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The EU AI Act: A Catalyst or Further Challenge for SMEs in Achieving Ethical AI

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Abstract

Title: The EU AI Act: A Catalyst or Further Challenge for SMEs in Achieving Ethical AI.

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Keywords: EU AI Act, AI Ethics, SMEs (Small and Medium-sized Enterprises), Ethical AI Development, Ethical Compliance, Regulatory Framework, Compliance Costs, AI Risk Categorization, Resource Constraints, Legislative Adjustments, AI Innovation, FAST Framework

The EU Artificial Intelligence Act (AIA) introduces a groundbreaking legal framework that aims to establish a balance between encouraging innovation and upholding ethical standards in the development of AI. Small and medium-sized enterprises (SMEs) are particularly affected and face unique challenges at the intersection of ethical compliance and operational profitability. This study uses qualitative insights from industry experts to examine how SMEs are adapting their practices to meet the requirements of the AIA while taking ethical imperatives into account.

The findings show that while the AIA is raising awareness and providing a foundation for ethical AI development, SMEs face significant obstacles such as unclear regulatory guidelines, high regulatory burdens, and resource constraints. These challenges often prevent the seamless integration of ethical principles into AI operations. The study argues for legislative refinements, including clearer guidelines, financial support, and support structures tailored to SMEs. It also highlights the need for a paradigm shift within SMEs to embed ethical considerations in their core strategies.

This thesis adds to the ongoing discussion about AI ethics and regulations by giving useful suggestions for balancing moral goals with real-world operations. The study highlights the potential for the AIA to serve as a catalyst for ethical AI innovation, but only if the challenges faced by European SMEs in their efforts to comply with ethical standards are sufficiently mitigated.

Resumo

Título: The EU AI Act: A Catalyst or Further Challenge for SMEs in Achieving Ethical AI.

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Palavras-chave: Lei da IA da UE, Ética da IA, PME (pequenas e médias empresas), Desenvolvimento ético da IA, Conformidade ética, Quadro regulamentar, Custos de conformidade, Categorização do risco da IA, Restrições de recursos, Ajustamentos legislativos, Inovação da IA, Quadro FAST

A Lei da Inteligência Artificial da UE (AIA) introduz um quadro jurídico inovador que visa estabelecer um equilíbrio entre a promoção da inovação e a manutenção de normas éticas no desenvolvimento da IA. As pequenas e médias empresas (PME) são particularmente afectadas e enfrentam desafios únicos na intersecção entre a conformidade ética e a rentabilidade operacional. Este estudo utiliza conhecimentos qualitativos de peritos da indústria para explorar a forma como as PME estão a adaptar as suas práticas para cumprir os requisitos do AIA, incorporando simultaneamente imperativos éticos.

Os resultados mostram que, embora o AIA aumente a consciencialização e forneça uma base para o desenvolvimento ético da IA, as PME enfrentam obstáculos significativos, tais como orientações regulamentares pouco claras, elevados encargos regulamentares e restrições de recursos. Estes desafios impedem muitas vezes a integração perfeita dos princípios éticos nas operações de IA. O estudo defende a necessidade de aperfeiçoamentos legislativos, incluindo diretrizes mais claras, apoio financeiro e estruturas de apoio adaptadas às PME. Sublinha também a necessidade de uma mudança de paradigma nas PME para incorporar considerações éticas nas suas estratégias fundamentais.

Esta tese contribui para o debate em curso sobre a ética e a regulamentação da IA, fornecendo sugestões úteis para conciliar os objectivos morais com as operações no mundo real. O estudo destaca o potencial da AIA para servir de catalisador para a inovação ética da IA, mas apenas se os desafios enfrentados pelas PME europeias nos seus esforços para cumprir as normas éticas forem suficientemente mitigados.

Preface

First of all, I would like to express my deepest gratitude to the Católica University Lisbon. It has not only helped me to develop professionally, but also to grow personally. This city and its inspiring atmosphere, as well as the great academic opportunities, have left a lasting impression on me.

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List of Abbreviations

AI - Artificial Intelligence

AIA - Artificial Intelligence Act

CSR - Corporate Social Responsibility

ECCOLA - Ethical and Control Framework for AI Systems Lifecycle

EU - European Union

FAST - Fairness, Accountability, Sustainability, Transparency

FAT - Fairness, Accountability, Transparency

GDPR - General Data Protection Regulation

QMS - Quality Management System

SIENNA - Stakeholder-Informed Ethics for New and Emerging Technologies with High Socio-Economic and Human Rights Impact

SME - Small and Medium-sized Enterprises

Introduction

Stephen Hawking famously said: “AI will be either the best or the worst thing ever to happen to humanity. We do not yet know which.” (Hern, 2017). Even if this seems somewhat dramatic, the effects of this statement are very clearly recognizable for us in the present. Artificial Intelligence (AI) has emerged as one of the most disruptive and transformative technological forces of the 21st century, revolutionizing industries as diverse as healthcare, finance, marketing, and manufacturing (Haenlein & Kaplan, 2019; Davenport et al., 2020; Hamet & Tremblay, 2017; Sheikh et al., 2023). Yet, for every promise AI holds, there is a shadow of uncertainty, a risk that, if left unchecked, these systems could exacerbate societal inequalities and moral dilemmas.

The stakes are clear. Poorly designed or inadequately governed AI systems can result in outcomes that are not just inconvenient but profoundly unethical (Goodall, 2014; Remenyi et al., 1996; Hagendorff, 2020; Floridi, 2018). Amazon’s recruitment algorithm, which systematically discriminated against female candidates (BBC News, 2018), and Clearview AI’s invasive facial recognition technology, which scraped billions of personal images without consent (Garza et al., 2024), are cautionary tales of what happens when ethical oversight falters. These incidents reveal a glaring truth: as AI’s capabilities accelerate, so must our ethical vigilance.

Despite increasing awareness, AI ethics risk to often remains an abstract goal that organizations struggle to translate into practice (Mengyi Wei & Zhixuan Zhou, 2022). This challenge is particularly acute for small and medium-sized enterprises (SMEs). With fewer than 250 employees or revenues below €50 million, these businesses often face a significant struggle: how to develop ethical AI systems when they lack the resources, tools, and frameworks to do so (Mengyi Wei & Zhixuan Zhou, 2022; Hagendorff, 2020; Soudi & Bauters, 2024; McWilliams & Siegel, 2001). The gap between aspiration and implementation widens, leaving SMEs grappling with ethical uncertainty in a rapidly evolving landscape.

In response to these mounting challenges, the European Union introduced the Artificial Intelligence Act (AIA) in 2023, a historic attempt to bring order to the chaos. As the first comprehensive AI regulation from a major governing body, the AIA represents both a promise and a warning (European Parliament, 2023). By categorizing AI systems into four risk levels: unacceptable, high, specific, and minimal, the legislation seeks to protect society from AI’s most dangerous applications while fostering innovation within safe boundaries (EU, 2023;

Floridi, 2021). Its ambition is clear: to ensure the responsible usage of AI in our society and to make sure that companies have a certain framework and guide they must adhere to.

Yet, the AIA raises a deeper question: can regulation alone build ethical AI? Scholars like Vaccaro (2022) argue that organizations aiming for mere juridical compliance often fail to recognize ethical compliance and, therefore, achieve ethical behavior and prevent ethical risks. Meeting the legal requirements, while required by society does not necessarily guarantee that companies act ethically, as expected, and desired by society (Carrol, 1991). Laws may encourage organizations to “tick the boxes” of transparency or risk assessment, but they cannot guarantee genuine ethical commitment. Tenbrunsel and Messick (2004) warn of a “false sense of moral security,” where companies focus on meeting regulatory requirements without addressing the broader societal impact of their actions. For example, an AI system might satisfy transparency guidelines while still contributing to environmental harm or exacerbating bias (Floridi et al., 2018; Hagendorff, 2020).

For SMEs, the stakes are even higher. Regulatory compliance comes with costs, that can be crippling for smaller firms (Fletcher, 2001; Mina et al, 2021). The very legislation designed to foster ethical AI might unintentionally hinder SMEs, forcing them to divert limited resources toward compliance rather than innovation or ethical investment (Fletcher, 2001; Mcwilliams & Siegel, 2001). It is therefore not clear whether the AIA creates a starting point for more ethical AI in SMEs or whether it further hinders them by diverting resources to compliance with legislation, while ethical aspects are being neglected. (Soudi & Bauters, 2024, Haataja & Bryson, 2021).

Taking those thoughts into consideration the research question guiding this study is: **How does the regulatory framework from the EU AI Act influence the development and implementation of AI ethics policies in SMEs?**

To answer this question, this thesis investigates how the legislative framework of the AIA affects the efforts of SMEs to develop ethical AI, thereby addressing a critical research gap, as SMEs, although crucial to innovation in the EU AI market (Cohen, 2010; Government of Ireland, 2021; EU, 2021; Mina et al, 2021; European Commission, 2021), remain underrepresented in the AI ethics discourse (Soudi & Bauters, 2024). This study will take a special look at SMEs that develop systems in the “high-risk” category, as this is where compliance challenges, ethical risks, and economic impacts are most pronounced (Smuha et al, 2021; Madiega, 2023; Mueller, 2021). As the first comprehensive legislation of its kind, the

AIA provides a unique opportunity to assess whether such measures can reconcile ethical imperatives with the operational realities of SMEs, and provides valuable insights for policymakers, businesses, and academics.

This study begins with a literature review that summarizes the fundamentals of AI ethics in business, the operational obstacles faced by SMEs, and the content and intent of the AIA. It criticizes the assumption that compliance ensures ethical behavior and emphasizes the need for broader accountability. Following that, the research design and qualitative methodology to analyze the ethical and operational challenges in the context of AIA are outlined. Next, the findings are presented on how the AIA impacts SMEs approach to AI ethics, followed by a discussion of AIA's dual role as an ethical catalyst and as a regulatory burden. The study concludes with recommendations for SMEs and policymakers, providing insights into the interplay of AI ethics, regulation, and SME operations.

Literature Review

General Topic of AI Ethics in Business

When relating ethical AI issues to the business world today, the general concerns focus on unintended consequences that arise with the deployment of widely used AI technologies (Floridi et al., 2018), (Hagendorff, 2020), (Etzioni, 2017), (Attard-Frost, 2023), (Russell & Norvig, 2020). While AI's capacity to process vast amounts of data in real-time has transformed decision-making processes (Brynjolfsson & McAfee, 2017), the performance and accuracy of AI models are directly influenced by the quality, quantity, and variety of the data used (Russell & Norvig, 2020; Dwivedi et al., 2023; Munoko, 2020; Floridi et al., 2018). It is therefore easy to see that AI has great potential, but that its implementation also entails considerable risks.

