Achieving the "AI sweet spot": Balancing feasibility, viability, and desirability in Artificial Intelligence Implementation

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ABSTRACT

This paper presents the "AI Sweet Spot" framework for systematically identifying Artificial Intelligence (AI) initiatives that balance technical feasibility, commercial viability, and user desirability, addressing the challenge of turning ambitious AI concepts into sustainable, high-impact solutions. A structured literature review of innovation management and AI deployment studies was combined with analyses of industry best-practice case studies. Insights were synthesized through the Innovation Sweet Spot lens to form a three-dimensional model, with design-thinking methods embedded to keep user desirability central. Critical success factors include robust data governance, rapid prototyping, cross-functional collaboration, and executive sponsorship. Recurring pitfalls involve siloed decision-making, underinvestment in user research, and misaligned performance metrics. Case studies show design-thinking interventions surface user pain points early, improving adoption and reducing wasted effort. A balanced view of feasibility, viability, and desirability is essential for AI project success. The "AI Sweet Spot" framework provides a roadmap for assessing trade-offs, prioritizing high-value opportunities, and mitigating technical, commercial, and human-centered risks. Practitioners can use the framework's diagnostic questions and prioritization criteria to evaluate use cases, allocate resources strategically, and establish governance processes that enable responsible, scalable, and user-centric AI deployments.

Keywords: *AI software, AI sweet spot, Artificial intelligence, Desirability, Digital transformation, Feasibility, Innovation sweet spot, Market demand, User-centricity, Viability.*

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Highlights of this paper

- This paper introduces the "AI Sweet Spot" framework—derived from the Innovation Sweet Spot—to help organizations balance technical feasibility, commercial viability, and user desirability when planning and scaling AI initiatives.
- Through a comprehensive literature review and best-practice analysis, it identifies the key success factors and common obstacles in each dimension and offers actionable recommendations for integrating AI solutions effectively.
- By incorporating user-centered methods like design thinking and mapping the interplay of feasibility, viability, and desirability, the study equips businesses with a practical guide to develop sustainable, high-impact AI applications and suggests directions for future research.

1. INTRODUCTION

Artificial intelligence (AI) is considered a key technology for digital transformation and promises companies in a wide range of industries significant efficiency gains and the development of new business opportunities (Perifanis & Kitsios, 2023). Numerous studies have highlighted the enormous potential of AI software applications in optimizing business processes and increasing competitiveness (Bitkom, 2023). Generative AI (GenAI) is a type of AI that many managers want to try in their companies on an ad hoc basis. However, managers often overlook the need for a solid, holistic, and feasible AI strategy to utilize the value of this technology and sustainably manage risks (Gartner Information Technology, 2024). In practice, there is often a discrepancy between high expectations and the actual implementation of AI solutions in companies. While many companies see AI as a future technology, many AI projects fail because of the complexity of implementation (Benbya, Pachidi, & Jarvenpaa, 2021).

Successful implementation of AI software applications requires a holistic view of various dimensions. The concept of the "Innovation Sweet Spot" proves to be a very useful framework concept and was further developed into the "AI Sweet Spot" in this study, as shown in Figure 1.

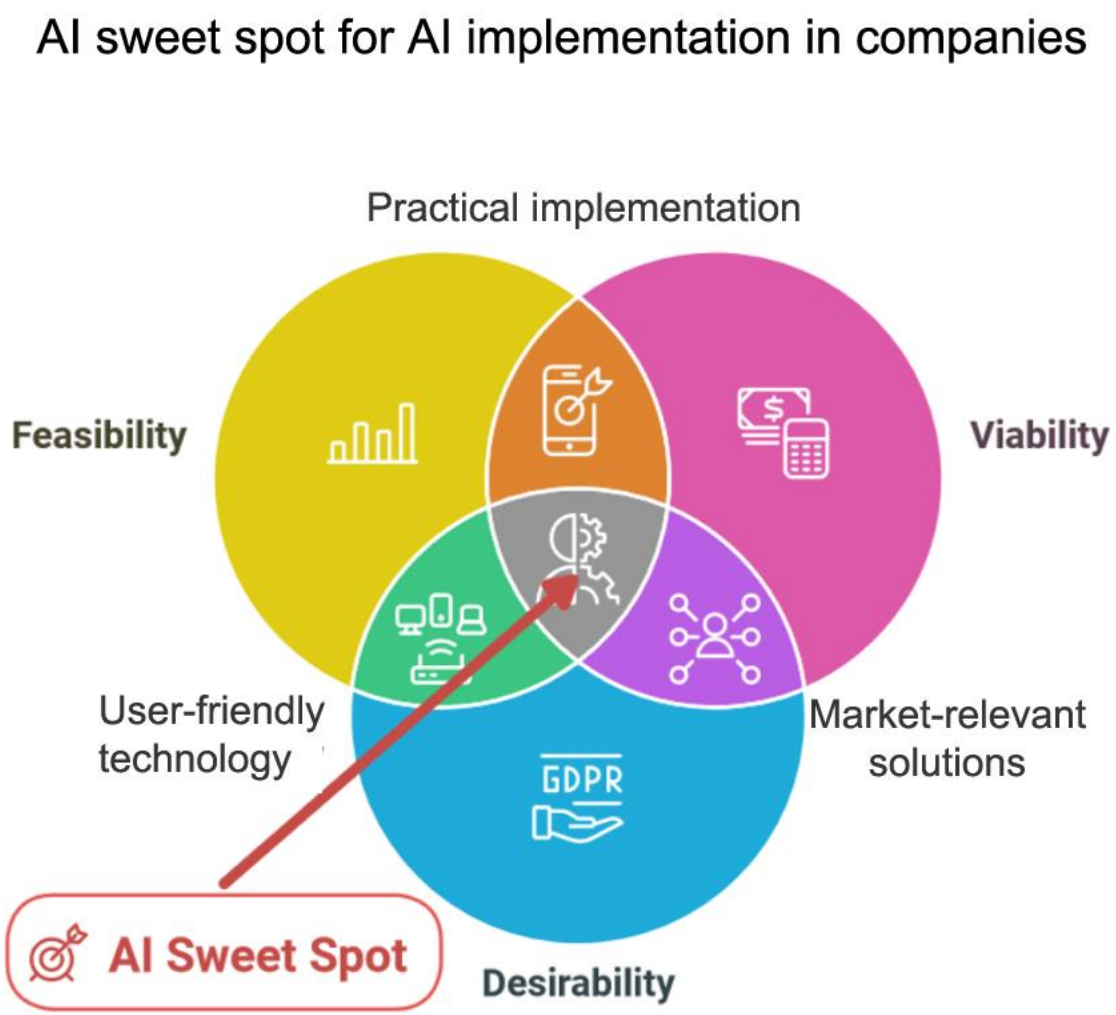

Figure 1. The AI sweet spot as a derivation of the innovation sweet spot (Own illustration).

An Innovation Sweet Spot describes the ideal point at which an innovation is feasible, economical, and satisfies demand (Jarr-Koroma, 2021). In the context of AI implementation, companies must consider the following three dimensions.

- Feasibility: Availability of the necessary IT infrastructure, data quality and quantity, and technical expertise within the company.
- Viability: Cost-benefit analysis, long-term strategic advantages, increasing competitiveness, and opening up new markets.
- Desirability: User-centric requirements, alignment with business objectives, and potential benefits of AI solutions.

This study examines the factors that influence the successful implementation of AI software applications in companies. The three dimensions of the AI or Innovation Sweet Spot—feasibility, viability, and desirability—are analyzed holistically. Therefore, the central research question is as follows.

What factors influence the successful implementation of AI software applications in companies, considering the three dimensions of the Innovation Sweet Spot: Feasibility, Viability and Desirability?

A qualitative approach was used to answer the research question. This study is based on a comprehensive literature review that sheds light on the current state of research in the fields of AI implementation and digital

transformation. In addition, relevant company reports and white papers were examined as part of the document analysis. The data obtained were systematically evaluated using qualitative methods, particularly content analysis.

In the remainder of this article, the three dimensions of the Innovation Sweet Spot are analyzed in detail, and the results of the study are presented. Specific recommendations for actions were derived for companies that want to implement AI software successfully. Finally, potential future developments in the AI field and their impacts on companies are discussed. The remainder of this paper is organized as follows. Section 2 presents the materials and methods used in this study. Section 3 presents the results of the analysis. Section 4 discusses the results and embeds them in the context of the existing literature. The limitations of this study and further in-depth research areas were identified. Finally, Section 5 summarizes the most important conclusions and provides an outlook for future research.

2. MATERIALS AND METHODS

This section describes the methodology used in this research to analyze the opportunities and challenges of integrating AI into business processes (see Figure 2).

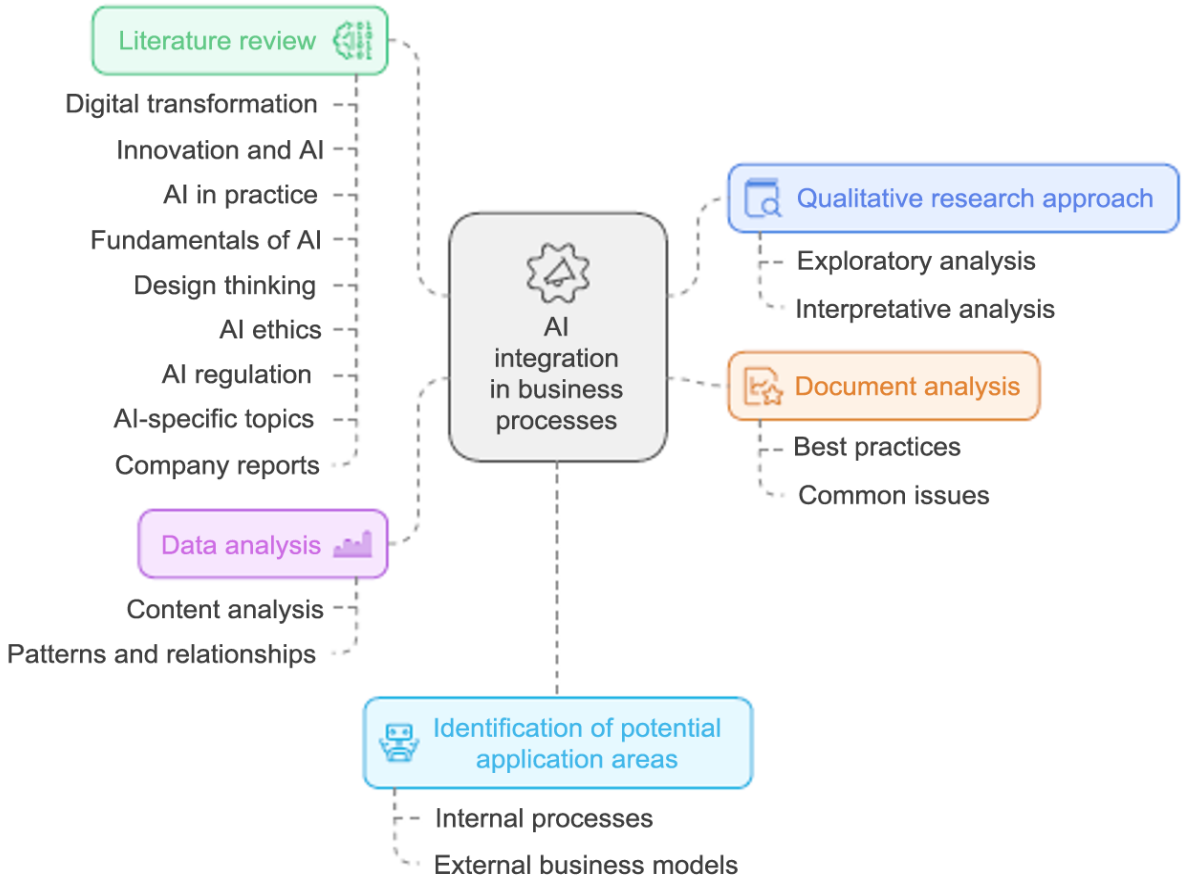

Figure 2. Applied Methodology of this study (Own depiction).

