Challenges and Opportunities in AI Adoption for Small and Medium-Sized Family Firms

A Strategic Analysis

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Abstract

Artificial Intelligence (AI) is reshaping industries, yet small and medium-sized family firms often struggle to unlock its potential. Many family-owned SMEs resist change, face financial constraints, and lack AI expertise, which makes AI adoption a complex challenge. This study examines the unique hurdles family businesses encounter and offers a structured framework to help owners, successors, and consultants navigate AI integration effectively.

Using a qualitative approach, this research combines in-depth expert interviews with a systematic literature review. Insights from various participants, including family firm owners, successors, non-family managers, AI specialists, and consultants, provide a well-rounded perspective on both the obstacles and opportunities of AI adoption.

Findings reveal that financial constraints, generational resistance, and risk aversion frequently slow down AI implementation. However, family firms also have key advantages, such as agility, strong stakeholder relationships, and a long-term vision. These advantages, when leveraged strategically, can drive successful AI adoption. These strengths can help improving efficiency, decision-making, and competitive positioning.

To address adoption challenges, this study presents a phased framework that prioritizes leadership commitment, alignment with family values, workforce training, gradual implementation, and ongoing adaptation. By following this structured approach, family firms can integrate AI in a way that enhances competitiveness while preserving their traditions and core identity.

Keywords:

Family Business, Small and Medium-Sized Enterprises (SMEs), AI Adoption, AI in Family Firms, Challenges and Opportunities of AI, Family Firm Resilience, Socio-Emotional Wealth (SEW), Legacy

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Abstrato

A Inteligência Artificial (IA) está transformando indústrias, mas pequenas e médias empresas familiares frequentemente enfrentam dificuldades para aproveitar seu potencial. Muitas resistem à mudança, enfrentam restrições financeiras e carecem de expertise em IA, tornando a adoção um desafio complexo. Este estudo examina os obstáculos específicos que as empresas familiares enfrentam e oferece um modelo estruturado para ajudar proprietários, sucessores e consultores a integrar a IA de forma eficaz.

Utilizando uma abordagem qualitativa, esta pesquisa combina entrevistas aprofundadas com especialistas e uma revisão sistemática da literatura. As percepções de diversos participantes, incluindo proprietários de empresas familiares, sucessores, gestores não familiares, especialistas em IA e consultores, proporcionam uma visão abrangente tanto dos desafios quanto das oportunidades na adoção da IA.

Os resultados revelam que restrições financeiras, resistência geracional e aversão ao risco frequentemente retardam a implementação da IA. No entanto, as empresas familiares também possuem vantagens significativas, como agilidade, relacionamentos sólidos com stakeholders e uma visão de longo prazo. Essas vantagens, quando exploradas estrategicamente, podem impulsionar uma adoção bem-sucedida da IA, permitindo melhorias na eficiência, na tomada de decisões e no posicionamento competitivo.

Para enfrentar os desafios da adoção, este estudo apresenta um modelo em fases que prioriza o compromisso da liderança, o alinhamento com os valores familiares, a capacitação da força de trabalho, a implementação gradual e a adaptação contínua. Ao seguir essa abordagem estruturada, as empresas familiares podem integrar a IA de maneira que fortaleça sua competitividade, preservando ao mesmo tempo suas tradições e identidade central.

Palavras-chave:

Empresa Familiar, Pequenas e Médias Empresas (PMEs), Adoção da Inteligência Artificial, Inteligência Artificial em Empresas Familiares, Desafios e Oportunidades da Inteligência Artificial, Resiliência das Empresas Familiares, Riqueza Socioemocional (SEW), Legado

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List of Abbreviations

1. ADKAR - Awareness, Desire, Knowledge, Ability, Reinforcement
2. AI - Artificial Intelligence
3. CEO - Chief Executive Officer
4. ESG - Environmental, Social, and Governance
5. EU - European Union
6. GDP - Gross Domestic Product
7. IT - Information Technology
8. M&A - Mergers and Acquisitions
9. n.d. - No Date (used in references)
10. RQ - Research Question
11. SEW - Socioemotional Wealth
12. SMEs - Small and Medium-sized Enterprises

"The key to growth? Race with the machines, not against them." - Erik Brynjolfsson

1 Introduction

Family-owned businesses generate over 70% of global Gross Domestic Product (GDP) and account for around 60% of global employment (McKinsey, 2024). Nevertheless, family firms lag in AI adoption, due to their unique cultural and strategic challenges (Kumar, 2024). To maintain competitiveness in a digitalized economy, it is crucial to understand the challenges and opportunities of AI adoption in family-owned SMEs (Hang and Chen, 2022; Ulrich et al., 2023). From machine learning algorithms to process automation, artificial intelligence technologies are transforming company operations worldwide. However, AI adoption in SMEs remains slow due to several challenges. These include financial constraints, limited expertise, and uncertainty about return on investment (Pfister and Lehmann, 2023). Additional challenges for family businesses are generational conflicts, staff resistance to change, and the prioritizing of socio-emotional wealth over technological development (Gómez-Mejía et al., 2018).

Although AI has been extensively studied in business and entrepreneurial settings, family firms have received comparatively little attention in studies on digital transformation. Their distinct governance structures, long-term orientation, and emotional attachment to tradition create unique challenges and opportunities for AI integration (Tuncalp, 2024). Addressing this gap is crucial, as AI adoption could enhance operational efficiency, optimize decision-making, and secure long-term competitiveness in family-owned SMEs.

The aim of this thesis is to identify family firm-specific challenges and opportunities in the adoption of AI in SMEs. It synthesizes insights from expert interviews and high-impact journal articles. This way it bridges the gap between family business research and AI adoption. Further, it provides tailored strategies to overcome challenges and leverage opportunities.

To explore these challenges, the study employs a mixed-methods approach. It combines expert interviews with a systematic literature review. Primary data is collected through semi-structured interviews with a diverse group of experts. Experts include family firm owners and successors, non-family employees in family businesses, AI experts, and succession consultants.

The review of the literature undertakes a critical analysis of the challenges and opportunities of AI adoption in family-owned SMEs. The literature examined discusses unique characteristics of family businesses, opportunities in AI adoption, and key challenges of

SMEs in digitalization and specifically AI adoption. This study contributes to both academic literature and business practice. From an academic point of view, it bridges the gap between AI research and family business studies by highlighting how family-specific dynamics affect AI adoption. Practically, it provides a structured framework for AI adoption. The framework offers tailored recommendations for family business owners, successors, and consultants.
This dissertation is structured around three research questions. The first one is, *"What are the primary challenges that small and medium-sized family firms face in adopting AI technologies?"*. This question seeks to find specific cultural, financial, and strategic obstacles that hinder AI adoption in family businesses. The second one is, *"What are the biggest opportunities that AI technologies offer for small and medium-sized family firms?"*. This question explores how AI can enhance efficiency, decision-making, and innovation in family firms. The third question is, *"What family firm-specific dynamics influence the adoption of AI?"*. Through examining governance structures, generational perspectives, and socio-emotional wealth, this study uncovers how family business characteristics shape the digital transformation process. Addressing these questions will provide actionable insights for family business leaders, helping them navigate AI adoption successfully.
Following the introduction, the literature review explores family firms' decision-making dynamics, SME-specific challenges in digital transformation, and AI adoption. The last part of the literature review explains the identified research gap. The methodology section then outlines the research design and approach. The study continues with the findings. This section starts with a visualization of the data analysis using the Gioia methodology and concludes with a phased framework for successful AI adoption in small and medium-sized family firms. The discussion part connects the findings to existing literature, and finally
the conclusion summarizes key insights and implications.

2 Literature Review

2.1 Family Firms

This part of the literature review examines the unique dynamics and characteristics of family firms. It explores how family and structural dimensions influence a firm's adaptability and innovativeness. The review also focuses on the interplay between family influence and external pressures. It highlights the challenges and opportunities that family firms possess in a changing technological landscape. The section provides insights into the topics of resilience,

innovation potential, and ability to cope with change. It deals with the principal controversies of family firm literature and reveals contrasts with non-family firms.

2.1.1 Overview of family firms

Family firms are typically owned and controlled by one family, with multiple generations often involved in management (Miller and Rice, 1967; Anderson and Reeb, 2003). There are several factors distinguishing family firms from non-family firms. The family dynamics between owner, successor, and even predecessor often influence operations and strategic decisions within the business. The unique emotional attachment of family members to the firm affects operations, which is different from the more transactional nature of non-family management relationships (Gómez-Mejía et al., 2018).

A very prominent concept in the research of family firms is legacy. Legacy can be referred to as a process involving the building, interpretation, and use of values, norms, knowledge, and beliefs from the past. According to research, legacy in family businesses can be divided into founder, family, family firm, and entrepreneurial legacy (Burton and Beckman, 2007; LeCounte 2022; Keplinger et al., 2016). Legacy in family firms can be an asset or a liability, influencing the behavior and decisions of legacy senders and receivers. The term legacy sender usually refers to the founder or senior generations. The term legacy receiver usually refers to the next generation (Jaskiewicz et al., 2015; Combs et al., 2023; Hammond et al. 2016). A sense of legacy can induce a special way of managing the business. For example, the succession process is likely to favor family members over non-family members in the workforce (Sharma et al., 2001).

Another characteristic of family firms, which is a prominent subject in research, is long-term orientation. Family firms tend to prioritize long-term goals because they focus on planning for the future, ensuring business continuity, and staying committed to their goals over time (Lumpkin and Brigham, 2011). On the one hand, long-term orientation in family firms is proposed to be positively associated with innovativeness, proactiveness, and autonomy. On the other hand, research suggests it is negatively associated with risk-taking and competitive aggressiveness (Lumpkin et al., 2010).

Family firms often adopt a conservative approach to investments. Investments are often driven by their long-term orientation and the significant portion of family wealth tied to the business. This focus on steady growth and stability over short-term gains can have both advantages and disadvantages. For instance, during economic downturns, family firms often

carry fewer liabilities. This can enhance resilience. However, it may sometimes limit growth opportunities or slow down innovation (Block, 2009). There are also studies out there that found the exact opposite. For example, a study from Belgium shows that Belgian family firms invest more money, pay out lower dividends, and have a higher risk tolerance than firms that are not family-owned. These findings may indicate that significant differences in family firms can exist across countries (Neckebrouck et al., 2018).

Most studies on family firms agree on a special long-term orientation. This long-term orientation leads to resilience, but it is also a source of conflict. Only a fraction of family-owned businesses makes it to the second generation, and an even smaller portion reaches the third (Beckhard and Dyer, 1983; Le Breton-Miller et al., 2004).

Therefore, succession and succession planning are subjects of great relevance. Family firms often struggle with developing effective successors (Goldberg, 1996). Successful succession requires transferring key knowledge and skills from predecessor to successor (Cabrera-Suárez et al., 2001). Research emphasizes the importance of succession planning for future success, growth, and the legacy of the family business. Despite the importance, family firms rarely plan the succession sufficiently (LeCounte, 2022).

Leadership successors in family firms are predominantly male. According to research, the preference for male successors is not based on superior qualifications. But rather on cultural norms, gender biases, and family traditions (Ahrens et al., 2015). There is significant potential for conflict. There are numerous family firms confronted with this fate. One such case can be found in the Dassault family in France. After the death of Serge Dassault, tensions arose among his children regarding the succession of his companies, such as the aerospace manufacturer Dassault Aviation. Despite having capable daughters, the succession favored his sons. The decision supports traditional gender roles within the family business and left some family members feeling sidelined and undervalued (Bacqué and Schneider, 2024).

Family firms may struggle to attract talent due to perceptions of lower compensation and limited career growth (Chrisman et al., 2014). This perception of lower compensation is supported by a study that uses data from 14,961 private Belgian firms over a 19-year period (Neckebrouck et al., 2018). These findings cannot be transferred to other regions but are reason enough for further studies in different countries. Other research suggests that explicitly communicating family ownership does not affect perceptions of family firms. Nevertheless, the factor of organizational size has an impact on perceptions of job security, advancement, and attractiveness. The larger the firm, the better those perceptions become (Botero et al., 2012).

2.1.2 Socioemotional Wealth (SEW) and Cultural Resistance in Family Firms

The unique culture of family firms may result in resistance to innovation. A topic that is very prominent in the research of family-owned businesses is legacy. Legacy can lock firms into maintaining traditional practices that hinder their ability to innovate. Legacy can also prevent family members from taking bold, future-oriented actions (Radu-Lefebvre et al., 2024). Contrary to this, other studies argue that there are certain advantages to legacy in family firms. For example, entrepreneurial legacy can inspire entrepreneurship in both successors and non-successors (Combs et al., 2023).

Another concept influencing the strategic management decisions of family firms is Socioemotional Wealth (SEW). SEW represents the non-economic rewards that owners of family firms gain from their businesses. Examples of these non-economic rewards are family identity and legacy, control and influence, family values and traditions, social status, emotional fulfillment, and creating a family dynasty. Family firms tend to prioritize these rewards, sometimes even over financial goals. (Gómez-Mejía et al., 2011; Gómez-Mejía et al., 2007). The concept of SEW is frequently used to explain the strategic choices made by family firms compared to non-family firms. SEW can promote stability and continuity, as many family firms try to preserve the family legacy. Prioritizing benevolent ties among family members and safeguarding the firm's reputation, for example, encourages long-term strategic planning and resistance to short-term financial pressures. Consequently, this promotes continuity and stability in a business. But SEW can also make a family-owned company resistant to innovation. A reason for that is the focus of family firms on preserving family control, legacy, and traditions. This focus can lead to risk aversion and reluctance to support disruptive change. Family firms face a dilemma of "maintaining current SEW versus pursuing financial wealth" (Gómez-Mejía et al., 2018).