By the late 2010s and early 2020s, these concerns began to be reflected in various ethical guidelines and frameworks, aiming to address and summarize the risks associated with continuous AI development (Jobin et al., 2019). One of these are the “FAT Guidelines”, which stand for fairness, accountability, and transparency. They were developed by the FAT/ML community and gained recognition in corporate and legislative circles in the following years (Barocas et al., 2019). They have been considered in the political arena such as the EU and Singapore, as well as in Microsoft's corporate responsibility guidelines (Zhdanov, 2021). In an overview of AI ethics guidelines, Hagendorff found that of 22 articulated legislative and company-based guidelines, 18 cover fairness, accountability, and transparency. (Hagendorff, 2020). Different overviews find similar results (Attard-Frost, 2023; Jobin et al, 2019). The FAT guidelines can be decrypted the following notions:

Fairness means that algorithmic decisions should not result in discriminatory or unjust outcomes. AI systems, trained on biased historical data, may perpetuate, or even exacerbate societal inequalities (Barocas et al., 2019; Attard-Frost, 2023; Floridi et al., 2018). Studies show that bias in AI systems can manifest in hiring, resource allocation, and customer segmentation, with significant implications for social justice. (Zou & Schiebinger, 2018; Leslie, 2019). Other examples of unfair practices might include banks approving loans based on a person's ethnicity (Shin & Park, 2019).

Accountability begins with the system's designers and developers. These individuals are ultimately responsible for the impacts and consequences their systems have on stakeholders and society. Recognizing the possibility of unintended consequences is an important part of

algorithmic accountability. Those who make and use these systems must understand and handle these consequences (Martin, 2018; Shin & Park, 2019).

Transparency means clearly communicating the reasons for an AI's decision, especially when sensitive data is used (Shin & Park, 2019). Many AI systems, particularly those that rely on complex machine learning models, operate as “black boxes”, making it difficult for human users to understand how decisions are made (Burrell, 2016). This opacity can undermine trust in AI systems, leading to reputational and legal risks (Munoko, 2020). Privacy is also at the core of this issue, particularly as AI systems often rely on large datasets containing personal information (Dilmaghani et al, 2019). This reliance on data has sparked debates about consent, data ownership, and the protection of privacy rights in AI applications (Zuboff, 2019).

Leslie highlighted a critical gap in existing ethical guidelines and addressed it by reformulating FAT into the FAST framework, which incorporates sustainability as a key component (Leslie, 2019). Strubell et al. (2019) highlight that training a single AI model can emit as much CO₂ as several cars over their lifetimes, emphasizing the environmental cost of AI research and development. Moreover, the production of hardware necessary for AI depends on the extraction of rare minerals, further straining natural resources and contributing to ecological degradation. Sakao et al. (2021) discuss how the lifecycle of these materials, from mining to disposal, raises ethical and environmental concerns, especially regarding the sustainability of sourcing and recycling practices.

Organizational challenges of AI Ethics integration

While companies may adopt or acknowledge guidelines based on the FAST principles, a problem is the fact that they still often lack real and actionable solutions on how to put the guidelines into practice. Hagendorff in his analysis of Guidelines critiques the current state of AI ethics and calls for more actionable, responsible, and holistic approaches to ensure that AI development aligns with societal values. (Hagendorff, 2020). This disparity gives the impression that the AI industry did not seem to have the goal in mind to really enforce those guidelines. These rather seem to serve to suggest to legislators that internal self-governance in science and industry is sufficient and that no special laws are needed to mitigate potential technological risks and rule out abuse scenarios (Mittelstadt, 2019; Rességuie & Rodrigues, 2020).

SMEs are particularly concerned by this separation, as they face additional particular challenges when it comes to integrating ethical principles into their business activities, especially in the context of AI (Soudi & Bauters, 2024). A key obstacle is the lack of resources and tailored guidelines. SMEs are often excluded from discussions on AI ethics, resulting in frameworks that do not adequately address their needs or operational realities (Mengyi Wei & Zhixuan Zhou, 2022; Fassin et al., 2011). In contrast to large companies, SMEs face resource scarcity and cognitive barriers that limit their ability to interpret and implement ethical principles (McWilliams & Siegel, 2001; Soudi & Bauters, 2024). The lack of clear and unified terminologies in the field of ethics further complicates their understanding and implementation (Fassin et al., 2011). Beyond that, awareness remains a critical issue: only 30% of SMEs are aware of the ethical implications of AI, according to a recent report by Deloitte (Deloitte, 2020).

Economic pressure often leads to market-based approaches when it comes to ethical considerations. While those are potentially effective, they are often insufficient to ensure genuine ethical practices in SMEs (Santos, 2011; Heath, 2014). In the absence of regulatory intervention, some companies may prioritize image over substantive ethical behavior, perpetuating “ethics of self-interest” rather than addressing core ethical tasks (Cambra-Fierro et al., 2008). Furthermore, the technical complexity of AI systems poses unique challenges for SMEs, as these companies often lack the expertise and financial capacity to use and manage these systems responsibly. This leads to ethical vulnerabilities and an increased risk of non-compliance with new regulations (Soudi & Bauters, 2024).

In summary, literature presents a handful of solutions, that could help SMEs to these challenges through organizational and legislative change:

Simplified and Practical Ethical Guidelines: Frameworks that SMEs can understand and implement effectively (Fassin et al., 2011; Pošćić & Martinović, 2023; Soudi & Bauters, 2024).

Capacity-Building Measures: Training and Tools to bridge the knowledge gap in AI and ethics (Soudi & Bauters, 2024; Oldemeyer, 2023).

Incentive-Based Regulations: Policies that combine market incentives for ethical behavior with clear enforcement mechanisms (Cambra-Fierro et al., 2008; Soudi & Bauters, 2024).

Yet even though some factors are understandable, literature highlights the existing gap between ethical frameworks and practical implementation. Weaver (2006) suggests that ethical considerations may not be as resource-constraining as managers often perceive (Weaver, 2006).

Similarly, Prentice (2014) and Buhmann (2016) explore how behavioral ethics can aid individuals and organizations in aligning with ethical standards in a resource-efficient manner, challenging the notion that ethical considerations inherently strain resources (Prentice, 2014; Buhmann, 2016). On top of this, the existence of numerous methods and tools can help AI companies operationalize their ethical AI principles in a more effective and cost-efficient way. These methods not only aid in the application of ethics but can also assist in early assessments of potential compliance gaps (Cappelli & Serugento, 2024).

For instance, the ECCOLA toolkit, developed by Vakkuri et al., offers a practical approach to integrating ethics into AI development. This toolkit consists of a deck of cards, each addressing a specific ethical consideration, guiding developers through ethical questions and potential issues, from initial design to deployment. (Vakkuri et al., 2019). Similarly, the SIENNA project provides a structured five-step model for translating ethical values into actionable guidelines (Brey et al., 2021). As open-source tools, these are examples of cost-effective and user-friendly solutions, making them ideal for SMEs that may lack specialized AI expertise and budget (Brey et al., 2021; Vakkuri et al., 2019).

The Risk-Based Approach of the EU AI Act

Given the gap between the presence of ethical concerns and their actual implementation in practice, the calls for an actionable and publicly accepted legislative framework to enforce ethical guidelines are at the central point of a lot of literature (Floridi et al., 2019; Hagendorff, 2020; Baker-Brunnbauer, 2021).

The calls were finally answered when EU lawmakers presented the proposal for AIA in April 2021 (EU, 2021). The stated aim of this legislation was to create a comprehensive legal framework for AI that ensures AI systems are aligned with EU values, fundamental rights, and ethical principles (Floridi, 2021, Madiega 2023). To achieve this, the AIA introduces a novel risk-based framework for the regulation of AI systems, which categorizes them into four levels of risk: unacceptable risk, high risk, limited risk, and minimal risk (EU, 2023; Madiega, 2023).

Unacceptable Risk: AI systems categorized as posing an unacceptable risk are prohibited under the AIA. These include systems that use subliminal manipulation, AI for social scoring, or AI that exploits vulnerabilities in specific groups, such as children or persons with disabilities (Veale & Borgesius, 2021). These AI systems are deemed too harmful to individuals and society to be allowed in the European market. (EU, 2023).

High Risk: These are systems used in the production of products that are subject to a conformity assessment according to certain legal acts and stand-alone AI systems that address use cases in certain critical societal areas, such as education, healthcare, and insurance. Because they are high-risk applications, AI systems in this category are subject to the strictest regulatory requirements. These include the creation of a quality management system (QMS), technical documentation, event logging, registration in the event of a malfunction, and a human-readable description of the decisions made by the AI system. AI systems in this category must undergo a conformity assessment procedure before being placed on the market to determine whether they meet the requirements of the AI law (EU, 2023; Madiega, 2024; Liebl & Klein, 2023).

Limited Risk: These systems are not clearly defined as systems but as use cases. Tools such as chatbots or emotion recognition tools, are required to meet transparency obligations. Users must be informed when they are interacting with an AI system. These systems do not face the same level of scrutiny as high-risk systems, but they are still required to follow ethical guidelines to ensure transparency and fairness (EU, 2023; Veale & Borgesius, 2021).

Minimal Risk: AI systems that pose minimal risk, such as spam filters or AI tools for automating inventory management, are not subject to any additional regulatory requirements beyond existing laws like GDPR. However, the AIA encourages developers of minimal-risk systems to voluntarily follow best practices, which are outlined in codes of conduct, to ensure that even low-risk systems adhere to ethical standards (EU, 2023; Madiega, 2024).

The AIA entered into force on August 1, 2024. Still, its provisions will become applicable over time, starting February 2, 2025. Enforcement will be done by external “Notified Bodies”, like the TÜV in Germany, that are responsible for assessing, designating, and monitoring conformity assessment (EU Commission, 2024).

Reception of EU AI Act Ethics Framework

The AIA is widely regarded as a significant milestone in the regulation of artificial intelligence. Haataja and Bryson (2021) describe it as "probably the most influential AI-focused policy paper published to date," while Smuha et al. (2021) characterizes the AIA as a "pioneering effort to ensure that the development and use of AI systems in Europe aligns with European values, especially those of human dignity, freedom, and justice." In general, scholars see that the AIA provides a structured framework that could help companies operationalize AI ethics. By categorizing AI systems based on risk levels and imposing obligations such as human oversight,

data governance, and transparency, the AIA somewhat forces companies to give greater priority to ethical aspects in their operations (Hickman & Petrin, 2021). Additionally, it also highlights tools for conformity assessments, ensuring that AI systems align with legal, ethical, and technical standards (Theellisson & Verma, 2024). It is also recognized that the AIA, through its created awareness, could even lead to a global momentum towards more responsible use of AI (Musch et al., 2023; Siegmann & Anderl jung, 2022).