The extensive analysis was primarily aimed at identifying the influencing factors that significantly determine the success of AI implementation so that companies can increase their competitiveness and/or open up new markets. Another aim was to derive concrete recommendations for best practices and typical problem areas in AI implementation of artificial intelligence. The Innovation Sweet Spot model (see section 2.1) was used as the theoretical basis for the analysis.

2.1. The Concept of the Innovation Sweet Spot

In this study, the model of the Innovation Sweet Spot was used as a theoretical basis to systematically analyze the requirements, especially for successful AI implementations, and derive practical recommendations for action. An Innovation Sweet Spot describes the ideal point at which technological innovation is technically feasible (feasibility), economically viable (viability), and aligned with real needs (desirability). This concept was originally coined by design and innovation methods, such as design thinking (see section 3.3.2), in particular by authors such as Tim Brown and Roger Martin. It is used to ensure that innovations cover all relevant dimensions and can therefore be successfully implemented (Brown, 2009; Martin, 2009). This approach was developed in innovation research and strategic management and is now a proven model for evaluating new products and technologies. In particular, it is used in digital transformation to assess the holistic feasibility of innovative projects (Creswell & Poth, 2018). Application in other contexts: The concept of the Innovation Sweet Spot can be found in various areas, such as product development, software development, and the introduction of disruptive technologies. It serves as a decision-making framework for aligning innovations in such a way that they both generate benefits and efficiently use resources (Flick, 2019).

The authors of this study view the Innovation Sweet Spot as a particularly valuable framework for implementing AI in companies. They therefore transfer the concept specifically to AI implementation in companies and thus define the "AI sweet spot". AI projects often fail because they are technically complex (lack of feasibility), not economically scalable (lack of viability), or fail to meet the needs of users (lack of desirability). A holistic view of these three dimensions helps companies plan AI projects in a targeted manner and implement them successfully (Liedtka & Ogilvie, 2011; Osterwalder, Pigneur, Bernarda, & Smith, 2014).

2.2. Qualitative Research Approach

As previously mentioned, this study was based on a qualitative research approach. This approach was selected to gain an in-depth understanding of the challenges and success factors in implementing AI applications in companies. Qualitative research is particularly suitable for complex explorative questions that include technological, organizational, and cultural factors. Compared to the quantitative methodology, which uses numerical data and statistical analysis, this methodology offers decisive advantages for investigating multilayered phenomena, such as AI implementation (Appelfeller & Feldmann, 2023a; Nadkarni & Prügl, 2021).

As the use of AI in companies is still relatively new and involves a wide range of interactions, qualitative methods enable comprehensive and in-depth analysis of individual and organizational dynamics. Instruments, such as surveys and case studies, can be used to ask open questions and gather specific experiences and perceptions of those involved (Yin, 2018). This is particularly helpful for exploring stakeholder perspectives because standardized quantitative metrics are often lacking in this area (Patton, 2015).

Another advantage of the qualitative methodology is its flexibility. The research process can be adapted to newly emerging findings that are particularly important in dynamic environments, such as the implementation of AI (Denzin & Lincoln, 2018). While quantitative methods are particularly suitable for measuring the spread of certain phenomena or hypothesis testing, qualitative research offers the opportunity to generate new insights and provide comprehensive descriptions of processes, challenges, and patterns of action.

Therefore, the choice of qualitative methodology for this study makes sense as it creates space for the collection of open, non-standardized data. This enables a deeper understanding of the success factors and obstacles in the implementation of AI and forms the basis for practical action recommendations. It can also serve as a starting point for future quantitative studies to further validate and scale the insights gained here (Nadkarni & Prügl, 2021; Patton, 2015). The focus is on explorative and interpretative analysis of text data to gain a deeper understanding of

the complex relationships between AI and business processes. In addition to identifying the factors that have a significant impact on the success of AI implementation, the aim was to shed light on the challenges and opportunities of using AI in business processes.

2.3. Literature Research

The research process began with a comprehensive literature review to capture the current state of research in the field of AI and digital transformation and to lay the theoretical foundations of the work. The literature review involved analyzing a wide range of publications to capture a broad spectrum of perspectives and insights on the topic of AI and business. A total of 87 relevant scientific articles, specialist books, industry reports, twelve company reports, and white papers were used for literature research. In addition, 50 publications on the fundamentals of artificial intelligence, design thinking, ethics of AI, regulation of AI, and other AI-specific topics were analyzed. In each case, it was determined whether and to what extent the fundamentals of AI, innovation, and Innovation Sweet Spot aspects listed in the following overview (Figure 3) were covered in the respective publications:

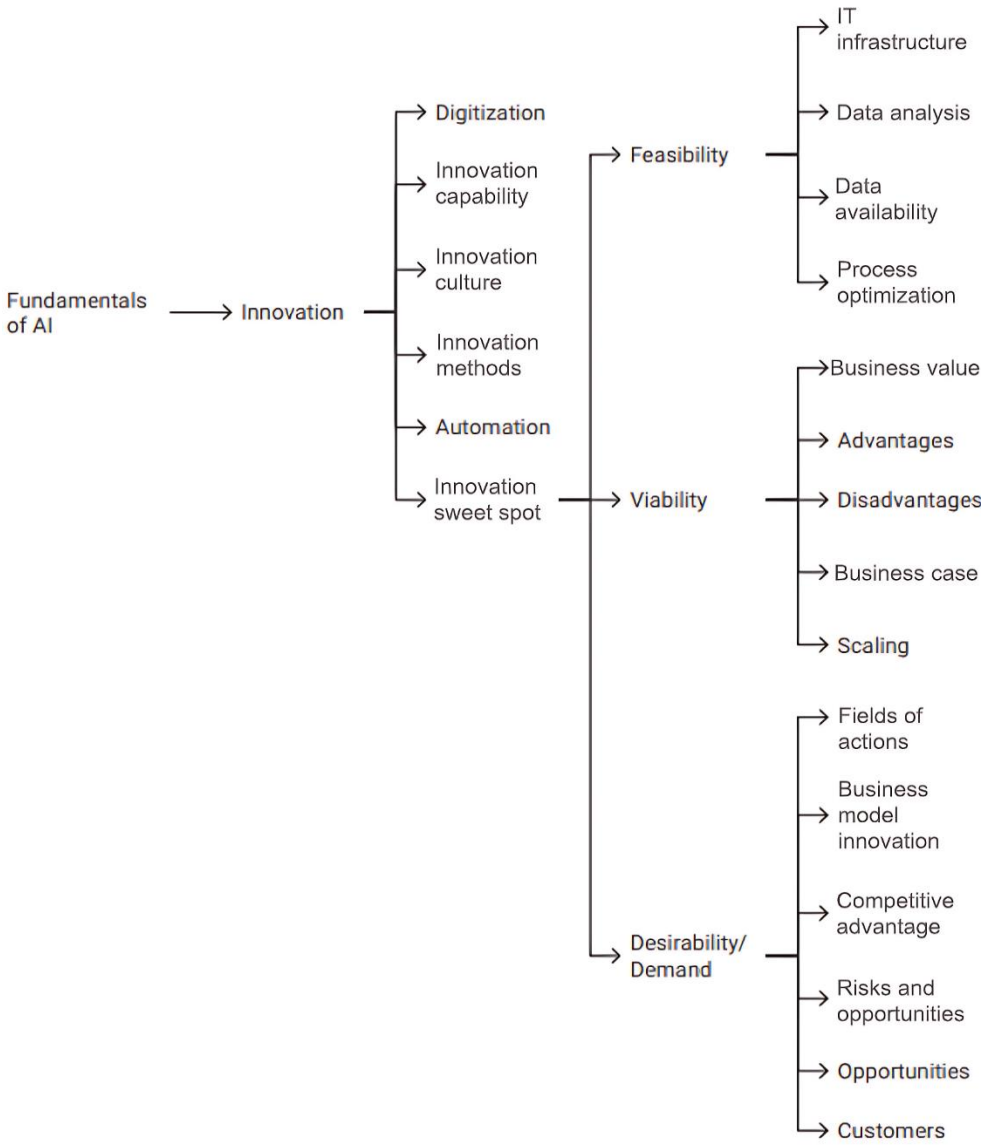

Figure 3. Dissection of the examination contents within the scope of the literature research.

A comprehensive and well-founded analysis of the opportunities and challenges of using AI in companies has been conducted. Diverse perspectives and findings from various publications contribute to an in-depth understanding of the complex relationships between AI and business processes.

2.3.1. Relevant Literature

Digital transformation: In order to comprehensively understand the influence of AI on digital transformation, works by authors such as Altenfelder, Schönfeld, and Krenkler (2021); Appelfeller and Feldmann (2023a); Balakrishna (2022); Binckebanck, Elste, and Haas (2023); Bitkom (2023) and Zada, Persson, and Nielsen (2022) were analyzed. These sources offer insights into the challenges and opportunities of digital transformation, and the influence of new technologies and strategies for successfully shaping change.

Innovation and AI: The literature research also included an analysis of publications dealing with innovation in the field of AI to understand the potential and challenges of the technology for innovation processes. For example, Fraunhofer IEM (2022); Fraunhofer ISI (2023) and Gausemeier (2009) were consulted.

AI in practice: To shed light on the practical application of AI in companies, case studies and practical examples from the literature were analyzed by Döbel et al. (2019); Enholm, Papagiannidis, Mikalef, and Krogstie (2022); Fraunhofer IAO (2021); Göpfert (2024); Haller (2022); Harwardt, Niermann, Schmutte, and Steuernagel (2022) and Hornung (2024). These sources provide insights into the specific applications of AI, the successes achieved, and the challenges in its implementation.

2.3.2. Basics of Artificial Intelligence

To gain a comprehensive understanding of AI, machine learning, deep learning, and related technologies, numerous fundamental publications have been consulted. Examples include works by Appelfeller and Feldmann (2023b); Fink (2023); Heesen (2023); Heid (2024) and Taulli (2022). These studies were used to shed light on the technical foundations of AI systems and gain a deeper understanding of how AI works and how it can be used.

2.3.3. Design Thinking

To emphasize the user-centered approach to AI implementation, sources of design thinking (see section 3.3.2) were included in the literature review, including the studies by Feichtenbeiner (2022) and Franken and Franken (2023). These sources highlight the importance of the user perspective and the inclusion of design thinking methods in the development process of AI solutions.

2.3.4. Ethics of AI

Publications on the ethics of AI, such as that by Koska (2023) were analyzed to consider the ethical implications of AI use in companies. These sources shed light on important aspects such as data protection, discrimination, transparency, and accountability in the use of AI systems.

