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Narrative framework on success among SME representatives

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Forging Successful AI Applications for European Economy and Society

Mapping of social expectations: understanding of success from a lifeworld perspective

The capabilities of artificial intelligence (AI) are advancing rapidly, yet understanding what constitutes successful AI for society and the conditions that enable its effective deployment remains limited. AI promises economic growth, knowledge creation, and broader societal benefits, but realising this potential depends on developing and integrating applications that are successful not only technologically and economically but also socially, and ethically. AI applications are embedded within complex social contexts, reflecting and shaping aspirations, biases, and inequalities; thus, understanding AI success requires attention to these broader dimensions.

The FORSEE project (*Forging Successful AI Applications for European Economy and Society*) adopts a sociological perspective to examine these dynamics, focusing on how different stakeholders define success and how controversies, and unequal distributions of risks and benefits are articulated and potentially resolved.

This cluster of research papers maps social expectations of AI success across stakeholders, adopting a lifeworld perspective that situates understandings within societal and economic contexts. It comprises four interrelated reports. The first examines **digital small and medium-sized enterprises' (SMEs) success narratives**, identifying recurring themes and operational challenges. The second addresses **civil society organisations (CSOs) perspectives on gendered risks related to AI**, examining potential paths to advocate for gender vulnerable communities. The third investigates **criteria for awards and prizes**, providing an external perspective on standards of AI success. The fourth applies a **gendered lens**, exploring SMEs' perspectives on AI and gender bias. Together, these reports link SMEs' and CSOs' viewpoints with societal concerns, offering a multidimensional understanding of AI success in Europe.

The present report focuses on digital SMEs' narratives and understandings of AI success, providing in-depth insights into their experiences. SMEs are critical actors in the European AI ecosystem, functioning both as developers and deployers of AI systems. Their intermediate position offers valuable analytical insights into the capabilities and constraints of the EU AI landscape, informing policymakers on strategies to enhance the societal impact of AI in Europe.

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Executive Summary

Present FORSEE study engages with SMEs that develop and deploy AI systems, applying a narrative framework on success among SME representatives to analyse the expectations they hold and the societal factors that act as enablers and barriers for emerging technologies.

Expectations play a central role in shaping technological development, and the Sociology of Expectations (SoE) provides a valuable lens for understanding how visions of AI's future guide organisational decisions.

The study follows the key conceptualisation of SoE while simultaneously attempting to expand SoE by integrating broader societal conditions, including funding structures, digital sovereignty issues, regulatory frameworks, and sustainability concerns that may co-determine how expectations are formed and acted upon by SMEs.

SMEs are critical stakeholders within the European AI landscape, functioning both as developers of AI solutions and as deployers who integrate AI into their operational workflows, yet they operate within structural limitations that shape their strategic choices. The intermediate position that they hold, situated between large technology providers that develop foundational AI infrastructures and end users who primarily consume AI-powered services, is analytically valuable and provides insights for the capabilities and constraints of the European AI industry.

AI development by small and medium companies remains under-examined in current literature. This research addresses an existing gap by including both developers and deployers to provide a more holistic account of the SME position on the factors that shape AI success.

The research methodology combined qualitative interviews with participatory SME workshops, capturing both individual perspectives and collective deliberation. Thirty-nine interviews were conducted with representatives of SMEs developing and/or deploying AI across 15 EU Member States, covering a wide range of applications, including legal compliance, recruitment, marketing and communication, software development, energy efficiency, insurance, manufacturing, and robotics. In addition, three workshops were organised, allowing contributions from a broader group of SME stakeholders beyond the interview sample.

Findings indicate that SMEs hold largely positive expectations for AI, identifying benefits at three levels: improvements in technological performance, measured in AI systems' accuracy; sector-specific gains in productivity and efficiency; and broader societal contributions. The latter are also related to efficiency gains framed in their potential to

transform sectors like higher education and healthcare.

At the same time, expectations are curbed by structural constraints, including restricted access to funding, dependencies on large tech firms, and limited access to computational infrastructure and partly to regulatory challenges. Sustainability was identified as a factor of low importance in shaping expectations.

Questions of digital sovereignty and infrastructural dependency emerge as central challenges, raising uncertainty about how Europe can pursue AI development when key technical resources remain controlled by large non-European stakeholders.

Furthermore, findings show that SMEs are receptive toward regulation, but with important qualifications: they call for sector-specific governance, clearer implementation guidance, and regulatory approaches that balance restrictions with enabling mechanisms such as funding and shared infrastructures.

Overall, SMEs are placed in a contradictory position. They hold high and positive expectations which fuel their attempts to mobilise resources and attention for their operations. At the same time, they face structural vulnerabilities, limiting their strategic potential. Therefore, their expectations must be understood as in-flux. Policymakers need to engage with these findings and examine how to support SMEs in a manner that strengthens their position.

Finally, SMEs expectations need to be regarded in terms of their social position, as SMEs are situated actors with strategic interests. Therefore, within the responses included in the present study, expectations are also mobilised to engage in policy discussion and highlight the contribution of their firms and respective products. Keeping in line with SoE present study does not seek to evaluate the validity of these claims but to bring them to the fore, while also illuminating the environment that shapes them.

Section 1: Introduction

Artificial intelligence is widely promoted as a driver of productivity and competitiveness for small and medium-sized enterprises, yet prevailing accounts of AI success remain largely confined to technological performance and economic returns. Such perspectives overlook the fact that AI systems are developed and deployed within specific organisational, and institutional contexts that shape their outcomes. In response, this report adopts a socio-technical approach to scoping and defining AI, which understands AI not as a fixed technological object but as a shifting field that is continuously contested through market, institutional, and social practices. For SMEs in particular, resource constraints, regulatory environments, and stakeholder expectations make these contextual factors especially consequential. According to the European Commission (2003), SMEs are defined as organisations with fewer than 250 employees and an annual turnover below EUR 50 million or a balance sheet total of up to €43 million (see also, Schwaeke et al., 2024, p. 1300). The vast majority of European companies fall into this category, with some estimates suggesting that SMEs account for as much as 99% of all businesses across Europe (Watney & Auer, 2021). Of particular relevance to this research are small enterprises for which digital technologies play a central role in value creation and competitive positioning, hereafter referred to as digital SMEs. A defining characteristic of these firms is the strategic importance of digital capabilities and skills, which underpin continuous innovation, and enable adaptation to rapidly evolving technological and market conditions. As digitally advanced SMEs often drive the digitalisation of other small firms, understanding their perspective and particular expectations is critical for the effective integration of AI across the European economy and society.

Against this backdrop, the expectations of SMEs that develop and deploy AI systems form a complex framework representing one building block of FORSEE's research, enabling a more holistic and expanded understanding of success. **This report therefore not only seeks to capture SMEs' expectations, but also situates them within their wider European context, examining how they are shaped by funding opportunities, digital sovereignty concerns, regulatory challenges, and issues relating to sustainability.**

This report is structured as follows. **Section 2** introduces the theoretical framework, drawing on the Sociology of Expectations to examine how expectations shape technological development and adoption, with particular attention to hype dynamics and the formation of expectations among SMEs. **Section 3** situates SMEs within the broader landscape of AI adoption and development, identifying recent shifts, macro-level enablers and constraints, and the role of European policy priorities such as digital sovereignty, funding mechanisms, and the twin digital and green transitions. **Section 4** outlines the methodological approach, describing the success criteria matrix used to capture SMEs' expectations, the qualitative methods employed, and the demographic profile of participating SMEs. **Section 5** presents the empirical findings, detailing SMEs' understandings of AI success and failure, funding conditions, perceptions of digital sovereignty, regulatory influences, and the role attributed to sustainability. **Section 6** discusses the findings in relation to SMEs' expectations of AI, perceived societal benefits, and the mediating role of the European AI policy and innovation

environment. **Finally, section 7** concludes present study, synthesises findings and reflects on the broader significance of expectations in shaping AI development and deployment in Europe.

Section 2: Theoretical framework - Sociology of Expectations

The objective of this section is to introduce the Sociology of Expectations and the formation of expectations among SMEs, linking this theoretical approach to the FORSEE project. SoE is a strand of the Social Construction of Technology (SCOT) Paradigm. SCOT posits that technologies do not emerge in a vacuum but are shaped by social forces, including the values, beliefs, interests, and power dynamics of the stakeholders involved in their development and deployment (Pinch & Bijker, 1984). Since technologies are imbued with meaning through social processes, their development and adoption is influenced by the interests of specific stakeholder groups, policymaker agendas, and the competitors' strategies. In this sense, technological development is co-constructed by different social groups and should not be treated as "predetermined by technological "facts" (Kitzinger, 2008, p.418). In this perspective, the universality of technological solutions is critically questioned as "there is not one best technological solution to a single problem; for different stakeholders, different technologies fit best" (Bakker et al., 2011, p.153).

Situated within this approach, SoE highlights the prominent role that expectations play in shaping technological processes. Expectations are perceived as socio-technical visions of the future that shape the present. As Brown et al. (2003, p.3, emphasis in original), note:

> *Expectations mobilize the future into the present,* they do so with varying success and according to different time frames and forms of organisational relationship…so while expectations can be formulated as (probabilistic) predictions,…*there is always a performative aspect* to them.

Expectations and also promises about the future have a direct impact on the present, and this is particularly evident in the fields of science and technology (Brown et al., 2003; van Lente, 2012; Hirsch-Kreinsen, 2016). Within this process, discourses of hope often serve as vectors, embedding promissory futures within effects (Brown, 2014). While expectations are primarily articulated through narratives, once they gain traction they "may materialise in experiments and prototypes" (van Lente et al., 2013, p. 1616) and also in particular actions (van Lente & Rip, 1998).

Therefore, the primary concern of SoE lies in understanding how expectations are generated and disseminated, how they acquire and lose influence, and how the expectations of different social stakeholders interact, converge, or diverge within specific structured action contexts into collective effects (van Lente & Rip, 1998). This makes this perspective relatable to FORSEE's goals of developing a clear understanding of what

successful AI means for society as a whole, also, in engaging in identifying the particular conditions of possibility for successful AI.

According to SoE, expectations can be categorised according to:

- Level, including micro (e.g. research groups), meso (technological fields), or macro (societal contexts) (van Lente et al., 2013).
- Content, since "expectations may concern technical, commercial, or societal aspects, and probably a mix of these" (van Lente, 2012, p. 772).

In practice, particular technologies and areas of scientific research are rarely associated with a single, neatly bounded set of expectations. Rather, they tend to attract multiple and overlapping expectations that vary in scope, content, and degree of internal coherence. Furthermore, each area of research and technological development also includes a network of innovation where different groups of stakeholders and organisations hold different positions and sets of expectations. However, the scholars contributing to the SoE paradigm primarily focus on scientists and innovators (sometimes called 'pioneers') engaged in the design of new applications.

In contrast, the FORSEE research seeks to conceptually expand the SoE framework to encompass digital SMEs as a specific stakeholder group, whose expectations and expectation-fueled actions have significant implications for the development and adoption of AI within the European context due to their intermediate position: they act both as deployers of new technologies and as developers or modifiers of existing ones (Arroyabe et al., 2024). As will be shown in the following sections, European SMEs frequently adapt and customise AI systems supplied by large technology companies, mainly of US origin; this particular position shapes a specific set of expectations, where, as will be shown, high expectations coexist with uncertainty and vulnerability. Thus SMEs are relevant for discussions about technological and digital transformation, because they represent the vast majority of firms in most economies, are often considered as innovation-drivers in niche markets, and can serve as key nodes in regional and sectoral value chains. In particular, in relation to AI, Big Tech companies expectedly dominate public discussion as they have access to funds, data and infrastructure that make them key players (Couldry & Mejias, 2019). However, especially in the European context, it would be erroneous to assume that technological development is driven solely by a handful of companies while the rest is completely restricted to and aligned with Big Tech goals. In that sense, a holistic view of the AI industry necessitates the engagement with SMEs,

2.1 The functions of expectations

Science and technology are competitive fields, marked by competition for resources, organisations, and stakeholders. The decision to prioritise certain fields of research over others is never automatic; it reflects competing claims and contesting perspectives. Furthermore, as economic interests become embedded in these fields, "the commodification of time (time=money) has been translated into a commodification of the future (uncolonised future time=future time wasted)" (Brown & Michael, 2003, p.6).

Scientists are under pressure to not only argue about the potential economic usefulness of their research, but also to situate breakthroughs into a near-future time frame, capable of returning an adequate return on investment. The competition for funding dictates the need to manage expectations, often by entering "arenas of expectations" where enactors and selectors of new technologies come into contact (Bakker et al., 2011).

In summarising the potential force that expectations yield, van Lente (2012, p.773-774, emphasis in original) notes the following key aspects:

- "First, what expectations do is to raise attention and *legitimise* investments: a project or programme can be defended by referring to a promising future.
- Second, expectations provide *direction* to the search processes of science and technology…Typically there are many possible paths while choices have to be made. The optimal direction cannot simply be calculated.
- Finally, there is a *coordination* effect of expectations…Technical development is not solitary work, but the work of networks of companies and research institutions. When a central control is lacking, as is usually the case, expectations indicate pieces of work and stipulate roles".

Taken together, these dimensions show that expectations operate not merely as visions of the future, but as active structuring forces that shape present decisions, and organise technological trajectories; they open up certain potential futures while closing off others (Vicsek, 2021). Their impact is tangible as they potentially drive adoption or rejection, guide future investments, or help implement safeguards to protect from expected negative effects. This is exemplified by Brown & Michael (2003, p.4) who discuss "how the future is mobilised in real time to marshal resources, coordinate activities and manage uncertainty" and by Brown et al. (2003) who underline the capability of promises to create protected spaces where research and innovation proceed, allowing abstract visions to develop into concrete plans.

The third point raised above (the coordination function of expectations) points once again to the positioned subjectivity of different stakeholders. Shared expectations can *align* heterogeneous stakeholders at the level of stakeholder and organisations (such as firms, researchers, investors, and policymakers) around a common direction. In that sense expectations function as informal governance mechanisms: they signal priorities, and synchronise timelines across distributed networks of innovation. By doing so, expectations reduce uncertainty, enable cooperation among stakeholders with different interests, and stabilise collective investment in particular technological pathways.