However, many experts criticize the Act for containing significant ethical gaps (Floridi, 2021; Veale & Borgesius, 2021; Laux et al., 2023). One prominent example is the failure to impose a complete ban on biometric surveillance systems. The AIA still permits mass biometric surveillance, provided it is not conducted in real-time. Delayed identification and the use of biometric systems by law enforcement are still allowed (Barkane, 2022), which represents a major infringement on transparency values, as defined under the FAST principles (Zuboff, 2019; Leslie, 2019).

Furthermore, the AIA lacks provisions that create incentives for developing energy-efficient AI systems or require the assessment and reporting of the environmental footprint of AI technologies (Crawford, 2021). Thus, sustainability issues remain largely unregulated in the current AIA framework (Pereira, 2024; Crawford, 2021).

Floridi (2021) furthermore indicates, that the law still does not establish clear accountability mechanisms, making it difficult to assign responsibility for ethical misconduct, especially in cases involving multiple stakeholders. In this context, the AIA also does not provide any avenue for legal redress or complaints for affected communities (Veale & Borgesius, 2021).

These gaps not only reveal problems in the AIA framework but also illustrate that companies that comply with guidelines or laws do not automatically act ethically (Keyes et al., 2019). Compliance with laws sets the minimum standard, while compliance with ethical principles increases a company's moral responsibility (Vaccaro, 2022).

Financial Pressure on European Firms Under the EU AI Act

Apart from the ethical considerations, one of the main concerns regarding the first draft of the AIA is its potential impact on the competitiveness of European AI firms, particularly SMEs, including Startups (Todorova, 2023).

Compliance with the Act's high-risk regulations may impose significant financial and administrative burdens on smaller firms, which could struggle to meet the strict requirements for transparency, accountability, and risk management (Morley et al., 2020). For example, AI systems used in healthcare or law enforcement, both high-risk categories, require rigorous testing, risk assessments, and compliance certifications, which can be prohibitively expensive for startups and SMEs (Madiaga, 2024; EU, 2023). With companies that deploy AI technologies classified as high-risk, the cost of complying with these regulations could amount to 330.050 €. (AIA Impact Assessment, 2021), or as much as 17% to 40% of an AI project's total budget for an SME. (Renda, 2020; Mueller, 2021). Even though the EU was determined to reduce the burdens for SMEs, the compliance requirements were not significantly reduced (Haataja & Bryson, 2021).

Compared to global markets like the U.S. and China, where AI regulations are more lenient (Heymann et al., 2023), European firms, particularly SMEs, may face a competitive disadvantage due to the significant entry barriers and compliance costs imposed by the AIA (Klapper et al., 2006). SMEs are disproportionately affected by these regulations, as smaller companies and start-ups struggle with the burden (Fletcher, 2001). The stringent requirements on AI systems could slow innovation and make European firms less agile compared to those in less-regulated markets, raising concerns about their ability to compete globally (Vereckey, 2024; Smuha, 2021).

Gaps, Unsolved Problems, and New Perspectives

Contrary to beliefs like the one from Friedmann (1970), it is apparent, that while adherence to the AIA regulatory standards is mandatory, there is still a need for internal ethical considerations, which is put forward by the organizations themselves (Carrol, 1999). However, in this regard, the AIA could have the quite opposite effect. For SMEs, especially those working with high-risk AI systems, the high costs of compliance can lead to ethical compromises (Bessen, 2022). These financial pressures may result in underfunded ethical systems, reduced employee training on ethical issues, or abandonment of sustainable practices, areas beyond the AIA's direct scope (McWilliams & Siegel, 2001). Moreover, significant gaps in the AIA's legislative framework could exacerbate these challenges (Pereira, 2024; Martin, 2018; Floridi, 2021; Cooman, 2022). Organizations may also fall into compliance "myopia", assuming that regulatory adherence equates to ethical behavior (Tenbrunsel & Messick, 2004).

High-performance pressures can further push managers to circumvent regulations (Jenkins, 1993), with some SMEs potentially relocating to less regulated regions like the U.S. or Asia (Desai et al., 2006). In some cases, companies may continue unethical practices despite fines, as seen with Meta, whose repeated violations had minimal impact on shareholder reactions (Gneezy & Rustichini, 2020; Halpin, 2022; Suarez et al., 2023).

Ethical AI assessment tools could help businesses navigate CSR challenges and facilitate compliance (Cappelli & Serugento, 2024). However, the adoption of such systems remains limited, especially among SMEs. To date, there are no universally recognized ethical AI frameworks or assessment systems tailored specifically for SMEs, making it harder for these companies to establish robust AI ethics programs (Soudi & Bauters, 2024). Additionally, as highlighted by Hagendorff (2021) and Soudi & Bauters (2024), many companies, particularly SMEs, engage with AI ethics only at a theoretical level, which is one reason legislative action became necessary (Floridi et al., 2018). Under current circumstances, there is little indication that these challenges will diminish.

On the other hand, the AIA could serve as a starting point for SMEs to embrace ethical AI practices. Historically, SMEs have shown limited involvement in ethical AI due to the associated costs, and the general vagueness of AI ethics, which smaller companies are often unwilling to manage (Fassin et al., 2011; McWilliams & Siegel, 2001). However, with the external legislative pressure of the AIA, SMEs must now find solutions to at least comply. Also, the introduction of this legislation could solve the general awareness issue that SMEs still have (Deloitte, 2020). This may lead to the improvement of internal ethical compliance mechanisms, or the development of tailored solutions better suited to SMEs' specific needs (Ufert, 2023; Soudi & Bauters, 2024).

In conclusion, the current situation of AI ethics in Europe is at a crossroads. Though the first real legislative measures have finally been taken after a long wait, high compliance costs and gaps in legislation nevertheless suggest that there is great potential for ethical dilemmas. It seems clear, that despite the new legislation, it is essential to find a collaborative solution consisting of ethical and legal compliance requirements to ensure AI in this area.

Research Design

This thesis aims to shed light on how small and medium-sized enterprises (SMEs) engaging in AI technologies are navigating the ethical challenges posed by AI with the introduction of the AIA. To explore this, the dissertation adopts an inductive qualitative approach (Tenny et al., 2017). The qualitative approach offers a way to gain deep insights into under-researched areas by producing rich, nuanced data that helps to fill existing knowledge gaps, especially by enquiring into complex, still unfolding empirical phenomena (Yin, 2015). This research marks a shift in focus compared to the previous studies, as it seeks to uncover how SMEs have adapted their AI ethics programs in response to AIA, whether by reducing or expanding them. It also examines how AIA has influenced their broader approach to ethical practices in AI, providing a comprehensive perspective on the ethical implications of compliance for SMEs.

Methodology

This study employs a qualitative methodology as described by Moser & Korstjens (2017), following a grounded theory approach to guide future research (Moser & Korstjens, 2017; Glaser & Strauss, 2017). Grounded theory supports an open investigation of previously little-explored fields and studies, which allows researchers to develop new theories or conceptual frameworks directly from the data (Smith, 2024). This is particularly fitting for this research as it supports a flexible, open-ended exploration of the ethical and operational challenges faced by SMEs in the context of the newly introduced AIA, allowing insights to emerge organically from participant experiences, which were not explored before in this context (Glaser & Strauss, 2017). Qualitative methods, and particularly in-depth interviews, provide the flexibility needed to engage smaller samples while still capturing detailed responses (Yin, 2015).

This thesis uses the Gioia methodology (Gioia et al., 2013), to analyze qualitative data and contribute to the development of relevant concepts through iteration between data and existing literature. Unlike rigid construct-based approaches, the Gioia methodology allows for an open-ended exploration of the ethical and operational challenges SMEs face under the AIA. Especially in empirical settings which are new and relatively less discussed, this flexibility supports uncovering essential ethical dilemmas SMEs encounter, beyond regulatory compliance, thus fostering a grounded theory approach to inform future research (Glaser & Strauss, 2017).

Empirical Setting

Guided by Trinczek's principles for expert interviews (Trinczek, 2009), this study conducts semi-structured interviews with SME managers. Semi structured interviews balance structured questioning with the openness needed to capture diverse viewpoints, allowing interviews to be focused, while the investigator still has the autonomy to explore relevant ideas that may arise during the interview (Magaldi & Berler, 2020). This approach enables interviewees to navigate between structured questions and spontaneous insights, capturing practical challenges that SME managers face under the AIA, that may not have been approached through the literature.

This study focuses on European small and medium-sized enterprises (SMEs) engaging in AI technologies. The European Commission defines SMEs as companies with fewer than 250 employees (European Commission, 2023). The selection of SMEs centers on companies that are included in the EU's high-risk classification, such as healthcare, autonomous driving, and finance, as these areas are the most affected by AIA (Smuha et al., 2021; Madiega, 2023; Mueller, 2021). To isolate certain potential problems of SMEs developing high-risk AI, three SMEs from lower-risk levels were also surveyed. Adding comparative cases strengthens the ability to draw analytical contrasts, ensuring that findings are not overgeneralized and that unique challenges stand out more clearly (Yin, 2018).

Sampling

For this study, purposive sampling (Campbell et al., 2020) was used to select participants whose insights are directly relevant to understanding how the AIA will impact AI-developing SMEs. As Kelly (2010) states, purposive sampling is used "to select respondents who are most likely to provide appropriate and useful information" (Kelly, 2010). In this case, managers in SMEs, who are directly involved in ethical decisions regarding AI and compliance.

The theoretical sampling method was applied as described by Glaser and Strauss (2017) in their grounded theory methodology. In this sampling method, the sample size is defined by the point of saturation. Saturation means that no additional data can be found with which the sociologist can develop properties of the category. When the researcher repeatedly sees similar cases, they can empirically be sure that a category is saturated (Glaser & Strauss, 2017). As I plan to interview specialized individuals with significant knowledge in the field, a generally smaller sample size is expected to suffice due to the depth of insight they bring (Sandelowski, 1995).

Expert Selection

The selection of interview participants was based on criteria aligned with the research focus on AI ethics and compliance in SMEs, drawing on insights discussed in the theoretical background (Floridi et al., 2018; Hagendorff, 2020; Carroll, 1991). The criterion was the professional roles of the interviewees, ensuring that participants hold decision-making or authority positions, such as founders, CEOs, department heads, or AI ethics specialists within or with expertise in SMEs, as these individuals can share first-hand experiences and critical insights that are not accessible to those not directly involved (Saunders & Townsend, 2018). The reason is that only respondents in these positions can provide unique insights into practical challenges, adaptations, and responses that an external expert might not fully capture (Kvale & Brinkmann, 2009), and have enough expertise and oversight to reflect on internal decision-making processes regarding AI ethics and compliance (Patton, 2014).