2.3.5. Regulation of AI

To understand the legal framework for the use of AI, sources on the regulation of AI were included in the literature review, including works by Bocksch (2024); Kraft and Wockel (2024); Long (2024) and PwC Germany (2024). These publications provide information on the European Artificial Intelligence Act and other regulatory frameworks that influence the use of AI.

2.3.6. AI-Specific Topics

In addition to the aforementioned topics, publications on specific AI applications and technologies were included in the literature search. Examples include publications on the topics of computer vision (Safar, 2022) hyper automation (Siebel, 2024) AI integration in Industry 4.0 (Fraunhofer IKS, 2024) and image processing (Fraunhofer IPK, 2024). These sources were used to cover a broad spectrum of AI applications and technologies and to shed light on the many possible uses of AI in companies.

2.4. Document Analysis of Company Reports/White Papers

In addition to the relevant literature, 12 company reports and white papers were analyzed to gain practical insights into the implementation of AI in companies. Examples include publications such as the results of the Cisco survey on the use of artificial intelligence among German companies in October 2023 (Cisco Systems., 2023) the Cisco study with 8,000 participating IT managers in 30 countries in December 2024 (Cisco Systems., 2024a) the Deloitte report on the State of AI in Enterprise 2020 (Deloitte Insights, 2020) and 2024 (Deloitte Insights, 2024) and the 2021 Fraunhofer IAO study on the impact of artificial intelligence in business practice on services and production (Fraunhofer IAO, 2021). These sources provide information on the strategies, challenges, and success factors of companies that already use AI. Important insights were gained into the practical application of AI, best practices were identified, and typical problem areas for the implementation of AI were identified.

2.5. Data Analysis

The data collected in the literature review and document analysis were evaluated using a qualitative research approach based on the analysis of textual data from academic articles, textbooks, industry reports, company reports, and white papers mentioned in sections 2.3 and 2.4. This approach aims to gain an in-depth understanding of the opportunities and challenges of AI implementation in organizations by identifying patterns and correlations in the data. Various AI foundations, such as machine learning, neural networks, computer vision, and robotics, were initially considered. However, the analysis of various AI foundations highlighted only the technical possibilities and challenges in the context of feasibility. A description of the technological foundations is not provided here, as it is beyond the scope of this article.

The analysis of the text data involved extracting relevant information from the texts and categorizing and interpreting it. Data were coded using a coding matrix containing various categories and subcategories. The results of the content analysis are presented in the form of tables, graphics, and text to visualize and interpret the identified patterns and correlations.

2.6. Identification of Potential Fields of Application and Recommendations for Action

The identification of potential applications of AI in companies considers internal processes and external business models. The analysis includes both established fields of application and innovative uses of AI that have the potential to increase companies' value creation. Conclusions were drawn and recommendations for practical action were derived based on a solid scientific foundation. The results are discussed in the context of this research question.

3. RESULTS

In accordance with the previously formulated research question, which factors influence the successful implementation of AI software applications in companies, considering the three dimensions of feasibility, viability, and desirability, the results of the analysis are presented in detail in this section with regard to precisely these three aspects.

3.1. Feasibility of AI Solutions

3.1.1. Business Capabilities in the Context of Artificial Intelligence

The feasibility of AI solutions in companies depends largely on their existing business capabilities. Companies require specific capabilities in various areas to successfully implement AI projects. The capabilities identified in this study, which are explained below and shown in Figure 4, are closely interlinked and, in some cases, have smooth transitions and form the basis for the successful implementation of AI solutions in companies (Bitkom, 2018; Bundesdruckerei, 2022; Lixenfeld, 2015; Mittelstand Digital Center Augsburg, 2024; Müller-Jones, 2017; Pfannstiel & Steinhoff, 2020; Rüping, 2024; Statista, 2024).

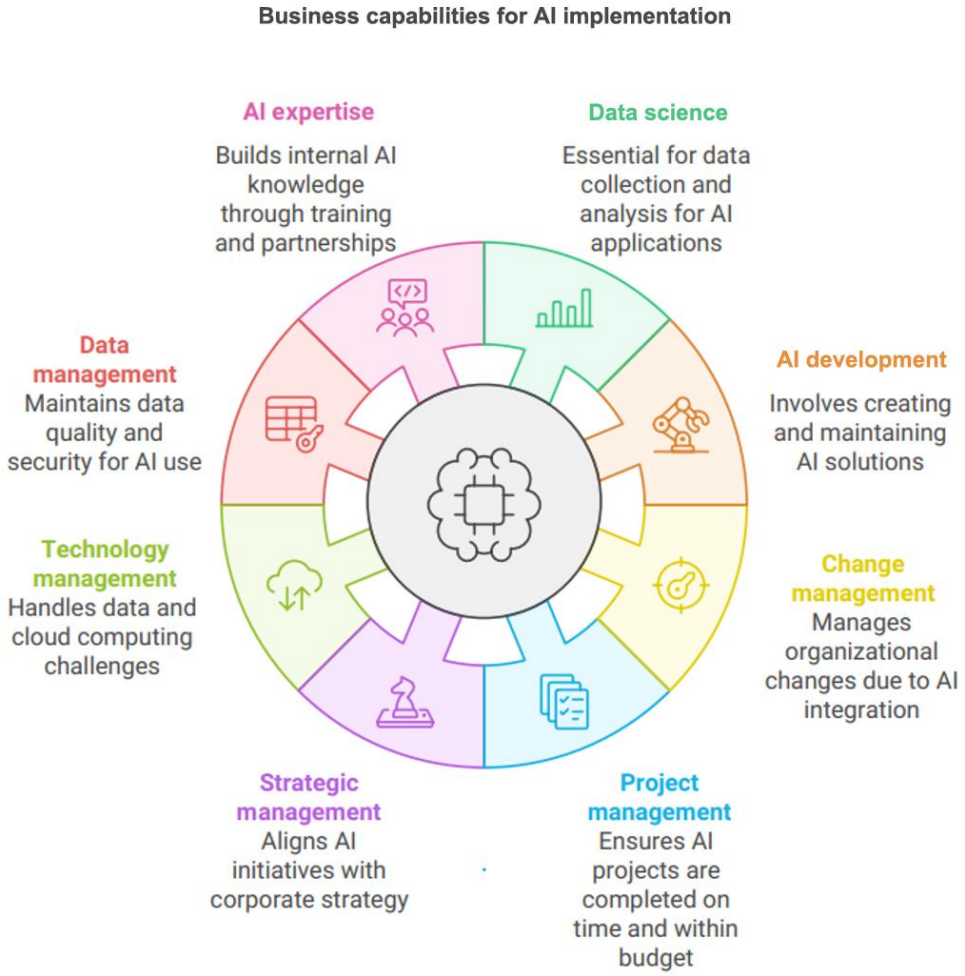

Figure 4. Business capabilities required for AI implementation.

- Data Science: This skill involves the collection, processing, analysis, and interpretation of the data required for AI applications. Data scientists play an important role in providing insights from the data that can be used to develop and optimize AI models.
- AI Development: Companies need the ability to develop, implement, and maintain AI solutions. This includes knowledge in the areas of machine learning, deep learning, computer vision, and/or robotics. AI solutions can be developed internally or collaboratively by external partners.

- Change management: The introduction of AI in companies often entails far-reaching changes. Therefore, companies must plan, communicate, and manage these changes to ensure the acceptance of AI solutions among employees.
- Project management: The implementation of AI solutions requires structured project management to ensure that projects are successfully completed within a specified timeframe and budget.
- Strategic management: Companies must recognize the strategic potential of AI and integrate it into their corporate strategy. It is important to evaluate the potential of AI in optimizing existing business processes and developing new business models.
- Technology Management: Dealing with large amounts of data ("big data") is a key challenge in implementing AI solutions. Therefore, companies need the ability to collect, store, process, and analyze data. The increasing importance of cloud computing in the context of AI requires strategic cloud management.
- Data management: Ensuring data quality, availability, and security is essential to the success of AI projects. Companies must be able to integrate data from different sources to make it usable in AI applications.
- AI expertise: Companies require qualified specialists with knowledge of data science, machine learning, and AI development. Internal AI expertise can be developed through collaboration with external partners and targeted training of employees.

As far as strategic management and technology management are concerned, which are crucial for the successful implementation of AI within a company, several levels have been identified for these two capabilities that must be successfully implemented, see Figure 5.

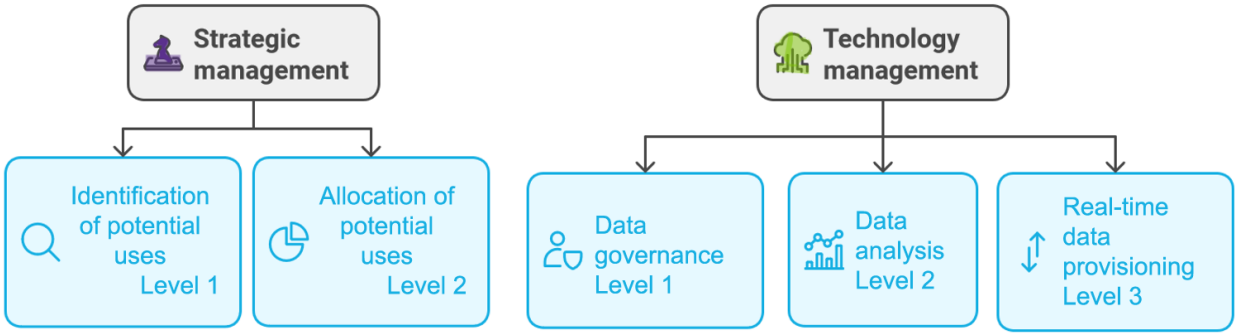

Figure 5. Crucial business capabilities with regard to AI implementation and their levels (Own illustration).

1. Strategic management: Implementation of AI in a company requires a clear strategic approach that focuses on several key levels. Level 1 involves the identification of potential uses. The ability to identify the application potential of AI in company processes forms the basis of strategic management (Mittelstand Digital Center Augsburg, 2024). Given the transformative power of self-learning systems, prompt identification of this potential is essential. Companies that already have experience in data science have a competitive advantage, while others run the risk of being left behind (Müller-Jones, 2017). For example, the AI periodic table developed by Bitkom, which presents the individual elements of AI as subfunctions within a periodic table, can be used as a basis for identification (Bitkom, 2018). The second level concerns the integration of the identified potential into company processes (allocation of potential uses). Euphoria and uncertainty owing to a lack of knowledge about AI technologies pose major challenges (Pfannstiel &

Steinhoff, 2020). Companies should gather practical experience and use external expertise to conduct realistic assessments.

2. Technology management: The first relevant level identified is data management/data governance, which is the foundation for the use of AI. The availability of large amounts of data ("Big Data") is crucial for the performance of AI systems. Forecasts have shown a significant increase in the amount of global data (Statista, 2024) which opens new possibilities for sensor-based machines and systems (Rüping, 2024). Another decisive factor is the availability of data scientists and engineers as specialists who process data to ensure successful cooperation with AI. However, this considerable demand is offset by a major shortage of skilled workers in the IT sector, which has become a tangible problem in Germany and worldwide (DataCraft, 2023). Rapid growth in the data industry, including a steadily increasing demand for IT experts for complex analyses and machine learning models, contrasts with an insufficient supply of qualified candidates in the labor market. The demand for data experts is growing much faster than the supply of corresponding specialists (DataCraft, 2023).

