). The reason for this is that policy solutions are framed (Luimes, 2023).

3.2.2 Complex policy problems

As framing of a policy problem involves defining the policy problem that need to be addressed, it is necessary to depict current policy problems (Luimes, 2023). One form of current policy problems are the wicked problems. Wicked problems are complex issues that are difficult to define, involve a variety of stakeholders with conflicting interests and lack clear solutions (Head & Alford, 2015; Peters, 2017; Peters, 2018). Consequently, they exist in a complex environment and are surrounded by a high level of uncertainty.

Marchant (2020) argues that emerging technologies such as AI could be seen as wicked problems. One reason for this is that these technologies are difficult to comprehensively regulate as the policymakers usually lack the legal authority to do so and requires a high level of coordination as they span over sectors and across international borders. In addition, it is challenging for policymakers to try to regulate a fast-developing technology and the regulatory response struggles to keep up with the development. Managing these wicked problems therefore

becomes complex as many stakeholders are involved with different interests and goals, which also requires coordination across sectors and country borders.

Peters (2017) is critical of the explanation of policy problems as wicked issues. The argument for this reasoning is that a small number of problems meet all the ten characteristics that defines wicked problems. This thesis will not delve further into these ten characteristics as the thesis will discuss AI as a complex policy problem and not a wicked problem. Nevertheless, Peters (2017) states that even if a policy problem is not wicked, it can still be very complex and difficult to solve in a definite way. Therefore, policy problems can still be complex and include several of the characteristics used to define a wicked policy problem. Peters also states that it can nevertheless be important to gain insight into how stakeholders understand complex problems to be able to link these problems to potential solutions.

3.3 Factors to create an effective policy

Taeihagh (2021) explains that policymakers need to understand the challenges that AI poses to enhance the benefits it entails. However, this might be difficult as the field is rapidly changing, which obstructs the regulatory response. Consequently, there is a great need to develop new, effective regulations to manage these challenges and navigate the AI landscape. As this thesis will discuss possible policy solutions based on the framed solutions proposed by the Swedish stakeholders, factors to create an effective AIA are relevant to point out to enable the discussion.

Making of an effective policy requires that several factors are considered (Howlett & Mukherjee, 2018). Effectiveness in the case of policymaking can be seen as the goal of the policy design as it covers how well the policy achieves the set goals it strives towards. McConnel (2010, p.351) also explains that "A policy is successful if it achieves the goals that proponents set out to achieve and attracts no criticism of any significance and/or support is virtually universal.". This definition therefore focuses on both goal achievement and the interpretation of the goals (McConnel, 2010).

One factor that needs to be managed to create an effective policy is the high level of uncertainty and ambiguity usually connected to policymaking (Hertting, 2018; Howlett & Mukherjee, 2018; Matland, 1995; Peters & Hornbeek, 2005; Stone, 2012; Vedung, 2016). Uncertainty may

occur as policies often strive to manage complex issues that involve a variety of different stakeholders with different interests and values (Howlett & Mukherjee, 2018; Matland, 1995). In addition, these problems often appear in complex environments that involves conflict, which makes it difficult to find a common ground for which type of policy would be most effective and successful. Nevertheless, it is more likely that a policy that is well-designed can succeed in solving the issues it strives to address over a policy that is insufficient in its design or non-designed (Howlett & Mukherjee, 2018).

Howlett and Mukherjee (2018) state that uncertainty and ambiguity can affect the effectiveness of a policy negatively if it fails to achieve the pre-defined goals and solve the issues it strives to manage. Furthermore, Vedung (2016) explains that the ambiguity hinders the implementation of the policy if suboptimal and inconsistent arrangements occur when the local implementers try to interpret the vague policy. The reason for this is that the local implementers are realizing the policy and therefore important parts in creating effective policy (Hjern, 1982; Hjern & Hull, 1982; Hull & Hjern, 1982). The local implementer or street-level bureaucrats as Lipsky calls them, influence the performance of the policy by using their discretion (Lipsky, 2010). The risk with this is that a gap occurs between the policy in theory that has been developed by policymakers and the policy in practice when implemented on the street-level. Thus, the gap between the policy goals and the practical outcome shows how effective the policy is (Lundquist, 1972). The risk is therefore that the discretion could result in poor goals performance if the goals of the street-level and top-level differ (Matland, 1995).

Accordingly, one important factor to succeed with policy implementation is to create consistent and distinct goals (Bardach & Patashnik, 2020; Gustafsson & Richardson, 1979; Mazmanian & Sabatier, 1989; Stone, 2012; Van Meter & Van Horn, 1975). In addition, the policy can also be made successful by explaining how these goals can be achieved (Bardach & Patashnik, 2020; Gustafsson & Richardson, 1979; Stone, 2012). However, Matland (1995) argues that the political aspect becomes overlooked in this case as goals might not be clear or consistent in practice. Hence, there are also advantages with making an ambiguous policy (Hertting, 2018; Matland, 1995; Peters & Hoornbeek, 2005; Stone, 2012;). One advantage of having an ambiguous policy is that it is more likely to be accepted as different stakeholders with conflicting interests then can interpret the regulation in a way that suits them (Matland, 1995).

Stone (2012) also claims that the vagueness is used to unify stakeholders and receive their support to accept a new law. This means that as the policymakers need to balance competing interests and values, it might be easier to combine these if the policy is ambiguous. The vagueness thus enables the stakeholders to interpret the policy in a manner they prefer in accordance with their environments and conditions.

3.4 Summary of theory on policymaking

This chapter has described the policymaking process, what a policy problem is, the framing of policy problem, complex policy problems and factors to create an effective policy. The presented theory is valuable to fulfill the purpose of this thesis. In the analytical discussion in chapter 6, the theory will be used to understand AI as a complex policy problem through the frames constructed by the Swedish stakeholders. The section about factors to create an effective policy will be used to discuss potential solutions to improve the AIA in accordance with the solutions proposed by the stakeholders. Hence, this study focuses on the frames presented in the comment letters describing policy problems and solutions emphasising challenges with the AIA. In the conclusion of this thesis, I will provide recommendations for policymakers to promote the making of effective policies in complex situations surrounded by a high level of uncertainty based on the knowledge gained in the empirical and analytical discussion. Table 2 below is a short summary of the main points from the chapter about theory on policymaking.

Table 2. Summary of theory on policymaking

Policy problems	➢ An existing need for improvement has not been addressed
	➢ Defining and understanding the policy problem is key to create an effective policy and find solutions
	➢ Policy problems are constructed and framed according to different perspectives and knowledge, interests, beliefs, and values
Complex policy problems	➢ Complex policy problems are difficult to define and involve many stakeholders with conflicting interests
	➢ Complex policy problems usually lack clear solutions
Creating effective policy	➢ Need to manage the high level of uncertainty and ambiguity
	➢ Complexity makes it difficult to find common ground
	➢ Design the policy and do it well.
	➢ Need to create distinct goals and state how these can be achieved
	➢ Ambiguity affects the prerequisites to achieve goals and results in suboptimal and inconsistent arrangements
	➢ Ambiguity unites opposing stakeholders and conflicting interests

4. Method

This chapter begins with describing the methodologic arguments for the chosen method and then continues to elaborate on the ethical aspects that need consideration for this thesis. Lastly, the chapter explains how the method has been implemented when conducting the study.

4.1 Methodologic arguments

The methodological arguments are used to explain why the qualitative, documentary study and the thematic analysis were chosen for this thesis.

4.1.1 Qualitative document study

The choice of method for this thesis was a qualitative, documentary study. The reasons for choosing this approach are several. Firstly, data used in qualitative studies can be collected from available documents such as policy documents (Funck & Karlsson, 2021; Patel & Davidson, 2011). This form of method is useful to understand the content of documents (Lindstedt, 2017). As the data for this thesis was collected from public documents in the form of comment letters, a documentary study was an adequate choice.

Secondly, this approach includes categorizing large amount of data where the categories represent content or meaning, which creates a deeper knowledge for the research topic (Funck & Karlsson, 2021). The qualitative approach is also valuable to understand nuanced contents of data that might not be visible on the surface (Alvehus, 2019). The qualitative approach was therefore valuable to gain a deeper knowledge of AI as a policy problem by examining the challenges with the AIA framed by the Swedish stakeholders. The approach was also useful to discuss the solutions suggested by the stakeholders that potentially could improve the AIA and to provide recommendations for policymakers on how to create effective policies concerning complex problems in uncertain environments. To conclude, the method used was a suitable choice as it created a deeper knowledge of the contents of the comment letters and provided a nuanced understanding to fulfill the purpose and research question.

4.1.2 Thematic analysis

According to Tight (2019), the thematic analysis is a form of content analysis where the scholar identifies recurrent themes in the data. Braun and Clarke (2006) agree with this and state that it

is used not only to find themes or patterns, but also for analysing them. This analysis was helpful to gain an understanding for the occurring themes and patterns concerning the challenges connected to the AIA and the proposed solutions. The patterns showed what themes, the challenges, and what codes, the sub-challenges, were present in the material to condense these in the empirical discussion to understand what kinds of challenges the Swedish stakeholders identify.

Braun and Clarke (2006) continue by highlighting that the thematic analysis provide rich and complex data and that it is flexible to use, both for analysing existing theoretical frameworks, but also to unravel what is unknown. By using a theoretical thematic analysis top-down analyst-driven approach, the analytical interest is in focus and the research question can evolve from the process of coding the material. Thus, the thematic approach was a suitable choice for this thesis to be able to uncover complex data by exploring themes and patterns of constructed challenges and their associated solutions in the material. This knowledge could then be used to discuss potential solutions to improve the AIA and recommendations for the policymakers.

This approach was made possible by using an abductive approach where the material was analysed through the Four-AI-challenges model. However, while the material was systematically processed, other challenges of interest that were not part of the model unravelled. These concerned the issue of defining and the problem and the issue of regulating a fast-developing technology. Theory on these challenges were also added after processing the data. The reason for this was that it revealed a more nuanced and accurate picture of the challenges posed by the AIA. The flexibility and possibility to capture what is both known, and unknown was therefore useful for this thesis.

4.2 Implementation of the method

The sub-chapter about the implementation of the method explains how the selection of comment letters were made and how the data was processed when conducting the study.

4.2.1 Selection of comment letters

As the thesis aims to identify the challenges from the perspective of the stakeholders, the material in form of comment letters was suitable. Furthermore, Lindstedt (2017) argues that

Sweden is a fitting case to use for documentary analysis due to the principle of public access to information with great amounts of accessible public documents. The choice of Swedish stakeholders and public documents was therefore useful to access a great amount of data. The documents were also written in languages, Swedish and English, that I master, which also was beneficial. As mentioned in 1.5 on delimitations, the comment letters were also selected as they provided a nuanced picture of the challenges from a variety of perspectives.

The Government Offices of Sweden (2021) asked 130 stakeholders to provide their responses to the AIA through comment letters. The authorities subordinate to the Government were obliged to respond, while other stakeholders had the possibility to give their opinion if they wanted to. Out of 130 stakeholders that were asked, 100 stakeholders gave their responses through the comment letters. These 100 comment letters were published on the Government Offices webpage. In addition, other stakeholders that were not asked to send their responses could also send their remarks on their own initiative. These were not published on the webpage.

The comment letters written by stakeholders that were not asked to respond by the Government Offices were also requested from the registrar at the Ministry of Rural Affairs and Infrastructure. The registrar had received ten stakeholders' comment letters that were sent on the initiative of the sender. These were also used for this thesis to be able to analyse all relevant incoming comment letters concerning the AIA.

To conclude, all 110 incoming comment letters, both the published and unpublished, were collected and processed in the initial stage of working through the data. However, to promote reliability and validity, it was important to select the documents that connected to the study and could help to answer the research question and to fulfill the purpose. Out of the 110 incoming letter, 84 were relevant and related to the study and research question. Thus, these 84 comment letters were chosen to be analysed. References to the 84 chosen comment letters can be found in Appendix 1. The comment letters excluded from the continued data processing were not used because they either had no opinion or because they did not elaborate on risks or challenges at all. Most of the comment letters that did not share their opinion stated that it was because of the short deadline set to answer or as the issue was too complex. Table 3 below will clarify the number of incoming and selected comment letters.

Table 3. Incoming and selected comment letters

Asked to respond by the Government	Asked to respond by the Government who gave their responses	Not asked by the Government but responded	Total number of incoming responses	Number of relevant responses to study
130 comment letters	100 comment letters	10 comment letters	110 comment letters	84 comment letters

4.2.2 Data processing

Reliability is important for a study as that means that the material collected is connected to the study and is reliable (Funck & Karlsson, 2021). Validity on the other hand is central as it concerns to what extent a paper really examines what it is aimed to study. According to Funck and Karlsson, documenting the choices promote reliability and validity. The implementation of the method was therefore documented throughout the process to be clear and transparent with the choices made.