Data Collection

Contact with potential interview partners was made via LinkedIn and email. The search filters applied are listed in the appendix. Through this approach, 130 potential partners were contacted, resulting in a final sample of seven interviews. Of these, four executives worked in sectors that are described as high-risk use cases under the AIA, such as healthcare, insurance, and autonomous mobility. In addition, three participants were involved in AI technologies with “low-risk” use cases, such as marketing and consulting.

Subject	Gender	Position	Industry (Risk-Classification)	AI-Experience	Relevant Experience	Length
Expert 1	Male	CEO	Automotive Vehicles (High-Risk)	20 years	10 years of experience in consulting 6 year of experience as Founder and CEO of an AI company	23 min
Expert 2	Male	CFO	Marketing (Limited-Risk)	5 years	5 years in academia 1 year as Co-founder of an AI company	28 min
Expert 3	Male	CEO	Insurance (High-Risk)	10 years	7 years as CEO and founder	23 min
Expert 4	Male	CEO	Consulting (Limited-Risk)	25 years	Over 20 years as consultant and CEO of own company	31 min

Expert 5	Female	AI Ethics Manager	Automotive Vehicles (High-Risk)	10 years	6 years as an ethics manager at a multinational	41 min
Expert 6	Male	CEO	Medical (High-Risk)	>10 years	Over 10 years as CEO of multiple AI start-ups in the medical sector	19 min
Expert 7	Male	Founder	Consulting Limited-Risk)	>5 years	Cofounder of own AI start-up	16 min

Table 1: Sample of interviewed subjects.

The target duration per interview was 30 minutes, which is approximately the recommended time for semi-structured interviews (DiCicco-Bloom & Crabtree, 2006). However, since it is an approach with open-ended interview questions, this study does not adhere to strict time limits and allows the interviewees to answer the questions freely (Weller et al., 2018).

The interviews were recorded in order to capture as much data as possible and keep it as original as possible (Jamshed, 2014). The recordings were done through Google Meets. The interviews were then transcribed using turboscribe.ai. Denaturalized transcription was used as it emphasizes the meaning of content over the form of language and excludes filler words, stutters, and accents unless they are analytically relevant. This approach is consistent with Grounded Theory's focus on identifying patterns, codes, and themes to develop a theory while minimizing distractions from irrelevant linguistic details. It provides clarity and supports the iterative nature of data analysis (Davidson, 2009).

Some interviews were conducted in German and had to be translated into English. This was done using the deep learning translation tool DeepL. Translating the interviews into English was essential for standardizing the coding process during analysis.

All subjects gave informed consent for their data to be recorded. To maintain anonymity, some data in the transcripts has been replaced by general terms such as the subject's company or institution and personal information about the respondent.

Data analysis

This study uses the Gioia methodology for qualitative data analysis, which supports inductive theory development by systematically organizing data into concepts, themes, and theoretical insights.

The data analysis process began with First-Order Coding, focusing on capturing the participants' language and perceptions without applying predefined theoretical constructs. Using MAXQDA as the primary tool, I systematically segmented and categorized data from interviews into distinct concepts. MAXQDA is a qualitative data analysis software that organizes, codes and analyzes textual, visual, and audio data to extract meaningful insights from sources (MAXQDA, 2024).

Subsequently, I transitioned to Second-Order Coding, where the first-order concepts were interpreted to identify broader themes and patterns. This phase involved refining raw codes into theoretical constructs, exploring the connections between emerging themes to create a deeper understanding of how SMEs navigate the ethical and compliance challenges posed by high-risk AI systems.

Finally, I summarized these topics into aggregate dimensions that represent overarching insights from the data. To increase clarity and facilitate communication of the results, a visual data structure was created that shows the relationships between first-order concepts, second-order topics, and aggregate dimensions. This structured representation helped articulate the progression from raw data to theoretical contributions. The full table with the coding can be found in the appendix.

Findings

First-Order Codes	Second-Order Themes	Aggregate Dimensions	
Resource constraints at SMEs	Monetary Barriers to Ethical AI Implementation	AI Ethics Challenges in SMEs	
Regulatory complexity			
Operationalizing challenges	Structural Barriers to AI Ethics Implementation		
Vagueness of ethics			
General awareness	AI Ethics Priorities of SMEs		
Accountability issues			
Sustainability challenges			
Bias and Fairness concerns			
First mover effect	Operational Regulatory Framework	Regulatory Change Through the AIA	
Starting point			
Increased Guidance and awareness			
Lack of relation to real operation	Regulatory Constraints		
Financial burdens of compliance			
Lack of clear communication			
Reduced global competitiveness			
Ambiguous definitions and criteria			
Regulatory burden reduction	Reform Suggestions		Legislative Adjustments of the AIA Framework
Simplified and better communicated guidelines			
Sandboxing	Supplementary Support Mechanisms		
Accountability frameworks			
Courage	Change of Mindset	Necessary Changes in SME's	
Stop making excuses			
Ethics as a priority			
New York Times Approach	Tools and Frameworks		
Markkula Center program			

Table 2: Illustration of Gioia method coding structure (Gioia et al., 2013)

AI Ethics Priorities of SMEs

27 codes represent statements about SMEs views on ethical implications of AI. No distinction between the high-risk and “lower” risk classification were noticeable in those observations. The results align with the literature, which emphasizes the growing recognition of ethical AI in the business world (Floridi et al., 2018; Hagendorff, 2020; Soudi & Bauters 2024). Ethical priorities and challenges expressed by SME managers can be resumed into the well-known FAST (Fairness Accountability Sustainability Transparency) framework (Hagendorff, 2020, Leslie, 2019, Shin & Park, 2019).

All interview partners expressed a **general awareness** that ethical implications of their AI applications are an issue. All interviewees see ethical challenges that AI can pose and, also see certain ethical problems in their system that theoretically need to be addressed: "AI ethics must be a significant topic for companies these days (Exp 5, Pos. 6)". Generally, it is also seen that AI ethics is a crucial part not just for ethical consideration but also for their business success: "I strongly believe that ethics in AI is a critical consideration for businesses (Exp 5, Pos. 5)".

Accountability is seen as crucial, as AI decisions ultimately reflect the values and decisions of the organizations that develop and deploy these systems. To identify who takes responsibility for actions of the AI is considered important. As Exp 3, a founder in the insurance sector, emphasized: “Responsibility for AI decisions lies with the people and organizations that develop and deploy these systems. It is an extension of our own decisions and must be treated with care (Exp 3, Pos. 5)”. 4 out of 7 interviewees see this as particularly critical, which is reflected in 7/14 codes on ethical implications and is thus the most frequently repeated point.

Another concern mentioned is **sustainability**. This point is emphasized by Exp 1. As the environmental impact of large-scale AI model training becomes increasingly apparent: "Especially when it comes to the environmental and long-term impacts of large-scale model training. (Exp 1, Pos. 5)".

Finally, **Fairness/Bias** are also seen as critical. It is emphasized that AI systems are not inherently biased, but the data used to train them often is. Correcting these biases is not only a technical challenge but also a financial one. As Exp 3 emphasized: “It's not that AI is inherently biased, but that the data is. It is not the problem to recognize where the problem is, but it is costly to address it continuously. And that is just one aspect (Exp 3, Pos. 38)”. Exp 7 adds: “The

biases that the application of technology can have in the clinical use is very dangerous (Exp 7, Pos. 22)”.

Structural Barriers to AI Ethics Implementation

Mittelstadt (2019) & Fassin (2021) critiques the vagueness of ethical guidelines, which hinders their application. Hagendroff (2020) and Fassin (2011) also comment that companies are often missing standardized tools or frameworks tailored to their needs, to give clarity on how to implement AI ethics effectively. Mengyi Wei and Zhixuan Zhou also found in their analysis of real-world AI ethics issues that the impact of AI ethics frameworks is often limited, particularly due to ambiguity in the guidelines (2022). This can be observed in the data. Prior to the introduction of the AIA, most SMEs lacked formalized ethical frameworks for AI, and not one of the subjects interviewed had clear ethical guidelines or programs that were operationalized in their processes. Again, no differentiation can be made between low and high-risk AI systems in these observations.

One of the biggest obstacles is the **vague nature of ethics** and ethical guidelines. SMEs often struggle to translate general ethical principles into actionable steps. As Exp 3 noted, “I think the main issue is that the whole topic is incredibly vague (Exp 3, Pos. 9)”. Larger companies can afford dedicated teams that are well-versed in this complexity, but for SMEs, the lack of clear and affordable tools is a significant barrier.

SMEs struggle with **operationalizing challenges**. Converting ethical principles into practical tools and processes is seen as complicated. Exp 2 shared, "While we were aware of the importance of ethical AI, we lacked the capacity to formalize and operationalize these principles (Exp 2, Pos. 7)". Exp 3 also expressed, " There are no standardized programs that a small business can just use off the shelf. It's all so vague. It's not clear what is considered safe or where to start (Exp 3, Pos. 15)".

Monetary Barriers to Ethical AI Implementation

The dataset contained 13 codes relating to the obstacles faced by SMEs in implementing ethical AI, due to financial constraints. Haataja & Bryson (2021) emphasize that SMEs often operate with limited resources, forcing them to prioritize survival over long-term ethical investments. As a result, financial pressures can result in underfunding key areas like ethical compliance systems, employee training on ethical issues, or abandoning sustainable practices (McWilliams & Siegel, 2001; Fletcher, 2001).

One of the most pressing barriers for SMEs is **resource limitations**, encompassing financial, human, and time constraints. Exp 1,2,3,4,6 and 7 repeatedly highlighted how these challenges make implementing ethical AI practices difficult. Their focus was on immediate business priorities such as market adaptation and scaling up operations. Exp 4 highlighted this challenge succinctly: “When you go to the implementation phase, what does it mean to comply with ethical uses of AI? Suddenly, it’s not a person anymore, it’s a team, and you need to pay for it. That’s a huge burden, especially for startups still trying to find what their business is (Exp 4, Pos. 15)”. Exp 2 added: “The primary reason for this was a focus on other priorities, typical for startups and SMEs, where resources and efforts are directed toward growth and product development (Exp 2, Pos. 7)”. This is not to say that ethical issues were ignored, but formalizing ethical practices was often seen as a luxury rather than a necessity.

The situation is further complicated by **regulatory weight and complexity**. Regulations like the GDPR are essential to protecting user privacy, but they are often too complicated for SMEs to navigate without legal and technical expertise. Exp 2 comments: "One significant challenge we face, especially as a startup, is navigating regulations like GDPR. While these laws are designed to protect user data and privacy, they can be complex and unclear (Exp 2, Pos. 9)". This complexity acts as a deterrent, causing SMEs to delay or avoid implementing AI solutions for fear of inadvertently violating the rules. On top of that additional legal expertise is often required to correctly navigate those legislations: "The complexity of the regulations creates substantial resource constraints, as navigating the legal requirements demands expertise and time that many SMEs simply do not have (Exp 2, Pos. 20)".