Data analysis was identified as the second level, and real-time data provision as the third level. The ability to perform both of these activities is crucial for AI applications (Bundesdruckerei, 2022). Companies with a high degree of automation and comprehensive data acquisition are advantageous. Companies whose working methods are still based on traditional methods generally have neither sufficient networking of processes nor the ability to generate internal data and are therefore at a disadvantage. Identifying trends and patterns in datasets is a core task that machine learning enables (Krebs, 2018). The implementation of advanced technologies such as 5G networks plays a key role in Level 3 real-time data processing (BMDV, 2020). Corresponding technologies accelerate the training of AI algorithms, leading to an exponential increase in AI performance and benefits for organizations (Fraunhofer-Gesellschaft, 2024).

3.1.2. Strategic Challenges Within Feasibility

In addition to the aforementioned business capabilities, companies must overcome various **strategic challenges** from the beginning of an AI implementation project to ensure the feasibility of AI solutions. In this study, the strategic implementation of AI was analyzed within a feasibility assessment in three phases: 1. problem solving, 2. decision making, and 3. control, see Figure 6. Each phase entails specific strategic challenges that can be overcome through careful planning, provision of the right resources, and the continuous adaptation of corporate structures. This analysis clarifies that the success of AI implementation depends largely on the company's ability to make the right strategic decisions at each stage and deploy the technology in line with the company's objectives.

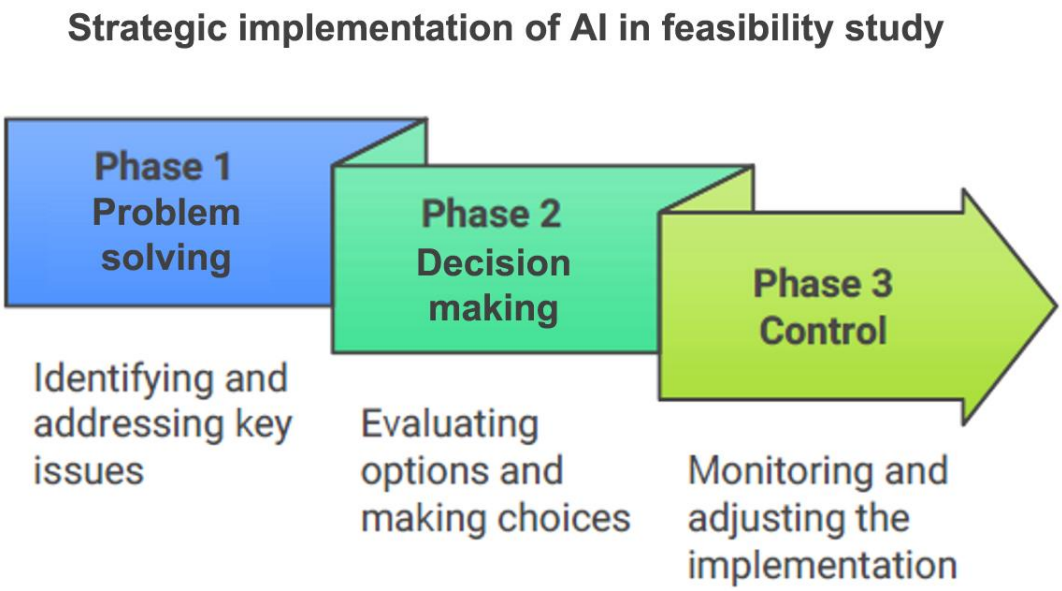

Figure 6. Key challenges in the strategic implementation of AI (Own illustration).

- Phase 1: Problem solving: In the first phase, the focus is on optimizing individual processes using AI, with the technology primarily serving as a support in solving specific problems. AI is used to structure data and provide users with an improved basis for decision-making. This phase is considered low-risk, as AI mainly performs support functions and no far-reaching changes to company structures are required. Nevertheless, the analysis shows that companies should not underestimate the fundamentally low risk in this phase. Practical implementation often shows that there is still a fundamental lack of knowledge and understanding of the necessary requirements and potential of AI in companies (Kiron, Ransbotham, Gerbert, & Reeves, 2017). The introduction of new technologies often requires a comprehensive adaptation of internal structures to meet the associated challenges. Coping with large amounts of data is an obstacle that has led to increased demand for digital solutions. Companies must digitize their business processes and effectively integrate IT systems. It is crucial that implementation is driven forward quickly, particularly through pilot projects that demonstrate potential, and that the necessary resources are made available. In addition, companies should identify their existing structures as potential obstacles and adapt them if necessary to successfully shape the innovation process (Kaufman, Christensen, & Shih, 2020). When initiating pilot projects, the make-or-buy decision also plays an important role in identifying and avoiding potential risks and costs at an early stage; companies are faced with the decision of whether to develop AI solutions themselves or purchase them from external providers (Obermaier, 2019). The make-or-buy decision depends on various factors, such as the complexity of the AI solution, available resources, and the strategic importance of AI for the company. Companies should not be fundamentally opposed to acquisition and cooperation, because the introduction of AI is expected to benefit the business model or value chain. The aim of this measure is to prevent costs or context-specific difficulties, which would be difficult to overcome, from arising in the first place. Furthermore, it is crucial that companies make a realistic assessment of whether the use of AI technology promises short-term, medium-term, or long-term success, as this has a significant influence on the strategic direction (see Section 3.3.1). Focusing purely on short-term success carries the risk that any existing problem in the relevant processes will worsen, which can lead to exponentially increasing negative development.
- Phase 2: Decision making: In the second phase of AI implementation, the application becomes increasingly complex. The aim is to use AI as a decision-support system in areas that involve complex but recurring tasks.

Research has shown that AI in this phase is used to develop more autonomous systems that can replace human actors or take over tasks. Precise analysis of the challenges that arise in the development of such systems is essential during this phase. The analysis shows that companies need to adapt their business processes to ensure effective communication and collaboration between departments (Obermaier, 2019). It is particularly important to optimize data transfer and ensure the flexibility of IT systems to enable seamless interaction between different departments. At this stage, it also becomes clear that companies need to consider not only the technical aspects of AI integration but also the impact on organizational structures and the need to promote interdisciplinary collaboration. A lack of consideration of these aspects can lead to a slowdown in implementation and inefficient systems.

- Phase 3: Control: The third phase of AI implementation involves fully integrating AI into complex systems that can make decisions autonomously. This phase requires continuous monitoring and control of AI systems, as they act increasingly independently. Research has shown that the introduction of monitoring mechanisms is essential for ensuring transparency regarding the success or failure of AI applications (VDI, 2022). In addition, AI must be continuously adapted to the company's goals, supported by safeguarding mechanisms that proactively accompany AI in its actions. In this phase, the interlocking of corporate structures is particularly important because successful implementation is only possible if all relevant departments and systems work together smoothly. Furthermore, the analysis shows that sustainable adaptation of employees to new technology is necessary to ensure the long-term use and success of AI. Therefore, the implementation of an advanced AI system is closely linked to a company's ability to adapt its internal structure and continuously involve employees in these processes.

Regarding strategic challenges, it must be emphasized that the integration of AI solutions into existing IT systems and processes is a complex and cost-intensive challenge. Companies with outdated IT systems must ensure that their systems satisfy the requirements of AI applications. In addition to the technical aspects of AI use, ethical and legal aspects must also be considered. The increasing regulation of AI, such as the European Artificial Intelligence Act of the European Union on March 13, 2024 (Long, 2024) poses new challenges for European companies and requires the implementation of mechanisms to ensure security, transparency, fairness, and data protection. This applies particularly to AI systems that are classified as high-risk, such as autonomous driving and maintenance robots, and are therefore subject to a range of comprehensive requirements.

3.1.3. Operationalizing Implementation within Feasibility Constraints

A structured process is required to successfully implement AI solutions. A phase model (see Figure 7) can serve as a guide for companies. The model comprises the following phases.

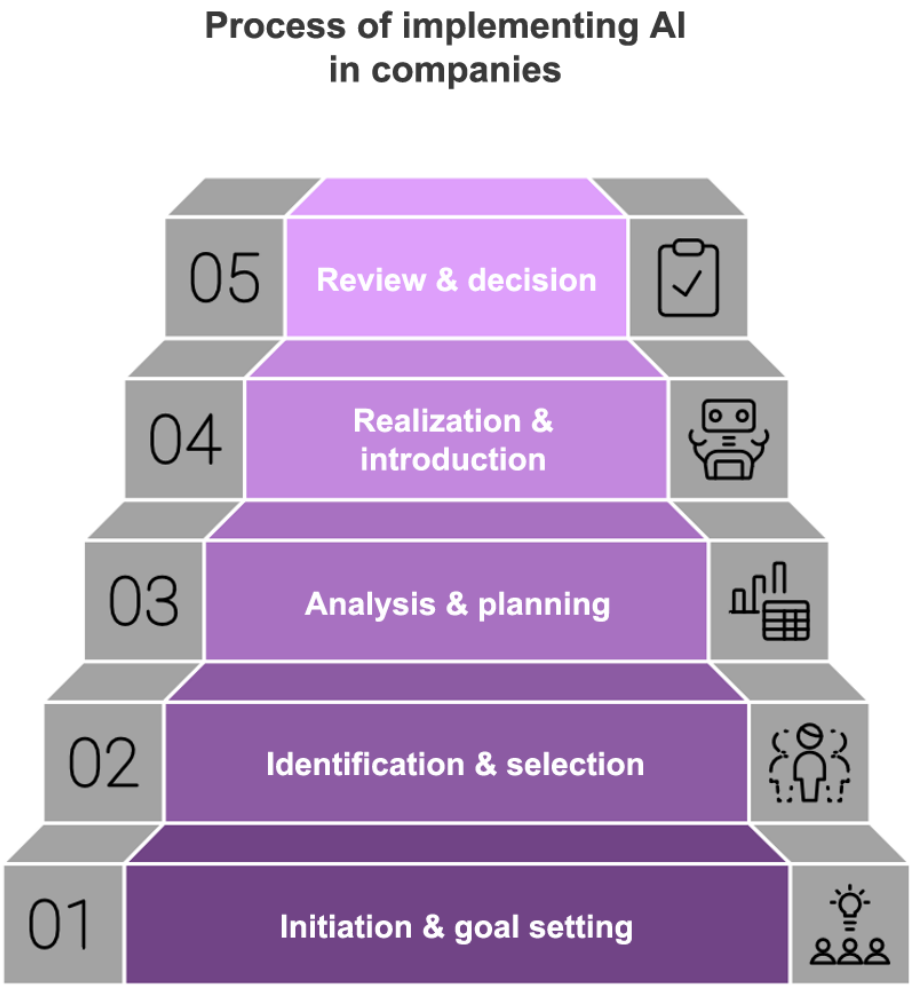

Figure 7. Possible procedure for implementing AI in a company (Own illustration).

1. Initiation and goal setting: The objectives, scope, and resources of an AI project are defined during this planning phase. The involvement of relevant stakeholders from various specialist areas is essential for considering the needs and requirements of all those involved. Precise definitions of internal and external resources, including personnel, time, and money, are required. The overarching goal of the project is to increase the company's benefits, which is why the content and scope of the artificial intelligence to be used in the project must be aligned accordingly.
2. Identification and selection of use cases: As part of the business process analysis, areas in which AI solutions can create added value are identified. It is advisable to create a comprehensive collection of potential use cases, for example, through suggestions submitted by employees for improvement. Creating an overview of the entire company allows for the identification of different levels of maturity with regard to suitability for the application of artificial intelligence (Funke, 2023). The subsequent evaluation of the probability of success of individual use cases is important for prioritizing projects (Hofmann et al., 2020).
3. Analysis and planning of technical and organizational implementation: Technical requirements, data sources, and necessary organizational adjustments are defined. It is advisable to form several teams to ensure that all aspects of AI are considered adequately (Kröning & Abend, 2022). An analysis of the status quo of the processes in which AI is to be used is essential to ensure the compatibility of the AI solution. The tasks, participants, quantity, effort, limits, and problems should be identified for each of the relevant processes (see

Figure 8). The results should be made available to all stakeholders involved in a comprehensive and precise documentation.