Bryman (2018) explains that it is relevant to begin reading through the material and become familiar with the data. At this stage, the researcher can also begin by writing notes for initial ideas (Braun & Clarke, 2006). For this study, this meant that all 110 comment letters were systematically read through and initial notes for codes and themes related to challenges were written down. I was looking for patterns, characteristics, metaphors, and repetitions concerning knowledge, interests, beliefs or values relating to challenges with the AIA. This was done manually, and the initial ideas were noted in a Word document. As mentioned in sub-chapter 4.2.1, at this stage the 84 comment letters, see Appendix 1, that were of interest and included information that could be relevant for this study were chosen for further examination.

As explained in sub-chapter 4.1.2, the thematic analysis in the paper has a top-down theoretical approach where the themes were already chosen being the four major challenges from the Four-AI-challenges model namely (1) AI technology implementation, (2) AI law and regulations, (3) AI ethics, and (4) AI society. The 14 initial codes were the sub-challenges belonging to these four challenges which are (1) AI safety, (2) system/data quality and integration, (3) financial feasibility, (4) specialization and expertise, (5) governance of autonomous intelligence systems, (6) responsibility and accountability, (7) privacy/safety, (8) AI rulemaking for human behavior,

(9) compatibility of machine versus human value judgment, (10) moral dilemmas, (11) AI discrimination, (12) workforce substitution and transformation, (13) social acceptance/trust in AI, and (14) transformation of Human-to-Machine (H2M) /Machine-to-Machine (M2M) interaction.

Though, the approach was abductive, which made it possible to add other themes of interest later if needed. During the stage of familiarizing with the material, common characteristics, patterns, and repetitions occurred that could be relevant for the study. Bryman (2018) and Tight (2019) claim that this is usually a way to identify themes of interest. These occurring patterns of challenges that were not part of the Four-AI-challenges model were also added as themes. The added themes were (1) the definition of Artificial Intelligence and (2) the pacing problem. Initial codes for these themes were also decided on. The four initial codes for the definition of Artificial Intelligence were (1) the lack of a common definition, (2) the vague and broad definition, (3) high-risk AI, and (4) unaccepted-risk. The six initial codes for the pacing problem were (1) the fast development, (2) technological neutrality, (3) asymmetries in policy, (4) policy uncertainty, (5) structural policy dynamics, and (6) errors in design of interventions and policy responses.

Boréus and Kohl (2018) explains that a manually coding through a program such as Nvivo makes it possible to make more complex interpretations of the data. Hence, Nvivo was used when processing the data for this thesis. The whole material was systematically processed and coded in clusters of references from the text in accordance with both the predetermined themes and codes and the added themes and codes. References in this case are sentences or paragraphs that belongs to a certain code. Through the data processing, 679 relevant references were found.

Bryman (2018) explains that after developing the themes and codes and coding the full dataset, these should be assessed to make sure that they are relevant for the study. This was also done for this study to ensure that all themes and codes were valid and distinct. The six themes previously found were still relevant, however, two initial codes belonging to the Four-AI-challenges were deleted as they were not accurate in relation the data. These were (1) compatibility of machine versus human value judgment and (2) moral dilemmas. After removing these, 22 codes in total were used. Table 4 below shows the final themes and codes

that were used for the thematic analysis that were the basis for the condensed empirical discussion.

Table 4. Final themes and codes

Themes	Codes
The definition of Artificial Intelligence	➢ Lack of a common definition ➢ Vague and broad definition ➢ High-risk AI ➢ Unaccepted-risk
The pacing problem	➢ The fast development ➢ Technological neutrality ➢ Asymmetries in policy ➢ Policy uncertainty ➢ Structural policy dynamics ➢ Errors in design of interventions and policy responses
AI technology implementation	➢ AI safety ➢ System/data quality and integration ➢ Financial feasibility ➢ Specialization and expertise
AI law and regulations	➢ Governance of autonomous intelligence systems ➢ Responsibility and accountability ➢ Privacy/safety
AI ethics	➢ AI rulemaking for human behavior ➢ AI discrimination
AI society	➢ Workforce substitution and transformation ➢ Social acceptance/trust in AI ➢ Transformation of human-to-machine (H2M) and machine-to-machine (M2M) interaction.

To continue, the next step in a thematic analysis is to analyse the material and highlight the themes (Braun & Clarke, 2006). This can be done by providing quotations or examples from the data (Tight, 2019). By doing this, the scholar shows that the themes are of importance (Braun & Clarke, 2006). For this study, the empirical finding can be found in chapter 5. The empirical discussion accounts for the framing of challenges and solutions made by the stakeholders. The discussion includes examples and quotations from the comment letters that stresses their perception and highlight the importance of the themes. As some comment letters were written in Swedish, I have made my own translation for the quotes used from these. The original quotes and my own translations can be found in Appendix 2.

Furthermore, to be able to analyze AI as a policy problem as framed by the stakeholders, I needed to link the policy problem analysis to the thematic analysis. Based on the stakeholders' identifications of challenges with the AIA, I was focusing on how the stakeholders framed AI as a policy problem and what policy solutions they framed as answers to these challenges. To recognize elements that suggested that AI is a policy problem, I was looking for perceptions that acknowledged the challenges posed by AI and emphasized the need for policy interventions. The reason for this is that a policy problem is defined as a need for improving an existing situation that has not yet been fully addressed through policy actions (Peters, 2018). It was therefore important to look for elements that could be linked to the understanding of what a policy problem is. This analysis could support the translation of the identified challenges into a comprehensive understanding of AI as a policy problem. After this, I used the empirical and analytical discussion to discuss potential recommendations for the policymakers in the conclusion.

4.3 Ethical considerations and limitations

Even though documents used for a documentary study might be accessible and already exist, it is still important to consider ethical issues connected to consent, anonymity, and transparency (Tight, 2019). For this thesis, the material used in the form of the comment letters are first of all official documents that have been published by the Government Offices of Sweden. Consequently, the source was perceived as authentic and trustworthy. Second of all, the comment letters are written by stakeholders on the sub-national level, for instance by authorities, regions, municipalities, companies, or organizations and not by individuals. The risk of exposing individuals' personal data is therefore low.

One limitation with thematic analysis is that it might be more difficult to replicate in comparison to the quantitative document analysis (Tight, 2019). On the same note, Bryman (2018) explains that another limitation is that it risks being subjective as the scholars' interpretations and what they find important is what the research builds on. It should also be acknowledged that trying to understand frames and how they are constructed is also a way of framing the challenges and potential solutions (Luimes, 2021). Bryman (2018) also emphasizes that another issue concerning this is regarding transparency as it might be difficult to know what the scholar has done or how the conclusions were reached. To handle these limitations, I described the

implementation of the method thoroughly and the choices made when conducting the study in 4.2 about the implementation of the method. To be transparent with my interpretations of the text, I also chose to provide the translations of the quotes in Appendix 2.

Another limitation connected to using a qualitative approach is that the results are sometimes argued to not be generalizable for other cases or situations (Bryman, 2018). However, Bryman explains that even though the results might not be generalizable for the population, it could instead be helpful to generalize theory. As this thesis provides recommendations for policymakers in the conclusion, this is a way to generalize theory, from focusing on AI to a focus on complex issues in uncertain environments.

5. Empirical discussion

This section will reason about the challenges with AI that the stakeholders have framed connected to the AIA. These challenges will include (1) the definition of Artificial Intelligence, (2) the implementation, (3) regulatory issues, (4) ethical questions, and (5) societal impacts.

5.1 Definition of Artificial Intelligence

The definition of AI is highly debated challenge due to its ambiguous nature and as it lacks a common definition (Gasser & Almeida, 2017; Larsson 2020; Wirtz et al., 2019). It is therefore considered as an important theme to study based on the stakeholders' perspective on the AIA.

5.1.1 Defining and understanding the problem

As mentioned in chapter 2, there is no common definition of AI (Gasser & Almeida, 2017; Larsson 2020; Wirtz et al., 2019). Larsson (2020) also explains that a variety of definitions for AI have been used throughout time, both by scholars and by governmental institutions. However, a clear definition is useful to support the understanding of AI, its implications and what is being regulated (Larsson & Ledendal, 2022). This is also supported by several comment letters (Research Institutes of Sweden AB, 2021; Swedsoft, 2021; Uppsala University, 2021). For instance, Swedsoft's (2021) comment letter emphasizes that it is difficult to capture the definition of a concept such as AI that has evolved over time ever since the 1960's. In addition, Lund University (2021, p.5, own translation) states that "There is an inherent difficulty to use a concept such as 'artificial intelligence', which expresses a more than 70-year-old flexible and changing research area to guide a comprehensive regulation".

Furthermore, the Research Institutes of Sweden AB (2021) and Uppsala University (2021) highlight that different EU institutions and other organizations uses different definitions of AI in their ongoing projects concerning the area. The stakeholders argue that this makes it even more difficult to comprehend what AI is and what really will be regulated. Uppsala University (2021) claims that this is unfortunate as the Act is dependent on a clear definition of the concept. The Swedish Defence Materiel Administration (2021, p.1, own translation) also questions "the need and the possibilities to create a clear and predictable regulatory framework in the field without a clear definition of the concept".

AI Sweden also states that:

> The legal uncertainty created by; the lack of principles for including new technologies, by the unclear definition of what AI is, as well as the lack of definitions of what an AI system constitutes, will create a number of potential risks for societal advancements in terms of welfare delivery, competitiveness and quality of life for European citizens. (AI Sweden, 2021, p.2).

Swedish Post and Telecom Authority (2021) also explains that a clear problem formulation is central to reduce the regulatory uncertainty. In addition, AI Sweden (2021) states that the lack of a clear definition of AI creates uncertainty, which can result in bias and leave room for discretion when implementing the AIA. Linköping University (2021) also claims that the legal uncertainty generates room for interpretations, which potentially could inhibit innovation. On the same note, Combient AB (2021) argues that the policy involves a lot of uncertainty that could have negative effects on investments, innovations, and competitiveness.

As previously mentioned, the definition of what AI is, is central to know what is being regulated and the implications of the regulation (Larsson & Ledendal, 2022). However, policymakers might not be aware of the nature of a certain policy area that they want to regulate (Taeihagh et al., 2021). This could make it difficult for policymakers to know what type of regulation that would be the most suitable for a certain policy area. The reason for this is that there might be asymmetries between the policymakers and the practitioners in the field. In terms of technologies, this means that the developer or user of the technology most likely have more knowledge about it, the implications and what will be feasible to do with the technology than the policymaker.

This issue is also highlighted by the Board of Swedish Industry and Commerce for Better Regulation which explains that:

> […] the proposal enters a technical area where detailed regulation is never appropriate due to the policymakers' knowledge being significantly worse concerning what is being regulated, which is usually referred to as the principal-agent relationship because there is asymmetric information. (Board of Swedish Industry and Commerce for Better Regulation, 2021, p.2, own translation)

The Board of Swedish Industry and Commerce for Better Regulation (2021) therefore argues that the asymmetry generates unintended consequences. In addition, Swedish Trade Federation

(2021) also stresses the information asymmetry where the developer has a great information advantage and might not be very willing to share what the technology is built on with the policymakers. As mentioned in chapter 2, the developer can use this information advantage regarding the innovation's potential and limitations in their favor (Taeihagh et al., 2021). This also makes it more difficult for policymakers to try to regulate a field where they do not know what is possible or feasible.

5.1.2 Clear definition

As stated in chapter 2, a clear definition makes it easier to understand AI and its implications (Larsson & Ledendal, 2022). It also provides clarity in what is really being regulated. However, this is argued to be difficult to achieve according to several comment letters (AI Sustainability Center, 2021; AI Sweden, 2021; Board of Swedish Industry and Commerce for Better Regulation, 2021; Combient AB, 2021; Lund University, 2021; Swedish Police Authority, 2021; Swedish Social Insurance Agency, 2021). For instance, AI Sustainability Center (2021) states that a distinct definition might be difficult to legally define as it can generate delimitations issues when categorizing AI.

AI Sweden (2021) and the Board of Swedish Industry and Commerce for Better Regulation (2021) also highlight that the definition of AI used in the AIA is unclear and does not take the complexity of these technologies into considerations. In addition, a multiple stakeholders state that the AIA would benefit from a clearer definition of AI (AI Sustainability Center, 2021; Lund University, 2021; Swedish Police Authority, 2021; Swedish Social Insurance Agency, 2021). A clearer definition could also make the policy more effective (Swedish Authority for Privacy Protection, 2021).

5.1.3 Vague and broad definition

AI is difficult to regulate as it continues to evolve and therefore also complicates how vague or distinct the definition should be defined (Haenlein & Kaplan, 2019). A vague definition could be beneficial for legal purposes and make it more future-proof, but the risk could be that everything counts as AI (Kaplan & Haenlein, 2019). For that reason, it is challenging to find a balance with having a distinct and accurate definition that covers only AI-technologies and no other technologies that are not really AI (Haenlein & Kaplan, 2019).