Nonetheless, this remains only a possibility. The prospect of failure remains open, whether due to a lack of coordination, divergent visions, or the inability of scientific communities to effectively perform "expectations work" and thereby mobilise funding and attention (Bakker et al., 2011, p.159).

Furthermore, SoE explicitly acknowledges the possibility of setbacks or failure to mobilise resources. This is particularly important for research on AI, a set of technologies characterised, among other features, by high levels of uncertainty and a historical trajectory

marked by repeated cycles of hype followed by disappointment. For this reason, FORSEE adopts SoE as a particularly suitable analytical approach, as it is able to capture the contradictory, contested, and non-linear trajectories of technological development.

2.2 Hype and the potential impact of negative expectations on AI

This contradictory dynamic of expectations is highlighted in the discussion surrounding hype and the management of uncertainty. Particularly high or even unrealistic expectations surrounding new technologies (what is often defined as "hype") are often followed by a wave of disappointment and mistrust towards stakeholders that formerly played a prominent role in expressing promises for the future (Geels & Smit, 2000). Following the functions of expectations outlined above, SoE scholars have treated hype as a specific resource-mobilisation strategy. As van Lente et al. (2013, p.1626) note:

> The promises of the future that make up a hype, have a performative capacity in the present as they attract resources, coordinate activities, and spur competition. For policy makers and other actors in the innovation process, hypes can thus be considered as a *resource* as well as a *pitfall*.

Therefore, hype is conceptualised as an ambivalent phenomenon: a potentially necessary driving force and a significant risk for emerging technologies simultaneously. To enhance our understanding of hype and the corresponding expectations, we need to engage with specific technologies and their characteristics as well as with the different social positions and embedded interests of stakeholders and communities (Konrad, 2006). In discussing the notion of hype, van Lente et al. (2013) argue that the dynamics of high and low expectations (hype and disappointment) do not follow a single predetermined pattern. Instead, they highlight the interplay between the social environment, potential industrial applications, and the specific technical capabilities of an emerging technology. This interaction shapes not only the peak of expectations and subsequent trough of disillusionment, but also the potential modification of expectations necessary to sustain interest and funding; technologies and scientific fields that are unable to adjust expectations, may not recover from the wave of disappointment.

Uncertainty occupies a prominent role in the research of expectations. As Fitzgerald (2014, p.252) notes, SoE "acknowledges both that 'expectations' are not always positive, and also that even positive imagined futures will generally coexist with some sense of failure, or simply frustration". Managing uncertainty positions professionals within a "structured ambivalence" (Fitzgerald, 2014), as they work through a contradictory field, retaining expectations, while acknowledging limitations and including metaphors of uncertainty in their discourse.

This dual understanding of expectations (as both enablers of innovation and potential sources of constraint) further underscores why SoE is particularly well suited to the study of AI. Artificial Intelligence has a long and well-documented history marked by recurrent cycles of hype followed by disappointment, often accompanied by successive recalibrations of expectations aimed at sustaining funding and public attention. These cycles emerge from

the interplay between internal technical capabilities (and their limitations) and the mediatised dynamics of AI hype. These dynamics have become especially pronounced in the current cycle spanning the past three years with the widespread public adoption of commercial large language models, most notably among them, ChatGPT.

In particular, media narratives and investor discourse frequently emphasise the transformative potential of these technologies, fostering a techno-solutionist ethos in which AI is presented as an inevitable fix for a wide range of social and economic challenges (Lindgren & Dignum, 2023). In a similar vein, AI is treated as an "inevitability", an unstoppable force that is not subject to debate; thusly the techno-deterministic narrative of "permissionless innovation" (Dotson, 2015) is echoed in the discourse around AI, fuelling aversion to regulation and democratic governance of emerging technologies. The same effect is created by positive/negative ideal types of expectations that associate AI either with utopian or dystopian visions of the future, obscuring limitations and a grounded debate on AI's actual impact (Vicsek, 2021). Negative expectations around AI persist, including both dystopian visions and concerns about an inevitable decline following the peak of hype. Therefore, as the hype subsides, "inflated expectations are followed by disillusionment and possible standstills in innovation" (De Togni et al, 2024, p. 2011).

Once again, it is important to highlight the role of different social positions in the shaping of expectations. In that vein, Kerr at al. (2020) identify a change in expectations surrounding AI when focus shifts from the individual to the societal level as well as a demand for steering of AI by public authorities. This finding illuminates potential conflicts between stakeholders' and organisations' expectations surrounding AI and broader societal concerns and ambivalent positions (Kerr at al., 2020).

That is why FORSEE seeks to operationalise SoE through examining how stakeholder expectations are generated and disseminated; how they gain or lose influence; and how they interact, converge, or diverge across different social stakeholders. In this vein, the next section focuses on the characteristics that shape SMEs and their particular intermediate position.

2.3 What shapes the expectations of SMEs

In the context of SMEs, expectations play a particularly important role because smaller firms often operate under resource constraints and face heightened uncertainty when deciding whether to adopt new technologies (Restrepo-Morales et al., 2024). For digitally advanced SMEs, expectations about potential efficiency gains, market expansion, or competitive differentiation can accelerate the adoption of "cutting-edge" solutions, guiding strategic decisions and network partnerships. Conversely, more traditional SMEs' representatives may hold certain expectations on the way to assess the feasibility and relevance of technologies relative to their established processes, customer base, and operational capacities. A potential expectation towards the adoption of new technologies not only shapes their own competitiveness and growth but also influences broader patterns of digital diffusion.

To sum up, the specific aspects of SoE relevant in the context of SMEs expectation analysis:

- Across both digitally advanced and traditional SMEs, expectations function not merely as background beliefs but as societally mediated *active drivers* for action. They minimise uncertainty and influence collective outcomes via *legitimation*, *direction* and *coordination*: which technologies are pursued, how adoption is phased, and the degree of organisational commitment invested in transformation.
- In this sense, the SoE framework referred here highlights that SME engagement with technology is shaped by *both* collective and anticipatory narratives as well as concrete technical and organisational capacities.
- Focusing empirical research on digitally advanced SMEs, adds a hitherto underresearched field to complement the SoE literature's narrow focus on pioneers, and, in turn, contributes to a better understanding of how broader social expectations about technology translate (or fail to translate) into meaningful digital transformation and desirable technological trajectories.

The following section 3 proceeds in depicting and situating the current state of European digital SMEs into the growing body of AI adoption literature.

Section 3: Digital SMEs and adoption of AI

Research on AI has historically centred on large corporations: firms with extensive resources, in-house data science teams, and the scale necessary to deploy advanced AI systems. In recent years, a growing body of work examining AI adoption by SMEs has arisen, recognising their distinct constraints and potential to benefit from AI-driven innovation (Agbaakin, 2025; Mohib et al., 2025).

3.1 Barriers to adoption

Across the literature, SMEs' expectations of AI adoption are largely framed around productivity gains and new market opportunities (Schwaeke et al., 2024, p. 1298); Wilczynska et al., 2024, p. 12). Furthermore, SMEs approach AI as a means to improve customer experience through data analytics, predictive insights, and continuous customer engagement through virtual assistants and recommendation systems (Schönberger, 2023, p. 89).

Research has also identified key barriers to SMEs' AI adoption. Funding limitations constrains SMEs' ability to invest in compatible infrastructure, update legacy systems, and attract skilled personnel (Schwaeke et al., 2024; Schönberger, 2023; Ulrich & Frank, 2021). Data limitations, both in terms of quality and availability, also emerge as a key challenge for SMEs' of all levels of digital maturity, deterring both AI 'pioneers' and 'deniers' from further digital transformation (Dinh et al., 2025; Szedlak et al., 2020; Ulrich & Frank, 2021).

Regulation constitutes a distinct challenge, shaping expectations in its own right. While large technology firms often operate within relatively light regulatory environments and possess the influence to shape or circumvent rules to their advantage (Couldry & Mejias, 2019), SMEs frequently express concerns about the high compliance costs and confusion arising from overlapping or contradictory regulatory frameworks (Watney & Auer, 2021). In addressing these issues, scholars emphasise the importance of initiatives supporting SMEs' access to infrastructure, data, and funding for digitalisation efforts (Watney & Auer, 2021; Zimmermann, 2021).

Unsurprisingly, these market, funding, and regulatory challenges effectively constrain both the expectations and the practical capacity of SMEs regarding AI adoption. In 2025, 18.9% of SMEs employing more than 10 people in the EU deployed internally some form of AI technology, though this does mark a significant increase from the 7.1% of SMEs using AI in 2021. Adoption is uneven throughout the European Union, with Nordic and Western countries enjoying higher adoption than countries in Eastern Europe (Eurostat, 2025).

3.2 The Gen AI hype cycle of 2023

The rapid proliferation of Generative AI (GenAI) systems in 2023 marked a new hype cycle, reigniting high expectations for AI's transformative potential. Researchers and institutions further amplified this momentum by emphasising potential productivity gains (Calvino et al., 2025) and GenAI's role in addressing complex issues such as energy efficiency and climate change (Mohammadi Lanbaran et al., 2024).

From a SoE perspective, this moment can be understood as a critical juncture in which hype functions as a resource, mobilising investment and research (van Lente et al., 2013). Since 2023, SMEs across a wide range of sectors have expressed increased interest in AI, particularly Machine Learning and Natural Language Processing systems (Dinh et al., 2025; Khan et al., 2025; Segarra-Blasco et al., 2025).

3.3 SMEs and AI development

While most literature examining SME adoption of AI focuses on externally-developed AI tools (Schwaeke et al., 2024; Ulrich & Frank, 2021), a smaller but growing literature focuses on AI development within these firms for internal deployment, including the creation, customisation, or training of AI models tailored to a company's specific workflows and strategic goals (Agbaakin, 2025; Dinh et al., 2025). SMEs may opt to develop their own AI solutions rather than deploy off-the-shelf products to better align with organisational workflows and competitive positioning.

It is also important to acknowledge that artificial intelligence cannot be treated as a monolithic technology; rather, it comprises a diversity of systems and application paradigms whose adoption pathways differ substantially across economic sectors and organisational

functions. For instance, Generative AI systems such as large language models (LLMs) tend to find early and widespread application in knowledge-intensive business functions, such as human resources, marketing, and customer service, where automated text generation, information synthesis, and decision support can be readily integrated into existing workflows (OECD, 2025). In contrast, sectors oriented toward physical production, including advanced manufacturing and industrial operations, generally deploy AI in specialised forms such as robotics, predictive maintenance, sensor-based optimisation, and other machine-oriented applications that often rely on bespoke engineering and domain-specific data infrastructures rather than off-the-shelf language models (OECD, 2025; Gavrila et al., 2025). Empirical evidence from large surveys also indicates that the prevalence and nature of AI use vary not only by industry but also by functional emphasis; services sectors show higher adoption of AI for personnel training and customer-facing tasks, whereas manufacturing exhibits stronger adoption in logistics, process control, and product design (OECD, 2025). For the purposes of this study, however, no distinction is made between different AI technologies or applications; all AI systems are considered when assessing development and deployment.

SMEs developing AI systems face many of the same barriers encountered in AI adoption including funding, data access, and skills shortages. At the same time, rising compliance costs intensify the perceived trade-off between ethical development and data availability (Bessen et al., 2022). Additional challenges stem from dependence on third-party models, typically provided by large firms, and from the often underestimated effort required to scale from prototypes or "proofs of concept" to market-ready products (Khan et al., 2025).

Despite its relevance, systematic research on SMEs that deploy and/or develop AI remains limited. This study addresses this gap by applying the SoE framework to capture the contradictory and multifaceted expectations shaping SMEs' engagement with AI. In this process, expectations do not merely reflect attitudes towards AI but actively orient SMEs' actions; expectations, as will be demonstrated in section 5, have shaped SMEs' decisions on development and deployment of AI systems and are actively shaping the future trajectory of these organisations.

Furthermore, FORSEE seeks to expand SoE by incorporating 'macro-level' conditions that influence how expectations are shaped (Stefan et al., 2025); see next subsection for an account of factors that will be considered in present study.

Finally, regarding the present literature review, it should be noted that it is mostly informed by management studies in which the further digital transformation of SMEs is implicitly (and sometimes explicitly) treated as an "inevitability" or a "necessity", with "innovation" uncritically assumed as good and desirable (see further Segercrantz et al., 2017). This strand of literature holds the strongest up-to-date research interest in SMEs, but is often directly concerned with optimising business outcomes. Still, such an implicit techno-optimist framing tends to suggest that existing barriers are primarily technical in nature and therefore to be superseded through more technological innovation. Such an assumption, however, overlooks cases in which certain SMEs may have little or no use for AI and are consequently not motivated to engage with it. This is an important aspect that remains

beyond the scope of the present research, as it focuses on SMEs that are already interested and involved in AI development and deployment.

3.4 Macro-level enablers and constraints for AI in European SMEs

SMEs' intentions to adopt and develop AI are shaped not only by firm-level capabilities or by technical characteristics of AI itself but also by macro-level structures. Four factors are particularly relevant: the European Funding Landscape, Regulation, Sustainability Concerns and Digital Sovereignty. Collectively, these macro-level conditions form the framework within which European SMEs assess and pursue engagement with AI technologies. SMEs that have access to adequate funding, operate within environments that provide infrastructure and data pools, are able to navigate the regulatory framework, and can address the sustainability implications of AI are more likely to develop positive expectations and to feel confident in their engagement with AI and vice versa. Therefore, these factors can act either as enablers or constraints, influencing, one way or the other, the way expectations are developed.

3.4.1 European funding landscape and SMEs

Funding for SMEs is critical during early growth stages, allowing firms to cover essential operational costs ranging from R&D and marketing to staff salaries and HR. However, European SMEs often face challenges accessing the funding they need to support long-term innovation, stunting the growth of the larger EU AI ecosystem (European Commission, 2025). European public investment in AI has grown significantly in recent years, but it is outpaced by US public spending, which has exploded in recent years in an effort to "win the AI race" (Executive Office of the President of the United States, 2025; Maslej et al., 2025). The effectiveness of public funds is further stunted by burdensome application processes, and slow bureaucracy (Biaggi, 2025; Isaraj, 2025; Matthews, 2024).