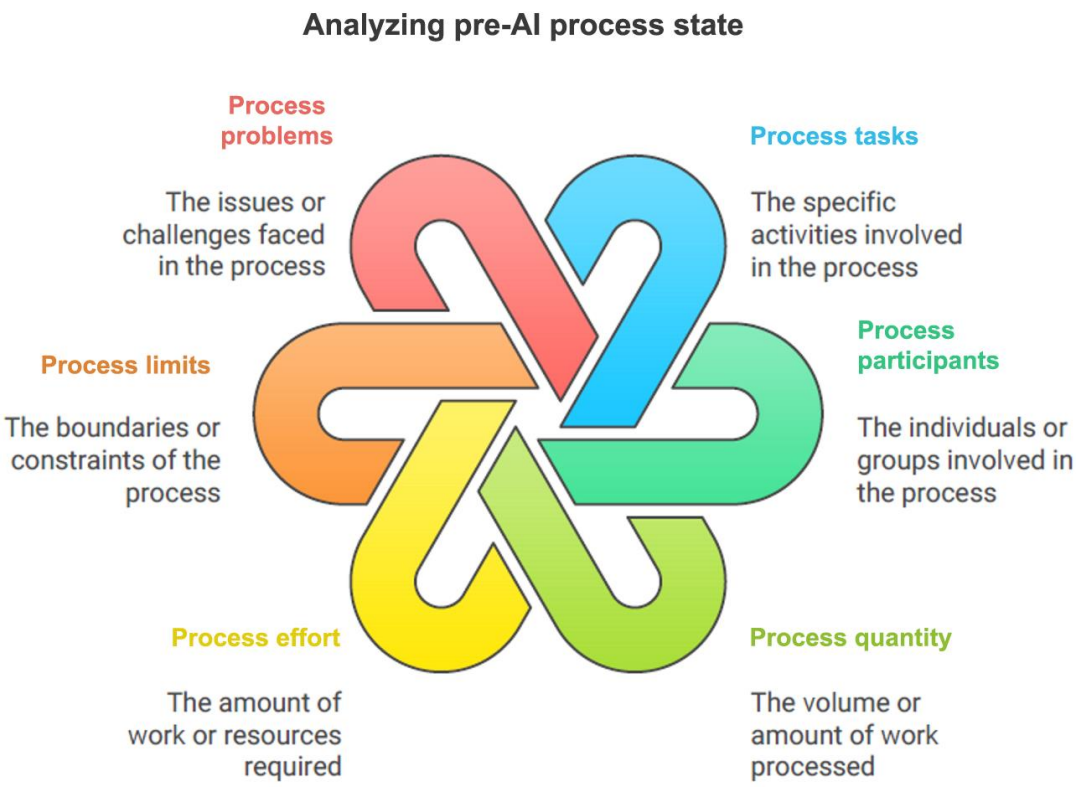

Figure 8. Required process information before AI implementation (Own illustration).

Based on the existing formulations of the actual state, the desired target state must be defined as follows: measurable goals must be defined, the attainability of which must be guaranteed by considering the existing structures of the company (Dukino, Hanussek, & Kötter, 2020). It is advisable to create a requirement specification sheet that adequately reflects the requirements and specifications of the technology. Among other things, this allows the need for necessary resources to be precisely determined and, if necessary, procured externally to compensate for any deficits within the company. In this case, it is advisable to create a functional specification sheet that deals in detail with the necessary technical basis for the introduction of AI. To check the feasibility, an AI feasibility check form should be used, in which the criteria of data scope, quality, availability, intelligence requirements, and solution alternatives are evaluated in detail (see Figure 9).

Evaluation of the reasonable feasibility (AI feasibility) of an AI application option								
AI Application:				Process:				
AI feasibility indicators				Assessment per indicator in points				
				low = 0	medium = 1	high = 2	very high = 3	Points
A	Scope of data	A1	What is the amount of information/data to be considered and available in the process?					
		A2	How diverse/different is the information/data used and available in the process?					
B	Data availability	B1	Is the information used/generated in the process available in digital form as data?					
		B2	Is process information exchanged digitally with upstream/downstream processes?					
C	Data quality	C1	How trustworthy/correct is the information/data available for the process?					
		C2	How meaningful (detailed/accurate) is the information/data available in the process?					
D	Intelligence requirement	D1	Do information-dependent conclusions or decisions have to be made in the process?					
		D2	How high (diverse/complex) are the conclusion/decision rules in the process?					
E	Alternative solutions	E1	Have simple alternative solutions without AI been tested for the application?					
		E2	Could the defined objectives of the application possibly be achieved without the use of AI?					
							Total points	

Figure 9. AI feasibility check form (own scheme).

Source: Stowasser (2023)

If the evaluation is positive and suitable hardware and software have been secured, AI implementation can be initiated, and a schedule can be drawn up.

4. Realization and introduction of the AI solution: The AI solution is developed, tested, and implemented in a company. To ensure the smooth introduction of AI, it is necessary to use it over a certain period, as this allows the identification and resolution of potential complications. User acceptance and friendliness of the AI solution are important success factors that also must be considered during this phase.

5. Review and decision on further use: The results of the AI project are evaluated, and a decision is made regarding the scaling and expansion of the AI solution. As part of the final acceptance, a final check of the target-actual comparison is carried out with regard to technical integration, whereby any improvements or optimizations can still be carried out (Hartmann & Schamberger, 2021). The success of a project should be evaluated using measurable key figures that were defined at the start of the project. A form should be used to evaluate the improvements realized by the AI application in a concrete and tangible way (see Figure 10).

Evaluation of the realized improvement (AI success) through the AI application
Example: predictive maintenance in the manufacturing industry

Application:							AI in operation since:			Date:		
Target aspect		AI application goals		Quantitative performance evaluation - Key performance indicators			Qualitative performance evaluation - improvement					
				Measured variable (KPI)	before AI	after AI	Change (in %)	none	very low	low	medium	high	very high
A	Profitability	A1	Increasing machine availability for customers	Availability time [hrs/week]									
		A2	Reduction of unplanned downtimes	Number of cases per month [pcs]									
		A3	Reduction in stocks of spare parts	Stock in [k €]									
		A4	Longer use of more expensive components (e.g. spindle)	Growth in [%]									
		A5	Increase in delivery reliability	Proportion of late deliveries [%]									
B	Knowledge/Technology	B1	Protection of process/company knowledge	No key figure available									
		B2	Improving AI competence in the company	No key figure available									
		B3	Improvement of technical AI equipment Company	Number of application tools [pcs]									
		B4	Realization State of the art in maintenance	No key figure available									
		B5	Improving technological competitiveness	No key figure available									
C	Environment	C1	Reduction in express deliveries and transportation	No key figure available									
		C2	Contribution of AI application to reducing CO2 emissions	No key figure available									
		C3	Contribution of AI application to reducing waste and wastewater	No key figure available									
		C4	Contribution of AI application to the reduction of environmentally critical substances	No key figure available									
D	Human resources	D1	Reduction in workload for employees	Overtime [hrs/month]									
		D2	Improving occupational health and safety	Sickness rate [%]									
		D3	Improving employee job satisfaction	MA satisfaction level [%]									
		D4	Conformity with legal requirements	No key figure available									

Figure 10. Checklist for evaluating the positive effects of AI: example "predictive maintenance".

Source: Stowasser (2023)

A misinterpretation of successes must be avoided, as this could lead to an unjustified continuation of the project and thus to a waste of resources.

3.2. Economic Viability of AI Solutions

Analysis of the economic viability of AI solutions focuses on assessing the business value of AI projects and identifying the factors that influence return on investment (ROI). The results show that the profitability of AI projects depends on various factors, such as the development of a robust business case**.** A detailed business case is essential to prove the economic viability of AI solutions and justify necessary investments. Scalability of the AI solution must also be ensured. This is an important factor for profitability as it maximizes benefits and reduces costs per application. Seamless integration of AI solutions into existing systems and processes is crucial for efficiency and ROI. These aspects are discussed in the following sections.

3.2.1. Identifying the Fundamentals of Business Value

The economic viability of AI solutions is an essential factor in companies' decision-making. AI solutions can achieve various benefits (Haller, 2022).

1. Information benefits: AI solutions can improve data quality, data analysis, and the basis for decision-making. For example, AI systems can analyze large amounts of data and identify patterns that are invisible to

analysts. In addition, a more precise analysis of developments in the market and customer behavior is possible, which enables companies to act proactively (Kitsios & Kamariotou, 2021).

2. Transaction benefits: AI solutions can automate processes, reduce costs, and increase efficiency (Perifanis & Kitsios, 2023). For example, AI systems can perform repetitive tasks, thereby freeing employees from more complex tasks.
3. Strategic advantages: AI solutions can improve competitiveness, open new markets, and enable new business models (Swen Nadkarni & Reinhard Prügl, 2021). For example, AI systems can develop personalized products and services that better meet customer needs.
4. Transformative benefits: AI solutions can fundamentally change the way work is done and the corporate culture. For example, AI systems can improve collaboration between employees and speed up decision-making. Relevant criteria include the availability of additional functionalities or optimized usage options, although these can generally be fully exploited with increasing familiarity with the technology (Enholm et al., 2022).

However, the strategic value of an initiative in the field of AI cannot be determined solely by assessing the specific benefits; it must also consider the long-term sustainability and profitability of the project. Companies should pursue a balanced strategy that considers both short-term gains and sustainability (see Section 3.3.1). A focus on short-term market share entails the risk that the company may achieve success quickly but lose stability in the long term. To build a stable position, it is necessary for the company to develop a strategy that is geared towards both short- and long-term goals.

When designing a business case for AI projects, two aspects must be taken into account: 1. The insights gained serve only as inspiration and are not directly transferable owing to the individuality of companies and situations (Ruess et al., 2024). 2. Corporate culture and policy significantly influence the choice of the most suitable benefits (Kutzias, 2021).

In principle, transactional benefits are easy to quantify and are suitable for companies that base their decisions primarily on financial figures. Transformative and strategic benefits are more difficult to measure, but can be attractive for visionary decision-makers (Döbel et al., 2019). Financing information benefits are often the easiest to realize because it does not require prior quantification. This enables easier entry into data and AI-driven transformation, typically starting with easy-to-implement projects (Stowasser, 2023). In addition to quantifiable benefits, an open corporate culture and awareness of elusive but potentially fundamental benefits are crucial for investing in AI.

3.2.2. The Scaling of Artificial Intelligence

Scaling AI solutions enables companies to maximize the benefits of AI solutions and reduce costs per application. A scaled AI solution is used throughout the company and thus generates a measurable added value for the company (Wallraff et al., 2024). Therefore, AI scaling is crucial for the economic success of AI projects. While the early phases of an AI project ("Start" to "Proof of Concept," see below and Figure 11) often raise high expectations of ROI. However, many projects fail in practice because the concepts developed cannot be transferred to the entire operating situation (Feike, Bienzeisler, & Neuhüttler, 2024). For long-term success, AI should by no means be regarded as a prototype project but must be scaled up to increase the company's competitiveness and achieve growth targets.