According to Lund University (2021) the broad definition used in the AIA can avoid delimitation issues. On the contrary, a broad variety of stakeholders point out that the vague and broad definition makes it difficult to know what will be covered by the AIA as the definition used includes almost all data processed software (Agency for Digital Government, 2021; AI Sweden, 2021; BIL Sweden, 2021; Linköping University, 2021; Lund University, 2021; Peltarion AB, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Economic Crime Authority, 2021; Swedish Environmental Protection Agency, 2021; Sweden's Innovation Agency, 2021; Swedish Prosecution Authority, 2021; Swedish Security Service, 2021; Swedsoft, 2021; Wallenberg AI Autonomous Systems and Software Program humanities and society, 2021; Örebro University, 2021). According to several stakeholders, the reason for this is that all software that includes rule-based or statistical methods will be covered by the AIA (AI Sustainability Center, 2021; Lund University, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Defence Research Agency, 2021; Swedish Police Authority, 2021). Combient AB (2021) explains that by including all statistical methods, even regression analysis will be defined as AI, which is seen as unreasonable.

By using a definition that covers almost all data processed software, Peltarion AB (2021) emphasizes that would entail overregulation of a variety of technologies, which could affect society negatively. Overregulation occurs due to structural policy dynamics and benefits some stakeholders while others lose (Taeihagh et al., 2021). A variety of stakeholders emphasize this type of dynamics from the perspective of companies (Board of Swedish Industry and Commerce for Better Regulation, 2021; Combient AB, 2021; Confederation of Swedish Enterprise, 2021; Linköping University, 2021; Lund University, 2021; Nasdaq Stockholm AB, 2021; Research Institutes of Sweden AB, 2021; Schibsted, 2021; Swedsoft, 2021; TechSverige, 2021). For instance, one risk with this policy is that the developers within the EU will have a competitive disadvantage towards the developers outside of the EU as they are not covered by the strict requirements (Lund University, 2021; Nasdaq Stockholm AB, 2021; Research Institutes of Sweden AB, 2021). Research Institutes of Sweden AB (2021) also explains this type of definition could result in disadvantages in comparison to adjacent product segments both outside and within the EU if their technologies are not defined as AI.

Another disadvantage with having a broad and vague definition is that it can create interpretation difficulties (Research Institutes of Sweden AB, 2021; Swedish Environmental Protection Agency, 2021; Swedish Police Authority, 2021). For instance, a broad definition can create room for misunderstanding and a variety of interpretations, which could create loopholes that can be circumvented (Swedish Authority for Privacy Protection, 2021). The Research Institutes of Sweden AB (2021) also stresses that the vagueness can lead to that stakeholders do not perceive that the regulation applies to their activities. Swedsoft (2021) and Uppsala University (2021) also explain that this may result in incentives where stakeholders strive to not have their technologies defined as AI to avoid the regulation.

To manage the issues concerning the definition of AI, the Swedish Economic Crime Authority (2021) and the Swedish Police Authority (2021) therefore recommend that the definition would benefit from a narrower definition. The definition developed by the High-Level Expert Group on AI is for exmaple argued to be a more suitable definition. This definition is argued to better cover relevant characteristics and appropriate techniques connected to AI. Another solution mentioned by Linköping University (2021) is to delete the point covering methods for statistics, estimations and search and optimization. However, the Swedish Defence Research Agency (2021) states that this could make the definition too narrow and possible to circumvent. Lund University (2021) instead suggests that if the definition involves 'autonomous' technologies, it could help to distinguish AI from other software.

5.1.4 Technological neutrality or technologically preciseness

As mentioned in chapter 2, one solution to develop a more sustainable and future-proof policy is to keep the regulation technologically neutral (Butenko & Larouche, 2015). According to Sweden's Innovation Agency (2021), the risk of having a technologically neutral legislation is that it is vaguer, thus, it might become more future-proof. On the contrary, the risk of having a definition that is technological precise, is that it might become outdated quickly (Wallenberg AI Autonomous Systems and Software Program, 2021; Örebro University, 2021). The reason for this is that it is difficult to have a technologically-based approach and try to regulate technologies that continuously evolves in a rapid pace (BIL Sweden, 2021; Linköping University, 2021; Peltarion AB, 2021).

As discussed in chapter 2, Kaplan and Haenlein (2019) explain that the disadvantage of a narrower definition is that it would focus on specific aspects and not cover all AI-systems. Several stakeholders are critical towards the narrow definition and its implications and instead stress the importance of creating a technologically neutral Act (AI Sweden, 2021; BIL Sweden, 2021; Board of Swedish Industry and Commerce for Better Regulation, 2021; Confederation of Swedish Enterprise, 2021; Karolinska Institutet Medical University, 2021; Linköping University, 2021; Swedenergy, 2021; Swedish Association of Local Authorities and Regions, 2021; Swedish Confederation of Professional Employees, 2021; Swedish Defence Research Agency, 2021; Swedish Economic Crime Authority, 2021; Sweden's Innovation Agency, 2021; Swedish Tax Agency, 2021; Swedish Transport Administration, 2021; TechSverige, 2021; Swedsoft, 2021; Wallenberg AI Autonomous Systems and Software Program, 2021; Wikimedia, 2021; Örebro University, 2021). For instance, the Swedish Association of Local Authorities and Regions (2021, p.2, own translation) states that "[…] it is not the technology itself that constitutes the problem, but rather how it is applied and the effects of this.". The Swedish Association of Local Authorities and Regions (2021) thus argues that due to the fast development, a technologically neutral regulation would be preferred.

In addition, the Swedish Confederation of Professional Employees (2021, p.3) states that the technological precise focus could make the AIA "[…] casuistic where certain technologies or areas of use are carefully regulated while other adjacent technologies and areas of use are not.". Swedenergy (2021) also expresses that a narrow definition risk distorting the market as adjacent segments are treated differently. This could in its turn lead to difficulties for delimitation and result in issues to predict implications of the development and use of these technologies (Swedish Confederation of Professional Employees, 2021).

Furthermore, the Swedish Defence Research Agency (2021, p.1, own translation) opposes the AIA with the reason that it proceeds from "[…] a set of named technologies and instead advocates for a regulation based on the principle of technological neutrality.". Swedsoft (2021) also explains that this toolcentric approach can result in a technology defined as AI being valued legally and morally differently compared to a similar technology that has not been recognized as AI. On the same topic, AI Sweden (2021) argues that the definition used is not future-proof as it only is a broad list, which could include AI technologies but most likely not all AI.

Consequently, the prerequisites for future-proofing are dependent on accurate technologies being added to the list. The Agency for Digital Government (2021) also states that this might lead to that current technologies that are not perceived to be AI, will be defined as AI in the future. A narrow, exhaustive list may therefore have an impeding effect on both present and future innovations (Swedish Environmental Protection Agency, 2021). This could potentially also increase the legal uncertainty (Swedsoft, 2021). Karolinska Institutet Medical University (2021) also claims that as policymakers struggles to keep up with the pace of the technological development, it might be difficult to future-proof the AIA with this type of definition. As mentioned in chapter 2, a list quickly becomes outdated and might not be an insurance for future-proofing (Raposo, 2022).

The Board of Swedish Industry and Commerce for Better Regulation) explains that:

> Another aspect connected to AI that does not seem to be considered is that the technology is dynamic, while the proposal seems to assume that the technology is static and thus it is therefore a bit like trying to regulate a moving target. (Board of Swedish Industry and Commerce for Better Regulation, 2021, p.2, own translation).

Accordingly, the Board of Swedish Industry and Commerce for Better Regulation (2021) urges the Swedish Government to explain to the EC that the AIA is not accurate, and that the problem definition needs improvement.

5.2 The implementation

Wirtz et al. (2019) explain that implementing AI-technologies is a major challenge, which needs a deliberate process to fully utilize the potential of AI. This is supported by the comment letters written by Combient AB (2021) and the Swedish Gender Equality Agency (2021) that state the importance of having an intentional plan to succeed with the design and implementation of the AIA. In addition, the Swedish Association of Local Authorities and Regions (2021) points out that one challenge with the implementation of the AIA will be to ensure that all member states of the EU are coordinated in the implementation of the policy. The risk with lack of consistency is that the member states develop national suboptimal arrangements. The implementation was therefore seen as a central challenge to study to explore the concerns of the stakeholders involved.

5.2.1 Safety and quality of data

Wirtz et al. (2019) highlight that AI safety concerns general security issues and focuses on the challenge to ensure that the impact and performance of AI-technologies are safe. Several stakeholders point out that the strive for a safe regulation might be difficult to achieve with the current form of the AIA (Research Institutes of Sweden AB, 2021; Sweden's Innovation Agency, 2021; Swedish Social Insurance Agency, 2021; Swedsoft, 2021). For instance, Sweden's Innovation Agency (2021) claims that the AIA is vague with many potential grey areas. To create security and a consistent implementation, the Agency argues that it is important to clarify the Act to make the member states able to implement it similarly. In addition, Swedsoft (2021) explains that one challenge concerning safety relates to the wording in the AIA. Swedsoft (2021, p.7) explains that "[…] the AI-system has to be safe enough given its intended purpose.". Swedsoft (2021) states that this type of formulation increases uncertainty for the responsible stakeholders as it might be difficult to know what is enough to avoid failures until the incidents occurs.

The Research Institutes of Sweden AB (2021) also stresses that the vagueness of the AIA might risk counteracting the purpose of the AIA, namely, to create trust in AI-technologies. The Swedish National Archives (2021) also highlights that the requirements to promote transparency and traceability by demanding a lot of documentation could provide a false security of control and transparency. Safety might therefore not be ensured and could require other means.

Furthermore, BIL Sweden (2021) and Lund University (2021) explain that it is important to prevent risk but almost impossible to ensure safety fully in practice as the data cannot be free from errors or complete. Lund University (2021) also highlights that it might be difficult to even measure what could be considered as free of errors.

On the same topic, another sub-challenge mentioned by Wirtz et al. (2019) is the system or data quality and integration. The intelligence of the AI is dependent on the intelligence of the available data. This means that the AI cannot become more intelligent than the data used, and high quality and trusted data is necessary to succeed with the implementation. Mehr (2017) therefore states that it is central to collect, store and use unbiased, high-quality data to be able

to succeed with the implementation of a technology. However, as explained in the previous paragraph, this might be challenging to achieve (BIL Sweden, 2021; Lund University, 2021).

A variety of stakeholders agree that the collection of high-quality and representative data is important for the AIA but also claim that it is limited in the case of the AIA (Confederation of Swedish Enterprise, 2021; Linköping University, 2021; Region Västra Götaland, 2021; Sahlgrenska University Hospital, 2021; Schibsted, 2021; Swedish Mapping, Cadastral, and Land Registration Authority, 2021; TechSverige, 2021; Wallenberg AI Autonomous Systems and Software Program, 2021; Wikimedia, 2021). Firstly, it would require that data is error-free and that errors can be detected easily, which is not the case (Chalmers University of Technology, 2021; Confederation of Swedish Enterprise, 2021; Swedish Mapping, Cadastral and Land Registration Authority, 2021; Swedish National Space Agency, 2021; Örebro University, 2021).

Chalmers University of Technology explains that:

> On page 48, point 3, among other things, the requirement that the data must be 'free of errors and complete' is stipulated. This wording probably needs to be softened, because if it is used literally, the requirement would be met by very few or none of today's machine learning systems [...]. (Chalmers University of Technology, 2021, p.3, own translation).

Secondly, the GDPR hinders collection of complete and error-free data as it does not allow extensive collection of personal data that would be needed to have complete data that is free of errors (Confederation of Swedish Enterprise, 2021; Linköping University, 2021; TechSverige, 2021). This is because the GDPR enables people to have their data forgotten and deleted, which would lead to data not being complete. Consequently, the GDPR will affect the quality of the accessible data. In addition, the management of personal data in the GDPR would also have to be revised to counteract bias in the AI-systems. For instance, it must be possible to control the data afterwards to detect the origins of errors without consent from the individual. To be able to collect data of the highest quality, the GDPR would therefore need to be modified and reformulated.

On the same note, the Swedish Gender Equality Agency (2021) states that the AIA should implement systems to handle risks and reduce inequality. For instance, the Swedish Gender

Equality Agency (2021, p.3, own translation) claims that "[...] systems classified as high-risk AI must be trained and tested with sufficiently representative data. The development must also be traceable backwards so that all data can be checked afterwards.". However, TechSverige (2021) and the Confederation of Swedish Enterprise (2021) argue that it might be difficult to make datasets traceable to examine the quality and the representation of the data. According to the Confederation of Swedish Enterprise (2021), the reason for this is that the dataset might not explain that much, and it is therefore better to reword these requirements as they are seen as inappropriate and almost impossible to achieve.