European private sector investment AI is similarly outpaced by global competitors despite recent increases. In 2024, US private investment in AI reached 109.08 billion USD, towering above Europe's 19.42 billion USD in investment (Maslej et al., 2025). Barriers identified as limiting European private investment into SMEs include risk aversion and fragmented markets (Tubokirifuruar Tula et al., 2024; Wilson, 2015), as well as bank-based finance (Arnold et al., 2024). While Europe's strong talent pool and cross-border mobility offer significant benefits for founders, these structural and financial constraints leave European AI SMEs with slower scaling paths, narrower options for raising late-stage capital, and weaker incentives to commercialise locally (Arnold et al., 2024).

3.4.2 European regulatory framework

The regulatory environment constitutes a central macro-level factor shaping SMEs' intentions to adopt artificial intelligence, reflecting a broader role of regulatory framework conditions in influencing innovation activities at the firm, industry, and economy-wide levels (Blind, 2012, p. 1). The EU's regulatory approach, anchored in instruments such as the EU Artificial Intelligence Act (EU AI Act) and the standards supporting its implementation, and the General Data Protection Regulation (GDPR), seeks to enhance trust, and harmonisation across the single market. This ensures cross-border movement of AI-based products and services, prohibiting Member States from limiting the development and utilisation of AI systems, except when explicitly banned by the EU AI Act (Eberhardsteiner, 2025). For SMEs, such regulatory clarity can positively influence adoption intentions by lowering perceived legal and reputational risks associated with AI deployment, strengthening their confidence in the long-term legitimacy and market acceptance of AI-based solutions. At the same time, scholars note important weaknesses of this approach (Veale & Zuiderveen Borgesius, 2021) including compliance complexity, documentation requirements, and potential liability risks that may disproportionately burden SMEs, thereby weakening their intention to invest in or experiment with AI technologies.

3.4.3 Sustainability and EU's Twin Transition policy

Sustainability as a macro-level factor reflects conceptual and regulatory gaps in the EU regulatory framework around the premise that digitisation, including AI processes, and sustainability are compatible goals. Sustainability considerations increasingly act as both an enabler and a constraint, as environmental and social policy objectives embedded in European strategies create normative pressure and market incentives for responsible AI deployment, yet also raise concerns about compliance costs and resource requirements. The sustainability implications of AI technologies are subject to fundamentally different logics than industrial growth driven by multinational technology firms. AI's material, cloud and data centre infrastructures place immense demand on the energy grid, and lead to wasteful practices and deleterious ecological impacts, which the policy narrative of growth imperatives has yet to critically answer for (Bresnihan & Brodie, 2025). This results in untenable policy contradictions, preluding AI digitalisation efforts from actionable sustainability policy. The perspective of EU SMEs stakeholders is therefore important here, as the sustainable implications of growth are more apparent to them relative to foreign industrial actions that import sustainability problems while exporting economic benefits from overseas.

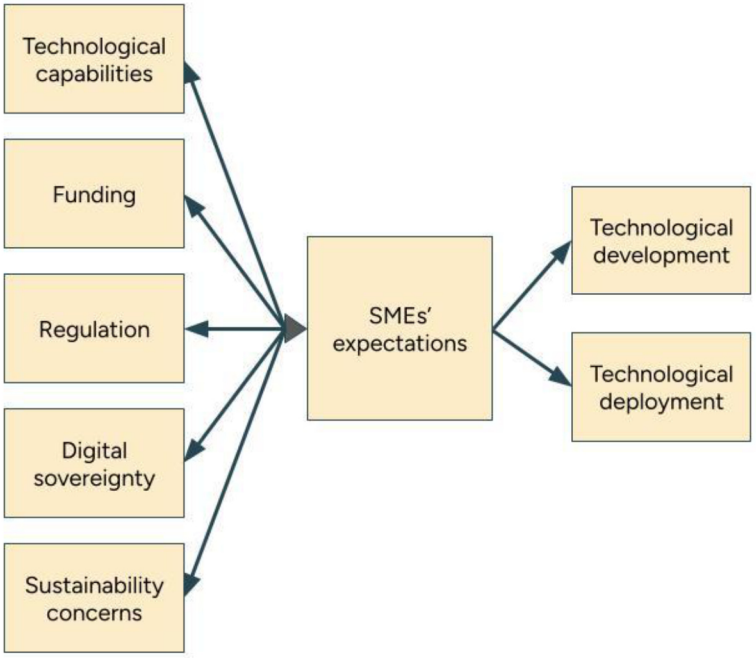
3.4.4 SMEs in Europe's path to "digital sovereignty"

In 2025, Europe has intensified its efforts for achieving "digital sovereignty", wherein AI technologies are considered a crucial pillar of transformative industrial dynamics and an important geopolitical field of action for achieving competitiveness and independence in strategic sectors. SMEs act both as *initiators* and *receivers* of digital sovereignty efforts and, as intermediaries in innovation networks are directly concerned with, e.g. data security, cloud services and platform regulation. However, digital sovereignty, which at its core

delineates state and non-state stakeholders' efforts at establishing authority over digital technologies (Roberts, 2025), must be considered a contested concept (Pohle et al., 2025; Farrand & Carrapico, 2022; Falkner et al., 2024), and presumably accompanied by high uncertainty for SMEs. Different stakeholders, like enterprises or civil society organisations, compete over potentially conflicting visions of sovereignty and interdependence, yet geoeconomic interests might not be naturally aligned with promises of individual digital sovereignty or "trustworthy AI". Therefore, this field of tension also concerns the build-up of European "AI sovereignty" (Mügge, 2024). Of research interest here is how SMEs navigate or address infrastructural dependencies at the (inter)firm and EU levels.

Figure 1

Visual representation of the dynamics influencing and resulting from SMEs' expectations of AI.



Section 4: Methodology

This research is guided by the deductive method in thematic analysis (Braun & Clark, 2006) as our top down approach to the Sociology of Expectations. We have created the success criteria matrix as a structured framework which is used to validate propositions emerging from semi-structured interviews with SME representatives.

4.1 Capturing SMEs expectations on AI development and deployment

In order to capture SMEs' expectations regarding AI development and deployment, FORSEE seeks to operationalise the SoE paradigm by focusing on the notion of success. Different understandings of what constitutes success in terms of technology have the potential to lead to different actions and different future trajectories. For the purposes of this work, AI is understood through a socio-technical lens: not as a single, fixed technology, but as a dynamic and evolving field shaped by the interaction of technical systems with organisational practices, market forces, institutional frameworks, and societal values. This perspective recognises that expectations around AI performance, risks, and benefits are continuously negotiated and redefined over time, and must therefore be assessed in relation to both technical capabilities and their broader implications. Therefore, the present research developed a **success criteria matrix** (see Appendix 2) in order to label the data collected from semi-structured in-depth interviews with European digital SMEs. The success criteria matrix that enables the identification of both positive and negative expectations held by SMEs in relation to AI. In doing so we also seek through the matrix to identify the context of these expectations, whether they relate to technical excellence or broader societal risks and benefits, and whether they represent minimum baseline standards or aspirational future goals. In Appendix 2, an indicative version of the success criteria matrix can be found explaining how each of the categories outlined below coexist and interact.

The matrix is structured around three main categories, each corresponding to a conceptual dimension of success and expectation formation. Within each category, two mutually exclusive criteria (labels) are defined. The categories themselves can co-occur in the analysis, offering a multidimensional understanding of how SMEs develop their own expectations surrounding AI systems.

Category 1: Benefits and risks

This category distinguishes between success and failure, defined as current or potential positive and negative developments respectively. This distinction is expressed in the following two labels

- **Positive Criteria** refer to any **positive** development that a person, organisation, company, or public entity expects to result from the deployment or development of an AI system. This can be taken to correspond to SoE's promissory notes.
- **Negative Criteria** refer to any **negative** development expected to hinder a person, organisation, company, or public entity from developing or deploying an AI system. This can be taken to correspond to SoE's cautionary visions.

Category 2: Context of reference

This category differentiates between the technical characteristics and capabilities of an AI system and its broader social, cultural, and political impact. This distinction is expressed in the following two labels:

- **Internal Criteria** refer to developments that arise from the perceived technical characteristics and capabilities of an AI system.

- **External Criteria** refer to developments that emerge from the interaction between AI systems and their wider societal context.

This categorisation stems from SoE's insight that expectations are situated within hybrid networks of stakeholders, institutions, and technological artefacts, and that these contexts jointly structure how stakeholders imagine future outcomes of AI.

Category 3: Level of Expectation

This category refers to the distinction between the minimum expectations an AI system must meet –those essential requirements for its development and deployment– and the broader, maximum expectations tied to its future potential, including the possibility of exceeding those expectations. This distinction is expressed in the following two labels:

- **Minimum Criteria** refer to the essential requirements that an AI system must fulfil to be developed or deployed.

- **Maximum Criteria** refer to the highest standards an AI system can achieve, going beyond basic expectations.

SoE distinguishes between near-term, obligatory requirements that stabilise innovation trajectories and long-term aspirational visions that sustain momentum and mobilise resources (Van Lente, 2012; Borup et al., 2006). Our typology operationalises this through minimum criteria, referring to baseline requirements for AI deployment, and maximum criteria, referring to higher-order, future-oriented aspirations. These categories aim to capture the layered temporal structure of expectations and more broadly the graduated nature of these expectations.

The unit of analysis in this research is an *utterance of speech*, understood in the broadest sense. An utterance may range from a brief reference to an elaborate argument on a particular topic. Context is crucial in determining whether a given utterance conveys an expectation relevant to the study.

As mentioned earlier, different categories of success criteria may co-exist within a single utterance and in practice, they frequently do. For instance, an interviewee stating that the AI system they are developing boosts healthcare practitioners' productivity, thereby improving citizens' access to healthcare, expresses both positive criteria of success (as the statement refers to expected benefits) and external criteria (as it situates these benefits within a broader societal context).

The success criteria matrix can be found in Appendix 2, with specific and indicative examples filled out. This version served to develop a joint understanding across researchers in the process of coding the interview transcripts.

4.2 Data collection: interviews and workshops

To identify the expectations of SMEs developing and deploying AI, 39 semi-structured in-depth interviews were conducted between June and December 2025 with digital SMEs from 15 EU countries, each lasting approximately 40 minutes. This approach was selected to capture participants' experiences and interpretations while allowing discussion of interconnected themes, including organisational capabilities of SMEs themselves and macro-level enablers (funding, digital sovereignty, regulation, sustainability, as outlined in section 3.4).

Participants were recruited through the European DIGITAL SME Alliance, a FORSEE consortium partner, which facilitated access to relevant SMEs and coordinated interview scheduling. Participants selected for the interviews were representatives of SMEs with direct experience in relation to artificial intelligence. The sample included SMEs that deploy AI-based solutions to support specific business operations, as well as SMEs that develop AI products or services as part of their core activities. As is shown in table 1, the interviewed SMEs further exhibited substantial heterogeneity in terms of business models, spanning business-to-business (B2B), business-to-consumer (B2C), software-as-a-service (SaaS), business-to-government (B2G), and research-and-development partnership arrangements. With respect to technological configurations, many firms relied on existing digital infrastructures, such as external cloud services and large language models, which they adapted and customised to develop proprietary solutions, while a smaller subset pursued fully in-house AI development; others primarily deployed off-the-shelf AI systems. Across these diverse organisational and technological profiles, the SMEs addressed a broad range of application domains, including legal and regulatory compliance, recruitment and human resources, marketing and communication, software development, energy efficiency, insurance, health, manufacturing, robotics, and related sectors. No exclusion criteria were applied with respect to the type, scope, or technical characteristics of the AI systems used, in order to capture a broad range of experiences and perspectives across different application contexts.

A semi-structured guide was developed to assist the interviewers while allowing flexibility; it is provided in Appendix 1. The wording and focus of questions were adapted to the role of each participant, with distinct questions for SMEs that deploy AI systems and for those that develop them.

To support data analysis, interviews were transcribed in accordance with the Data Management Plan, anonymised, and assigned numerical identifiers for use in the findings section. Data were analysed using deductive content analysis approach (Schreier, 2012)

using the NVivo 15 analysis tool, drawing on a set of predefined labels derived from the presented conceptual framework.

4.3 Demographic overview of SMEs interviewed

To contextualise the interview data, we compiled a demographic table capturing key characteristics of all participants, including job title, business model, sector, company headquarter, whether firms act primarily as developers or deployers of AI, and what kind of infrastructure they use for their AI systems. These categories allow us to situate each perspective within its organisational context, identify patterns across different types of SMEs, and interpret differences in perceived success factors.

Table 1

Demographic profile of SME interview participants.