Operational Regulatory Framework

Floridi et al., (2018) argued that to ensure ethical compliance of companies there is a need for a functioning regulatory framework. Hagendorff (2020) and Renda et al. (2021) argue that regulatory frameworks can act as catalysts for ethical innovation, providing companies with the awareness and guidance to adopt ethical practices. This heightened awareness is particularly beneficial for SMEs that may have previously overlooked the importance of ethical AI due to limited resources or competing priorities (Fletcher 2001; McWilliams & Siegel, 2001). The law can serve as a baseline for developing internal policies and practices that align with global standards (Soudi & Bauters, 2024). Those notions are very well reflected in the data a can be summarized as the creation of an **Operational Regulatory Framework** under the AIA. Again,

no differentiation can be made between companies developing low- and high-risk AI systems in these observations.

The interviewees basically agree that the AI Act is a necessary and correct step during AI development creating Increased guidance and awareness. 6 out of 7 interviewees see it as generally influential and could also be of help. As one participant explained, "I think it helps in the sense that at least now there's more awareness, especially for the basics (Exp 3, Pos. 17)". Another added, "I believe it ultimately supports them by creating awareness and providing a baseline for companies to follow (Exp 5, Pos. 13)". Exp 3, a founder in the insurance industry, pointed out the value of this standardization: "The law is meant to be a starting point, a framework. It raises awareness of the fundamentals – like how to ensure the security of your technology and how to guarantee it".

Many participants viewed the AIA as a positive **starting point** toward standardizing ethical AI practices, on which further legislation can be built on. Exp 3 said, "The Act is meant to be a starting point (Exp 3, Pos. 15)". Exp 1 commented, "It will be the basis from which some other standards will start (Exp 1, Pos. 22)". This optimism aligns with the literature, which sees the Act as a pioneering effort to align AI development with European values (Smuha, 2021).

The **first mover effect** was also mentioned. Three of the seven experts state that the AIA framework could become a competitive advantage for organizations in the EU region gain, as organizations in other regions will have to follow suit when it is their time to follow. As addressed by Exp 2: "In that sense, the EU might actually gain a long-term advantage by being an early adopter of comprehensive AI regulations. (Exp 2, Pos. 22)". Exp 5 adds: "I believe there is a clear advantage to being a pioneer in this area because regulations and legislation related to AI are also emerging globally (Exp 5, Pos. 15)".

Regulatory Constraints

The regulatory demands of the AIA impose significant challenges for SMEs, with compliance costs disproportionately straining their resources and forcing many to redirect funds from innovation and growth efforts (Madiega, 2024; Haataja & Bryson, 2021; Fletcher, 2001). The Act's vague definitions, such as broad classifications of AI systems, exacerbate these issues, creating uncertainty around compliance obligations (Veale & Borgesius, 2021; Mittelstadt, 2019). These constraints could not only hinder internal innovation but also jeopardize SMEs' global competitiveness, particularly against firms in the U.S. or China, where regulatory

landscapes are more lenient (Heymann et al., 2023; Todorova, 2023). Such themes are equally expressed in the data, with worries about cost explosions, lack of clarity, and ambiguous definitions expressed by all CEO's and Founders (Exp 1,2,3,4,6,7). It is striking that 23 out of 29 codes about regulatory constraints stem from high-risk SMEs.

Financial burdens of complying with the law were a common concern reflected in 9 codes. Exp 7 strongly emphasizes the disproportionate financial impact of compliance on SMEs in high-risk classification, due to the privatization of regulatory authorities that derive the necessary requirements for the "Quality Management Systems" (QMS): "The privatization of notified bodies has driven up hourly rates to a completely unreasonable level. It's like startups needing to hire McKinsey just to get through regulatory clearance. It's incredibly unreasonable (Exp 7, Pos. 144)". The resources needed to carry out the risk assessments, ensure data quality, and create documentation were seen as significant barriers for smaller companies, especially because of the non-transparent legislative structure. Exp 3 explained that even preparing for the requirements of the law was resource-intensive, noting, "Everyone tells you something different [about the compliance costs], but I think I have a rough idea, and it's not small. Resources are limited, and we have to prioritize certain things (Exp 3, Pos. 40)".

The law's **ambiguous definitions and criteria** through broad definitions and classifications were another point of discussion, with 6 codes pointing to this challenge. Exp 3 pointed to the inclusion of legacy technologies within the law's scope, stating, "Some definitions even include technologies that have been in use for 30 to 40 years. And you wonder, is this really practical? (Exp 3, Pos. 25)". This lack of clarity around what constitutes an AI system caused confusion for SMEs trying to determine their compliance obligations. Exp 4 noted, "A lot of taxonomy going into the European Act for Artificial Intelligence, defining what AI is and what that is, and this class, and this is high risk, and this is that. I mean, it's all very fluid (Exp 4, Pos. 43)".

Another sentiment that was still being expressed despite the AIA is the **lack of Clear Communication and Lack of relation to real operation**. This was highlighted in 8 codes. Exp 3 pointed out the need for detailed instructions, stating, "If you go to workshops with supposedly smart people who are experts, you'll attend three workshops and get five opinions (Exp 3, Pos. 22)". Uncertainty regarding the practical implications of the law was also a recurring theme. Exp. 7 noted that this is particularly critical due to the lack of central advisory bodies under the AI law and criticizes the responsibility of enforcing the law to private partners: "You can't consult with a designated body. You just read and hope (Exp 7, Pos. 187)". An

overarching sentiment in all subjects is that, due to unclear communication and lack of transparency in the regulatory body, there are no uniform specifications so far regarding one's own risk classification, but also with regard to compliance specifications.

Concerns that the law would **reduce the global competitiveness** of European companies or encourage companies to relocate outside the EU were reflected in 6 codes. Exp 7 warned, “The regulatory pathway in Europe is 10 times more expensive and far less transparent than in the US (Exp 7, Pos. 108)”. However, they all except one consider the risk of themselves or other SMEs leaving the EU market to be low. Nevertheless, the view was expressed that the EU market could become too restrictive, which could generally cause negative consequences on investments and innovation. Exp 4 commented on the reluctance of international companies to enter the EU market under such regulations: “If they don't know what the rules mean, they might leave it out altogether (Exp 4, Pos. 170)”. Exp 3 also suggests that large international companies have already decided not to bring certain products to the EU market, which could also be problematic for small companies that cannot use those products as a basis.

Reform Suggestions

The unique financial and organizational situations of SMEs often result in them being disproportionately affected by regulations (Fletcher 2001, Madiaga 2024). It is important that SMEs have a framework that can be understood and effectively implemented and that has clear enforcement mechanisms, without creating too big of an economic compliance burden (Cambra-Fierro et al., 2008; Soudi & Bauters, 2024, Fassin et al., 2011; Pošćić & Martinović, 2023). The data also suggest that making certain adjustments is not only beneficial for profitability but also very important for the successful implementation of ethical considerations in SMEs. These can be summarized in potential **regulatory reforms**, also mentioned in the literature (Morley et al., 2020; Smuha et al, 2021; Mueller, 2021). The interviews reflected in 11 codes on how to balance the regulatory goals of the AIA. Both these notions were equally mentioned by both, higher and lower-risk, classified companies.

Respondents emphasized the need for **simplified and better-communicated guidelines** tailored for SMEs, including standardized set of tools and templates on what is necessary for compliance. Exp 7 stated, “Of the 30,000 assessment requests submitted since the introduction of the AIA, fewer than 3,000 have been approved in more than two years. So better communication about what we need to do would be good (Exp 7, Pos. 234)”. Exp 6 highlights the point of better and more transparent communication: "For me it's just like knowing what

you can do or what you cannot do in an easy way and how does it affect me as a company (Exp 6, Pos. 32)".

Regulatory burden reduction, such as subsidies, tax incentives, or grants were seen as critical to helping SMEs manage compliance costs without stifling innovation, especially for start-ups still in the formative stages. Exp 2 expresses "Creating a framework that ensures ethical practices without placing undue burdens on companies, particularly startups and SMEs (Exp 2, Pos. 18)". Exp 6 shares this sentiment: "Try to reduce regulatory burdens (Exp 6, Pos. 32)".

Supplementary Support Mechanisms

There is a need for special measures to support SMEs in view of their particular circumstances. Training and tools can not only promote internal ethics efforts but also facilitate compliance requirements (Soudi & Bateurs, 2024; Oldemeyer, 2023). Some of the suggestions are also mentioned in the interviews and can be summarized by **supplementary legislative support mechanisms**.

Regulatory sandboxes could provide SMEs with a controlled environment in which to test and refine AI systems, while also alleviating compliance pressures if done correctly. As Exp 4 states: "Regulatory sandboxes can help SMEs test AI systems safely. You can sandbox startups up to a certain point. That could be an interesting. Problem is that governments usually when you talk about sandboxes, they're very conservative in what happens inside the sandbox. (Exp 4, Pos. 62)".

It was suggested that legislation should move more in the direction of **accountability models**, where companies are held accountable for their doing without excessive control. Exp 4 noted: "Accountability models focused on responsibility and not rigid risk categorization. I think it is responsibility and accountability. I mean, you've done something which is not right, pay for it. (Exp 4, Pos. 64)"; "If I had a wish list, it would be to perhaps harmonize on how that is being implemented in the U.S. More guidance, less regulation (Exp 7, Pos. 47)".

Change of Mindset

The data highlights that SMEs need fundamental organizational transformations to incorporate ethical AI considerations effectively. While regulations like the AIA set a baseline, organizations must move beyond compliance to embed ethical practices within their operational framework (Carroll, 1991; Zimmerly et al., 2007). It is often suggested in literature, that ethical

considerations may not be as resource constraining, as managers put them to be (Weaver, 2006; Prentice, 2014). Data suggests that a lot of hurdles can be overcome by simply changing attitudes towards the topic of AI ethics.

Courage is an important aspect. To implement ethical practices, SMEs need a proactive attitude. One participant noted, “It’s not about waiting for the perfect conditions; we must act now despite resource limitations (Exp 3, Pos. 21)”. Another participant reinforced this, stating: “Ethical compliance requires conviction, not just obligation. It’s about doing the right thing even when no one is watching (Exp 5, Pos. 19)”.

Also, SMEs need to stop **making excuses**. Contrary to the belief that ethics demand excessive resources, one interviewee stressed: “There are countless tools and resources available online. Getting started doesn’t require much, just a willingness to prioritize it (Exp 5, Pos. 176)”. It is said that SMEs often deceive themselves about the fact that implementing their ethical considerations is such a huge undertaking. Exp 5 goes further into detail: “No, I consider that an absolute excuse. It doesn’t take long to implement ethical considerations. Honestly, sit down for 15 minutes (Exp 5, Pos. 191)”.