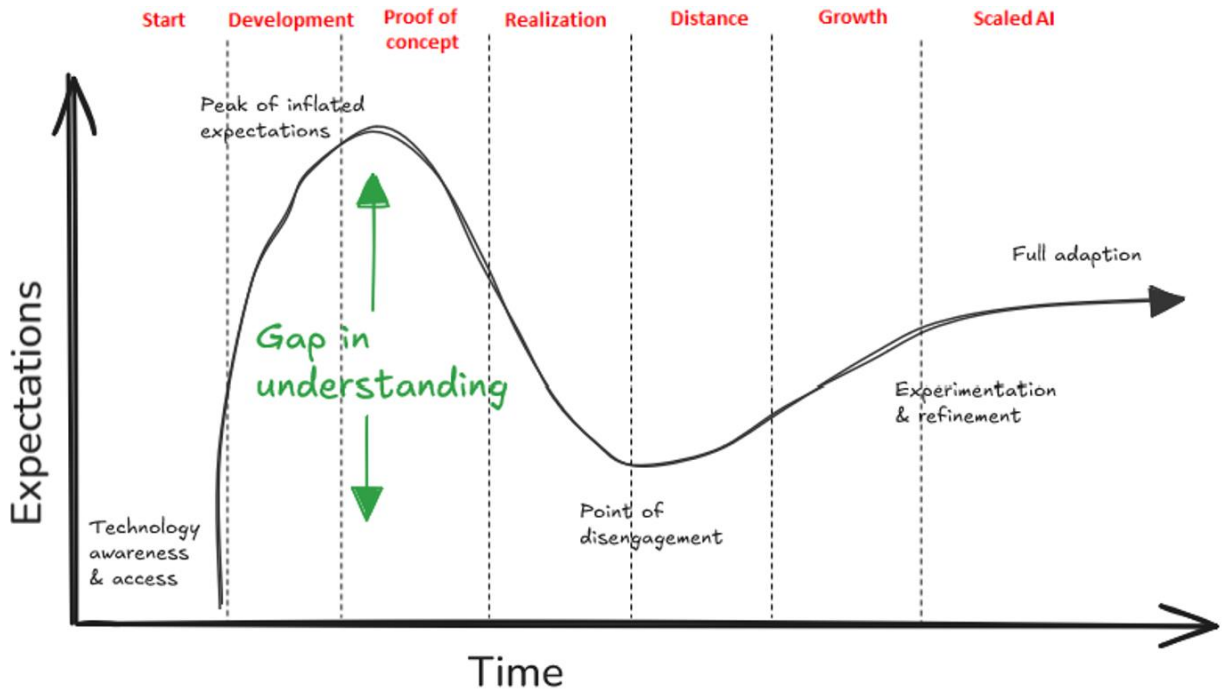

Figure 11. Typical progression of AI projects (own illustration).
Source: Ko and Morris (2024) and Lichtenthaler (2021).

The typical process of AI projects described here shows that the scaling of AI solutions occurs in different phases and is accompanied by different expectations as well as positive and negative experiences. Initial prototypes are developed and tested during the start-up phase. In the "proof of concept" phase, the feasibility of the AI solution is tested in practice. In the "realization" to "growth" phases, companies can gain valuable insights into what AI technologies can currently achieve in their own processes. Additionally, an initial overview of the efficiency of technology use, associated costs, and expected added value is provided (see (Feike et al., 2024)). Highly developed research concepts cannot easily be transferred or implemented in all operating situations (Vranješ, Topalis, & Niggemann, 2022). After the initial disillusionment, the focus returns to core entrepreneurial competencies, such as process design, software development, and employee integration. In the final phase, scaled AI, the AI solution is used throughout the company.

As far as costs are concerned, different costs are incurred in different phases, reflecting specific requirements and challenges. During the "start" phase, the highest costs are associated with the recruitment and retention of data scientists (DataCraft, 2023). Specialists with an in-depth knowledge of data processing are crucial for building the digital infrastructure necessary to successfully launch AI applications. Preventive workforce planning can avoid unnecessary follow-up costs due to inadequate staffing.

In the "realization" phase, there are additional costs for cloud services, particularly as these offer a flexible infrastructure for processing and storing large volumes of data. Cloud-based data storage is especially important for companies with large datasets or for regular training of AI models. However, the cloud model carries the risk of unforeseen cost increases if the usage is not effectively monitored. To ensure efficient use, a well-designed and transparent cloud strategy is required. Finally, in the "scaled AI" phase, costs are incurred through the adaptation and implementation of AI solutions across the entire company, which requires the comprehensive integration of AI tools and adaptation of company processes. It is crucial to ensure close collaboration among different departments to efficiently use the technology across companies.

In addition, companies implementing AI must be aware that the necessary scaling of AI solutions requires various challenges to be overcome and resources to be planned for from the outset. On the one hand, scaling requires robust data management that guarantees the availability, quality, and security of the data. In addition, scaling AI solutions requires organizational adjustments such as the creation of new roles and processes. Effective change management that promotes acceptance of AI solutions in the workforce is essential.

3.3. Demand for AI Solutions: Addressing Desirability

Analysis of the need for AI solutions focuses on identifying the specific fields of application of AI in companies and evaluating the benefits for companies and customers. The results show that AI solutions can create added value in various areas. For example, AI algorithms can be used to optimize production processes to increase efficiency, reduce costs, and improve quality. In addition, AI-based chatbots and personalized recommendations can improve the customer experience and strengthen customer loyalty. AI solutions can also automate repetitive and time-consuming business processes to increase productivity and reduce employee workloads. However, it is not helpful to simply implement the idea of artificial intelligence applications without reflection. Rather, it is essential to justify why AI technology should be used to move away from previous technologies.

3.3.1. Strategic Classification of Demand

Strategic classification of the need for AI solutions is essential to ensure that AI projects actually support a company's goals. To this end, it is helpful to apply the 3-horizon model originally described by McKinsey consultants Baghai, Coley, and White (1999) to assign the need for AI solutions to short-, medium-, and long-term goals (see Figure 12).

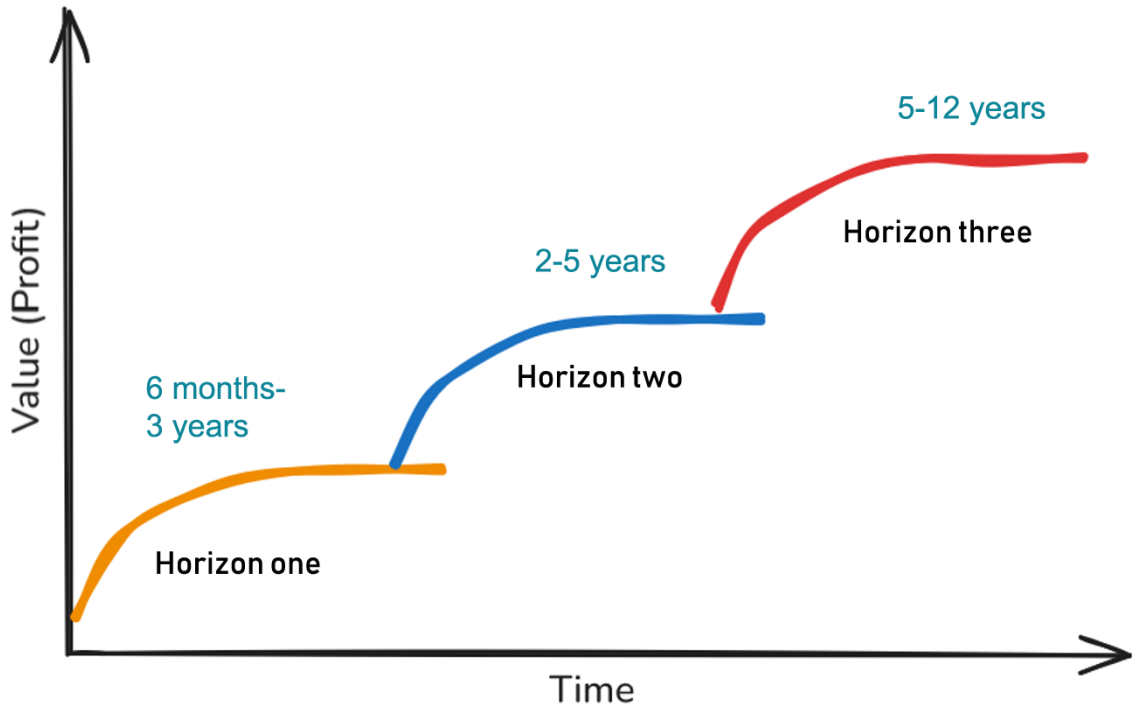

Figure 12. Three horizons growth model (own illustration, adapted from The McKinsey three horizons of growth model).
Source: Baghai et al. (1999).

The 3-horizon model provides a strategic framework that helps companies identify and prioritize growth opportunities without jeopardizing the existing business models. It divides the innovation process into three different horizons: short-term (horizon 1) of six months to three years, medium-term (horizon 2) of two to five

years, and long-term (horizon 3) of five to twelve years. In today's world, where AI is becoming increasingly important, this model provides a structured method for planning and implementing the need for AI solutions across the three horizons. This model enables companies to clearly structure their AI strategies and plan the implementation of AI solutions over different timeframes. Short-term efficiency gains are achieved in the first horizon, growth-enhancing innovations are developed in the second horizon, and long-term transformative AI applications are realized in the third horizon. The key to success lies in managing all three horizons in parallel and allocating resources in a way that supports both the current and future business goals. Through this integrative approach, companies can not only secure their competitiveness in the current market but also develop a sustainable, AI-supported growth strategy for the future.

Specifically, these three temporal levels and the goals assigned to them are to be considered in the integration of AI solutions:

- Horizon 1: Optimization of existing business models through AI.

In the first horizon, the focus is on continuous development through incremental improvements to the already implemented processes and maintenance of the existing business model (Kreutzer, 2020). AI solutions can help to automate processes, increase efficiency, and improve customer loyalty. Companies can use AI for data analysis and predictive analytics or to optimize supply chains. One example is the optimization of energy consumption in the steel industry through AI-based predictive demand calculation and efficient resource allocation, which helps reduce energy costs (Dusold & Ringel, 2023). At this stage, companies should implement AI technologies that deliver immediate, measurable value without significantly changing the existing infrastructure. The challenge is to identify appropriate applications that support current business processes while minimizing the risks posed by new technologies.

- Horizon 2: Expansion of the business through new AI applications.

The second horizon concerns researching and implementing innovation opportunities that can drive a company forward over the next two to five years. The focus here is on integrating new technologies such as AI into existing products and services. Radical changes are also observed. Companies want to use AI to develop new business models and enhance existing products through intelligent functions. One example is the use of machine learning to personalize products or services, or the implementation of AI-supported chatbots in customer service. Another example is the application of AI in robotics, where AI-controlled robots perceive their environment, process data, and perform complex tasks, such as autonomous testing of components based on specifications (Intel, 2024). This horizon requires investment and resources to successfully test and scale AI applications in order to secure a future competitive advantage.