5.2.2 High costs and new demands

Another sub-challenge in relation to the implementation of AI technology concerns the financial feasibility of the implementation (Wirtz et al., 2019). A great number of stakeholders argue that that the AIA will entail both high financial costs but also a heavy and expensive administrative burden for those developing and implementing AI-technologies (Agency for Digital Government, 2021; Confederation of Swedish Enterprise, 2021; National Library of Sweden, 2021; Peltarion AB, 2021; Region Västra Götaland, 2021; Research Institutes of Sweden AB, 2021; Sahlgrenska University Hospital, 2021; Skellefteå Municipality, 2021; Sweden's Innovation Agency, 2021; Swedish Association of Local Authorities and Regions, 2021; Swedish Authority for Privacy Protection, 2021; Swedish Defence Research Agency, 2021; Swedish Police Authority, 2021; Swedish Prosecution Authority, 2021; Swedish Social Insurance Agency, 2021; Swedish Tax Agency, 2021; Swedish Transport Agency, 2021; TechSverige, 2021).

Several stakeholders emphasize that the strict requirements with the AIA will demand a lot of financial resources which will be challenging for many stakeholders, especially for smaller or medium sized businesses (AI Sweden, 2021; Board of Swedish Industry and Commerce for Better Regulation, 2021; Confederation of Swedish Enterprise, 2021; Linköping University, 2021; Research Institutes of Sweden AB, 2021; Swedsoft, 2021; TechSverige, 2021). This is a form of structural policy dynamic where some actors win and some are losing on the overregulation (Taeihagh et al., 2021). The increasing costs in combination with the strict requirements are thought to hinder innovation and favour established companies and create barriers for small or non-established businesses (Board of Swedish Industry and Commerce for

Better Regulation, 2021; Combient AB, 2021; Linköping University, 2021; Research Institutes of Sweden AB, 2021; Schibsted, 2021; Swedsoft, 2021). For instance, AI Sweden (2021, p.2) highlights that "This could be detrimental to the smaller but crucial AI-startups and scaleups as they struggle with the regulatory burden as well as a lack of capital due to the legal uncertainty for investors.".

Another expensive cost that several stakeholders highlight relates to the examination, evaluation, and compliance with the complex regulation (Agency for Digital Government, 2021; Sahlgrenska University Hospital, 2021; Sweden's Innovation Agency, 2021; Swedish Civil Contingencies Agency, 2021; Swedsoft, 2021). Thus, some stakeholders state that the high costs might make it almost impossible to follow and implement the regulation (Research Institutes of Sweden AB, 2021; Wallenberg AI Autonomous Systems and Software Program, 2021; Örebro University, 2021). In addition, Swedish Association of Local Authorities and Regions (2021) and the Swedish Defence Research Agency (2021) explain that the difficulty to comply with the strict requirements can make the development stop if the costs to comply are too high.

Furthermore, Wirtz et al. (2019) explain that one major cost driver concerning the implementation of technologies relates to the resource-intensive investments needed to collect and store data. In the case of the AIA, several stakeholders claim that the storing will drive costs and be financially challenging (Confederation of Swedish Enterprise, 2021; Sweden's Innovation Agency, 2021; TechSverige, 2021). For instance, BIL Sweden (2021, p.3, own translation) states that "[...] storing logs for a longer period of time requires a large storage capacity, which can lead to major consequences in terms of increased costs for data storage, increased energy consumption and maintenance.". The Swedish National Archives (2021) highlights that storing will become very costly and that it is important to balance the safety and utility it brings with the costs and lost competitiveness.

Another major cost driver according to Wirtz et al. (2019) is the highly demanded AI experts that are capital intensive in terms of both education and salaries. In the case of the AIA, a broad range of stakeholders emphasize that the fast-developing technological development will require a lot of resources and new competences (Combient AB, 2021; National Library of

Sweden, 2021; Peltarion AB, 2021; Sahlgrenska University Hospital, 2021; Sweden's Innovation Agency, 2021; Swedish Authority for Privacy Protection, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Trade Union Confederation, 2021; TechSverige, 2021). Furthermore, the Swedish National Archives (2021) also states that requirements on continuous auditing of high-risk AI will demand high competence of highly qualified engineers.

The Swedish National Archives explains that

> This can make the use of AI-systems significantly more expensive and will effectively limit which companies and public bodies can implement and use these types of solutions. […] As there already is a shortage of engineers with machine learning skills, this will further hamper development within the EU […]. (Swedish National Archives, 2021, p.4, own translation).

On the same note, Wirtz et al. (2019) identify specialization and expertise as one major challenge when implementing AI-systems. As the use of AI applications has fully exploded in recent years, the demand for AI specialists and experts that support the development and implementation has also rapidly increased. In line with this, a variety of stakeholders highlight the challenge with an increasing demand for personnel with expertise for those stakeholders falling under the regulation (Combient AB, 2021; Confederation of Swedish Enterprise, 2021; National Library of Sweden, 2021; Peltarion AB, 2021; Region Västra Götaland, 2021; Swedish Bar Association, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Companies Registration Office, 2021; Swedish Energy Agency, 2021; Swedish Police Authority, 2021; TechSverige, 2021; Transport Analysis, 2021). For instance, the Swedish Civil Contingencies Agency (2021, p.3, own translation) states that "[…] competence and expertise will include deep knowledge in AI-technologies, data, data processing, fundamental rights, health- and safety risks as well as knowledge about current standards and legal requirements.".

Several stakeholders stress that the complex requirements the AIA entails will be a challenge to handle as it demands expertise in areas where there is a gap in supply (Confederation of Swedish Enterprise, 2021; Swedish Civil Contingencies Agency, 2021; TechSverige, 2021). Similarly to what the Swedish National Archives (2021) stated above, the Confederation of Swedish Enterprise (2021) and Region Västra Götaland (2021) also emphasize that there is shortage of people with AI-expertise and competence in AI. Furthermore, TechSverige (2021,

p.2, own translation) explains that the AIA "[…] will also lead to increasing costs and bottlenecks due to the far-reaching and complex requirements that requires competence in fields where there currently is a great shortage of employees with relevant knowledge.". This is argued to be an issue due to the current shortage in experts with knowledge in AI.

The Swedish Public Employment Service (2021, p.2, own translation) claims that "[…] a national increase in knowledge regarding AI and data governance among authorities in general will be needed.". This is in line with the challenge Wirtz et al. (2019) emphasize concerning the need for education and competence-building in AI. However, both the Administrative Court of Appeal in Stockholm (2021) and the Swedish Police Authority (2021) explain that the need for new competence will be a difficult challenge to handle for individual stakeholders. The Administrative Court of Appeal in Stockholm (2021) stresses that the court will probably need members with technological competence. The Swedish Police Authority (2021) claims that the AIA will require a comprehensive administration to manage archiving, data governance, and documentation and new competence to handle AI such as in machine-learning and statistics.

5.3 Regulatory issues

Wirtz et al. (2019) state that one major challenge concerning AI relates to law and regulations and the capacity to administer and control these technologies. Several comment letters explain that this might be difficult as the AIA uses broad and vague definitions and wordings as well as overlaps and conflict with other regulations (Agency for Digital Government, 2021; AI Sweden, 2021; BIL Sweden, 2021; Confederation of Swedish Enterprise, 2021; Swedish Bar Association, 2021; Swedish Prosecution Authority, 2021; Swedish Tax Agency, 2021). This will obstruct rule compliance (Confederation of Swedish Enterprise, 2021). Linköping University (2021) and TechSverige (2021) also argue that the legal uncertainty created by the vague formulations that leave room for interpretations act impeding for innovation and competitiveness. Furthermore, another challenge concerning the regulation is to be able to regulate a fast-developing technology (Ludlow et al., 2015; Marchant et al., 2011; Swedish Agency for Growth Policy Analysis, 2022). This phenomenon is referred to as the pacing problem. In relation to the AIA, the regulatory issues were seen as a major challenge that could be useful to examine to gain insight into the concerns of the relevant stakeholders.

5.3.1 The black boxes of Artificial Intelligence

One regulatory issue highlighted by Wirtz et al. (2019) concern black boxes. They call this sub-challenge governance of autonomous intelligence systems. This challenge involves the challenge in managing and controlling decision-making and actions connected to the black boxes of AI. However, several stakeholders emphasize the difficulty to manage and control the black boxes of AI (Confederation of Swedish Enterprise, 2021; Lund University, 2021; Swedish National Archives, 2021; TechSverige, 2021; Union for Professionals, 2021). For instance, TechSverige (2021) and the Confederation of Swedish Enterprise (2021) explain that AIA needs to be revised to be better at handling risks connected to autonomous, self-learning systems such as the black box issue. The Union for Professionals (2021) also claims that the black boxes can make it difficult to explain and evaluate the processes. On the same note, Lund University (2021) highlights that one issue with these systems is that they lack transparency, which makes it difficult to detect errors.

Furthermore, both the Swedish National Archives (2021) and Swedsoft (2021) discuss explainability concerning the black boxes of AI. The Swedish National Archives (2021, p.4, own translation) argues that "It is not suitable to have fully automated decision-making processes based on machine-learning as these cannot fulfill for example the requirements the GDPR has that people should be able to have a decision concerning themselves explained to them.". The Swedish Agency for Public Management (2021) also highlights the importance of people understanding decisions concerning them and how and on what grounds the decisions have been made. Swedsoft (2021) has another approach and points out that the demands for explainability and traceability will force AI to be limited to perform tasks that can be understood and followed by humans. This will most likely inhibit innovation and raise the standards on what expertise the human that will be employed must have. In addition, the Swedish National Archives (2021) states that the requirements on documentation create transparency to some extent. It might still though be difficult to use this information to understand the output of the AI as the black boxes cannot always be understood or controlled fully. According to Uppsala University (2021), the reason behind this is that it might be difficult for people that are not developers themselves to understand the data and information. The provision of data might therefore not be necessary. The Swedish Environmental Protection Agency (2021) instead emphasizes that one way to be transparent could be to introduce requirements on open-source

code. Wikimedia (2021) also states that the open codes can be used to protect human rights and make citizens understand decisions.

5.3.2 Responsibility and accountability

Wirtz et al. (2019) explain that one sub-challenge connected to law and regulations is regarding responsibility and accountability. This issue concerns the challenge to establish a distinct legal status where accountability and liability are clear. A variety of stakeholders point out the importance of ensuring responsibility and accountability through the AIA (Agency for Digital Government, 2021; Amnesty International Sweden, 2021; Swedish Armed Forces, 2021; Swedish Bar Association, 2021; TechSverige, 2021; University of Gothenburg, 2021; Wallenberg AI Autonomous Systems and Software Program Humanities and Society, 2021). For instance, the Swedish Armed Forces (2021) highlights that safety issues should be considered to a greater extent in the AIA and that human control should be used to enable accountability and responsible practices. Some stakeholders also emphasize that documentation can be used to support accountability further (Lund University, 2021; Schibsted, 2021; Stockholm municipality, 2021). Lund University (2021) and Schibsted (2021) highlight that documentation promotes transparency and traceability, which is important to detect errors and demand accountability.

As discussed in chapter 2, one issue concerning responsibility is to decide if the AI itself is accountable for negative outcomes or if the authorities, designers, or operators that have been part of the process are responsible (Wirtz et al., 2019). On one hand, Johnson (2015) questions if the developers or operators can be responsible for the actions of autonomous AI as they might not be able to control or foresee its actions. However, De George (2003) on the other hand argues that humans should always be accountable for the technologies' implications.

Karolinska Institutet Medical University leans more towards De George's (2003) explanation and states that

> AI cannot replace the personal responsibility, which is why the need for human supervision and control must be ensured. AI must be trusted for the common good. Responsibility for what an AI-system does should be clearly regulated to make sure that people always can be held accountable for what an AI does. (Karolinska Institutet Medical University, 2021, p.1, own translation).

Several stakeholders also argue that the AIA is ambiguous and vague, which makes it difficult to know who is accountable in different cases (Engineers Sweden, 2021; Research Institutes of Sweden, 2021; Schibsted, 2021; Swedish National Archives, 2021). This also highlighted as an issue for the AIA because of the overlapping with other legislation (Agency for Digital Government, 2021; Region Stockholm, 2021; Stockholm municipality, 2021; Swedish Bar Association, 2021; TechSverige, 2021). For instance, the division of responsibility becomes uncertain as the Act is overlapping and in conflict with other laws and regulations. Hence, the legal uncertainty makes it difficult to know who is responsible in a certain area or case. According to the Swedish Bar Association (2021), this could make it difficult to know which regulation should sanction non-compliance. The result might be that either both regulation sanctions the behavior or that none feels responsible to do so.