Therefore, SEW can limit a firm's ability to adapt to technological changes such as AI. Further high-risk strategies, namely mergers, acquisitions, and internationalization efforts, are often omitted to protect SEW (Arregle et al., 2024).

But if family firms engage in Mergers and Acquisitions (M&A), family firm acquirers achieve better M&A performance than non-family firm acquirers on average. Because they aim to preserve SEW (Palm et al., 2024). The reviewed literature on SEW successfully explains certain behavioral patterns within family firms but lacks sufficient differentiation between cultural, size, and industry contexts. For instance, a family firm operating in high-tech industries may be less impacted by the consequences of SEW compared to one in more traditional sectors (Chen et al. 2022).

Similar to the concept of SEW is the social learning theory (Bandura, 1969). While SEW focuses on emotional rewards and tradition, the social learning theory suggests that family members learn the behaviors and values from previous generations. Depending on the person, this can lead to the preservation of the status quo, mimicking outdated practices, and resistance to new ideas. But for the most part, the social learning theory can be viewed as an asset because the previous generation teaches their successors an entrepreneurial orientation and innovative thinking (Wang et al., 2018; Radu-Lefebvre et al., 2024).

2.1.3 Potential competitive Advantages of Family Firms

Research shows that family firms are more resilient in volatile environments. One reason for it seems to be that family-owned companies are long-term oriented. Family firms are often focused on stability, and they are more risk-averse in economic downturns (Arregle et al., 2024). For example, a study from Japan, comparing data from family and non-family firms after the Asian crisis of 1997, showed that family firms not only achieve stronger resilience in times of crises but also after an economic crisis. They recover faster and perform better (Amann and Jaussad, 2012). Further, during the 2007-2009 financial crisis, family firms have outperformed non-family firms in Europe as well. A study employing a data set of 2,949 firms across 27 European countries shows that family-controlled firms financially outperformed non-family-controlled firms (van Essen et al., 2015). Family firms are also more likely to redeploy resources and adopt practices that enable them to better resist future external shocks (Mzid et al., 2018).

Further, family firms foster long-term stakeholder relationships, enhancing stability in uncertain times (Arregle et al., 2024). Similarly, family firms often foster a loyal workforce, enhancing resilience (Gagné et al., 2014). For example, European family firms were less likely to lay off employees or cut wages in both pre-crisis and 2007-2009 crisis. This shows their strong relationships with employees (van Essen et al., 2015).

Family firms balance risk-aversion and strategic risk-taking to preserve control (Gómez-Mejía et al., 2007; Antony and Ranajee, 2024). Many family firms do favor debt minimization and equity retention, which also minimizes financial risk and ultimately reduces the risk of bankruptcy (Kumar, 2024).

Another competitive advantage of family-owned companies can arise through long-term relationships with financial institutions. Favorable financing terms can become accessible for family-owned companies. These financing terms reduce the cost of capital and can be a

financial advantage over competitors, especially in uncertain times (Antony and Ranajee, 2024).

A study by Arregle et al. reveals family-owned firms have deeper and more significant relations with their communities compared to non-family firms. This can lead to better performance in terms of environmental, social, and governance (ESG) practices, as they value their immediate environment (Arregle et al., 2024). The long-term orientation may also foster sustainable innovation practices (Calabrò et al., 2019).

However, research from 2022 showed the exact opposite. The study used a sample of 40,910 firms, covering 202,402 observations over a 12-year period from 2009 to 2020, and found family firms have slightly lower environmental performance compared to non-family firms (Miroshnychenko, 2022). These two discordant studies do not allow for a clear statement to be made about ESG performance advantages of family firms over non-family firms.

Family firms' ownership structure enhances strategic adaptability and efficiency (Hoopes and Miller, 2006; Kumar, 2024). An empirical study conducted through a field survey found that the ownership structure of family firms can lead to performance advantages over professionally managed firms. The reason for it is the unification of ownership and control (Daily and Dollinger, 1992).

The reviewed literature on potential competitive advantages of family firms rarely differentiates between family firms from different industries, and the heterogeneity of family firms is often not addressed.

2.2 SMEs

This part of the literature review looks into studies on small and medium-sized enterprises in general. It deals with SMEs' readiness for AI and digital transformation. Additionally, it explores the unique challenges of SMEs in integrating advanced technologies. While exploring these challenges, factors like size, resources, and organizational structures are considered. This section sheds light on the capabilities of SMEs for innovation and adaptation in a rapidly changing technological landscape.

2.2.1 Digital Transformation in SMEs

SMEs represent 99% of enterprises from the European Union but lag behind larger firms in digital transformation (SME Definition - European Commission, 2025; Eller et al., 2020).

There are several factors influencing SMEs' digital transformation. Those include internal-external, micro-macro, and socio-economic aspects (Bin and Hui et al., 2021). For example, an internal factor influencing digital transformation is insufficient knowledge within a company. SMEs are aware of the need for digital transformation, but their knowledge about Industry 4.0 technologies is still low. The lack of internal knowledge further intensifies the challenges posed by external competition (Tišma et al., 2022).

Another study emphasizes the importance of understanding the factors influencing the digital transformation of SMEs. The study highlights the need for further education and training in these areas. The digital transformation of a company strengthens the ability of SMEs to address key business issues like customer access, competition, and regulatory changes. The study conducted addresses business issues universally, even though SMEs in different sectors, sizes, and geographic locations might face diverse challenges (Škare et al., 2023).

Before implementing new technologies, it is important to assess a company's digital readiness. A digital readiness model by De Carolis et al. helps SMEs assess key processes before adopting new technologies. The model is used to assess five areas in which manufacturing key processes can be grouped. By ranking the assessment areas with a scoring system, manufacturing companies can measure their own digital readiness and identify areas that need improvement before implementing digital technologies. The model can also be adapted to other industries by defining different assessment areas (De Carolis et al., 2017).

According to a recent study, successful digital transformation in SMEs depends on three managerial dimensions. These dimensions are rethinking digital infrastructures, implementing new organizational mechanisms, and senior management initiating significant change. If the required knowledge is not available in-house, management needs consultation from experts. The first managerial dimension of rethinking digital infrastructures includes analyzing the status quo of the current digital infrastructure. This process can make problems visible and potentially lead to ideas on what must change (Ben Slimane et al., 2022). An example for the second managerial dimension of implementing a new organizational mechanism would be creating cross-functional digital teams. Cross-functional teams can drive digital transformation in SMEs, but their feasibility depends on resources. To successfully rethink digital infrastructures and ultimately implement new technologies, employees from different departments must work together (PricewaterhouseCoopers, n.d.). The most important managerial dimension is the third dimension. For digital transformation to be successful, senior management must take the lead in driving change (Ben Slimane et al., 2022).

A factor influencing the digital transformation, among others, is the digital confidence of entrepreneurs and decision-makers (Malodia et al., 2023). Digital confidence in management is often nonexistent and must be sourced externally (Ben Slimane et al., 2022). Both studies by Malodia et al. and Slimane et al. emphasize the importance of top-down change. However, while Slimane et al. focus more on the individual confidence levels of entrepreneurs, Malodia et al. highlight the act of taking initiative as the most critical factor. These digital competencies will directly impact the success of digital transformation.
Another four-level approach to SME digital engagement consists of digital awareness, digital enquiry, collaboration, and transformation. According to the model, SMEs need to begin with digital awareness. In this phase, the firms are introduced to digital transformation through outreach and workshops. Digital enquiry comprises the active search, analysis, and understanding of digital opportunities and requirements. Digital collaboration includes starting to use digital tools to enhance communication and workflows. The last level of digital transformation means fully integrating advanced digital technologies into the company's operations, driving strategic and organizational change (Garzoni et al., 2020). The four-level approach conducted by Garzoni illustrates a path to a successful digital transformation.
Digital transformation can significantly enhance the competitiveness of SMEs by reducing operational costs, improving customer service, or streamlining supply chains. Nonetheless, there are several challenges, such as a shortage of skilled employees and the need for external support in technology integration (Škare et al., 2023).

2.2.2 Specificity of Family Firms within SMEs

According to research comparing family and non-family firms, there are many similarities and differences between these types of businesses. Some studies have found significant differences (Jorissen et al., 2002). Others lead to the belief that many observed differences may be the result of demographic factors like firm size, age, and industry rather than family influence (Smith, 2007).
Family firms tend to benefit more from external relationships, while non-family firms leverage functional skills more effectively (Chrisman et al., 2009). The extent of differences varies between industries. Manufacturing, for instance, is showing the most distinctions. Manufacturing exhibits the most pronounced distinctions between family and non-family firms due to factors like capital intensity, the need for continuous innovation, operational

complexity, and workforce management practices. These distinctions amplify the impact of unique family-driven strategies and values (Smith, 2007).

On the one hand, a study from 1995 states that family businesses tend to exhibit less professional management in areas like strategic decision-making and personnel evaluation (Cromie et al., 1995). On the other hand, family firms often outperform their non-family competitors in terms of financial performance metrics such as return on sales, equity, and assets (Cassia et al., 2012). The studies by Cromie et al. and Cassia et al. are contradictory, as one would typically expect better financial performance to be associated with more professional management. Further research on the differences in financial performance and its triggers must be conducted to adequately address the corresponding questions.

The better financial performance metrics might be a result of family firms benefiting more from external relationships, as mentioned by Chrisman et al.. An example of this is maintaining long-standing business relationships with customers who remain loyal. This is an advantage that is less prevalent in non-family-owned firms (Miller et al., 2007).

The influencing factors are often family characteristics that impact governance mechanisms and contribute to a different way of handling certain situations (Felício and Villardón, 2015). The innovativeness of family-owned SMEs for the most part depends on firm characteristics such as size, industry, and area of activity (Ključnikov et al., 2021). Family businesses, especially SMEs, are less likely to invest in AI compared to non-family businesses (Ulricht et al. 2023).

Companies with successors demonstrate a higher organizational innovativeness. Actual factors impacting innovativeness in family-owned SMEs are the age of founders, the legal structure, and succession (Ključnikov et al., 2021). However, a different study suggests global innovativeness does not change based on firm or owner characteristics (Ključnikov et al., 2021). The literature is partially divided on the distinct characteristics of family firms and the extent to which their dynamics truly influence decision-making. Nevertheless, these findings highlight the complex nature of family-owned SMEs and their special attributes in comparison to non-family businesses.

2.3 AI Adoption Challenges and Opportunities

This section delves into the challenges organizations face in AI adoption, the opportunities AI presents, and the ethical concerns around its implementation. This part of the literature review not only names challenges in integrating AI, but also explores methods to overcome those

difficulties. Additionally, it examines broader consequences of AI for innovation and organizational change.

2.3.1 Challenges in the AI Implementation and Strategies for Success

The implementation of AI in organizations is facing many challenges. Most of them are barriers connected to organizational data capabilities, insufficient AI-specific competencies, and issues that are generic in nature concerning implementation (Bérubé et al., 2021). To use data successfully, data must be managed in a systematic way. Knowledge deficits, costs, and insufficient infrastructure remain the most prevalent inhibitors for SMEs (Oldemeyer et al., 2024). However, costs are falling, and development is improving, so the outlook for the integration of AI in SMEs seems promising (Govori and Sejdija, 2023).

A variety of stakeholders and careful evaluation of the intricate issues are necessary for the successful implementation of AI. Top management commitment, readiness of the organization, external support, employee adoption, and competitive pressure are the driving factors (Ingalagi et al., 2021). Based on their capabilities, available resources, and degree of ethical consciousness, SMEs can choose the best course of action. Initially, SMEs should focus on the conceptualization stage of the AI lifecycle. A comprehensive AI lifecycle covers design, development, and deployment of AI systems (Crockett et al., 2023; De Silva and Alahakoon, 2021).

Employee resistance to organizational change is common. Successful implementation may be hampered by this reluctance (Mealiea, 1978; Zafar and Naveed, 2014; Furxhi, 2021). Employees believing that change will compromise their ability to meet their needs will rebel. This leads to a bad impression of next efforts for transformation (Mealiea, 1978). The kind and approach of change introduction determine the degree of opposition (Zafar and Naveed, 2014).

External and internal factors, including crises, can make organizational changes aimed at improving performance essential (Furxhi, 2021). Managers can use many approaches to get beyond obstacles. Jeff Hiatt's so-called ADKAR model for efficient change management is one among them. The letters stand for awareness, desire, knowledge, ability, and reinforcement. Awareness is knowing one needs change. Desire is about the will to help and participate in the transformation. Knowledge is about knowing what the change entails and how to go forward. Ability is about having the needed capability to implement change, and

the last stage known as reinforcement is making sure the change is maintained (Zafar and Naveed, 2014).

Dealing with resistance and fostering good attitudes about change depend a lot on leaders. Knowing the elements behind resistance and applying suitable management strategies enables companies to adapt more effectively and save possible expenses and delays (Zafar and Naveed, 2014; Furxhi, 2021).

The application of artificial intelligence in companies affects staff members both favorably and negatively. AI poses questions regarding job security, data privacy, and information security even while it can improve job performance, creativity, and work flexibility. Work overload and complexity could cause employees to suffer from a "job satisfaction dilemma" and technostress (Malik et al., 2021; Bhargava et al., 2020). However, many employees believe that the “human touch” and soft skills remain irreplaceable by AI (Bhargava et al., 2020). Organizations that want to effectively integrate AI must change employee perceptions (Lichtenthaler, 2019). A sociotechnical approach to AI integration, is crucial for building organizational value. It must focus on AI socialization and employee collaboration (Makarius et al., 2020). Employees always need to be learning and developing their skills to adapt to changes in the workplace caused by AI (Bhargava et al., 2020; Malik et al., 2021).