For **ethics** to be embedded in business operations, it must be treated **as a core business priority**, not an afterthought. The data shows that companies that integrate ethics into their strategies not only fulfill the ethical requirements under CSR, but also comply more efficiently and cost-effectively. Exp 5 suggests: "I advocate for a top-down model, meaning that a fundamental corporate mindset exists where every person in a specific role is aware of the values they should uphold and their responsibilities. If this is the case, it becomes much easier for companies to adhere to standards, significantly reducing the effort required. (Exp 5, Pos. 147)". A Strategy that was effectively introduced in one of the biggest automotive companies in worldwide, for their autonomic driving programs.

Tools and Frameworks

A wide range of assessment tools are available on the market that could help SMEs to better address AI ethics challenges (Cappelli & Serugento, 2024; Brey et al, 2021; Vakkuri et al., 2019). Methods like these not only aid in the application of ethics but can also assist in early assessments of potential compliance gaps (Oldemeyer, 2023). Two toolkits suitable for SMEs were given as examples in the literature review.

Exp 5 recommended the program of the **Markkula Center for Applied Ethics**: "One that might be particularly well-suited, as it is very easy to implement and I have experience with it, is the program from the Markkula Center for Applied Ethics (scu.edu). (Exp 5, Pos. 250)".

Exp 6 also recommended an easy and fast method to access ethical matters, that he generally used for all his business activities." I call it the **New York Times test**, and there the idea is like if you do something and you would feel comfortable that what you do, for instance, with that algorithm, with AI, will be published tomorrow in the New York Times and you say like on the front page and you feel like, yeah, that's fine (Exp 6, Pos. 78)".

Discussion

Using the Gioia method (Gioia et al., 2013), a grounded theory model was created (Figure 1). This involved organizing emergent concepts based on my observations and visualizing their interrelationships with arrows to represent my interpretation.

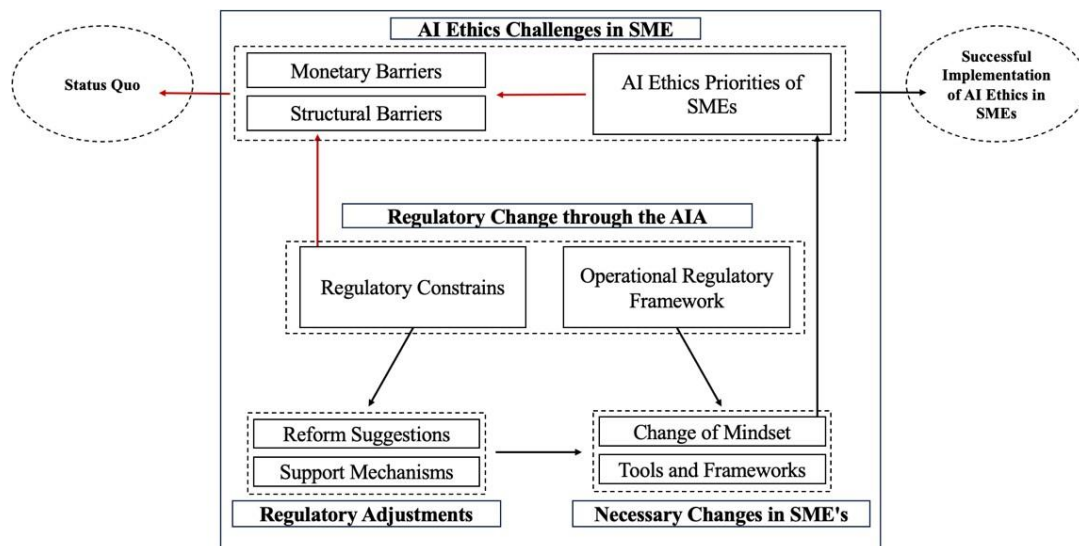


Fig. 1: grounded-theory model: SME's AI ethic framework map. Source: Author's illustration, based on Gioia (2013).

AI Ethics Challenges in SMEs

AI ethics challenges in SMEs are a critical point of this work. As Soudi & Bateurs (2024) correctly observed in their work, SMEs generally lack measures to address and counteract the ethical implications of their AI systems before the introduction of the AIA.

According to the findings, this issue can generally be divided into two levels. On the one hand, there is a general awareness of the topic of ethics in their applications, even in SMEs. This is largely consistent with the observations of Hagendorff (2020), Jobin et al. (2019), and Attart-Frost (2022), who found a general omnipresence of ethical questions in the business of AI. Furthermore, this is also in line with the work of Soudi & Bateurs (2024), who were able to identify this phenomenon in principle at the SME level as well, in contrast to a recent Deloitte paper (2020).

Furthermore, findings suggest that SMEs do not see AI ethics as just a means to an end, in order to have as little trouble as possible from bad press or further legislative guidelines. The concerns expressed by the CEOs seemed authentic and were also based on aspects that they admittedly

had no influence over. This contradicts the observation by Rességuie & Rodrigues (2020) that concerns about AI are more of a way to present a more positive image to the outside world and to prevent real regulation.

Findings show that the main concerns expressed by SMEs focus largely around Fairness, Accountability, and Sustainability. Those aspects are largely in line with Leslie's FAST framework or FAT/ML FAT framework, although the part about transparency tends not to be mentioned (Leslie, 2019; Hagendorff, 2020; Martin, 2018). One possible reason for this is that these boundaries are not entirely rigid and, depending on the interpretation, the aspect of transparency overlaps somewhat with accountability and fairness (Shin & Park, 2019). Another reason may be the GDPR, which already regulates this area in Europe to a large extent and with which all SMEs must already comply (Madiaga, 2024). Subsequently, it is striking that the aspect of accountability, as described by Martin (2018), is mentioned most often. This indicates that the focus of ethical considerations for SMEs is based on being held accountable for one's misconduct.

Turning to the second aspect of the ethical challenges of AI in SMEs. As addressed, data suggests that SMEs are aware and keen on considering ethical implications for their AI system, challenging the current literature on the topic (Deloitte, 2020; Oldemeyer, 2023). However, these considerations are limited by the existence of certain barriers, which are mentioned in the literature by Mittelstadt (2019), Souidi & Bauters (2024), Haataja & Bryson (2021), and (Fletcher, 2001). These barriers are, on the one hand, for monetary reasons. SMEs in the AI sector also have limited budgets and have to make certain priorities or trade-offs. Almost all SMEs see AI ethics as a major financial hurdle, and as a huge effort that a small company cannot afford. The findings support the observations of Bessen (2022) and McWilliams & Siegel (2001), that financial aspects are a top priority, especially for smaller companies with less budget, high competition, and a focus on growth.

On the other hand, there are complications in the field of AI ethics itself, which also present an obstacle. The data shows that for many, AI ethics seems to be a kind of buzzword, a collective term that is supposed to symbolize an overarching idea of ethical "correctness". For SMEs, it can therefore often seem overwhelming when people throw this term around without specifically addressing certain aspects. In principle, this is also a theme in literature. Like the term AI, AI ethics encompasses a vast range of aspects that are not clear at first glance (Floridi et al., 2018, Fassin et al., 2011; Pošćić & Martinović, 2023). As Floridi et al. (2018) points out,

there is a lack of concrete behavioral templates that companies can use as a guide for the concrete implementation of their ethical concerns. Although large tech companies have long since taken a big step forward. But Soudi & Bouters (2024) point out, that these templates were not really tailored to the specific situation and requirements of SMEs, or at least that is how it appeared to SMEs.

The hurdles expressed by the SMEs make them reluctant to pay too much attention to AI ethics. As can be seen, the situation before the introduction of the AI Act is such that SMEs have slipped into a certain status quo in which ethical aspects are given attention but in the end, other aspects are prioritized and their operations are not changed. It cannot be assumed that this problem will be solved satisfactorily through internal processes. The need for an external impulse, including through a regulatory framework, as expressed by Floridi et al. (2018), Hagendorff and Soudi & Bouters (2024), is therefore apparent and necessary.

Regulatory Change through the EU Act

The regulatory change through the AIA puts SMEs of all risk classifications, in Europe, in a completely new situation. On the one hand, it was of course a goal to generally prohibit AI with extremely high-risk potential. However, it was also important to create a kind of orientation that companies, including SMEs, could use (Madiaga, 2023). It is, so to speak, the long-awaited external impetus that is finally getting companies to take AI ethics seriously and, to a certain extent, obliging them to do so. But as is also clearly mentioned in the literature, ethics cannot be equated with compliance with laws or regulations (Carrol, 1991). In order to achieve the goal of creating an ethical AI, one must not fall into the compliance myopia described by Tenbrunsel & Messick (2004) but must continue to actively build one's own AI ethics programs. Whether the AIA is a successful model for SMEs to do so was not clear from the literature (Morley et al., 2021; Madeira, 2024; Soudi & Bouters (2024), and the data does not provide a clear picture either.

On the positive side, certain successes of this legislation are already apparent. SMEs feel that the issue of AI ethics has been pushed to an even higher level of importance and that it has once again created the necessary awareness of the importance of these issues across the board. The data suggest that today a way higher number of SME CEOs are aware of the thematic of AI ethics than back in 2020 (Deloitte, 2020). This hints that regulations can be an important factor in providing a catalyst for ethical innovation, providing companies with the awareness and guidance to adopt ethical practices, even if companies are not directly or fully affected by it,

supporting observations by Renda (2021), Hagendorff (2020) and Musch et al. (2023). Data also shows that the AIA makes it easier for SMEs to classify certain things and to see which applications or activities may not be recommended. Ultimately, this could provide a starting point for companies to better standardize AI ethics and thus overcome problems such as the vague definition of AI ethics or the lack of operational guidance, which SMEs have repeatedly seen as a roadblock to their AI ethics programs, supporting statements like that from Smuha et al (2021). Moreover, data hints that in the long term, a positive economic impact may be possible. This is because companies that now meet a certain standard are better prepared for future regulations, which may soon be standard, and this can lead to a certain market advantage, known as the Brussels effect (Siegmann & Anderljung, 2022).

However, on the flip side, while the AIA is praised for trying to provide a potential for a functional and operational framework, certain factors complicate or directly negate this. For example, while definitions for AI and AI ethics are presented, data suggest that they lack a connection to the actual real business. Applications that have been standard in certain industries for decades are suddenly categorized as AI and must now meet these regulatory standards. This problem is also addressed by Laux et al. (2023), who criticize an oversimplification in the AIA. Although they identify an inaccuracy in the risk classification system, the data suggests that this inaccuracy also affects the definitions, a common fact also already described in literature (Fassin et al., 2011). Furthermore, one year after the official introduction of the law (EU, 2024), data shows that there is still no clear line of communication to SMEs that explains how compliance will be effectively implemented and what risk class they will now be assigned to. SMEs feel a lack of transparency and clarity, due to the outsourcing of regulatory tasks to private partners. This leads to confusion about which regulations need to be complied with and how and makes it difficult to determine how other regulatory frameworks harmonize with them, amplifying and typical hurdle that SME's have on AI ethics implementation (Fassin et al., 2011; Pošćić & Martinović, 2023).