- Horizon 3: Long-term transformation and disruptive AI innovations.

The third horizon concerns the company's long-term vision, which is based on radical innovations that will be realized in the next five to twelve years. AI technologies can form the basis for completely new business models or products that do not yet exist (Hornung, 2024). While AI in Horizons 1 and 2 is primarily focused on the speed of development and the short- and medium-term benefits, and the aim is to generate a preliminary market share, companies in horizon 3 focus on exploring new opportunities through AI. The possibility of new competition emerging in the market is also considered. This is because companies in this horizon could open new markets or even create completely new industries using advanced AI, such as AI in research and development. One example is the ChatGPT application from OpenAI. This horizon requires a high level of R&D and a willingness to invest in potentially risky but also potentially lucrative projects. It is worth mentioning that companies whose industries are developing their focus in the field of AI are under a certain amount of pressure to participate in this development. A

long-term view leads to the conclusion that future marketability could be impaired, which could lead to the decimation of market share.

3.3.2. Evaluating the Need for Artificial Intelligence

A significant increase in the importance of AI has been observed in recent years (Hildesheim & Michelsen, 2021). This trend has led to continuous changes in business models and processes. Considering the desirable characteristics of the applications through AI, companies are required to carry out a strategic analysis to determine the optimal use of the technologies and thus generate maximum benefit for all parties involved. Various methods can be used to evaluate the actual needs of AI solutions. The following sections present the Design Thinking approach to ensure a structured and user-centered methodology, as well as the AI Canvas to identify relevant and beneficial applications of AI.

1. Design Thinking: Design thinking is an iterative and user-centered approach that can ensure that AI applications can be used successfully in a corporate context. This creative process occurs in several phases (Feichtenbeiner, 2022). It can help understand the needs of users of AI solutions and develop innovative solutions (see Figure 13).

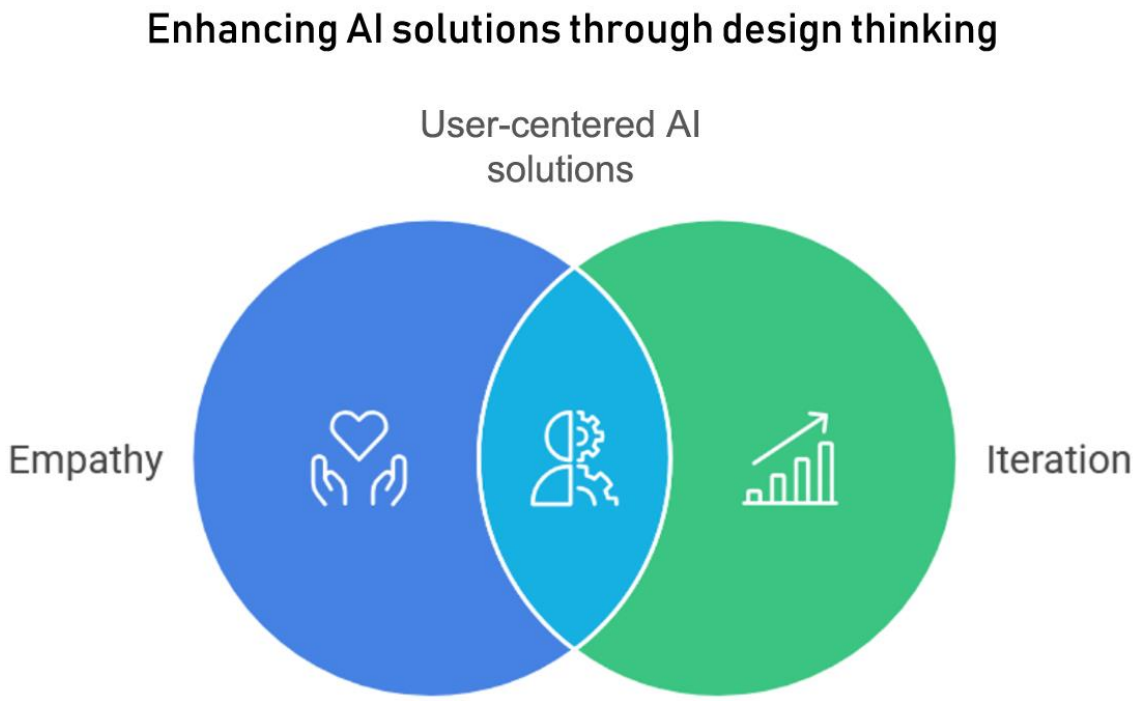

Figure 13. Enhancing AI solutions through design thinking (Own illustration).

AI solutions can be developed to increase user acceptance and friendliness by involving users in the development process. Design thinking can help ensure that the factors of technical feasibility, economic viability, and strategic orientation of the AI solution are considered in a user-centered manner.

A key advantage of design thinking is the avoidance of undesirable developments, as the focus on user needs prevents AI solutions from being developed without considering user needs from the outset (Feichtenbeiner, 2022). By involving users in the development process, AI solutions with a higher level of user acceptance and friendliness can be created. Additionally, design thinking enables a holistic view of a company and its processes in the context of AI implementation. By analyzing the needs and challenges of the users, defining the problem that the AI application should solve, and developing and testing prototypes, it is ensured that the AI solution is optimally tailored to the

specific requirements of the company. Another advantage of design thinking is the evaluation of functionality. This method helps companies assess the suitability of the functionality of the AI solution for the user and determines the extent to which the user can use and evaluate the resulting benefit. Finally, design thinking enables the development of a minimum viable product (MVP) (Ries, 2017) which is recommended for innovation projects based on data-based processes such as AI (see Gehm, 2022). This allows companies to develop and test prototypes quickly, without having to make large investments. This enables them to collect feedback from users at an early stage and iteratively improve their AI solution. To apply this approach, one must follow a five-phase procedure, as illustrated in Figure 14.

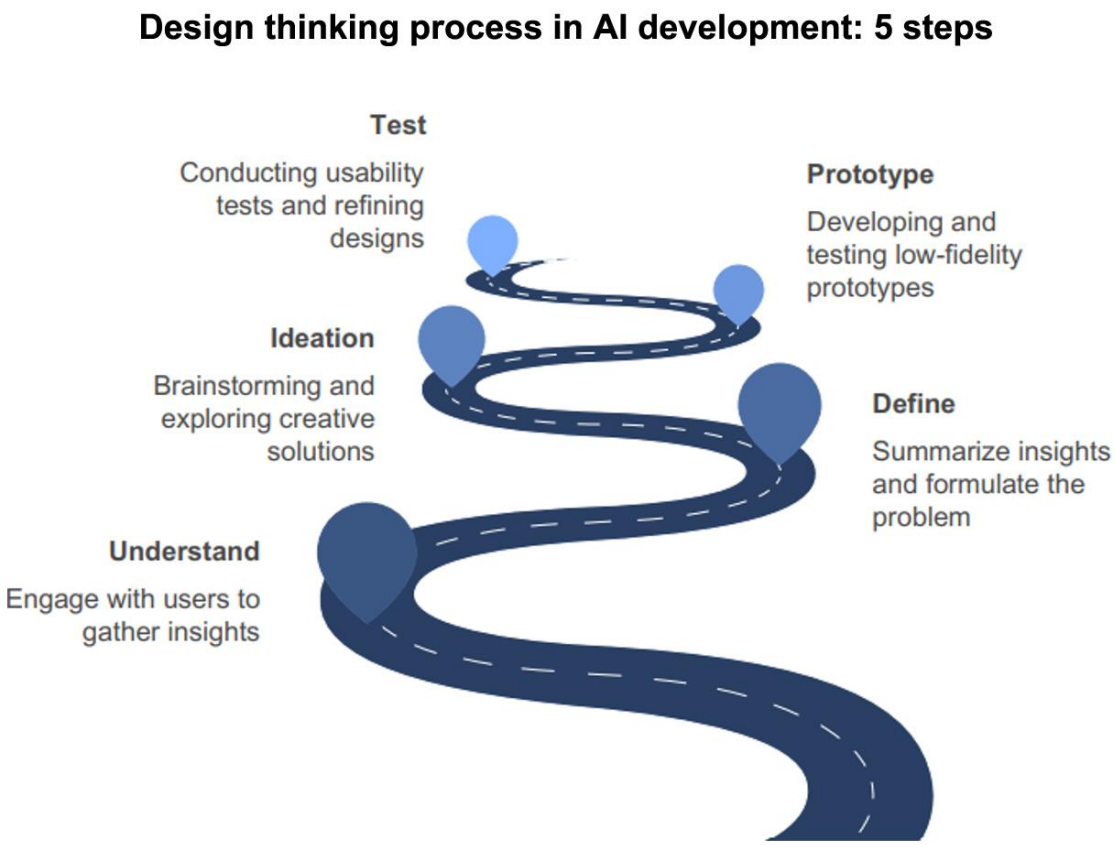

Figure 14. Key phases of design thinking in AI development (Own illustration).

The design-thinking approach is divided into five phases, which serve as processes for solving problems and developing innovative solutions. In the first two phases, "Understand" and "Define", the focus is on thoroughly analyzing the problem to be solved and identifying the basic needs of the users. The aim is to understand without bias which challenges are to be solved by the introduction of AI in the company, whereby the problem is analyzed openly and existing solution approaches are not initially considered (Gehm, 2022; Wobser, 2022). Entrepreneurs should ensure that they develop a deep understanding of the specific requirements of their organization and users' perspectives. In this phase, it is crucial to iteratively evaluate one's own strengths and resources and gather insights into AI. In the following phases, "Ideation", "Prototype", and "Test", the insights gathered are used to develop solutions and test them in practical prototypes. Entrepreneurs should ensure that the functionality of AI solutions is tailored to the actual needs of users and focus their efforts on the essentials. The concept of the MVP is helpful to initially work with a functional but simple prototype and make any necessary adjustments on this basis. An iterative approach makes it possible to develop an AI solution step-by-step and to identify errors or opportunities for

improvement at an early stage. Overall, design thinking ensures that AI solutions are developed in a tailored and user-centered manner, which increases the chances of successful implementation in the company. Therefore, entrepreneurs should use the principles of design thinking to optimize their internal processes and ensure the sustainable introduction of AI.

3. AI Canvas: AI Canvas is a tool that helps companies identify and structure AI opportunities and goals. The AI Canvas helps consider the relevant aspects of AI implementation, such as data sources, AI algorithms, resources required, and expected results (see Figure 15).

4.