2.3.2 Opportunities in the Implementation of AI

The rapid evolution of AI offers companies great possibilities in many different fields. For example, in business, healthcare, and economics (Horák and Turková, 2023). In business, AI is redefining decision-making processes. AI can help to enhance corporate performance and support sustainable practices (Kaggwa et al., 2024).

A positive example of that is the American agriculture machinery manufacturer John Deere. John Deere integrates AI and machine learning into machinery to optimize planting, fertilization, and harvesting, improving efficiency and sustainability (Sense & Act, n.d.). Businesses use AI in sales, marketing, supply chain management, customer service, and financial analysis (Pendy, 2023; Abousaber and Abdalla, 2023). For example, Amazon’s AI-powered recommendation system enhances customer loyalty and conversion rates (Aboutamazon.com, n.d.).

Moreover, AI can simplify administrative tasks and automate tasks. Especially, those tasks that are repetitive. Professionals can thus concentrate on more important subjects (Canhoto and Clear, 2020; Eden et al., 2024).

AI's analytical capabilities can enable significant information extraction from enormous amounts of data. For the financial industry, for instance, AI has brought about a notable revolution. It offers several chances for tailored and customized services, cost-effective development of new business models, and reduction of expenses. AI enables smart financial services such as intelligent consultants and automated risk monitoring (Joshi, 2021).
The integration of AI and big data can greatly improve consumer experiences. For instance, through personalized services, chatbots, voice assistants, and recommendation systems. Further, the integration of AI enables the creation of new business models and services. Which can ultimately lead to new revenue streams (Ahmadi et al., 2024; Atlam et al., 2018). Based on Accenture's 2024 research, 74% of companies have seen investments in generative AI and automation either reaching or exceeding expectations. 63% of organizations plan to expand these efforts and enhance these capabilities by 2026. According to the research report, organizations using AI-led systems have 2.5 times more income growth and 2.4 times higher productivity than those not using AI (Chakraborty et al., 2024).
To successfully adopt AI, businesses need to identify the specific problems they want to address first. Finally, it is crucial to develop in-house expertise to ensure smooth adoption and sustainability (Davenport, 2018; Akerkar, 2018). A four-step roadmap can help organizations in the adoption process. The steps are understanding AI capabilities, assessing current business models, developing necessary capabilities, and fostering organizational acceptance. These actions help properly apply AI (Reim et al., 2020).
Predictive analytics, tailored marketing, and improved process automation are projected to be the main future uses of AI (Pendy, 2023). Potential benefits from AI include better decision-making, accessibility, and efficiency. The potential benefits of AI highly depend on the context and the stage of AI adoption. In conclusion, AI has the potential to significantly enhance people's lives in multiple fields, making it a valuable technology for future business opportunities (Horák and Turková, 2023)

2.3.3 Managing Resistance and Cultural Shifts in AI Adoption

Resistance to change is a common challenge in organizations. It often hinders adaptation, innovation, and progress in general (Jain et al., 2018). The digital economy is driving significant changes in organizational culture and leadership. AI technologies are transforming organizational culture towards data-driven decision-making, innovation, and collaboration (Maddula, 2019).

Resistance can have many causes. These causes include fear of the unknown, loss of status quo, and lack of understanding (Kotter and Schlesinger, 2008). To be able to tackle resistance, organizations should employ specific strategies. Some of the critical factors in handling resistance are education, communication, facilitation, and motivation (Agboola and Salawu, 2010).

It is necessary to create a clear change management process that involves preparation, implementation, and reinforcement. The preparation phase focuses on creating awareness about the need for change and preparing the organization. During the implementation phase, the organization executes the change plans. According to the paper, providing training programs helps employees develop necessary skills to adapt to new processes. The following reinforcement phase ensures that the changes are sustained over time. Monitoring the changes, providing feedback, and reinforcing positive behaviors will help organizations to be successful (Kuzhda, 2016).

Leaders should proactively address resistance. Understanding the causes of resistance is very important (Aladwani, 2001). Managers must recognize that change affects multiple aspects of an organization. These aspects are for example strategy, technology, structure, and employees (O'Connor, 1993). By promoting voluntary participation, organizations can successfully implement change and maintain competitiveness (Rozencweig and Rozencweig, 2008).

An example for overcoming resistance in a company is Ford. In 2006, Alan Mulally took over as CEO of Ford and implemented a comprehensive strategy to transform Ford's operations. Ford's AI adoption success stemmed from leadership transparency, collaboration, and strategic vision (Edmondson and Jung, 2021).

In addition, it is essential for decision-makers and managers involved in Industry 4.0 transformations to understand the above-stated challenges and opportunities of AI adoption (Jan et al., 2023). Ethics are becoming increasingly important. Regulatory frameworks and moral guidelines for responsible AI deployment are major topics. Organizations can successfully cope with these changes through the adoption of ethical engagement, adaptive leadership, and collaboration. Ethical engagement is the organizational practice of actively considering and addressing ethical implications of decisions and actions. It involves ensuring that the application of technology is responsible, fair, and transparent. Decision-makers should always keep the well-being of all stakeholders in mind. The stakeholders include employees, customers, and society at large (Maddula, 2019).

2.3.4 Ethical Concerns of AI

The ethics of AI and its applications are becoming increasingly important as AI is used in various sectors of the economy (Esther et al., 2023).

AI ethics revolves around five key principles: transparency, fairness, non-maleficence, responsibility, and privacy (Jobin et al., 2019). Transparency concerns arise from the ability of AI systems to classify and manage data. Further, AI can make judgments. The decision-making processes of AI systems are not always clear or easily interpretable by humans. Many AI algorithms run as “black boxes” (Dubber et al., 2020; Siau and Wang, 2020). AI systems have a “wide-reaching and often intimate impact” on people's daily lives. This relevance emphasizes the importance of transparency. Individuals impacted by the judgments of AI want to know why and how certain decisions came about. There is a need for transparency in AI systems to ensure they are behaving ethically and in alignment with human values (Dubber et al., 2020).

Data biases define one of the main issues of justice and fairness in artificial intelligence. Large datasets are used for training AI systems; however, if these datasets include natural biases, the resulting AI models may either preserve or even magnify these biases in their decision-making procedures (Siau and Wang, 2020). Additionally, the potential of AI to automate jobs may amplify income inequality or unemployment. This raises ethical concerns about how businesses can balance automation with fair labor practices.

In the group of non-maleficence concerns is the potential for AI systems to cause unintended harm. Applications like self-driving cars and autonomous weaponry very clearly show this. These devices can make decisions directly affecting human safety (Coeckelbergh, 2020).

AI decision-making raises accountability concerns, particularly regarding responsibility for outcomes. This delegation begs questions regarding who is finally in charge of the results of these choices. Is it the AI system, the developers, or the companies implementing it (Coeckelbergh, 2020)?

One widely discussed situation in artificial intelligence ethics is the programming of self-driving cars. Sometimes in certain situations in traffic, the car has to make a decision between injuring the driver or other people. This presents an ethical dilemma that touches on non-maleficence (Luzuriaga et al., 2020).

AI systems, mostly depend on vast amounts of data. This dependence begs serious privacy issues about the gathering, storing, and using of personal data (Siau and Wang, 2020). The large data needs of AI systems may perhaps violate people's privacy (Coeckelbergh, 2020).

Addressing ethical issues is crucial for responsible AI implementation. “Establishing and vigilantly monitoring ethical standards and principles is imperative to ensure the responsible deployment of AI” (Taiwo and Akinwande, 2023).
A few of these fundamental ideas tend to conflict with each other. While transparency is often highlighted as a priority in AI systems, it may conflict with the need for confidentiality in certain industries, such as healthcare, where patient data privacy is paramount.
Furthermore, if not adequately controlled, an AI system meant to promote fairness may introduce biases. Using AI and balancing all ethical principles is a huge challenge. Resolving these conflicts between certain AI ethics principles is complex. Usually it calls for a context-dependent consideration (Whittlestone et al., 2019).

2.4 Relevance and Research Gap

SMEs are significantly impacted by AI adoption, presenting both challenges and opportunities. However, research has not comprehensively investigated the special dynamics of AI adoption in family-owned SMEs. This study aims to fill this gap by focusing on the intersection of family business characteristics, firm size, and AI integration.
While several studies have examined aspects of digital transformation in SMEs, they often exclude family firms from their scope. Slimane et al. (2022) for instance, explore digital transformation strategies within SMEs. The research stresses innovation and adaptation challenges but does not separate family-owned from non-family-owned businesses. Family businesses often show unique ways of governance. Further, they often have a special long-term orientation and emotional attachment to the business. For that reason, they might have particular difficulties embracing new digital technologies. The lack of focus on family firms represents a critical gap of knowledge.
Govori and Sejdija (2023), for example, discuss AI integration in SMEs. The paper provides valuable information on implementation strategies and the resulting operational benefits. However, this research does not consider family firm characteristics. For example, their intergenerational leadership dynamics or potential resistance to change due to the continuation of family traditions. All these factors might have significant implications for family-owned SMEs’ perceptions of AI technologies, and their adoption.
Furthermore, research begins exploring AI adoption in family firms but does not examine how much firm size influences successful application. Small family firms, for example, often lack human resources and budget to implement cutting-edge AI solutions. While medium-

sized family firms might face different challenges related to scalability and strategic alignment. The intersection of family firm dynamics, firm size, and AI adoption remains underexplored.

This thesis aims to fill some of these gaps by providing a sophisticated understanding of AI adoption in family-owned SMEs. Through an examination of the challenges and opportunities that these firms face, the research adds to the literature on digital transformation, family business strategy, and innovation management. Through offering a phased framework for successful AI adoption, the study has practical recommendations on AI adoption for family firms seeking to balance tradition and innovation.

3 Methodology

The methodology section outlines the qualitative research approach employed to explore AI adoption in family-owned SMEs. By using semi-structured expert interviews and a systematic literature review, the study identifies key challenges, opportunities, and the influence of family firm-specific dynamics on AI integration. The research process ensures a comprehensive analysis by capturing diverse perspectives. Applying the Gioia methodology for structured data analysis, enables maintaining a balance between theoretical contributions and practical insights.

3.1 Research Design

This study adopts a qualitative research approach. To address the three main research questions - “What specific challenges do small and medium-sized family firms face in adopting AI?”, “What specific opportunities do small and medium-sized family firms have in adopting AI?”, and “How do values, traditions, and legacy of family firms shape their approach to AI adoption and integration?” - an empirical study is conducted to generate valuable knowledge and insights (Creswell and Creswell, 2017). Given the novelty of AI adoption in small and medium-sized family firms, qualitative research is likely to yield new insights (Saunders et al., 2019). Qualitative research captures expert perspectives on AI adoption in family firms. The adoption of AI in family-owned SMEs involves complex human elements. These include decision-making processes, family dynamics, and organizational culture (Freeman & Given, 2011).

By comparing the primary data collected from semi-structured interviews with secondary data from top journals, this research aims to uncover the specific dynamics within family firms

influencing the process of AI adoption. Through that, associated challenges and opportunities can be identified. Semi-structured interviews offer flexibility. Through providing the interviewees with the interview guides in advance, they can prepare for the questions, while consistent questioning across interviews ensures comparability of responses. The semi-structured take on interviews allows the interviewer to explore certain statements further to gain deeper insights. This approach enables the identification of patterns and trends (Adams, 2015).

3.2. Interviewee Selection

The main objective of the study is to capture several perspectives that successfully answer the research questions. The selected interviewees are chosen to represent a spectrum of positions, experiences, firm sizes, industries, and genders within family firms and related fields. Diversity ensures a comprehensive understanding of AI adoption in family firms.

First, owners of family firms who remain actively involved in managing their businesses are being interviewed. These interviews explore their strategies, challenges, and resistance factors in the adoption of AI. While selecting the owners of SME-sized family firms, diversity in company size, industry, and gender of the owner are decision criteria.

Secondly, potential successors working within their family firms at varying stages of the succession process are included. These participants are part of the owner families and ranged from those on the verge of getting into the leadership of the company to those expected to do so in years. Their statements can clarify intergenerational dynamics, readiness, and attitudes towards incorporating AI, among other things. Furthermore, non-family managers in family firms are interviewed. Their external perspective provides valuable insights into how family dynamics influence day-to-day business operations, decision-making processes, and openness to innovation.

Furthermore, consultants from top management consultancies were interviewed. The consultants' answers offer a professional perspective on the critical factors for successful AI implementation in companies. Their insights highlight the distinct approaches of family firms compared to non-family firms.

AI experts offer insights into the technology's potential for SMEs and family firms.

Finally, the interview with a succession consultant who has spent more than three decades working with family businesses adds insightful detail to family business dynamics. Especially

how these dynamics affect strategic decision-making and innovation. This expert's insights are valuable for understanding the interplay between family legacy and technology adoption. A total of 12 expert interviews are being conducted for this research. This sample size was determined based on thematic saturation. Many of the participants' statements showed significant overlap. Recurring themes confirmed robust findings, making further interviews unnecessary. The selection process of interviewees ensures that the data is both relevant and diverse. Since it has to offer a solid basis for the qualitative research. A substantial effort was made to ensure the findings were representative of the broader population of family businesses.