In addition, there is the criticism in the literature and in the reactions to the AIA of the possible cost explosion due to high compliance and the potential competitive disadvantage (Renda, 2020; Mueller, 2021). The data supports this concern about excessive compliance costs, particularly in the high-risk class, which is disproportionately affected. The QMS system is particularly problematic because it makes compliance a real cost trap. Also mentioned, albeit somewhat more controversially among SMEs, is the short-term competitive disadvantage compared to companies outside the EU (Heymann et al., 2023). This was particularly often

reflected by high-risk SMEs, as they fear a slowdown in investment in the EU in their segments in the coming years. Still, there is no real fear of having to leave the EU by most SMEs, as described by Desai et al. (2006).

What is becoming apparent, is that, through the introduction of the AIA, SMEs are becoming more aware of the issue and believe that there is potential for a well-functioning operational framework and a right step forward, like describe by Floridi (2021). However, this potential is currently not being fully exploited, at least in the section of SMEs, due to communicational mismanagement on the part of the EU and a lack of regulations tailored to them. Therefore, the data seems to support the theories of Floridi (2021), Hagendorff (2020), Musch et al., (2023), Smuha et al (2021), and Baker-Brunnbauer (2021), that legislation could potentially be a solution to the asymmetry between ethical concerns and the ethical guidelines that can be applied in practice, but the potential is not fully realized due to the aforementioned problems arising from the legislation itself. As a result, SMEs are at risk of slipping back towards the status quo, where they comply with the new laws, but do not commit fully to the necessary operational changes, as they feel overwhelmed and have the impression that they lack the resources needed to set up a functioning AI ethics program.

Potential Legislative Adjustments of the AIA Framework

Findings from this study highlight how the full identified potential of the AIA legislation for SMEs (Smuha et al., 2021; Hickman & Petrin, 2021; Musch et al., 2023; Siegmann & Anderljung, 2022; Morley, 2021) cannot be adequately utilized because, although solutions to old barriers have been provided, new ones have been created and old concerns have been exacerbated. The results of this study therefore underscore the urgent need for targeted legislative reforms to help SMEs cope with the dual pressures of compliance and ethical AI development under the AIA, as the current guidelines are insufficient or not planned accordingly. These adjustments provide additional insight into the literature, which highlights the challenges faced by smaller companies in reconciling regulatory obligations and ethical imperatives (Morley et al., 2021; Haataja & Bryson, 2021; Fletcher, 2001).

A simple and very easy measure to implement would be to create a clear, simple and harmonized communication network directly with the stakeholders concerned, which are covered by the AIA. Data shows that if SMEs do not even officially know which risk class they are in, it is of course difficult for them to plan and implement certain measures. This also encompasses all the new requirements that were created that SME's need to comply with, so

that they can prepare and find solutions to their challenges (Madeiga, 2023). Literature and data suggest that this network could be built through workshops or guidelines planned and executed directly by the legislator, or through early and active education of all parties to create planning security on the one hand and on the other hand to take away the “fear” of the big step involved (Soudi & Bauters, 2024; Oldemeyer, 2023). The costs of compliance would be significantly reduced for SMEs, as clear guidelines would now be in place and there would no longer be a need to guess how to comply. The vagueness and lack of clarity of AI ethics is one of the major barriers to overcoming ethical AI challenges, and this is not improved by additional unclear legislation (Fassin et al., 2011; Pošćić & Martinović, 2023; Attart-Frost, 2022).

This aspect also applies to the sandboxes planned by the EU (Thellisson & Verma, 2024). Data and literature, indicate that sandboxes have great potential to help SMEs adapt and improve their products cost-effectively and without much pressure (Madeiga, 2024; Pošćić & Martinović, 2023). However, the data further indicates a certain uncertainty in how these sandboxes will be presented. The responsibility for the sandboxes, like all the other legislative requirements, has been passed on to private subcontractors like the TÜV e.V in Germany, who have not yet presented a firm plan for what these sandboxes will look like (TÜV e.V, 2024).

Financial support mechanisms such as subsidies or tax incentives could be another approach, especially for companies classified as high-risk. The data supports the literature, which suggests that the cost of compliance with regulations places a disproportionate burden on their limited resources (Renda, 2020; Mueller, 2021). The currently available resources do not appear to be sufficient, since the QMS system alone can account for a significant portion of the financial costs of an entire project. Such relief measures are in line with Haataja & Bryson (2021) recommendations for financial interventions to reduce compliance costs and support ethical innovation.

Necessary Change in SMEs

The findings of this study confirm previous literature highlighting significant hurdles in the adoption of AI ethics (Mittelstadt, 2019; Soudi & Bauters, 2024; Haataja & Bryson, 2022; Fletcher, 2001). However, a deeper issue is revealed through the data: many SMEs, regardless of risk classification, perceive these challenges as insurmountable, leading to a reluctance to engage with ethical considerations at all. While financial constraints remain a critical factor (Bessen, 2022), the findings suggest that attitudes toward AI ethics play an equally crucial role in shaping adoption. This perspective enhances earlier insights by Weaver (2006) and Prentice

(2014), emphasizing that organizations' mindsets and willingness to address ethical concerns significantly influence their ability to navigate these barriers and take meaningful steps forward.

Buhmann (2015) and Prentice (2014) also observed that a shift in priorities towards ethics as a priority is another point that is necessary and can also reduce the potential burden of compliance for the future. Firstly, it will lead to less stringent scrutiny by regulators in the long term. Secondly, it also reduces the effort required, because if AI ethics is an important part of the corporate strategy and everyone who works there is aware of it, this significantly reduces the effort required to control it. This is also indicated by parts of the data.

Of course, a distinction must still be made. Literature and the data agree that resource scarcity and high compliance costs are an issue for SMEs (Fletcher, 2001; Madiaga, 2024) and a legitimate concern, particularly in the high-risk segment. Meeting compliance requirements and all ethical considerations is not a task that can realistically be solved in 15 minutes. However, for SMEs, the important thing is to find a starting point. The literature highlights various resources available for addressing ethical considerations, such as the ECCOLA toolkit and the SIENNA project (Brey et al, 2021; Vakkuri et al., 2019). The findings of this study support these observations and contradict the findings of (Soudi & Bauters, 2024), as some interview participants suggested tools and assessments themselves, that are of use even for SMEs. While these examples are relatively general and do not guarantee ethical compliance, they demonstrate how straightforward it can be to address specific ethical aspects, often sufficient to make meaningful progress in many cases.

As mentioned earlier, it should be clear by now that a big theme in the literature is that legal reforms alone are not enough to overcome the ethical challenges faced by SMEs. Internal organizational changes are just as important (Buhmann, 2015; Prentice, 2014; Zimmerly et. al, 2007). This means that even if regulatory change is introduced, a fundamental change in the way SMEs operate will be needed to ensure that their ethical challenges will be met. Regulations can only be the nudge needed to get change rolling.

Conclusion

This thesis aims to explore how the EU AI Act influences AI ethics policies in small and medium-sized enterprises (SMEs). The primary research question addressed was: **How does regulatory framework from the EU AI Act influence the development and implementation of AI ethics policies in SMEs?**

Key findings

This study shows that the EU Artificial Intelligence Act has significantly increased awareness of ethical AI among SMEs in all risk categories, including those classified as “high risk.” The study shows that while the legislation provides a solid starting point for promoting safe and ethical AI, translating ethical principles into actionable strategies remains challenging. The results suggest that SMEs recognize the importance of ethical AI and consider it an integral part of their corporate values, but that the operationalization of these principles is hindered by the vagueness of the guidelines and the overwhelming scope of ethical considerations.

The study reveals that a key obstacle lies in the ambiguous language of the AIA, which leaves many SMEs uncertain about where to begin or how to address specific issues. Additionally, the inclusion of legacy technologies, rigid definitions, and the law’s lack of transparency contribute to a sense of uncertainty, complicating compliance efforts. Interview data suggests that this ambiguity, coupled with concerns about potential high compliance costs and limited communication from EU bodies, exacerbates the complexity of implementing ethical AI practices. These factors, as highlighted by participants, create a scenario where SMEs, particularly in high-risk categories, often feel overwhelmed, making comprehensive action difficult.

Nevertheless, this study avoids presenting ethical programs as insurmountable hurdles for SMEs, even when risk ratings are involved. While study participants did point to resource constraints, the study does not claim that ethical considerations inevitably require significant capital investments. Instead, the results emphasize the importance of internal attitudes and cultural changes within organizations. Without these changes, even well-designed legislation may not achieve the intended results.

In summary, the study highlights that legislative action has the potential to be a functioning method, to ensure the ethicality of AI. However, while the EU AI Act is a step in the right

direction, it has yet to reach its full potential. Legislative reforms are needed that, on the one hand, close the gap between compliance and ethical innovation and, on the other hand, act as a catalyst for internal change at SMEs so that they not only meet regulatory standards but also develop sustainable and value-driven AI practices.

Implications

This research makes several contributions to the field of AI ethics and SME operations within the regulatory landscape. Theoretically, it extends the literature on regulatory impacts by highlighting the specific ethical and operational challenges faced by SMEs under the AIA. While earlier research focused on large organizations, this study bridges a critical gap by centering SMEs, which constitute the backbone of European innovation but remain underrepresented in AI ethics discourse.

In terms of public policy implications, this study highlights the need for simplified, clear, and actionable guidelines tailored specifically to SMEs. The vagueness of current ethical and compliance requirements adds unnecessary complexity, making it challenging for SMEs to translate these into practical actions. Policymakers must prioritize effective communication strategies, such as workshops and advisory services, to support SMEs in navigating these challenges. Regulatory sandboxes also emerge as a crucial recommendation, providing SMEs with safe environments to develop and test AI systems without fear of immediate non-compliance.

Financial incentives and support mechanisms remain a secondary consideration. Policymakers should shift their focus from extensive control, causing a competitive disadvantage in the region, to creating a more harmonized guidance approach with accessible tools and programs that help SMEs build foundational ethical practices.

For SME managers, the research underscores the importance of taking a proactive stance. Ethical AI is not just a compliance obligation but an opportunity to align business practices with societal values. Managers should consider adopting an incremental approach to integrating ethics into their operations, utilizing resources like the ECCOLA toolkit or frameworks from institutions such as the Markkula Center for Applied Ethics as practical starting points. A willingness to embrace “ethical courage” and take small, consistent steps can transform the perception of ethical challenges from overwhelming to achievable.