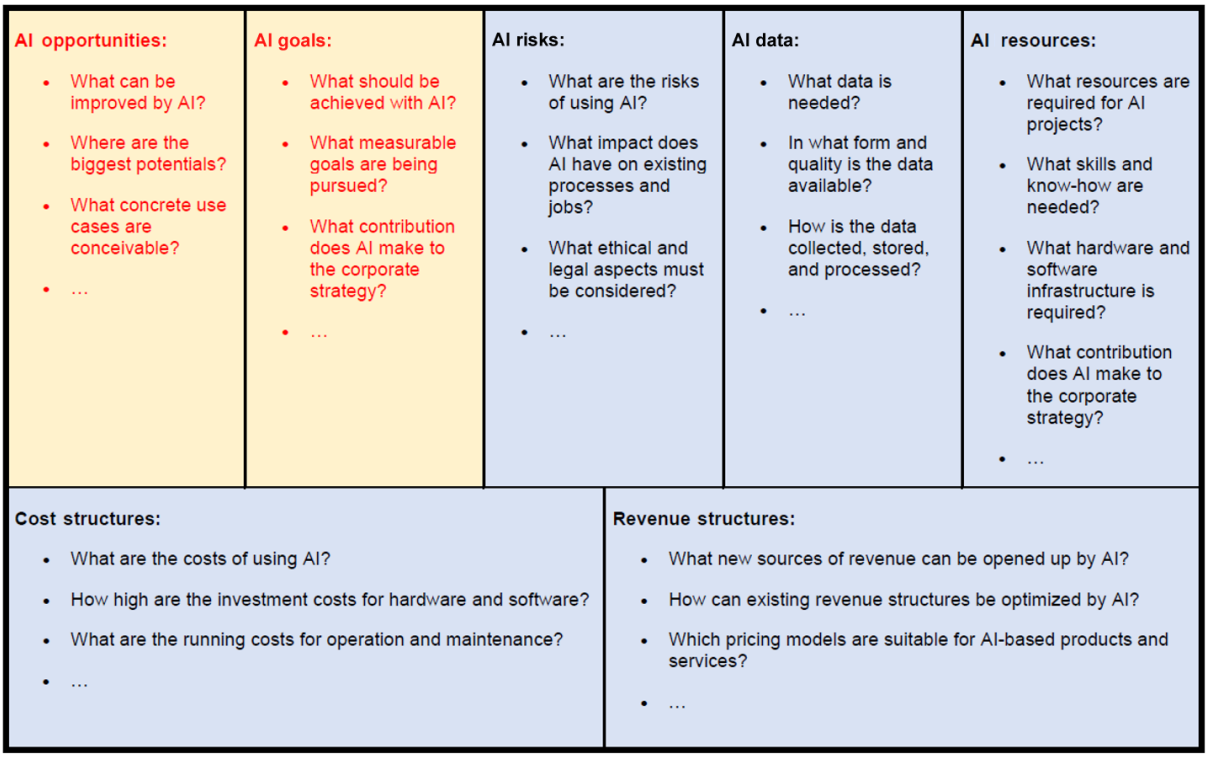

Figure 15. AI canvas (Own illustration, adapted from AI business model canvas).

Source: Kreutzer and Sirrenberg (2019).

The AI Canvas model provides valuable insights in the context of needs analysis for the use of AI and evaluation of AI Sweet Spots. It serves to clearly structure the opportunities, risks, goals, data basis, resources, cost structures, and revenue structures of AI innovations, and thus, identifies potential applications in companies. The two aspects, "AI Opportunities" and "AI Goals," are particularly important in the needs analysis, as they directly influence the need for AI and the direction of corporate strategy.

1. AI Opportunities: Using the canvas field "AI Opportunities" is about recognizing the potential of AI for your own company and analyzing where AI can improve existing processes or create completely new opportunities. Companies should ask themselves questions such as *What can be improved by AI? What is the greatest potential? What are the conceivable specific use cases?*

Numerous potential applications for AI have been identified in the manufacturing industry. One prominent example is predictive maintenance, in which algorithms optimize machine maintenance by predicting the maintenance requirements based on machine data. This reduces downtime and lowers maintenance costs (Kumar, Karim, Galar, & Kour, 2023). Further potential lies in production planning, where AI helps to maximize the use of resources and optimizes the utilization of machines, which leads to an increase in efficiency (Camarinha-Matos, Ferreira, & Brito, 2021).

In addition to increasing efficiency, AI technologies have provided opportunities for quality optimization. For example, machine vision and image processing systems can be used to monitor components in real time during production. Defects can be identified at an early stage, and corrective measures can be taken, which significantly reduce rejection rates and increase product quality (Fraunhofer IPK, 2024). Furthermore, AI offers the opportunity to produce more sustainably by optimizing energy consumption and minimizing material usage, which not only saves costs but also helps reduce the environmental impact (VDI Centre for Resource Efficiency, 2024).

Another potential of AI lies in individualized mass production, in which companies can personalize products without compromising the efficiency of mass production. This leads to a competitive differentiation and strengthens customer loyalty (Vöpel, 2023).

2. AI Goals: The canvas field "AI Goals" is intended to support the definition of clear goals that are to be achieved with the use of AI in your own company. These goals are crucial for AI projects and should be closely linked to corporate strategies. In the context of the AI Sweet Spot, this means formulating the objective in such a way that it maximizes both the technical and economic benefits for the company. Customers play a central role as well. Companies should answer questions such as *What should be achieved with AI? What measurable goals are being pursued? What contribution does AI make to corporate strategy?*

Improving customer interaction is a primary goal of the manufacturing industry. AI makes it possible to understand customer needs better and offer personalized products or services, leading to higher customer satisfaction (Peruchini, da Silva, & Teixeira, 2024). The development of customized products tailored to individual customer wishes strengthens customer loyalty and helps companies stand out from the competition. Another goal is to increase the product quality. AI can help minimize errors and increase efficiency by monitoring production processes in real time and by continuously optimizing quality (Jürgens, 2019). Ensuring high product quality and reliability is essential for companies to ensure customer satisfaction and to promote long-term brand loyalty.

An additional goal of manufacturing companies is to improve the flexibility and responsiveness of their supply chains. AI can be used to create demand forecasts that enable dynamic adjustments to the production plans. This leads to just-in-time production and reduced delivery times, which are particularly advantageous in markets with rapidly changing requirements (Göpfert, 2024).

The second goal is to promote sustainability and resource efficiency. By using AI, companies can optimize their energy consumption and minimize the use of materials, both of which reduce costs and protect the environment. These measures not only promote sustainability but can also lead to positive brand perceptions and greater customer loyalty (Grewal & Roggeveen, 2020).

In summary, it can be said that the needs analysis using the AI canvas model is a good tool for companies to specifically identify the opportunities and goals of AI. In particular, the optimization of production processes, the improvement of product quality, and the increase in flexibility and sustainability offer promising potential for the use of AI. When formulating AI goals, it is generally not sufficient to simply examine the technical feasibility; the needs and expectations of customers must also be considered. In this way, companies can ensure that their AI initiatives are not only technically successful but also create real added value for their customers and the company as a whole.

4. DISCUSSION

This study analyzes the implementation of AI in companies in the context of an Innovation Sweet Spot, i.e., it defines an AI Sweet Spot that encompasses the dimensions of feasibility, viability, and desirability. This study illustrates the challenges and potential of AI integration and offers practical insights and perspectives for future development.

In terms of hurdles, the results show that companies face considerable challenges when implementing AI (cf. (Altenfelder et al., 2021; Fraunhofer, 2023; Göpfert, 2024)). Technically, necessary IT infrastructure, high-quality data, and sufficient specialists in the fields of data science and AI development are often lacking (Cisco Systems., 2024b; DataCraft, 2023). In economic terms, uncertainties regarding long-term benefits and high initial investments are key hurdles. In addition, the identification and implementation of user-centric requirements are not always pursued consistently, which can impair the acceptance of AI systems.

This study provides valuable recommendations for actions aimed at addressing these challenges. These include the integration of user-centered methods, such as Design Thinking (Feichtenbeiner, 2022) the development of strategic skills, and effective change management that promotes the acceptance of AI among employees. In particular, the concept of the Innovation Sweet Spot has proven to be a helpful framework for balancing the dimensions of feasibility, viability, and demand, thus increasing the probability of the success of AI projects.

An important contribution of this study lies in answering the central research question: *What factors influence the successful implementation of AI software applications in companies, considering the three dimensions of the Innovation Sweet Spot: Feasibility, Viability, and Desirability?* The results show that the success of such projects strongly depends on the ability of companies to combine technical competence, strategic planning, and user-centered innovation. The validation of the success criteria clarifies that companies that holistically consider the dimensions of the AI Sweet Spot can realize a competitive advantage. This work emphasizes that an interdisciplinary approach is essential to meet technical, economic, and user-centric requirements. This provides a basis for practice-oriented recommendations for actions aimed at the sustainable and scalable integration of AI.

Another focus is on the discussion of potential future developments. New technologies such as generative AI create innovative opportunities for product development, customer interaction, and process optimization (Gartner Information Technology, 2024; Geramanis, Hutmacher, & Walser, 2023). Simultaneously, increasing legal regulations, such as the European AI Act, present companies with new challenges. These developments require the continuous adaptation of business strategies and the promotion of an innovation-friendly corporate culture to ensure long-term success (Kraft & Wockel, 2024). Companies that anticipate these trends at an early stage can play

a pioneering role in strengthening their competitiveness through targeted investments in technology, employee training, and strategic partnerships.

The findings of this study can help companies to successfully master the challenges of digital transformation and exploit the potential of AI for innovation and growth. However, this study has several limitations that should be considered when interpreting the results.

- Focusing on the manufacturing industry: This study focuses on the application of AI in the manufacturing industry. However, these results may not be applicable to other sectors.
- Qualitative research methodology: This study used a qualitative approach. Quantitative studies can validate and deepen the understanding of the findings of this study.
- Limited scope**:** This study provides an overview of the Innovation Sweet Spot and recommendations for the implementation of AI solutions by applying the concept of the Innovation Sweet Spot to AI implementation. It cannot provide a comprehensive analysis of all relevant aspects.

The research landscape in the field of AI software applications is dynamic and constantly evolving. However, several research gaps remain, particularly regarding the scalability, integration, and ethical aspects of AI solutions. Further research is required to investigate the long-term impact of AI on companies and society.

This study also directly opens up new fields of research, and additional research is needed to validate the models and tools proposed in this study in different industries and regional contexts. Therefore, future research could focus on the development of best practices for the implementation of AI solutions in different industries. The economic impact and practical applicability of the concepts presented in this thesis can also be explored in greater depth in future studies. Through comprehensive research in these areas, the full potential of AI can be harnessed for companies to successfully overcome the challenges of digital transformation.

5. CONCLUSIONS

This study shows that the success of AI projects depends crucially on the consideration of the dimensions of feasibility, cost-effectiveness, and demand. The AI Sweet Spot is a holistic approach for analyzing and evaluating these factors in a targeted manner. Companies that take a holistic view of these dimensions can realize competitive advantages and successfully shape digital transformation. The combination of technical expertise, strategic planning, and user-centered innovation is the decisive success factor.

Further development of AI technologies, such as generative AI, combined with increased regulation and the growing need to flexibly adapt business strategies, will further transform the role of AI in companies (Long, 2024; Siebel, 2024). Companies that proactively address these trends and establish an innovation-friendly corporate culture are in a better position to take full advantage of AI while meeting the ethical and regulatory requirements.

Although many companies currently see the urgency of increasingly addressing the potential of AI in their own company, very few currently see themselves in a position to successfully establish AI in their company. This is confirmed by a recent study on "AI Readiness" from November 2024 among 8,000 companies in 30 countries. While 98% of all respondents stated that the pressure to implement AI has increased in the last 12 months and 85% even saw a limited time window of a maximum of 18 months to successfully introduce AI, only 13% (in Germany, only 6%) of participants considered their company to be fully prepared for the implementation of AI (Cisco Systems., 2024b).

In summary, it can be said that the implementation of AI presents numerous challenges, but also immense opportunities. As the urgency for companies to successfully deal with the implementation of AI increases, further research on this topic should be promptly conducted. The recommendations for action developed in this study can

support companies from the strategic planning stage onwards in mastering the challenges of digital transformation and exploiting the opportunities and potential of AI to achieve sustainable success.

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