Acronym	Gender	Age	Type of Expert	Industry	Years of Experience	Number of Employees	Interview duration
A	Male	24	Family Firm Successor	Manufacturing	5	64	28:00
B	Male	24	Family Firm Successor	Manufacturing	5	64	28:00
C	Male	26	Consultant AI Implementation	Management Consulting	3	19.000	30:38
D	Male	27	Consultant AI Implementation	Management Consulting	3	774.000	21.00
E	Male	25	Expert on Family Firms and Succession	M&A Consulting	3	60	34:38
F	Male	25	Family Firm Successor	Construction	7	32	18:43
G	Male	58	Expert on Family Firms and Succession	Management Consulting	30	3	42:04
H	Male	25	Family Firm Successor	Steel Manufacturing & Storage	6	53	30:56
I	Female	54	Family Firm Owner	Construction	28	20	20:46
J	Female	28	Family Firm Successor	Construction	6	20	23:23
K	Male	29	Non-Family Manager in Family Firm	Construction	10	20	21:59
L	Male	24	AI Expert	Technology	3	13	32:27

Figure 1: List of Experts interviewed

Source(s): Created by author

3.3 Data Collection Method

A five-phase framework is being used consisting of: identifying prerequisites, utilizing previous knowledge, formulating preliminary questions, pilot testing, and finalizing the guide. This framework is used to properly construct and prepare the semi-structured interviews. The approach ultimately enhances the objectivity, trustworthiness, and effectiveness of qualitative interview guides in obtaining rich and focused data (Kallio et al., 2016).

Pilot testing refined questions for clarity and comparability. This approach allows the collection of diverse and in-depth insights on the topic. During the pilot testing, several questions were removed, and others were added to ensure understandability and comparability of the responses. These guides were designed to address the specific expertise and experiences of the interviewees.

The interview guides are divided into six main categories. As the guides are tailored to each type of expert, the interviews emphasize different categories. But they all explore the following six categories.

The first category covers interviewee expertise, demographics, and general AI perception. This section early clarifies their attitude towards AI and what the participants think about the technology.

The second category aims to gain insights on their own current involvement with AI. Questions about their own role in the digital transformation journey of their company are being asked.

The third category explores family firm-specific dynamics and particularities that could influence the adoption of AI in businesses. This part of the interview addresses RQ3.

The fourth category of questions focuses on family firm-specific challenges and opportunities. Participants were asked to describe what they experienced or heard from other family firms. Experts were also asked to describe in which specific areas they see the most potential for AI. Additionally, experts on family firms and consultants were asked to describe the differences between family firms and non-family firms in this category. This clearly addresses RQ1 and RQ2.

The fifth category explores the financial and strategic level of investing in the digital transformation. The goal here is to recognize family firm-specific patterns about financials that possibly influence the direction of the businesses. This section also addresses RQ3. The sixth and last section was created to get the experts' insights on how they see or plan the future regarding the implementation of AI. Finally, the experts were given time to share whatever they wanted to share in connection to family firms and AI adoption.

3.4 Conducting Interviews

The interviews were conducted in weeks 45, 46 and 47 of 2024 via Microsoft Teams. The platform provides an efficient and reliable tool for both recording and transcribing interviews. The built-in transcription feature ensures accurate documentation of the conversations. A test run for all six versions was conducted on the 5th of November 2024. The pilot testing was used to refine, add and erase questions to improve understandability and unbiasedness. Each interview was designed to last approximately 30 minutes, with the actual durations ranging from 18 minutes for the shortest to 42 minutes for the longest interview. During the interviews, questions were skipped in case the expert already answered them sufficiently

while replying to a different question. Further, additional questions were asked in case the expert's answer was going in a direction that inspired the interviewer to get into more detail. This structured yet flexible approach facilitated in-depth discussions while respecting the time constraints of the participants.

3.5 Data Analysis

The Gioia methodology is being used for a structured data analysis. It offers a methodical, inductive strategy for qualitative research (Gioia et al., 2013). To guarantee consistency and accuracy, every single interview was automatically recorded and transcribed through Microsoft Teams. After that, the interviews were translated from German into English using ChatGPT.

Initial themes were identified using the Gioia methodology. These themes are aimed at maintaining the interviewees' exact words during the first-order concept analysis. The Gioia methodology provides a structured approach for identifying themes and theoretical constructs (Gioia et al., 2013).

The coding process was conducted in multiple stages to ensure analytical rigor. First-order concepts were identified. These preserve the participants' original terminology to authentically reflect their perspectives. The codes were then grouped into emerging patterns to form higher-level, second-order themes. Subsequently, the analysis was transferred to Excel, where the three stages of the Gioia methodology were systematically organized. Manual assignment of first-order concepts to second-order themes allowed iterative improvement and exact alignment with the goals of the research. Aggregate dimensions emerged by further abstracting the second-order themes to find more general trends and links.

The first-order codes were assigned to second-order themes. They were then categorized under the aggregate dimensions. The manual procedure enables the researcher to make sure that the unique dynamics of family businesses were accurately picked up. The manual process permitted closer engagement with the data that facilitated the unique dynamics of the family businesses to be captured more accurately. Through this process, ongoing return to the data and iterative refinement guaranteed the reliability and validity of the thematic clusters.

By making use of this structured yet flexible approach, the analysis can preserve the richness of participants' experiences. At the same time, the data is transformed into actionable insights and theoretical contributions.

This method allowed the study to remain deeply grounded in the qualitative data while addressing the specificities of AI adoption in small and medium-sized family firms.
The relationships among the aggregate dimensions were mapped to provide a dynamic view of AI adoption in family firms. This step further transformed the static data structure into a conceptual model. This allows the findings to be compared to the literature that has been reviewed to potentially uncover precedents and make new contributions (Gioia et al., 2013). This holistic approach allowed the study to remain inductive, systematic, and grounded in the data.

4 Findings

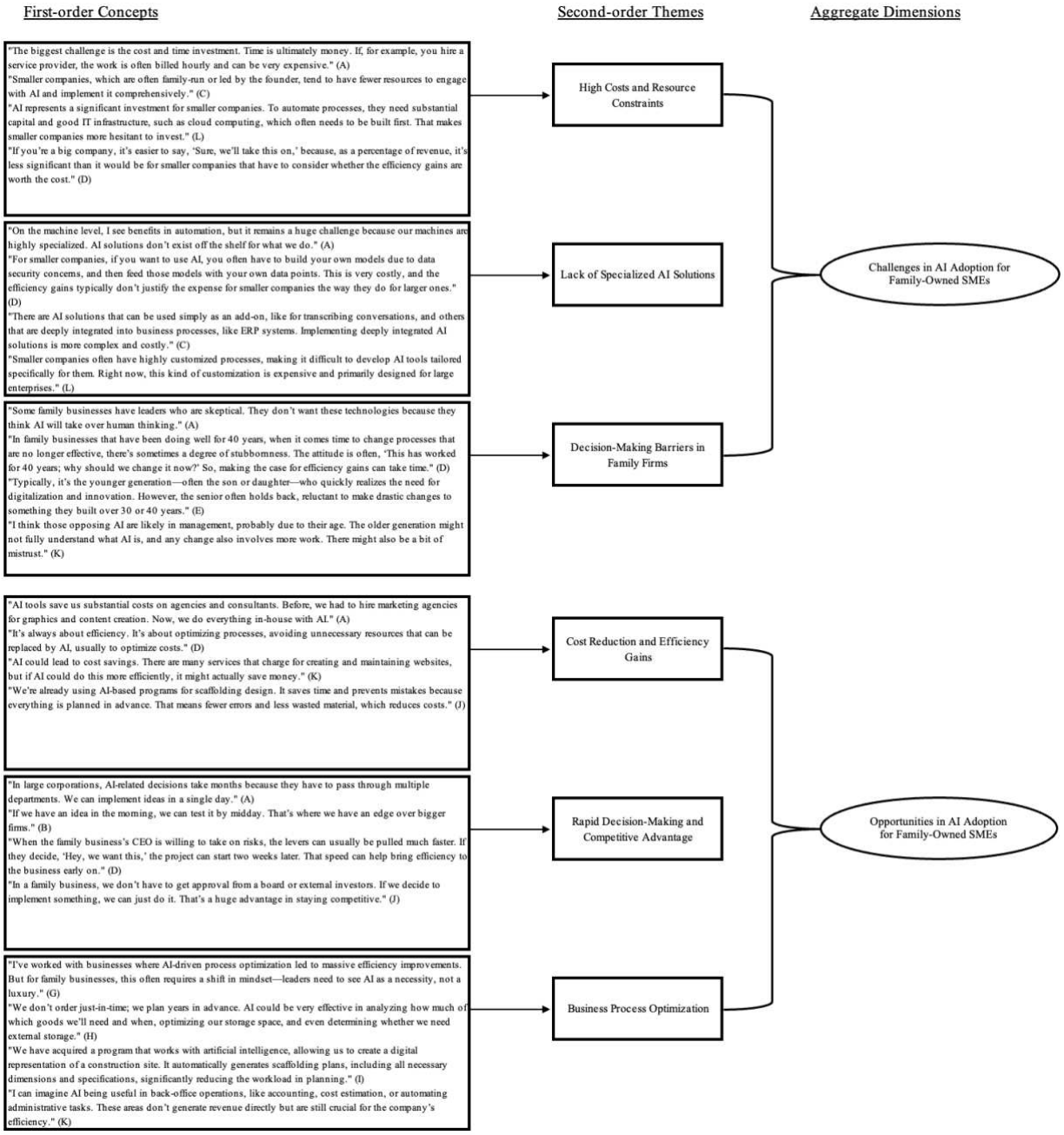

Figure 2: Overview of Data Analysis 1

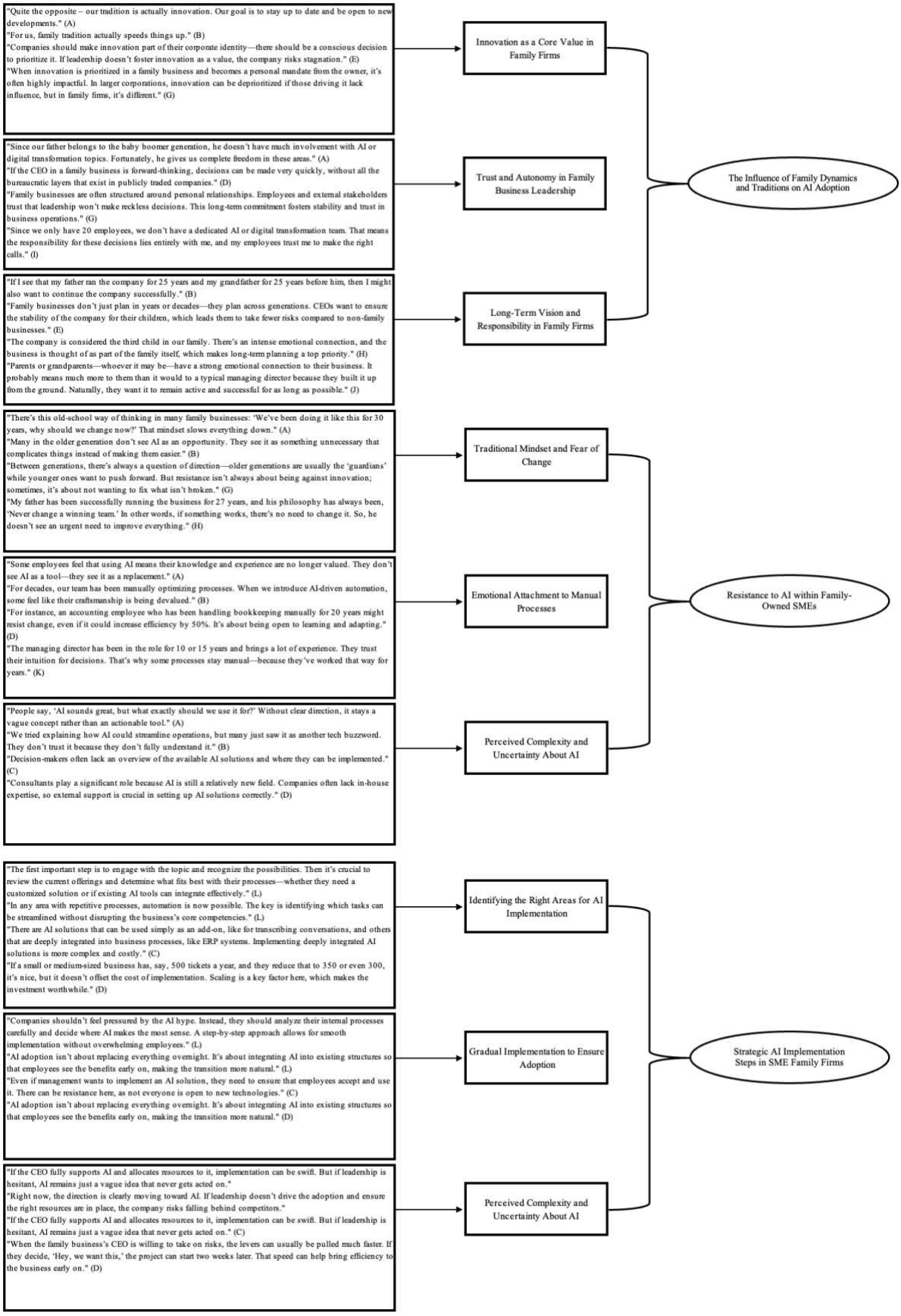

Figure 3: Overview of Data Analysis 2

Source(s): Created by author

This section explores the above-presented overview of the data analysis in detail. The statements of the interviewees allowed for the identification of patterns. The concordant quotes were grouped into second-order themes and ultimately enabled the development of the aggregate dimensions that build the structure of this section.