ID	Job title	Business model	Sector	Company headquarter	Developers or deployers	In-house or on top of existing architecture
1	Co-Founder	R&D partnerships	ICT	Greece	Developers	Strategic collaborations with external partners
2	Founder/CEO	B2B	HR Tech	Italy	Developers	Building on top of existing architecture
3	Founder	B2B, B2C	ICT	Hungary	Developers	Mostly in-house
4	Founder/ CEO	B2G, R&D partnerships	ICT	The Netherlands	Developers	In-house
5	Co-Founder/ CEO	B2C2B2B	Building performance optimisation	Italy	Developers	In-house
6	Co-Founder/ CEO	B2B, SaaS	Regulatory compliance	The Netherlands	Developers	Relies on an external cloud service
7	Co-Founder /CEO	D2B SaaS	Regulatory compliance	Italy	Developers	Relies on an external cloud service
8	Co-Founder/ CEO	B2B	Aerospace, defense	Norway	Developers	In-house
9	Director	B2B, B2G	Neurotechnology; applied neuroscience	Germany	Developers	Relies on an external cloud service
10	Senior executive and technical lead	B2B	Software development	Romania	Developers	Relies on an external cloud service
11	Founder/ CEO	B2B, SaaS	Predictive sales	Ireland	Developers	Relies on an external cloud service
12	Head of Research and EU Projects	B2G, B2B	Software development	Italy	Developers	Relies on an external cloud service; strategic collaborations with external partners
13	Founder/CEO	B2B	IT consulting	Germany	Deployers	Integrates feature from global LLMs
14	Founder/CEO	B2B, R&D Partnerships	IT	Italy	Developers	Relies on an external cloud service; strategic collaborations with external partners
15	Co-founder/Business Lead	B2B	FinTech	Italy	Developers	Relies on an external cloud service
16	Head of Innovation Department	B2B	Process automation	Spain	Developers	In-house
17	Co-Founder/	B2B	Health	Italy	Developers	Relies on an external cloud service

	CEO					
18	Founder and Lead Consultant	B2B	IT consulting and training	Italy	Deployers	N/A
19	Head of Research	B2B	Digital manufacturing	Germany	Developers	Non-strategic use of LLMs
20	Researcher/ data analyst and software developer	B2G, R&D	Software development	Italy	Developers	Relies on an external cloud service; strategic collaborations with external partners
21	Co-Founder	B2B	AI systems management	France	Developers	Relies on an external cloud service; strategic collaborations with external partners
22	Founder/Director	B2B	Human Factors and Responsible AI Consulting	Ireland	Deployers	N/A
23	CTO	B2B	Marketing	Portugal	Deployers	N/A
24	Head of Research and Development and AI project lead	R&D	R&D	Belgium	Developers	In- house
25	Founder/CEO	R&D	Health	Bulgaria	Developers	Relies on an external cloud service
26	CEO	R&D, B2B, B2C	Robotics	France	Deployers	N/A
27	Co-Founder/ CCO	B2B, B2G	Supply chain traceability	Belgium	Developers	In-house
28	Co-Founder/Managing director	B2B, B2C	Health	Greece	Deployers	N/A
29	Founder/ Managing Director	B2B, B2C	Consulting on sustainable AI	France	Deployers	N/A
30	Data engineer	B2B	IT consulting, software development	Spain	Deployers	N/A
31	Project Manager and AI Training Coordinator	B2C	Education	Spain	Deployers	N/A
32	Founder/CEO	B2B	Creative media, communication	Croatia	Deployers	Using off-the-shelf solutions
33	Founder/CEO	B2B	Industry, hardware innovation	Austria	Developers	In-house
34	Head of the AI transformation	B2B, B2C	Insurance	Belgium	Developers	Building on top of existing architecture
35	Founder and Director	B2B	Digital transformation and innovation	Spain	Developers	In-house
36	Founder	B2B	Agri-food trade	Italy	Deployers	Using off-the-shelf solutions
37	Founder	B2B	Digital transformation	The Netherlands	Deployers	Using off-the-shelf solutions

38	Founder/CEO	B2B	Software development	Romania	Developers	In-house and building on top of existing architecture
39	CEO	B2B	Defence	France	Developers	In-house and building on top of existing architecture

Section 5: Findings

5.1 SMEs expectations and understandings of success

What are the SMEs expectations when developing or using AI systems? Our interviews reflect a complex situation where positive expectations prevail but are simultaneously undermined by concerns on the prospects of the broader European environment. Therefore, in the following subsections, the expectations will be presented, as they were mapped by the success criteria matrix described above. Then certain factors that mediate and often mitigate/constrain expectations will be discussed at length; more specifically, the questions of funding, digital sovereignty, regulation and sustainability.

5.1.1 Narrating success and failure: Positive and Negative Criteria of Success

Regarding SME's expectations the first axis of the matrix to be addressed is Category 1: Benefits and risks as expressed in positive and negative criteria of success.

5.1.1.1 Narrating success: Positive criteria of success

Regarding positive criteria, overall, interviewees highlighted mostly benefits to be achieved through AI. More specifically, a common narrative emerged among our interviewees. Their positive expectations relate AI with the capability a) to augment human capacity, b) to boost productivity and c) to provide efficiency, reducing operational costs.

With regard to point a) on augmentation, in most cases our interviewees stressed that the benefits do not result from replacing humans, but from allowing them to devote time and resources to more complex tasks. For interviewee 2, AI-assisted recruitment is about empowerment of human recruiters:

> We want to augment humans to be more productive. So a recruiter is always short of time. You know, they often have to talk to 15-20 candidates, but they usually only manage 10. But what if they could scale that to 100 by using AI to support them as opposed to replacing them?

In a similar note, for interviewee 33 the benefits are clear:

> We encourage the team to use AI because all the laborious work should be delegated to AI. Only intelligence work and how to use the AI should be taken care of by humans.

With regards to point b) on productivity, for interviewee 21, AI is crucial for boosting productivity in quality control in industrial settings:

> When you make a visual inspection, you have people who control the quality of the product. If you can automate this with AI solutions, it's a great value.

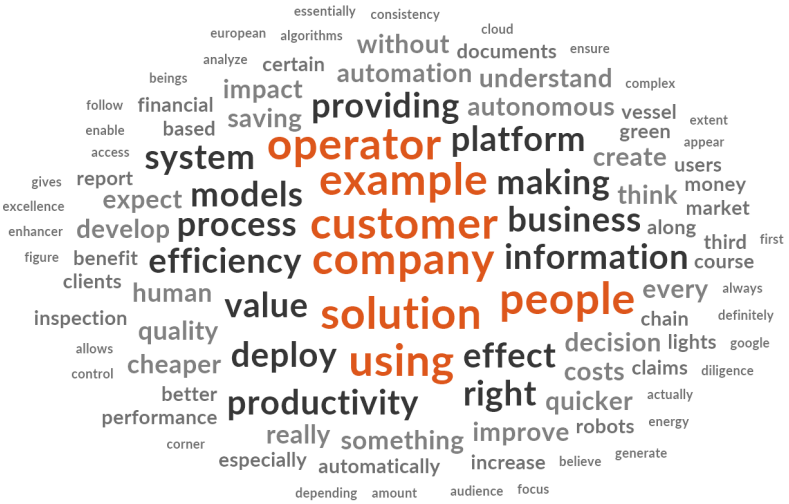
With respect to point c) on efficiency, interviewee 6 explains how AI helps develop a system that allows businesses to gain legal advice and comply with European regulations:

> It's about efficiency and speeding up the process. It's making sure you have access to much more information. So for you as a non-expert, without AI it would be so much more difficult to have access to legal information.

Figure 2 presents a word cloud summarising the most frequently used terms by interviewees when discussing positive criteria of success. All word clouds presented in section 5 were generated through word frequency queries in NVivo 15 and are used as indicative visualisations of recurring themes in participants' accounts.

Figure 2

Positive Criteria of Success.



5.1.1.2 Narrating Failure - Negative Criteria of Success

On the other hand, regarding negative criteria, interviewees did identify risks, referring to situations they wished to avoid. However, these concerns were considerably less prominent in our findings. For example, interviewee 31 referenced their concern for the reliability of AI-generated content:

> There is a danger of providing false information if we rely on AI outputs without reviewing them. We work in the educational sector and we must always carefully check what AI provides to ensure accuracy, and we consistently do so to prevent errors.

For interviewee 23, a potential risk is fully autonomous AI:

> We never do something with AI and put it to production. AI should not be fully autonomous, okay? So we always have control.

These quotes indicate that "human in the loop" is a firmly established principle across SMEs. Interviewee 7 is the one that perhaps best encapsulates this approach:

> Potential risk is overreliance on those AI systems. Despite having the disclaimer that content is generated by AI, it needs to be validated by a human despite the fact it's a recommender. Over reliance can be a problem, and people can take as written in stone whatever AI is saying. To mitigate that, we build a workflow where several levels of approval are required.

Figure 3 presents a word cloud summarising the most frequently used terms by interviewees when discussing negative criteria of success.

Figure 3

Negative Criteria of Success.

5.1.2 Understanding the context: Internal and External criteria

To better understand the interviewees' expectations, we need to bring into play the second axis of the matrix, Category 2: Context of Reference. This category differentiates between the technical characteristics and capabilities of an AI system and its broader social, cultural, and political impact. This distinction is expressed as internal and external criteria. Internal and external criteria of success do not appear on their own but as a complimentary category, often contextualising the first.

Interviewees typically frame their positive expectations for AI; they either relate them to the technical characteristics of the AI systems or as part of solutions to broader societal issues. This is expressed in internal positive and external positive criteria of success.

5.1.2.1 Framing Success: Internal positive criteria

The following quotes can clarify how internal positive criteria of success emerged from the interviews in discussing expectations regarding the technology itself.

Interviewee 13 describes the success of their company with AI systems:

> For an energy company that trades energy and gas, we developed a solution in order to make the right decision at the right time. We are trying to develop a solution that could reach 60%, 70% certainty in order to drive your decision with a good probability.

Discussing success in terms of specific accuracy rates was common among interviewees developing AI systems. For example, as interviewee 6 mentions:

> We only want to develop that [AI system] if the answers are 90% correct because otherwise it doesn't really make sense because you don't want them to have any big mistakes.

Similarly, for interviewee 15, accuracy is the determining factor:

> What we do is use machine learning and deep learning to provide to our customers products that are aimed at generating Alpha. In financial markets, generating Alpha means selecting stocks and other securities that perform better than their benchmark.

Closely tied to the emphasis on accuracy is a narrative focused on the reduction of time and costs. Interviewees often identified that saving time was the major benefit resulting from engaging with AI systems.

Figure 4 presents a word cloud summarising the most frequently used terms by interviewees when discussing internal positive criteria of success.

Figure 4

Internal Positive Criteria of Success.

5.1.2.2 Framing Success: External positive criteria

However, the strong emphasis on the technical characteristics of AI systems does not exclude a broader view in the SMEs' expectations. Our interviewees discussed benefits from AI systems that relate to societal issues and these were captured as external positive criteria of success.

Interviewees stressed that their work in AI has a positive impact on society as a whole or on specific sectors. Interviewee 14 expresses this in an abstract way:

> We use it in a polite way and we follow the rules and we are really interested in creating something good for people using AI in a better way.

In a similar way, for interviewee 20, AI can empower people instead of simply replacing them:

> Trying to substitute people, it's not a great idea. So, finding a very clever and nice way to use artificial intelligence, not to substitute anybody, but to support human work can be a good challenge.

For interviewee 24, developing an AI system for the railway network, the ambitions are even higher:

> The idea here is to make better use of energy, or to recognise a societal problem from data. We have a lot going on on the railways, because it means a more accessible society, a more democratic society, green transportation and so on.

While this level of ambition was not the norm among the interviewees, they often conceptualised their work in particular sectors as highly important. Interviewee 17 expects benefits for the healthcare system:

> There is a certain overload of physicians with respect to the number of patients which means there isn't much time that they can devote to each patient. So, any AI tool that helps them not miss a piece of evidence that might be important for a diagnosis or to examine some person that might be at risk is very important. I think there are big opportunities there, which we try to leverage.

On the other hand, for interviewee 4, universities and research centers are offered the opportunity to renew their operations in an age of austerity and cutbacks:

> So, we've seen that a lot of universities in Europe have to cut costs, but they also have to move towards new products. Universities themselves want to know what impact science is creating and we are combining data from different layers to monitor that impact.

Overall, interviewees demonstrated a substantial understanding of different sectors and of the challenges their clients face. This understanding intersects with their positive expectations of AI resulting in a narrative of technological optimism. Next subsection will examine narratives of failure and instances of what interviewees seek to avoid.

Figure 5 presents a word cloud summarising the most frequently used terms by interviewees when discussing external positive criteria of success.

Figure 5

External Positive Criteria of Success.

5.1.2.3 Framing failure: Internal negative criteria

To further clarify how "narratives of failure" operate, they need to be contextualised, either with regard to the technical characteristics of AI systems or with regard to their broader societal impact. This leads to examining internal negative and external negative criteria of success.

With respect to internal negative criteria, the most common pattern was the inverse aspect of the "accuracy/reliability" narrative, as many interviewees emphasised the risks associated with AI systems failing to perform. For example, interviewee 25, deploying AI in healthcare systems, mentioned that:

> I don't see any additional risks other than the classic ones, such as the program not understanding what it is seeing at that moment.

For interviewee 31, using AI systems in education, reliability is the main concern:

> There is a danger of providing false information if we rely on AI outputs without reviewing them. We consistently do so to prevent errors for students or supervisors.

Interviewees also stated that they do not pursue a fully autonomous AI system. Interviewee 26, developing AI for robotics notes that:

> Our idea is to build a specific AI workflow that is not fully autonomous. It would allow a human to intervene at key points in the process in order to check and control the workflow.

While our sample size does not allow generalisations, a pattern emerges. Interviewees involved in designing AI systems for production processes express greater concern about autonomous AI, whereas those working in marketing, education, or creative industries place greater emphasis on the reliability and quality of Generative AI outputs. A larger, cross-sector sample is necessary to verify this hypothesis.

Figure 6 presents a word cloud summarising the most frequently used terms by interviewees when discussing internal negative criteria of success.

Figure 6

Internal Negative Criteria of Success.

5.1.2.4 Framing Failure: External negative criteria

While internal criteria indicate that interviewees are concerned about the reliability and the efficiency of AI systems, equally important appear to be the broader negative societal impact. One of the criteria that emerged was the need to avoid biases and discrimination when designing an AI system. As interviewee 1 references:

> You need systematic consulting over this process to understand that machine learning might end up mimicking your preferences, but this might be legally problematic, because this is your bias.

For interviewee 25, designing AI for healthcare systems, biases is a pressing matter:

> We have biases which arise by healthcare professionals. We have biases which are raised by the hospital systems and management. So, all of those biases, we are trying to address.

Another major concern relates to privacy and regulatory compliance. For interviewee 3, developing a Generative AI system, compliance is an important criterion:

> In our business model, we give users the freedom to produce an image, but if they try to do something illegal we do not let them do it. Our AI solution is aligned with regulation, we do not prohibit them from generating an image, but we instead produce an image which is legal.

For interviewee 34, being compliant means actively engaging with risks to data privacy and potential violations of GDPR, while implicitly linking these to digital sovereignty.

> So, our main risks relate to privacy, accuracy, and governance. From a privacy and security perspective, the biggest risks involve the procurement of non-EU providers, and AI use cases that may include data from vulnerable customers. These scenarios require stricter safeguards and mitigation measures for us to remain compliant with the GDPR and to prevent the unlawful processing or exposure of personal data.

Figure 7 presents a word cloud summarising the most frequently used terms by interviewees when discussing negative external criteria of success.

Figure 7

External Negative Criteria of Success.