Limitations of the Study

The main limitations of this study relate primarily to the samples and the context of the samples. On the one hand, only a limited number of SMEs were surveyed. While the qualitative methodology provided rich insights, it included a relatively small sample, capturing the perspectives of a limited number of stakeholders. This may not fully reflect the diverse challenges and experiences of SMEs in different sectors or countries. Furthermore, it is also noticeable that the people interviewed are mainly men, who may have a different way of prioritizing ethical issues than women. Therefore, the points of view developed could possibly be confirmed by future quantitative studies. Furthermore, it is also the case that the observations are still very early. Certain requirements could and probably will be further specified or changed by next year when the EU law finally comes into force. Therefore, a follow-up study at a later date would also be advisable.

Finally, the study focused primarily on the internal challenges faced by SMEs, without examining external pressures, such as consumer expectations or global competition, in greater detail. Future research could address these gaps by expanding the sample size, incorporating longitudinal studies, and examining the interaction between SMEs' ethical practices and external market dynamics. These steps would allow for a more comprehensive understanding of the multifaceted challenges that SMEs face in implementing ethical AI within the framework of EU AI law.

Closing Statement

The EU AI Act represents a pioneering effort to regulate AI and align its development with ethical principles and European values. It is generally seen that legislation can be an appropriate tool to ensure ethical AI. However, its implementation highlights both opportunities and challenges, especially for SMEs. This study has demonstrated that while the AIA acts as a catalyst for raising ethical awareness and establishing operational frameworks, it also imposes significant financial and organizational burdens that may hinder innovation and ethical adoption for smaller enterprises. These challenges not only risk undermining AI ethics but may also, in the worst-case stifle growth and innovation across the European AI landscape.

In conclusion, achieving the balance between compliance and ethics is crucial for the responsible and sustainable growth of AI within SMEs. The findings of this study offer valuable

insights for policymakers, businesses, and researchers, emphasizing the need for collaborative efforts to create a future where ethical AI is not merely a regulatory requirement but a shared societal commitment in a field that is and will become an integral part of not just our way to do business but also our day-to-day life.

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Appendix

Appendix 1: Interview Guide

Introduction:

Please briefly introduce yourself and highlight your expertise in the field of AI.

- Current position
- Company size
- Industry
- Professional experience/background
- Connection to AI

Ethical Frameworks, AI Ethics in SME's:

1. What is your stance on the ethical challenges of AI and which aspects do you consider particularly relevant, especially in relation to your company/field?
2. Do you think AI ethics is a prominent topic in the business world?
3. Do you believe SMEs/Start-ups might face difficulties in implementing ethical considerations?
4. Are you aware of any solutions that could help start-ups put their ethical principles into practice in the context of AI?

AI-Regulation:

5. Did your approach toward developing AI systems has changed since the introduction of the EU AI Act, particularly regarding ethical AI systems?
6. Have you adopted any specific ethical frameworks or tools, or did you develop them yourself?
 1. If yes, have these been expanded upon since the introduction of the AI Act?
7. Do you believe it is necessary for companies to continue pursuing ethical AI programs, even if they comply with the new AI regulations?

8. Research findings show that high compliance costs can limit the investment capacity of companies, particularly SMEs, potentially even affecting ethical practices. Do you think this is a relevant concern in connection with the AI regulation?

9. In your opinion, does the AI Act support or hinder efforts to maintain ethical standards? Why or why not?

Economic Factors:

9. Critics argue that the AI regulation could reduce the competitiveness of companies developing and using AI in the EU and hinder innovation. Do you agree with this?

10. Do you see a risk that companies might consider relocating outside the EU due to the regulatory environment?

11. To avoid excessively high regulatory demands on smaller businesses, the EU has already introduced measures to ease their burden. Do you think the current regulatory environment provides sufficient support for SMEs involved in AI development?

12. What measures or policies could be introduced to better support SMEs?

Closing Questions:

13. Are there any other points you would like to address regarding the overall topic?

Appendix 2: Gioia Coding Table

Number of Coded Passages	Examples	First-Order Codes	Second-Order Themes	Aggregate Dimensions
7	"And suddenly it's not a person anymore, it's a team and you need to pay for it" (Exp 4,	Resource Constraints at SME's	Monetary Barriers to	AI ethics challenges in SME

	Pos. 15); Identifying where the problem lies is not the issue but addressing it on an ongoing basis is costly. (Exp 3, Pos. 10)		Ethical AI Implementation	
6	"The complexity of the regulations creates substantial resource constraints, as navigating the legal requirements demands expertise and time that many SMEs simply do not have" (Exp 2, Pos. 20); "One significant challenge we face, especially as a startup, is navigating regulations like GDPR. While these laws are designed to protect user data and privacy, they can be complex and unclear. (Exp 2, Pos. 5)"	Regulatory Complexity		
8	"{We are missing} Standardized systems." (Exp 4, Pos. 10); "while we were aware of the	Operationalizing Challenges	Structural Barriers to AI Ethics Implementation	

	importance of ethical AI, we lacked the capacity to formalize and operationalize these principles" (Exp 2, Pos. 7)			
7	"Their principles, which was don't be evil. It's sort of an act of faith and it's worth what it is" (Exp 4, Pos. 17); "Yes, absolutely. And I think the main issue is that the whole topic is incredibly vague." (Exp 3, Pos. 9)	Vagueness of Ethics		
13	"AI ethics must be a significant topic for companies these days. (Exp 5, Pos. 6)"; "I strongly believe that ethics in AI is a critical consideration for businesses (Exp 2, Pos. 5)"	General Awareness	Ethical Priorities of SMEs	
7	"I think it's responsibility and accountability. I mean, you've done	Accountability Issues		

	something which is not right, pay for it. (Exp 4, Pos. 64)."			
4	"Especially when it comes to the environmental and long-term impacts of large-scale model training. (Exp 1, Pos. 5)"	Sustainability Challenges		
3	"It's not the AI that is inherently biased but the data (Exp 3, Pos. 10); "While it can be efficient, such technology has the potential for misuse, and it's good that certain use cases are restricted. (Exp 1, Pos. 28)	Bias and Fairness Concerns		
6	"In that sense, the EU might actually gain a long-term advantage by being an early adopter of comprehensive AI regulations. (Exp 2, Pos. 22)"; "I believe there is a clear advantage to being a	First Mover Effect	Operational Regulatory Framework	Regulatory Change Through the AIA

	<p>pioneer in this area because regulations and legislation related to AI are also emerging globally. (Exp 5, Pos. 15)"</p>			
5	<p>"Yes, definitely. The Act is meant to be a starting point (Exp 3, Pos. 15); "So the EU law on artificial intelligence is still in its infancy and people will take this into account. It will be the basis from which some other standards will start (Exp 1, Pos. 22)"</p>	Starting point		
6	<p>"I believe it ultimately supports them by creating awareness and providing a baseline for companies to follow. (Exp 5, Pos. 13); "I think it helps in the sense that at least now there's more awareness, especially</p>	Increased Guidance and Awareness		

	for the basics (Exp 3, Pos. 17)"			
3	"Some definitions even include technologies that have been used in the insurance industry for 30–40 years (Exp 3, Pos. 25)"	Lack of Relation to Real Operation	Regulatory Constraints	
9	"Yes, I agree that high compliance costs can significantly limit the ability of startups and SMEs to invest in other areas, including ethical AI practices. (Exp 2, Pos. 16)"; The financial and resource burden associated with meeting stringent compliance requirements may divert valuable resources away from innovation and development. (Exp 2, Pos. 16)"	Financial Burdens of Compliance		
5	"If you go to workshops with supposedly smart people who are	Lack of Clear Communication		

	experts, you'll attend three workshops and get five opinions."(Exp 3, Pos. 22)"			
6	"International competitiveness is at risk due to restrictive EU regulations. I think the entire EU as a location is at risk. Not just for startups but also in general. (Exp 3, Pos. 21); "And if you put restrictions around it, then that means other people can compete freely. And because of that, they're gonna get closer to more innovation and quicker and you're gonna lose your footing (Exp 4, Pos. 55)"	Reduced Global Competitiveness		
6	"A lot of taxonomy going into the European Act for Artificial Intelligence, defining what AI is and what that is, and	Ambiguous Definitions and Criteria		

	<p>this class, and this is high risk, and this is that. I mean, it's all very fluid. (Exp 4, Pos. 43)"</p>			
5	<p>"Creating a framework that ensures ethical practices without placing undue burdens on companies, particularly startups and SMEs (Exp 2, Pos. 18)"; try to reduce regulatory burdens (Exp 6, Pos. 32)</p>	<p>Regulatory Burden Reduction</p>	<p>Reform suggestions</p>	<p>Legislative Adjustments of the AIA Framework</p>
7	<p>"For me it's just like knowing what you can do or what you cannot do in an easy way and how does it affect me as a company. (Exp 6, Pos. 32)"</p>	<p>Simplified and Better Communicated Guidelines</p>		
4	<p>"Regulatory sandboxes can help SMEs test AI systems safely. You can sandbox startups up to a certain point. That could be an</p>	<p>Sandboxing</p>	<p>Supplementary Support Mechanisms</p>	

	interesting. Problem is that governments usually when you talk about sandboxes, they're very conservative in what happens inside the sandbox. (Exp 4, Pos. 62-63)"			
3	Accountability models focused on responsibility and not right risk categorisation. I think it's responsibility and accountability. I mean, you've done something which is not right, pay for it. (Exp 4, Pos. 64)	Accountability Frameworks		
4	"However, it requires more effort from everyone than just adhering to the law. One must think ahead, and it's not hard to do so. Engaging genuinely and seriously with the topic is essential. (Exp 5, Pos. 20)"; "When companies claim that	Courage	Change of Mindset	

	AI ethics is too complex or difficult to implement, I always wonder if they've even tried (Exp 5, Pos. 8)"			
3	"No, I consider that an absolute excuse. It doesn't take long to implement ethical considerations. Honestly, sit down for 15 minutes, (Exp 5, Pos. 7)"	Stop Making Excuses		
3	"I advocate for a top-down model, meaning that a fundamental corporate mindset exists where every person in a specific role is aware of the values they should uphold and their responsibilities. If this is the case, it becomes much easier for companies to adhere to standards, significantly reducing the effort required. (Exp 5, Pos. 12)"	Ethics as a Priority		

			Tools and Frameworks	Necessary Changes in SMEs
2	"I call like the New York Times test, and there the idea is like if you do something and you would feel comfortable that what you do, for instance, with that algorithm, with AI, will be published tomorrow in the New York Times and you say like on the front page and you feel like, yeah, that's fine (Exp 6, Pos. 11)"	New York Times Approach		
1	One that might be particularly well-suited, as it is very easy to implement and I have experience with it, is the program from the Markkula Center for Applied Ethics (scu.edu). (Transcript Interview 5, Pos. 8)	Markkula Center Program		