4.1 Challenges in AI Adoption in Family-Owned SMEs

Interviewees identified several challenges in AI adoption, some of which are unique to family-owned SMEs, while others apply to SMEs more broadly. The statements of the interviewees on challenges in AI adoption were grouped into these second-order themes: *High Costs and Resource Constraints, Lack of Specialized AI Solutions, and Decision-Making Barriers Specific to Family Firms.*

The theme *High Costs and Resource Constraints* emphasizes the importance of financial and human resources for the successful adoption of AI. One interviewee stated, “AI represents a significant investment for smaller companies. To automate processes, they need substantial capital and good IT infrastructure, (…)” (L). Successfully adopting AI is not only a costly investment but also requires substantial expertise to implement complex tools effectively. Most experts agreed on insufficient knowledge within family-owned SMEs about AI. One of the interviewed family-firm successors even said, "Honestly, I don’t feel prepared for it at all. I haven’t taken any training on this. In my studies, we covered digital transformation, but it was more theoretical and not very application-specific.” (F). Because of the insufficient in-house knowledge, the importance of external expertise is evident. For that reason, one participant stated, "Consultants play a significant role because AI is still a relatively new field. Companies often lack in-house expertise, so external support is crucial in setting up AI solutions correctly." (D). Moreover, many family-owned SMEs have a high degree of specialization in the products they manufacture or the services they offer. Beyond financial constraints, many family-owned SMEs struggle with finding AI solutions that fit their specific needs. Unlike large corporations that can afford customized AI models, these firms often lack access to suitable off-the-shelf solutions.

The niche focus of many SMEs has led to a consensus among the experts on a *Lack of Specialized AI Solutions*. This lack constitutes the next second-order theme within the aggregate dimension of challenges. One of the family firm successors stated, “AI solutions don’t exist off the shelf for what we do.” (A). Additionally, the interviewed AI expert agreed and said, “Smaller companies often have highly customized processes, making it difficult to

develop AI tools tailored specifically for them. Right now, this kind of customization is expensive and primarily designed for large enterprises." (L). This statement highlights the disadvantage that smaller firms face, as most AI tools are designed for large enterprises, making adaptation costly and complex.

The third identified pattern that the experts agreed on is the theme of *Decision-Making Barriers Specific to Family Firms*. The interviewees stated that risk-averse leadership often slows down AI adoption in family firms. Many family business owners prioritize stability and legacy over digital transformations. One participant stated accordingly, "The attitude is often, 'This has worked for 40 years; why should we change it now?" (E). Further, experts note that it is often the older generation that resists change, as they remain in control, while the younger generation is more open to innovation and proposes new ideas. However, senior leaders frequently perceive these changes as non-essential. One family firm successor stated, "My father has been successfully running the business for 27 years, and his philosophy has always been, 'Never change a winning team.' In other words, if something works, there's no need to change it. So, he doesn't see an urgent need to improve everything." (H). The interviewed family firm succession consultant reported, "Between generations, there's always a question of direction—older generations are usually the 'guardians' while younger ones want to push forward. But resistance isn't always about being against innovation; sometimes, it's about not wanting to fix what isn't broken." (G).

These challenges constitute the primary obstacles to AI adoption in family-owned SMEs, shaping how these businesses perceive and approach digital transformation.

4.2 Opportunities in AI Adoption for Family-Owned SMEs

The experts also identified several opportunities in AI adoption for family-owned SMEs. Some of them are unique to family-owned SMEs while others once again apply to SMEs more broadly. This section examines the identified second-order themes in more detail.

The first theme is *Cost Reduction and Efficiency Gains*. If AI is implemented effectively, it has the potential to significantly reduce costs and improve efficiency. This potential of AI is not specific to family-owned SMEs, but it is the main opportunity AI presents. Some of the experts already use AI tools in a way that saves costs and improves their efficiency. One participant states, "AI tools save us substantial costs on agencies and consultants. Before, we had to hire marketing agencies for graphics and content creation. Now, we do everything in-house with AI." (A). Another family firm successor mentions specific AI-powered tools that

save their company money. “By introducing AI tools like Adobe Firefly, Photoshop AI, and Microsoft Copilot, we cut a lot of costs. This level of independence would have been unthinkable a few years ago.” (B).

The second identified opportunity of family-owned SMEs is *Rapid Decision-Making and Competitive Advantage*. Family-owned SMEs can implement AI into operations faster than large corporations due to their unique ownership structure. Usually, only a few people own the firm and have the sole decision-making power. If a family firm owner decides to implement a new technology, there are no bureaucratic slowdowns. One participant states, “If a family business has a strong leader who believes in AI, decisions can be made and executed very quickly. Unlike in corporations, where innovation often gets stuck in bureaucratic approval processes, family firms can implement changes almost immediately.” (L). Further, the unique ability of family firms to respond to market changes and customer behaviors can lead to a competitive advantage. One of the family successors says about their business, “If we have an idea in the morning, we can test it by midday. That’s where we have an edge over bigger firms.” (B). The flexibility through sole decision-making authority is only an asset if the owner or the few owners are innovative thinkers. If not, it’s more of an inhibitor to AI adoption and other digital transformation measures. The interviewed consultant for family firm succession observes, “In a family business, if the owner fully backs an innovation initiative, it can be highly effective.” and, “However, if leadership says, ‘Let’s wait,’ then nothing happens.” (G).

The third identified theme is *Business Process Optimization*. The experts agreed on the potential of AI in business process automation. It can significantly reduce manual work in areas like inventory management, accounting, and human resource management. One family firm owner states, “We have acquired a program that works with artificial intelligence, allowing us to create a digital representation of a construction site. It automatically generates scaffolding plans, including all necessary dimensions and specifications, significantly reducing the workload in planning.” (I). While some of the companies already implemented certain AI tools that automate business processes, others still dream of specialized AI-powered solutions. “We don’t order just-in-time; we plan years in advance. AI could be very effective in analyzing how much of which goods we’ll need and when, optimizing our storage space, and even determining whether we need external storage.” (H)

These opportunities represent the key advantages of AI adoption in family-owned SMEs, influencing how these businesses leverage technology to enhance efficiency, competitiveness, and innovation.

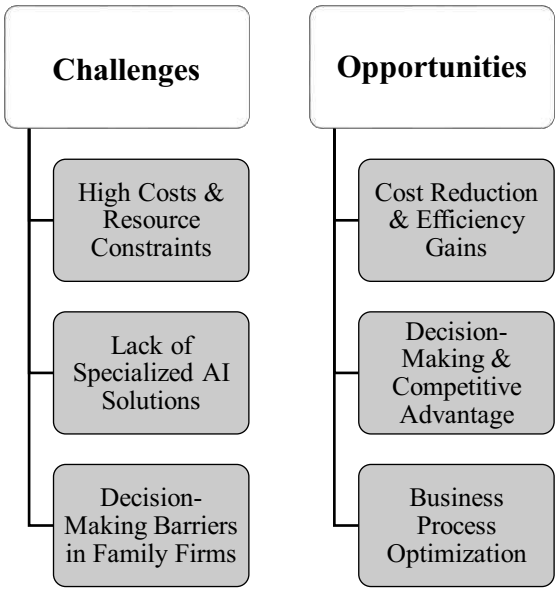

Figure 4: Challenges and Opportunities

Source(s): Created by author

4.3 The Influence of Family Dynamics and Traditions on AI Adoption in Family-Owned SMEs

The experts identified dynamics and traditions within family firms that significantly influence the adoption of AI and the digital transformation in general. The first discovered theme for the influence of family dynamics and traditions is *Innovation as a Core Value in Family Firms*. Some of the family firm owners and successors state that innovation is an integral part of their identity. When asked if tradition slows down their innovation processes, one participant responded, "Quite the opposite – our tradition is actually innovation." (A). "Our goal is to stay up to date and be open to new developments." (A). Another family firm successor supports that statement, saying, "For us, family tradition actually speeds things up." (B). The influence of tradition and family dynamics is highly dependent on the specific family firm. When leadership prioritizes innovation, family firms tend to integrate AI more quickly and effectively. As one expert states, "When innovation is prioritized in a family business and becomes a personal mandate from the owner, it's often highly impactful. In larger corporations, innovation can be deprioritized if those driving it lack influence, but in family firms, it's different." (G).

Another identified theme is the *Trust and Autonomy in Family Business Leadership*. Many experts note that family firms often exhibit high levels of trust between employees and leadership. This trust can facilitate AI adoption, as employees will not question everything.

Further, many family firm successors mention that the older generation that is still in charge of the company has high trust in their potential successors. Consequently, these successors enjoy a significant degree of autonomy in their work. One successor notes, “Since our father belongs to the baby boomer generation, he doesn’t have much involvement with AI or digital transformation topics. Fortunately, he gives us complete freedom in these areas.” (A). This personal approach to decision-making in family businesses allows for faster implementation of technology-related changes. One expert observes, “There’s a strong connection between employees and management in family firms, which leads to stability. Employees know the leadership personally and trust that they won’t make reckless strategic decisions.” (E).

The third identified theme for the aggregate dimension *Influence of Family Dynamics and Traditions on AI Adoption in Family-Owned SMEs* is *Long-Term Vision and Responsibility in Family Firms.* Family businesses often operate with generational timeframes in mind. As a result, they prioritize stability over rapid transformation. As a consequence, they often act more risk-averse and this ultimately slows down AI adoption. A fitting example of this is a statement from an expert who says, “Family businesses don’t just plan in years or decades—they plan across generations. CEOs want to ensure the stability of the company for their children, which leads them to take fewer risks compared to non-family businesses.” (E). One successor reports that there is an extreme emotional attachment to their family firm. “The company is considered the third child in our family. There’s an intense emotional connection, and the business is thought of as part of the family itself, which makes long-term planning a top priority.” (H). This statement illustrates the felt responsibility for the company and for future generations. These emotional ties to the company and legacy drive careful decision-making rather than short-term profit motives. Another successor described the emotional connection to the business in further detail by stating, “Parents or grandparents—whoever it may be—have a strong emotional connection to their business. It probably means much more to them than it would to a typical managing director because they built it up from the ground. Naturally, they want it to remain active and successful for as long as possible.” (J). Delaying the transfer of decision-making authority often has a negative impact on innovation.

These family dynamics and traditions are the main influencing factors on AI adoption in family-owned SMEs, according to the interviewed experts.

4.4 Resistance to AI within Family-Owned SMEs

The previously discussed long-term orientation and emotional attachment to the family business are factors that can lead to resistance to AI adoption. The experts continued naming several other inhibitors that also lead to resistance to change within family firms. One theme found in the statements from experts is *Traditional Mindset and Fear of Change.* One expert states, “In many family businesses, there is an ingrained mindset of ‘we’ve always done it this way, why change now?’ This attitude can slow down AI adoption significantly.” (E). Another successor says, “There are definitely such dynamics in family businesses, especially in trades. I believe many older people say, ‘No, it’s always worked perfectly, 100%, and now they come around with this weird new toy. I’m not willing to accept it. It doesn’t fit into our business.” (I)

The next identified theme, which negatively impacts AI adoption is *Emotional Attachment to Manual Processes.* Experts note that family firms often employ older workers. “I think one challenge is that many of our employees are older. I’d estimate the average age is around mid-40s. As a result, there’s a certain sense of tradition and skepticism towards new technologies, with the mindset, ‘Why change something that works?’ ”(H).This makes the generational transition a key challenge. Another interviewee adds, “For instance, an accounting employee who has been handling bookkeeping manually for 20 years might resist change, even if it could increase efficiency by 50%. It’s about being open to learning and adapting.” (D). This statement emphasizes the importance of managing long-term employees properly to ensure they stay open to innovation and changes in general.

The third theme identified in the context of *Resistance to AI in Family-Owned SMEs* is the *Perceived Complexity and Uncertainty About AI.* Many business owners and employees feel overwhelmed by AI and struggle to understand its practical applications. This struggle is a consequence of a lack of knowledge about AI implementation and its benefits. The lack of knowledge creates uncertainty and leads to a hesitation in investment. Experts state, “People say, ‘AI sounds great, but what exactly should we use it for?’ Without clear direction, it stays a vague concept rather than an actionable tool.” (A) and “We tried explaining how AI could streamline operations, but many just saw it as another tech buzzword. They don’t trust it because they don’t fully understand it.” (B). Many employees, and even company owners, perceive AI as an abstract, futuristic concept, rather than an immediate, practical tool. One participant states, “A lot of mid-sized companies don’t fully understand AI’s potential. They

see it as something abstract and costly rather than an essential tool for maintaining competitiveness. That uncertainty slows down adoption." (G).
These three themes are the most prominent factors leading to resistance at both the leadership level and within the workforce of family-owned SMEs.

4.5 Strategic Implications for AI Adoption in Family-Owned SMEs

The experts explained specific ways to properly adopt AI in family-owned SMEs. They agreed on certain steps. One theme identified in the statements is *Identifying the Right Areas for AI Implementation.* They mention that AI adoption should start with identifying areas where automation can bring the most value. Further, interviewees state that processes involving repetitive and data-intensive tasks are typically the best areas for AI integration. For example, one participant says, "In any area with repetitive processes, automation is now possible. The key is identifying which tasks can be streamlined without disrupting the business's core competencies." (L). Similarly, one expert says, "Areas like personnel management and customer service often offer good starting points for AI, as processes here can be relatively well-automated." (C). This statement highlights the importance of strategically selecting areas where AI can bring efficiency improvements quickly. Another finding from the interviews is that businesses should avoid implementing AI simply because it's a trend. It is essential that it aligns strategically with business needs. Accordingly, one expert says, "Companies shouldn't feel pressured by the AI hype. Instead, they should analyze their internal processes carefully and decide where AI makes the most sense." (L).
The second identified theme that led to the aggregate dimension *Strategic Implications for AI Adoption in Family-Owned SMEs* is *Gradual Implementation to Ensure Adoption.* Many experts mention the importance of gradually implementing AI. This allows employees to adapt to new technologies over time and minimizes the risk of resistance. One expert says, "AI adoption isn't about replacing everything overnight. It's about integrating AI into existing structures so that employees see the benefits early on, making the transition more natural." (L)
Additionally, the interviewees mention that leadership plays a crucial role in ensuring successful AI integration. One management consultant reports, "When the family business's CEO is willing to take on risks, the levers can usually be pulled much faster. If they decide, 'Hey, we want this,' the project can start two weeks later. That speed can help bring efficiency to the business early on." (D).