5.1.3 Level of expectations: Minimum and Maximum Criteria of Success

Shifting to the third category in the criteria matrix, regarding the level of expectations (minimum-bare essentials or maximum aspirations), it should be noted that it was significantly less prominent in the interviews. However, in certain cases, interviewees outlined their minimum expectations regarding AI (minimum requirements that AI systems must meet) as well as their maximum expectations (with reference to the highest standards an AI system can achieve, going beyond basic expectations).

5.1.3.1 Maximum criteria of success

Following the prevalence of positive expectations over negative, within this category maximum criteria were more prominent than minimum. Interviewees outlined future goals about the AI systems they develop and deploy, indicating ways that AI can meet their highest standards.

Often, within these narratives of success, business goals intersect with technological progress. Interviewee 19, head of research in an SME that provides AI-powered solutions that optimise manufacturing workflows, clearly summarises this:

> We want to represent, to some extent, the whole bunch of potential customers, and once we develop the technology, we may license or sell it across the whole Europe, so that means that we are the single player.

In a similar note, interviewee 2 envisions a development of their AI solutions that leads to the point where:

> We want to be the only platform that solves all the hiring problems for the hybrid workforce in 5 years time.

These quotes echo the monopolistic tendencies of large tech companies and the aspiration that AI can lead to the occupation of a prominent position in a given sector. These expectations also intersect with internal criteria of success regarding technical excellence. This is clear in the case of interviewee 26, CEO of a company developing AI powered robots:

> What drives us forward is this whole ocean digital twin carbon sink type of modeling, which we think can be massively useful for all the carbon credits issued in the ocean in the future. And so we think that that's the direction we want to go into, which is to own that and that would make us a mega unicorn.

In this case, entrepreneurial success (becoming a "mega unicorn") is correlated with a leap in AI modelling of the ocean.

The next subsection will examine how maximum expectations are framed with regard to internal and external criteria of success.

5.1.3.2 Maximum internal and maximum external criteria of success

In line with what was mentioned above, interviewees envisioned the potential to scale up their AI solutions. For interviewee 34, developing AI systems that engage with insurance claims this means larger scale and volume:

> We are going to continue focusing on AI use. It will just be in larger volume, and at a bigger scale. But we want to continue investing in AI in customer care, claims management, etc.

Within the same topic, narratives of efficiency and technical excellence were reiterated. For interviewee 6, developing an agentic AI this means:

> I'm a believer of our AI, so I expect it to become better and better, and to be able to get a better agentic approach for our clients, to provide efficiency and access to knowledge and expertise. So yeah, I'm hopeful.

A workshop participant deploying AI within their small enterprise also describes AI agents that exceed expectations.

> I'm excited about AI and its potential. They say the future will allow solo entrepreneurs to achieve great success, and I want to experiment with having AI agents work for me. I believe this approach can empower small enterprises to grow faster.

If focus is shifted on broader benefits (external criteria of success) resulting from AI, similar patterns with previous sections emerged as interviewees often discussed the potential to transform whole sectors. For interviewee 4, this means a new era for higher education though their AI solution:

> It would be great if in 5 years that there is an established science standard metric that we have developed, so that every university in Europe is using that, and that governments are also using that, too, to track the performance of universities. We can help make the system better, we can make the universities and all those institutions and the government a bit more entrepreneurial and proactive

Moving beyond sector-specific advances, interviewee 5, developing AI systems for energy-efficient applications, expressed expectations on an even higher level:

> Energy efficiency and the European goals are the main drivers for us to build this technology.The ultimate goal is that I would love to be able to contribute to the carbon neutrality of the whole planet.

The next subsection moves to examine minimum criteria of success.

5.1.3.3 Minimum criteria of success

This category, referring to the minimum requirements that deployment or development of AI systems must meet, was the least prominent among our interviewees. No clear narrative of minimum requirements emerged through these instances. For some interviewees, being legal and compliant was the bare minimum goal to meet. For example, for interviewee 2 and their Generative AI:

> We believe it is a minimum standard to be legal and ethical, like privacy, like the images and the IP rights for the customers. This is very important, and of course this is from the legal aspect or point of view.

For interviewee 8, the requirements set by the AI Act are the "default" in their company and the AI systems they develop. In a similar note, interviewee 4 considers the AI Act requirements as baseline goals:

> A lot of things that are in there [in the AI Act], we already have them in place. We try to make at least explainable AI and transparent, and have human oversight, well, all these things.

If we shift to minimum internal criteria of success (minimum technical requirement to develop or deploy an AI system), familiar narratives on accuracy and reliability resurface. For interviewee 15, accuracy is the sine qua non of their AI system:

> The most important one is the accuracy of our models. Our customers buy our solutions, because of the accuracy and performance of our models. That's the reason why they buy. If it wasn't for the model performance they would not buy at all.

Invoking a different side of the "cost reduction" narrative, interviewee 32 mentioned the importance of developing a cost-effective AI system:

> One of the minimum requirements is price would be the most important criterion. Customers would expect the system to be reasonably priced, ideally similar to ChatGPT, which has a free version for limited use and is not too expensive if you need to pay.

5.1.3.4 Summary of criteria of success

Overall, interviewees expressed largely positive expectations for AI, grounded mainly in its technical promise but without overlooking its potential societal impact. Alongside these optimistic views, they also articulated narratives of failure (concerns about unreliability, bias or autonomous AI). Having examined these expectations, the discussion now turns to the broader societal and economic factors that condition how SMEs express and act upon these expectations.

5.2 Structural Factors / Macro-enablers of success

During interviews, SME representatives presented a series of concerns regarding the larger AI innovation ecosystem. These issues - including funding, digital sovereignty, regulation, and sustainability - shape the environment in which different understandings of success are developed.

5.2.1 Funding

Across interviews, SMEs described a challenging funding landscape that significantly shapes their AI development and decision-making. Two key factors emerged as shaping this process: customer preferences and capital availability. SMEs argue that clients, public

institutions and private investors are characterised by a risk-conscious approach to AI development that balances opportunities with the realities of a competitive funding environment. The following section presents these findings with respect to three central types of funding and their limitations: internal and client co-funding, private investor funding, and public funding.

5.2.1.1 Internal and client co-funding

Client-led development models are designed to respond to unmet customer needs and address existing challenges, as highlighted in interview 18:

> You always look at the market — at least, that's my experience working with the US. You have two options: you either create a product that disrupts the market, which is rare and requires a lot of luck as well as knowledge, and means identifying a problem customers haven't even fully acknowledged yet. Or you take the more classical route: study the market, find unmet needs, use some design thinking, empathise, build prototypes, and carve out a niche.

This approach was also discussed in interview 8, who noted that customers themselves act as a key source of funding for developing new AI tools:

> [Customers] want more AI capabilities in the tools...so everything we've done so far has been in response to customer requests. We haven't sought external funding. But of course, we also ask customers to co-fund the development.

5.2.1.2 Accessing investor funding

Private sector funding, particularly through stakeholders like venture capitalists, is critical to supporting SMEs in the early stages of development. Several SMEs noted the importance of investor funding, as referenced by interviewee 26:

> For a startup like ours, the main route is venture capital. We managed to raise funds from French, UK, Swedish firms - European VCs, more or less - quite early in the development stage. Thanks to that, we can hire and accelerate and try to make this technology European.

Given the important role of this early stage funding, investor priorities can influence development strategy, as noted by interviewee 17:

> Trends get funded because there's an expectation of return, so it's not just about money but where the business will be in a few years. This definitely changes the decisions we make.

While venture capital (VC) remains essential for scaling AI SMEs, interviewees consistently described a funding landscape that is fragmented, risk-averse, and unable to match the depth of capital available in the United States, as discussed by interviewee 14:

> The size of investment can't really compete with other companies, especially in the United States.

This sentiment was shared by interviewee 26, who referenced the risk-averse tendencies of European VCs relative to their American counterparts:

> European investors usually invest too little, too late compared to Americans, who will put more cash on the table at earlier stages because they believe in the team and they have a more integrated market at a continental level. So they know that if your thing works, it's going to penetrate the market faster... In Europe, there are fewer VCs... so they're more picky and take more time.

This conservative investment philosophy is linked to the structure of the European financial system, as noted in interview 26:

> The biggest capitalists in Europe are banks and insurance firms, while in the US it's hedge funds and capital markets, so the risk appetite is completely different. They invest in equity, while we focus on debt, bonds, and low-yield instruments.

SMEs also noted that the dominance of Big Tech within the market deters some investors, who doubt the ability of smaller firms to meaningfully compete, as noted in interview 4:

> I also noticed that a lot of investors are a bit hesitant to invest in AI, and that has more to do with OpenAI and Facebook. I literally got a response that said 'I don't believe that you can win with AI in this market.'

5.2.1.3 Public funding

Many SMEs discussed the role of public funding in their organisation, particularly as a tool to fill the gap presented by a lack of private-sector funding. This opportunity was explicitly referenced by interviewee 4:

> I think that the public market should jump in that gap by helping a lot of start-ups in an earlier phase to actually prove that they build something.

SME representatives expressed frustration with the European grant ecosystem, citing heavy administrative burdens and intense competition. As noted by interviewee 6:

> It's a barrier to accessing funding and grants because they make it so difficult to apply - there are so many criteria you have to meet. For instance, Europe now has a grant specifically for what we're building, but we could only apply if we were already a big company with significant revenue, and we'd also have to collaborate with two other European companies, which is a nightmare from a business-model perspective.

This burden is further exacerbated by the strong likelihood that grant applications will be unsuccessful. Interviewee 19 described the intense competition:

> Nowadays, getting funding from the European Union is very competitive...let's say 100 proposals are submitted for a call: only the top three get funded. The difference among the top ten proposals is so marginal that it's not even clear.

However, these public supports will not replace the strength of a vibrant private marketplace, noted interviewee 7:

> European funds and tenders are very helpful, but it's not enough. We need the private sector to be as proactive as it is in the US. We need a change of mentality.

In conclusion, several issues and expectations raised here with regards to the European funding landscape are heavily linked to expectations towards European digital sovereignty efforts, which the next section aims to unravel.

5.2.2 European digital sovereignty

With regard to European digital sovereignty, digital SMEs demonstrate widely varying levels of awareness of both the key challenges and the potential pathways for action. Some take a markedly pessimistic view, arguing that, from a European perspective, the AI race has already been lost, largely due to longstanding deficiencies in investment and capacity building in core information technology infrastructure. As interviewee 12 notes:

> I think that AI, of course, is behind the main actors, which are definitely the United States and China, but Europe lost all major IT battles.

The prospects for individual digital SMEs to become fully independent of, or to emerge as reliable alternatives to, Big Tech AI infrastructure are also considered. Interviewee 13 is clear on this:

> For a small company it's impossible. The level of the quantity of energy, the infrastructure that you need in order to develop this kind of solution is impossible.

Another participant, interviewee 18, compared the AI race to a race for nuclear weapons:

> If you depend on another bloc, you are basically a tenant of somebody who is providing you with core services, so it is important for Europe to have its own AI. I think the race for AI is like the race for weapons. In this case, there is no doubt that Europe needs to develop its own AI. However, I think it is a very late start, and it does not have the necessary conditions to move forward.

Still, others claim that they do not really perceive conflicts of interest with Big Tech, as long as the data is located in Europe, stating that they do not see "how it hurts us or how it matters if it's European or not" (Interviewee 10). However, the monopolisation of AI infrastructure remains highly relevant for SMEs in several respects, as the following quote from interviewee 11 illustrates:

> If I want to create my product, I need vendors and providers that will give me the infrastructure to save data and to transfer data in a flexible way. And I also need the people who would create my product, and they only know those systems. So, Amazon, Azure, and probably I forgot to mention Google. They are monopolising that. There are alternatives now in Europe (...) but it takes time.

Data security - including data protection, data processing, and data management - is among the most addressed digital sovereignty issues. SMEs seem to mostly adapt to their client's wishes, for example by offering custom enterprise solutions, as was the case with interviewee 14:

> We use the embedded version, and we use not a public OpenAI solution but a custom enterprise solution that we put inside their subscription. So, with this kind of element the clients say, 'okay, it's safer to use this kind of technology with us.'

Data protection is given as a main reason to stick to EU products, as interviewee 27 emphasises:

> For us, it's a business model to be compliant with the EU (...) We got new shareholders who did not approve of taking foreign products from outside of the European Union because of data protection.

However, choosing European alternatives comes at higher financial costs for companies. For some, the price is too high, as noted by interviewee 6:

> We use OpenAI for our AI, which is something that I would rather not do. I would rather use a European option so that the data we're processing will also be in Europe, but we haven't found an alternative yet that also matches our budget because we are a startup. The European alternatives that are out there are too expensive.

An issue raised by several interviewees and closely tied to the data security dimension is *trust* in foreign digital infrastructures and business partners. According to interviewee 8:

> If you look into the domain specifics where we are in aeronautic space and defense, that kind of data is extremely difficult to load up to a commercial type of AI platform. So, if you look into the obstacles that you have for SMEs is that we don't trust in platforms provided in the cloud.

A potential source of conflict with US AI vendors and providers is anticipated in future geopolitical developments. When asked whether it is important for European companies to develop their own infrastructures and AI systems, interviewee 17 responded:

> I would definitely say yes, because reliance on external partners creates potential issues in the future. I think it's very important that there is an independent way for the European Union to develop their own AI systems. Not necessarily because the ones that are made in the US or in China are bad, but because a reliance on external providers might prove problematic in the future.

The most striking element in regards to computing infrastructure is the dependency on cloud providers (hyperscalers) and their solutions and applications. Many interviewees referred to the prevalence of non-EU (primarily US-based) cloud providers within their business operations. In particular, interviewee 7 discussed the challenges presented by Europe's limited computing power:

> We still don't have the firepower in Europe. We don't have the computing infrastructure to compete with what America and China have produced. I welcome, as a European, all the projects that are happening at European level to regain our technological sovereignty, to build an infrastructure that allows us to develop AI at the same level as the other powers in the world are doing.

Digital SMEs acknowledged the lack of EU-based hardware as a particular challenge. As interviewee 8 mentioned:

> Today, maybe we can put something together on the software side, but we are not able to do hardware in Europe. We don't have the capability to build all the necessary computing

> infrastructure. So, if we could add that dimension, then maybe we'd have something. I think the most critical issue is that we might have 60-80% of a solution for AI - European, open source, etc. - but we still don't have any European hardware to run it.