Furthermore, the Agency for Digital Government (2021) also explains that the AIA involves a variety of authorities, supervisory authorities, boards, and other stakeholders. The risk with this is that the division of roles and the responsibility areas becomes unclear. This issue is also highlighted by Region Stockholm (2021) and Stockholm municipality (2021) which state that the separation of roles between the European Artificial Intelligence Board (EAIB) and the European Data Protection Board (EDPB) is not distinct. Region Stockholm (2021, p.3, own translation) states that a clarification is needed concerning "[…] which regulation should take precedence in cases of avoiding duplicate and/or conflicting supervisory procedures and sanctions, how the national supervisory authorities should relate to each other, envisaged division of responsibilities between the EDPB and the EAIB.".

5.3.3 Privacy and safety

Another sub-challenge concerning regulations regards privacy and safety (Wirtz et al., 2019). This challenge connects to the importance of promoting privacy and safety by collecting and managing data with consent and in line with existing regulations. Multiple stakeholders highlight the importance of taking privacy into consideration when developing the AIA, but state that the Act might not fully succeed in this (AI Sweden, 2021; Amnesty International Sweden, 2021; Swedish Commission on Security and Integrity Protection, 2021; Wikimedia, 2021).

The Swedish Authority for Privacy Protection (2021) and the Swedish National Archives (2021) mention that AI usually requires large amounts of data, including personal data. These datasets would then be considered as security risks as it could have devastating consequences for individuals if the data leak. In addition, Amnesty International Sweden (2021) argues that the AIA does not go far enough to ensure privacy through the Act. For instance, the AIA is claimed to overlook serious risks connected to mass surveillance by not fully prohibiting technologies related to facial recognition and remote biometric categorization that can be intrusive and violate privacy. However, the Swedish Police Authority (2021) and Uppsala University (2021) instead claim that it is important to balance values like privacy with other interests such as crime prevention. The Swedish Police Authority (2021) also explains that is vital to not merely focus on risks with these technologies, but also the utilities they might provide. Swedish Customs (2021) also states that it is central to be reasonable when considering the protection of privacy against the need for efficient law enforcement, which is not seen as the case for the AIA.

As mentioned in chapter 2, Wirtz et al. (2019) emphasize that one issue for policymakers is to create a policy that balances the development of sophisticated AI systems that can ensure privacy and safety with a flexible system that can adapt to new technological developments. This balance is also discussed by the Swedish Public Employment Service (2021, p.1, own translation) which states that "[…] it must be clarified how the AIA relates to the EU data protection regulation and authorities' register legislation regarding the processing of sensitive personal data, so that authorities are not hampered in the work of developing AI-capabilities.". Thus, several stakeholders stress the importance of balancing safety with using data effectively (Swedish Public Employment Service, 2021; Swedish Companies Registration Office, 2021; Swedenergy, 2021).

Therefore, a broad variety of stakeholders highlight that it is important to clarify how the Act relates to the GDPR in terms of security of sensitive data (Confederation of Swedish Enterprise, 2021; Linköping University, 2021; Nasdaq Stockholm AB, 2021; National Board of Health and Welfare, 2021; Swedish Authority for Privacy Protection, 2021; Swedish Bar Association, 2021; Swedish Economic Crime Authority, 2021; Swedish National Financial Management Authority, 2021; Swedish Public Employment Service, 2021; Swedish Tax Agency, 2021;

TechSverige, 2021). The Swedish National Financial Management Authority (2021) and Swedenergy (2021) also state that it will probably become difficult to interpret and manage personal data without impeding on innovation. The Confederation of Swedish Enterprise (2021) also claims that the GDPR and the AIA are conflicting, which makes it almost impossible to collect data in a manner that aligns with both regulations.

Another concern mentioned by the Swedish Authority for Privacy Protection (2021) is that scrutinizing documentation to enable transparency would not be possible with the current GDPR legislation. For instance, the GDPR would not allow collecting and storing all data needed to detect and correct bias in the AI-systems. In addition, TechSverige (2021) and the Confederation of Swedish Enterprise (2021) also stress that the GDPR would need to be rephrased to effectively use the AIA and avoid overlaps and contradictions.

Another issue raised regards ensuring safety of data for companies (Combient AB, 2021; Swedish Bar Association, 2021; TechSverige, 2021). The reason for this is that it is proposed that high-risk AI-solutions should be registered in a database provided by the EC to ensure rule compliance. It is therefore argued to be unproportional as companies must reveal their industrial secrets with this demand of registering their innovations. This is stated to be disproportionate as that would require a high degree of sharing of both information and industrial secrets (Combient AB, 2021; Sweden's Innovation Agency, 2021; TechSverige, 2021). In addition, the Swedish Social Insurance Agency (2021) also stresses that this could generate a requirement where data that is confidentially regulated will become public through the database.

5.3.4 Regulating a fast-developing technology

Another regulatory issue mentioned in chapter 2 concerns the pacing problem and the difficulty to regulate a fast-developing technology (Ludlow et al., 2015; Marchant et al., 2011; Swedish Agency for Growth Policy Analysis, 2022). The speed of the technological development is thought to be faster than the establishment of the applicable regulation, which is challenging to manage (Kaal, 2016; Ludlow et al., 2015; Marchant et al., 2011; Swedish Agency for Growth Policy Analysis, 2022; Thierer, 2020; Wallach & Marchant, 2018). A variety of stakeholders also highlight this challenge in their comment letters (BIL Sweden, 2021; Confederation of Swedish Enterprise, 2021; Karolinska Institutet Medical University, 2021; Linköping

University, 2021; Peltarion AB, 2021). The Confederation of Swedish Enterprise (2021) even goes as far as to state that it might even be impossible for the policymakers to keep up with the fast pace and regulate at the same speed as the innovations evolve. Karolinska Institutet Medical University (2021) also stresses the importance of not letting the technological development direct the development of AI without a clear regulatory framework.

As discussed in chapter 2, one major challenge regarding this is to balance having an environment that promotes innovation while also reducing risks with these innovations by regulating them (Swedish Agency for Growth Policy Analysis, 2022). Policymakers therefore need to be able to balance different and conflicting interests (Taeihagh, 2021). However, a great number of stakeholders highlight that the AIA struggle to balance innovation and competitiveness with other values (Agency for Digital Government, 2021; AI Sweden, 2021; BIL Sweden, 2021; Combient AB, 2021; Confederation of Swedish Enterprise, 2021; Sweden's Innovation Agency, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Companies Registration Office, 2021; Swedish Defence Research Agency, 2021; Swedish Economic Crime Authority, 2021; Swedish National Space Agency, 2021; Swedish Public Employment, 2021; Swedish Social Insurance Agency, 2021; Swedish Tax Agency, 2021; Uppsala University, 2021). The Swedish Economic Crime Authority (2021) explains that this is partly due to the fast pace of the technological development, which makes it difficult to regulate AI and at the same time does not risk EU falling behind in the development of these technologies.

Furthermore, Region Västra Götaland also explains that:

> Simultaneously, the use of AI has the potential to contribute significant benefits in a variety of areas through increased economic growth as well as solutions to environmental and social societal challenges. It is therefore important that there is a balance between consideration of risk on the one hand and development and innovation on the other. (Region Västra Götaland, 2021, p.2, own translation)

In addition, TechSverige (2021, p.2, own translation) claims that "In order to both strengthen trust in AI- applications and promote fast technology development, ethical guidelines, certifications and Codes of Conduct should be used as much as possible.". However, some stakeholders also argue that ensuring trust in the technologies will most likely inhibit innovation (Swedish Trade Federation, 2021; Swedsoft, 2021; Transport Analysis, 2021).

Swedsoft states that:

> […] depending on how strict the requirements for being able to trace and explain the result of a specific outcome is, the AI-system may need to be limited to operate in ways that are accessible for a human to follow. This would in turn limit the scope for innovation, especially innovation that introduces radically new or previously unthinkable ways of performing specific tasks. (Swedsoft, 2021, p.3).

The Swedish Trade Federation (2021) stresses that rather than being fully transparent, it is more important that the users of AI understand the opportunities with the technologies to accept and trust it. The Swedish National Archives (2021) also explains that the requirements on documentation could be expensive and impede on competitiveness and therefore more costly than the actual utility and safety provided through it. Sweden's Innovation Agency (2021) and the Swedish Tax Agency (2021) thus argue that the AIA is not proportional and accurate and instead risks overregulating to the degree that innovation and competitiveness is negatively affected. This could in its turn generate bottle necks concerning competence and capacity. Some stakeholders also state that the regulatory burdens and negative effects on innovation and competitiveness should be studied closer to ensure that the utility of the regulation is larger than the negative consequences (Swedish Companies Registration Office, 2021; Swedish Mapping, Cadastral and Land Registration Authority, 2021; Swedish Social Insurance Agency, 2021).

5.4 Ethical questions

Wirtz et al. (2019) highlight that one major challenge concerns AI ethics. In line with this, AI Sustainability Center (2021) emphasizes the importance of taking ethical and social principles into account when developing a regulation for AI. University of Gothenburg (2021) also stresses that AI is a field that continues to transform where not all potential risks have been discovered yet. The category regarding ethical questions was therefore seen as a major challenge to study and explore from the perspective of the relevant stakeholders.

Wirtz et al. (2019) explain that one sub-challenge regarding ethics concerns AI rulemaking for human behavior. One issue in this regard is that human behavior might be affected by characteristics such as irrational emotions, which the AI might not be able to learn (Banerjee et al., 2017). It could therefore be questionable if it really is possible to justify AI's rulemaking for human behavior (Wirtz et al., 2019). For instance, Amnesty International Sweden (2021)

argues that facial recognition is based on flawed preconceptions that can sustain discrimination as the systems cannot recognize emotions in a sufficient way and as they profile vulnerable groups.

On the same note, another sub-challenge relating to ethics concerns AI discrimination (Wirtz et al., 2019). This sub-challenge emphasizes the importance of preventing AI from acting unequal or unfair and to detect discriminatory behavior. However, several stakeholders express concerns that the AIA is not effective in counteracting discrimination (AI Sweden, 2021; Swedish Authority for Privacy Protection, 2021; the Equality Ombudsman, 2021). For instance, Amnesty International Sweden (2021) argues that facial recognition and biometric categorization technologies should be fully prohibited as they pose a danger to human rights and can be used for mass surveillance. In addition, Amnesty International Sweden stresses that not even law enforcement authorities should be able to use these technologies due to the risk of abusing fundamental rights.

5.5 Societal impacts

The last major challenge that Wirtz et al. (2019) emphasize concerns society. This perspective focuses on the societal challenges that arise as AI has increased its influence on society and citizens. As the potential risks and damages caused by AI are difficult to predict, this raises concerns for the future. Furthermore, University of Gothenburg (2021) states that the growing influence of AI on society requires that all relevant stakeholders understand potential risks and take these into consideration to use AI as an advantage for society. This major challenge was therefore seen as important to study and explore from the perspective of the stakeholders.

Wirtz et al. (2019) explain that one sub-challenge connected to society concerns workforce substitution and transformation. This challenge reflects on the consequences AI potentially could have on the labor market as tasks become automated and new skills are in demand. Multiple stakeholders highlight a variety of issues concerning this challenge (Engineers Sweden, 2021; Swedish Trade Union Confederation, 2021; Swedsoft, 2021). For instance, Swedsoft (2021, p.3) states that "AI is at its best when it can perform tasks that humans cannot - or accomplish tasks in ways that humans cannot - rather than just substituting human work through automation.". However, Swedsoft (2021) points out that a major issue, in this case, is

that the demands for explainability and traceability will force AI to be limited to perform tasks that can be understood and followed by humans. This will most likely inhibit innovation and raise the standards on what humans that are employed to be able to manage AI.

Another societal challenge that Wirtz et al. (2019) mention concerns the importance of social acceptance and trust in AI. This sub-challenge relates to previously mentioned challenges to a great extent. For instance, trust is thought to be promoted by increasing transparency and openness (AI Sustainability Center, 2021; Lund University, 2021). One issue concerning trust is due to the fact that AI conflicts with other regulations which obstructs rule compliance (Confederation of Swedish Enterprise, 2021; Swedish Economic Crime Authority, 2021; TechSverige, 2021). The AIA is for example not compatible with the GDPR, and the risk is that AIA hurts trust as it risks violating privacy (Swedish Economic Crime Authority, 2021).

The last sub-challenge that connects to society that Wirtz et al. (2019) highlight is the transformation in interaction between humans and machines and the communication between machines. This challenge concerns miscommunication and lack of control in the interaction. In term of the AIA, one concern in this regard is that the strict requirements of the Act will scare off investors and developers in machine-learning in the field of languages technology (Swedish National Archives, 2021). This fear especially concerns stakeholders outside of the EU like the US and China as they have been dominating this market and have more knowledge in this field. The risk is that these stakeholders will not be as eager to collect and develop these technologies using data from the EU. This could result in the EU falling behind in technological development as the technologies will not understand languages from Europe to the same extent as languages from other regions. As a consequence, people fear that the machine will misunderstand or make bad decisions due to the lack of knowledge.