The third theme identified second-order theme in the interviews is the importance of *Overcoming Perceived Complexity and Uncertainty about AI*. Many businesses still struggle to understand how AI can be applied to their specific needs. For example, the uncertainty about AI's return on investment makes decision-makers hesitant to invest. One quote of a successor puts it in a nutshell, "People say, 'AI sounds great, but what exactly should we use it for?' Without clear direction, it stays a vague concept rather than an actionable tool." (A). A lack of knowledge about AI and its benefits contributes to slow down adoption. Another expert says, "A lot of mid-sized companies don't fully understand AI's potential. They see it as something abstract and costly rather than an essential tool for maintaining competitiveness. That uncertainty slows down adoption." (G). This shows the need for explanations and workshops to help the workforce understand the technology better.

These three identified themes can guide decision-makers in family-owned SMEs toward successful AI implementation. The three key themes, along with the reviewed literature, serve as the foundation for the phased framework outlined below, which is designed to facilitate successful AI adoption in family-owned SMEs.

Phase 1: AI Readiness Assessment & Overcoming Resistance

1. Identify AI Opportunities & Assess Readiness:

- Conduct a business process review to determine which tasks can benefit from AI. Focus on repetitive, data-heavy, or time-consuming processes
- Assess whether AI aligns with firm's core competencies and strategic goals
- Do not Implement just for the sake of innovation
- Evaluate IT infrastructure (data quality, availability, security, cloud capabilities)
- Align AI adoption with business strategy and family firm values

2**. Address Organizational Resistance & Cultural Barriers:**

- Understand family business dynamics
- Overcome fear of change by educating employees and leadership on AI benefits
- Address concerns actively (e.g., job displacement, privacy, etc.)
- Foster an innovation mindset by showcasing AI success stories from similar SMEs

Phase 2: Gradual implementation and Workforce Integration

1. Develop a Step-by-Step AI Implementation Plan:

- Start with a small-scale AI pilot project in low-risk, high-impact area (e.g., automating repetitive tasks in accounting or HR)
- Define clear objectives, success metrics, and expected outcomes before scaling AI solutions

2. Build AI knowledge & Train the Workforce:

- Conduct AI literacy training tailored to different employee levels
- Encourage hands-on learning by involving employees in AI experimentation and tool selection
- Collaborate with AI consultants and industry experts to bridge expertise gaps
- Establish mentorship programs where in-house early adopters support others in learning

3. Foster Employee Engagement & Change Management:

- Communicate AI's role as a productivity enhancer rather than a job replacement tool
- Set up feedback loops to address concerns and refine AI implementation
- Gradually scale AI adoption

Phase 3: Leadership Commitment & Long-Term AI Strategy

1. Establish Leadership Commitment & Strategic Vision:

- Ensure top management actively supports AI adoption and communicates its log-term benefits
- Align AI initiatives with firm's value, family legacy, and long-term stability
- Foster culture of continuous innovation while maintaining the firm's core traditions

2. Monitor AI Performance & Adapt Strategy:

- Define key performance indicators (KPIs) to track AI's impact on efficiency, costs, and business outcomes
- Regularly review AI implementation outcomes to identify areas for improvement
- Adjust AI tools, process, and strategies based on real-world feedback and evolving business needs
- Ensure AI remains an on-going strategic investment rather than a one-time project

3. Foster Employee Engagement & Change Management:

- Expand AI integration from initial pilot areas to broader business operations
- Encourage a data-driven decision-making culture
- Explore partnerships with AI vendors, research institutions, and industry experts to stay updated
- Ensure AI adoption remains flexible and adaptable to future industry trend and technological changes

Figure 5: Framework AI Adoption

Source(s): Created by author

5 Discussion

The discussion section is divided into three parts and compares the studies' results to existing research. The theoretical contribution part explores how family business characteristics influence AI adoption and compares these findings to prior studies. The managerial contribution part discusses the provided phased framework for successful AI implementation and compares it to literature, including other frameworks in similar fields. It addresses practical challenges faced by family firms. Lastly, the limitations and future research agenda section highlights the study's scope and suggests areas for further exploration.

5.1 Theoretical Contribution

This research extends the theoretical understanding of AI adoption in SMEs by integrating the unique characteristics of family businesses. These include governance, generational leadership, and emotional attachment, which have been largely overlooked in prior studies. By empirically examining AI adoption in family SMEs, this study refines digital transformation theories by incorporating socio-emotional wealth (SEW) theory and organizational change models into AI adoption discussions. This nuanced approach explains the situations under which family SMEs are capable of leveraging AI despite economic and cultural limitations.

Prior research either focused on the use of AI in SMEs (Slimane et al., 2022; Govori and Sejdija, 2023) or digital transformation in family businesses (Liu et al., 2023), but not on the intersection of these factors. The findings of this research provide new insights into how family business characteristics affect AI adoption, both positively and negatively. This research builds on and advances current literature on AI in SMEs. Additionally, this research contributes to the current literature on digital transformation, and family business innovation. The insights from the interviews in connection with the literature reviewed enable concrete practical recommendations for action.

There has not been significant research on the influence of family ownership structure and emotional attachment on the adoption of AI in SMEs. While studies have examined the technological, financial, and strategic challenges of digital transformation (Oldemeyer et al., 2024), this research incorporates the influence of family ownership, generational leadership, and emotional attachment on AI adoption decisions.

Another study focuses on the potential of AI in family businesses but is predominantly conceptual with weak empirical backing. On the one hand, it also highlights challenges such

as AI knowledge gaps and cultural resistance. But on the other hand, it does not sufficiently explore how firm size influences these challenges (Kumar and Ratten, 2024). By empirically investigating these barriers through qualitative interviews with experts, real-world insights are being provided. Which ultimately makes the findings more actionable.

While prior research confirms that family SMEs adopt AI less frequently due to risk aversion, it overlooks how family-specific governance structures and strategic decision-making patterns can also create advantages for AI adoption (Ulrich et al., 2023).

Other studies treat family-owned SMEs as a homogeneous group, failing to consider how family governance and succession shape AI adoption decisions (Schönberger, 2023). This study introduces the family business perspective, showing that AI adoption is not only a financial or technical issue but also a cultural and strategic one, influenced by long-term orientation and generational leadership.

Ultimately, this research addresses multiple theoretical gaps:

1. Bridging AI adoption research in SMEs with family business theory, particularly regarding governance and emotional attachment.
2. Providing empirical insights where previous studies relied primarily on conceptual models or systematic reviews.
3. Differentiating between small and medium-sized family firms, recognizing that size influences both AI implementation capacity and resistance factors.

By integrating family business research, digital transformation research, and organizational change theories, this study offers a more profound understanding of AI adoption by family-owned SMEs.

5.2 Managerial Contribution

Unlike non-family SMEs, family businesses must harmonize the application of AI with their unique structures of governance, long-term strategic intent, and deeply entrenched traditions. This study provides a systematic approach to dealing with these challenges so that AI implementation is harmonized with family business identity and strategic intent. To help family firms navigate AI adoption, the study introduces a three-phase framework that reflects the gradual, structured integration of AI into family SMEs. Each phase is designed to enable

the effective use of AI in family businesses without risking stability, values, and long-term vision.

Small- and medium-sized family businesses face financial constraints, a lack of experience, and limited access to industry-specific AI solutions. To overcome the financial barrier, the businesses should target investments in low-cost, high-impact AI solutions. Such AI solutions can often be found for areas like accounting and marketing. Other studies agree that these applications are a good place to start to deploy AI. While prior research has already discovered AI implementation barriers for SMEs, few research papers offer systematic and actionable guidelines to family businesses (Sawang and Kivits, 2023). The knowledge-related AI barriers can be overcome by collaborating with industry AI consultants, or the necessary skills can often be taught to oneself through dedicated research. Other research corroborates these findings and emphasizes the need for external knowledge to successfully implement AI (Schönberger, 2023). Only one reviewed study emphasizes that SMEs can successfully develop AI-related knowledge internally (Kopka and Fornahl, 2023).

The study found that family businesses prioritize stability and continuity over short-term gains, which leads to a low volume of AI investments. Other non-family competitors are often more aggressive, putting family firms at risk of falling behind in efficiency and innovation. Leveraging AI to enhance long-term competitiveness without compromising stability should be a goal of family firms. Therefore, AI should be used to enhance decision-making, improve efficiency, and support strategic goals. Waiting too long to implement AI may be a risk that risk-averse family firms should want to avoid. Other studies support the finding that AI investment volume in family firms is low due to risk aversion but fail to suggest ways to invest in AI without being exposed to a lot of risk (Kumar and Ratten, 2024).

Further, the findings of this study emphasize the importance of managing resistance and ensuring gradual AI implementation. Many employees and business owners perceive AI as complex and sometimes unnecessary, which slows down adoption. Gradually implementing AI helps to build confidence and reduce resistance in the workforce. In the implementation process, leadership plays a crucial role and must lead the way. Gradual implementation of AI also reduces resistance and increases the level of acceptance based on previous studies (Oldemeyer et al., 2024).

Unlike existing research, which often stops at identifying barriers, this study presents a structured, phased approach to AI adoption that aligns with family business stability, values, and leadership dynamics. By following the three-phase framework, family firms can improve AI adoption and ensure alignment with family business identity and long-term goals. They

can also minimize resistance by engaging employees and stakeholders early. Further, the family firms can adopt AI gradually and sustain the AI initiatives through strong leadership commitment and continuous monitoring.

The study moves beyond theoretical discussion by providing an empirical, structured framework for implementation. In doing so, this study contributes to both academic research and managerial practice, helping family firms navigate the complexities of AI adoption while preserving their core identity.

5.3 Limitations & Future Research Agenda

The conducted study is qualitative, based on interviews with a limited number of participants. Even though it does provide rich insights, its findings may not be broadly generalizable to all family businesses. Using an even larger sample could validate the identified patterns further. To make the results even more generalizable, it would be helpful to diversify the sample. This study includes statements of experts from several different industries, such as manufacturing, construction, consulting, logistics, and technology. Future research should include other industries such as healthcare, tourism, food, and retail since the challenges of implementing AI might not be the same in every industry.

Further, most of the chosen experts are living and working in Germany. Several of the experts have operations abroad, but only one of them lives abroad. Therefore, the research focuses on Germany. Family business dynamics, AI adoption rates, and cultural attitudes towards technology may differ in other regions. A cross-country comparative study could explore how cultural and economic factors shape AI adoption in family-owned SMEs.

Future research could also include more non-family firm experts to further assess whether AI adoption barriers differ significantly between family and non-family SMEs.

Additionally, the interviews may include personal biases from the business owners, successors, and consultants. Some of the experts may overstate or understate AI adoption challenges and benefits. To minimize the bias, a mixed-methods approach could be used, including interviews as well as survey data. This process would most likely yield an even more objective understanding.

This study captures a snapshot of AI adoption in family firms but does not track long-term effects. A long-term study over multiple years might make AI’s impact on business performance, legacy preservation, and succession planning visible.

The identified key barrier, that there is a generational resistance, could be explored deeper. Future research could dive into how successors effectively introduce AI and what strategies reduce resistance among older leaders.

Quantifying the economic value added by AI in family businesses would be helpful as well. Future studies could measure the actual financial impact of AI in the identified areas, such as marketing and accounting.

As resistance in the workforce is a significant barrier to AI adoption in family firms, it would be recommendable to research AI training and employee adaptation methods. Comparing different AI training approaches could help make future AI adoption in family firms more effective.

Although this study has identified numerous barriers to AI implementation and pinpointed areas where companies should act, there is still significant potential for further research to explore specific topics in greater depth.

6 Conclusion

This study explores the challenges and opportunities of AI adoption in family-owned SMEs. It highlights how governance structures, long-term strategic vision, and emotional attachment shape digital transformation. AI adoption in family firms is often slowed down by financial constraints, generational resistance, and risk aversion. However, these businesses also share some key strengths that can effectively support innovation. Their ability to make quick decisions, maintain strong stakeholder relationships, and focus on long-term success creates a solid foundation for AI-driven transformation, when approached with the right strategy. Success depends on whether senior leaders and successors position AI as an enabler, not a disruptor, and whether they adopt a phased, step-by-step implementation. This research found that gradual implementation, starting with AI-driven efficiency improvements before scaling up, is the most effective approach to overcoming resistance and fostering a culture of innovation.

One of the most striking insights from this study is the deep emotional connection family business owners have with their firms, often prioritizing legacy and socioemotional wealth over short-term efficiency gains. This long-term perspective provides both stability and resilience, yet it can also result in hesitation toward technological change. However, those who successfully integrate AI do so not just for competitive advantage, but to ensure the business's sustainability for future generations.

The study highlights that AI's greatest potential for SMEs lies in automating repetitive tasks, improving decision-making, and optimizing operations, particularly in areas like administration, inventory management, and customer interactions. However, the implementation of AI depends on internal knowledge creation as much as on external partnerships, as the majority of family businesses lack internal knowledge. Engaging with consultants, universities, or AI start-ups bridges the gap, making AI implementation more accessible.