Interviewee 30 highlighted what they perceive as a lack of strategic coherence at the European level, framing it particularly as a "speed problem":

> This is also a kind of speed problem between AI and the decision-making process in the EU. We don't have a strategy for the big things, to go beyond what Americans do. I think the strategy - or lack of it - is mostly the problem. And this competition among brothers and sisters is not very good for us. We need to cooperate instead of competing.

The necessity of a European-level strategy becomes even more evident when considering SMEs' concerns with Big Tech companies, as expressed by interviewee 3:

> We have several third party solutions, but it is not strategic. These are not strategic collaborations. We do not want to engage too deeply with these kinds of Big Tech companies.

In seeking ways to empower the European AI industry, participants emphasised the importance of accessible European solutions, EU funding, and the broader infrastructural landscape for digital SMEs. Interviewee 9 criticised the procedures and costs involved in using European compute resources:

> The only European alternative that I know of is the high-performance computing network formed by supercomputing centres, but the problem is that they are not very usable. The usability of their services is at level 0, as far as we understand. (...) If you need to contract AI services like the ones you could get from Amazon Web Services, you have to go through a process: you have to apply, they assign you an engineer, and then you have to adapt your code for that.

These examples highlight a shortage of European AI infrastructure, further compounded by time-consuming application procedures. Several interviewees, including interviewee 9, stressed the need for public AI infrastructures:

> I agree, from a political point of view, that the EU needs a new perspective, but the fact is that the competitive landscape in Europe, with respect to EU and China providers, is very limited. One interesting development would be to establish public infrastructures for AI. This could be a differentiating factor if we really manage to put them in place.

Concrete examples mentioned include "cloud data repositories, high-performance computing infrastructure, [and] quick data transfer facilities" (Interviewee 9).

Unsurprisingly, discussions of digital sovereignty are closely intertwined with regulatory considerations. The next subsection will examine the EU regulatory framework, with a particular focus on the AI Act.

5.2.3 Regulation as an ambivalent factor

5.2.3.1 Regulation is welcomed

Interviewee 11 noted the significance of Europe taking a leading role in AI regulation:

> I was very happy that the European Union was globally the first association of countries that started regulating this technology with a critical eye, but also enabled innovation.

Contrary to what is often observed in the relevant literature, SMEs in our sample did not perceive regulation strictly as a barrier to innovation. Instead, the majority of interviewees supported regulation, acknowledging that AI posits significant risks that necessitate the establishment of a regulatory framework. As interviewee 5 mentioned:

> For sure, regulations limit certain things. I'm not saying the limitation is always bad, because I do believe certain things need to be limited because we are not a society only of capital. We're also a society of people.

Interviewee 32 expressed their satisfaction with the AI Act

> I think the AI Act is a very good initiative. I fully support it and believe it's necessary because I know there are risks; even the biggest AI experts have warned about them. I definitely think the AI Act is needed, not only in Europe but worldwide, and I look forward to seeing a situation where everything related to AI is properly regulated.

Interviewee 36 linked regulation with innovation and empowerment of SMEs:

> If you look at the EU, you'll see that a lot of new European companies have emerged because they address regulatory needs. Those regulations created entire business models. Small companies have grown because they fill gaps created by regulation and standards. From there, they expand into broader digital and data services, but it all starts with regulation. So if we reduce regulations, we're essentially helping big tech and large enterprises consolidate.

As expected, interviewees stressed that the EU must consider its competition with the US and China when shaping AI regulation. In this context, interviewee 3 noted that

> I believe that there are advantages and disadvantages to the technology, so the regulation should protect the rights of customers. But it should also be flexible enough to allow innovation to continue, because sometimes, if the regulation is too strong, too heavy, or too strict, it limits the ways we can innovate - and Europe is in a contest, an AI race.

5.2.3.2 Caveats and concerns for the EU regulatory framework

At the same time, SME support for the AI Act comes with certain caveats. Further discussion on this topic revealed substantial criticism of the regulation, focusing on four main areas; it should be noted that the first three are seen as barriers to innovation:

a) Over-generalised approach
b) High compliance costs
c) Uncertainty
d) Limited enforcement capabilities

Overgeneralised approach of the AI Act

The primary criticism centred on the AI Act's overly abstract nature, as it targets entire AI methods. Interviewees argued that a more granular approach would be preferable - one that audits specific AI systems instead. Drawing from their own experiences, interviewee 9 states that:

> Some of the systems that we have developed are for the characterisation of emotional response. In this context, I think the AI Act is not very well targeted because it is very focused on a very specific type of algorithms and not as focused on the applications themselves. If you are developing a system that launches an alarm when someone is stressed and then applies normal social measures within labour legislation, I think this could be positive. But if you forbid any kind of applications in the workplace that measure emotional responses, then you are in the wrong.

On the same issue, interviewee 8 noted that the EU "needs more specific, application-based regulation and not in terms of AI methodologies." Interviewee 34 raised concerns regarding the risk-classification system:

> Proportionality and innovation are undermined with the current framework because obligations in the AI Act are triggered by category rather than context. The AI Act simply does not scale obligations, once you fall within the high-risk category, then the burden is the same. So the problem is the automatic high-risk classification without prior factual assessment.

These quotes possibly indicate an undercurrent that contests the risks-based approach of the AI act and the way it classifies different AI systems. In this context, it is important to clarify that interviewees do not support unregulated technological development by SMEs that could place unsafe products on the market. Rather, they call for a more nuanced regulatory approach that allows SMEs to demonstrate the potential benefits of their solutions without being automatically classified as high-risk. Such classification involves significant compliance obligations, which may pose a disproportionate burden for SMEs, as discussed in the following subsection.

High compliance costs

The significance of compliance costs for SMEs, frequently highlighted in the literature, was also evident in this study. SMEs often face resource constraints and require costly support to ensure compliance. As interviewee 6 noted:

> SMEs don't know what to do. They don't know how to do that. Most of them do not have the budget or the time for the legal expertise that this [compliance with the AI Act] requires.

Interviewee 7 has established a consultancy firm that is also engaging with compliance. In explaining their business model, they confirm what other interviewees have stated:

> Our business helps SMEs comply with the regulations. Of course they are worried about the AI Act. How they will comply and when they will need to comply. The major concern with the AI Act is how to implement it inside an organisation with scarce resources

High uncertainty and poor communication

Compliance costs are partly linked to a broader sense of uncertainty. Across interviews, this uncertainty was unpacked into two thematic areas:

A. Inadequate communication regarding the content of the Act
B. The complexity of the regulation itself.

Regarding the first theme, interviewee 21 highlights the overall importance of proper communication for new regulations:

> Regulation is something which blocks discussion, because people are afraid about it and it generates fear. Not necessarily of the regulation itself, but the way they understand them.

Furthermore, interviewee 2 notes that the AI Act in particular was communicated poorly and this results in suspicion and hesitance among the broader public to engage with AI:

> I would like the regulation explained much better. I'm not a fan of the abstract regulations that spook the whole population and leaves them hesitant to use a piece of groundbreaking technology.

Regarding the second theme, interviewee 6 emphasises the amount of information, its complexity and the lack of relevant expertise on the part of SMEs:

> If you look into the EU AI act, it's crazy how much information is out there, but also how much information is lacking because the AI office still has to write a lot of guidance. So you're insecure on how to implement things because it might change. The language used in the Act is also difficult.

Interviewee 22, which is consulting with SMEs regarding the AI Act, believes that:

> SMEs genuinely want to do the right thing, but they're not always sure how and what, and exactly what they need to do to be sure that everything is absolutely compliant.

For interviewee 36, the new Digital Omnibus proposal is also shaping up to lead to larger uncertainty, while also enabling US policy directives within the EU:

> Everything is changing again with the new omnibus package. The United States has put pressure on the European Union, so they may develop another omnibus that could block parts of the AI Act. At the moment, nobody really knows what will happen...To be honest, I do not understand why we need to follow every condition set by the United States. I still believe that we should maintain the European approach and protect our data protection standards.

Limited enforcement capabilities

The final point of criticism concerned the EU's limited enforcement capabilities regarding AI, reflecting a lack of trust in its ability to regulate technology largely developed outside Europe. This is partly attributed to the rapid pace of AI development. As Interviewee 14 observes:

> The problem in that case for the regulation is that the technology goes faster than the rule. So basically, it's not easy to follow. It's not easy to create a good regulation system.

Similarly, interviewee 31 highlights this gap:

> It is impossible for the regulators and for the laws to be up-to-date. Because, you know how hard it is and how long it takes for a law or for an Act to become official. When they approve everything, there are updates that have already been launched.

Enforcement challenges also relate to the discrepancy between powerful global Big Tech companies and regional institutions with certain limitations, as interviewee 20 states, linking back to questions of digital sovereignty:

> Unfortunately, I don't see how it's possible to contain a technology at a global level with regional regulation. I'm pessimistic about what I see for now – the intent of the EU institutions to try to regulate just Europe, when AI is a global phenomenon. The big players are literally bigger than some European countries. Meta, Google, Amazon – they have immense power and resources.

In the following subsection, the SMEs' approach to regulations and suggestions for a different regulatory framework will be addressed.

5.2.3.3 An SME approach to regulation: incentives to comply

Interviewees often converged on the view that the existing regulations are primarily restrictive and do not create incentives and a framework of support. Interviewee 3 summarises this viewpoint:

> The approach from the authorities should be not to punish the companies, but to support them to be aligned with the regulation.

A recurring theme was that regulation should not only identify applications with "unacceptable risks" but also provide SMEs with access to the necessary resources. Interviewee 10 emphasised this point:

> You cannot stay still and say, "Oh, we're not going to use it". I think you need to invest also in making sure this technology can grow here. And this has to do with subsidising some of the companies adopting this kind of technology.

Interviewee 18 adds that financial incentives should not be confined to funding:

> Another issue would be some financial support but not funds. Let's say, less tax on somebody who works with AI. I'm not in favor of giving money to companies, but rather giving them tax exemption.

Another aspect of resource access concerns shared databases, established and maintained by EU authorities, which SMEs could use at low cost. Interviewee 21 discussed this proposal:

> All initiatives that help to share data is something that is needed. If we can have shared data, not free, we can benefit from data from different companies, groups, SMEs, and we share the value.

In a similar vein, interviewee 27 states that "the EU should be a form of open source data", while for interviewee 5, the EU should take the initiative to create an "interconnected network of companies in every area of Europe to exchange data faster, and more effectively".

Within the same trend, interviewees referenced the importance of digital sandboxes as environments where products can be tested while being exempt from regulation. Interviewee 15 stressed that:

> The second most important thing is having a sort of sandbox, or a 1 or 2 year period where startups do not have to take into account all the regulations regarding the use of AI and have a lot more flexibility than a big company.

Overall, these findings suggest that SMEs are broadly receptive to regulation and, given the current weakness of the European AI ecosystem, view EU intervention as a means of compensating for this shortfall. However, they also express specific concerns about the existing regulatory framework and offer clear caveats regarding how the EU should engage with the AI industry moving forward. Regulation is therefore not perceived as a factor that constrains expectations but is understood in an ambivalent manner, often linked to concerns about funding and digital sovereignty.

The next and final subsection will engage with the question of sustainability and how interviewees perceived it as a criterion when developing or using AI systems.

5.2.4 Sustainability has limited impact on SMEs understandings of success

Overall, sustainability did not emerge as a factor shaping understandings of success across the interviews. Many participants were unfamiliar with the debate surrounding the "hidden costs" of AI systems. Few had measures in place to mitigate negative impacts, such as high energy consumption. Interviewee 30 suggested that this lack of concern may be attributed to clients' expectations.

> I think it's something that the client wants to say –"we care about the environment"– but it's not their number one goal. And as a company, we're not really worried about sustainability. I know that AI really pollutes but it's not something that we really care about in our job.

Interviewee 16 expressed an interest in the topic but, in a similar vein, pointed towards clients' priorities:

> If we need to train the model, we use the computer without paying a lot of attention to energy consumption. In the past, I worked a lot in energy optimisation but in reality, clients want to have working models in their production lines.

Following a different path to a similar conclusion, interviewee 26 acknowledges environmental impact of AI but concludes that:

> You probably have seen the CO2 emissions of LLMs and the water intake. Probably it's true, but it's always a cost-benefit equation. I do think the benefits far outweigh the cost. To me, the ability of AI to discover new materials, new drugs, enable autonomous robotics to automate dangerous tasks, and allow us to find new sequences of DNA in the ocean to make new drugs, this can only happen if you have autonomous robotics that needs AI. And so if in the future we solve some major illnesses, it might come down to that.

However, the above should not be equated with a total disregard of the sustainability question. Some of our interviewees indicated an understanding of the energy cost involved in AI development. For example, interviewee 11 noted that a change in approach is necessary:

> Sustainability has to be integrated inside the cost of your system. You have to make trade-offs between what is the value you added versus the cost and environmental impact is a cost.

Interviewee 13 highlighted the importance of sustainability as a goal, while stressing that it is often overlooked:

> I think that sustainability is not a trending topic but for me it is something related to the economic wellness of an organisation. So I don't think [sustainability] is something that we must do because Europe wants this, I think we must choose this way in order to be competitive in a complex market.

5.2.4.1 Concerns about SMEs' capability to promote sustainable development and deployment of AI

In discussing ways to promote sustainable development and deployment of AI, certain findings stand out. First of all, some interviewees set forth a "frugal use of AI" approach, chastising what they consider to be reckless or meaningless deployment of new technologies. For example, interviewee 23 mentioned that in their company:

> We have the awareness to not use AI for fun. We don't use AI to create stupid images, we don't use AI to request another joke. The costs are huge and I think the scariest thing is the water consumption.

This serves as an implicit critique of the broader AI hype that often overlooks other, more environmentally friendly technological solutions. Nonetheless, interviewees were skeptical of large-scale sustainability policies related to AI, noting that reliance on non-European infrastructure, such as data centres and cloud computing, limits transparency and undermines the potential for effective policymaking. Interviewee 10 notes that

> Our AI products are sitting on some AWS clouds. They take care of it. "They" is the vendor, who is responsible for this. We're using whatever is already available. So we do not calculate carbon emission.