5.6 Summary of the empirical discussion

The themes of challenges and the main challenges are summarized in table 5 below to gain an understanding for the kind of challenges identified with the AIA.

Table 5. Summary of the empirical discussion

The definition of Artificial Intelligence
➢ Different definitions
➢ No comprehension
➢ No clear policy which creates uncertainty and affects effectiveness
➢ Asymmetries between policymakers and practitioners
➢ Fails to consider complexity
➢ Vague definition is more future-proof and avoids delimitation issues but risks defining everything as AI
➢ Distinct definition creates delimitations issues while broad definition avoids delimitation issues
➢ Overregulation generates winners and losers
➢ Broad definition creates interpretation difficulties
➢ Having a technologically neutral regulation that is future-proof demands vagueness
➢ Technology-precise policy becomes outdated quickly, distorts the market and regulates adjacent segments differently

Implementation
➢ The AIA risks generating suboptimal arrangements among the member states
➢ Current form of AIA fails to achieve safety
➢ Vagueness creates grey areas and uncertainty which affect security and consistency
➢ Strict requirement on documentation provides a false security of transparency
➢ Collection of high-quality and representative data is limited as data cannot be complete and error-free
➢ Full datasets are difficult to access and might not reveal that much
➢ The AIA entails high financial cost and administrative burdens
➢ Requires new competences and expertise which will be costly
➢ The current shortage in AI-experts will be challenging to overcome

Regulatory issues
➢ The AIA needs revision to avoid overlaps with other regulations and room for interpretation
➢ Black boxes obstruct explainability and evaluation to detect errors and risks
➢ Explainability limits AI's performance
➢ Documentation promotes transparency partly but not fully
➢ The AIA is not effective in promoting responsibility and accountability
➢ The AIA lacks a clear division of responsibility
➢ Must take privacy into consideration to a greater extent and balance with other values
➢ The AIA and the GDPR are conflicting which causes issues for collection of and access to data
➢ Difficult to regulate due to the fast development
➢ Difficult to balance risks with innovation with other values when regulating

Ethical questions
➢ The AIA is not sufficient in counteracting discrimination
➢ Systems that recognize emotions poses a risk as they are flawed and sustains discrimination
➢ Mass surveillance technologies sustains discrimination and violate fundamental rights

Societal impacts
➢ Explainability and traceability limits AI's performance if it must be understood by humans
➢ Need to be improved to promote acceptance and trust in AI
➢ Strict requirements scare off stakeholders outside of the EU which affects technological development

6. Analytical discussion

The analytical discussion analyses how AI is defined as a policy problem based on the framed challenges constructed by the stakeholders and continues with discussing potential solutions based on these frames. Hence, this chapter is used to fulfill the purpose and gain an understanding of AI as a policy problem by examining the challenges with the AIA from the perspective of the Swedish stakeholders and discuss potential solutions to improve the AIA based on the framed solutions from the stakeholders. The aim of this is to provide insight into how the AIA can be adjusted to become a more effective AI policy.

6.1 Artificial Intelligence defined as a policy problem

Peters (2018) explains that a policy problem can be understood as when a need, opportunity or value for improvement exists but has not yet been fully addressed through policy actions. Policy problems are usually complex and surrounded by a high level of uncertainty (Howlett & Mukherjee, 2018). The European Commission (2021) recognized the need to address AI to be able to utilize the benefits but also manage the risks and challenges and therefore proposed the AIA. As explained in the introduction, both scholars and the media have been critical towards the AIA to manage potential challenges (Barkane, 2022; Diaz, 2023; Hacker, 2021; Raposo, 2022; Rising, 2022; Van Kolfschooten, 2022; Varošanec, 2022). The findings from this study discussed in chapter 5 also support the critical viewpoint as a broad variety of stakeholders have emphasized the challenges with the AIA.

Based on the thematic analysis, the empirical discussion in chapter 5 condenses five major challenges concerning the AIA: (1) the definition of Artificial Intelligence, (2) implementation, (3) regulatory issues, (4) ethical questions, and (5) societal impacts. These were used to understand how the stakeholders framed AI as a policy problem. In order to do so, I was looking for elements that acknowledged the challenges posed by AI and emphasized the need for policy interventions in the material. The reason for this is that a policy problem is defined as a need for improving an existing situation that has not yet been fully addressed through policy actions (Peters, 2018). Consequently, it was important to look for elements that could be linked to the understanding of what a policy problem is. Accordingly, this sub-chapter describes how the Swedish stakeholders define AI as a policy problem.

6.1.1 The definition of Artificial Intelligence

According to the frames of the stakeholders, the root to AI as a policy problem seems to be the challenge with the definition of AI. This is because the other challenges are linked to the definition to a great extent. Defining the policy problem is argued to be a fundamental part of the policymaking process and key to be able to create an effective policy (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). Otherwise, the risk is that the policy might not be effective in solving the problems it aims to address (Brunner, 1991). In addition, an effective policy requires knowledge of what the actual issue is which the policy strives to address to be able to find a suitable solution to the problem (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). Several stakeholder emphasizes that the challenge in defining the policy problem is a main problem for the AIA (Research Institutes of Sweden AB, 2021; Swedsoft, 2021; Uppsala University, 2021).

Defining AI is key to even know what is being regulated (Larsson & Ledendal, 2022). Furthermore, a clear definition makes it easier to understand AI and its implications This study suggests that the AIA fails to clearly define what AI really is (Research Institutes of Sweden AB, 2021; Swedsoft, 2021; Uppsala University, 2021). One reason for this is claimed to be that the field of AI is complex and that the concept is fuzzy and lacks a common definition. Scholars have similar explanations as they argue that the complexity and lack of common understanding of AI makes it difficult to grasp the concept (Gasser & Almeida, 2017; Larsson, 2020; Wirtz et al., 2019). The fact that the EU also uses different definitions of AI in their on-going projects is argued to create even more confusion (Research Institutes of Sweden AB, 2021; Uppsala University, 2021). The stakeholders thus highlight that the AIA struggles to define what AI is and how it should be defined. This ambiguity also makes it difficult to know what is even being regulated. In addition, as the definition of AI is not clear, it becomes difficult to develop a policy that is clear and effective (Lund University, 2021; Swedish Defence Materiel Administration, 2021).

As stated above, an effective policy requires knowledge about the issue to be able to develop a solution that can address the problem (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). This is also argued to be a problem for the policymakers as they do not have enough knowledge

about the nature of the issue (Board of Swedish Industry and Commerce for Better Regulation, 2021). One reason for this is the asymmetry between the policymakers and the developers and users where these stakeholders have more knowledge and insight into the problem than the policymakers who try to regulate them. Taeihagh et al. (2021) explain that the asymmetry complicates regulation as the policymakers lack knowledge in the field and do not know what is possible or feasible. As the policy is constructed by the policymakers in accordance with their frames and knowledge, this might limit the AIA. The reason for this is that they might not understand the nature of AI, its potentials, and its limitations to the same extent as stakeholders with more knowledge regarding the field of AI.

To conclude, the legal uncertainty is due to the lack of principles for including new innovations, the vague definition of what AI is and what it constitutes (AI Sweden, 2021). Thus, defining the policy problem is key to create an effective policy (Howlett & Mukherjee, 2018; Peters & Hoornbeek, 2005). The risk with not defining the policy problem well is also that the policy might not be effective in solving the problems it aims to address (Brunner, 1991). In addition, not defining the problem well can delay the finding of optimal solutions (Peters & Howlett, 2005). As the concept of AI is not clear and difficult to comprehend, it therefore seems like it might be difficult to find a suitable solution to address the issue of defining the policy problem. Policymakers need to be very considerate when they formulate the definition to create a policy that achieves the purpose of the AIA.

6.1.2 Distinctiveness or technological neutrality?

Another issue concerning defining policy problems is how vague or distinct a definition should be (Haenlein & Kaplan, 2019). A vague and broad definition of AI could potentially future-proof the legislation, but the risk is that the definition covers technologies that are not typically seen as AI. Several stakeholders also emphasize this balance, but argue that the vague and broad definition used risks that everything counts as AI (Agency for Digital Government, 2021; AI Sweden, 2021; BIL Sweden, 2021; Linköping University, 2021; Lund University, 2021; Peltarion AB, 2021; Sweden's Innovation Agency, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Economic Crime Authority, 2021; Swedish Environmental Protection Agency, 2021; Swedish Prosecution Authority, 2021; Swedish Security Service, 2021; Swedsoft, 2021; Wallenberg AI Autonomous Systems and Software Program humanities and society, 2021;

Örebro University, 2021). According to various stakeholders, the reason for this is that all software that includes rule-based or statistical methods will be covered by the AIA (AI Sustainability Center, 2021; Lund University, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Defence Research Agency, 2021; Swedish Police Authority, 2021). Taeihagh et al. (2021) argue that a regulation that either underregulates harmful technologies or overregulates kind technologies is an error in the design of a policy as it does not balance these factors well. This seems to be the issue for the AIA as the broad regulation will cover a broad range of technologies that are usually not considered as AI, which is seen as unreasonable and as an overregulation (Combient AB, 2021; Peltarion Ab, 2021).

Another challenge concerning how distinct or vague the policy should be concerns the contrast between those stakeholders that want a distinct and clear definition and those that argue for a technologically neutral legislation. Here, the issue is that it might be difficult to combine a distinct definition with a technologically neutral legislation as technological neutrality usually entails vagueness (Sweden's Innovation Agency, 2021). Nevertheless, several stakeholders stress the importance of having a technologically neutral legislation (BIL Sweden, 2021; Board of Swedish Industry and Commerce for Better Regulation, 2021; Confederation of Swedish Enterprise, 2021; Karolinska Institutet Medical University, 2021; Linköping University, 2021; Sweden's Innovation Agency, 2021; Swedish Association of Local Authorities and Regions, 2021; Swedish Confederation of Professional Employees, 2021; Swedish Defence Research Agency, 2021; Swedish Economic Crime Authority, 2021; Swedish Tax Agency, 2021; Swedish Transport Administration, 2021; TechSverige, 2021; Wallenberg AI Autonomous Systems and Software Program, 2021; Wikimedia, 2021; Örebro University, 2021). The reason for this is that a technologically neutral regulation is less likely to become outdated due to the fast pace of the development (Board of Swedish Industry and Commerce for Better Regulation, 2021; Wallenberg AI Autonomous Systems and Software Program, 2021; Örebro University, 2021). Thus, the technologically-based approach used in the AIA is not seen as optimal when regulating technologies that continue to evolve at a rapid pace (BIL Sweden, 2021; Linköping University, 2021; Peltarion AB, 2021). In addition, the technology precise approach regulates technologies recognized as AI very strictly while adjacent technologies might not be regulated at all (Swedish Confederation of Professional Employees, 2021). This could lead to difficulties

for delimitation and create legal uncertainty which can result in issues to predict implications of AI.

A technologically neutral definition is more vague but also more likely to be future-proof (Sweden's Innovation Agency, 2021). These types of trade-offs are distinctive for policy problems as they usually involve a high level of complexity and conflicting interests (Howlett & Mukherjee, 2018). Thus, the challenge is to define the complex policy problem and find suitable solutions to address these policy problems (Peters, 2017). Some scholars argue that distinctiveness is important to succeed with the implementation of a policy (Bardach & Patashnik, 2020; Gustafsson & Richardson, 1979; Mazmanian & Sabatier, 1989; Stone, 2012; Van Meter & Van Horn, 1975). Matland (1995) and Stone (2012) instead take another approach and argue that ambiguity is useful to unify stakeholders with conflicting interests as the vagueness enables stakeholders to interpret the regulation in a way that suits them. In the case of the AIA, policymakers must therefore make a trade-off between using a distinct definition to know what AI is and what is regulated and a future-proof and more ambiguous definition. As discussed above the policymakers need to balance between different conflicting values and interests and choose between options that both have advantages and disadvantages.

6.1.3 Vagueness and uncertainty

Another problem concerning vagueness is that an ambiguous and broad definition creates interpretation difficulties and legal uncertainties (Combient AB, 2021; Linköping University, 2021; Research Institutes of Sweden AB, 2021; Swedish Environmental Protection Agency, 2021; Swedish Police Authority, 2021;). Therefore, stakeholders might not understand that their technology is covered by the AIA (Research Institutes of Sweden AB, 2021). Or, as Swedsoft (2021) and Uppsala University (2021) explain, stakeholders might consciously strive toward not having their technology defined as AI to avoid the regulation. Howlett and Mukherjee (2018) state that vagueness in a policy can affect the effectiveness of a policy negatively as this makes it more difficult to achieve the predefined goals and solve the issues it strives to manage.