Despite common concerns, this study demonstrates that AI is not at odds with family business values, when implemented thoughtfully, it can reinforce them. AI-driven automation allows employees to focus on higher-value tasks. This can enhance customer relationships and long-term sustainability, both of which align with the core principles of family firms. As one interviewee insightfully put it, "Tradition and innovation don't have to be opposites. In our family firm, our tradition is to keep evolving." (A)

To navigate AI adoption successfully, this research introduces a structured, three-phase strategy. It consists of an AI readiness assessment, gradual implementation, and continuous optimization. Specifically designed for family businesses, all three phases aim to minimize the risk, maximize organizational buy-in, and optimize the benefits of AI without undermining the unique character of family businesses.

From an academic perspective, this study contributes to the underexplored intersection of family business research and digital transformation, providing empirical insights into how succession planning, emotional attachment, and governance structures influence AI adoption. Practically, the findings offer actionable guidance for family business owners, successors, and consultants on adopting AI while maintaining their firm's legacy and values.

Looking ahead, future research could explore how AI adoption varies across industries and cultural contexts or conduct longitudinal studies to assess its long-term impact on family business performance and succession planning.

Lastly, AI implementation in family businesses presents both opportunities and challenges. Change resistance and traditions may hamper implementation, but AI presents powerful abilities to enhance efficiency, decision-making, and long-term resilience. Those that implement AI responsibly do not only sustain their legacy but improve it for generations to come. As one interviewee rightly noted, "Many companies aren't prepared to embrace this transformation and take advantage of it, even though it comes with tremendous growth potential." (L).

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Appendices

Appendix 1: Gioia Methodology Data Structure Table

First-order Concepts	Second-order Themes	Aggregate Dimensions
-"The biggest challenge is the cost and time investment. Time is ultimately money. If, for example, you hire a service provider, the work is often billed hourly and can be very expensive." (A) -"Smaller companies, which are often family-run or led by the founder, tend to have fewer resources to engage with AI and implement it comprehensively." (C) -"AI represents a significant investment for smaller companies. To automate processes, they need substantial capital and good IT infrastructure, such as cloud computing, which often needs to be built first. That makes smaller companies more hesitant to invest." (L) -"If you're a big company, it's easier to say, 'Sure, we'll take this on,' because, as a percentage of revenue, it's less significant than it would be for smaller companies that have to consider whether the efficiency gains are worth the cost." (D)	High Costs and Resource Constraints	Challenges in AI Adoption for Family-Owned SMEs
-"On the machine level, I see benefits in automation, but it remains a huge challenge because our machines are highly specialized. AI solutions don't exist off the shelf for what we do." (A) -"For smaller companies, if you want to use AI, you often have to build your own models due to data security concerns, and then feed those models with your own data points. This is very costly, and the efficiency gains typically don't	Lack of Specialized AI Solutions	

justify the expense for smaller companies the way they do for larger ones." (D) -"There are AI solutions that can be used simply as an add-on, like for transcribing conversations, and others that are deeply integrated into business processes, like ERP systems. Implementing deeply integrated AI solutions is more complex and costly." (C) -"Smaller companies often have highly customized processes, making it difficult to develop AI tools tailored specifically for them. Right now, this kind of customization is expensive and primarily designed for large enterprises." (L)		
-"Some family businesses have leaders who are skeptical. They don't want these technologies because they think AI will take over human thinking." (A) -"In family businesses that have been doing well for 40 years, when it comes time to change processes that are no longer effective, there's sometimes a degree of stubbornness. The attitude is often, 'This has worked for 40 years; why should we change it now?' So, making the case for efficiency gains can take time." (D) -"Typically, it's the younger generation—often the son or daughter—who quickly realizes the need for digitalization and innovation. However, the senior often holds back, reluctant to make drastic changes to something they built over 30 or 40 years." (E) -"I think those opposing AI are likely in management, probably due	Decision-Making Barriers in Family Firms	

to their age. The older generation might not fully understand what AI is, and any change also involves more work. There might also be a bit of mistrust." (K)		
-"AI tools save us substantial costs on agencies and consultants. Before, we had to hire marketing agencies for graphics and content creation. Now, we do everything in-house with AI." (A) -"It's always about efficiency. It's about optimizing processes, avoiding unnecessary resources that can be replaced by AI, usually to optimize costs." (D) -"AI could lead to cost savings. There are many services that charge for creating and maintaining websites, but if AI could do this more efficiently, it might actually save money." (K) -"We're already using AI-based programs for scaffolding design. It saves time and prevents mistakes because everything is planned in advance. That means fewer errors and less wasted material, which reduces costs." (J)	Cost Reduction and Efficiency Gains	Opportunities in AI Adoption for Family-Owned SMEs
-"In large corporations, AI-related decisions take months because they have to pass through multiple departments. We can implement ideas in a single day." (A) -"If we have an idea in the morning, we can test it by midday. That's where we have an edge over bigger firms." (B) -"When the family business's CEO is willing to take on risks, the levers can usually be pulled much faster. If they decide, 'Hey, we want this,' the project can start two weeks later. That speed can help	Rapid Decision-Making and Competitive Advantage	

bring efficiency to the business early on." (D) -"In a family business, we don't have to get approval from a board or external investors. If we decide to implement something, we can just do it. That's a huge advantage in staying competitive." (J)		
-"I've worked with businesses where AI-driven process optimization led to massive efficiency improvements. But for family businesses, this often requires a shift in mindset—leaders need to see AI as a necessity, not a luxury." (G) -"We don't order just-in-time; we plan years in advance. AI could be very effective in analyzing how much of which goods we'll need and when, optimizing our storage space, and even determining whether we need external storage." (H) -"We have acquired a program that works with artificial intelligence, allowing us to create a digital representation of a construction site. It automatically generates scaffolding plans, including all necessary dimensions and specifications, significantly reducing the workload in planning." (I) -"I can imagine AI being useful in back-office operations, like accounting, cost estimation, or automating administrative tasks. These areas don't generate revenue directly but are still crucial for the company's efficiency." (K)	Business Process Optimization	
-"Quite the opposite – our tradition is actually innovation. Our goal is	Innovation as a Core Value in Family Firms	

to stay up to date and be open to new developments." (A) -"For us, family tradition actually speeds things up." (B) -"Companies should make innovation part of their corporate identity—there should be a conscious decision to prioritize it. If leadership doesn't foster innovation as a value, the company risks stagnation." (E) -"When innovation is prioritized in a family business and becomes a personal mandate from the owner, it's often highly impactful. In larger corporations, innovation can be deprioritized if those driving it lack influence, but in family firms, it's different." (G)		The Influence of Family Dynamics and Traditions on AI Adoption
-"Since our father belongs to the baby boomer generation, he doesn't have much involvement with AI or digital transformation topics. Fortunately, he gives us complete freedom in these areas." (A) -"If the CEO in a family business is forward-thinking, decisions can be made very quickly, without all the bureaucratic layers that exist in publicly traded companies." (D) "Family businesses are often structured around personal relationships. Employees and external stakeholders trust that leadership won't make reckless decisions. This long-term commitment fosters stability and trust in business operations." (G) "Since we only have 20 employees, we don't have a dedicated AI or digital transformation team. That means the responsibility for these decisions lies entirely with me, and my employees trust me to make the right calls." (I)	Trust and Autonomy in Family Business Leadership	

-"If I see that my father ran the company for 25 years and my grandfather for 25 years before him, then I might also want to continue the company successfully." (B) -"Family businesses don't just plan in years or decades—they plan across generations. CEOs want to ensure the stability of the company for their children, which leads them to take fewer risks compared to non-family businesses." (E) -"The company is considered the third child in our family. There's an intense emotional connection, and the business is thought of as part of the family itself, which makes long-term planning a top priority." (H) -"Parents or grandparents—whoever it may be—have a strong emotional connection to their business. It probably means much more to them than it would to a typical managing director because they built it up from the ground. Naturally, they want it to remain active and successful for as long as possible." (J)	Long-Term Vision and Responsibility in Family Firms	
-"There's this old-school way of thinking in many family businesses: 'We've been doing it like this for 30 years, why should we change now?' That mindset slows everything down." (A) -"Many in the older generation don't see AI as an opportunity. They see it as something unnecessary that complicates things instead of making them easier." (B) -"Between generations, there's always a question of direction—	Traditional Mindset and Fear of Change	Resistance to AI within Family-Owned SMEs

older generations are usually the ‘guardians’ while younger ones want to push forward. But resistance isn’t always about being against innovation; sometimes, it’s about not wanting to fix what isn’t broken." (G) -"My father has been successfully running the business for 27 years, and his philosophy has always been, ‘Never change a winning team.’ In other words, if something works, there’s no need to change it. So, he doesn’t see an urgent need to improve everything." (H)		
-"Some employees feel that using AI means their knowledge and experience are no longer valued. They don’t see AI as a tool—they see it as a replacement." (A) -"For decades, our team has been manually optimizing processes. When we introduce AI-driven automation, some feel like their craftsmanship is being devalued." (B) -"For instance, an accounting employee who has been handling bookkeeping manually for 20 years might resist change, even if it could increase efficiency by 50%. It’s about being open to learning and adapting." (D) -"The managing director has been in the role for 10 or 15 years and brings a lot of experience. They trust their intuition for decisions. That’s why some processes stay manual—because they’ve worked that way for years." (K)	Emotional Attachment to Manual Processes	
-"People say, ‘AI sounds great, but what exactly should we use it for?’ Without clear direction, it stays a	Perceived Complexity and Uncertainty About AI	

vague concept rather than an actionable tool." (A) -"We tried explaining how AI could streamline operations, but many just saw it as another tech buzzword. They don't trust it because they don't fully understand it." (B) -"Decision-makers often lack an overview of the available AI solutions and where they can be implemented." (C) -"Consultants play a significant role because AI is still a relatively new field. Companies often lack in-house expertise, so external support is crucial in setting up AI solutions correctly." (D)		
-"The first important step is to engage with the topic and recognize the possibilities. Then it's crucial to review the current offerings and determine what fits best with their processes—whether they need a customized solution or if existing AI tools can integrate effectively." (L) -"In any area with repetitive processes, automation is now possible. The key is identifying which tasks can be streamlined without disrupting the business's core competencies." (L) -"There are AI solutions that can be used simply as an add-on, like for transcribing conversations, and others that are deeply integrated into business processes, like ERP systems. Implementing deeply integrated AI solutions is more complex and costly." (C) -"If a small or medium-sized business has, say, 500 tickets a	Identifying the Right Areas for AI Implementation	Strategic AI Implementation Steps in SME Family Firms

year, and they reduce that to 350 or even 300, it’s nice, but it doesn’t offset the cost of implementation. Scaling is a key factor here, which makes the investment worthwhile." (D)		
-"Companies shouldn’t feel pressured by the AI hype. Instead, they should analyze their internal processes carefully and decide where AI makes the most sense. A step-by-step approach allows for smooth implementation without overwhelming employees." (L) -"AI adoption isn’t about replacing everything overnight. It’s about integrating AI into existing structures so that employees see the benefits early on, making the transition more natural." (L) -"Even if management wants to implement an AI solution, they need to ensure that employees accept and use it. There can be resistance here, as not everyone is open to new technologies." (C) -"AI adoption isn’t about replacing everything overnight. It’s about integrating AI into existing structures so that employees see the benefits early on, making the transition more natural." (D)	Gradual Implementation to Ensure Adoption	
-"If the CEO fully supports AI and allocates resources to it, implementation can be swift. But if leadership is hesitant, AI remains just a vague idea that never gets acted on." (L) -"Right now, the direction is clearly moving toward AI. If leadership doesn’t drive the adoption and ensure the right resources are in place, the company risks falling behind competitors." (L)	Overcome perceived Complexity and Uncertainty About AI	

-"If the CEO fully supports AI and allocates resources to it, implementation can be swift. But if leadership is hesitant, AI remains just a vague idea that never gets acted on." (C) -"When the family business's CEO is willing to take on risks, the levers can usually be pulled much faster. If they decide, 'Hey, we want this,' the project can start two weeks later. That speed can help bring efficiency to the business early on." (D)		

Appendix 2: Interview Guide (1): Family Firm Successors

1 Introduction	
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.* - ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*	
2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Role	What is your role in the company, and what responsibilities do you have?
3 General Perception of AI	
In the following, I aim to understand their current status regarding AI adoption in their family firm to tailor my questions to their level of use and progress. To achieve this, I have prepared specific questions.	
First Thoughts	What are your general thoughts on Artificial Intelligence (AI) and its potential in businesses?
Opportunity or Challenge	Do you see AI as more of an opportunity or a challenge for family businesses like yours?
Ethical Concerns	Do you have any ethical concerns connected to the adoption of AI?
4 Role in Digitalization and AI Adoption	
Involvement	Are you personally involved in the digital transformation of the company?
Leading Role	Who is primarily leading the digital transformation in the company?

Leading Role	What about your parents or non-family managers?
5 Family Dynamics and Decision-making	
Role of Family Dynamics	Do family dynamics play a role in decision-making regarding the adoption of AI and other innovations?
Family Traditions	Do you feel that family traditions could slow down progress?
Intergenerational Conflicts	Are there tensions between the older and younger generations regarding the management of the business, particularly in relation to digital transformation?
Influence of Conflicts	how do these tensions impact decision-making related to AI or other digital innovations?
6 Personal Role and Vision for the Future	
AI Vision	What is your vision for the future of the company with regard to AI and digital transformation?
Areas of Implementation	Are there specific areas where you would like to see AI implemented? Which ones?
Own Approach	If you had full decision-making power, would you approach AI adoption differently than your parents or the current management?
Risk	Would you be more willing to take risks or invest in AI tools?
7 Specific Challenges and Opportunities for Family Businesses	
Challenges	Do you think there are specific challenges for family businesses that make the adoption of AI or other technologies more difficult?
Elaborate	Do family traditions, internal politics, limited resources, or decision-making structures present obstacles?
Firm Size	Do you believe that family businesses like yours can benefit from AI in the same way as larger corporations?
Opportunities	Conversely, do you see specific opportunities for family businesses in adopting AI?
Elaborate	Are there strengths in family businesses that could support innovation?
8 Preparedness for Succession	

Preparedness	As a successor, do you feel well-prepared to handle the technological demands of running the business in the future?
Tech-savviness	Have you received any specific training or experience with AI and digital tools, perhaps through your studies?
Role of AI	How do you envision the future role of AI in the company?
Growth and Innovation	Could AI play a central role in your strategy for growth and innovation?
9 Financial and Strategic Considerations	
Willingness to Invest	Are you willing to invest in AI or other digital technologies to ensure the future competitiveness of the company?
Allocation	If so, where would you prioritize these investments? If not, what factors hold you back?
Performance Enhancement	How can AI help your company to reduce costs, increase revenue, or improve operational efficiency?
Areas of Improvement	Can you name specific areas where AI might benefit the company?
10 Closing	
Additions	Is there anything you would like to add to our conversation?
Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?