Interviewee 9 states in a similar manner that:

> I would like to consider sustainability but it's difficult because there is no stamp on the carbon footprint of providers. It's something basically that you cannot really evaluate.

For interviewee 29, data centers should be a priority for public authorities:

> Public organisations have to ask for the environmental footprint. It's compulsory. We don't have standardisation for the measure of data centers. We don't have these tools to measure them, and we don't have the information about many things.

These suggestions point to digital sovereignty as a crucial node, linking many issues that emerge across the different stages of the AI chain. However, in the broader picture, sustainability is a factor of low importance for SMEs. These findings raise concerns about the capability to address the high energy consumption of AI systems, while also highlighting the need for a deeper understanding of the challenges associated with digital sovereignty.

Section 6: Discussion

The current wave of AI enthusiasm has been largely driven by the widespread adoption of generative, large-scale AI models. However, this focus does not necessarily reflect the operational realities of SMEs. Whether as developers (the majority of our sample) or as deployers of AI, SMEs are less inclined towards general-purpose AI systems, instead orienting themselves towards sector-specific solutions. This orientation stems not only from certain limitations and dependencies on Big Tech firms, but also from the relative advantages of SMEs: their specialised expertise and deep understanding of their customers' needs. Consequently, unlike major tech firms, SMEs may be better positioned to innovate through the development and deployment of smaller, domain-specific AI models tailored to precise industry or market requirements.

At the same time, as highlighted by our study, significant limitations and challenges persist: access to funding and digital infrastructure, as well as the capacity to navigate a complex regulatory landscape, remain critical and cannot be taken for granted. Moreover, a dimension often overlooked in existing research is SMEs' perception of digital sovereignty and technological dependencies, and how this shapes their operations. This study

contributes to filling that gap, capturing how broader societal factors influence SMEs' expectations and, in turn, technological development and innovation.

6.1 What are SMEs' expectations regarding AI?

Overall, SMEs hold positive expectations regarding AI systems. They are not particularly swayed by the broader AI hype, nor do they view AI as a fully autonomous technology (as reflected in the negative criteria of success). Nonetheless, in relation to the AI systems they are using or developing, SMEs identified a wide range of benefits, which can be summarised in three categories:

a) Human empowerment
b) Productivity boost
c) Efficiency boost, which reflected upon reduction of operational costs

These three categories refer to the capacity of AI systems to automate menial and repetitive tasks, thereby freeing human resources to focus on more complex and value-adding activities. In addition, they reflect AI's potential to enhance output within a given production process, as well as its ability to detect errors, identify inefficient expenditures, and reduce waste, ultimately contributing to lower operational costs. Given that two-thirds of the sample (27 out of 39) are AI developers, these findings are unsurprising as they reflect respondents' position within the AI industry and their need to establish products in a competitive environment dominated by Big Tech. This context also helps explain the presence of "sales-pitch" elements in the interviews, which is to be expected, as expectations are shaped not only by current technical capabilities but also by interviewees' future aspirations for their companies.

The central concept linking SMEs' expectations is accuracy. Whether discussing positive or negative expectations, interviewees consistently emphasised the importance of AI systems being accurate. These anticipated benefits also reflect the dual role held by many interviewees: both technology developers or deployers and business leaders. In many cases, they were simultaneously founders of their companies and designers of their core product, a common feature in SMEs. This hybrid role shaped their expectations: they aim to deliver a product that meets their customers' needs (often other businesses) while also achieving a high standard of technological excellence. This dual focus is particularly evident in how they discuss failure and express concern that AI, to date, remains a relatively unreliable technology, requiring careful oversight and continuous, benchmark-based evaluation.

A fully autonomous AI, or AGI (Artificial General Intelligence), was not considered a realistic or acceptable goal by our interviewees. In their view, despite advances in automation and predictive analytics, human judgment remains essential in organisational decision-making. AI systems—whether general-purpose or domain-specific—operate within the constraints of their training data and predefined objectives. SMEs, in particular, depend on contextual knowledge, tacit expertise, and values-driven reasoning that AI cannot fully replicate. As a result, effective AI adoption requires hybrid models, where human decision-makers retain

oversight, interpretive authority, and responsibility, ensuring that AI augments rather than replaces human strategic thinking.

Nonetheless, interviewees consistently emphasised technical excellence as a key criterion of success. By contrast, the "bottom line" of profitability was mentioned only rarely and did not appear to serve as a major indicator of successful AI development and deployment. Even when discussing their future plans or articulating their highest expectations, interviewees focused less on financial returns and more on the recognition of their AI solutions, their uptake within a given sector, and the value they could deliver to their customers.

6.1.1 What are the positive expectations that SMEs hold with regards to AI?

In discussing positive expectations, which were dominant across the interviews, it should be noted that interviewees often framed benefits resulting from the adoption or development of AI within a broader societal context. While technical excellence was the main framing of potential benefits (what was captured as internal positive criteria of success), interviewees were persistent in identifying societal benefits (what was captured as external positive criteria of success).

Within this context, accuracy was linked both with increased productivity and cost reduction. In discussing potential deployers for the AI systems they were working on, interviewees identified either wasteful practices in the corresponding sectors or points of tension where bottlenecks occurred, from hiring processes to higher learning evaluation and healthcare to industrial settings. In many cases, interviewees drew from their personal experiences within these sectors and "fed them" in AI engineering with the expectation that AI can address longstanding inefficiencies in key parts of public life. This is to be expected and necessary in the process of developing a small enterprise with limited funding. Furthermore, this is what creates a vantage point for SMEs within an innovation ecosystem dominated by large firms.

At the same time, it should be noted that an exclusive focus on narratives of accuracy and efficiency (measured as cost reduction) offers a limited and ultimately limiting way of understanding technological artefacts. This is even more the case for AI, which cannot be treated as a mere tool. Rather, AI systems constitute complex assemblages of relations, techniques, and infrastructures, whose effects extend across multiple economic sectors as well as into social life more broadly (Lindgren, 2023). Although this narrow focus on efficiency and optimisation may be partly shaped by the study's methodology, it also exposes important gaps in SMEs' understanding of AI and the agency they hold in shaping its deployment. More broadly, this limited scope reflects the fragmented landscape in which AI is developed and deployed, in which stakeholders concentrate on isolated concerns and overlook the wider implications, including environmental costs, labour impacts, and long-term dependencies.

A similar pattern emerges regarding concerns about bias. Interviewees clearly recognised the risks of reproducing bias through machine-learning systems and expressed an interest in

addressing these issues. However, their capacity to do so is shaped less by a lack of willingness and more by the limited frameworks available to them. Within a fragmented governance landscape and under broader constraints, SMEs often lack the agency and resources to pursue more substantive approaches. Their responses therefore reflect the understandings embedded in the environment in which they operate. As shown in FORSEE Deliverable D3.4 (Gendered perspectives among SME representatives), this often results in a focus on addressing biased datasets, while the broader socio-technical dimensions of bias remain difficult for SMEs to influence or integrate meaningfully into their development practices.

6.1.2 What are the negative expectations that SMEs hold with regards to AI?

The interviews suggest that SMEs do acknowledge risks associated with AI, but these concerns are largely outweighed by the potential benefits of AI. Interviewees primarily frame risk in terms of maintaining human oversight, ensuring reliability, and preventing an overreliance on AI. Notably, "human-in-the-loop" emerged as a widely shared principle. Other structural concerns, such as biases, appear infrequently and are framed as a potential legal liability rather than an ethical failure.

Furthermore, the results revealed an interesting distinction among interviewees: those designing AI systems within production processes expressed greater concern about the potential pitfalls of autonomous AI. This suggests that automation processes need to be closely monitored, particularly as they become more complex or specialised and as AI systems are integrated into critical parts of value chains and production networks. In these contexts, negative expectations are linked to a potential loss of control over segments of the production process. For SMEs, AI deployment and development may therefore encounter higher barriers, costs, and risks, which can vary across sectors.

In contrast, interviewees creating or using Generative AI in marketing, education, or the creative industries were primarily concerned with the reliability and quality of system outputs. As shown in Table 1, these applications are often business-to-consumer (B2C) and situated at the downstream end of value chains. The stronger focus on AI's potential social harms is thus understandable, given the direct relationship with end users. Here, negative expectations centre on a possible mismatch between AI systems and customer or societal needs.

These concerns are even more pronounced for SMEs developing AI systems for specialised or regulated sectors, such as health or finance. Their negative expectations are primarily linked to the inherent risks of machine-learning systems, particularly those arising from system design and training data. Actively monitoring these risks and preventing regulatory violations is seen as resource-intensive yet unavoidable, reinforcing negative expectations about the complexity and cost of AI adoption. Implicitly, these concerns are closely tied to digital sovereignty: control over data, compliance-capable infrastructures, and trustworthy AI systems is viewed as essential for maintaining autonomy and reducing reliance on external providers whose practices may not fully align with European regulatory and ethical standards.

In general, SMEs characterised potential negative outcomes as operational challenges that could be managed through workforce design and quality assurance systems, rather than a defining dimension of AI itself. This framing can be understood as the flip side of the dominant positive expectations narrative: attributes discussed in terms of accuracy and efficiency are here rearticulated as issues of unreliability, indicating that SMEs expectations remain anchored in a primarily technical understanding of success.

6.1.3 Curbing expectations: the role of the European AI environment

So far, what has been highlighted is the prevalence of positive expectations and the secondary role of negative expectations and concerns. However, this represents only part of the overall picture. As already noted, FORSEE, through its engagement with the Sociology of Expectations, aims to account for the broader societal, political, and economic factors that co-shape expectations. In the present research, these factors emerged as regulation–funding–sustainability concerns and issues related to digital sovereignty.

SMEs consistently described funding barriers that shape growth prospects and strategic decision-making. Reflecting well-documented limitations of the European funding landscape, interviewees highlighted persistent difficulties accessing both private and public capital. Venture capital was viewed as essential for sustaining core operations - particularly in pre-revenue stages - but its scarcity in Europe forces some SMEs to look abroad for support, particularly to the US. SMEs also pointed to structural shortcomings in European public funding mechanisms. Public, non-dilutive funding is particularly valuable for organisations seeking to maintain control, but interviewees stressed that EU programmes are highly competitive, administratively burdensome, and too limited in scale to offer meaningful support to most applicants. Overall, there was a call by interviewees for stronger private sector investment networks and better vehicles for mobilising capital in support of innovative SMEs.

These constraints push SMEs toward foreign capital, reinforcing dependencies that undermine digital sovereignty and concentrate influence in the hands of non-European investors and Big Tech firms. The resulting funding gap is more than a financial problem: investor expectations shape which forms of AI development are treated as legitimate or desirable (Van Lente, 2012). European investors' risk aversion narrows the scope of fundable innovation, effectively offshoring this influence to more failure-tolerant US investors who end up shaping the developmental trajectories of European SMEs. In this sense, funding dynamics operate not simply as resource shortages but as mechanisms that define expectations about what European AI should be, who gets to build it, and whose priorities ultimately guide innovation.

On the other hand, regarding regulation, findings point to a different direction than existing literature. Interviewees did not adopt a one-dimensional understanding of regulation as merely an obstacle to innovation. On the contrary, they held positive views on the EU framework and considered the AI Act a valuable and necessary initiative. This approach can be partly interpreted by their complex relationship with Big Tech companies; they view them

simultaneously as partners and competitors that operate by their own rules, without being subject to rules. In that sense, the AI Act may be seen as a necessary equaliser; further research is necessary to address this.

Nonetheless, criticism of regulation also emerged. The AI Act was described as overly abstract, while the categorisation system was considered too broad. Interviewees felt that the regulation lacked contextual understanding of risk, leading certain applications to be placed unfairly into the high-risk category. Such critiques of the risk-based approach may become particularly significant once the Act is fully implemented. Compliance costs were also highlighted, echoing concerns already noted in the literature, with many interviewees stressing that the burden falls disproportionately on SMEs.

At the same time, SMEs articulated an alternative view: one that emphasises incentives for compliance and a regulatory environment that not only imposes restrictions but also supports SMEs through access to funding and shared infrastructure and high-quality data. Many interviewees welcomed EU intervention as a potential means of addressing the structural disadvantages faced by the European AI ecosystem. This observation of the ambivalence and limited scope of regulative initiatives from the perspective of digital SMEs points to a necessity of global AI regulation.

The above findings point to the centrality of European digital sovereignty efforts and discourse as an important factor shaping SMEs' expectations. For digital SMEs there appears to be no shared understanding of digital sovereignty in European AI or how to achieve it. However, they share a consensus that the EU is lagging behind in the AI race and that dependencies with Big Tech raise certain issues related to data privacy and management. As presented throughout the findings, dependencies, as well as the institutional room for maneuver and "catch-up" are assessed differently by SMEs: Some emphatically state a stronger need for strategic decoupling and distinctly "European" AI systems. A common practice among SMEs addressing expectations mediated by digital sovereignty efforts is the strategic distribution of risks among different digital infrastructure and service providers and the systematical usage of embedded (cloud) solutions, which allow for a stronger customisation of control over data management and storage.

Also in regards to digital sovereignty, the overall amount of European private investment in AI companies is still regarded as comparatively low, dampening expectations of successful "catch-up". In 2024, US private investment in AI reached 109.08 billion USD, drastically outpacing Europe's 19.42 billion USD in private AI investment (Maslej et al., 2025). Furthermore, public funding for sovereignty-relevant solutions is considered a bottleneck. This is regarded as an important factor obstructing the development of European alternatives: there is little incentive for digital SMEs (or startups) to compete with hyperscalers, or companies like OpenAI, be it because of limited company resources or a decisive delay in entering the competition.

One potential course of action is the strategic support of more advanced European AI companies, often framed under the "national champions" approach, given that the prospect of EU firms building reliable alternatives to Big Tech AI infrastructure is seen as low or near

impossible. At present, only the French company Mistral was mentioned as offering a potentially competitive European AI model. Another avenue is fostering demand through public procurement of AI systems: public funding, at both national and EU levels, as well as improved access to AI infrastructure, is therefore viewed as crucial for digital sovereignty efforts. There is broad support for European advances in promoting digital autonomy, alongside a strong conviction that Europe has the right to regulate and chart its own path - expectations regarding the development and value of the European AI environment that may, in turn, significantly shape SMEs' actions in the future.