Stone (2012) instead claims that the vagueness can unify competing interests as it enables the stakeholders to interpret the policy in a manner they prefer in accordance with their environments and conditions. However, Sweden's Innovation Agency (2021) emphasizes that

the vague regulation creates grey areas and uncertainty. In addition, the Swedish Authority for Privacy Protection (2021) argues that the ambiguity generates loopholes that can be used to circumvent the regulation or make it difficult to have a consistent implementation of the AIA in the different member states (Swedish Authority for Privacy Protection, 2021). Regulating across sectors and country borders is usually very complex as it demands a high level of coordination (Marchant, 2020). Hence, it is a typical characteristic of a complex policy problem.

The inconsistencies and suboptimal arrangements occur when local implementers try to interpret a vague policy (Vedung, 2016). The local implementers' discretion may therefore create a gap between the policy in theory and in practice (Lipsky, 2010). The gap shows how effective the policy is (Lundquist, 1972). This challenge was partly highlighted previously in 6.1.3 regarding when a stakeholder either consciously or unconsciously acts like the regulations do not apply to them. This kind of challenge is also illustrated by AI Sweden (2021) which states that the lack of a clear definition of AI creates uncertainty, which can result in bias and leave room for discretion when implementing the AIA. The risk with this is that the discretion could result in poor goals performance if the goals of the street-level and top-level differ (Matland, 1995). As the empirical findings suggests, the goals of the local stakeholders and the top-level of policymakers most likely differs as the stakeholders frame challenges they see with the AIA. For instance, the goals seem to be conflicting regarding innovation and competitiveness and strict requirements to create safety and trust (Swedish Agency for Growth Policy Analysis, 2022). The Swedish Economic Crime Authority (2021) explains that this is partly due to the fast pace of the technological development, which makes it difficult to regulate AI and at the same time does not risk EU falling behind in the development of these technologies.

6.1.4 A complex policy problem

As argued by Peters (2017) a policy problem might not be a wicked problem as it usually does not meet all requirements to be considered as wicked. Nevertheless, it can still include many of

these characteristics and be a complex problem. This thesis supports the idea of AI as a complex policy problem and this sub-chapter will explain why.

One characteristic for a complex policy problem is that it usually is difficult to define (Luimes, 2023). As this thesis has put a lot of effort to explain the difficulty in defining the policy problem of AI, both in chapter 5 and chapter 6, this is argued to be one reason why AI could be understood as a complex policy problem. Furthermore, the empirical discussion in chapter 5 highlights the difficulty in regulating a complex and rapidly evolving phenomenon like AI (BIL Sweden, 2021; Confederation of Swedish Enterprise, 2021; Karolinska Institutet Medical University, 2021; Linköping University, 2021; Peltarion AB, 2021). According to Marchant (2020), the challenge to regulate a fast-developing technology and keep up with the development is a trait of a complex policy problem. Another characteristic of complex policy problems that Marchant mentions is that they usually are difficult to coordinate as they span across different sectors and country borders. This is also seen as an issue for the AIA as stakeholders stress the difficulties of having a consistent implementation in the different member states (Swedish Authority for Privacy Protection, 2021).

Another trait associated with complex policy problems is that they involve a variety of actors with conflicting interests (Head & Alford, 2015; Peters, 2017; Peters, 2018). This is claimed to be the case for AI as well (Marchant, 2020). This thesis also observes these traits and suggest that AI could be considered a complex policy problem due to the structural policy dynamics between different stakeholders and interests. For instance, regarding how vague or distinct that AI should be defined as mentioned previously in this chapter. Stakeholders have opposite perceptions in this case as some argue for a vague and future-proof Act while others state that a distinct legislation is necessary to succeed with the implementation of policy.

Stakeholders also have conflicting interests regarding interests such as innovation and competitiveness and other values such as safety (Agency for Digital Government, 2021; AI Sweden, 2021; BIL Sweden, 2021; Combient AB, 2021; Confederation of Swedish Enterprise, 2021; Sweden's Innovation Agency, 2021; Swedish Civil Contingencies Agency, 2021; Swedish Companies Registration Office, 2021; Swedish Defence Research Agency, 2021; Swedish Economic Crime Authority, 2021; Swedish National Space Agency, 2021; Swedish

Public Employment, 2021; Swedish Social Insurance Agency, 2021; Swedish Tax Agency, 2021; Uppsala University, 2021). Other contrasting values are also the balance between crime prevention with values such as privacy and integrity (Swedish Police Authority, 2021; Uppsala University, 2021). Or, to create an effective policy that protects citizens but does not disfavor companies or scare off investors and developers from the EU due to the strict requirements (Board of Swedish Industry and Commerce for Better Regulation, 2021; Combient AB, 2021; Confederation of Swedish Enterprise, 2021; Linköping University, 2021; Lund University, 2021; Nasdaq Stockholm AB, 2021; Research Institutes of Sweden AB, 2021; Schibsted, 2021; Swedsoft, 2021; TechSverige, 2021). That could result in the EU falling behind in the development of AI (Swedish Economic Crime Authority, 2021). In addition, the risk might also be that the AI-systems are not as smart as those outside of the union (Swedish National Archives, 2021).

These arguments strengthen the understanding of AI as a complex policy problem that involves a high level of uncertainty and is difficult to manage. As stated, the stakeholders also emphasize different interests that sometimes are conflicting, which is further adding to the complexity.

6.2 Policy solutions

Policy solutions can be presented as responses to policy problems (Luimes, 2023). As policy solutions are framed, they may also involve disagreements on what response is the most suitable for a certain policy problem. The understanding of the policy problem is used to link these problems to potential solutions (Peters, 2017). This sub-chapter will therefore discuss potential solutions to improve the AIA based on the framed solutions from the stakeholders.

6.2.1 Reformulate the definition

The main challenge that generates problems is as stated previously in the chapter the definition of the problem. The Board of Swedish Industry and Commerce for Better Regulation (2021) emphasizes that the AIA is not accurate, and that the problem definition needs to be improved. In addition, multiple stakeholders state that the AIA would benefit from a clear definition of AI (AI Sustainability Center, 2021; Lund University, 2021; Swedish Police Authority, 2021; Swedish Social Insurance Agency, 2021).

Hence, one suggestion as a solution is to develop a clear problem formulation (Board of Swedish Industry and Commerce for Better Regulation, 2021; Combient AB, 2021; Sweden's Innovation Agency, 2021; Swedish Post and Telecom Authority, 2021). A more distinct definition could also promote security and facilitate a consistent implementation (Sweden's Innovation Agency, 2021). A solution could therefore be to use a narrow definition as it reduces uncertainty (Peltarion AB, 2021; Swedish Economic Crime Authority, 2021; Swedish Police Authority, 2021).

The Swedish Economic Crime Authority (2021) and the Swedish Police Authority (2021) suggests that the definition developed by the High-Level Expert Group on AI is a more suitable definition and should be used instead of the current one. This definition is argued to better cover relevant characteristics and appropriate techniques connected to AI. Another solution could be to use the current definition but make it sharper by stating that the definition concerns 'autonomous' technologies (Lund University, 2021). Including 'autonomous' in the definition is argued to support distinguishing AI from other software.

Another suggestion to make the definition of AI more distinct is to delete the point covering methods for statistics, estimations and search and optimization (Linköping University, 2021). However, the Swedish Defence Research Agency (2021) states that excluding that point could make the definition too narrow and possible to circumvent. It is therefore important to balance vagueness and distinctiveness (Kaplan & Haenlein, 2019). If the policy is very ambiguous, it might become difficult to reach the predefined goals (Howlett & Mukherjee, 2018). The ambiguity creates suboptimal and inconsistent arrangements when the implementers try to interpret a vague policy (Vedung, 2016). Furthermore, the discussion regarding vagueness and distinctiveness does also apply to the discussion of technological neutrality. For instance, developing a more technologically neutral regulation is highlighted as a solution to make the AIA more future-proof (Sweden's Innovation Agency, 2021). A future-proof definition is also argued to require ambiguity with the risk once again to use a definition that covers too much (Kaplan & Haenlein, 2019).

As explained above, several stakeholders argue for different ways of reformulating the definition to improve the AIA. However, as policy solutions also are framed, it is still

challenging to know what the most suitable solutions are as disagreement prevails (Luimes, 2023). Accordingly, policymakers must find a way to unify stakeholders in a common definition that can be accepted. The reason for this is that a common definition is a must to even know what is being regulated (Larsson & Ledendal, 2022).

6.2.2 Manage the overlaps with other regulations

The vague wordings and overlapping with other regulations are thought to negatively affect the effectiveness of the AIA (Agency for Digital Government, 2021; Region Stockholm, 2021; Stockholm municipality, 2021; Swedish Bar Association, 2021; Swedish Tax Agency, 2021; TechSverige, 2021;). One way to handle this is therefore either to reformulate regulations such as the GDPR to be compatible with the AIA or change the Act so it does not overlap areas or issues that are already regulated by other laws (Confederation of Swedish Enterprise, 2021; Swedish Economic Crime Authority, 2021; TechSverige, 2021). This is important to make sure that there are no loopholes or gaps that can be used to disclaim responsibility (Research Institutes of Sweden, 2021). The overlapping and conflicting rules should also be reformulated to avoid legal uncertainty that inhibits innovation and competitiveness (Linköping University, 2021; TechSverige, 2021). By clarifying the AIA, safety can be promoted, and the implementation of these systems can become more consistent (Sweden's Innovation Agency, 2021).

The GDPR would also need to be revised to gain complete data of higher quality (Confederation of Swedish Enterprise, 2021; Linköping University, 2021; TechSverige, 2021). This would be key to counteract bias in the AI-systems as it enables control of full datasets to detect the origins of errors. Allowing scrutinization of data could be important to promote transparency and counteract discrimination (AI Sweden, 2021; Confederation of Swedish Enterprise, 2021; Linköping University, 2021; TechSverige, 2021).

Thus, the AIA should not only harmonize rules on AI across the EU but also harmonize the AIA with other regulations. This is a complex task as a comprehensive regulation requires a high level of coordination.

7. Conclusions

This thesis has aimed to answer the research question on 'How do the Swedish stakeholders define Artificial Intelligence as a policy problem; in particular, what kind of challenges do they identify with the Artificial Intelligence Act?'. The thesis has also strived to satisfy the purpose to study the challenges with the AIA from the perspective of the Swedish stakeholders and to suggest solutions to improve the AIA and make it more effective based on the framed solutions from the stakeholders. In addition, this thesis will provide recommendations to policymakers which aspire to contribute with knowledge on how policymakers can create effective policies concerning complex problems surrounded by a high level of uncertainty.

7.1 The identified challenges with the AIA

By thematically analysing the comment letters by using the theory on challenges with AI from chapter 2, the empirical discussion in chapter 5 shows the kind of challenges the Swedish stakeholders identify with the AIA. These kinds of challenges are challenges with: (1) the definition of Artificial Intelligence, (2) the implementation, (3) regulatory issues, (4) ethical questions, and (5) societal impacts. These challenges proceeds from different perspectives of challenges and concerns everything from the difficulty in finding a common and comprehensive definition of AI to succeeding with a joint implementation and achieve the desired objectives. In addition, these challenges also include issues to create a well-formulated regulation that is legally distinct and can balance conflicting interests, ensure ethical principles, and counteract harm as well as promote as well as lay the basis for trustworthy and competitive AI, now and in the future. By examining what kind of challenges the Swedish stakeholder identify with the AIA in the empirical discussion, the thesis answered the second half of the research question.

7.2 Artificial Intelligence as a policy problem

The identified challenges illustrate needs that have not yet been fully addressed in the AIA and must be solved. The analytical discussion in chapter 6 analyses how AI is defined as a policy problem based on the framed challenges constructed by the Swedish stakeholders. To be able to analyse AI as a policy problem, the theory on policymaking, policy problems and complex policy problems from chapter 3 were used to understand how the challenges were framed to constitute the policy problem of AI. The empirical discussion in chapter 5 showed that the

definition of the policy problem seemed to be the root of AI as a policy problem and permeated the other challenges. AI could therefore be considered a policy problem where different challenges need to be managed to fully tackle the problem. AI also appeared as a complex policy problem that was difficult to regulate and involved a variety of stakeholders with different, incompatible goals. For instance, stakeholders did not agree on how vague or distinct the definition should be and did not perceive the same values and goals as the most important to take into consideration when formulation of the AIA. Consequently, it becomes difficult to satisfy all these and combine conflicting values and perspectives. By examining AI as a policy problem through the analytical discussion, the thesis answered the first half of the research question and fulfilled the purpose to gain an understanding of AI as a policy problem.

7.3 Policy solutions

Frames translate a situation perceived as uncertain or problematic into a policy problem (Laws & Rein, 2003). The frames can thus be used to imply a certain policy action. However, as policy problems are framed, disagreements on how to solve the problem may also arise (Luimes, 2023). These can differ depending on interests and perceptions (Turnpenny et al., 2015).