Appendix 3: Interview Guide (2): Owners of Family Firms

1 Introduction
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.*

- ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*	
2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Role	What is your role in the company, and what responsibilities do you have?
3 General Perception of AI	
In the following, I aim to understand their current status regarding AI adoption in their family firm to tailor my questions to their level of use and progress. To achieve this, I have prepared specific questions.	
First Thoughts	What are your general thoughts on Artificial Intelligence (AI) and its potential in businesses?
Opportunity or Challenge	Do you see AI as more of an opportunity or a challenge for family businesses like yours?
Ethical Concerns	Do you have any ethical concerns connected to the adoption of AI?
4 Knowledge Within the Company	
AI Experts	Has anyone in your company actively explored the potential that AI could offer?
Leading Role	If so, is it a family member or employee who is not part of the family? Are there people in your company who actively advocate for the adoption of AI?
Department	Are there specific roles or teams in your company that focus on innovation or digital transformation?
5 AI Usage and Readiness for AI Adoption	
Status quo	Are you currently using AI-powered tools in your company?
Tools	If yes, which ones, and how do they support you? If no, are you considering adopting such tools in the near future?
6 Role of Succession and Future Perspectives	

Role of Successor	Do you believe that the next generation (your children or other successors) are more interested in or capable of integrating AI into the company?
Influence on Management	Do you think the adoption of AI could influence how future generations manage the family business?
7 Financial and Strategic Considerations	
Challenges	Are you willing to invest in AI technologies for your company?
Motivation	What motivates this decision?
Hindrance	What hinders this decision?
Costs and Revenue	Do you believe AI could help reduce costs or increase revenues?
8 Challenges and Barriers to AI Adoption	
Barriers	In your opinion, what are the biggest barriers for small and medium-sized family businesses in adopting AI?
Factor of Firm Size	Do you believe small and medium-sized family businesses can also benefit from AI, or is it more suited for larger companies?
9 Future Outlook	
Opportunities	How do you see the impact of AI on your industry over the next 5–10 years? Could this fundamentally change the way businesses operate?
10 Closing	
Additions	Is there anything you would like to add to our conversation?
Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?

Appendix 4: Interview Guide (3): Consultants driving AI adoption in firms

1 Introduction	
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.* - ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*	
2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Role	What is your role in the company, and what responsibilities do you have?
3 General Experience with AI Implementation	
In the following, I aim to understand their expertise in the process of adopting AI in companies to tailor my questions accordingly. To achieve this, I have prepared specific questions.	
Experience	Can you briefly describe your experience with implementing AI in business processes?
Types of Companies	What industries or types of businesses have you worked with on AI projects?
Reasons for AI use	From your experience, what are the most common reasons businesses turn to AI?
4 Family Firms vs. Non-Family Firms in AI Adoption	
Differences	Based on your experience, do family firms approach digital transformation, particularly AI, differently from non-family firms? If yes, what are they doing differently?

Family Dynamics	How do family dynamics impact the adoption of AI in family-owned businesses?
Family Firm Challenges	What challenges specific to family firms have you encountered when implementing AI in such businesses?
Strengths of Family Firms	Conversely, do you think family firms have any unique strengths or advantages over non family firms?
5 Influence of Firm Size and Ownership Structure	
Firm Size	In your opinion, how does the size of a company influence its approach to AI adoption? Do you think family-owned SMEs can benefit from AI in the same way as larger companies?
Ownership	How does the ownership structure of a company impact AI-specific actions?
6 Role of External Consultants	
Role of Successor	What roles do external consultants and advisors play in helping family firms overcome these challenges?
Receptiveness of family firms	Are family firms generally receptive to outside advice, or do family dynamics sometimes hinder external influence?
7 AI Opportunities for Family Firms	
Opportunities	What opportunities do you see for family firms or firms in general to leverage AI for competitive advantage?
Most valuable Implementation	Are there specific business functions (e.g., operations, customer relations, supply chain) where AI can add the most value for family-owned SMEs?
Environment	How can family firms create a more supportive environment for AI adoption?
8 Strategic Differences Between Family Firms and Non-Family Firms	
Strategic Differences	In your experience, how do family firms' strategic priorities differ from non-family firms?
9 Future of AI in Family-Owned Businesses	
Opportunities	What trends do you foresee in AI adoption among family-owned businesses over the next 5-10 years?
10 Closing	
Additions	Is there anything you would like to add to our conversation?

Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?

Appendix 5: Interview Guide (4): Succession Consultant for Family Firms

1 Introduction	
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.* - ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*	
2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Specilization	Have you specialized in a specific type of family business (e.g., by size, industry, or generation within the business)?
3 Family Dynamics and Innovation	
In the following, I aim to understand their expertise in the process of adopting AI in companies to tailor my questions accordingly. To achieve this, I have prepared specific questions.	
Influence of Family Dynamics	Based on your experience, how do family dynamics typically influence a family business's ability to innovate?
Barriers	Do you often observe patterns where familial relationships promote the innovation process? What specific family dynamics can act as barriers to innovation in family-owned businesses?

Positive Impact	Do you often observe patterns where familial relationships hinder the innovation process? Are there family dynamics that can have a positive impact on innovation?
4 Succession and Its Impact on Innovation	
Impact	How does the succession process typically affect the ability of family businesses to innovate?
Successors	Are successors generally more open to new ideas and technologies, or do they tend to maintain the status quo?
Leadership transition	Do you observe differences in the approach to innovation when leadership transitions to the next generation?
Challenges connected to succession	What challenges do family businesses face in balancing succession planning with the need for continuous innovation?
5 Family Businesses vs. Non-Family Businesses Regarding Innovation	
Competitive Advantage	Do you believe non-family businesses have an advantage over family businesses when it comes to innovation? If so, what do you think are the key factors that give non-family businesses an edge?
Decision-Making Process	How does decision-making in family businesses differ from that in non-family businesses in terms of flexibility and willingness to take risks with new ideas?
Risk Aversion	Do you believe family businesses are generally more risk-averse?
6 Challenges and Opportunities in Family Businesses	
Challenges	What are the most common challenges family businesses face regarding leadership transitions?
Facing Challenges	How can family businesses overcome internal resistance to change, especially during succession periods?
Strategies	What strategies have proven effective for families that successfully manage these transitions while staying innovative?
Role of Non-Family members	What role do non-family executives or external consultants play in supporting family businesses during the succession process?
7 AI Opportunities for Family Firms	
Opportunities	What opportunities do you see for family firms or firms in general to leverage AI for competitive advantage?

Most valuable Implementation	Are there specific business functions (e.g., operations, customer relations, supply chain) where AI can add the most value for family-owned SMEs?
Environment	How can family firms create a more supportive environment for AI adoption?
8 Strengths and Weaknesses of Family Businesses	
Strengths	In your opinion, what are the key strengths that family businesses bring to ensure sustainable growth and long-term stability?
Weaknesses	What are the main weaknesses or limitations of family businesses that may hinder their ability to drive greater innovation or competitiveness?
Strategies	In your view, how can family businesses best leverage their strengths to overcome the challenges they face in maintaining their competitiveness and capacity for innovation?
9 Future Prospects for Family Businesses	
Opportunities	How do you see the future of family businesses in terms of innovation and growth?
Steps	What key steps do you believe family businesses should take to remain innovative while preserving their family values and legacy?
10 Closing	
Additions	Is there anything you would like to add to our conversation?
Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?

Appendix 6: Interview Guide (5): Non-Family Managers of Family Firms

1 Introduction	
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.* - ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*	
2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Role	What is your role in the company, and what responsibilities do you have?
3 General Perception of AI	
In the following, I aim to understand their current status regarding AI adoption in the family firm the work in to tailor my questions to their level of use and progress. To achieve this, I have prepared specific questions.	
First Thoughts	What are your general thoughts on Artificial Intelligence (AI) and its potential in businesses?
Opportunity or Challenge	Do you see AI as more of an opportunity or a challenge for family businesses like yours?
Ethical Concerns	Do you have any ethical concerns connected to the adoption of AI?
4 AI Adoption within the Family Firm	
AI Usage	Do you currently use AI-based tools within the company? If yes, in what areas (e.g., operations, customer service, financial analysis)?

Status Quo	Is AI adoption actively discussed within the company, and if so, by whom?
AI Leader	Who is actively supporting the AI adoption in the company? (family members, external advisors, non-family managers?)
Reasoning	Are there specific reasons why the company has or has not adopted AI?
5 Personal Role and Decision-making	
Role of Family Dynamics	Do you believe that more investment in AI could improve the company's future performance?
Personal Role	What is your personal role in the digital transformation of the company?
6 Financial and Strategic Considerations	
Barriers	In your view, what are the financial or strategic barriers that the company faces in adopting AI?
Impact of AI	Do you think AI adoption could help the business reduce costs or increase revenue?
7 Challenges Specific to Family Firms	
Risk Aversion	Do you think family businesses, in general, are more risk-averse when it comes to digital transformation? How does this impact the adoption of AI and other technologies in the company?
Challenges	Are there specific challenges within this family business that you feel hinder AI adoption?
Strategies	What do you think the company could do differently to overcome these challenges?
8 Opportunities of AI for Family Firms	
Preparedness	What opportunities do you think AI presents for the company in terms of growth, innovation, or competitive advantage?
Firm Size	Do you believe family-owned SMEs can benefit from AI in the same way as larger companies?

9 Future Outlook	
Future	How do you see AI impacting this industry over the next 5-10 years? Do you think the company will need to adopt AI to remain competitive?
10 Closing	
Additions	Is there anything you would like to add to our conversation?
Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?

Appendix 7: Interview Guide (6): AI Strategy Experts

1 Introduction
- ***Personal Introduction****: Thank you for taking the time for this interview. My name is Nick-Marvin Künne, I am a Management Master's student at Católica Lisbon School of Business and Economics. Currently, I am writing my thesis on Challenges and Opportunities in AI Adoption for small and medium-sized family firms under the supervision of Liliana Dinis* - ***Interview Purpose:*** *As mentioned in my message, I am particularly interested in understanding the current status of AI adoption within your family-owned SME, as well as your approach to its implementation. I would like to delve deeper into the challenges you face and the opportunities you perceive in this process. Additionally, I aim to explore the underlying reasons behind these challenges and opportunities to gain a comprehensive perspective.* - ***Disclaimer:*** *I would like to ask your permission to record our conversation. Please let me know if you wish for me to anonymize the data and findings related to [Company name] as well as yourself.*

2 Interviewee	
Company	Could you please provide a brief introduction about yourself? Specifically, where do you work, what is the focus of your company, and what is its approximate size?
Role	What is your role in the company, and what responsibilities do you have?
3 General Insights on AI Technology	

In the following, I aim to better understand the current state of AI technology and its most common application in companies to tailor my questions accordingly. To achieve this, I have prepared specific questions.	
Current state	Can you describe the current state of AI technology and its capabilities for businesses?
Areas of Application	What are the most common business functions where AI is currently making the greatest impact?
Challenges in Implementation	From a technological perspective, what challenges do businesses commonly face when trying to implement AI?
4 Dynamics of AI Adoption	
Factor Firm Size	In your opinion, how does the adoption of AI vary between different types of organizations, such as SMEs versus larger corporations? Are there specific technologies or tools better suited for smaller businesses?
Role of Executives	How important is leadership buy-in and cultural readiness for successful AI implementation?
Family Dynamics	How might family dynamics, such as generational differences or the influence of family legacy, shape the adoption of AI within family firms? (Positive, Negative)
5 Size Structure, and AI Accessibility	
Firm Size	How does the size of a company influence its ability to leverage AI effectively? Are smaller companies limited by resources, or do advancements like cloud-based solutions help bridge the gap?
Organizational Structure	Do you think businesses with less hierarchical decision-making structures are better positioned to experiment with AI? How does organizational agility affect the speed of adoption?
AI tools for SMEs	Do you know emerging AI solutions specifically designed to address the needs of SMEs or businesses with limited technical expertise?
6 Broader Challenges in AI Adoption	
Main Challenges	From a technological perspective, what are the primary hurdles businesses face when trying to implement AI?
Preparation	How can organizations better prepare themselves to adopt AI effectively?

7 Opportunities in AI	
Competitive Advantage	What opportunities do you see for businesses to leverage AI for competitive advantage?
Important AI Tools	Are there any emerging AI technologies or applications you believe businesses should focus on in the near future?
8 Future of AI in Family-Owned Businesses	
Opportunities	Looking ahead, what advancements in AI technology do you think will have the greatest impact on businesses over the next 5–10 years?
9 Closing	
Additions	Is there anything you would like to add to our conversation?
Network	Do you feel like there is anybody within your network that I should talk to, such as experts in the field of AI, owners of family firms or successors?