Both concerns expressed around funding and regulation forge links between all topics under consideration. SMEs feel that their expectations regarding AI cannot be fulfilled if the European AI landscape remains weak, fragmented and dependent on large tech firms and frontier model developers.

Finally, the findings indicate that sustainability occupies only a marginal role in shaping the expectations of European SMEs developing or deploying AI. While interviewees demonstrate a basic awareness of AI's environmental impact—particularly its high energy consumption - they generally do not treat sustainability as a meaningful criterion of success. Concerns are primarily framed through the lens of client expectations rather than as intrinsic organisational priorities, and few participants recognise sustainability as either a competitive advantage or a contributor to broader societal benefits.

However, the limited emphasis on sustainability cannot be understood in isolation from the structural conditions in which SMEs operate. The findings highlight a persistent dependency on non-European infrastructures - cloud services, data centres, and model hosting - largely controlled by Big Tech firms. Some interviewees emphasised that this infrastructural asymmetry directly constrains SMEs' ability to monitor the environmental footprint of their AI systems and undermines the feasibility of EU-level sustainability policies. Without transparency regarding providers' energy use or carbon impact, and without viable European alternatives, SMEs cannot meaningfully integrate sustainability into their expectations or practices. Once again, this issue is closely linked to digital sovereignty: how can Europe promote ecologically responsible AI when it lacks control over the technical substrates on which AI operates?

6.2 SMEs: Between strategic potential and structural vulnerability

As the present study indicates, SMEs' position is shaped by contradictions and characterised by precarity. Overall, SMEs hold positive expectations regarding the AI systems they deploy or develop. These expectations serve as fuel for their effort, motivating them to invest time and resources in their enterprises. At the same time, SMEs perform "expectation work" in the hope that they will be able to legitimise their operations, direct funds and research attempts in their projects, while also coordinating with other stakeholders and stakeholders within a network of innovation (Van Lente, 2012). In that sense, SMEs expectations can be hypothesised to also be public-facing and form part of

their interaction with large tech firms, public authorities, policymakers as well as their client base. Across the interviews, different social groups are "present", they are implicitly addressed through the participants' responses, indicating that SMEs seek to influence decision-making across various levels, while simultaneously recognising their disadvantaged position and limited capacity to exert influence.

A more complex image emerged as research moved beyond the initial high expectations and inquired into the structural (societal, organisational and institutional) factors that co-shape SMEs expectations. To summarise findings, SMEs operate within a landscape of technological dependency, ambivalent regulatory frameworks and limited funding opportunities, expressed both in private investor reluctance and in lack of public funding initiatives. Within this environment, SMEs feel that both the European AI industry and their own enterprises run the risk of "falling behind" in the competition with their USA and China counterparts. Furthermore, they conceptualise shortcomings in an interrelated manner as a quasi "vicious circle": infrastructural dependency creates regulatory risks, undermines European digital sovereignty, while in turn limiting funding and leading to an even deeper dependency on Big Tech firms. Even sustainability concerns, which were of low importance for our interviewees overall, are linked into this vicious circle as the lack of transparency undermines the potential to effectively measure AI's impact on the environment.

Therefore, a different conceptualisation of negative expectations is necessary at this point. For SoE, negative expectations relate to limitations of the technology itself (Fitzgerald, 2014) but also to the failure of positive expectations to materialise (Kitzinger, 2008), as a wave of disappointment may follow the peak of expectations. In the case of present study, interviewees mentioned negative expectations with regards to the technology itself (mostly in terms of potential unreliability and lack of compliance with regulations) but these were not that prominent (see section 5.1.3.3). Neither did interviewees discuss AI in terms of a hype and disappointment cycle that could potentially limit their engagement with it (Geels & Smit, 2000). Instead, their concern of potential sources of constraint were largely related with structural barriers that will lead to high expectations not materialising. Therefore, SMEs are precariously positioned and their expectations should be understood as both stable and in flux.

6.3 Theoretical and policy implication of present research

This sense of precarity and the corresponding expectations reflect the social positions of SMEs and their embedded interests (Konrad, 2006), an aspect often overlooked in debates on technological innovation. SMEs occupy an intermediate position as both developers and deployers of new technologies, and the power asymmetry between SMEs and large tech companies further shapes their perspectives. This has theoretical implications for the study of SoE, which typically focuses either on innovators and inventors of new technologies (Brown & Michael, 2003; Van Lente, 2013) or on end-deployers (Brown, 2014). In the former

case, actors generate expectations, while in the latter, they are often tasked with mitigating and grounding expectations in practice (Kitzinger, 2008).

SMEs, by performing both functions, provide a unique vantage point that illuminates the societal factors shaping AI development within the EU. This is of particular interest to SoE, which has primarily examined societal factors through media coverage of new technologies (Brown, 2014; Fitzgerald, 2014) or through the availability of funding opportunities (Van Lente, 2012).

In line with SoE, the present study does not seek to evaluate the validity of SMEs' claims, but rather to bring them to the fore while highlighting the environment that shapes them. While concrete policy recommendations fall beyond the scope of SoE - which is more concerned with addressing and managing expectations (Kitzinger, 2008; Fitzgerald, 2014; Brown, 2014) - the comprehensive nature of this study, its focus on SMEs (particularly those developing AI), and the identification of "expectations in flux" provides a conceptual starting point for policymakers.

Certain key points for intervention emerge. SMEs' concerns do not merely reflect a lack of funding, although that remains significant. Rather, their precarious position can be understood through a lens in which digital sovereignty acts as a unifying node, connecting issues across societal factors. Strengthening European digital sovereignty would create a more secure and sustainable environment for AI development and deployment, build trust in the enforceability of EU regulation, and encourage engagement from private investors and broader client bases with domestic AI systems. It would also represent a step towards addressing the environmental risks associated with AI, which are currently understood and managed in a fragmented manner.

6.4 Limitations and future directions

Several limitations of the present study should be acknowledged. The novelty of this research lies, among other aspects, in its focus on SMEs and the inclusion of a substantial proportion of AI developers in the sample (27 out of 39). As mentioned earlier, SMEs developing AI systems remain an under-researched area. However, this focus also introduces limitations regarding the generalisability of the findings.

First, access to SMEs engaged with AI relied on the DigitalSME network. While this facilitated recruitment, it also excluded potentially smaller or less networked SMEs that may use AI in their operations but do not participate in networks composed of SMEs. In addition, SMEs that are in the early stages of engaging with AI, without actual experience in developing or deploying AI systems, were not represented in the sample. As a result, the findings cannot be taken as representative of SMEs' broader expectations and perspectives on AI.

Second, SMEs developing AI systems constituted a significant portion of the sample (27 out of 39), which influenced the findings through the inclusion of narratives promoting their products in participants' responses. This tendency, also discussed in 2.1 from the viewpoint of SoE as expectations potentially functioning as resource-mobilisation strategies, was reinforced by the fact that interviewees perceived their participation as representing their organisations rather than expressing personal views. This constitutes a common challenge in qualitative research based on self-reported perspectives, where accounts are shaped by participants' institutional roles and strategic interests.

Third, in a similar vein, several responses suggested a tendency toward socially acceptable or reputationally cautious framing, particularly when discussing expectations. This raises concerns about social desirability bias. Such dynamics may have led interviewees, particularly those in senior or client-facing roles, to downplay potential risks (and corresponding negative expectations) in the AI systems they develop or deploy. Future research could include purposive sampling strategies that explicitly incorporate mid level and junior staff in non communication roles, as well as mixed-methods approaches that triangulate organisational narratives with demographic data.

Finally, the sample used in the present study did not allow for sector-specific analysis of SMEs' expectations. Certain hypotheses were formulated (for example, that SMEs in creative industries are more concerned of AI hallucinations while SMEs engaging with manufacturing are focused on human oversight of AI systems) but they cannot be confirmed. Future research could focus on SMEs in specific sectors where AI tends to occupy a prominent position and engage with their expectations.

In addition to innovation awards (discussed in FORSEE Report 3.3), future research could engage with public announcements by SMEs (press statements, mission statements, etc) to indicate how expectations expressed in the interviews are correlated (or not) with the public "work on expectations" performed by SMEs.

As outlined in Section 5.5.3, the present study highlights a series of SME suggestions for the EU regulatory framework. Future research could engage with these systematically, examining their presence in official policy discussions and assessing their impact on policy outcomes.

Section 7: Conclusion

This FORSEE research illustrates that digitally-advanced SMEs hold consistently positive expectations for the role of AI, whether they operate primarily as deployers, developers, or both simultaneously. Their aspirations centre on the development of reliable and efficient AI systems, and the perceived benefits unfold across three interconnected levels: improvements in the technology itself, enhanced productivity within specific sectors, and contributions to broader societal goals. These expectations, however, do not emerge in isolation and are bound to a specific structured action context, primarily the challenges that

shape the EU AI industry and the ambivalent dynamics of the current AI hype cycle. Thus, SMEs' expectations are to be regarded within the societal configuration of hype-related resource-mobilisation strategies. Furthermore, they are shaped and constrained by the wider European context in which SMEs operate; a context marked by structural dependencies on non-European infrastructure, persistent funding limitations, and uneven access to the computational resources necessary for AI development.

This landscape complicates SMEs' capacity to fully realise their expectations or to articulate a unified narrative of what supportive policy should look like. Nonetheless, several common threads surface across our study. Interviewees frequently pointed to the importance of EU initiatives aimed at strengthening digital sovereignty, such as the promotion of European cloud infrastructures, strategic investment in computing capacity, and efforts to reduce reliance on proprietary models provided by large technology companies. A second recurring theme concerns the need for a more nuanced and multi-level regulatory approach, one that maintains protections while remaining sensitive to the operational realities and resource constraints of SMEs. This topic, among others, will be addressed in the policy brief to be presented by FORSEE in March 2026.

Ultimately, the expectations articulated by SMEs reveal both the promise and the precarity of the European AI landscape. They underscore the importance of addressing structural asymmetries, enhancing access to resources, and fostering an enabling environment in which SMEs can translate ambition into practice. Supporting these stakeholders is therefore essential not only for technological innovation but for the broader societal trajectories that AI will shape.

Abbreviations and Definitions

Social Construction of Technology (SCOT) Paradigm. SCOT posits that technologies do not emerge in a vacuum but are shaped by social forces, including the values, beliefs, interests, and power dynamics of the stakeholders involved in their development and deployment

Sociology of Expectations (SoE). A strand of SCOT and highlights the prominent role that expectations play in shaping technological processes. Expectations are perceived as socio-technical visions of the future that shape the present.

SMEs. Small and Medium Enterprises, defined as organisations with fewer than 250 employees and an annual turnover below EUR 50 million or a balance sheet total of up to €43 million;

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Appendix 1. Questionnaire guiding the interviews

General background
Can you describe your company's work in AI development or deployment?
What motivated your company to integrate AI into its business model? Who makes the decision and how?
What factors have influenced your AI journey the most—technological advancements, market demands, or regulatory requirements?
How do you engage with AI in your everyday work routine?
Organisational & technical matters
What kind of AI system are you currently developing?
Who/how makes the decision regarding the development of AI systems in your company?
What are your goals for these AI systems?
What are your future plans regarding AI?
Do you cooperate with similar companies in the US or internationally? (follow up) How do you cooperate?/ How would you define successful cooperation?
Which are the partners in your AI ecosystem? (Follow-up) How would you characterise your cooperation with these partners/actors?
What is the nature of your relationship with Big Tech companies?
What are the minimum requirements to deliver an AI system in the market?
What are the broader potential benefits of these AI systems?
What AI systems did you incorporate in your products/services?
Who/how makes the decision regarding the development of AI systems in your company?

What are the potential benefits of implementing AI in your company?
What are the potential risks associated with introducing AI in your company?
Which feature makes an AI system desirable for your workplace?
Which feature would make you avoid using an AI system?
Have you observed any impacts—positive or negative—of AI technologies on different groups of employees?
Gender & Inclusivity
Could you tell us about your engineering team?
Are there any considerations for diversity and representation within the team, especially in technical roles?
If yes, are there any tools or practices you are using/considering?
Have you considered gender biases in your AI products or services? If so, how?
Are there difficulties in designing AI systems that work well across different groups of people?/ What are the key issues in making AI systems perform reliably for diverse user populations?
How do you assess issues of bias and discrimination that might arise from using AI in your workplace?
(Follow-up) How do you preemptively address sexist bias that may result from using AI in your workplace?
Economic factors & sustainability
What expectations did you have when first implementing AI, and how have they changed?
How do investor or funding expectations shape your AI decisions?
How do you anticipate AI trends, and how do they affect your company's direction?
What are the economic benefits your company expects or has experienced from using AI?
Have you encountered any economic barriers (e.g. cost of implementation, talent, compute power) in adopting or developing AI?
Do you consider environmental impact when designing or choosing AI solutions?
Governance & regulation
Have you faced challenges due to differing AI governance policies across regions?
What challenges have you faced regarding data protection and privacy in AI development?
How do EU priorities influence your development of AI applications?
Regarding recent EU regulation, how would your company address compliance?
What changes would you like to see in AI governance to better support SMEs?
Digital sovereignty
What do you think of the role of the EU in (global) AI development?
Where do you see the strengths of the EU regarding competitive AI development?
Where do you see the greatest challenges?

How important is it for you that that company is based within Europe when choosing AI solutions?
How important do you think it is for Europe to develop its own AI systems/infrastructure?
In your recent impression: which fields of AI development are being prioritised among SMEs? Is there a shift towards certain topics?

Appendix 2 Success criteria matrix

In the following table, specific and indicative examples for each category of the success criteria matrix are provided.

Criteria	Minimum	Maximum
Internal Positive (Intra-org, immediate impact)	increase productivity	My company is turning profit
Internal Negative(Intra-org, broader influence)	Lack of accuracy	Disruption within organisation. Creates waste.
External Positive (Policy/Public-driven, immediate impact)	Explicit compliance with GDPR, AI Act etc, good degree of accuracy, deployment value	AI development/deployment may address broader social issues (e.g. climate change, better diagnosis in healthcare)
External Negative (Policy/ Public-driven, broader influence)	Non compliance with regulation. Lack of social approval.	Exacerbates bias (eg racism, sexism, ableism). Creates mass unemployment