The discussion on suggested solutions to improve the AIA can be found in the analytical discussion in chapter 6. To be able to detect proposed solutions in the data, the theory on policy framing from chapter 3 was used. The theory guided me to look for patterns that suggested that the stakeholders acknowledged the challenges posed by AI and associated policy interventions. Due to the different perspectives and frames, the stakeholders have emphasized different solutions to improve the AIA. However, many stakeholders especially stressed the importance of formulating a more distinct problem formulation and define the problem clearer. The issue then is that a future-proof definition benefits from a more ambiguous definition. In addition, a more ambiguous definition may be used to unify different groups and interests to accept a legislation. It is therefore important for the policymakers to find a balance between vagueness and distinctiveness. Another solution to improve the AIA and make it more effective is also to reformulate either the Act or other regulations to avoid overlapping that creates uncertainty and inconsistency. For instance, the GDPR would need to be revised to be able to have access to full datasets and data of higher quality. This would also be useful to counteract bias and

discrimination. By discussing the solutions proposed by the stakeholders, the thesis aimed to fulfil the purpose to suggest solutions to improve the AIA and make it more effective.

7.4 Recommendations

Based on the findings and discussions, this thesis suggests recommendations for policymakers that could be valuable in the policymaking process when creating policies in a complex field surrounded by a lot of uncertainty. The aim of this is to fulfil the last part of the purpose that strives to contribute knowledge that could be useful for policymakers. As the analytical discussion suggest that AI can be understood as a complex policy problem, certain considerations are necessary when creating policies. This knowledge is used to provide recommendations for the policymakers on how to create effective policies concerning policy problems in complex environments. This could be useful in a society where complex problems become increasingly common.

➢ One recommendation is that policymakers put effort into defining the problem they want to address. Based on the findings of this study, defining the problem seems to be half the solution as this challenge permeates the other challenges to a great extent. If the problem is not well-defined, the risk is that the right solutions are being delayed. In addition, the regulation might not solve the issue it strives to address without a well-defined problem and might therefore not be effective. A clear definition can also reduce uncertainty, promote security, and facilitate a consistent implementation. Accordingly, policymakers must find a way to unify stakeholders in a common and distinct definition that can be accepted to state what is being regulated.

➢ As the thesis suggests, it is important to gain insight into the nature of the problem to understand what the phenomenon is that needs to be handled. As stated in the analytical discussion, this seems to be a problem for the policymakers of the AIA as they do not have enough knowledge about the nature of the issue. Instead, the developers and users are knowledgeable and have more insight into the problem than the policymakers who try to regulate the problem. As the policy is constructed by the policymakers in accordance with their frames and knowledge, this might limit the AIA. A recommendation is therefore to try to reduce this asymmetry. This could be done be

consulting with stakeholders concerned by the policy to better understand the problem from different perspectives. Stakeholders such as developers and investors might have more knowledge about the nature of the problem in comparison to the policymakers due to asymmetries. Policymakers should therefore take advantage of this and learn from these stakeholders with better insight into the complex problem.

➢ Another recommendation is to make the legal status distinct and make sure that the regulation does not cover areas that are already regulated by other laws. If this still is the case, either the policy in the making needs to be reformulated or other laws should be revised. This seems to be a challenge for the AIA and the risk is that it becomes difficult to know which regulation covers what and who is responsible in different overlapping questions. Thus, policymakers must harmonize rules and increase the coordination with relevant stakeholders.

➢ The last recommendation concerns balance and urges policymakers to find a balance between vagueness and distinctiveness when developing policies. This is important to manage the complexity with a variety of stakeholders with incompatible interests and values. This thesis suggests that this is an issue for the AIA which struggles to combine different approaches on the definition and on what values that should be considered in the making of the policy. The policy must also be vague enough to unite conflicting interests, but at the same time distinct enough to make it clear what is being regulated and not leave room for misinterpretations or abuse. It is important to define goals and how they can be achieved clearly enough to achieve them but vague enough to be adjustable for local conditions and prerequisites. A proportional balance is therefore recommended in relation to complex problems.

7.5 Worth noting

As the AIA is in the drafting process, the thesis has used this opportunity to highlight the challenges with the AIA and suggested solutions to these challenges based on the stakeholders' frames. Worth noting is that some changes to the draft might have been made during the writing process of this thesis. However, as the focus is on the stakeholders' comment letters, not the draft or final Act, that should not be a major problem for this thesis.

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Annex

Appendix 1. Comment letters

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Appendix 2. Translations of Swedish quotes to English translations

Stakeholder	Swedish	English translation
Swedish Defence Materiel Administration (2021, p.1)	"[…] behovet och möjligheterna att skapa ett tydligt och förutsebart regelverk inom området utan en klar definition av begreppet."	"[…] the need and the possibilities to create a clear and predictable regulatory framework in the field without a clear definition of the concept."
Lund University (2021, p.5)	"Det finns en inneboende svårighet att använda ett koncept, "artificiell intelligens", som uttrycker ett över 70-årigt flexibelt och föränderligt forskningsområde till att styra en omfattande reglering"	"There is an inherent difficulty to use a concept such as 'artificial intelligence', which expresses a more than 70-year-old flexible and changing research area to guide a comprehensive regulation"
Swedish Confederation of Professional Employees (2021, p.3)	"kasuistisk där viss teknik eller vissa användningsområde är noggrant reglerade medan andra angränsande tekniker och användningsområden inte är det.	"[…] casuistic where certain technologies or areas of use are carefully regulated while other adjacent technologies and areas of use are not."
Swedish Defence Research Agency (2021, p.1)	"[…] en uppsättning namngivna teknologier och förordar i stället reglering utgående från principen om teknikneutralitet."	"[…] a set of named technologies and instead advocates for a regulation based on the principle of technological neutrality."
Board of Swedish Industry and Commerce for Better Regulation (2021, p.2)	"En annan aspekt kopplat till AI som inte tycks beaktas är att tekniken är dynamisk, medan förslaget tycks utgå från att tekniken är statisk och det blir därmed lite som att försöka reglera ett rörligt mål."	"Another aspect connected to AI that does not seem to be considered is that the technology is dynamic, while the proposal seems to assume that the technology is static and thus it is therefore a bit like trying to regulate a moving target."
Swedish Association of Local Authorities and Regions (2021, p.2)	"[…] det inte är tekniken i sig som utgör problemet, utan snarare hur den appliceras och effekterna av detta."	"[…] it is not the technology itself that constitutes the problem, but rather how it is applied and the effects of this."
Board of Swedish Industry and Commerce for Better Regulation (2021, p.2)	"förslaget går in på ett tekniskt område där detaljreglering aldrig är lämplig p.g.a. att regelgivanas kunskap är betydligt sämre om det som ska	"[…] the proposal enters a technical area where detailed regulation is never appropriate due to the policymakers' knowledge being significantly

	"regleras, vilket brukar benämnas principal – agent förhållande eftersom det föreligger asymmetrisk information."	worse concerning what is being regulated, which is usually referred to as the principal-agent relationship because there is asymmetric information."
Region Västra Götaland (2021, p.2)	"Samtidigt har användningen av AI potential att bidra med betydande nytta inom en mängd områden genom ökad ekonomisk tillväxt såväl som lösningar på miljömässiga och sociala samhällsutmaningar. Det är därför viktigt att det finns en balans i förhållandet mellan beaktande av risk å ena sidan och utveckling och innovation å andra sidan."	"Simultaneously, the use of AI has the potential to contribute significant benefits in a variety of areas through increased economic growth as well as solutions to environmental and social societal challenges. It is therefore important that there is a balance between consideration of risk on the one hand and development and innovation on the other."
TechSverige (2021, p.2)	"För att både stärka förtroendet för AI-tillämpningar och gynna snabb teknikutveckling bör etiska riktlinjer, certifieringar och uppförandekoder användas så mycket som möjligt."	"In order to both strengthen trust in AI- applications and promote fast technology development, ethical guidelines, certifications and Codes of Conduct should be used as much as possible."
Chalmers University of Technology (2021, p.3)	"På sidan 48, punkt 3, stipuleras bland annat kravet att data skall vara "free of errors and complete". Denna formulering behöver nog mjukas upp, för om den tas bokstavligt torde kravet uppfyllas av ytterst få eller inga alls av dagens maskininlärningssystem […]"	"On page 48, point 3, among other things, the requirement that the data must be 'free of errors and complete' is stipulated. This wording probably needs to be softened, because if it is used literally, the requirement would be met by very few or none of today's machine learning systems [...]"
Swedish Gender Equality Agency (2021, p.3)	"[…] måste system som klassificeras som högrisk-AI tränas och testas med en tillräckligt representativ data. Utvecklingen måste också kunna spåras bakåt så att all data kan kontrolleras i efterhand."	"[…] systems classified as high-risk AI must be trained and tested with sufficiently representative data. The development must also be traceable backwards so that all data can be checked afterwards."

BIL Sweden (2021, p.3)	"[…] förvaring av loggar under en längre tid kräver stor lagringskapacitet vilket kan leda till stora konsekvenser när det gäller ökade kostnader för datalagring, ökad energiförbrukning samt underhåll."	"[…] storing logs for a longer period of time requires a large storage capacity, which can lead to major consequences in terms of increased costs for data storage, increased energy consumption and maintenance."
Swedish Civil Contingencies Agency (2021, p.3)	"kompetens och expertis ska inkludera djupa kunskaper om AI-teknologier, data och databehandling, fundamentala rättigheter, hälso- och säkerhetsrisker samt kunskaper om existerande standarder och legala krav."	"[…] competence and expertise will include deep knowledge in AI-technologies, data, data processing, fundamental rights, health- and safety risks as well as knowledge about current standards and legal requirements."
Swedish National Archives (2021, p.4)	"Detta kan fördyra användningen av AI-systemen avsevärt och kommer i praktiken att sätta gränser för vilka företag och offentliga organ som kan implementera och använda den här typen av lösningar. […] Eftersom det redan råder brist på ingenjörer med maskininlärningskompetens så kommer detta att hämma utvecklingen inom EU ytterligare […]"	"This can make the use of AI-systems significantly more expensive and will effectively limit which companies and public bodies can implement and use these types of solutions. […] As there already is a shortage of engineers with machine learning skills, this will further hamper development within the EU […]"
The Swedish Public Employment Service (2021, p.2)	"[…] det kommer att behövas ett nationellt kunskapslyft rörande AI och data governance hos myndigheter i allmänhet."	"[…] a national increase in knowledge regarding AI and data governance among authorities in general will be needed."
TechSverige (2021, p.2)	"[…] kommer också leda till högre kostnader och flaskhalsar på grund av att de långtgående och komplexa kraven kräver kompetens inom områden där det idag råder stor brist på medarbetare med relevant kunskap."	"[…] will also lead to increasing costs and bottlenecks due to the far-reaching and complex requirements that requires competence in fields where there currently is a great shortage of employees with relevant knowledge."

Swedish National Archives (2021, p.4)	"Det är inte lämpligt att ha helautomatiserade beslutsprocesser som bygger på maskininlärning eftersom dessa inte kan leva upp till bl.a. GDPRs krav på att människor ska kunna få beslut som gäller dem förklarade för sig."	"It is not suitable to have fully automated decision-making processes based on machine-learning as these cannot fulfill for example the requirements the GDPR has that people should be able to have decision concerning themselves explained to them."
Karolinska Institutet Medical University (2021, p.1)	"AI får inte ersätta det personliga ansvaret varför behovet av mänsklig tillsyn och kontroll därför måste säkerställas. AI måste gå att lita på för det allmännas bästa. Ansvaret för vad ett AI-system gör bör tydligt regleras så att det alltid finns människor att ställa till svars för vad en AI gör."	"AI cannot replace the personal responsibility, which is why the need for human supervision and control must be ensured. AI must be trusted for the common good. Responsibility for what an AI-system does should be clearly regulated to make sure that people always can be held accountable for what an AI does."
Region Stockholm (2021, p.3)	"[…] vilken reglering som ska ha företräde i fall av undvikande av dubbla och/eller motstridiga tillsynsförfaranden och sanktioner, hur de nationella tillsynsmyndigheterna ska förhålla sig till varandra, tänkt ansvarsfördelning mellan EDPB och EAIB."	"[…] which regulation should take precedence in cases of avoiding duplicate and/or conflicting supervisory procedures and sanctions, how the national supervisory authorities should relate to each other, envisaged division of responsibilities between the EDPB and the EAIB."
Swedish Public Employment Service (2021, p.1)	"[…] det måste klargöras hur AI-förordningen förhåller sig till EU:s dataskyddsförordning och myndigheters registerlagstiftningar beträffande behandling av känsliga personuppgifter, för att myndigheter inte ska hämmas i arbetet med att utveckla AI-förmågor."	"[…] it must be clarified how the AIA relates to the EU data protection regulation and authorities' register legislation regarding the processing of sensitive personal data, so that authorities are not hampered in the work of developing AI-capabilities."